# IEEE 100
# The Authoritative Dictionary of IEEE Standards Terms

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# Introduction

IEEE standards establish an authoritative common language that defines quality and sets technical criteria. By guaranteeing consistency and conformity through open consensus, IEEE standards add value to products, facilitate trade, drive markets, and ensure safety. That's why leading companies, organizations, and industries around the globe rely on them.

Critical components of this common language are the terms and definitions that are at the foundation of the vast body of IEEE standards. In the past decade alone, hundreds of terms—describing the latest tools, techniques, and best practices—have been added to the lexicon of IEEE standards.

In this newly updated *Authoritative Dictionary of IEEE Standards Terms,* professional experts and students alike will gain an in-depth understanding and appreciation for the breadth of coverage of IEEE standards terms and definitions not found in any other single source.

The seventh edition of IEEE 100 has been revised to include nearly 35 000 technical terms and definitions from over 800 standards—covering areas such as power and energy, communications, information technology, and transportation systems. In addition to an extensive list of widely used acronyms and abbreviations, this new edition also contains detailed abstracts of each term's associated standard(s). What's more, all definitions are augmented by a combination of indispensable information, including:

- Preferred and popular usage of each term
- Variations in meanings among different technical specialties
- Cross-indexing to related works
- Key explanatory notes for further term clarification

In preparing this latest edition of the Dictionary, we realized that the standards community desired more than just a compilation of IEEE standardized terms and definitions. They needed an authoritative resource created by the organization that develops and produces the standards from which the terms and definitions are derived—the IEEE. In addition, we determined the Dictionary needed to be not only user friendly, but also rich in information. In other words, it needed to be the *Authoritative Dictionary of IEEE Standards Terms*.

Susan K. Tatiner
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Additional assistance was provided by the IEEE Standards editorial staff.

## How to Use This Dictionary

The terms defined in the Dictionary are listed in *letter-by-letter* alphabetical order. Spaces are ignored in this style of alphabetization, so *cable value* will come before *cab signal*. Descriptive categories associated with the term in earlier editions of the Dictionary will follow the term in parentheses. New categories appear after the definitions (see Categories, below), followed by the designation of the standard or standards that include the definition. If a standard designation is followed by the letter *s,* it means that edition of the standard was superseded by a newer revision and the term was not included in the revision. If a designation is followed by the letter *w,* it means that edition of the standard was withdrawn and not replaced by a revision. A bracketed number refers to the non-IEEE standard sources given in the back of the book.

Abstracts of the current set of approved IEEE standards are provided in the back of the book. It should be noted that updated information about IEEE standards can be obtained at any time from the IEEE Standards World Wide Web site at http://standards.ieee.org/.

## Categories

The category abbreviations that are used in this edition of the Dictionary are defined below. This information is provided to help elucidate the context of the definition. Older terms for which no category could be found have had the category *Std100* assigned to them. Note that terms from sources other than IEEE standards, such as the National Electrical Code® (NEC®) or the National Fire Protection Association, may not be from the most recent editions; the reader is cautioned to check the latest editions of all sources for the most up-to-date terminology.

### Categories sorted by abbreviation

| | |
|---|---|
| AES | aerospace and electronic systems |
| AHDL | computer—Analog Hardware Descriptive Language |
| AMR | automatic meter reading and energy management |
| AP | antennas and propagation |
| ATL | computer—Abbreviated Test Language for All Systems |
| BA | computer—bus architecture |
| BT | broadcast technology |
| C | computer |
| CAS | circuits and systems |
| CE | consumer electronics |
| CHM | components, hybrids, and manufacturing technology |
| COM | communications |
| CS | control systems |
| DA | computer—design automation |
| DEI | dielectrics and electrical insulation |
| DESG | dispersed energy storage and generation |
| DIS | computer—distributed interactive simulation |
| ED | electron devices |
| EDU | education |
| EEC | electrical equipment and components |
| ELM | electricity metering |
| EM | engineering management |
| EMB | engineering in medicine and biology |
| EMC | electromagnetic compatibility |
| GRS | geoscience and remote sensing |
| GSD | graphic symbols and designations |
| IA | industry applications |
| IE | industrial electronics |
| II | information infrastructure |
| IM | instrumentation and measurement |
| IT | information theory |



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| | |
|---|---|
| IVHS | intelligent vehicle highway systems |
| LEO | lasers and electro-optics |
| LM | computer—local and metropolitan area networks |
| MAG | magnetics |
| MIL | military |
| MM | computer—microprocessors and microcomputers |
| MTT | microwave theory and techniques |
| NEC | National Electrical Code |
| NESC | National Electrical Safety Code |
| NFPA | National Fire Protection Association |
| NI | nuclear instruments |
| NIR | non-ionizing radiation |
| NN | neural networks |
| NPS | nuclear and plasma sciences |
| ODM | computer—optical disk and multimedia platforms |
| OE | oceanic engineering |
| PA | computer—portable applications |
| PE | power engineering |
| PEL | power electronics |
| PQ | power quality |
| PSPD | power surge protective devices |
| PV | photovoltaics |
| QUL | quantities, units, and letter symbols |
| R | reliability |
| RA | robotics and automation |
| REM | rotating electrical machinery |
| RL | roadway lighting |
| S&P | computer—security and privacy |
| SB | stationary batteries |
| SE | computer—software engineering |
| SMC | systems, man, and cybernetics |
| SP | signal processing |
| Std100 | Standard 100 legacy data |
| SUB | substations |
| SWG | power switchgear |
| T&D | transmission and distribution |
| TF | time and frequency |
| TRR | transformers, regulators, and reactors |
| TT | test technology |
| UFFC | ultrasonics, ferroelectrics, and frequency control |
| VT | vehicular technology |

## Categories sorted by name

| | |
|---|---|
| aerospace and electronic systems | AES |
| antennas and propagation | AP |
| automatic meter reading and energy management | AMR |
| broadcast technology | BT |
| circuits and systems | CAS |
| communication | COM |
| components, hybrids, and manufacturing technology | CHM |
| computer | C |
| computer—Abbreviated Test Language for All Systems | ATL |
| computer—Analog Hardware Descriptive Language | AHDL |
| computer—bus architecture | BA |
| computer—design automation | DA |
| computer—distributed interactive simulation | DIS |
| computer—local and metropolitan area networks | LM |
| computer—microprocessors and microcomputers | MM |
| computer—optical disk and multimedia platforms | ODM |
| computer—portable applications | PA |
| computer—security and privacy | S&P |
| computer—software engineering | SE |
| consumer electronics | CE |



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| | |
|---|---|
| control systems | CS |
| dielectrics and electrical insulation | DEI |
| dispersed energy storage and generation | DESG |
| education | EDU |
| electrical equipment and components | EEC |
| electricity metering | ELM |
| electromagnetic compatibility | EMC |
| electron devices | ED |
| engineering in medicine and biology | EMB |
| engineering management | EM |
| geoscience and remote sensing | GRS |
| graphic symbols and designations | GSD |
| industrial electronics | IE |
| industry applications | IA |
| information infrastructure | II |
| information theory | IT |
| instrumentation and measurement | IM |
| intelligent vehicle highway systems | IVHS |
| lasers and electro-optics | LEO |
| magnetics | MAG |
| microwave theory and techniques | MTT |
| military | MIL |
| National Electrical Code | NEC |
| National Electrical Safety Code | NESC |
| National Fire Protection Association | NFPA |
| neural networks | NN |
| non-ionizing radiation | NIR |
| nuclear and plasma sciences | NPS |
| nuclear instruments | NI |
| oceanic engineering | OE |
| photovoltaics | PV |
| power electronics | PEL |
| power engineering | PE |
| power quality | PQ |
| power switchgear | SWG |
| quantities, units, and letter symbols | QUL |
| reliability | R |
| roadway lighting | RL |
| robotics and automation | RA |
| rotating electrical machinery | REM |
| signal processing | SP |
| Standard 100 legacy data | Std100 |
| stationary batteries | SB |
| substations | SUB |
| surge-protective devices | PSPD |
| systems, man, and cybernetics | SMC |
| test technology | TT |
| time and frequency | TF |
| transformers, regulators, and reactors | TRR |
| transmission and distribution | T&D |
| ultrasonics, ferroelectrics, and frequency control | UFFC |
| vehicular technology | VT |

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# C

**c** *See:* centi.

**C** A programming language, standardized by ANSI and ISO, designed for systems programming but also well-suited for general problem solving. Features include concise expressions, well-designed control flow and data structures, and a broad range of operators. *Note:* B is an ancestor of C. *See also:* C++; ANSI C; block-structured language. (C) 610.13-1993w

**C++** A general-purpose programming language based on C, characterized by having facilities for performing object-oriented programming. (C) 610.13-1993w

**cabinet (1)** An enclosure designed either for surface or flush mounting and provided with a frame, mat, or trim in which a swinging door or doors are or may be hung. (NESC/NEC) [86]

**(2) (power system communication equipment)** An enclosure provided with an internal equipment mounting rack and hinged doors. (PE/PSC) 281-1984w

**(3) (electronic)** A protective enclosure to house modules, backplane(s), I/O connector assemblies, internal cables, and other electronic, mechanical, and thermal devices. *Synonyms:* rack; box; rack; box. (BA/C) 14536-1995

**cabinet interface** The cabinet interface provides within a cabinet the standardized mechanisms for mounting modules, backplane(s), and I/O connector assemblies, and for mounting other electronic, mechanical and thermal devices. The cabinet interface provides heat exchanging facilities, with standardized capabilities for transferring heat from modules and other heat sources within the cabinet, to external heat sink(s). (C/BA) 14536-1995

**cabinet for safe (burglar-alarm system)** Usually a wood enclosure, having protective linings on all inside surfaces and traps on the doors, built to surround a safe and designed to produce an alarm condition in a protection circuit if an attempt is made to attack the safe. *See also:* protective signaling. (EEC/PE) [119]

**cable (1) (signal-transmission system)** A transmission line or group of transmission lines mechanically assembled into a complex flexible form. *Note:* The conductors are insulated and are closely spaced and usually have a common outer cover which may be an electric portion of the cable. This definition also includes a twisted pair. (MTT) 146-1980w

**(2) (communication and control cables)** An insulated conductor or combination of electric conductors that are insulated from each other. A shield is usually provided. (PE/PSC) 789-1988w

**(3)** An assembly of one or more conductors within an enveloping protective sheath, constructed to allow use of the conductors separately or in groups. *See also:* transceiver cable; coaxial cable; drop cable; trunk cable; attachment unit interface cable; twinaxial cable; optical cable. (C) 610.7-1995

**(4)** A conductor with insulation, or a stranded conductor with or without insulation and other coverings (single-conductor cable) or a combination of conductors insulated from one another (multiple-conductor cable). *See also:* spacer cable. (NESC/T&D) C2-1997, C2.2-1960

**(5) (fiber optics)** *See also:* optical cable. 812-1984w

**(6)** *See also:* conductor. (PE/T&D) 524-1992r

**cable accessories (power cable systems)** Those components of a cable system which cannot be readily disconnected from the cable and which will be subjected to the full test voltage applied to the cable system. (PE) 400-1980s

**cable armor** A metallic element or envelope inserted in or around a cable sheath to provide mechanical protection against rodents, severe installation conditions, etc. (PE/PSC) 789-1988w

**cable assembly** *See:* optical cable assembly; multifiber cable.

**cable attenuation** *See:* cable tilt.

**cable bedding (power distribution, underground cables)** A relatively thick layer of material, such as a jute serving, between two elements of a cable to provide a cushion effect, or gripping action, as between the lead sheath and wire armor of a submarine cable. (PE) [4]

**cable bond** An electric connection across a joint in the armor or lead sheath of a cable, or between the armor or lead sheath and the earth, or between the armor or sheath of adjacent cables. *See also:* continuity cable bond; cross cable bond. (EEC/PE) [119]

**cable buggy** *See:* conductor car.

**cable bus** An approved assembly of insulated conductors with fittings and conductor terminations in a completely enclosed, ventilated protective metal housing. The assembly is designed to carry fault current and to withstand the magnetic forces of such current. Cablebus shall be permitted at any voltage or current for which the spaced conductors are rated. Cablebus is ordinarily assembled at the point of installation from components furnished or specified by the manufacturer in accordance with instructions for the specific job. (NESC/NEC) [86]

**cable car** A seat or basket-shaped device, designed to be suspended by a framework, and two or more sheaves arranged in tandem to enable a workman to ride a single conductor, wire, or cable. *Synonyms:* conductor car; bicycle; cable trolley. (T&D/PE) 524-1992r

**cable charging current** Current supplied to an unloaded cable. *Note:* Current is expressed in rms amperes. (SWG/PE) C37.100-1992

**cable clamp** A device designed to clamp cables together. It consists of a "U" bolt threaded on both ends, two nuts, and a base, and is commonly used to make temporary *bend back* eyes on wire rope. *Synonym:* Crosby clip. (T&D/PE) 524-1992r

**cable complement (communication practice)** A group of pairs in a cable having some common distinguishing characteristic. *See also:* cable. (EEC/PE) [119]

**cable connection assembly** The combination of the cable termination with the cable connection enclosure, GIS conductor end and removable conductor link. (PE/IC) 1300-1996

**cable connection enclosure** The part of the GIS which surrounds the cable termination. (PE/IC) 1300-1996

**cable core (1) (A) (cable)** The portion lying under other elements of a cable. **(B)** The core of a cable is the cylindrical center consisting of insulated conductors usually twisted together in pairs and in pairs arranged together in groups that lie under the sheath. (T&D/PE/PSC) [10], 789-1988

**(2)** The portion of a cable that includes the conductor, the conductor shield, the insulation, and the extruded insulation shield. (PE/IC) 1142-1995

**cable core binder** A wrapping of tapes or cords around the several conductors of a multiple-conductor cable used to hold them together. *Note:* Cable core binder is usually supplemented by an outer covering of braid, jacket, or sheath. (T&D/PE) [10]

**cable coupler (rotating machinery)** A form of termination in which the ends of the machine winding are connected to the supply leads by means of a plug-and-socket device. (PE) [9]

**cable entrance fitting (pothead)** A fitting used to seal or attach the cable sheath or armor to the pothead. *Note:* A cable entrance fitting is also used to attach and support the cable sheath or armor where a cable passes into a transformer removable cable terminating box without the use of potheads. *See also:* transformer. (PE/TR) [107], [108]

**cable fill** The ratio of the number of pairs in use to the total number of pairs in a cable. *Note:* The maximum cable fill is the percentage of pairs in a cable that may be used safely and

economically without serious interference with the availability and continuity of service. *See also:* cable. (EEC/PE) [119]

**cable filler (1)** The material used in multiple-conductor cables to occupy the interstices formed by the assembly of the insulated conductors, thus forming a cable core of the desired shape (usually circular). (T&D/PE) [10]

**(2) (communication and control cables)** The material used in multiple-pair cables to occupy the interstices formed by the assembly of the insulated conductors, and to form a cable core of the desired shape (usually circular). A material may be used that resists the entrance of water (nonhydroscopic) and ionizes at a higher voltage than air. (PE/PSC) 789-1988w

**cable-fire break** Material, devices, or an assembly of parts installed in a cable system, other than at a cable penetration of a fire-resistive barrier, to prevent the spread of fire along the cable system. (PE/SUB/EDPG) 690-1984r, 525-1992r

**cableheads** *See:* submersible entrance terminals.

**cable in free air** That portion of a cable not routed in either a raceway or an enclosure. (PE/NP) 384-1992r

**cable in the zone of influence (wire-line communication facilities)** A high dielectric cable which provides high-voltage insulation between conductors and between conductors and shield. (PE/PSC) 487-1980s

**cable jacket (1)** A protective covering over the insulation, core, or sheath of a cable. (NESC) C2-1997

**(2) (communication and control cables)** A thermoplastic or thermosetting covering that is extruded over a cable to provide physical protection and electrical insulation. *(A) inner jacket*. A jacket that is extruded over the cable core covering to provide additional dielectric strength when it is needed between the conductors and the shield. An inner jacket may be used in cables that are used for direct burial and also where high ground potential rise is to be withstood. *(B) outer jacket*. A jacket that is extruded over the cable shield. It also may be extruded over both the shield and a supporting messenger cable. (PE/PSC) 789-1988w

**cable joint (1) (cable splice)** A connection between two or more separate lengths of cable with the conductors in one length connected individually to conductors in other lengths and with the protecting sheaths so connected as to extend protection over the joint. *Note:* Cable joints are designated by naming the conductors between which the joint is made, for example, 1 single-conductor to 2 single-conductor cables; 1 single-conductor to 3 single-conductor cables; 1 concentric to 2 concentric cables; 1 concentric to 1 single-conductor cable; 1 concentric to 2 single-conductor cables; 1 concentric to 4 single-conductor cables; 1 three-conductor to 3 single-conductor cables. *See also:* branch joint; reducing joint. (T&D/PE) [10]

**(2) (power cable joints)** A complete insulated splice or group of insulated splices contained within a single protective covering or housing. In some designs, the insulating material may also serve as the protective covering. Insulated end caps are considered joints in this context. *See also:* straight joint; branch joint; transition joint; insulating (isolating) joint. (PE/IC) 404-1986s

**cable Morse code** A three-element code, used mainly in submarine cable telegraphy, in which dots and dashes are represented by positive and negative current impulses of equal length, and a space by absence of current. *See also:* telegraphy. (EEC/PE) [119]

**cable penetration (cable-penetration fire stops, fire breaks, and system enclosures) (nuclear power generating station)** An assembly or group of assemblies for electrical conductors to enter and continue through a fire-rated structural wall, floor, or floor-ceiling assembly. (PE/SUB/EDPG) 690-1984r, 525-1992r, 634-1978w

**cable-penetration fire stop** Material, devices, or an assembly of parts providing cable penetrations through fire-rated walls, floors, for floor-ceiling assemblies, while maintaining required fire rating. (PE/SUB/IC/EDPG) 848-1996, 690-1984r, 525-1992r

**cable PHY** *See:* cable physical layer.

**cable physical layer** The version of the physical layer applicable to the Serial Bus cable environment. (C/MM) 1394-1995

**cable powered** Supplying power to active CATV equipment (for example, amplifiers) from the coaxial cable. This ac or dc power does not interfere with the RF information signal. (LM/C) 802.7-1989r

**cable pullback** The pulling of one or more cables out of a conduit system for the express purpose of repulling the cables into the same conduit. *Note:* Cable pullback is normally performed to allow relocation of a portion of a conduit system or to avoid pullbys during the installation of additional cables. (PE/IC) 1185-1994

**cable pullby** The pulling of cable(s) into a conduit that already contains one or more cables. (PE/IC) 1185-1994

**cable rack** A device usually secured to the wall of a manhole, cable raceway, or building to provide support for cables. (T&D/PE) [10]

**cable reel** A drum on which conductor cable is wound, including one or more collector rings and associated brushes, by means of which the electric circuit is made between the stationary winding on the locomotive or other mining device and the trailing cable that is wound on the drum. *Note:* The drum may be driven by an electric motor, a hydraulic motor, or mechanically from an axle on the machine. *See also:* mine feeder circuit. (PE/EEC/MIN) [119]

**cable segment (FASTBUS acquisition and control)** A FASTBUS segment consisting of a cable together with appropriate connectors for mating with devices. (NID) 960-1993

**cable separator (power distribution, underground cables)** A serving of threads, tapes, or films to separate two elements of the cable, usually to prevent contamination or adhesion. (PE) [4]

**cable sheath (1)** A tubular impervious metallic protective covering applied directly over the cable core. (PE/T&D/IC) [4], [10]

**(2) (communication and control cables)** The outer covering over the insulated conductors to provide mechanical and electrical protection for the conductors. In telephone-type cables, the sheath usually includes a shield, and may include armor. (PE/PSC) 789-1988w

**(3)** A conductive protective covering applied to cables. *Note:* A cable sheath may consist of multiple layers, of which one or more is conductive. (NESC/T&D) C2-1997, C2.2-1960

**cable sheath insulator (pothead)** An insulator used to insulate an electrically conductive cable sheath or armor from the metallic parts of the pothead or transformer removable cable terminating box in contact with the supporting structure for the purpose of controlling cable sheath currents. *See also:* transformer; transformer removable cable-terminating box. (PE/TR) [107], [108]

**cable shield (communication and control cables)** A conducting envelope, composed of metal strands, ribbon or sheet metal that encloses a wire, group of wires, or cable, so constructed that substantially every point on the surface of the underlying insulation or core wrap is at ground potential or at some predetermined potential with respect to ground. *See also:* duct edge fair-lead. (PE/PSC) 789-1988w

**cable shielding (nuclear power generating station) (cable systems in power generating stations) (shielding and shield grounding)** A nonmagnetic metallic material applied over the insulation of the conductor or conductors to confine the electric field of the cable to the insulation of the conductor or conductors. (PE/EDPG) 422-1977, 690-1984r

**cable splicer** A short piece of tubing or a specially formed band of metal generally used without solder in joining ends of portable cables for mining equipment. *See also:* mine feeder circuit. (PE/EEC/MIN) [119]

**cable spreading room (cable systems)** The cable spreading room is normally the area adjacent to the control room where cables leaving the panels are dispersed into various cable

trays for routing to all parts of the plant. (PE/EDPG) 422-1977

**cable-system enclosure (nuclear power generating station) (cable-penetration fire stops, fire breaks, and system enclosures)** An assembly installed around a cable system to maintain circuit integrity, for a specified time, of all circuits within the enclosure when it is exposed to the most severe fire that may be expected to occur in the area. (PE/SUB/EDPG) 690-1984r, 525-1992r

**cable terminal (1)** A device that provides insulated egress for the conductors. *Synonyms:* termination. (NESC) C2-1997
**(2) (power work)** A device that seals the end of a cable and provides insulated egress for the conductors. *Synonyms:* pothead; end bell. (PE/T&D) [10]

**cable termination** Parts assembled onto the end of the cable to provide the electrical and mechanical interface into the gas-insulated environment. Typically this includes a solid insulation barrier between the cable/cable fluid and the gas insulation of the GIS. (PE/IC) 1300-1996

**cable tilt (loss)** The amount of RF signal attenuation by a given coaxial cable. Cable attenuation is mainly a function of signal frequency, cable length, and diameter. Cables attenuate higher frequency signals more than lower frequency signals (tilt). Cable losses are usually referenced to the highest frequency carried (greatest loss) on the cable. (LM/C) 802.7-1989r

**cable tray (1) (raceway systems for Class 1E circuits for nuclear power generating stations)** A prefabricated metal raceway with or without covers consisting of siderails and bottom support sections. Bottom support sections may be ladder, trough, or solid. (PE/NP) 628-1987r
**(2) (electric power systems in commercial buildings)** A unit or assembly of units or sections, and associated fittings, made of metal or other noncombustible material forming a continuous rigid structure used to support cables. (IA/PSE) 241-1990r
**(3)** A raceway resembling a ladder and usually constructed of metal. Other styles of trays include solid-bottom and channel type. (PE/IC) 848-1996
**(4)** A continuous rigid structure used to support cables. Cable trays include ladders, troughs, channels and other similar structures. Conduits are not included in this category. (PE/IC) 817-1993w

**cable tray system (raceway systems for Class 1E circuits for nuclear power generating stations)** An assembly of metallic cable tray sections, fittings, supports, anchorages, and accessories that form a structural system to support wire and cables. (PE/NP) 628-1987r

**cable trolley** *See:* cable car.

**cable TV** A communication system that simultaneously distributes several different channels of broadcast programs and other information to customers via a coaxial cable. Previously called community antenna television (CATV). (LM/C) 802.7-1989r

**cable type (nuclear power generating station)** A cable type for purposes of qualification testing shall be representative of those cables having the same materials, similar construction, and service rating, as manufactured by a given manufacturer. (PE/NP) 380-1975w

**cable value** *See:* manhole.

**cab signal (1)** A signal located in the engineman's compartment or cab indicating a condition affecting the movement of a train or engine and used in conjunction with interlocking signals and in conjunction with or in lieu of block signals. *See also:* automatic train control. (EEC/PE) [119]
**(2) (system)** A signal located in the cab, indicating a condition affecting the movement of a train and used in conjunction with interlocking signals and in conjunction with or in lieu of block signals. (VT) 1475-1999

**cache (1)** A buffer inserted between one or more processors and the bus, used to hold currently active copies of blocks from main memory. (C/BA) 896.3-1993w
**(2)** A small portion of high-speed memory used for temporary storage of frequently-used data, instuctions, or operands. *See also:* instruction cache; disk cache; high-speed buffer; caching; cache architecture; data cache; cache memory. (C) 610.10-1994w
**(3)** *See also:* copy. (C/PA) 1328.2-1993w, 1224.2-1993w

**cache coherence** A system of caches is said to be coherent with respect to a cache line if each cache and main memory in the coherence domain observes all modifications of that same cache line. A modification is said to be observed by a cache when any subsequent read would return the newly written value. (C/BA) 1014.1-1994w, 10857-1994, 896.3-1993w, 896.4-1993w

**cache agent** A module that uses split transactions to assume all the rights and responsibilities of some number of remote cache modules. (C/BA) 896.4-1993w

**cache line (1)** Often called simply a "line." The unit of data on which coherence checks are performed, and for which coherence tag information is maintained. In SCI, a line consists of 64 data bytes. (MM/C) 1596-1992
**(2)** Often called simply a "line." The block of memory (sometimes called a "sector") that is managed as a unit for coherence purposes; i.e., cache tags are maintained on a per-line basis. SCI directly supports only one line size, 64 bytes. (C/MM) 1596.5-1993
**(3)** Often simply called a "line," the block of memory (sometimes called a sector) that is managed as a unit for coherence purposes; i.e., cache tags are maintained on a per-line basis. Although the SCI line size influenced the RamLink packet sizes, coherence protocols are beyond the scope of this standard. (C/MM) 1596.4-1996

**cache architecture (A)** A computer architecture that employs an extremely high-speed memory block, called a cache, in which data is stored. **(B)** The organization of cache memory; for example, direct mapped cache, two-way set associative cache. (C) 610.10-1994

**cache hit** *See:* hit.

**caching** The process of accessing a cache. (C) 610.10-1994w

**cache memory (1)** A buffer memory inserted between one or more processors and the bus, which is used to hold currently active copies of blocks of information from main memory. (C/BA) 1014.1-1994w
**(2)** A buffer memory inserted between one or more processors and the bus, used to hold currently active copies of blocks from main memory. Cache memories exploit spatial locality by what is brought into a cache. Temporal locality is exploited by the strategy employed for determining what is removed from the cache. (C/BA) 10857-1994, 896.4-1993w

**CAD** *See:* computer-aided design.

**CADD** *See:* computer-aided design and drafting.

**CADEM** *See:* computer-aided engineering; computer-aided manufacturing; computer-aided design.

**CADF** *See:* commutated antenna direction finder.

**CADM** *See:* computer-aided manufacturing; computer-aided design.

**CAE** *See:* computer-aided engineering; computer-aided education.

**cage (1)** A system of conductors forming an essentially continuous conducting mesh or network over the object protected and including any conductors necessary for interconnection to the object protected and an adequate ground. *See also:* Faraday cage. (EEC/PE) [119]
**(2)** emptydef;. *See also:* aerial platform. (T&D/PE) 524-1992r

**cage antenna** A multi-wire element whose wires are so disposed as to resemble a cylinder, in general of circular cross section; for example, an elongated cage. (AP/ANT) 145-1993

**cage synchronous motor (rotating machinery)** A salient pole synchronous motor having an amortisseur (damper) winding embedded in the pole shoes, the primary purpose of this winding being to start the motor. (PE) [9]

**cage winding** *See:* squirrel-cage winding.

**caging (gyros)** The process of orienting and mechanically locking one or more gyro axes or gimbal axes to a reference position. (AES/GYAC) 528-1994

**CAI** *See:* computer-assisted instruction; computer-aided inspection; computer-aided instruction.

**CAL** *See:* Conversational Algebraic Language; computer-assisted learning; computer-augmented learning.

**calc algorithm** *See:* hash function.

**calc chain** *See:* collision chain.

**calculating punch** A calculator, with card reader and card punch, that reads data from a punch card, performs some arithmetic operations or logic operations on the data, and punches the results on the same or another punch card. *Synonym:* multiplying punch. (C) 610.10-1994w

**calculations (International System of Units (SI))** Errors in calculations can be minimized if the base and the coherent derived International System (SI) units are used and the resulting numerical values are expressed in power-of-ten notation instead of using prefixes. *See also:* prefixes and symbols; units and letter symbols. (QUL) 268-1982s

**calculator (1) (A)** A device capable of performing arithmetic. **(B)** A calculator as in definition (A) that requires frequent manual intervention. **(C)** Generally and historically, a device for carrying out logic and arithmetic digital operations of any kind. (C) [85]

**(2)** A device that is suitable for performing logic and arithmetic digital operations, but that requires manual intervention to initiate each operation. *See also:* calculating punch. (C) 610.10-1994w

**calibrate (1) (monitoring radioactivity in effluents)** Adjustment of the system and the determination of system accuracy using one or more sources traceable to the National Bureau of Standards (NBS). (NI) N42.18-1980r

**(2) (radiological monitoring instrumentation) (plutonium monitoring)** To determine the response or reading of an instrument relative to a series of known radiation values over the range of the instrument. (NI) N317-1980r, N320-1979r

**(3) (radiation protection)** To determine the response or reading of an instrument relative to a series of known radiation values over the range of the instrument or the strength of a radiation source relative to a standard. (NI) N323-1978r

**(4) (airborne radioactivity monitoring)** To adjust or determine or both: The response or reading of an instrument relative to a series of conventionally true values; or The strength of a radiation source relative to a standard or conventionally true value. (NI) N42.17B-1989r

**calibrated** Checked for proper operation at selected points on the operating characteristic. (IA/ICTL/IAC) [60]

**calibrated-driving-machine test (rotating machinery)** A test in which the mechanical input or output of an electric machine is calculated from the electric input or output of a calibrated machine mechanically coupled to the machine on test. *See also:* direct-current commutating machine; asynchronous machine. (PE) [9]

**calibrated Marinelli beaker standard source (germanium semiconductor detector)** A calibrated MBSS is an MBSS that has been calibrated by comparing its photon emission rate to that of a certified MBSS. *Note:* The photon emission rate as used in this standard is the number of photons per second resulting from the decay of radionuclides in the source and is thus higher than the detected rate at the surface. (NPS) 680-1978w

**calibrated-solution Marinelli beaker standard source (germanium semiconductor detector)** A calibrated-solution MBSS is a standard beaker that contains as its radioactive filling material a solution that has been calibrated by comparing its photon emission rate at specified energies to that of a certified solution. *Note:* The photon emission rate as used in this standard is the number of photons per second resulting from the decay of radionuclides in the source and is thus higher than the detected rate at the surface. (NPS) 680-1978w

**calibrated source** *See:* radioactivity standard source.

**calibration (1) (nuclear power generating station)** Comparison of items of measuring and test equipment with reference standards or with items of measuring and test equipment of equal or closer tolerance to detect and quantify inaccuracies and to report or eliminate those inaccuracies. (PE/NP) 498-1985s

**(2) (supervisory control, data acquisition, and automatic control)** Adjustment of a device so that the output is within a specific range for particular values of the input. (PE/SUB) C37.1-1994

**(3)** The adjustment of a device to have the designed operating characteristics, and the subsequent marking of the positions of the adjusting means, or the making of adjustments necessary to bring operating characteristics into substantial agreement with standardized scales or marking. (SWG/PE/PSR) C37.100-1992, C37.90-1978s, [56], [6]

**(4) (metering)** Comparison of the indication of the instrument under test, or registration of the meter under test, with an appropriate standard. (ELM) C12.1-1988

**(5)** The process of determining the numerical relationship, within an overall stated uncertainty, between the observed output of a measurement system and the value, based on standard sources, of the physical quality being measured. (EMC/NI) 1140-1994r, N42.13-1986

**(6) (germanium spectrometers)** The determination of a value that converts a measured number into a desired physical quantity (e.g., pulse height into photon energy, or counts per second into emission rate). (NI) N42.14-1991

**calibration error (1) (electric pipe heating systems)** In operation, the departure under specified conditions of actual performance from performance indicated by scales, dials, or other markings on the device. *See also:* alarm signal. (PE/EDPG) 622A-1984r, 622B-1988r

**(2)** In the operation of a device, the departure, under specified conditions, of actual performance from performance indicated by scales, dials, or other markings on the device. *Note:* The indicated performance may be by calibration markings in terms of input or performance quantities (amperes, ohms, seconds, etc.) or by reference to a specific performance data recorded elsewhere. *See also:* setting error. (SWG/PE) C37.100-1992

**calibration factor (A) (bolometer-coupler unit)** The ratio of the substitution power in the bolometer attached to the side arm of the directional coupler to the microwave power incident on a nonreflecting load connected to the output port of the main arm of the directional coupler. *Notes:* 1. If the bolometer unit is attached to the main arm of the directional coupler, the calibration factor is the ratio of the substitution power in the bolometer unit attached to the main arm of the directional coupler to the microwave power incident upon a nonreflecting load connected to the output port of the side arm of the directional coupler. **(B) (bolometer units)** The ratio of the substitution power to the radio-frequency power incident upon the bolometer unit. The ratio of the bolometer-unit calibration factor to the effective efficiency is determined by the reflection coefficient of the bolometer unit. The two terms are related as follows:

$$K_b/\eta_e = 1 - |\Gamma|^2$$

where $K_b$, $\eta_e$, and $\Gamma$ are the calibration factor's effective efficiency, and reflection coefficient of the bolometer unit, respectively. **(C) (calibration)** (loosely called antenna factor) The factor or set of factors that, at given frequency, expresses the relationship between the field strength of an electromagnetic wave impinging upon the antenna of a field-strength

meter and the indication of the field-strength meter. *Note:* The composite of antenna characteristics, balun and transmission line effects, receiver sensitivity and linearity, etc. *See also:* measurement system. (IM/HFIM) [40], 284-1968

**(2) (A) (electrothermic unit)** The ratio of the substituted reference power (dc, audio, or rf) in the electrothermic unit to the power incident upon the electrothermic unit for the same dc output voltage from the electrothermic unit at a prescribed temperature. *Notes:* 1. Calibration factor and effective efficiency are related as in the equation above, where $K_b$, $\eta_e$, and $\Gamma$ are the calibration factor, effective efficiency, and reflection coefficient of the electrothermic unit, respectively. 2. The reference frequency is to be supplied with the calibration factor. **(B) (electrothermic-coupler unit)** The ratio of the substituted reference power (dc, audio, or rf) in the electrothermic unit attached to the side arm of the directional coupler to the power incident upon a nonreflecting load connected to the output port of the main arm of the directional coupler for the same dc output voltage from the electrothermic unit is attached to the main arm of the directional coupler, the calibration factor is the ratio of the substituted reference (dc, audio, or rf) power in the electrothermic unit attached to the main arm of the directional coupler to the power incident upon a nonreflecting load connected to the output port of the side arm of the directional coupler for the same dc output voltage from the electrothermic unit at a prescribed temperature. *Note:* The reference frequency is to be supplied with the calibration factor. (IM) 544-1975

**calibration interval (test, measurement, and diagnostic equipment)** The maximum length of time between calibration services during which each standard and test and measuring equipment is expected to remain within specific performance levels under normal conditions of handling and use. (BT) 511-1979w

**calibration level (signal generators)** The level at which the signal generator output is calibrated against a standard. *See also:* signal generator. (IM/HFIM) [40]

**calibration markers** *See:* calibration marks.

**calibration marks (radar) (navigation aids)** Indications superimposed on a display to provide a numerical scale of the parameters displayed. (AES/GCS) 686-1997, 172-1983w

**calibration procedure (test, measurement, and diagnostic equipment)** A document which outlines the steps and operations to be followed by standards and calibration laboratory and field calibration activity personnel in the performance of an instrument calibration. (MIL) [2]

**calibration programming (power supplies)** Calibration with reference to power-supply programming describes the adjustment of the control-bridges current to calibrate the programming ratio in ohms per volt. *Note:* Many programmable supplies incorporate a calibrate control as part of the reference resistor that performs this adjustment. (AES/PE) [41], [78]

**calibration scale** A set of graduations marked to indicate values of quantities, such as current, voltage, or time at which an automatic device can be set to operate. (SWG/PE) C37.100-1992

**calibration voltage** The voltage applied during the adjustment of a meter. *See also:* test. (ELM) C12.1-1982s

**calibrator (oscilloscopes)** The signal generator whose output is used for purposes of calibration, normally either amplitude or time or both. (IM) 311-1970w

**caliche (cable plowing)** Common sedimentary rock normally formed from ancient marine life. (T&D/PE) 590-1977w

**call (1) (computers)** The action performed by the calling party, or the operations necessary in making a call, or the effective use made of a connection between two stations. (COM/C) [85]

**(2) (telephone switching systems)** A demand to set up a connection. (COM) 312-1977w

**(3) (A) (software)** A transfer of control from one software module to another, usually with the implication that control will be returned to the calling module. *Contrast:* go to. **(B) (software)** A computer instruction that transfers control from one software module to another as in definition (A) and, often, specifies the parameters to be passed to and from the module. **(C) (software)** To transfer control from one software module to another as in definition (A) and, often, to pass parameters to the other module. *Synonym:* cue. *See also:* call list; call by name; call by reference; call by value; calling sequence. (C) 610.12-1990

**(4) (telecommunications)** A measure of traffic intensity or event data. *Synonym:* call attempts per hour. *See also:* CCS; time-consistent traffic measures. (COM/TA) 973-1990w

**call announcer (automatic telephone office)** A device for receiving pulses and audibly reproducing the corresponding number in words so that it may be heard by a manual operator. (EEC/PE) [119]

**call arrow** An arrow that enables the sharing of detail between IDEF0 models (linking them together) or within an IDEF0 model. The tail of a call arrow is attached to the bottom side of a box. One or more page references are attached to a call arrow. (C/SE) 1320.1-1998

**call attempts per hour** A measure of traffic intensity or event data. *Synonym:* call. *See also:* time-consistent traffic measures; CCS. (COM/TA) 973-1990w

**callback** A function written as part of the application, associated with a specific widget resource, that is invoked as a result of a specific change of state associated with that widget. For example, the `XmNactivateCallback` resource of the `PushButton` widget points to the callback function that is called when the button is pushed. (C) 1295-1993w

**call back** A security procedure that verifies the identity of a terminal accessing a computer system by terminating the original connection and then reestablishing it by placing a new call to the terminal. (C) 610.7-1995

**call by address** *See:* call by reference.

**call by location** *See:* call by reference.

**call by name** A method for passing parameters, in which the calling module provides to the called module a symbolic expression representing the parameter to be passed, and a service routine evaluates the expression and provides the resulting value to the called module. *Note:* Because the expression is evaluated each time its corresponding formal parameter is used in the called module, the value of the parameter may change during the execution of the called module. *Contrast:* call by reference. (C) 610.12-1990

**call by reference** A method for passing parameters, in which the calling module provides to the called module the address of the parameter to be passed. *Note:* With this method, the called module has the ability to change the value of the parameter stored by the calling module. *Synonyms:* call by address; call by location. *Contrast:* call by value; call by name. (C) 610.12-1990

**call by value** A method of passing parameters, in which the calling module provides to the called module the actual value of the parameter to be passed. *Note:* With this method, the called module cannot change the value of the parameter as stored by the calling module. *Contrast:* call by name; call by reference. (C) 610.12-1990

**call capacity** The number of call attempts per busy hour that can be processed without exceeding various service standards. The capacity may alternatively be expressed in terms of originating-plus-incoming (O + I) calls that can be processed during the busy hour. (COM/TA) 973-1990w

**call circuit (manual switching)** A communication circuit between switching points used by the traffic forces for the transmission of switching instructions. (EEC/PE) [119]

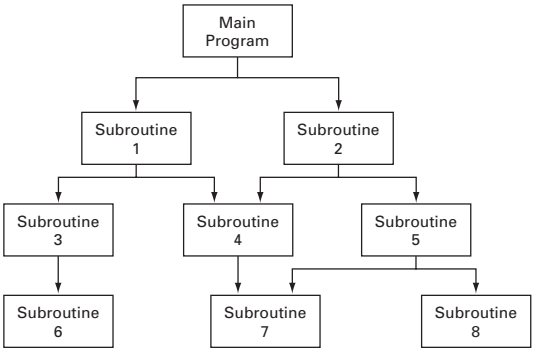
**call count** Occurs when one digit of the called number is received by the system after dial tone or wink is sent. (COM/TA) 973-1990w

**called diagram** A decomposition diagram invoked by a calling box and identified by a page reference attached to a call arrow. (C/SE) 1320.1-1998

**called-line release (telephone switching systems)** Release under the control of the line to which the call was directed. (COM) 312-1977w

**call forwarding (telephone switching systems)** A feature that permits a customer to instruct the switching equipment to transfer calls intended for his or her station to another station. (COM) 312-1977w

**call graph** A diagram that identifies the modules in a system or computer program and shows which modules call one another. *Note:* The result is not necessarily the same as that shown in a structure chart. *Synonym:* tier chart; call tree. *Contrast:* structure chart. *See also:* data structure diagram; control flow diagram; state diagram; data flow diagram.




**call graph**

(C) 610.12-1990

**call indicator** A device for receiving pulses from an automatic switching system and displaying the corresponding called number before an operator at a manual switchboard. (EEC/PE) [119]

**calling box** A box that is detailed by a decomposition diagram that is not the box's child diagram. A call arrow is attached to the bottom of a calling box. (C/SE) 1320.1-1998

**calling device (telephone switching systems)** An apparatus that generates the signals required for establishing connections in an automatic switching system. (COM) 312-1977w

**calling line identification (telephone switching systems)** Means for automatically identifying the source of calls. (COM) 312-1977w

**calling-line release (telephone switching systems)** Release under the control of the line from which the call originated. (COM) 312-1977w

**calling-line timed release (telephone switching systems)** Timed release initiated by the calling line. (COM) 312-1977w

**calling plug and cord** A plug and cord that are used to connect to a called line. (EEC/PE) [119]

**calling sequence (1) (computers)** A specified arrangement of instructions and data necessary to set up and call a given subroutine. (C) [20], [85]
**(2) (software)** A sequence of computer instructions and, possibly, data necessary to perform a call to another module. (C) 610.12-1990

**call list** The ordered list of arguments used in a call to a software module. (C) 610.12-1990

**call packing (telephone switching systems)** A method of selecting paths in a switching network according to a fixed hunting sequence. (COM) 312-1977w

**call rate (telephone switching systems)** The number of calls per unit of time. (COM) 312-1977w

**call reference** A page reference attached to a call arrow. (C/SE) 1320.1-1998

**call splitting (telephone switching systems)** Opening the transmission path between the parties of a call. (COM) 312-1977w

**call tone (telephone switching systems)** A tone that indicates to an operator or attendant that a call has reached the position or console. (COM) 312-1977w

**call trace** *See:* subroutine trace.

**call tracing (telephone switching systems)** A means for manually identifying the source of calls. (COM) 312-1977w

**call tree** *See:* call graph.

**call-type information (CTI) digits** Digits sent to the switch from the central office service unit (COSU) via signaling on the utility telemetry trunk, per call, which specify the customer premise equipment (CPE) transmission interface (i.e., on-hook or off-hook operation). These information digits are assigned, on a trunk group basis, through the switch administration procedures. (SCC31/AMR) 1390.3-1999, 1390.2-1999, 1390-1995

**call waiting (telephone switching systems)** A feature providing a signal to a busy called line to indicate that another call is waiting. (COM) 312-1977w

**call-waiting tone (telephone switching systems)** A tone used in the call-waiting feature. (COM) 312-1977w

**calomel electrode** *See:* calomel half-cell.

**calomel half-cell (calomel electrode)** A half-cell containing a mercury electrode in contact with a solution of potassium chloride of specified concentration that is saturated with mercurous chloride of which an excess is present. *See also:* electrochemistry. (EEC/PE) [119]

**calorie** The quantity of heat required to raise one gram of water 1°F. (IA/PSE) 241-1990r

**calorimeter (laser maser)** A device for measuring the total amount of energy absorbed from a source of electromagnetic radiation. (LEO) 586-1980w

**calorimetric test (rotating machinery)** A test in which the losses in a machine are deduced from the heat produced by them. The losses are calculated from the temperature rises produced by this heat in the coolant or in the surrounding media. *See also:* asynchronous machine. (PE) [9]

**CAM** *See:* computer-aided management; computer-aided manufacturing.

**CAMA** *See:* centralized accounting, automatic message.

**CAMAC** *See:* computer automated measurement and control.

**CAMAC branch driver** *See:* CAMAC parallel highway driver.

**CAMAC branch highway** *See:* CAMAC parallel highway.

**CAMAC compatible crate** A mounting unit for CAMAC plug-in units that does not conform to the full requirements for a CAMAC crate but in which CAMAC modules can be mounted and operated in accordance with the dataway requirements of IEEE Std 583-1975. (NPS) 583-1975s

**CAMAC crate** A mounting unit for CAMAC plug-in units that includes a CAMAC dataway and conforms to the mandatory requirements for a CAMAC crate as specified in IEEE Std 583-1975. (NPS) 583-1975s

**CAMAC crate assembly** An assembly of a CAMAC crate controller and one or more CAMAC modules mounted in a CAMAC crate (or CAMAC compatible crate), and operable in conformity with the dataway requirements of IEEE Std 583-1975. (NPS) 583-1975s

**CAMAC crate controller** A functional unit that when mounted in the control station and one or more normal stations of a CAMAC crate (or CAMAC compatible crate) communicates with the dataway in accordance with IEEE Std 583-1975. (NPS) 583-1975s

**CAMAC data array (subroutines for CAMAC)** The symbol *intc* represents an array of CAMAC data words. Each element of *intc* has the same form as the CAMAC data word variable *int*. The length of *intc* is given by the value of the first element of *cb* at the time the subroutine is executed. *See also:* control block; CAMAC data word. (NPS) 758-1979r

**CAMAC dataway** An interconnection between CAMAC plug-in units which conforms to the mandatory requirements for a CAMAC dataway as specified in IEEE Std 583-1975. (NPS) 583-1975s

**CAMAC data word (subroutines for CAMAC)** The symbol *int* represents a CAMAC data word stored in computer memory. The form is not specified, but the word must be stored in an addressable storage entity capable of containing twenty-four bits. In a computer or programming system which does not have an addressable unit of storage which can contain twenty-four bits, multiple units must be used. (NPS) 758-1979r

**CAMAC external addresses (subroutines for CAMAC)** The symbol *exta* represents an array of integers each of which is a CAMAC register address. The form and information content of each element of *exta* must be identical to the form and information content of the quantity *ext*. The length of *exta* is given by the value of the first element of *cb* at the time the subroutine is executed. *See also:* control block; external address. (NPS) 758-1979r

**CAMAC module** A CAMAC plug-in unit that when mounted in one or more normal stations of a CAMAC crate is compatible with IEEE Std 583-1975. (NPS) 583-1975s

**CAMAC parallel highway** A standard highway (for a CAMAC system) in which the data is transferred in parallel and that conforms to the requirements of IEEE Std 596-1982. *Synonym:* CAMAC branch highway. (NPS) 583-1975s

**CAMAC parallel highway driver** A unit that communicates via the CAMAC parallel highway with up to seven CAMAC crates and conforms to the requirements as specified in IEEE Std 596-1982. *Synonym:* CAMAC branch driver. (NPS) 583-1975s

**CAMAC plug-in unit** A functional unit that conforms to the mandatory requirements for a plug-in unit as specified in IEEE Std 583-1975. (NPS) 583-1975s

**CAMAC serial highway** A standard highway (for a CAMAC system) in which the data is transferred in bit or byte serial and which conforms to the requirements of IEEE Std 595-1982. (NPS) 583-1975s

**CAMAC system** A system including at least one CAMAC crate assembly. (NPS) 583-1975s

**CAMAL** *See:* CAMbridge ALgebra system.

**cambium** A layer of delicate meristematic tissue between the inner bark and the wood that produces all secondary growth in plants and is responsible for the annual rings of wood. (T&D/PE) 751-1990

**CAMbridge ALgebra system** A programming language used to perform large scale formal algebraic manipulation, particularly in celestial mechanics and general relativity. (C) 610.13-1993w

**cam contactor (cam switch)** A contactor or switch actuated by a cam. *See also:* control switch. (VT/LT) 16-1955w

**camera storage tube** A storage tube into which the information is introduced by means of electromagnetic radiation, usually light, and read at a later time as an electric signal. *See also:* storage tube. (ED) 158-1962w, [45]

**camera tube (television)** A tube for conversion of an optical image into an electrical signal. (BT/AV) 201-1979w

**cam-operated switch** A switch consisting of fixed contact elements and movable contact elements operated in sequence by a camshaft. *See also:* switch. (IA/ICTL/IAC) [60], [84]

**camping trailer** A vehicular portable unit mounted on wheels and constructed with collapsible partial side walls that fold for towing by another vehicle and unfold at the campsite to provide temporary living quarters for recreational, camping, or travel use. *See also:* recreational vehicle. (NESC/NEC) [86]

**camp-on busy (telephone switching systems)** A feature whereby a call encountering a busy condition can be held and subsequently connected automatically when the busy condition is required. (COM) 312-1977w

**cam-programmed (test, measurement, and diagnostic equipment) (A)** A programming technique that uses a rotating shaft, having specifically oriented, eccentric projections that control a series of switches that set up the proper circuits for a test. **(B)** A cam-follower system used to set positions or values of a shafted instrument for programming instructions to the test system. (MIL) [2]

**camshaft position (electric power system)** The angular position of the main shaft directly operating the governor-controlled valves. (PE/PSE) 94-1991w

**CAN** *See:* cancel character.

**can (1) (dry cell)** A metal container, usually zinc, in which the cell is asserted and that serves as its negative electrode. *See also:* electrolytic cell. (PE/EEC) [119]
**(2)** An indication of a permissible optional feature or behavior available to the application; the implementation shall support such features or behaviors as mandatory requirements. (C/PA) 2003.2-1996

**cancel (numerically controlled machines)** A command that will discontinue any fixed cycles or sequence commands. (IA/EEC) [61], [74]

**cancel character (CAN) (A)** A control character used by some convention to indicate that the data with which it is associated are in error or are to be disregarded. **(B)** An accuracy control character used to indicate that the data with which it is associated are in error or are to be disregarded. (C) 610.5-1990

**canceled video** In moving-target indication (MTI), the video output remaining after the cancellation process. *See also:* clutter residue; moving-target indication. (AES) 686-1997

**canceler** That portion of the system in which unwanted signals, such as clutter, fixed targets, and other interference, are suppressed by a process of linear subtraction. (AES) 686-1997

**cancellation ratio (A)** In moving-target indication (MTI), the ratio of canceler voltage amplification for fixed-target echoes received with a fixed antenna, to the gain for a single pulse passing through the unprocessed channel of the canceler. *Note:* This measure of MTI performance, in which high performance is represented by a low numerical value, has been largely replaced by the MTI improvement factor. *See also:* moving-target indication. **(B)** In interference-reduction techniques other than MTI, the cancellation ratio is the ratio of interference output power in the absence of the technique to that when the technique is applied, when the system gains for the two cases are adjusted to provide equal noise outputs. *Note:* High performance is indicated by a high numerical value, generally expressed in decibels to avoid ambiguity between power and voltage ratios. (AES) 686-1997

**cancelled video (radar moving-target indicator)** The video output remaining after the cancellation process. *See also:* navigation. (AES/RS) 686-1982s, [42]

**cancer promoter** An agent that advances carcinogenesis after its initiation. (T&D/PE) 539-1990

**candela (1) (illuminating engineering)** The SI unit of luminous intensity. One candela is one lumen per steradian (lm/sr). Formerly, candle. *Notes:* 1. The fundamental luminous intensity definition in the SI is the candela in terms of a complete (blackbody) radiator. From this relation $K_m$ and $K_m$, and consequently the lumen, are determined. One candela is defined as the luminous intensity of 1/600 000 of one square meter of projected area of a blackbody radiator operating at the temperature of solidification of platinum, at a pressure of 101 325 newtons per square meter ($N/m^2 = PA$). From 1909 until the introduction of the present photometric system on January 1, 1948, the unit of luminous intensity in the United States, as well as in France and Great Britain, was the "international candle," which was maintained by a group of carbon-filament vacuum lamps. For the present unit as defined above, the internationally accepted term is candela. The difference between the candela and the old international candle is so small that only measurements of high precision are affected. The following resolution was adopted at the Seizièeme Conférence Générale des Poids et Mesures (the Sixteenth General Conference on Weights and Measures) on October 11, 1979. The Conference had decided: (1) The candela is the luminous intensity, in a given direction, of a source emitting mono-

chromatic radiation of frequency $540 \times 10^{12}$ Hz and whose radiant intensity in this direction is 1/683 watt per steradian. (2) The candela so defined is the base unit applicable to photopic quantities, scotopic quantities, and quantities to be defined in the mesopic domain. *See also:* luminous flux. (EEC/IE) [126]

**(2) (metric practice)** The luminous intensity, in the perpendicular direction, of a surface of 1/600 000 square meters of blackbody at the temperature of freezing plantinum under a pressure of 101 325 newtons per square meter (adopted by the 13th General Conference on Weights and Measures 1967). (QUL) 268-1982s

**(3) (television)** The luminous intensity, in the perpendicular direction, of a 1/600 000 square meter surface of a blackbody at the freezing temperature of plantinum under a pressure of 101 325 pascals. *Notes:* 1. Values for standards having other spectral distributions are derived by the use of accepted spectral luminous efficiency data for photopic vision. 2. From 1909 until the introduction of the present photometric system on January 1, 1948, the unit of luminous intensity in the United States, as well as in France and Great Britain, was the international candle, which was maintained by a group of carbon-filament vacuum lamps. For the present unit as defined above, the internationally accepted term is candela. The difference between the candela and the old international candle is so small that only measurements of high precision are affected. (BT/AV) 201-1979w

**candidate key (1)** In a relational data model, any minimal set of attributes within a relation that forms a key that is a determinant of all attributes in the relation. *Note:* In normalization, one of the candidate keys of each relation is chosen as the primary key and the others are known as alternate keys. *See also:* compound key. (C) 610.5-1990w

**(2)** An attribute, or combination of attributes, of an entity for which no two instances agree on the values. (C/SE) 1320.2-1998

**candle** *See:* candela.

**candlepower (illuminating engineering) (television)** Luminous intensity expressed in candelas. (BT/EEC/IE/AV) 201-1979w, [126]

**can loss (rotating machinery)** Electric losses in a can used to protect electric components from the environment. *See also:* asynchronous machine. (PE) [9]

**canned (rotating machinery)** Completely enclosed and sealed by a metal sheath. (PE) [9]

**canned cycle** *See:* fixed cycle.

**canonical input processing** The processing of terminal input in the form of text lines. (C) 1003.5-1999

**canonical model** A data model that represents the inherent structure of the data, independent of any specific implementations. (C) 610.5-1990w

**canonical synthesis** A technique for generating a canonical model from the relations in a database. (C) 610.5-1990w

**cant hook** A tool similar to a peavey (except that it has a blunt end) used to turn a pole or stabilize it if necessary during installation. (T&D/PE) 751-1990

**capability (1) (power operations)** The maximum load-carrying capability expressed in kilovolt-amperes (kVA) or kilowatts (kW) of generating equipment, other electrical apparatus, or system under specified conditions for a given time interval. *See also:* installed incremental transfer capability; dependable capability; second contingency incremental transfer capability; maximum capability; extended capability; system assured capability; first contingency incremental transfer capability; total for load capability; normal transfer capability; steam capability; system margin capability; pumped-storage hydro capability; hydro capability.

**(2)** A set of functions that are logically related by the common set of resources on which they operate. (C/MM) 855-1990

**capability margin (electric power supply)** The difference between the "total capability for load" and the "system load responsibility." It is the margin of capability available to provide for scheduled maintenance, emergency outages, adverse system operating requirements, and unforeseen loads. *See also:* generating station. (PE/PSE) [54]

**capability module** A set of functions within a capability that provide a class of support. Each module is intended to be provided in its entirety. (C/MM) 855-1990

**capacitance (1) (semiconductor diode) (semiconductor radiation conductor)** The small-signal capacitance measured between the terminals of the diode or detector under specified conditions of bias and frequency. *See also:* rectification; semiconductor device; semiconductor. (IM/ED/NPS/HFIM/NID) 314-1971w, 216-1960w, 325-1986s, 301-1976s

**(2)** A property expressible by the ratio of the time integral of the flow rate of a quantity, such as heat, or electric charge to or from a storage, divided by the related potential change. *Note:* Typical units are microfarads, Btu/°F, lb/psi, gal/ft. (CS/PE/EDPG) [3]

**(3) (A) (outdoor apparatus bushings)** The main capacitance, $C_1$, of a condenser bushing is the value in picofarads between the high-voltage conductor and the potential tap or the test tap. **(B) (outdoor apparatus bushings)** The tap capacitance, $C_2$, of a condenser bushing is the value in picofarads between the potential tap and mounting flange (ground). **(C) (outdoor apparatus bushings)** The capacitance, $C$, of a bushing without a potential or test tap is the value in picofarads between the high-voltage conductor and the mounting flange (ground). (PE/TR) 21-1976

**(4) (VLF insulation testing)** Capacitance, as used here, and distinguished from power-frequency capacitance, is that value which would result from a measurement at VLF, that is, 0.1 Hz ± 25%. In magnitude, it would tend to be greater than the power-frequency capacitance, to the extent of increased contributions made by dipole and interfacial polarizations. (PE/EM) 433-1974r

**(5) (of a semiconductor radiation detector)** The small-signal capacitance measured between terminals of the detector under specified conditions of bias and frequency. (NPS) 300-1988r

**(6)** The ratio of a conductor's electrostatic charge to the potential difference between conductors (required to maintain that charge). (PE/IC) 1143-1994r

**(7) (A)** (of bushing) The main capacitance, $C_1$, of a bushing is the capacitance between the high-voltage conductor and the voltage tap or the test tap. **(B)** (of bushing) The tap capacitance, $C_2$, of a capacitance graded bushing is the capacitance between the voltage tap and mounting flange (ground). **(C)** (of bushing) The capacitance, C, of a bushing without a voltage or test tap is the capacitance between the high-voltage conductor and the mounting flange (ground). (PE/TR) C57.19.03-1996

**(8)** That property of a system of conductors and dielectrics that permits the storage of electricity when potential differences exist between the conductors. Its value is expressed as the ratio of a quantity of electricity to a potential difference. A capacitance value is always positive. (IA/MT) 45-1998

**capacitance between two conductors, balanced** *See:* balanced capacitance.

**capacitance coupling** *See:* coupling capacitance.

**capacitance current (1) (electric submersible pump cable)** Current required to charge the capacitor formed by the dielectric of the cable under test. (IA/PC) 1017-1985s

**(2) (rotating machinery)** (or component) A reversible component of the measured current on charge or discharge of the winding that is due to the geometrical capacitance; that is, the capacitance as measured with alternating current of power or higher frequencies. With high direct voltage this current has a very short time constant and so does not affect the usual measurements. (PE/EM) 95-1977r

**(3) (power cable systems)** Current that charges the capacitor that is formed by the capacitance of the cable under test. (PE/IC) 400-1991

**capacitance, detector** *See:* detector capacitance.

**capacitance, discontinuity** *See:* discontinuity capacitance.

**capacitance, effective** *See:* effective capacitance.

**capacitance graded bushing** A bushing in which metallic or non-metallic conducting layers are arranged within the insulating material for the purpose of controlling the distribution of the electric field of the bushing, both axially and radially. (PE/TR) C57.19.03-1996

**capacitance, input** *See:* input capacitance.

**capacitance meter** An instrument for measuring capacitance. *Note:* If the scale is graduated in microfarads the instrument is usually designated as a microfaradmeter. *See also:* instrument. (EEC/PE) [119]

**capacitance, nonlinear element** *See:* nonlinear element capacitance.

**capacitance, output** *See:* output capacitance.

**capacitance potential device** A voltage-transforming equipment or network connected to one conductor of a circuit through a capacitance, such as a coupling capacitor or suitable high-voltage bushing, to provide a low voltage such as required for the operation of instruments and relays. *Notes:* 1. The term "potential device" applies only to the network and is exclusive of the coupling capacitor or high-voltage bushing. 2. The term "capacitance potential device" indicates use with any type of capacitance coupling. 3. Capacitance potential devices and their associated coupling capacitors or bushings are designed for line-to-ground connection, and not line-to-line connection. The potential device is a single-phase device, and, in combination with its coupling capacitor or bushing, is connected line-to-ground. The low voltage thus provided is a function of the line-to-ground voltage and the constants of the capacitance potential device. Two or more capacitance potential devices, in combination with their coupling capacitors or bushings, may be connected line-to-ground on different high-voltage phases to provide low voltages of other desired phase relationships. 4. Zero-sequence voltage may be obtained from the broken-delta connection of the auxiliary windings or by the use of one device with three coupling capacitors or bushings. In the latter case, the three operating-tap connection-points are joined together and one device connected between this common point and ground. Although used in combination with three coupling capacitors or bushings, the device output and accuracy rating standards are based on the single-phase conditions. *See also:* outdoor coupling capacitor. 341

**capacitance ratio (nonlinear capacitor)** The ratio of maximum to minimum capacitance over a specified voltage range, as determined from a capacitance characteristic, such as a differential capacitance characteristic, or a reversible capacitance characteristic. *See also:* nonlinear capacitor. (ED) [46]

**capacitance, short-circuit input** *See:* short-circuit input capacitance.

**capacitance, short-circuit output** *See:* short-circuit output capacitance.

**capacitance, short-circuit transfer** *See:* short-circuit transfer capacitance.

**capacitance, signal electrode** *See:* electrode capacitance.

**capacitance, stray** *See:* stray capacitance.

**capacitance-switching transient overvoltage ratio (high voltage air switches, insulators, and bus supports)** The ratio of the peak value of voltage above ground, during the transient conditions resulting from the operation of the switch, to the peak value of the steady-state line-to-neutral voltage. *Note:* It is measured at either terminal of the switch, whichever is higher, and is expressed in multiples of the peak values of the operating line-to-ground voltages at the switch with the capacitance connected. (SWG/PE) C37.30-1971s, C37.100-1992

**capacitance, target** *See:* target capacitance.

**capacitance unbalance detection function** The detection of objectionable unbalance in capacitance between capacitor groups within a phase, such as that caused by blown capacitor fuses or faulted capacitors, and to initiate an alarm, the closing of the capacitor bypass switch, or both. (T&D/PE) 824-1994

**capacitance unbalance, pair to ground** The unbalance that exists between the capacitance of each conductor of pair *ab* to the grounded shield with all the other conductors connected to the shield. This is: $C_{UB,PG} = (Cag + Cap) - (Cbg + Cbp)$, where *Cag* and *Cbg* are capacitances between each conductor (*a* and *b*) to ground and *Cap* and *Cbp* are capacitances between each conductor (*a* and *b*) and all other pairs connected together and grounded. (PE/PSC) 789-1988w

**capacitance unbalance, pair to pair** The unbalance in capacitance that exists between each conductor in a pair (*ab*) to each conductor in another pair (*cd*). This is: $C_{UB,PP} = (Cad + Cbc) - (Cac + Cbd)$, where *Cac*, *Cad*, *Cbc*, and *Cbd* are direct capacitances between conductors. (PE/PSC) 789-1988w

**capacitator braking (rotating machinery)** A form of dynamic braking for induction motors in which a capacitator is used to magnetize the motor. *See also:* asynchronous machine. (PE) [9]

**capacitive coupling** *See:* electrical coupling.

**capacitive current (1) (rotating machinery)** (or component) A reversible component of the measured current on charge or discharge of the winding that is due to the geometrical capacitance; that is, the capacitance as measured with alternating current of power or higher frequencies. With high direct voltage this current has a very short time constant and so does not affect the usual measurements. (PE/EM) 95-1977r
**(2) (maintenance of energized power lines)** The component of the measured current that leads the applied voltage by 90° due to the geometrical capacitance of the tool or equipment. (T&D/PE) 516-1995

**capacitive gap (nonlinear, active, and nonreciprocal waveguide components) (microwave receiver protectors)** The distance between cone apexes (apices) in a waveguide resonant structure. *See also:* resonant gap. (MTT) 457-1982w

**capacitive load** A lumped capacitance that is switched as a unit. (SWG/PE) C37.100-1992

**capacitive weighting** Response weighting by change of capacitance between fingers and bus bar, where the capacitance value is varied from electrode to electrode along the interdigital transducer. (UFFC) 1037-1992w

**capacitor (1) (series capacitor)** An assembly of one or more capacitor elements in a single container, with one or more insulated terminals brought out. (T&D/PE) 824-1994
**(2)** An element within a circuit consisting of two conductors, each with an extended surface exposed to that of the other, but separated by a layer of insulating material called the dielectric. *Note:* The dielectric is designed so the electric charge on one conductor is equal in value but opposite in polarity to that of the other conductor. *See also:* storage capacitor. (C) 610.10-1994w
**(3)** A device with the primary purpose of introducing capacitance into an electric circuit. Capacitors are usually classified, according to their dielectrics, as air capacitors, mica capacitors, paper capacitors, etc. (IA/MT) 45-1998

**capacitor antenna (condenser antenna)** An antenna consisting of two conductors or systems of conductors, the essential characteristic of which is its capacitance. *See also:* antenna. (CHM) [51]

**capacitor bank** An assembly at one location of capacitors and all necessary accessories, such as switching equipment, protective equipment, controls, etc., required for a complete operating installation. It may be a collection of components as-

sembled at the operating site or may include one or more piece(s) of factory-assembled equipment.power systems relaying. (T&D/PE) 18-1992, C37.99-2000

**capacitor bank overcurrent protection** Common name for all or part of the overcurrent protective equipment at a capacitor installation. (SWG/PE) C37.40b-1996

**capacitor bus (series capacitor)** The main conductors that serve to connect the capacitor assemblies in series with the line. (T&D/PE) 824-1994

**capacitor bushing (outdoor apparatus bushings)** A bushing in which cylindrical conducting layers are arranged coaxially with the conductor within the insulating material for the purpose of controlling the electric field of the bushing. *Synonym:* condenser bushing. (PE/TR) 21-1976

**capacitor bypass switch (series capacitor)** A switch device with moving and stationary contacts that functions as a means of bypassing the capacitor. This switch may also have the capability of inserting the capacitor against a specified level of current. (T&D/PE) [26]

**capacitor-bypass-switch interlocking devices (series capacitor)** Devices that perform the function of having all three integral bypass switches of a capacitor step take the same open or close position. (T&D/PE) [26]

**capacitor control** The device required to automatically switch shunt power capacitor banks.power systems relaying. (T&D/PE) 1036-1992, C37.99-2000

**capacitor element (1) (series capacitor)** An individual part of a capacitor unit consisting of coiled conductors separated by dielectric material. (T&D/PE) [26]

**(2)** The smallest unit of a capacitor consisting of metallic foil plates separated by a dielectric film made typically of a polymer, paper, or combination of the two materials. (T&D/PE) 824-1994

**(3) (power systems relaying)** A device consisting essentially of two electrodes separated by a dielectric. (PE) C37.99-2000

**capacitor enclosure** The case in which the capacitor is mounted. (EEC/PE) [119]

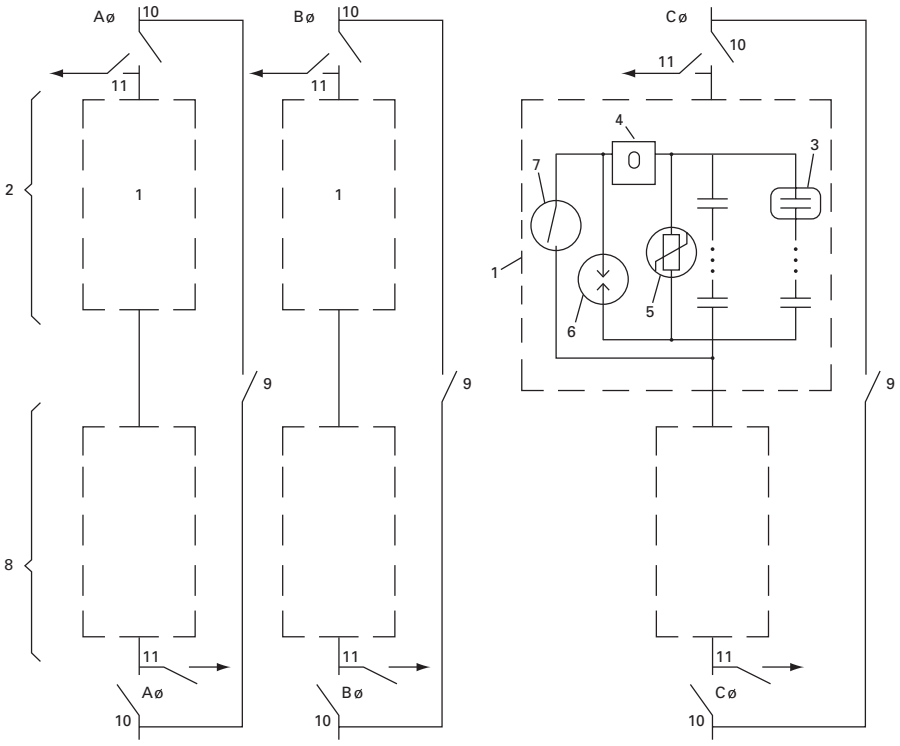
**capacitor equipment (shunt power capacitors)** An assembly of capacitors with associated accessories, such as fuses, switches, etc., all mounted on a common frame for handling, transportation, and operation as a single unit. (PE/T&D) 18-1992

**capacitor fuse (series capacitor)** A capacitor fuse that provides an externally visible indication of fuse operation. (T&D/PE) 824-1985s, 824-1994

**capacitor group (series capacitor)** An assembly of more than one capacitor connected in parallel between two buses or terminals. (SWG/PE/T&D) C37.82-1971s, 824-1994

**capacitor group fuse** *See:* capacitor line fuse.

**capacitor, ideal** *See:* ideal capacitor.




1—Capacitor segment (1ø)
2—Capacitor switching step/Capacitor module (3ø)
3—Capacitor group
4—Discharge current limiting damping device
5—Varistor
6—Bypass gap
7—Bypass switch
8—Additional switching steps when required
9—External bypass disconnect switch
10—External isolating disconnect switch
11—External grounding disconnect switch

*Typical series capacitor bank nomenclature*

**capacitor group**

**capacitor indicating fuse (series capacitor)** A capacitor fuse that provides an externally visible indication of fuse operation. (T&D/PE) 824-1985s, 824-1994

**capacitor inrush current** The transient charging current that flows in a capacitor when a capacitor bank is initially connected to a voltage source.power systems relaying. (T&D/PE) 1036-1992, C37.99-2000

**capacitor line fuse (capacitor group fuse) (power systems relaying)** A fuse applied to disconnect a faulted phase of a capacitor bank from a power system. (SWG/PE/T&D) C37.40b-1996, 1036-1992, C37.99-2000

**capacitor loudspeaker** *See:* electrostatic loudspeaker.

**capacitor microphone** *See:* electrostatic microphone.

**capacitor motor** A single-phase induction motor with a main winding arranged for direct connection to a source of power and an auxiliary winding connected in series with a capacitor. The capacitor may be directly in the auxiliary circuit or connected into it through a transformer. *See also:* two-value capacitor motor; permanent-split capacitor motor; capacitor-start motor; asynchronous machine. (PE) [9]

**capacitor mounting strap** A device by means of which the capacitor is affixed to the motor. (EEC/PE) [119]

**capacitor outrush current** The high-frequency, high-magnitude current discharge of one or more capacitors into a short circuit, such as into a failed capacitor unit connected in parallel with the discharging units, or into a breaker closing into a fault.power systems relaying. (PE/T&D) C37.99-2000, 1036-1992

**capacitor pickup** A phonograph pickup that depends for its operation upon the variation of its electric capacitance. *See also:* phonograph pickup. (EEC/ACO) [109]

**capacitor platform** A structure that supports the capacitor rack assemblies and all associated equipment and protective devices, and is supported on insulators compatible with line-to-ground insulation requirements. (T&D/PE) 824-1994

**capacitor rack (series capacitor)** A frame that supports one or more capacitors. (T&D/PE) 824-1994

**capacitor segment** A single-phase assembly of groups of capacitors that has its own voltage-limiting device and relays to protect the capacitors from overvoltages and overloads. *See also:* capacitor group. (T&D/PE) 824-1994

**capacitor start-and-run motor** A capacitor motor in which the auxiliary primary winding and series-connected capacitors remain in circuit for both starting and running. *See also:* asynchronous machine; permanent-split capacitor motor. (PE) [9]

**capacitor-start motor** A capacitor motor in which the auxiliary winding is energized only during the starting operation. *Note:* The auxiliary-winding circuit is open-circuited during running operation. *See also:* asynchronous machine. (PE) [9]

**capacitor storage** A type of storage that uses the capacitive properties of certain materials. (C) 610.10-1994w

**capacitor(s) stored energy** The value of energy, measured in Joules, that is stored in a capacitor or group of capacitors at a given instantaneous value of voltage.

$$E = \frac{CV^2}{2}$$

where
$E$ = Energy in Joules
$C$ = Capacitance in microfarads
$V$ = instantaneous voltage in kilovolts

(SWG/PE) C37.40b-1996

**capacitor switch** A switch capable of making and breaking capacitive currents of capacitor banks. (SWG/PE) C37.100-1992

**capacitor switching step** A three-phase function that consists of one or more capacitor segments per phase with capacitor bypass devices connected in parallel control devices, and provision for interlocked operation of the single-phase or three-phase switches when bypassing or inserting the capacitor segments. This is sometimes referred to as a capacitor module. (T&D/PE) 824-1994

**capacitor unbalance protection** A protective system sensitive to unbalanced voltages and/or currents in a normally balanced capacitor bank. The imbalance may be the result of blown fuses or due to an insulation failure within the capacitor bank. (SWG/PE) C37.40b-1996

**capacitor unit (1) (general)** A single assembly of dielectric and electrodes in a container with terminals brought out. *See also:* indoor; outdoor; alternating-current distribution. (T&D/PE) 18-1980s

**(2) (series capacitor)** An assembly of one or more capacitor elements in a single container, with one or more insulated terminals brought out. (T&D/PE) [26]

**(3)** An assembly of dielectric and electrodes in a container (case), with terminals brought out, that is intended to introduce capacitance into an electric power circuit.power systems relaying. (PE) C37.99-2000

**capacitor unit fuse** A fuse applied to disconnect an individual faulted capacitor from its bank. *Synonyms:* individual capacitor fuse; capacitor fuse. (SWG/PE/T&D) C37.40b-1996, 1036-1992

**capacitor voltage** The voltage across two terminals of a capacitor. (ED) [46]

**capacity (C) (1) (A) (data transmission)** The number of digits or characters in a machine word regularly handled in a computer. **(B) (data transmission)** The upper and lower limits of the numbers which may be regularly handled in a computer. **(C) (data transmission)** The maximum number of binary digits that can be transmitted by a communications channel in one second. (PE) 599-1985

**(2) (nuclear power generating station)** Maximum output of a turbine generator unit. (PE/EDPG) 1020-1988r

**(3)** A measure of the ability to generate electric power, usually expressed in megawatts or kilowatts. Capacity can refer to the output of a single generator, a plant, an item of electrical equipment, an entire electric system, or a power pool. (PE/PSE) 858-1993w

**(4)** The combined weight for which the component is designed to be used. Combined weight includes the user's body weight and clothing, tools, and other objects borne or carried by the user. (T&D/PE) 1307-1996

**(5)** Generally, the total number of ampere-hours that can be withdrawn from a fully charged battery at a specific discharge rate and electrolyte temperature, and to a specific cutoff voltage. (SCC21) 937-2000

**capacity charge** The charge for generation or transmission capacity used or reserved on the seller's system. *Synonyms:* demand charge; reservation charge. (PE/PSE) 858-1993w

**capacity emergency** The operating situation that exists when a system is unable to supply its firm demand and regulating requirements. (PE/PSE) 858-1993w

**capacity factor** The ratio of the average load on a machine or equipment for the period of time considered to the capacity of the machine or equipment. *See also:* generating station. (T&D/PE/PSE) [10], 346-1973w

**capacity, firm, purchases or sales (electric power supply)** Firm capacity that is purchased, or sold, in transactions with other systems and which is not from designated units, but is from the overall system of the seller. *Note:* It is understood that the seller treats this type of transaction as a load obligation. (PE/PSE) 346-1973w

**capacity, heat** *See:* heat capacity.

**capacity limits (major)** There are three major capacity categories that may limit the ultimate size of a switching system. The categories are termination capacity, call capacity, and traffic usage capacity. The fundamental hardware and software architecture of the switching system determines these major capacity limits. *See also:* traffic usage capacity; call capacity; termination capacity. (COM/TA) 973-1990w

**capacity, specific unit, purchases or sales (electric power supply)** Capacity that is purchased, or sold, in transactions with other systems and which is from a designated unit on the system of the seller. (PE/PSE) 346-1973w

**capacity test (battery)** A discharge of a battery at a constant current or a constant power to a specified voltage. (SB/PE/EDPG) 1188-1996, 450-1995, 1106-1995

**cap-and-pin insulator** An assembly of one or more shells with metallic cap and pin, having means for direct and rigid mounting. *See also:* insulator. (EEC/IEPL) [89]

**capstan** A rotating shaft within a tape drive that pulls the tape across the read or write heads. (C) 610.10-1994w

**capture effect (1) (modulation systems)** The effect occurring in a transducer (usually a demodulator) whereby the input wave having the largest magnitude controls the output. (Std100) 270-1964w

**(2)** The tendency of a receiver to suppress the weaker of two time-coincident signals within its passband. (AES) 686-1997

**capturing (accelerometer) (gyros)** The use of a torquer (forcer) in a servo loop to restrain a gyro gimbal, rotor, or accelerometer proof mass to a specified reference position. (AES/GYAC) 528-1994

**car** *See:* vehicle.

**carabiner** A connector component generally comprised of a trapezoidal or oval shaped body with a normally closed gate or similar arrangement which may be opened to permit the body to receive an object, and when released, automatically closes to retain the object. (T&D/PE) 1307-1996

**carabiner, locking** *See:* locking carabiner.

**carabiner, manual locking** *See:* manual locking carabiner.

**carabiner, non-locking** *See:* nonlocking carabiner.

**car annunciator** An electric device in the car that indicates visually the landings at which an elevator-landing signal-registering device has been actuated. *See also:* elevator. (EEC/PE) [119]

**carbon-arc lamp (illuminating engineering)** An electric-discharge lamp employing an arc discharge between carbon electrodes. One or more of these electrodes may have cores of special chemicals that contribute importantly to the radiation. (EEC/IE) [126]

**carbon block protector** An assembly of two or three carbon blocks and air gaps designed to a specific breakdown voltage. These devices are normally connected to telecommunication circuits to provide overvoltage protection and a current path to ground during such overvoltage. (PE/PSC) 487-1992

**carbon brush (A) (motors and generators)** A specific type of brush composed principally of amorphous carbon. *Note:* This type of brush is usually hard and is adapted to low speeds and moderate currents. **(B) (motors and generators)** A broader classification of brush, containing carbon in appreciable amount. *See also:* brush. (PE) [9]

**carbon-consuming cell (carbon-combustion cell)** A cell for the production of electric energy by galvanic oxidation of carbon. *See also:* electrochemistry. (PE/EEC) [119]

**carbon-contact pickup** A phonograph pickup that depends for its operation upon the variation in resistance of carbon contacts. *See also:* phonograph pickup. (EEC/PE) [119]

**carbon-dioxide system (rotating machinery)** A fire-protection system using carbon-dioxide gas as the extinguisher. (PE) [9]

**carbon-graphite brush** A carbon brush to which graphite is added. This type of brush can vary from medium hardness to very hard. It can carry only moderate currents and is adapted to moderate speeds. *See also:* brush. (EEC/EM/LB) [101]

**carbon noise (carbon microphones)** The inherent noise voltage of the carbon element. *See also:* close-talking pressure-type microphones. (SP) 258-1965w

**carbon-pressure recording facsimile** That type of electromechanical recording in which a pressure device acts upon carbon paper to register upon the record sheet. *See also:* recording. (COM) 168-1956w

**carbon telephone transmitter** A telephone transmitter that depends for its operation upon the variation in resistance of carbon contacts. *See also:* telephone station. (EEC/PE) [119]

**car builder (1)** The entity assembling or manufacturing the vehicle. (VT) 1475-1999

**(2)** The entity manufacturing the vehicle. (VT) 1476-2000

**car, cable** *See:* cable car.

**carcinogen** An agent that tends to produce cancer. (T&D/PE) 539-1990

**carcinotron (microwave tubes) (m-type backward-wave oscillator)** A crossed-field oscillator tube in which an electron stream interacts with a backward wave on the nonreentrant circuit. The oscillation frequency is a function of anode-to-solve voltage. (ED) [45]

**car, conductor** *See:* conductor car.

**card (1) (STD bus)** A printed circuit board and components that make up the modules that plug in to the bus backplane. (C/MM) 961-1987r

**(2) (A)** A generic term used as an abbreviation for a circuit board. **(B)** An input medium made of paperboard, formed in a uniform size and shape such that it may be punched or marked and sensed electronically. *See also:* magnetic card; mark-sensing card; punch card. (C) 610.10-1994

**(3) (computers)** *See also:* magnetic card; tape to card; punched card.

**card cage** A chassis in which a printed circuit board may be mounted. (C) 610.10-1994w

**card code** The set or combination of punched holes in a punch card that represent a character. (C) 610.10-1994w

**card column** A single vertical line of punch positions on a punch card. *Contrast:* card row. (C) 610.10-1994w

**card deck** A group of punch cards. (C) 610.10-1994w

**card duplicator** *See:* card reproducing punch.

**card extender** A device that provides access to components on a circuit card for testing purposes while maintaining all the electrical connections to the card. (SWG/PE) C37.100-1992

**card feed (1) (test, measurement, and diagnostic equipment)** The mechanism that moves cards serially into a machine. (MIL) [2]

**(2)** A mechanism that moves cards one at a time from the card hopper to the card path. (C) 610.10-1994w

**card field (test, measurement, and diagnostic equipment)** An area (one or more columns) of a card that is regularly assigned for the same information item. (MIL) [2]

**card hopper (1) (computers)** A device that holds cards and makes them available to a card-feed mechanism. *See also:* card stacker. (C) [85]

**(2)** The part of a card-processing device that holds the cards to be processed and makes them available to the card feed mechanism. *Synonym:* punched card holder. *Contrast:* card stacker. (C) 610.10-1994w

**card image (1) (computers)** A one-to-one representation of the contents of a punched card, for example, a matrix in which a 1 represents a punch and a 0 represents the absence of a punch. (C) [85]

**(2)** A representation of the hole patterns found in a punched card, for example, a matrix in which a one represents a punch and a zero represents the absence of a punch. (C) 610.10-1994w

**cardinality (1) (A)** The number of elements in a set. **(B)** In a relational data model, the number of tuples in a relation. (C) 610.5-1990

**(2)** The numeric relationship between entity sets, labeled as one to one (1-1), many to one (M-1), or many to many (M-N), which indicates the number of items in one entity set that could possibly be associated with the items in another entity set. (PE/EDPG) 1150-1991w

**(3)** A specification of how many instances of a first class may or must exist for each instance of a second (not necessarily distinct) class, and how many instances of a second class may

or must exist for each instance of a first class. For each direction of a relationship, the cardinality can be constrained. *See also:* cardinality constraint. (C/SE) 1320.2-1998

**cardinality constraint (A)** A kind of constraint that limits the number of instances that can be associated with each other in a relationship. *See also:* cardinality. **(B)** A kind of constraint that limits the number of members in a collection. *See also:* collection cardinality. (C/SE) 1320.2-1998

**cardinal plane** For an infinite planar array whose elements are arranged in a regular lattice, any plane of symmetry normal to the planar array and parallel to an edge of a lattice cell. *Notes:* 1. This term can be applied to a finite array, usually one containing a large number of elements, by the assumption that it is a subset of an infinite array with the same lattice arrangement. 2. This term is used to relate the regular geometrical arrangement of the array elements to the radiation pattern of the antenna. (AP/ANT) 145-1993

**cardiogram** *See:* electrocardiogram.

**cardiovascular effect** Effect pertaining to the system comprised of the heart and the blood vessels. (T&D/PE) 539-1990

**car door (elevators)** The sliding portion of the car or the hinged or sliding portion in the hoistway enclosure that closes the opening giving access to the car or to the landing. *See also:* hoistway. (PE/EEC) [119]

**car-door contact** An electric device, the function of which is to prevent operation of the driving machine by the normal operating device unless the car door or gate is in the closed position. *See also:* elevator. (EEC/PE) [119]

**car-door closer** A device or assembly of devices that closes a manually opened car door or gate by power other than by hand, gravity, springs, or the movement of the car. *See also:* elevator. (EEC/PE) [119]

**card path** In a card-processing device, a path along which cards are moved and guided. *See also:* card feed. (C) 610.10-1994w

**card-processing device** Any device that can read or write data to punch cards. *See also:* card reader; card reproducing punch; card punch. (C) 610.10-1994w

**card-programmed (test, measurement, and diagnostic equipment)** The capability of performing a sequence of tests according to instructions contained in one or a deck of punched cards. (MIL) [2]

**card punch** An output device that produces a record of data as hole patterns in punch cards. *Synonym:* automatic punch. *See also:* card reproducing punch; keypunch. (C) 610.10-1994w

**card reader (1) (test, measurement, and diagnostic equipment)** A mechanism that senses and obtains information from punched cards. (MIL) [2]

**(2)** An input device that reads or senses hole patterns in a punch card, transforming the data from hole patterns to electrical signals. *Synonym:* punched card reader. *See also:* card stacker; card hopper; card track; paper tape reader. (C) 610.10-1994w

**(3)** A device used to read a coded credential at an entry point. (PE/NP) 692-1997

**card, relay** *See:* relay armature card.

**card reproducer** *See:* card reproducing punch.

**card reproducing punch** A card-processing device that prepares one punch card, copying all or part of the data from another punch card. *Synonyms:* card reproducer; card duplicator. (C) 610.10-1994w

**card row** A single horizontal line of punch positions on a punch card. *Contrast:* card column. (C) 610.10-1994w

**card set function generator (analog computer)** A diode function generator whose values are stored and set by means of a punched card and a mechanical card-reading device. (C) 165-1977w

**card sorter** A sorting device that deposits punch cards in pockets selected according to the hole patterns in the cards. (C) 610.10-1994w

**card stacker (1) (computers)** An output device that accumulates punched cards in a deck. *See also:* card hopper. (MIL/C) [2], [20], [85]

**(2)** The part of a card-processing device that receives the cards after they have been processed. *Contrast:* card hopper. (C) 610.10-1994w

**card tester (test, measurement, and diagnostic equipment)** An instrument for testing and diagnosing printed circuit cards. (MIL) [2]

**card-to-disk converter** An input device that converts data from punch cards to disk storage. *See also:* card-to-tape converter; key-to-disk converter. (C) 610.10-1994w

**card-to-tape converter** An input device that converts data from punch cards to magnetic or paper tape. *See also:* card-to-disk converter; key-to-tape converter. (C) 610.10-1994w

**card track** That part of a card-processing device that moves and guides the card along the card path. (C) 610.10-1994w

**car enclosure (elevators)** Consists of the top and the walls resting on and attached to the car platform. *See also:* elevator. (EEC/PE) [119]

**car-frame sling** The supporting frame to which the car platform, upper and lower sets of guide shoes, car safety and hoisting ropes or hoisting-rope sheaves, or the plunger of a direct-plunger elevator are attached. *See also:* elevator. (EEC/PE) [119]

**cargo vessel** A vessel that carries bulk, containerized, or roll-on/roll-off dry cargo, and no more than 12 passengers. Research vessels, search and rescue vessels, and tugs are also considered to be cargo vessels. (IA/MT) 45-1998

**car platform (elevators)** The structure that forms the floor of the car and that directly supports the load. *See also:* hoistway. (EEC/PE) [119]

**car retarder** A braking device, usually power operated, built into a railway track and used to reduce the speed of cars by means of brake shoes that when set in braking position press against the sides of the lower portions of the wheels. *See also:* master controller; control machine; switch machine; trimmer signal. (EEC/PE) [119]

**carriage** The mechanism in a typewriter or other printing device that holds the paper and moves it past the printing position. *See also:* automatic carriage. (C) 610.10-1994w

**carriage control tape (A)** A tape that is used to control vertical tabulation of printing or display positions. **(B)** A tape that contains line feed and form feed control data for a printing device. (C) 610.10-1994

**carriage restore key** *See:* carriage return key.

**⟨carriage-return⟩** A character that in the output stream shall indicate that printing should start at the beginning of the same physical line in which the ⟨carriage-return⟩ occurred. The ⟨carriage-return⟩ shall be the character designated by '\r' in the C-language binding. It is unspecified whether this character is the exact sequence transmitted to an output device by the system to accomplish the movement to the beginning of the line. (C/PA) 9945-2-1993

**carriage return (CR) (1) (typewriter)** The operation that causes the next character to be printed at the left margin. (C) [85]

**(2)** A command or signal sent to a printer to instruct it to move to the beginning of the writing line. *Note:* Often used in conjunction with a line feed to move to the beginning of the next writing line. (C) 610.10-1994w

**carriage return character (CR)** A format effector that causes the print or display position to move to the first position on the same line. *Synonym:* new-line character. (C) 610.5-1990w

**carriage return key** A control key on a keyboard that initiates a carriage return. *Note:* Often used to terminate a command or to request its execution. *Synonyms:* carriage restore key; enter key. (C) 610.10-1994w

**carried traffic (telephone switching systems)** A measure of the calls served during a given period of time. (COM) 312-1977w

**carrier (1) (A) (data transmission)** A wave having at least one characteristic that may be varied from a known reference value by modulation. **(B) (data transmission)** That part of the modulated wave that corresponds in a specified manner to the unmodulated wave, having, for example, the carrier-frequency spectral components. *Note:* Examples of carriers are a sine wave and a recurring series of pulses. (PE/AP/ANT) 599-1985, 145-1993

**(2) (overhead-power-line corona and radio noise)** A continuous electromagnetic wave having a repeating variation in time and at least one characteristic that may be varied from a known reference value by modulation. *Note:* Examples of carriers are a sine wave and a recurring series of pulses. (T&D/PE) 539-1990

**(3) (semiconductor)** A mobile conduction electron or hole. *See also:* semiconductor device. (MIL) [2]

**(4) (electrostatography)** The substance in a developer that conveys a toner, but does not itself become a part of the viewable record. *See also:* electrostatography. (ED) 224-1965w, [46]

**(5) (A)** A continuous frequency capable of being modulated or impressed with a signal. *Synonym:* carrier wave. **(B)** An alternating current that oscillates at a fixed frequency, used to transmit a signal. (C) 610.7-1995

**carrier amplifier (signal-transmission system)** An alternating current amplifier capable of amplifying a prescribed carrier frequency and information side-bands relatively close to the carrier frequency. *See also:* signal. (IE) [43]

**carrier-amplitude regulation** The change in amplitude of the carrier wave in an amplitude-modulated transmitter when modulation is applied under conditions of symmetrical modulation. *Note:* The term "carrier shift," often applied to this effect, is deprecated. (AP/ANT) 145-1983s

**carrier beat (facsimile)** The undesirable heterodyne of signals each synchronous with a different stable reference oscillator causing a pattern in received copy. *Note:* Where one or more of the oscillators is fork controlled, this is called fork beat. *See also:* facsimile transmission. (COM) 168-1956w

**carrier chrominance signal** *See:* chrominance signal.

**carrier-controlled approach system (CCA) (1)** An aircraft carrier radar system providing information by which aircraft approaches may be directed via radio communication. (AES/GCS) 172-1983w

**(2)** An aircraft carrier radar system providing information that facilitates direction of aircraft via radio communication. (AES) 686-1997

**carrier current** The current associated with a carrier wave. *See also:* carrier. (PE) 599-1985w

**carrier-current choke coil (capacitance potential devices)** A reactor or choke coil connected in series between the potential tap of the coupling capacitor and the potential device transformer unit, to present a low impedance to the flow of power current and a high impedance to the flow of carrier-frequency current. Its purpose is to limit the loss of carrier-frequency current through the potential-device circuit. *See also:* outdoor coupling capacitor. (PE/EM) 43-1974s

**carrier-current grounding-switch and gap** Consists of a protective gap for limiting the voltage impressed on the carrier-current equipment and the line turning unit (if used); and a switch that, when closed, solidly grounds the carrier equipment for maintenance or adjustment without interrupting either high-voltage line or potential-device operation. *See also:* outdoor coupling capacitor. (PE/EM) 43-1974s

**carrier detect** A dc electrical signal presented by a modem to its associated terminal equipment when the modem is receiving a modulatory signal. (SUB/PE) 999-1992w

**carrier extension** The addition of nondata symbols to the end of frames that are less than slotTime bits in length so that the resulting transmission is at least one slotTime in duration. (C/LM) 802.3-1998

**carrier frequency (1) (A) (data transmission)** (periodic carrier) The reciprocal of its period. *Note:* The frequency of a periodic pulse carrier is often called the pulse repetition frequency in a signal transmission system. **(B) (data transmission)** (modulated amplifier) The frequency that is used to modulate the input signal for amplification. (PE) 599-1985

**(2)** A unique frequency of a carrier that is used to carry data. *Note:* It is measured in cycles per second or hertz. (C) 610.7-1995

**carrier-frequency pulse** A carrier that is amplitude modulated by a pulse. *Notes:* 1. The amplitude of the modulated carrier is zero before and after the pulse. 2. Coherence of the carrier (with itself) is not implied. (IM/WM&A) 194-1977w

**carrier frequency range (transmitter)** The continuous range of frequencies within which the transmitter may be adjusted for normal operation. A transmitter may have more than one carrier-frequency range. *See also:* radio transmitter. (AP/BT/ANT) 145-1983s, 182-1961w

**carrier frequency stability (radio transmitters) (transmitter performance)** The measure of the ability to remain on assigned channel as determined on both a short-term (1 second) and a long-term (24 hour) basis. (VT) [37]

**carrier, fuse** *See:* fuse carrier.

**carrier group (data transmission)** The frequency band, 60 kHz to 108 kHz, containing twelve voice channels which serves as the basic building block of a larger system. (PE) 599-1985w

**carrier group alarm** A combination of a carrier failure alarm and trunk conditioning, which is the process of disconnecting any trunk-group connections and making trunks busy. (COM/TA) 1007-1991r

**carrier isolating choke coil** An inductor inserted, in series with a line on which carrier energy is applied, to impede the flow of carrier energy beyond that point. (IM) [120]

**carrier modulation (data transmission)** A process whereby a high-frequency carrier wave is altered by a signal containing the information to be transmitted. (PE) 599-1985w

**carrier noise level (residual modulation)** The noise produced by undesired variations of radio-frequency signal in the absence of any intended modulation. (AP/ANT) 145-1983s

**carrier or pilot-wire receiver relay (power system device function numbers)** A relay that is operated or restrained by a signal used in connection with carrier-current or direct-current (dc) pilot-wire fault relaying. (SUB/PE) C37.2-1979s

**carrier-pilot-protection** A form of pilot protection in which the communication means between relays is a carrier current channel. (SWG/PE) C37.100-1992

**carrier power output (transmitter performance)** The radio-frequency power available at the antenna terminal when no modulating signal is present. *See also:* audio-frequency distortion. (VT) [37]

**carrier relaying protection** A form of pilot protection in which high-frequency current is used over a metallic circuit (usually the line protected) for the communicating means between the relays at the circuit terminals. (SWG/PE) C37.100-1981s

**carrier sense** In a local area network, an ongoing activity of a data station to detect whether another station is transmitting. *Note:* The carrier sense signal indicates that one or more DTEs are currently transmitting. (LM/C) 610.7-1995, 8802-3-1990s, 802.3-1998

**carrier sense multiple access with collision detection** A local area network access technique. When a station wants to gain access to the network, it listens for conflicting traffic and checks to see if the network is free. If the network is not free, it waits for a small amount of time and retries. (C) 610.7-1995

**carrier shift (1) (data transmission)** The difference between the steady state, mark, and space frequencies in a system utilizing frequency shift modulation. (PE) 599-1985w

**(2)** *See also:* carrier-amplitude regulation. (AP/ANT) 145-1983s

**carrier suppression (radio communication)** The method of operation in which the carrier wave is not transmitted. *See also:* modulation. (AP/ANT) 145-1983s

**carrier system (1) (data transmission)** A communication system using frequency multiplexing to a number of channels over a single path by modulating each channel upon a different carrier frequency and demodulating at the receiving point to restore the signals to their original form. (PE) 599-1985w

**(2)** A means for obtaining a number of channels over a single path, known as a carrier. (C) 610.7-1995

**carrier tap choke coil** A carrier-isolating choke coil inserted in series with a line tap. (IM) [120]

**carrier telegraphy** The form of telegraphy in which, in order to form the transmitted signals, alternating-current is supplied to the line after being modulated under the control of the transmitting apparatus. *See also:* telegraphy. (COM) [49]

**carrier telephone channel** A telephone channel employing carrier transmission. *See also:* channel. (EEC/PE) [119]

**carrier-to-noise ratio (1) (A)** The ratio of the powers of the carrier and the noise after specified band limiting and before any nonlinear process such as amplitude limiting and detection. *Note:* This ratio is expressed in many different ways, for example, in terms of peak values in the case of impulse noise and in terms of mean-squared values for other types of noise. **(B)** A combination of transmission media and equipment capable of accepting signals at one point and delivering related signals at another point. *See also:* amplitude modulation; information theory. (IT) [7]

**(2) (data transmission)** The ratio of the magnitude of the carrier to that of the noise after selection and before any nonlinear process, such as amplitude limiting and detection. The bandwidth used for measurement of the noise should be specified when using this ratio. (PE) 599-1985w

**(3) (broadband local area networks)** The carrier-to-noise ratio expresses the relationship between signaling and noise power on a communications medium. The ratio is normally referenced to a specific noise bandwidth that corresponds to the signaling bandwidth. (LM/C) 802.7-1989r

**carrier transmission** That form of electric transmission in which the transmitted electric wave is a wave resulting from the modulation of a single-frequency wave by a modulating wave. *See also:* carrier. (EEC/PE) [119]

**carrier velocity (semiconductor) (nonlinear, active, and nonreciprocal waveguide components)** The average velocity of the random thermal motion of electrons in *n*-type semiconductors and of holes in *p*-type semiconductors. (MTT) 457-1982w

**carrier wave** *See:* carrier.

**carry (A)** A character or characters, produced in connection with an arithmetic operation on one digit place of two or more number representations in positional notation, and forwarded to another digit place for processing there. **(B)** The number represented by the character or characters in definition (A). **(C)** Usually, a signal or expression as defined in definition (A) which arises in adding, when the sum of two digits in the same digit place equals or exceeds the base of the number system in use. *Note:* If a carry into a digit place will result in a carry out of the same digit place, and if the normal adding circuit is bypassed when generating this new carry, it is called a high-speed carry, or standing-on-nines carry. If the normal adding circuit is used in such a case, the carry is called a cascaded carry. If a carry resulting from the addition of carries is not allowed to propagate (for example, when forming the partial product in one step of a multiplication process), the process is called a partial carry. If it is allowed to propagate, the process is called a complete carry. If a carry generated in the most-significant-digit place is sent directly to the least-significant place (for example, when adding two negative numbers using nines complements) that carry is called and end-around carry. **(D)** A carry, in direct subtraction, is a signal or expression as defined in definition (A) that arises when the difference between the digits is less than zero. Such a carry is frequently called a borrow. **(E)** To carry is the action for forwarding a carry. **(F)** A carry is the command directing a carry to be forwarded. *See also:* high-speed carry; end-around carry; standing-on-nines carry; complete carry; partial carry; cascaded carry. (C) 162-1963

**(2) (A) (mathematics of computing)** A mathematical process used in addition and subtraction, in which a value is generated when a sum or product in a digit place exceeds the largest number that can be represented in that digit place, and the value is transferred to the next higher digit place for processing there. *See also:* complete carry; partial carry; cascaded carry; standing-on-nines carry; half carry; high-speed carry; end-around carry. **(B) (mathematics of computing)** The value generated in definition (A). **(C) (mathematics of computing)** To perform the process defined in definition (A). (C) 1084-1986

**car safety** (counterweight safety) A mechanical device attached to the car frame or to an auxiliary frame, or to the counterweight frame, to stop and hold the car or counterweight in case of predetermined overspeed of free fall, or if the hoisting ropes slacken. *See also:* elevator. (EEC/PE) [119]

**car-switch automatic floor-stop operation (elevators)** Operation in which the stop is initiated by the operator from within the car with a definite reference to the landing at which it is desired to stop, after which the slowing down and stopping of the elevator is effected automatically. *See also:* control. (PE/EEC) [119]

**car-switch operation (elevators)** Operation wherein the movement and direction of travel of the car are directly and solely under the control of the operator by means of a manually operated car switch of continuous-pressure buttons in the car. *See also:* control. (PE/EEC) [119]

**cartridge (1)** A container holding some form of data medium such that the medium can be accessed without separating it from the container; for example, a magnetic tape cartridge or a font cartridge. *See also:* cassette. (C) 610.10-1994w

**(2)** A unit of physical media that contains one or more sides. (C/SS) 1244.1-2000

**cartridge font** A font that is stored on a font cartridge. (C) 610.10-1994w

**cartridge fuse** A low-voltage fuse consisting of a current-responsive element inside a fuse tube with terminals on both ends. (SWG/PE) C37.100-1992

**cartridge size** (of a cartridge fuse) The range of voltage and ampere ratings assigned to a fuse cartridge with specific dimensions and shape. (SWG/PE) C37.100-1992

**cartridge-type bearing (rotating machinery)** A complete ball or roller bearing assembly consisting of a ball or roller bearing and bearing housing that is intended to be inserted into a machine endshield. *See also:* bearing. (PE) [9]

**cart, splicing** *See:* splicing cart.

**car-wiring apparatus** *See:* wire; multiple-unit control.

**cascade (1) (electrolyte cells)** A series of two or more electrolytic cells or tanks so placed that electrolyte from one flows into the next lower in the series, the flow being favored by differences in elevation of the cells, producing a cascade at each point where electrolyte drops from one cell to the next. *See also:* tandem; electrowinning. (EEC/PE) [119]

**(2) (broadband local area networks)** The number of amplifiers connected in series. (LM/C) 802.7-1989r

**(3)** A multilevel repeater topology in which higher-level repeaters are connected through their local ports to the cascade port of lower-level repeaters.local area networks. (C) 8802-12-1998

**cascade button** A choice on a menu that, when activated, presents another menu with additional related choices. (C) 1295-1993w

**cascade connection (cascade)** A tandem arrangement of two or more similar component devices in which the output of one is connected to the input of the next. *See also:* tandem. (PE/EEC) [119]

**cascade control (1) (street lighting system)** A method of turning street lights on and off in sections, each section being controlled by the energizing and de-energizing of the preceding section. *See also:* direct-current distribution; alternating-current distribution. (T&D/PE) [10]

**(2) (automatic control)** *See also:* cascade control system. (PE/EDPG) [3]

**cascade control system** A control system in which the output of one subsystem is the input for another subsystem. *See also:* feedback control system. (IM/PE/EDPG) [120], [3]

**cascaded carry (mathematics of computing)** A carry process in which the addition of two numerals results in a partial-sum numeral and a carry numeral that are in turn added together, this process being repeated until no new carries are generated.

**Cascaded Carry**

| | |
|---|---|
| Augend | 289594 |
| Addend | 320607 |
| First Partial Sum | 509191 |
| First Partial Carry | 101010 |
| Second Partial Sum | 600101 |
| Second Partial Carry | 010100 |
| True Sum | 610201 |

*Contrast:* high-speed carry. *See also:* partial carry; carry; partial sum. (C) [20], 1084-1986w

**cascade development (electrostatography)** Development in which the image-forming material is carried to the field of the electrostatic images by means of gravitational forces, usually in combination with a granular carrier. *See also:* electrostatography. (ED) 224-1965w, [46]

**cascaded thermoelectric device** A thermoelectric device having two or more stages arranged thermally in series. *See also:* thermoelectric device. (ED) [46], 221-1962w

**cascade matrix** *See:* chain matrix.

**cascade merge sort** An unbalanced merge sort in which the distribution of the sorted subsets is based on the cascade numbers. *See also:* polyphase merge sort. (C) 610.5-1990w

**cascade node (network analysis)** A node (branch) not contained in a loop. (CAS) 155-1960w

**cascade port** The repeater port that enables a cascade connection to a higher-level repeater.local area networks. (C) 8802-12-1998

**cascade rectifier (cascade rectifier circuit)** A rectifier in which two or more similar rectifiers are connected in such a way that their direct voltages add, but their commutations do not coincide. *Note:* When two or more rectifiers operate so that their commutations coincide, they are said to be in parallel if the direct currents add, and in series if the direct voltages add. *See also:* power rectifier; rectifier circuit element; rectification. (IA/EEC/PCON) 59-1962w, [110]

**cascade summing of X and gamma rays** The simultaneous detection of two or more photons originating from a single nuclear disintegration that results in only one observed (summed) pulse. *Synonym:* coincidence summing. (NI) N42.14-1991

**cascade thyristor converter** A thyristor converter in which two or more simple converters are connected in such a way that their direct voltages add, but their commutations do not coincide. (IA/IPC) 444-1973w

**cascade transitions** Gamma rays in the radioactive decay of a single atom that are emitted sequentially and within the resolving time of the spectrometer. (NI) N42.14-1991

**cascade-type voltage transformer (1)** An insulated-neutral terminal type voltage transformer with the primary distributed on two or more cores electromagnetically coupled by coupling windings. The secondary is on the core at the neutral end of the primary. Each core is insulated from the other cores and is maintained at a fixed percentage of the voltage between the primary terminal and the neutral terminal. (PE/TR) [57]

**(2) (instrument transformers) (power and distribution transformers)** An insulated-neutral terminal type voltage transformer with the primary winding distributed on several cores with the cores electromagnetically coupled by coupling windings. The secondary winding is on the core at the neutral end of the high-voltage winding. Each core of this type of transformer is insulated from the other cores and is maintained at a fixed voltage with respect to ground and the line-to-ground voltage. (PE/TR) C57.12.80-1978r

**(3)** A voltage transformer that has an insulated-neutral or grounded-neutral terminal and that has the primary winding subdivided into two or more (usually equal) series connected sections, mounted on one or more magnetic cores, and that has the secondary winding located about the core at the neutral end of the primary winding. The sections of the primary winding are coupled by "coupling windings." The cores, if more than one, are insulated from each other and connected to definite voltage levels along the primary winding. (PE/TR) C57.13-1993

**cascading** (of switching devices) The application of switching devices in which the devices nearest the source of power have interrupting ratings equal to, or in excess of, the available short-circuit current, while devices in succeeding steps further from the source, have successively lower interrupting ratings. (SWG/PE) C37.100-1992

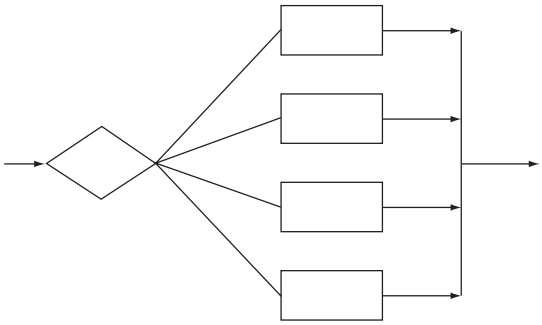
**CASE** *See:* computer-aided software engineering.

**case (1) (storage battery) (storage cell)** A multiple compartment container for the elements and electrolyte of two or more storage cells. Specifically, wood cases are containers for cells in individual jars. *See also:* battery. (EEC/PE) [119]

**(2) (electrotyping)** A metal plate to which is attached a layer of wax to serve as a matrix. (EEC/PE) [119]

**(3) (semiconductor devices)** The housing of a semiconductor device. (IA) [12]

**(4) (software)** A single-entry, single-exit multiple-way branch that defines a control expression, specifies the processing to be performed for each value of the control expression, and returns control in all instances to the statement immediately following the overall construct. *Synonym:* multiple exclusive selective construct. *Contrast:* if-then-else; go to; jump. *See also:* multiple inclusive selective construct.



*case construct (software)*

**case**

(C) 610.12-1990

**(5) (accelerometer) (gyros)** The structure that provides the mounting surfaces and establishes the reference axes. (AES/GYAC) 528-1994

**case capacitance (nonlinear, active, and nonreciprocal waveguide components) (semiconductor)** The fixed capacitance of an empty enclosure (neither semiconductor chip nor connecting wires or straps are present). (MTT) 457-1982w

**case ground protection** Overcurrent relay protection used to detect current flow in the ground or earth connection of the equipment or machine. (SWG/PE) C37.100-1992

**case shift (telegraphy)** The change-over of the translating mechanism of a telegraph receiving machine from letters-case to figures-case or vice versa. *See also:* telegraphy. (COM) [49]

**CASE tool** A software tool that aids in software engineering activities, including, but not limited to, requirements analysis and tracing, software design, code production, testing, docu-

ment generation, quality assurance, configuration management, and project management. *Note:* A CASE tool may provide support in only selected functional areas or in a wide variety of functional areas. (C/SE) 1209-1992w, 1348-1995

**CASE tool evaluation** A process wherein various aspects of a CASE tool are measured against defined criteria and the results are recorded for future use. (C/SE) 1209-1992w

**CASE tool selection** A process wherein the data from one or more CASE tool evaluations are weighted and compared against defined criteria to determine whether one or more of the CASE tools can be recommended for selection. (C/SE) 1209-1992w

**Cassegrainian feed (communication satellite)** A feed system used for parabolic reflector antennas, where a small hyperbolic subreflector is placed near the focus of the paraboloid. The Cassegrainian feed system prevents spillover to the back of the reflector; thus, a better noise performance is achieved. (COM) [24]

**Cassegrain reflector antenna** A paraboloidal reflector antenna with a convex subreflector, usually hyperboloidal in shape, located between the vertex and the prime focus of the main reflector. *Notes:* 1. To improve the aperture efficiency of the antenna, the shapes of the main reflector and the subreflector are sometimes modified. 2. There are other alternate forms that are referred to as Cassegrainean. Examples include the following: one in which the subreflector is surrounded by a reflecting skirt and one that utilizes a concave hyperboloidal reflector. When referring to these alternate forms the term shall be modified in order to differentiate them from the antenna described in the definition. (AP/ANT) 145-1993

**cassette** A container holding some form of data medium on reels which are driven at their axis at a variable speed which allows the tape to be accessed without separating it from the container. *See also:* cartridge; magnetic tape cassette. (C) 610.10-1994w

**cast** To treat an object of one type as an object of another type. *Contrast:* coerce. (C/SE) 1320.2-1998

**casting (electrotyping)** The pouring of molten electrotype metal upon tinned shells. (PE/EEC) [119]

**casting out nines** A method of checking addition, subtraction, or multiplication results by dividing decimal values by nine and comparing the remainders. *Synonym:* nines check. (C) 1084-1986w

**cat** *See:* tractor, crawler; crawler tractor.

**CAT** *See:* computerized axial tomography; computer-assisted tomography; computer-aided testing.

**catalog (1) (A)** A directory of the location of files within a system. *See also:* file directory. **(B)** The set of all indices used to reference a file, database, or system. **(C)** The index to all other indices. **(D)** To enter information about a file, database, or system as in definitions (A) and (B). (C) 610.5-1990
**(2)** The metadata describing all the software objects that are a part of a single software_collection (distribution or installed_software object). Catalogs exist both in distributions and for installed software, although storage of catalogs for installed software is undefined within this standard. A catalog in a distribution shall always use the exported catalog structure, since it is required to be stored in a portable or exported catalog structure. A catalog for installed software shall use the exported catalog structure when information is listed with `swlist -v`. (C/PA) 1387.2-1995

**catastrophic failure (1) (software)** A failure of critical software. (C) 610.12-1990
**(2)** Failure that is both sudden and complete. (R) [29]
**(3)** A failure of any portion of the GIS due to internal or external faults that results in sufficient damage to that portion of the GIS that it cannot be returned to service without major repairs. (PE/SUB) C37.123-1996

**catcher** *See:* output resonator.

**catcher space (velocity-modulated tube)** The part of the tube following the drift space, and where the density modulated-electron beam excites oscillations in the output resonator. It is the space between the output-resonator grids. *See also:* velocity-modulated tube. (ED) [45], [84]

**categorization** *See:* generalization.

**category (1)** In pattern recognition, a synonym for **pattern class.** (C) 610.4-1990w
**(2)** An attribute of an anomaly to which a group of classifications belongs. (C/SE) 1044-1993
**(3)** An attribute of an anomaly to which a group of classifications belongs. A specifically defined division in a system of classification; class. (C/SE) 1044.1-1995

**category cluster** *See:* subclass cluster.

**category discriminator** *See:* discriminator.

**category entity** An entity whose instances represent a subtype or subclassification of another entity (generic entity). *Synonyms:* subclass; subtype. (C/SE) 1320.2-1998

**Category 3 balanced cabling** Balanced 100 Ω and 120 Ω cables and associated connecting hardware whose transmission characteristics are specified up to 16 MHz. Commonly used by IEEE 802.3 10BASE-T installations. (C/LM) 802.3-1998

**Category 4 balanced cabling** Balanced 100 Ω and 120 Ω cables and associated connecting hardware whose transmission characteristics are specified up to 20 MHz. (C/LM) 802.3-1998

**Category 5 balanced cabling** Balanced 100 Ω and 120 Ω unshielded twisted-pair (UTP) cables and associated connecting hardware whose transmission characteristics are specified up to 100 MHz. (C/LM) 802.3-1998

**catelectrotonus (electrobiology)** Electrotonus produced in the region of the cathode. *See also:* excitability. (EMB) [47]

**catenate** *See:* concatenate.

**cathode (1) (electron tube or valve)** An electrode through which a primary stream of electrons enters the interelectrode space. *See also:* electrode. (ED) 161-1971w, [45]
**(2) (semiconductor rectifier diode)** The electrode to which the forward current flows within the cell. *See also:* semiconductor. (IA) 59-1962w, [12]
**(3) (electrolytic)** An electrode through which current leaves any conductor of the nonmetallic class. Specifically, an electrolytic cathode is an electrode at which positive ions are discharged, or negative ions are formed, or at which other reducing reactions occur. *See also:* electrolytic cell. (EEC/PE) [119]
**(4) (thyristor)** The electrode by which currents leaves the thyristor when the thyristor is in the ON state with the gate open-circuited. *Note:* This term does not apply to bidirectional thyristors. (ED/IA) [46], [62]

**cathode border (gas) (gas tube)** The distinct surface of separation between the cathode dark space and the negative glow. *See also:* discharge. (Std100) [84]

**cathode cleaning (electroplating)** Electrolytic cleaning in which the metal to be cleaned is the cathode. *See also:* battery. (EEC/PE) [119]

**cathode coating impedance (electron tube)** The impedance excluding the cathode interface (layer) impedance, between the the base metal and emitting surface of a coated cathode. (ED) 161-1971w, [45]

**cathode, cold** *See:* cold cathode.

**cathode current** *See:* electrode current; electronic controller.

**cathode current, peak (A) (fault)** The highest instantaneous value of a nonrecurrent pulse of cathode current occurring under fault conditions. *See also:* electrode current. **(B) (steady-state)** The maximum instantaneous value of a periodically recurring cathode current. *See also:* electrode current. **(C) (surge)** The highest instantaneous value of a randomly recurring pulse of cathode current. *See also:* electrode current. (ED) [45]

**cathode dark space (gas tube)** The relatively nonluminous region in a glow-discharge cold-cathode tube between the cathode glow and the negative glow. *Synonym:* Crookes dark space. *See also:* gas tube. (ED) [45]

**cathode efficiency** The current efficiency of a specified cathodic process. *See also:* electrochemistry.

**cathode fall (gas)** The difference of potential due to the space charge near the cathode. *See also:* discharge.
(ED) [45], [84]

**cathode follower** A circuit in which the output load is connected in the cathode circuit of an electron tube and the input is applied between the control grid and the remote end of the cathode load, which may be at ground potential. *Note:* The circuit is characterized by low output impedance, high input impedance, gain less than unity, and negative feedback.
(AP/BT/ANT) 145-1983s, 182A-1964w

**cathode glow (gas tube)** The luminous glow that covers all, or part, of the surface of the cathode in a glow-discharge cold-cathode tube, between the cathode and the cathode dark space. *See also:* gas tube. (ED) 161-1971w, [45]

**cathode heating time (vacuum tubes)** The time required for the cathode to attain a specified condition; for example: a specified value of emission, or a specified rate of change of emission. *Note:* All electrode voltages are to remain constant during measurement. The tube elements must all be at room temperature at the start of the test. *See also:* operation time.
(ED) 161-1971w, [45]

**cathode interface (layer) capacitance (electron tube)** A capacitance that, in parallel with a suitable resistance, forms an impedance approximating the cathode interface impedance. *Note:* Because the cathode interface impedance cannot be represented accurately by the two-element resistance-capacitance circuit, this value of capacitance is not unique.
(ED) 161-1971w, [45]

**cathode interface (layer) impedance (electron tube)** An impedance between the cathode base and coating. *Note:* This impedance may be the result of a layer of high resistivity or a poor mechanical bond between the cathode base and coating. (ED) 161-1971w, [45]

**cathode interface (layer) resistance (electron tube)** The low-frequency limit of cathode interface impedance.
(ED) 161-1971w, [45]

**cathode, ionic-heated** *See:* ionic-heated cathode.

**cathode layer** A molten metal or alloy forming the cathode of an electrolytic cell and which floats on the fused electrolyte, or upon which fused electrolyte floats. *See also:* fused electrolyte. (EEC/PE) [119]

**cathode luminous sensitivity (photocathodes)** The quotient of photoelectric emission current from the photocathode by the incident luminous flux under specified conditions of illumination. *Notes:* 1. Since cathode luminous sensitivity is not an absolute characteristic but depends on the spectral distribution of the incident flux, the term is commonly used to designate the sensitivity to radiation from a tungsten filament lamp operating at a color temperature of 2870 kelvins. 2. Cathode luminous sensitivity is usually measured with a collimated beam at normal incidence. *See also:* phototube.
(ED/NPS) 161-1971w, 398-1972r

**cathode modulation** Modulation produced by application of the modulating voltage to the cathode of any electron tube in which the carrier is present. *Note:* Modulation in which the cathode voltage contains externally generated pulses is called cathode pulse modulation. (EEC/PE) [119]

**cathode, pool** *See:* pool cathode.

**cathode, preheating time** *See:* preheating time cathode.

**cathode pulse modulation** Modulation produced in an amplifier or oscillator by application of externally generated pulses to the cathode circuit. (AP/ANT) 145-1983s

**cathode radiant sensitivity (photocathodes)** The quotient of the photoelectric emission current from the photocathode by the incident radiant flux at a given wavelength under specified conditions of irradiation. *Note:* Cathode radiant sensitivity is usually measured with a collimated beam at normal incidence. (ED/NPS) 161-1971w, 398-1972r

**cathode-ray charge-storage tube** A charge-storage tube in which the information is written by means of cathode-ray beam. *Note:* Dark-trace tubes and cathode-ray tubes with a long persistence are examples of cathode-ray storage tubes that are not charge-storage tubes. Most television camera tubes are examples of charge-storage tubes that are not cathode-ray storage tubes. *See also:* charge-storage tube.
(ED) 158-1962w

**cathode-ray oscillograph** An oscillograph in which a photographic or other record is produced by means of the electron beam of a cathode-ray tube. *Note:* The term "cathode-ray oscillograph" has frequently been applied to a cathode-ray oscillograph, but this usage is deprecated. *See also:* oscillograph. (EEC/PE) [119]

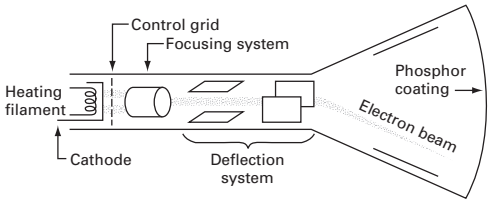
**cathode-ray oscilloscope** An oscilloscope that employs a cathode-ray tube as the indicating device. *See also:* oscillograph.
(EEC/PE) [119]

**cathode ray storage** A type of matrix storage in which a cathode ray beam is used to access data. (C) 610.10-1994w

**cathode-ray storage tube** A storage tube in which the information is written by means of a cathode-ray beam. *See also:* storage tube. (ED) 158-1962w

**cathode-ray tube (1) (supervisory control, data acquisition, and automatic control) (station control and data acquisition)** A display device in which controlled electron beams are used to present alphanumeric or graphical data on an electroluminescent screen.
(SUB/PE/SWG-OLD) C37.1-1987s, C37.100-1992

**(2) (computer graphics)** An evacuated glass tube in which a beam of electrons is emitted and focused onto the phosphor-coated display surface of the tube. A beam deflection system moves the beam as required to generate an image.




**cathode-ray tube**

(C) 610.6-1991w

**(3)** An evacuated glass tube in a well-defined and controllable beam of electrons is focused onto a phosphor-coated display surface of the tube causing the phosphors to emit light. *Note:* A beam deflection system moves the beam as required to generate an image. *See also:* Williams-tube storage; storage tube. (C) 610.10-1994w

**cathode-ray-tube display area** *See:* graticule area.

**cathode ray tube display device** A display device that presents data in visual form by means of controlled electron beams within a cathode ray tube. (C) 610.6-1991w

**cathode region (gas) (gas tube)** The group of regions that extends from the cathode to the Faraday dark space inclusively. *See also:* discharge. (EEC/ACO) [109], [84]

**cathode spot** An area on the cathode of an arc from which electron emission takes place at a current density of thousands of amperes per square centimeter and where the temperature of the electrode is too low to account for such currents by thermionic emission. *See also:* gas tube.
(EEC/ACO) [109]

**cathode sputtering (gas)** The emission of fine particles from the cathode (or anode) produced by positive ion (or electron) bombardment. *Synonym:* anode sputtering. *See also:* discharge. (ED) [45], [84]

**cathode terminal (1) (semiconductor devices)** The terminal from which forward current flows to the external circuit. *Note:* In the semiconductor rectifier components field, the cathode terminal is normally marked positive. *See also:* semiconductor rectifier cell; semiconductor.
(IA) [62], [12], 59-1962w

**(2) (thyristor)** The terminal that is connected to the cathode. *Note:* The term does not apply to bidirectional thyristors. *See also:* anode. (IA/ED) 223-1966w, [12], [46]

**cathodic corrosion** An increase in corrosion of a metal by making it cathodic. *See also:* stray-current corrosion. (IA) [71], [59]

**cathodic polarization** Polarization of a cathode. *See also:* electrochemistry. (IA) [59], [71]

**cathodic protection** Reduction or prevention of corrosion by making a metal the cathode in a conducting medium by means of a direct electric current (which is either impressed or galvanic). (IA) [59], [71]

**catholyte** The portion of an electrolyte in an electrolytic cell adjacent to a cathode. If a diaphragm is present, it is the portion of electrolyte on the cathode side of the diaphragm. *See also:* electrolytic cell. (EEC/PE) [119]

**cation** A positively charged ion or radical that migrates toward the cathode under the influence of a potential gradient. *See also:* ion. (IA) [59], [71]

**CATV** *See:* community antenna television.

**CATV-type broadband medium** *See:* community antenna television (CATV)-type broadband medium.

**cat whisker** A small, sharp-pointed wire used to make contact with a sensitive point on the surface of a semiconductor. (EEC/PE) [119]

**caustic** A point in space where geometric or ray optics theory predicts infinite field strength. (AP/PROP) 211-1997

**caustic embrittlement** Stress-corrosion cracking in alkaline solutions. (IA) [59], [71]

**caustic soda cell** A cell in which the electrolyte consists primarily of a solution of sodium hydroxide. *See also:* electrochemistry. (EEC/PE) [119]

**caution** Advisory in a software user document that performing some action may lead to consequences that are unwanted or undefined. *Contrast:* warning. (C/SE) 1063-1987r

**cavitation (1) (liquid)** Formation, growth, and collapse of gaseous and vapor bubbles due to the reduction of pressure of the cavitation point below the vapor pressure of the fluid at the working temperature. (SP) [32]

**(2) (hydroelectric power plants)** With respect to an operating hydraulic turbine, the formation of vapor-filled bubbles in high velocity, low pressure regions of the water passage—for example, around the turbine runner. The rapid collapse of the bubbles as they are propelled out of the low pressure region produces a pressure wave, which can erode nearby material. (PE/EDPG) 1020-1988r

**cavitation damage** Deterioration caused by formation and collapse of cavities in a liquid. (IA) [59]

**cavity** *See:* optical cavity; unloaded applicator impedance.

**cavity dumpers (acousto-optic device)** Generally, a fast rise-time pulse modulator used intracavity. (UFFC) [17]

**cavity ratio (CR)** A number indicating cavity proportions.

$$CR = \frac{5 \times (\text{height of C}) \times (\text{C} + \text{C width})}{(\text{C length}) \times (\text{C width})}$$

For cavities of irregular shape,

$$CR = \frac{2.5 \times (\text{C height}) \times (\text{C perimeter})}{(\text{area of C base})}$$

*Note:* The relationship between "cavity ratio" and "room coefficient" should be noted. If the entire room is considered as a cavity, the room height becomes the cavity height and CR $= 10K_r$. (EEC/IE) [126]

**cavity resonator (1)** A space normally bounded by an electrically conducting surface in which oscillating electromagnetic energy is stored, and whose resonant frequency is determined by the geometry of the enclosure. *See also:* waveguide. (AP/ANT) 145-1983s

**(2) (waveguide components)** A resonator formed by a volume of propagating medium bounded by reflecting surfaces. *See also:* waveguide resonator. (MTT) 147-1979w

**cavity resonator frequency meter (waveguide components)** A cavity resonator used to determine frequency. *See also:* cavity resonator. (MTT) 147-1979w

**CAX** *See:* unattended automatic exchange.

**C-band** A radar-frequency band between 4 GHz and 8 GHz, usually in the International Telecommunications Union (ITU) allocated band 5.2–5.9 GHz. (AES) 686-1997

**C battery** A battery designed or employed to furnish voltage used as a grid bias in a vacuum-tube circuit. *See also:* battery. (EEC/PE) [119]

**CBCT** *See:* customer-bank communication terminal.

**CBE** *See:* computer-based education.

**CBEMA** *See:* Computer and Business Equipment Manufacturers Association.

**CBL** *See:* computer-based learning.

**CCA** *See:* carrier-controlled approach system.

**CCB** *See:* change control board; configuration control board.

**CCD** *See:* charge-coupled device.

**C channel (1)** A channel that provides an integer multiple of 64 kbit/s, full-duplex, isochronous clear channels. The "C" shall be used to indicate that this is a circuit-switched channel. $C_m$ stands for a channel ($m$) times 64 kbit/s in size. In general, a C channel has the same characteristics as an ISDN B or H channel, except that it can be any multiple of 64 kbit/s in size, rather than only the ITU-T approved rates. There may be multiple $C_m$ channels of varying sizes ($n \times C_m$). For ISLAN4-T/ISLAN16-T, the following also applies: The maximum composite bandwidth allocated for the C channel(s) shall be limited by the application requirements for the P channel. That is, the available bandwidth that may be assigned for C channels shall be limited to the difference between the TDM payload field minus the bandwidth required for the P channel. In practice, the C channel size(s) will be effected by the interconnection facility(ies) between the AU and the ISDN wide area network (WAN). (C/LM) 802.9a-1995w

**(2)** A channel that provides an integer multiple of 64 kb/s, full duplex, isochronous clear channels. The "C" is used to indicate that this is a circuit-switched channel. $C sub m$ stands for a channel (m) times 64 kb/s in size. In general, a C channel has the same characteristics as an ISDN B or H channel, except that it can be any multiple of 64 kb/s in size, rather than only the CCITT approved rates. There may be multiple C channels of varying sizes (n × C). Note the following equivalencies:

$C_1 = B = 64$ kb/s

$C_6 = H_0 = 384$ kb/s

$C_{24} = H_{11} = 1.536$ Mb/s

$C_{30} = H12 = 1.920$ Mb/s

The maximum composite bandwidth allocated for the C channel(s) shall be limited by the application requirements for the P channel. That is, the available bandwidth that may be assigned for C channels shall be limited to the difference between the TDM payload field minus the bandwidth required for the P channel. In practice, the C channel size(s) will be effected by the interconnection facility(ies) between the AU and the ISDN wide area network (WAN). (LM/C/COM) 8802-9-1996

**CCITT (Comité Consultatif International de Télégraphique et Téléphonique)** *See:* Consultative Committee on International Telegraphy and Telephony; Comité Consultatif Internationale Télégraphique et Téléphone.

**CCITT Standard** A standard recommended by CCITT (Consultative Committee on International Telegraphy and Telephony). *Notes:* 1. CCITT recommendations are published by lettered series. For example, the X-series, for equipment and protocols used with computer networks. 2. CCITT Standards are now designated as ITU-T Standards. *See also:* Consultative Committee on International Telegraphy and Telephony. (C) 610.7-1995

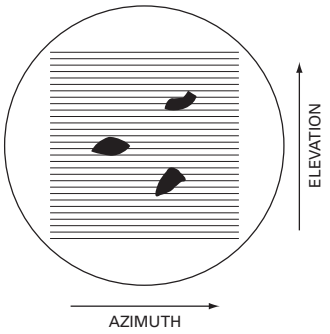
**C conditioning** A North American term for a type of conditioning that controls attenuation, distortion, and delay distortion, thus making transmission impairments of a circuit lie within specified limits. *See also:* D conditioning.
(C) 610.7-1995

**CCR** *See:* condition code register.

**CCS** Hundreds of call seconds per hour. A measure of traffic intensity or event data. *Synonym:* call attempts per hour. *See also:* time-consistent traffic measures.
(COM/TA) 973-1990w

**CD** *See:* compact disc; collision detection.

**C-display** A rectangular display in which each target appears as an intensity-modulated blip with azimuth indicated by the horizontal coordinate and angle of elevation by the vertical coordinate.



**C-display**

(AES) 686-1997

**CDL** *See:* Computer Design Language.

**CDO** *See:* unattended automatic exchange.

**CD1** *See:* clocked data one.

**CDP** *See:* commercial data processing.

**CDR** *See:* critical design review.

**CD-ROM** *See:* compact disc read-only memory.

**CD-ROM storage** A read-only form of optical storage employing compact discs to store information. (C) 610.10-1994w

**CD state** The state of an analog pin when it is isolated from the core circuit and all test circuits. *Note:* When a pin is in the CD state, there may be residual elements to which it remains connected. *See also:* core disconnect; residual element.
(C/TT) 1149.4-1999

**CD0** *See:* clocked data zero.

**C-effective** A capacitance value, often computed as an approximation to a resistor/inductor/capacitor (RLC) network or a $\pi$-model, that characterizes the admittance of an interconnect structure at a particular driver. The reduction of real parasitics and pin capacitances to a C-effective allows the calculation of delay and slew values from cell characterization data which assumes a pure capacitive output load. *Synonym:* effective capacitance. (C/DA) 1481-1999

**CEI (television)** The initials of the official French name, Commission Éléctrotechnique Internationale, of the International Electrotechnical Commission (IEC). (BT/AV) 201-1979w

**ceiling** The result obtained by rounding a number up to the nearest integer. For example, the ceiling of 5.3 is 6. *Contrast:* floor. (C) 1084-1986w

**ceiling area lighting (illuminating engineering)** A general lighting system in which the entire ceiling is, in effect, one large luminaire. *Note:* Ceiling area lighting includes luminous ceilings and louvered ceilings. *See also:* luminous ceiling; louvered ceiling. (EEC/IE) [126]

**ceiling cavity ratio (illuminating engineering)** For a cavity formed by the ceiling, the plane of the luminaire, and the wall surfaces between these two planes, the CCR is computed by using the distance from the plane of the luminaire to the ceiling ($h_c$ as the cavity height in the equations given in the definition of "cavity ratio." (EEC/IE) [126]

**ceiling current (excitation systems for synchronous machines)** The maximum direct current that the excitation system is able to supply from its terminals for a specified time.
(PE/EDPG) 421.2-1990, 421.1-1986r

**ceiling direct voltage (direct potential rectifier unit)** The average direct voltage at rated direct current with rated sinusoidal voltage applied to the alternating-current line terminals, with the rectifier transformer set on rated voltage tap and with voltage regulating means set for maximum output. *See also:* rectification; power rectifier.
(IA/EEC/PCON) [62], [110]

**ceiling projector (illuminating engineering)** A device designed to produce a well-defined illuminated spot on the lower portion of a cloud for the purpose of providing a reference mark for the determination of the height of that part of the cloud. (EEC/IE) [126]

**ceiling ratio (illuminating engineering)** The ratio of the luminous flux which reaches the ceiling directly to the upward component of the luminaire. (EEC/IE) [126]

**ceiling voltage (1) (excitation systems for synchronous machines)** The maximum direct voltage that the excitation system is able to supply from its terminals under defining conditions. *Notes:* 1. The no-load ceiling voltage is determined with the excitation system supplying no current. 2. The ceiling voltage under load is determined with the excitation system supplying ceiling current. 3. For excitation systems whose supply depends on the synchronous machine voltage and (if applicable) current, the nature of power system disturbance and specific design parameters of the excitation system and the synchronous machine influence the excitation system output. For such systems, the ceiling voltage is determined considering an appropriate voltage drop and (if applicable) current increase. 4. For excitation systems employing a rotating exciter, the ceiling voltage is determined at rated speed. (PE/EDPG) 421.1-1986r
**(2) (excitation systems)** The maximum direct voltage that the excitation system is able to supply from its terminals under defined conditions. (PE/EDPG) 421.2-1990

**ceiling voltage, exciter nominal** The ceiling voltage of an exciter loaded with a resistor having an ohmic value equal to the resistance of the field winding to be excited and with this field winding at a temperature of (A) 75°C for field windings designed to operate at rating with a temperature rise of 60°C or less; or (B) 100°C for field windings designed to operate at rating with a temperature rise greater than 60°C.
(PE/EDPG) 421-1972s

**ceilometer (navigation aid terms)** An instrument for measuring the height of clouds. (AES/GCS) 172-1983w

**celestial fix (navigation aid terms)** A position fix established by observation of celestial bodies. (AES/GCS) 172-1983w

**celestial-inertial navigation equipment (navigation aid terms)** An equipment employing both celestial and inertial sensors. *Synonyms:* astro-inertial navigation equipment; stellar-inertial navigation equipment. (AES/GCS) 172-1983w

**celestial mechanics (communication satellite)** The mechanics of motion of celestial bodies, including satellites.
(COM) [19]

**celestial navigation (navigation aid terms)** Navigation with the aid of celestial bodies. Applied principally to the measurement of the altitudes of a celestial body.
(AES/GCS) 172-1983w

**cell (1) (lead-acid batteries for photovoltaic systems)** The basic electrochemical unit, characterized by an anode and a cathode used to receive, store, and deliver electrical energy. For a lead-acid system, the cell is characterized by a nominal two-volt potential. (PV) 937-1987s
**(2) (batteries for photovoltaic systems)** The basic electrochemical unit, characterized by an anode, a cathode, and electrolyte, used to receive, store, and deliver electrical energy. *Notes:* 1. For a nickel-cadmium cell, the nominal voltage is 1.2 V. 2. For a lead-acid cell, the nominal voltage is 2.0 V.
(PV) 1013-1990, 1144-1996, 1145-1990s

**(3) (test pattern language)** The element of a memory in which one bit is stored. (TT/C) 660-1986w
**(4) (information storage)** An elementary unit of storage; for example, binary cell, decimal cell. (C) 162-1963w, 270-1966w
**(5)** A single, enclosed tubular space in a cellular metal floor member, the axis of the cell being parallel to the axis of the metal floor member. (NESC/NEC) [86]
**(6)** The primary unit of information in the architecture of a Forth System. (C/BA) 1275-1994
**(7)** A packet with fixed length. *Notes:* 1. Each cell has a 5 octet header and 48 octets of data. 2. This definition is specific to asynchronous transfer mode (ATM). (C) 610.7-1995
**(8) (A)** A module used in assembling application-specific integrated circuits. **(B)** The storage position of one unit of information, such as a character, a bit, or a word. *See also:* storage cell. (C) 610.10-1994
**(9)** A primitive in an integrated circuit library. Primitive means the timing properties of the cell are directly described in the DPCM without reference back to the application for the internal structure of the cell. This primitiveness typically is a result of the characterization of that cell by the semiconductor vendor, but it may instead be a result of the construction of a timing model for a subcircuit by the application, and its loading into the DPCM at run-time. For PDEF, cell refers to a logical instance, and a library primitive is called a gate. The term cell can arise in the context of the abstraction of a type of cell available in the library or in the concrete selection and placement of a cell in the final design. If the context is not clear, the terms cell type and cell instance (or just instance) shall be used. *See also:* cell type; instance. (C/DA) 1481-1999
**(10) (data management)** *See also:* data item; data element. (C) 610.5-1990w
**(11)** *See also:* memory cell. (ED) 1005-1998

**cell cavity (electrolysis)** The container formed by the cell lining for holding the fused electrolyte. *See also:* fused electrolyte. (PE/EEC) [119]

**cell connector (storage cell)** An electric conductor used for carrying current between adjacent storage cells. *See also:* battery. (EEC/PE) [119]

**cell constant (electrolytic cells)** The resistance in ohms of that cell when filled with a liquid of unit resistivity. (PE/EEC) [119]

**cell cover** The transparent medium (glass, quartz, etc.) that protects the solar cells from space particulate radiation. (AES/SS) 307-1969w

**cell instance** A particular, concrete appearance of a cell in the fully expanded (flattened, unfolded, elaborated) design description of an integrated circuit; also referred to elsewhere as an "occurrence." An instance is a "leaf" of the unfolded design hierarchy. In Physical Design Exchange Format (PDEF), this is a physical cluster or a logical cell. *See also:* cell; cell type; cluster; hierarchical instance. (C/DA) 1481-1999

**cell library** A collection of cells used to design and lay out application-specific integrated circuits in accordance with the functional requirements of particular end users. (C) 610.10-1994w

**cell line** An assembly of electrically interconnected electrolytic cells supplied from a source of dc power. (NESC/IA/PC) 463-1993w, [86]

**cell line attachments and auxiliary equipment** Include, but are not limited to: auxiliary tanks; process piping; duct work, structural supports, exposed cell line conductors; conduits and other raceways; pumps, positioning equipment, and cell cutout or by-pass electrical devices. Auxiliary equipment includes tools, welding machines, crucibles, and other portable equipment used for operation and maintenance within the electrolytic cell line working zone. In the cell line working zone, auxiliary equipment includes the exposed conductive surfaces of the ungrounded cranes and crane-mounted cell-servicing equipment. (NESC/NEC) [86]

**cell line potential (electrolytic cell line)** The dc voltage applied to the positive and negative buses supplying power to a cell line. (IA/PC) 463-1993w, 463-1977s

**cell line voltage (electrolytic cell line)** The dc voltage applied to the positive and negative buses supplying power to a cell line. (IA/PC) 463-1993w, 463-1977s

**cell line working zone** The space envelope where operation or maintenance is normally performed on or in the vicinity of exposed energized surfaces of electrolytic cell lines or their attachments. (IA/PC) 463-1993w

**cell-organized raster display device** A raster display device on which an image is constructed by a collection of rectangular characters, each character represented by an n-by-m set of illuminated control indicators. (C) 610.10-1994w

**cell potential (electrolytic cells)** The dc voltage between the positive and negative termials of one electrolytic cell. (IA/PC) 463-1977s

**cell relay** A fast packet switching technology that provides a virtual circuit service for the transfer of cells. For example, asynchronous transfer mode is the most common type of cell relay. *See also:* frame relay. (C) 610.7-1995

**cell size** The rated capacity of a lead-acid cell or the number of positive plates in a cell. (SCC29) 485-1997

**cell switching** A technique used in data communications, in which messages are broken into fixed-size packets and forwarded to another party over the network. *Contrast:* packet switching. (C) 610.7-1995

**cell type (1) (Class 1E lead storage batteries)** Cells of identical design (for example, plate size, alloy, construction details), but that may have differences in the number of plates and spacers, quantity of electrolyte, or length of container. (PE/EDPG) 535-1979s
**(2)** Name used to identify a particular cell in the library. (C/DA) 1481-1999

**cell-type tube (microwave gas)** A gas-filled radio-frequency switching tube that operates in an external resonant circuit. *Note:* A tuning mechanism may be incorporated in either the external resonant circuit or the tube. *See also:* gas tube. (ED) 161-1971w

**cellular metal floor raceway** The hollow spaces of cellular metal floors, together with suitable fittings, that may be approved as enclosures for electric conductors. (NESC/NEC) [86]

**cellulose** Unbleached kraft insulation material from which paper and transformerboard are made, that is suitable for use in 65°C average winding temperature rise insulation systems. (PE/TR) 1276-1997

**cell voltage (electrolytic cell line working zone)** The dc voltage between the positive and negative terminals of one electrolytic cell. (IA/PC) 463-1993w

**cent** The interval between two sounds whose basic frequency ratio is the twelve-hundredth root of 2. *Note:* The interval, in cents, between any two frequencies is 1200 times the logarithm to the base of 2 of the frequency ratio. Thus, 1200 cents equal 12 equally tempered semitones equal 1 octave. (SP/ACO) 157-1951w, [32]

**center** In text formatting, to format one or more lines of text so that the left and right margins are equal in size. (C) 610.2-1987

**center-break switching device** A mechanical switching device in which both contacts are movable and engage at a point substantially midway between their supports. (SWG/PE) C37.100-1992

**center-center point** A point on a VDT screen [cathode ray tube (CRT) face panel] that is both the horizontal and vertical midpoint. The center-center point is represented by the bisector of the horizontal and vertical center lines on the VDT screen. (EMC) 1140-1994r

**center frequency (1) (frequency modulation)** The average frequency of the emitted wave when modulated by a symmetrical signal. *See also:* frequency modulation. (AP/ANT) 145-1983s

**(2) (burst measurements)** The arithmetic mean of the two frequencies that define the bandwidth of a filter. *See also:* burst. (SP) 265-1966w

**(3) (spectrum analyzer) (non-real time spectrum analyzer)** That frequency which corresponds to the center of a frequency span. (IM) 748-1979w

**center-frequency delay (1)** The nominal group delay of the device at the center frequency $f_o$, generally expressed in microseconds, where $f_o$ is defined as the lower band-edge frequency plus one-half the bandwidth (dispersive delay line). (UFFC) 1037-1992w

**(2)** The frequency delay of the device at the center frequency, $F_0$, generally expressed in microseconds. (UFFC) [22]

**centerline (navigation aid terms)** The lows of the points equidistant from two reference points or lines, as the perpendicular bisector of the baseline of a hyperbolic system of navigation, such as loran. (AES/GCS) 172-1983w

**center of distribution (primary distribution)** The point from which the electric energy must be supplied if the minimum weight of conducting material is to be used. *Note:* The center of distribution is commonly considered to be that fixed point that, in practice, most nearly meets the ideal conditions stated above. (PE/T&D) [10]

**center pivot irrigation machines** A center pivot irrigation machine is a multi-motored irrigation machine that revolves around a central pivot and employs alignment switches or similar devices to control individual motors. (NESC/NEC) [86]

**center wavelength (1)** The wavelength that is the arithmetic mean of the half-maximum spectral intensity points of the transmitter. If the spectral intensity distribution is symmetric and singly peaked, the center wavelength is at maximum intensity. (C/BA) 1393-1999

**(2)** The average of two optical wavelengths at which the spectral radiant intensity is 50% of the maximum value. (C/LM) 802.3-1998

**centi (mathematics of computing)** A prefix indicating one hundredth ($10^{-2}$). (C) 1084-1986w

**centimeter-gram-second electromagnetic system of units** A system in which the basic units are the centimeter, gram, second, and abampere. *Notes:* 1. The abampere is a derived unit defined by assigning the magnitude one to the unrationalized magnetic constant (sometimes called the permeability of space). 2. Most electrical units of this system are designated by prefixing the syllable "ab-" to the name of the corresponding unit in the mksa system. Exceptions are the maxwell, gauss, oersted, and gilbert. (Std100) 270-1966w

**centimeter-gram-second electrostatic system of units** The system in which the basic units are the centimeter, gram, second, and statcoulomb. *Notes:* 1. The statcoulomb is a derived unit defined by assigning the magnitude 1 to the unrationalized electric constant (sometimes called the permittivity of space). 2. Each electrical unit of this system is commonly designated by prefixing the syllable "stat-" to the name of the corresponding unit in the International System of Units. (Std100) 270-1966w

**centimeter-gram-second system of units** A system in which the basic units are the centimeter, gram, and second. (Std100) 270-1966w

**central alarm station (CAS)** A continuously manned location that provides primary security system monitoring and communications functions. (PE/NP) 692-1997

**central arbiter requester** A module that requests access to the bus on a system that uses central arbitration. (C/BA) 896.4-1993w

**central computer** *See:* host computer.

**central control room (nuclear power generating station)** A continuously manned, protected enclosure from which actions are normally taken to operate the nuclear generating station under normal and abnormal conditions. (PE/NP) 567-1980w

**central distribution frame grounding** A type of grounding system where all signal grounds are referenced to a central point rather than at their respective signal sources. (PE/EDPG) 1050-1996

**centralized accounting, automatic message (CAMA) (telephone switching systems)** An arrangement at an intermediate office for collecting automatic message accounting information. (COM) 312-1977w

**centralized computer network (1)** A computer network configuration in which a central node provides computing power, control, or other services. *See also:* decentralized computer network. (LM/COM) 168-1956w

**(2)** A computer network in which a central node provides all network control functions and services to other nodes. *Contrast:* decentralized computer network. *See also:* distributed computer network. (C) 610.7-1995

**centralized control (1) (electric pipe heating systems)** A common (central) point where multiple control, alarm, or both signals or functions are brought together. With respect to electric pipe heating systems, centralized control/alarm stations usually consist of cabinets or panels where remote control, alarm, or both signals are brought together for a common output signal to the generating unit control room. (PE/EDPG) 622A-1984r

**(2) (electric heat tracing systems)** A common (central) point where multiple control, alarm, or both signals or functions are brought together. With respect to electric heat tracing systems, centralized control/alarm stations usually consist of cabinets or panels where remote control, alarm, or both signals are brought together for a common output signal to the generating unit control room. (PE/EDPG) 622B-1988r

**(3)** The local, remote, or programmed operations of more than one equipment or system from one central control station in a common area or room by a broadly skilled operator or supervisory system. (IA/MT) 45-1998

**centralized polling** A polling technique in which a single, central authority controls access to transmission medium. Each station is invited to transmit periodically according to a scheme or list. *Contrast:* distributed polling. (C) 610.7-1995

**centralized test system (test, measurement, and diagnostic equipment)** A test system that processes, records, or displays at a central location information gathered by test point data sensors at more than one remotely located equipment or system under test. (MIL) [2]

**centralized traffic-control machine (railway practice)** A control machine for operation of a specific type of traffic control system of signals and switches. *See also:* centralized traffic-control system. (EEC/PE) [119]

**centralized traffic-control system (railway practice)** A specific type of traffic control system in which the signals and switches for a designated section of track are controlled from a remotely located centralized traffic control machine. *See also:* electropneumatic interlocking machine; control machine; centralized traffic-control machine; block-signal system. (EEC/PE) [119]

**central office (CO) (1) (telephone loop performance)** The building, one or more switching systems, and related equipment contained therein that provide telephone service. (COM/TA) 820-1984r

**(2) (data transmission)** The place where communications common carriers terminate customer lines and locate the equipment which interconnects those lines. Usually the junction point between metallic pair and carrier system. (PE) 599-1985w

**(3) (telephone switching systems)** A switching entity that has one or more office codes and a system control serving a telecommunication exchange. (COM) 312-1977w

**(4)** A physical location where communications common carriers terminate customer lines and locate the switching devices that interconnect these lines. *Synonyms:* telephone exchange; local central office; exchange. *See also:* end office. (C) 610.7-1995

**central office diagram (telephone switching systems)** A simplified switching network plan for a given installation, specifying types and quantities of equipment and trunk groups and other parameters. (COM) 312-1977w

**central office exchange (data transmission)** The place where a communication common carrier locates the equipment which interconnects incoming subscribers and circuits. (PE) 599-1985w

**central office service unit (COSU)** A telephone company controller resident in a central office that connects to the utility controller and, via the utility telemetry trunk, to the switch. The COSU provides the function of originating and terminating calls to and from telemetry interface units (TIUs). For the COSU access method, the COSU performs a security check with the utility controller and places a call to the end user in response to the information sent to it by the utility controller. The COSU performs a security check and initiates a connection to the utility controller when called by the TIU. The COSU also provides a multiplexing interface between the utility controller and COSU and the COSU and TIU(s). The COSU may also provide traffic measurements. (AMR/SCC31) 1390-1995, 1390.2-1999, 1390.3-1999

**central office service unit (COSU) access method** An access method that utilizes the switched telephone network, comprised of a COSU, switch, and other network elements. This method provides for automatically invoking/ignoring certain switch-based telemetry communications capabilities and establishes a communications path between a utility/enhanced service provider (ESP) and a telemetry interface unit (TIU). (SCC31/AMR) 1390.3-1999, 1390.2-1999, 1390-1995

**central processing unit (CPU) (1)** The unit of a computing system that includes the circuits controlling the interpretation of instructions and their execution. (C/C) [20], [85]

**(2)** Describes that part of a computer that does the primary computational functions. Loosely describes the computer system other than connected input and output devices. (C/BA) 1496-1993w

**(3)** That unit of a computer system which fetches, decodes and executes programmed instructions and maintains the status of results as the program is executed. *Synonym:* central processor. *See also:* uniprocessor; processor. (C) 610.10-1994w

**central processor** *See:* central processing unit.

**central services module** A specific module that is required in all systems using the parallel system bus. Its services, such as starting certain bus operations and guaranteeing uniform initialization of all agents, are required by all agents on the parallel system bus. It is always located in a specific slot in the system backplane. *See also:* parallel system bus. (C/MM) 1296-1987s

**central station (protective signaling)** An office to which remote alarm and supervisory signaling devices are connected, where operators supervise the circuits, and where guards are maintained continuously to investigate signals. *Note:* Facilities may be provided for transmission of alarms to police and fire departments or other outside agencies. *See also:* protective signaling. (EEC/PE) [119]

**central station equipment (protective signaling)** The signal receiving, recording, or retransmission equipment installed in the central station. *See also:* protective signaling. (EEC/PE) [119]

**central station switchboard (protective signaling)** That portion of the central station equipment on or in which are mounted the essential control elements of the system. *See also:* protective signaling. (EEC/PE) [119]

**central station system (central office system) (protective signaling)** A system in which the operations of electric protection circuits and devices are signaled automatically to, recorded in, maintained, and supervised from a central station having trained operators and guards in attendance at all times. *See also:* protective signaling. (EEC/PE) [119]

**central vision (illuminating engineering)** The seeing of objects in the central or foveal part of the visual field, approximately two degrees in diameter. It permits seeing much finer detail than does peripheral vision. *Synonym:* foveal vision. (EEC/IE) [126]

**central visual field (illuminating engineering)** That region of the visual field that corresponds to the foveal portion of the retina. (EEC/IE) [126]

**centrex CO (telephone switching systems) (company)** The provision of centrex service by switching, station equipment, and attendant facilities located on the premises of the customer. (COM) 312-1977w

**centrex CU (customer) (telephone switching systems)** The provision of centrex service by switching, station equipment, and attendant facilities located on the premises of the customer. (COM) 312-1977w

**centrex service (telephone switching systems)** A service that provides direct inward dialing and identified outward dialing in accordance with the national numbering plan for stations served as they would be by a private branch exchange. (COM) 312-1977w

**centrifugal actuator (rotating machinery)** Rotor-mounted element of a centrifugal starting switch. *See also:* centrifugal starting switch. (PE) [9]

**centrifugal-mechanism pin (governor pin)** A component of the linkage between the centrifugal mechanism weights and the short-circuiting device. *See also:* centrifugal starting switch. (EEC/PE) [119]

**centrifugal-mechanism spring (governor spring)** A spring that opposes the centrifugal action of the centrifugal-mechanism weights in determining the motor speed at which the switch or short-circuiting device is actuated. *See also:* centrifugal starting switch. (EEC/PE) [119]

**centrifugal-mechanism weights (governor weights)** Moving parts of the centrifugal-mechanism assembly that are acted upon by centrifugal force. *See also:* centrifugal starting switch. (EEC/PE) [119]

**centrifugal relay** An alternating-current frequency-selective relay in which the contacts are operated by a fly-ball governor or centrifuge driven by an induction motor. (EEC/PE) [119]

**centrifugal starting switch (rotating machinery)** A centrifugally operated automatic mechanism used to perform a circuit-changing function in the primary winding of a single-phase induction motor after the rotor has attained a predetermined speed, and to perform the reverse circuit-changing operation prior to the time the rotor comes to rest. *Notes:* 1. One of the circuit changes that is usually performed is to open or disconnect the auxiliary winding circuit. 2. In the usual form of this device, the part that is mounted to the stator frame or end shield is the starting switch, and the part that is mounted on the rotor is the centrifugal actuator. (PE) [9]

**Centronics** The popular name for the parallel printer port used as the parallel interface for most printers and supported by most "MS-DOS compatible" PCs. The name is derived from the printer manufacturer that introduced this interface, Centronics Data Computer Corporation. This interface has never been formalized. Despite a basic similarity, many variations of this interface have been implemented in different peripherals and hosts. This specification describes the more prevalent variations of the "Centronics" interface and defines a family of signaling methods that are backward compatible with the typical "Centronics" interface. (C/MM) 1284-1994

**Centronics connector** The popular name for the 36-pin ribbon contact type connector commonly used for the parallel port on printers. (C/MM) 1284-1994

**CEP** *See:* circular probable error.

**ceramic insulator** Insulators made from porcelain or glass or a general class of rigid material. (T&D/PE) 957-1995

**ceraunic level** *See:* keraunic level.

**certificate** A statement that an asset has been assessed according to specified certification criteria. (C/SE) 1420.1a-1996

**certificate of conformance (replacement parts for Class 1E equipment in nuclear power generating stations) (nuclear power quality assurance)** A document signed by an authorized individual, certifying the degree to which items or services meet specified requirements. (PE/NP) 934-1987w, [124]r

**certification (1) (nuclear power quality assurance)** The act of determining, verifying, or attesting in writing to the qualifications of personnel, processes, procedures, or items in accordance with specified requirements. (PE/NP) [124]

**(2) (A) (software)** A written guarantee that a system or component complies with its specified requirements and is acceptable for operational use. For example, a written authorization that a computer system is secure and is permitted to operate in a defined environment. **(B) (software)** A formal demonstration that a system or component complies with its specified requirements and is acceptable for operational use. **(C) (software)** The process of confirming that a system or component complies with its specified requirements and is acceptable for operational use. (C) 610.12-1990

**(3) (test, measurement, and diagnostic equipment)** Attestation that a support test system is capable, at the time of certification demonstration, of correctly assessing the quality of the items to be tested. This attestation is based on an evaluation of all support test system elements and establishment of acceptable correlation among similar test systems. (MIL) [2]

**certification artifact** The tangible results from a certification process (e.g., inspection checklists, metrics, problem reports). (C/SE) 1420.1a-1996

**certification criteria** A set of standards, rules, or properties to which an asset must conform in order to be certified to a certain level. Certification criteria are defined by a certification policy. Certification criteria may be specified as a set of certification properties that must be met. (C/SE) 1420.1a-1996

**certification levels** The step-wise organization of a certification policy by a reuse library into increasingly more stringent certification processes and criteria. (C/SE) 1420.1a-1996

**certification method** A documented technique applied as part of a certification process (e.g., inspections, static analysis, testing, formal verification). (C/SE) 1420.1a-1996

**certification policy** The statement of a reuse library's standard process for asset certification, the levels of certification, the properties and criteria for each level and the methods employed. (C/SE) 1420.1a-1996

**certification process** The process of assessing whether an asset conforms to predetermined certification criteria appropriate for that class of asset. (C/SE) 1420.1a-1996

**certification property** A statement about some feature or characteristic of an asset that may be assessed as being true or false during a certification process. Properties may relate to what an asset is, what it does, or how it relates to its operating environment. An assessment of a certification quality factor is accomplished by assessing the underlying certification properties. (C/SE) 1420.1a-1996

**certification quality factor** A high level aspect of an asset (e.g., completeness, correctness, reusability) that is assessed during a certification process. A certification quality factor is a manifestation of one or more certification properties. (C/SE) 1420.1a-1996

**certification tests (1) (surge arresters)** Tests made, when required, to verify selected performance characteristics of a product or representative samples thereof. (SPD/PE) C62.1-1981s

**(2)** Tests run on a regular, periodic basis to verify that selected key performance characteristics of a product, or representative samples thereof, have remained within performance specifications. (SPD/PE) C62.11-1999, C62.62-2000

**certified design test (station control and data acquisition)** A test performed on a production model specimen of a generic type of equipment to establish a specific performance parameter of that genre of equipment. The condition and results of the test are described in a document that is signed and attested to by the testing engineer and other appropriate, responsible individuals. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**certified Marinelli beaker standard source (germanium semiconductor detector)** An MBSS that has been calibrated as to photon emission rate at specified energies by a laboratory recognized as a country's national standardizing laboratory for radioactivity measurements and has been so certified by the calibrating laboratory. *Notes:* 1. The photon emission rate as used in this standard is the number of photons per second resulting from the decay of radionuclides in the source and is thus higher than the detected rate at the surface. 2. For the United States, the US National Bureau of Standards is the National Standardizing Laboratory. *Synonym:* certified MBSS. *See also:* certified solution; Marinelli beaker standard source; certified-solution Marinelli beaker standard source; Marinelli beaker. (NPS) 680-1978w

**certified MBSS** *See:* certified Marinelli beaker standard source.

**certified radioactivity standard source (germanium detectors)** A calibrated radioactive source, with stated accuracy, whose calibration is certified by the source supplier as traceable to the National Radioactivity Meas-urements System. (PE/EDPG) 485-1983s

**certified reference material** A reference material one or more of whose property values are certified by a technically valid procedure, accompanied by or traceable to a certificate or other documentation which is used by a certifying body. (NI) N42.23-1995

**certified solution (germanium semiconductor detector)** A liquid radioactive filling material that has been calibrated by a laboratory (for the United States, the US National Bureau of Standards) recognized as a country's National Standardizing Laboratory for radioactivity measurements and has been so certified by the calibrating laboratory. (NPS) 680-1978w

**certified-solution Marinelli beaker standard source (germanium semiconductor detector)** A standard beaker that contains a certified solution as its radioactive filling material. *See also:* certified Marinelli beaker standard source; Marinelli beaker; certified solution; Marinelli beaker standard source. (NPS) 680-1978w

**certified-solution MBSS** *See:* certified-solution Marinelli beaker standard source.

**certified sources** Sources that have been certified for radionuclide activity (Bq) concentration (Bq/g) or alpha, beta, x-, or gamma-ray emission rate ($s^{-1}$). (NI) N42.22-1995

**certified unit (test, measurement, and diagnostic equipment)** A unit whose demonstrated ability to perform in accordance with preestablished criteria has been attested. (MIL) [2]

**certifying agency** Organization that validates that equipment meets tests and standards. (IA) 515-1997

**CFAR** *See:* constant-false-alarm rate.

**$C_{50}$** The difference in dB between the first 50 ms of reverberant decay energy and the remaining decay energy from 50 ms and later. It is a member of the class of acoustic measurements commonly known as early-to-late ratios. (COM/TA) 1329-1999

**CGF** *See:* computer generated force.

**CGI** *See:* Computer Graphics Interface.

**CGM** *See:* Computer Graphics Metafile.

**cgs electromagnetic system of units** *See:* centimeter-gram-second electromagnetic system of units.

**cgs electrostatic system of units** *See:* centimeter-gram-second electrostatic system of units.

**cgs system of units** *See:* centimeter-gram-second system of units.

**chad (1)** The piece of material removed when forming a hole or notch in a storage medium such as punched tape or punched cards. (MIL/C) [2], [85], [20]

**(2)** The bit of material resulting from punching a hole in a paper card or tape. *Synonym:* chip. (C) 610.10-1994w

**chadded** Pertaining to the punching of tape in which chad results. (C) [20], [85]

**chadless** Pertaining to the punching of tape in which chad does not result. (MIL/C) [2], [85], [20]

**chadless tape (1)** A punched tape wherein only partial perforation is completed and the chad remains attached to the tape. (IA) [61]

**(2)** Perforated tape that has been punched in such a way that chad is not formed. (C) 610.10-1994w

**chaff** Strips of lightweight metal or metallized material that are dispensed in large numbers (bundles) so as to simulate a true target, or, more usually, to create a large clutter signal that masks the detection of wanted targets. *Notes:* 1. Each bundle may contain thousands of individual reflectors whose lengths are related to the wavelength of the radar. 2. Chaff for use at HF and VHF frequencies is sometimes called "rope." 3. During WWII, chaff was called "window" in Great Britain and "Dueppel" in Germany. (AES) 686-1997

**chafing strip** *See:* drive strip.

**chain (1) (navigation aids)** A network of similar stations operating as a group for determination of position or for furnishing navigational information. (AES/GCS) 172-1983w

**(2) (mathematics of computing)** A sequence of bits used to construct a binary code. *See also:* chain code. (C) 1084-1986w

**(3) (data management)** *See also:* linked list. (C) 610.5-1990w

**chain binder** *See:* binder load.

**chain code** An arrangement in a cyclic sequence of some or all of the possible different *n*-bit words in which adjacent words are related such that each word is derivable from its neighbor by displacing the bits one place to the left or right, dropping the leading bit, and inserting a bit at the end. The value of the inserted bit needs only to meet the requirement that a word must not recur before the cycle is complete. For example, 000 001 010 101 011 111 110 100 000. . . (C) [20], 1084-1986w, [85]

**chain-drive machine (elevators)** An indirect-drive machine having a chain as the connecting means. *See also:* driving machine. (EEC/PE) [119]

**chained list (1) (software)** A list in which the items may be dispersed but in which each item contains an identifier for locating the next item. *Synonym:* linked list. *See also:* list; identifier. (C/SE) 729-1983s

**(2) (data management)** *See also:* linked list. (C) 610.5-1990w

**chain field** *See:* link field.

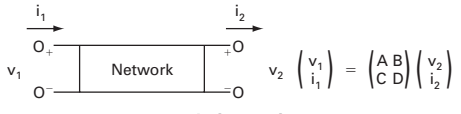
**chain hoist** *See:* hoist.

**chaining (1)** A method for storing records in which each record has a link field that is used to access subsequent records. (C) 610.5-1990w

**(2)** A mode of interaction optionally used by a DSA that cannot perform an directory operation itself; the DSA chains by invoking a directory operation of another DSA and then relaying the outcome to the original requester. (C/PA) 1328.2-1993w, 1326.2-1993w, 1327.2-1993w, 1224.2-1993w

**chaining search** A search in which each item contains a means for locating the next item to be considered in the search. (C) 610.5-1990w

**chain matrix** The 2 × 2 matrix relating voltage and current at one port of a two-port network to voltage and current at the other port.




**chain matrix**

(CAS) [13]

**chain printer** An element printer in which the type slugs are carried by the links of a revolving chain, called a print chain. (C) 610.10-1994w

**chain tugger** *See:* hoist.

**chain-type conveyor** A conveyor using a driven endless chain or chains, equipped with flights that operate in a trough and move material along the trough. *See also:* conveyor. (EEC/PE) [119]

**chair, boatswain** *See:* boatswain's chair.

**chalking (1) (composite insulators)** The powdered surface on weathersheds consisting of particles of filler resulting from ultraviolet exposure. (T&D/PE) 987-1985w

**(2)** The development of loose removable powder at or just beneath a coating surface. (IA) [59]

**(3)** The powdered surface on the polymeric insulator consisting of particles of filler resulting from ultraviolet exposure or leakage current activity. (PE/IC) 48-1996

**challenge (navigation aids)** To cause an interrogator to transmit a signal which puts a transponder into operation. *See also:* interrogation. (AES/GCS) 172-1983w

**change control** *See:* configuration control.

**change control board** *See:* configuration control board.

**change detection** An image processing technique in which the pixels of two registered images are compared to detect differences. (C) 610.4-1990w

**change dump** A selective dump of those storage locations whose contents have changed since some specified time or event. *Synonym:* differential dump. *See also:* dynamic dump; snapshot dump; static dump; selective dump; memory dump; postmortem dump. (C) 610.12-1990

**change-of-frame alignment** A state that occurs when an offline framer realigns the receiver to the proper frame alignment signal. *See also:* out-of-frame condition. (COM/TA) 1007-1991r

**change of state (COS)** A significant change (as defined by a particular system) in the condition of a point being monitored, for example, a change in flow rate, temperature, voltage, etc. Usually associated with dual-status (that is, alarm/normal conditions). (PE/SUB) 1379-1997

**change-over selector** A device designed to carry, but not to make or break current, used in conjunction with a tap selector or arcing tap switch to enable its contacts, and the connected taps, to be used more than once when moving from one extreme position to the other. (PE/TR) C57.131-1995

**change recording** *See:* nonreturn-to-zero (change) recording.

**changeover switch** A switching device for changing electric circuits from one combination to another. *Note:* It is usual to qualify the term "changeover switch" by stating the purpose for which it is used, such as a series-parallel changeover switch, trolley-shoe changeover switch, etc. *See also:* multiple-unit control. (EEC/PE) [119]

**change transaction** A transaction that causes information in a master file to be changed. *See also:* delete transaction; add transaction; update transaction; null transaction. (C) 610.2-1987

**CHANHI** Abbreviation for upper channel corresponding to the half-amplitude point of a distribution. (NPS) 398-1972r

**CHANLO** Abbreviation for lower channel corresponding to the half-amplitude point of a distribution. (GSD) 200-1975w

**Channel** A control or data path established between two buses that allows information to flow from one bus to the other. The Channels specific to this standard are the CSR channels, the F2V and V2F data channels, the event channel, and the dual port memory Channel. (C/BA) 1014.1-1994w

**channel (1) (A) (electric communication)** A single path for transmitting electric signals, usually in distinction from other parallel paths. **(B) (electric communication)** A band of frequencies. *Note:* The word "path" is to be interpreted in a broad sense to include separation by frequency division or time division. The term "channel" may signify either a one-way path, providing transmission in one direction only, or a

two-way path, providing transmission in two directions. (EEC/PE) [119], 599-1985

**(2) (A)** A path along which signals can be sent, for example, data channel, output channel. **(B)** The portion of a storage medium that is accessible to a given reading station. *See also:* track. (C) 162-1963

**(3)** A combination of transmission media and equipment capable of receiving signals at one point and delivering related signals at another point. *See also:* information theory. (IT) 171-1958w

**(4) (illuminating engineering)** An enclosure containing the ballast, starter, lamp holders, and wiring for a fluorescent lamp, or a similar enclosure on which filament lamps (usually tubular) are mounted. (EEC/IE) [126]

**(5) (nuclear power generating station)** An arrangement of components and modules as required to generate a single protective action signal when required by a generating station condition. A channel loses its identity where single protective action signals are combined. (PE/NP) 379-1994, 338-1987r, 603-1998

**(6) (metal-nitride-oxide field-effect transistor)** A surface layer of carriers connecting source and drain in an insulated-gate field-effect transistor (IGFET). This channel was formed by inversion with the help of a gate voltage, or by the presence of charges in the gate insulator, or by deliberate doping of the region. (ED) 581-1978w

**(7)** A band of frequencies dedicated to a certain service transmitted on the broadband medium. (LM/C) 610.7-1995, 802.3u-1995s

**(8) (broadband local area networks)** The bandwidth required for the transportation of a signal. The bandwidth will vary according to the information being transported. A band of frequencies dedicated to a certain service transmitted on a broadband medium. (LM/C) 802.7-1989r

**(9) (speech telephony)** A means of one-way or two-way transmission provided by a vendor between two defined interface points. (The customer can realize a connection by connecting together channels from one or more vendors.) *Notes:* 1. "Provided by a vendor" means responsibility for the service and does not necessarily mean ownership of facilities. 2. Channels are provided either dedicated or switched. A dedicated channel may be a non-switched channel for the exclusive use of a customer for a contracted time period. A switched channel may be a channel established (set up and released) under customer control. 3. A channel may consist of two or more equipment items, such as transmission facilities, switching systems, etc. *See also:* connection. (COM/TA) 823-1989w

**(10)** A logically independent data path between two Functions. Multiple channels can be used to reach different Functions or to represent independent instances of inter-unit communication (e.g., X.25 connections, I/O operations on different discs, datagrams to different network SAPs, etc.). Channels can either be provided by physically separate queues or by multiplexing a shared queue. (C/MM) 1212.1-1993

**(11) (A)** A one-way path for transmission of signals between two or more points; for example, a data channel. *See also:* line; circuit; link. **(B)** In data transmission, either one-way path, providing transmission in one direction only, or two-way path, providing transmission in two directions. *Synonyms:* path. (C) 610.7-1995

**(12) (A)** A one-way path for transmission of signals between two or more points; for example, an output channel or a data channel. *Synonyms:* link; path; line. *See also:* circuit. **(B)** The portion of a storage medium that is accessible to a given reading or writing station, such as a track, or a band. **(C)** A two-way communications path between the central processor and its peripheral devices. (C) 610.10-1994

**(13)** The tester electronics associated with a digital input/output (I/O) pin that either drives or senses a particular node on the unit under test (UUT). (SCC20) 1445-1998

**(14)** The data path from any transmitting MIC to the next downstream receiving MIC. (LM/C) 8802-5-1998

**(15)** A single flow path for digital data or an analog signal, usually in distinction from other parallel paths. An IEEE 1451.2 channel provides a path for a single commodity or logical state, either real or virtual, using a single data model and a single set of physical units. (IM/ST) 1451.2-1997

**(16)** An instance of medium use for the purpose of passing protocol data units (PDUs) that may be used simultaneously, in the same volume of space, with other instances of medium use (on other channels) by other instances of the same physical layer (PHY), with an acceptably low frame error ratio due to mutual interference. Some PHYs provide only one channel, whereas others provide multiple channels. Examples of channel types are as shown in the following table:

| Single channel | n-channel |
|---|---|
| Narrowband radio-frequency (RF) channel | Frequency division multiplexed channels |
| Baseband infrared | Direct sequence spread spectrum (DSSS) with code division multiple access |

(C/LM) 8802-11-1999

**(17)** A physical or logical communication link to a single transducer or to a group of transducers considered as a single transducer. (IM/ST) 1451.1-1999

**(18) (overhead power lines)** *See also:* frequency band. (T&D/PE) 539-1990

**(19)** *See also:* communication channel. (SUB/PE) 999-1992w

**channel address** The portion of a full data transport address that specifies the channel to which the read or write is directed. (IM/ST) 1451.2-1997

**channel-attached terminal** A terminal that is connected directly to the computer by wires or cables. *Synonym:* locally-attached terminal. *Contrast:* link-attached terminal. (C) 610.10-1994w

**channel bank** A device that multiplexes high-speed communication circuits into lower-speed communication channels; used primarily to digitize analog voice transmission. (C) 610.7-1995

**channel-busy tone (telephone switching systems)** A tone that indicates that a server other than a destination outlet is either busy or not accessible. (COM) 312-1977w

**channel calibration** The adjustment of channel output such that it responds, with acceptable range and accuracy, to known values of the parameter that the channel measures, and the performance of a functional test. (PE/NP) 338-1987r

**channel capacity (1) (data transmission)** The maximum possible information rate through a channel subject to the constraints of that channel. *Note:* Channel capacity may be either per second or per symbol. (PE) 599-1985w

**(2) (software)** The maximum amount of information that can be transferred on a given channel per unit of time; usually measured in bits per second or in baud. *See also:* memory capacity; storage capacity. (C) 610.12-1990

**channel check** A qualitative assessment of performance carried out at designated intervals to determine if all elements of the channel are operating within their designated limits. (PE/NP) 338-1987r

**channel failure alarm (power-system communication)** A circuit to give an alarm if a communication channel should fail. *See also:* power-line carrier. (PE) 599-1985w

**channel group (data transmission)** A number of channels regarded as a unit. *Note:* The term is especially used to designate part of a larger number of channels. (PE) 599-1985w

**channel groupings** Manufacturer specifications that define the inherent relationships between the channels of a multichannel Smart Transducer Interface Module. This grouping information is not normally used by the Smart Transducer Interface Module itself. This information will normally be used by Network Capable Application Processor applications to properly compose human readable displays or in formulating other

computations. For example, channel groupings can be used to indicate which channels represent the three vector axes of a three-axis vector measurement. (IM/ST) 1451.2-1997

**channel hot electrons (CHE)** Electrons that are generated by sufficiently high electric fields in the channel with energies that exceed the thermal equilibrium energy. (ED) 1005-1998

**channel insertion loss** The static loss of a link between a transmitter and receiver. It includes the loss of the fiber, connectors, and splices. (C/LM) 802.3-1998

**channeling, lattice** *See:* lattice channeling.

**channel lights (illuminating engineering)** Aeronautical ground lights arranged along the sides of a channel of a water aerodrome. (EEC/IE) [126]

**channel load factor (1)** The fraction of channel operating time used to transfer the required volume of information between its terminals. (SUB/PE) C37.1-1994

**(2)** The percent of channel capacity in bits per second required to support the effective data rate for information exchange. (SWG/PE) C37.100-1992

**channel, melting** *See:* melting channel.

**channel multiplier** A tubular electron-multiplier with a continuous interior surface of secondary-electron emissive material. *See also:* camera tube; amplifier. (ED) [45]

**channel_number** A system-dependent, system-global value that is used by communicating Functions to designate a channel. (C/MM) 1212.1-1993

**channel path** The routing, switching and line links between an input-output channel and some peripheral device. *Note:* There may be multiple channel paths between a channel and a device. (C) 610.7-1995, 610.10-1994w

**channel, radio** *See:* radio channel.

**channel router** A machine used to determine a path between two points. *Note:* Often used in the design and layout of integrated circuits and printed circuit boards. (C) 610.10-1994w

**channel spacing (radio communication)** The frequency increment between the assigned frequency of two adjacent radio-frequency channels. *See also:* radio transmission; two-frequency simplex operation; single-frequency simplex operation; dispatch operation. (VT) [37]

**channel service unit (CSU)** A device that performs transmit and receive filtering, signal shaping, longitudinal balance, voltage isolation, equalization, and remote loopback testing in a digital communications environment. *Synonym:* digital modem. *See also:* data service unit. (C) 610.7-1995

**channel supergroup (data transmission)** A number of channel groups regarded as a unit. *Note:* The term is especially used to designate part of a larger number of channels. (PE) 599-1985w

**channel, surface** *See:* surface channel.

**channel timeslots** A timeslot that occupies a specified position(s) in a frame and is allocated to a particular time-derived channel. (COM/TA) 1007-1991r

**channel utilization index** The ratio of the information rate (per second) through a channel to the channel capacity (per second). *See also:* information theory. (IT) 171-1958w

**Chapin chart** *See:* box diagram.

**char** The name of a data-type in the C programming language that stands for character, or a group of eight bits that function as a single unit. (PE/SUB) 1379-1997

**character (1) (A)** An elementary mark or event that may be combined with others, usually in the form of a linear string, to form data or represent information. If necessary to distinguish from definition (B) below, such a mark may be called a "character event." **(B)** A class of equivalent elementary marks or events as in definition (A) having properties in common, such as shape or amplitude. If necessary to distinguish from definition (A) above, such a class may be called a "character design." There are usually only a finite set of character designs in a given language. *Notes:* 1. In "bookkeeper" there are six character designs and ten character events, while in "1010010" there are two character designs and seven character events. 2. A group of characters, in one context, may be considered as a single character in another, as in the binary-coded-decimal system. *See also:* control character; numerical control; special character; check character; escape character. (C/MIL) 162-1963, [2]

**(2) (data transmission)** One of a set of elementary symbols which normally include both alpha and numeric codes plus punctuation marks and any other symbol which may be read, stored, or written and is used for organization, control, or representation of data. (PE) 599-1985w

**(3) (computers)** A letter, digit, or other symbol that is used to represent information. *See also:* alphanumeric; alphabetic. (C) 610.7-1995, 1084-1986w, 610.5-1990w, 610.12-1990

**(4)** A group of consecutive bits used to represent control or data information. Characters are of two types: normal characters (N_chars) or link characters (L_chars). *See also:* link character; normal character; control character; data character. (C/BA) 1355-1995

**(5)** A sequence of one or more bytes representing a single graphic symbol. *Note:* This term corresponds in the C Standard to the term *multibyte character,* noting that a single-byte character is a special case of multibyte character. Unlike the usage in the C Standard, *character* here has no necessary relationship with storage space, and byte is used when storage space is discussed. (PA/C) 9945-1-1996, 9945-2-1993

**(6)** A letter, digit, or other special form that is used as part of the organization, control, or representation of data. A character is often in the form of a spatial arrangement of adjacent or connected strokes. (PE/TR) C57.12.35-1996

**(7)** A sequence of one or more values of type `POSIX.POSIX_Character`. *Note:* This definition of the term *character* applies when it is used by itself. It does not apply to qualified phrases containing the word character, such as POSIX character, graphic character, Ada character, and character special file. (C) 1003.5-1999

**character-at-a-time printer** A printer that prints a single character at a time. *Synonym:* serial printer. *Contrast:* page printer; line printer. (C) 610.10-1994w

**character attribute** A characteristic of a single text character. For example, expansion factor, spacing, height, up vector. (C) 610.6-1991w

**character-based user interface** A user interface in which commands must be expressed in characters entered on a keyboard. *Synonym:* text-based user interface. *Contrast:* graphical user interface. (C) 610.10-1994w

**character boundary** In character recognition, the largest rectangle, with a side parallel to the document reference edge, whose sides are tangential to a given character outline. (C) 610.2-1987

**character class** A named set of characters sharing an attribute associated with the name of the class. The classes and the characters that they contain are dependent on the value of the LC_CTYPE category in the current locale. (PA/C) 9945-2-1993

**character code** A code that uses unique numeric values to represent character data; for example, in ASCII the hexadecimal value 40 is used to represent the character "@." (C) 610.5-1990w

**character-deletion character** A character within a line of terminal input specifying that it and the immediately preceding character are to be removed from the line; for example, if "\" is the character-deletion character in the string "ABD\C," the following would appear on the terminal: "ABC." *See also:* line-deletion character. (C) 610.5-1990w

**character density (test, measurement, and diagnostic equipment)** The number of characters that can be stored per unit area or length. (MIL) [2]

**character device** A printer or other peripheral device that receives data character by character. (C) 610.10-1994w

**character display device** A display device that provides a representation of data only in the form of characters. *Synonyms:* readout device; alphanumeric display device. *Contrast:* graphic display device. (C) 610.10-1994w

**character distortion (data transmission)** The normal and predictable distortion of data bit produced by characteristics of a given circuit at a particular transmission speed. (PE) 599-1985w

**character fill** To insert into a storage medium, as often as necessary, the representation of a specified filler character that does not itself convey data but that may delete unwanted data or initialize storage. *See also:* zero fill. (C) 610.5-1990w

**character font (1)** A set of graphic characters that are of the same size and style. *Synonym:* type font. *See also:* hand-printed character font; OCR-A; OCR-B; optical font; font disk. (C) 610.2-1987
**(2)** A family or related set of graphic characters that are of the same style of type. For example, Courier Bold Oblique. (C) 610.10-1994w

**character form (microprocessor object modules)** The printable character representation of binary information as opposed to bit pattern information. (C/MM) 695-1985s

**character generator (1)** A device that uses predefined character patterns to generate characters on a display surface. *See also:* stroke character generator; matrix character generator. (C) 610.6-1991w
**(2)** A device that forms character images on a display device or printer. (C) 610.10-1994w

**character-indicator tube** A blow-discharge tube in which the cathode glow displays the shape of a character, for example, letter, number, or symbol. (ED) [45]

**character interval (data transmission)** In start-stop operation the duration of a character expressed as the total number of unit intervals (including information, error checking and control bits, and the start and stop elements) required to transmit any given character in any given communication system. (PE) 599-1985w

**characteristic (1) (A) (mathematics of computing)** The integer part of a logarithm. *Contrast:* mantissa. **(B) (mathematics of computing)** For floating point arithmetic. *See also:* exponent. (C) 1084-1986
**(2) (software)** *See also:* data characteristic; software characteristic. (C) 610.12-1990
**(3) (nuclear power quality assurance)** Any property or attribute of an item, process, or service that is distinct, describable, or measurable. (PE/NP) [124]
**(4) (semiconductor devices)** An inherent and measurable property of a device. Such a property may be electrical, mechanical, thermal, hydraulic, electro-magnetic or nuclear and can be expressed as a value for stated or recognized conditions. A characteristic may also be a set of related values, usually shown in graphical form. (IA) [12]

**characteristic curve (1) (illuminating engineering)** A curve that expresses the relationship between two variable properties of a light source, such as candlepower and voltage, flux and voltage, etc. (EEC/IE) [126]
**(2) (Hall generator)** A plot of Hall output voltage versus control current, magnetic flux density, or the product of magnetic flux density and control current. (MAG) 296-1969w

**characteristic curves (rotating machinery)** The graphical representation of the relationships between certain quantities used in the study of electric machines. *See also:* asynchronous machine. (PE) [9]

**characteristic distortion (telegraphy)** A displacement of signal transitions resulting from the persistence of transients caused by preceding transitions. *See also:* telegraphy. (COM) [49]

**characteristic element (surge arresters)** The element that in a valve-type arrester determines the discharge voltage and the follow current. *See also:* surge arrester. (PE) [8]

**characteristic equation (feedback control system)** The relation formed by equating to zero the denominator of a transfer function of a closed loop. *See also:* feedback control system. (IM) [120]

**characteristic harmonic (1) (converter characteristics) (self-commutated converters)** Those harmonics produced by semiconductor converter equipment in the course of normal operation. In a six-pulse converter, the characteristic harmonics are the nontriplen odd harmonics, for example, the 5th, 7th, 11th, 13th, etc. (IA/SPC) 936-1987w
**(2)** Those harmonics produced by semiconductor converter equipment in the course of normal operation. In a six-pulse converter, the characteristic harmonics are the nontriple odd harmonics, for example, the 5th, 7th, 11th, 13th, etc.

$h = kq \pm 1$

$k$ = any integer

$q$ = pulse number of converter

(IA/SPC) 519-1992

**characteristic impedance (1) (A) (data transmission)** *(two-conductor transmission line for a traveling transverse electromagnetic wave).* The ratio of the complex voltage between the conductors to the complex current on the conductors in the same transverse plane with the sign so chosen that the real part is positive. **(B) (data transmission)** *(coaxial transmission line).* The driving impedance of the forward-traveling transverse electromagnetic wave. (PE) 599-1985
**(2) (circular waveguide)** For a traveling wave in the dominant ($TE_{1,1}$) mode of a lossless circular waveguide at a specified frequency above the cutoff frequency,

a) the ratio of the square of the root-mean-square voltage along the diameter where the electric vector is a maximum to the total power flowing when the guide is match terminated.
b) the ratio of the total power flowing to the square of the total root-mean-square longitudinal current flowing in one direction when the guide is match terminated.
c) the ratio of the root-mean-square voltage along the diameter where the electric vector is a maximum to the total root-mean-square longitudinal current flowing along the half surface bisected by the diameter when the guide is match terminated.

*Note:* Under definition (a) the power $W = V^2/Z_{(W,V)}$ where $V$ is the voltage and $Z_{(W,V)}$ is the characteristic impedance defined in (a). Under definition (b) the power $W = I^2Z_{(W,I)}$ where $I$ is the current and $Z_{(W,I)}$ is the characteristic impedance defined in (b). The characteristic impedance $Z_{(V,I)}$ as defined in (c) is the geometric mean of the values given by (a) and (b). Definition (c) can be used also below the cutoff frequency. *See also:* waveguide; self-impedance.
**(3) (rectangular waveguide)** For a traveling wave in the dominant ($TE_{1,0}$) mode of a lossless rectangular waveguide at a specified frequency above the cutoff frequency,

a) the ratio of the square of the root-mean-square voltage between midpoints of the two conductor's faces normal to the electric vector, to the total power flowing when the guide is match terminated.
b) the ratio of the total power flowing to the square of the root-mean-square longitudinal current, flowing on one face normal to the electric vector when the guide is match terminated.
c) the ratio of the root-mean-square voltage, between midpoints of the two conductor faces normal to the electric vector, to the total root-mean-square longitudinal current, flowing on one face when the guide is match terminated.

*Note:* Under definition (a) the power $W = V^2/Z_{(W,I)}$ where $V$ is the voltage, and $Z_{(W,V)}$ the characteristic impedance defined in definition (a). Under definition (b) the power $W = 2/Z_{(W,I)}$ where $I$ is the current and $Z_{(W,V)}$ the characteristic impedance defined in definition (b). The characteristic impedance $Z_{(V,I)}$

as defined in definition (c) is the geometric mean of the values given by definition (a) and definition (b). Definition (c) can be used also below the cutoff frequency. *See also:* self-impedance; waveguide.

**(4) (two-conductor transmission line)** (for a traveling transverse electromagnetic wave). The ratio of the complex voltage between the conductors to the complex current on the conductors in the same transverse plane with the sign so chosen that the real part is positive. *See also:* waveguide; self-impedance; transmission line.

**(5) (coaxial transmission line)** The driving impedance of the forward-traveling transverse electromagnetic wave. *See also:* self-impedance; transmission line. (MTT) 146-1980w

**(6) (surge arresters) (surge impedance)** The driving-point impedance that the line would have if it were of infinite length. *Note:* It is recommended that this term be applied only to lines having approximate electric uniformity. For other lines or structures the corresponding term is "iterative impedance." *See also:* self-impedance. (PE) [8]

**(7) (overhead-power-line corona and radio noise)** The ratio of the complex voltage of a propagation mode to the complex current of the same propagation mode in the same transverse plane with the sign so chosen that the real part is positive. *Note:* The characteristic impedance of a line with losses neglected is known as the surge impedance. *See also:* propagation mode. (T&D/PE) 539-1990

**(8)** The ratio of the complex value of voltage between the conductors to the complex value of current on the conductors in the same transverse plane with the sign so chosen that the real part is positive. (PE/PSC) 789-1988w

**(9) (planar transmission lines)** A parameter having the dimensions of impedance (volt per ampere = ohm) that characterizes a mode of propagation. For a transverse electromagnetic (TEM) mode propagating in a single direction on a two-conductor transmission line,

$Z_0$ = the ratio of voltage to current at any cross section or

$$Z_0 = R(Z/Y)$$

where
$Z$ = series inductance per unit length
$Y$ = shunt admittance per unit length of the transmission line

$$Z_0 = V^2/2P = 2P/I^2$$

where
$P$ = time-average power transmitted through any cross section
$V$ = amplitude of the voltage
$I$ = amplitude of the current

For modes other than TEM, different definitions will not in general provide the same numerical value; in those cases, the definition of the characteristic impedance is dictated by custom and by its usefulness in the specific application in question. For most planar transmission lines, the fundamental propagation mode is not purely TEM and a characteristic impedance cannot be defined unambiguously. Techniques for defining and calculating impedances in these cases can be found in the literature. (MTT) 1004-1987w

**(10)** (of a symmetrical pair of coupled lines) The geometric mean of the even and odd mode characteristic impedances. (MTT) 1004-1987w

**(11) (A)** For a transmission line, the ratio of the complex voltage between the conductors to the complex current on the conductors, taken at a common reference plane for a single transverse electromagnetic (TEM) propagating wave. **(B)** For a wave guide, the ratio of the complex transverse electric field component at any point in the wave guide to the complex magnetic field component measured perpendicular to the electric field at the same point in the wave guide for a single propagating wave guide mode. **(C)** For an unbounded homogeneous medium, the ratio of the complex transverse electric field component at any point to the complex magnetic field component measured perpendicular to the electric field at the same point. *Note:* For example, for a linearly polarized transverse electromagnetic (TEM) wave propagating in the z-direction of an isotropic medium $E_x/H_y$ is the characteristic impedance. (AP/PROP) 211-1997

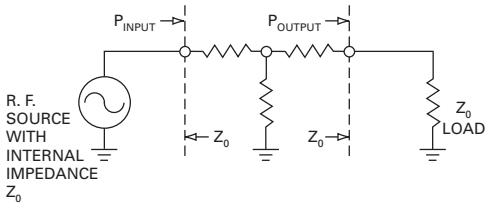
**characteristic insertion loss (1) (waveguide and transmission line)** The insertion loss in a transmission system that is reflectionless looking toward both the source and the load from the inserted transducer. *Notes:* 1. This loss is a unique property of the inserted transducer. 2. The frequency, internal impedance, and available power of the source and the impedance of the load have the same value before and after the transducer is inserted. *See also:* waveguide. (IM/HFIM) [40]

**(2) (fixed and variable attenuators)**

$P_{INPUT}$ = Incident power from $Z_0$ source

$P_{OUTPUT}$ = Net power into $Z_0$ load

Characteristic insertion loss = $10\log_{10}\frac{P_{INPUT}}{P_{OUTPUT}}$ (dB)




**characteristic insertion loss** (NPS/NID) 309-1970s

**characteristic insertion loss, incremental** The change in the characteristic insertion loss of an adjustable device between two settings. *See also:* waveguide. (IM/HFIM) [40]

**characteristic insertion loss, residual** The characteristic insertion loss of an adjustable device at an indicated minimum position. *See also:* waveguide. (IM/HFIM) [40]

**characteristic insertion phase shift (network analyzers) (waveguide and transmission line)** The phase shift occurring upon insertion of a device in a transmission system that is reflectionless looking toward both the source and the load from the insertion plane. *Notes:* 1. The frequency, incident power from the source port, and impedance of the load port are the same before and after the device is inserted. 2. The connectors of source and load ports mate directly. The device can be inserted and its connectors can mate directly with the connectors of the source and load ports. (IM/HFIM) 378-1986w

**characteristic overflow** *See:* exponent overflow.

**characteristic phase shift** For a two-port device inserted into a stable, nonreflecting system between the generator and its load, the magnitude of the phase change of the voltage wave incident upon the load before and after insertion of the device, or change of the device from initial to final condition. *Note:* The following conditions apply:

— The frequency, the load impedance, and the generator characteristics, internal impedance and available power, initially have the same values as after the device is inserted;
— the joining devices, connectors, or adapters belonging to the system conform to some set of standard specifications—the same specifications to be used by different laboratories, if measurements are to agree precisely;
— the nonreflecting conditions are to be obtained in uniform, standard sections of waveguide on the system sides of the connectors at the place of insertion.

*See also:* measurement system. (IM) [38]

**characteristics** Those inherent factors of software development that may have a significant impact on productivity. (C/SE) 1045-1992

**characteristics related to the voltage collapse during chopping (high voltage testing) (chopped impulses)** The characteristics of the voltage collapse during chopping are defined in terms of two points C and D at 70% and 10% of the voltage at the instant of chopping. The virtual duration of the voltage collapse is 1.67 times the time interval between points C and D. The virtual steepness of the voltage collapse is the ratio of the voltage at the instant of chopping to the virtual duration of voltage collapse. *Note:* The use of points C and D is for definition purposes only; it is not implied that the duration and steepness of chopping can be measured with any degree of accuracy using conventional measuring circuits. (PE/PSIM) 4-1978s

**characteristic telegraph distortion** Distortion that does not affect all signal pulses alike, the effect on each transistion depending upon the signal previously sent, due to remnants of previous transitions or transients that persist for one or more pulse lengths. *Note:* Lengthening of the mark pulse is positive, and shortening, negative. Characteristic distortion is measured by transmitting biased reversals, square waves having unequal mark and space pulses. The average lengthening or shortening of mark pulses, expressed in percent of unit pulse length, gives a true measure of characteristic distortion only if other types of distortion are negligible. *See also:* modulation. (AP/ANT) 145-1983s

**characteristic time (gyros)** The time required for the output to reach 63% of its final value for a step input. *Note:* For a single-degree-of-freedom, rate-integrating gyro, characteristic time is numerically equal to the ratio of the float moment of inertia to the damping coefficient about the output axis. For certain fluid-filled sensors, the float moment of inertia may include other effects, such as that of transported fluid. (AES/GYAC) 528-1994

**characteristic underflow** *See:* exponent underflow.

**characteristic wave** A wave that propagates in a homogeneous anisotropic medium with unchanging polarization. *See also:* extraordinary wave; ordinary wave. (AP/PROP) 211-1997

**characteristic wave impedance** The wave impedance of a traveling wave, with the sign so chosen that the real part is positive. *Note:* In a given mode, in a homogeneously filled waveguide, this is constant for all points and all cross-sections. (MTT) 146-1980w

**character layer** The layer of the protocol stack which specifies the representation of characters in terms of groups of consecutive bits. The character layer provides the service to the higher layers of the transmission of a continuous sequence of characters on a link. (C/BA) 1355-1995

**character outline** In character recognition, the graphic pattern established by the stroke edges of a character. (C) 610.2-1987

**character printer** A printer that can print only character text. *Contrast:* graphic printer. (C) 610.10-1994w

**character reader** A reader that can recognize hand-written or printed characters using character recognition. *See also:* optical character reader; page reader; magnetic ink character reader. (C) 610.10-1994w

**character recognition** The use of pattern recognition techniques to identify characters by automatic means. *See also:* magnetic ink character recognition; single-font character recognition; omni-font character recognition; optical character recognition. (C) 610.2-1987

**character representation system** *See:* character set.

**character set (1) (A)** The set of all characters that is defined for a given system. **(B)** A finite set of unique characters upon which agreement has been reached and that is considered complete for some purpose; for example, all the letters, numbers, and symbols used in a language. **(C)** A finite set of unique representations called characters, made to denote and distinguish data; for example, the 26 letters of the English alphabet; 0 and 1 of the boolean alphabet; the set of signals in the Morse code alphabet; and the 128 ASCII characters. *See also:* coded character set; numeric character set; alphanumeric character set; alphabetic character set. (C) 610.5-1990

**(2)** Those characters that are available for encoding within the bar code symbol. (PE/TR) C57.12.35-1996

**character spacing reference line** In character recognition, a vertical line that is used to evaluate the horizontal spacing of characters. *Note:* It may be a line that equally divides the distance between the sides of a character boundary or that coincides with the centerline of a vertical stroke. (C) 610.2-1987

**character special file** A file that refers to a device. One specific type of character special file is a terminal device file. (C/PA) 9945-1-1996, 1003.5-1999, 9945-2-1993

**character special file for use with XTI calls** A file of a particular type that is used for process-to-process communication. A character special file for use with XTI calls corresponds to a communications endpoint that uses a specified family of communications protocols. (C) 1003.5-1999

**character string (1)** A sequence of characters; for example, the character string 72ZABC. *See also:* bit string. (C) 610.5-1990w

**(2)** An ordered sequence of zero or more characters. (C/PA) 1328-1993w, 1224-1993w, 1327-1993w

**character string picture data** Picture data that is associated with a picture specification that specifies at least one alphanumeric character. (C) 610.5-1990w

**character stroke** In optical character recognition, a line, point, arc, or other mark used as a portion of a graphic character. For example, the dot over the letter i or the cross of the letter t. (C) 610.2-1987

**character type** A data type whose members can assume the values of specified characters and can be operated on by character operators, such as concatenation. *Contrast:* enumeration type; logical type; real type; integer type. (C) 610.12-1990

**character variable** A variable that may assume values of any character within some character set. (C) 610.5-1990w

**charactron** A CRT display device that incorporates a metallic foil into which characters are embossed. The electron beam is directed to the location of a desired character on the foil and its image focused onto the display surface. (C) 610.10-1994w

**charge (1) (power operations)** The amount paid for a service rendered or facilities used or made available for use. *See also:* terminations charge; facilities charge; wheeling charge; customer charge; connection charge; energy charge; demand charge. (PE/PSE) 858-1987s

**(2) (storage battery) (storage cell)** The conversion of electric energy into chemical energy within the cell or battery. *Note:* This restoration of the active materials is accomplished by maintaining a unidirectional current in the cell or battery in the opposite direction to that during discharge; a cell or battery that is said to be charged is understood to be fully charged. (EEC/PE) [119]

**(3) (electric power supply)** The amount paid for a service rendered or facilities used or made available for use. (PE/PSE) 346-1973w

**(4)** The conversion of electrical energy into chemical energy within the battery. (IA/PSE) 602-1996

**(5) (induction and dielectric heating usage)** *See also:* load.

**charge, apparent** *See:* apparent charge.

**charge carrier (1) (x-ray energy spectrometers) (charged-particle detectors) (germanium gamma-ray detectors)** (of a semiconductor) A mobile conduction electron or mobile hole. (IM/ED/NID) 314-1971w, 216-1960w, 300-1988r, 301-1976s

**(2)** A mobile electron or hole. (NPS) 325-1996

**charge collection time (1) (x-ray energy spectrometers) (charged-particle detectors) (germanium gamma-ray detectors) (semiconductor)** The time interval, after the passage of an ionizing particle, for the integrated current flowing between the terminals of the detector to increase from 10% to 90% of its final value. *Synonym:* charge sweep-out time. (IM/NPS/HFIM/NID) 314-1971w, 759-1984r, 300-1988r, 325-1996

**(2) (semiconductor radiation detectors)** The time interval, after the passage of an ionizing particle, for the integrated current flowing between the terminals of the detector to increase from 10% to 93% of its final value. (NID) 301-1976s

**charge, connection** *See:* connection charge.

**charge-coupled device** A storage device in which individual semiconductor components are connected to each other so that the electrical charge at the output of one device provides the input to the next. (C) 610.10-1994w

**charge, customer** *See:* customer charge.

**charged aerosol** Ion comprised of charged particles, liquid or solid, suspended in air. Typical radius is in the range of $2 \times 10^{-8}$ m to $2 \times 10^{-7}$ m. Mobility is in the range of $10^{-9}$ m to $10^{-7}$ $m^2$/Vs. *Note:* Historically, these have been referred to as large or Langevin ions. The use of the term "charged aerosols" is encouraged. (T&D/PE) 1227-1990r

**charge delay** The time delay after answer supervision is recognized before the beginning of charge recording. In public telephone service (PTS), a call is defined as answered when the called party off-hook supervision duration exceeds the minimum chargeable duration (MCD) after an allowance equal to the worst possible inaccuracy known about the timing sensor has been applied. Should called supervision return on-hook before the MCD has elapsed, MCD timing may start again with the next called party off-hook transition. (COM/TA) 973-1990w

**charge-delay interval (telephone switching systems)** The recognition time for a valid answer signal in message charging. (COM) 312-1977w

**charge, demand** *See:* demand charge.

**charge, energy** *See:* energy charge.

**charge, facilities** *See:* facilities charge.

**charge pump** Circuitry that is used to create an on-chip voltage that is greater in magnitude than the voltage available from the device power supply. This voltage is typically used for the write operation. (ED) 1005-1998

**charge-resistance furnace** A resistance furnace in which the heat is developed within the charge acting as the resistor. *See also:* electrothermics.

**charge-sensitive preamplifier** An amplifier preceding the main amplifier in which the output amplitude is proportional to the charge injected at the input. *See also:* voltage-sensitive preamplifier. (NPS) 325-1996

**charge, space** *See:* space charge.

**charge storage (semiconductor) (nonlinear, active, and nonreciprocal waveguide components)** An electrical property of step recovery, dual mode, and p-i-n diodes. As the diode is driven into forward conduction by the first half-cycle of the incident signal, it stores a charge and appears as a low impedance. As the polarity of the incident signal reverses, the charge is extracted, and the diode remains in its low-impedance state until virtually all of the charge is removed, whereupon the diode rapidly switches to a high-impedance state. (MTT) 457-1982w

**charge-storage tube (electrostatic memory tube)** A storage tube in which the information is retained on the storage surface in the form of a pattern of electric charges. (ED) 158-1962w

**charge sweep-out time** *See:* charge collection time.

**charge, termination** *See:* termination charge.

**charge-to-third-number call (telephone switching systems)** A call for which the charges are billed to a number other than that of the calling or called number. (COM) 312-1977w

**charge transfer** The process of charge movement, especially that occurring during a transient discharge. (PE/T&D) 539-1990

**charge transit time** *See:* transit time.

**charge voltage** The voltage difference between the intruder and the receptor just prior to an ESD. (SPD/PE) C62.47-1992r

**charge, wheeling** *See:* wheeling charge.

**charging (1) (overhead power lines)** The process, or the result of any process, by which an atom, molecule, molecular cluster, or aerosol acquires either a positive or a negative charge. (PE/T&D) 539-1990

**(2) (electrostatography)** *See also:* sensitizing; electrostatography.

**charging (capacitance) current** Current resulting from charge absorbed by the capacitor formed by the capacitance of the bushing. (PE/TR) C57.19.03-1996

**charging circuit (surge generator) (surge arresters)** The portion of the surge generator connections through which electric energy is stored up prior to the production of a surge. *See also:* surge arrester. (PE) [8], 64

**charging current (1) (transmission lines)** The current that flows in the capacitance of a transmission line when voltage is applied at its terminals. *See also:* transmission line. (T&D/PE) [10]

**(2)** The maximum continuous current at any charge voltage that may flow at the ESD simulator probe tip as measured to the return path of the simulator through a 1500 Ω resistor that is connected to the probe tip. (EMC) C63.16-1993

**charging inductor** An inductive component used in the charging circuit of a pulse-forming network. (MAG) 306-1969w

**charging rack** A device used for holding batteries for mining lamps and for connecting them to a power supply while the batteries are being recharged. *See also:* mine feeder circuit. (EEC/PE/MIN) [119]

**charging rate (1) (storage battery) (storage cell)** The current expressed in amperes at which a battery is charged. *See also:* charge. (EEC/PE) [119]

**(2)** The output current expressed in amperes at which the battery is charged. (IA/PSE) 602-1996

**charles or kino gun** *See:* end injection.

**chart (1) (navigation aids)** A map intended primarily for navigation use. (AES/GCS) 172-1983w

**(2) (recording instrument)** The paper or other material upon which the graphic record is made. *See also:* moving element. (EEC/PE) [119]

**chart-comparison unit (navigation aids)** A device for the simultaneous viewing of a navigational chart in such a manner that one appears superimposed upon the other. (AES/GCS) 172-1983w

**chart mechanism (recording instrument)** The parts necessary to carry the chart. *See also:* moving element. (EEC/ERI) [111]

**chart scale (recording instrument)** The scale of the quantity being recorded, as marked on the chart. *Note:* Independent of and generally in quadrature with the chart scale is the time scale that is graduated and marked to correspond to the principal rate at which the chart is advanced in making the recording. This quadrature scale may also be used for quantities other than time. *See also:* moving element. (EEC/PE) [119]

**chart scale length (recording instrument)** The shortest distance between the two ends of the chart scale. *See also:* instrument. (EEC/PE) [119]

**chassis (1) (printed-wiring boards)** (frame connection: equivalent chassis connection) A conducting connection to a chassis or frame, or equivalent chassis connection of a printed-

wiring board. The chassis or frame (or equivalent chassis connection of a printed-wiring board) may be at substantial potential with respect to the earth or structure in which this chassis or frame (or printed-wiring board) is mounted. (GSD) 315-1975r

**(2)** A subrack that is in accordance with IEC 50. (C/BA) 1101.3-1993

**(3)** A subrack as specified in IEC 50. (C/BA) 1101.4-1993

**chassis shield** A shield that resides between two modules and attaches to the mainframe. (C/MM) 1155-1992

**chatter** A condition that results when transceiver electronics fail to shut down and the transceiver floods the network with random signals. *Synonym:* transceiver chatter. (C) 610.7-1995

**chatter, relay** *See:* relay chatter time; relay contact chatter.

**CHDL** *See:* computer hardware description language.

**Chebyshev filter** A filter whose pass-band frequency response has an equal-ripple shape brought about by the use of Chebyshev cosine polynomials as the approximating function. (CAS) [13]

**check (1) (monitoring radioactivity in effluents)** The use of a source to determine if the detector and all electronic components of the system are operating correctly. (NI) N42.18-1980r

**(2) (radiological monitoring instrumentation)** To determine if the detector and all electronic components of a system are operating satisfactorily by determining consistent response to the same source. (NI) N320-1979r

**(3) (instrument or meter)** Ascertain the error of its indication, recorded value, or registration. *Note:* The use of the word "standardize" in place of "adjust" to designate the operation of adjusting the current in the potentiometer circuit to balance the standard cell is deprecated. *See also:* test. (EEC/PE) [119]

**(4) (computer-controlled machines)** A process of partial or complete testing of either the "correctness of machine operations" or "the existence of certain prescribed conditions within the computer." A check of any of these conditions may be made automatically by the equipment or may be programmed. (C) 162-1963w, 270-1966w

**(5) (nuclear power generating station)** The use of a source to determine if the detector and all electronic components of the system are operating correctly. (PE/NP) 380-1975w

**(6) (A) (transmission line supporting structures)** A separation along the grain of the wood, the separation occurring across the annual rings. **(B) (transmission line supporting structures)** A lengthwise separation of the wood that usually extends across the rings of annual growth and commonly results from stresses set up in wood during seasoning. (T&D/PE) 751-1990

**(7) (software)** To verify the accuracy of data transmitted, manipulated, or stored by any unit or device in a computer. *See also:* automatic check; sequence check; check key; echo check; consistency check; check character. (C) 610.5-1990w

**checkback (1)** The retransmission from the receiving end to the initiating end of a coded signal or message to verify, at the initiating end, the initial message before proceeding with the transmitting of data or a command. (SWG/PE) C37.100-1992

**(2)** *See also:* check before operate. (PE) 599-1985w

**check back** The retransmission from the receiving end to the initiating end of a coded signal or message to verify, at the initiating end, the initial message before proceeding with the transmitting of data or a command. (SWG/PE) C37.100-1981s

**checkback message** The response from the receiving end to the initiating end of a coded signal or message. *See also:* complete checkback message; partial checkback message. (SWG/PE/SUB) C37.100-1992, C37.1-1987s

**check before operate (data transmission)** A message and control technique providing for confirmation of control request before operation. *Synonym:* checkback. (PE) 599-1985w

**check bit** A binary check digit. For example, a parity bit. (C) 1084-1986w

**check bits (data transmission)** Associated with a code character or block for the purpose of checking the absence of error within the code character or block. *See also:* data processing. (COM) [49]

**check box** A visual user interface control used to set and reset parameters that have only two (binary) values (e.g., True/False, On/Off, Active/Inactive). When the control is set, a visual indication is provided to indicate its state (e.g., the check box is filled). The user can reset the parameter by selecting the check box again. A check box can be within a group of check boxes. Normally a group of check boxes are not mutually exclusive. (C) 1295-1993w

**check card** A punch card so formatted as to be suitable for use as a negotiable bank check; for example, a U.S. series E bond. (C) 610.10-1994w

**check character (1)** A character used for the purpose of performing a check, but often otherwise redundant. (C) [20]

**(2) (A) (data management)** A character used for the purpose of performing a check. **(B) (data management)** A single character from a check key. (C) 610.5-1990

**(3)** A character added to a group of characters to provide data redundancy to permit error detection and error correction. (C) 610.7-1995

**(4)** A calculated character often included within a bar code symbol whose value is used for performing a mathematical check of the validity of the decoded data. (PE/TR) C57.12.35-1996

**check code** *See:* security code.

**check digit (1)** A digit used for the purpose of performing a check, but often otherwise redundant. *See also:* forbidden combination; check. (C) [20]

**(2) (mathematics of computing)** One of a set of redundant digits in a word, byte, character, or message that depends upon the remaining digits in such a fashion that if a digit changes, the error can be detected. (C) 1084-1986w

**checking or interlocking relay (power system device function numbers)** A relay that operates in response to the position of a number of other devices (or to a number of predetermined conditions) in an equipment, to allow an operating sequence to proceed, or to stop, or to provide a check of the position of these devices or of these conditions for any purpose. (PE/SUB) C37.2-1979s

**check key** A key that is used for the purpose of performing a check; for example, in the following example the check key is equal to the sum of the first and last digit in field *x*; this check key could be used to ensure that field *x* is accurate and complete.

| record number | field *x* | check key |
|---|---|---|
| 1 | 0125 | 5 |
| 2 | 1136 | 7 |
| 3 | 2228 | 10 |

(C) 610.5-1990w

**checkout (1) (test, measurement, and diagnostic equipment)** A sequence of tests for determining whether or not a device or system is capable of, or is actually performing, a required operation or function. (MIL) [2]

**(2) (software)** Testing conducted in the operational or support environment to ensure that a software product performs as required after installation. (C) 610.12-1990

**checkout equipment (test, measurement, and diagnostic equipment)** Electric, electronic, optical, mechanical, hydraulic, or pneumatic equipment, either automatic, semiautomatic, or any combination thereof, which is required to perform the checkout function. (MIL) [2]

**checkout time (test, measurement, and diagnostic equipment)** Time required to determine whether designated characteristics of a system are within specified values. (MIL) [2]

**checkpoint (1) (electronic computation)** A place in a routine where a check, or a recording of data for restart purposes, is performed.

**(2) (electronic navigation)** *See also:* way point. (AES/C/RS) 686-1982s, [85], [20]

**(3) (software)** A point in a computer program at which program state, status, or results are checked or recorded. (C) 610.12-1990

**check problem (A) (electronic computation)** A routine or problem that is designed primarily to indicate whether a fault exists in the computer, without giving detailed information on the location of the fault. *Synonym:* check routine. *See also:* programmed check; test; diagnostic. **(B)** A test or problem that is chosen to determine whether an operations or computer program is operating properly. (C) 162-1963, 610.5-1990

**check, programmed** *See:* programmed check.

**check, redundant** *See:* redundant check.

**check routine** *See:* check problem.

**check, selection** *See:* selection check.

**check solution (analog computer)** A solution to a problem obtained by independent means to verify a computer solution. (C) 165-1977w

**check source (1) (radiological monitoring instrumentation) (liquid-scintillation counting) (radiation protection) (sodium iodide detector) (germanium detectors)** A radioactivity source, not necessarily calibrated, that is used to confirm the continuing satisfactory operation of an instrument. Four types of check sources that are of the vial type may be used:

1) Flame-sealed glass (activity known)
2) Flame-sealed glass (activity unknown)
3) Screw-capped glass or plastic (activity known)
4) Screw-capped glass or plastic (activity unknown)

Check sources of the type (1) can be used for all measurements described in the standards listed below. Such sources are available from instrument manufacturers of radiochemicals. They are often designated as "unquenched standards." (PE/EDPG) N320-1979r, N323-1978r, 485-1983s

**(2) (liquid-scintillation counting)** A radioactive source, not necessarily calibrated, that is used to confirm the continuing satisfactory operation of an instrument. (NI/NPS) N42.15-1990, N42.12-1994, 309-1999

**checksum (1) (microprocessor object modules)** A deterministic function of a file's contents. If a file is copied and the checksum of the copy is different from the original, there has been an error in copying. (MM/C) 695-1985s

**(2)** A sum obtained by adding the digits in a numeral, or a group of numerals, usually without regard to meaning, position, or significance. This sum may be compared with a previously computed value to verify that no errors have occurred. *See also:* summation check; sideways sum. (C) 610.7-1995, 1084-1986w

**check summation (data transmission)** A redundant check in which groups of digits are summed usually without regard for overflow, and that sum checked against a previously computed sum to verify accuracy. *See also:* checksum. (PE) 599-1985w

**check, transfer** *See:* transfer check.

**check valve** *See:* blocking capacitor.

**cheek, field-coil flange** *See:* collar.

**cheese antenna** A reflector antenna having a cylindrical reflector enclosed by two parallel conducting plates perpendicular to the cylinder, spaced more than one wavelength apart. *Contrast:* pillbox antenna. (AP/ANT) 145-1993

**chemical conversion coating** A protective or decorative coating produced in situ by chemical reaction of a metal with a chosen environment. (IA) [59]

**chemical vapor deposition technique (CVD) (fiber optics)** A process in which deposits are produced by heterogeneous gas-solid and gas-liquid chemical reactions at the surface of a substrate. *Note:* The CVD method is often used in fabricating optical waveguide preforms by causing gaseous materials to react and deposit glass oxides. Typical starting chemicals include volatile compounds of silicon, germanium, phosphorus, and boron, which form corresponding oxides after heating with oxygen or other gases. Depending upon its type, the preform may be processed further in preparation for pulling into an optical fiber. *See also:* preform. (Std100) 812-1984w

**Chicago grip** *See:* conductor grip.

**chief programmer (software)** The leader of a chief programmer team; a senior-level programmer whose responsibilities include producing key portions of the software assigned to the team, coordinating the activities of the team, reviewing the work of the other team members, and having an overall technical understanding of the software being developed. *See also:* backup programmer; chief programmer team. (C) 610.12-1990

**chief programmer team (software)** A software development group that consists of a chief programmer, a backup programmer, a secretary/librarian, and additional programmers and specialists as needed, and that employs procedures designed to enhance group communication and to make optimum use of each member's skills. *See also:* chief programmer; egoless programming; backup programmer. (C) 610.12-1990

**child** A widget that is the immediate inferior of the current widget in the widget instance hierarchy. *Synonym:* descendant. (C) 1295-1993w

**child box** A box in a child diagram. (C/SE) 1320.1-1998

**child diagram** A decomposition diagram related to a specific box by exactly one child/parent relationship. (C/SE) 1320.1-1998

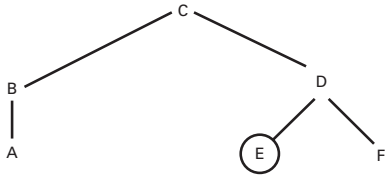
**child entity** The entity in a specific relationship whose instances can be related to zero or one instance of the other entity (parent entity). (C/SE) 1320.2-1998

**Child-Langmuir equation (thermionics)** An equation representing the cathode current of a thermionic diode in a space-charge-limited-current state.

$$I = GV^{3/2}$$

where $I$ is the cathode current, $V$ is the anode voltage of a diode or the equivalent diode of a triode or of a multi-electrode value or tube, and G is a constant (perveance) depending on the geometry of the diode or equivalent diode. *See also:* electron emission. (ED) [45], [84]

**child node** In a tree, a descendant node having a given node as its parent node. *Synonym:* daughter; son. *Contrast:* parent node. *See also:* sibling node.




*E is a child node of node D*

**child node**

(C) 610.5-1990w

**(2)** A node that "descends" from another node, i.e., all nodes except the root node. *See also:* parent node. (BA/C) 1275-1994

**(3)** In the device tree, a descendant node that represents a device plugged into an Sbus. (C/BA) 1275.4-1995, 1275.2-1994w

**child process** *See:* POSIX process.

**child segment** In a hierarchical database, a segment that has a parent segment and that is dependent on that segment for its existence. *Note:* If the parent segment is deleted, the child segment must be deleted. *Contrast:* parent node. *See also:* logical child segment; physical child segment; dependent segment; twin segment. (C) 610.5-1990w

**CHILL** A high-order language, standardized by CCITT (Consultative Committee on International Telephone & Telegraph, Geneva), used for communication applications. (C) 610.13-1993w

**Chinese binary** *See:* column binary.

**Chinese finger** *See:* woven wire grip.

**chip (1) (mechanical recording)** The material removed from the recording medium by the recording stylus while cutting the groove. (SP) [32]

**(2) (nonlinear, active, and nonreciprocal waveguide components) (semiconductor)** A small unpackaged functional element made by subdividing a wafer of semiconductor material. Sometimes referred to as a "die." (MTT) 457-1982w

**(3)** A small piece of silicon or other semiconductive material on which circuits can be placed. (C) 610.10-1994w

**(4)** A small unpackaged functional element made by subdividing a wafer of semiconductor material. Sometimes referred to as a die. Also used as a modifier to indicate an operation that applies to the entire chip as in chip enable or chip clear. *Synonym:* integrated circuit. (ED) 1005-1998

**chip clear (A)** Operation that causes the writing of all memory elements to a common "1" state. **(B)** Terminal to which the clear signal is applied (preferred usage). (ED) 1005-1998

**chip density** The number of transistors implemented on a single integrated circuit. (C) 610.10-1994w

**chip enable (semiconductor memory)** The inputs that when true permit input, internal transfer, manipulation, refreshing, and output of data, and when false cause the memory to be in a reduced power standby mode. *Note:* Chip enable is a clock or strobe that significantly affects the power dissipation of the memory. Chip select is a logical function that gates the inputs and outputs. For example, chip enable may be the cycle control of a dynamic memory or a power reduction input on a static memory. (TT/C) 662-1980s

**chip erase** *See:* bulk erase.

**chip-on-board testing** A test of a component after it has been assembled onto a printed circuit board or other substrate; for example, using the facilities defined by IEEE Std 1149.1-1990. (TT/C) 1149.1-1990

**chip select (semiconductor memory)** The inputs that when false prohibit writing into the memory and disable the output of the memory. *Note:* Chip enable is a clock or strobe that significantly affects the power dissipation of the memory. Chip select is a logical function that gates the inputs and outputs. For example, chip enable may be the cycle control of a dynamic memory or a power reduction input on a static memory. (TT/C) 662-1980s

**chirp** A form of pulse compression that uses frequency modulation (usually linear) during the pulse. (AES) 686-1997

**chirp filter** A filter whose group delay is a nonconstant function of the instantaneous frequency of the input signal. (UFFC) 1037-1992w

**chirping (fiber optics)** A rapid change (as opposed to long-term drift) of the emission wavelength of an optical source. Chirping is often observed in pulsed operation of a source. (Std100) 812-1984w

**choice (1) (telephone switching systems)** The position of an outlet in a group with respect to the order of selection. (COM) 312-1977w

**(2)** The language-independent syntax for a family of datatypes constructed from a sequence of base datatypes, each associated with a name. A value of choice datatype contains, for exactly one name, a value of the corresponding datatype. (C/PA) 1351-1994w

**(3)** A datatype constructed from a sequence of base datatypes, each associated with a name. A choice value contains, for exactly one name, a value of the corresponding datatype. (C/PA) 1224.1-1993w

**choice device** A logical input device used to make a selection from a set of predefined menu options in a graphics system. A typical physical device is a function keyboard or a set of function keys. *Synonym:* button device. (C) 610.6-1991w, 610.10-1994w

**choke (waveguide)** A device for preventing energy within a waveguide in a given frequency range from taking an undesired path. *See also:* waveguide. (AP/ANT) [35]

**choke coil** An inductor used in a special application to impede the current in a circuit over a specified frequency range while allowing relatively free passage of the current at lower frequencies. (CHM) [51]

**choke flange (1) (microwave technique)** A flange in whose surface is cut a groove so dimensioned that the flange may form part of a choke joint. *See also:* waveguide. (AP/ANT) [35]

**(2) (waveguide components)** A flange designed with auxiliary transmission-line elements to form a choke joint when used with a cover flange. (MTT) 147-1979w

**choke joint (waveguide components)** A connection designed for essentially complete transfer of power between two waveguides without metallic contact between the inner walls of the waveguides. It typically consists of one cover flange and one choke flange. (MTT) 147-1979w

**choke piston (waveguide)** A piston in which there is no metallic contact with the walls of the waveguide at the edges of the reflecting surface; the short-circuit to high-frequency currents is achieved by a choke system. *Note:* This definition covers a number of configurations: dumbbell; Z-slot; inverted bucket; etc. *Synonyms:* choke plunger; noncontact plunger. *See also:* waveguide. (AP/ANT) [35]

**choke plunger** *See:* choke piston.

**choker** *See:* traveler sling.

**chop** A sudden cessation of the flow of arc current during circuit interruption. (PE/IC) 1143-1994r

**chopped display (oscilloscopes)** A time-sharing method of displaying output signals of two or more channels with a single cathode-ray-tube gun, at a rate that is higher than and not referenced to the sweep rate. *See also:* oscillograph. (IM/HFIM) [40]

**chopped frequency** *See:* chopping rate.

**chopped impulses (high voltage testing)** Generally, chopping of an impulse is characterized by an initial discontinuity, decreasing the voltage, which then falls to zero with or without oscillations. See figures 1 and 3 to definition of "virtual origin $O_1$." *Note:* With some test objects or test arrangements, there may be a flattening of the crest or a rounding off of the voltage before the final voltage collapse. Similar effects may also be observed, due to imperfections of the measuring system. Exact determination of the parameters related to the chopping then requires special consideration. (PE/PSIM) 4-1978s

**chopped impulse voltage** A transient voltage derived from a full impulse voltage that is interrupted by the disruptive discharge of an external gap or the external portion of the test specimen causing a sudden collapse in the voltage, practically to zero value. *Note:* The collapse can occur on the front, at the peak, or on the tail. *See also:* test voltage.

**chopped impulse wave (surge arresters)** An impulse wave that has been caused to collapse suddenly by a flashover. (PE) [8], [84]

**chopped lightning impulse** A prospective full lightning impulse during which any type of discharge causes a rapid collapse of the voltage. (PE/PSIM) 4-1995

**chopped wave** A voltage impulse that is terminated intentionally by sparkover of a gap. (PE/SPD/T&D) 32-1972r, [10]

**chopped-wave lightning impulse test (power and distribution transformers)** A voltage impulse that is terminated intentionally by sparkover of a gap, which occurs subsequent to the maximum crest of the impulse wave voltage, with a specified minimum crest voltage, and a specified minimum time to flashover. (PE/TR) C57.12.80-1978r

**chopper (1) (analog computer)** A mechanical, electrical, or electromechanical device that converts dc into a square wave. As applied to a direct-coupled operational amplifier, it is a modulator used to convert the dc at the summing junction to ac for amplifier and reinsertion as a correcting voltage to reduce offset. (C) 165-1977w, 610.10-1994w
**(2)** A device for interrupting a current or a light beam at regular intervals. Choppers are frequently used to facilitate amplification. (COM/PE/EEC) [119]
**(3) (capacitance devices)** A special form of pulsing relay having contacts arranged to rapidly interrupt, or alternately reverse, the direct-current polarity input to an associated circuit. 31-1944w

**chopper amplifier (signal-transmission system)** A modulated amplifier in which the modulation is achieved by an electronic or electromechanical chopper, the resultant wave being substantially square. *See also:* signal. (IE) [43]

**chopping frequency** *See:* chopping rate.

**chopping rate (oscilloscopes) (cathode-ray oscilloscopes)** The rate at which channel switching occurs in chopped-mode operation. *See also:* oscillograph. (IM/HFIM) [40], 311-1970w

**chopping transient blanking** The process of blanking the indicating spot during the switching periods in chopped display operation. (IM) 311-1970w

**chroma** *See:* Munsell chroma.

**chromatic adaptation (illuminating engineering)** The process by which the chromatic properties of the visual system are modified by the observation of stimuli of various chromaticities and luminances. (EEC/IE) [126]

**chromatic color (illuminating engineering)** Perceived color possessing a hue. In everyday speech, the word "color" is often used in this sense in contradistinction to white, gray, or black. (EEC/IE) [126]

**chromatic dispersion** *See:* dispersion.

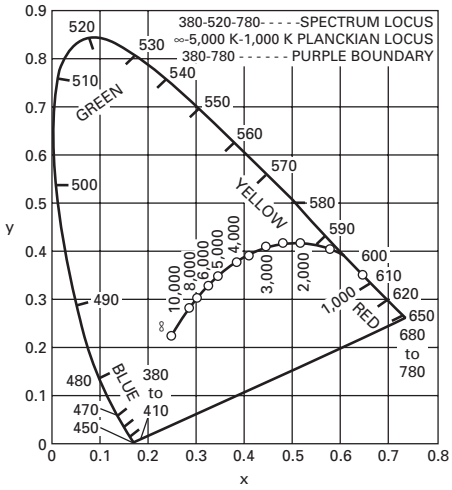
**chromaticity (1) (general)** The color quality of light definable by its chromaticity coordinates, or by its dominant (or complementary) wavelength and its purity, taken together. *See also:* color. (BT/AV) [34], [84]
**(2) (illuminating engineering)** The dominant or complementary wavelength and purity aspects of the color taken together, or of the aspects specified by the chromaticity coordinates of the color taken together. (EEC/IE) [126]
**(3) (television)** That color attribute of light definable by its chromaticity coordinates. *Note:* When a specific white, the value of dominant (or complementary) wavelength, and saturation are given, there will be a corresponding set of unique chromaticity coordinates. (BT/AV) 201-1979w
**(4) (electric power systems in commercial buildings)** The measure of the warmth or coolness of a light source, which is expressed in the Kelvin (K) temperature scale. (IA/PSE) 241-1990r

**chromaticity coordinates of a color, *x*, *y*, *z* (illuminating engineering)** The ratio of each of the tristimulus values of the color to the sum of the three tristimulus values. *See also:* tristimulus values of a light, ***X***, ***Y***, ***Z***. (IE/EEC/BT/AV) [126], 201-1979w

**chromaticity diagram (1) (illuminating engineering)** A plane diagram formed by plotting one of the three chromaticity coordinates against another. (EEC/IE) [126]
**(2) (television)** A plane diagram formed by plotting one chromaticity coordinate against another. *Notes:* 1. A commonly used chromaticity diagram is the 1931 CIE (*x*,*y*) diagram. 2. Another chromaticity diagram coming into use is defined in the 1960 CIE (*u*,*v*) uniform chromaticity system (UCS). In contrast with the CIE (x,y) diagram, chromaticities that have just noticeable differences (*j*, *n*, *d*) are spaced by essentially equal distances over the entire diagram. Coordinate values in the two systems are related by the transformations:

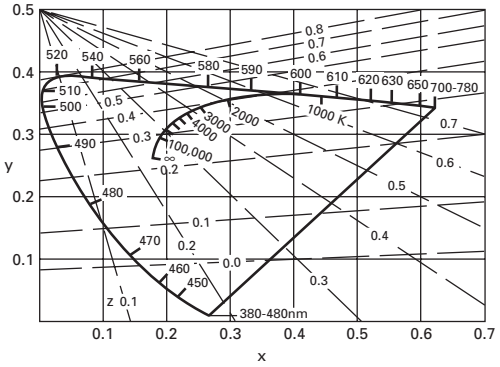
$$u = \frac{4x}{-2x + 12y + 3}$$

$$v = \frac{6y}{-2x + 12y + 3}$$




*1931 CIE (x, y) chromaticity diagram*

**chromaticity diagram**




*1960 CIE-UCS (u, v) chromaticity diagram*

**chromaticity diagram**

(BT/AV) 201-1979w

**chromaticity difference thresholds (illuminating engineering)** The smallest difference in chromaticity, between two colors of the same luminance, that makes them perceptibly different. The difference may be a difference in hue or saturation, or a combination of the two. (EEC/IE) [126]

**chromaticity flicker (television)** The flicker that results from fluctuation of chromaticity only. (BT/AV) 201-1979w

**chrominance (1) (television)** The colorimetric difference between any color and a reference color of an equal luminance, the reference color having a specified chromaticity. *Notes:* 1. In three-dimensional color space, chrominance is a vector that lies in a plane of constant luminance. In that plane, it may be resolved into components called chrominance components. 2. In color television transmission, for example, the chromaticity of the reference color may be that of a specified white. (BT/AV) 201-1979w
**(2) (broadband local area networks)** The portion of a video signal that contains color information. (LM/C) 802.7-1989r

**chrominance channel (color television)** Any path that is intended to carry the chrominance signal. (BT/AV) 201-1979w

**chrominance channel bandwidth (color television)** The bandwidth of the path intended to carry the chrominance signal. (BT/AV) 201-1979w

**chrominance components** *See:* chrominance.

**chrominance demodulator (color television)** A demodulator used for deriving video-frequency chrominance components from the chrominance signal and a sine wave of chrominance subcarrier frequency. (BT/AV) 201-1979w

**chrominance modulator (color television)** A modulator used for generating the chrominance signal from the video-frequency chrominance components and the chrominance subcarrier. (BT/AV) 201-1979w

**chrominance primary (color television)** A transmission primary that is one of two whose amounts determine the chrominance of a color. *Notes:* 1. Chrominance primaries have zero luminance and are nonphysical. 2. This term is obsolete because it is useful only in a linear system. (BT/AV) 201-1979w

**chrominance signal (color television)** The sidebands of the modulated chrominance subcarrier that are added to the luminance signal to convey color information. (BT/AV) 201-1979w

**chrominance signal component (television)** A signal resulting from suppressed-carrier modulation of a chrominance subcarrier voltage at a specified phase, by a chrominance primary signal such as the I Video Signal or the Q Video Signal. (BT) 204-1961w

**chrominance subcarrier (color television)** The carrier whose modulation sidebands are added to the luminance signal to convey color information. (BT/AV) 201-1979w

**chronaxie (medical electronics)** The minimum duration of time required to stimulate with a current of twice the rheobase. (EMB) [47]

**chronic exposure** Exposure over a relatively long time. (T&D/PE) 539-1990

**chronometer (navigation aids)** A time piece with a nearly constant rate. Set approximately to Greenwich Mean Time. (AES/GCS) 172-1983w

**chunk** A block of memory, typically 64 bits. (ED) 1005-1998

**chute** *See:* feed tube.

**CI** *See:* configuration item.

**CIE** *See:* Commission Internationale de l'Eclairage.

**CIE (L*a*b*) uniform color space (illuminating engineering)** A transformation of CIE tristimulus values X, Y, Z into three coordinates that define a space in which equal distances are more nearly representative of equal magnitudes of perceived color difference. This space is specially useful in cases of colorant mixtures, for example, dye-stuffs, paints. (EEC/IE) [126]

**CIE (L*u*v*) uniform color space (illuminating engineering)** A transformation of CIE tristimulus values X, Y, Z into three coordinates that define a space in which equal distances are more nearly representative of equal magnitudes of perceived color difference. This space is specially useful in cases where colored lights are mixed additively for example, color television. (EEC/IE) [126]

**CIE standard chromaticity diagram (illuminating engineering)** One in which the $x$ and $y$ chromaticity coordinates are plotted in rectangular coordinates. *Note:* The diagram may be based on the CIE 1931 Standard Observer or on the CIE 1964 Supplementary Standard Observer. *See also:* color matching functions. (EEC/IE) [126]

**CIE standard colorimetric observer, 1931** Receptor of radiation whose colorimetric characteristics correspond to the distribution coefficients $\bar{x}_\lambda$, $\bar{y}_\lambda$, $\bar{z}_\lambda$ adopted by the International Commission on Illumination in 1931. *See also:* color. (BT/AV) [34], [84]

**CIGRE** *See:* Conférence Internationale Des Grands Réseaux Electriques.

**CIM** *See:* computer input microfilm; computer-integrated manufacturing.

**CINEMA** A hardware description language with a compiler written in BCPL; contains normal control statements and also statements providing parallel execution of program statements. (C) 610.13-1993w

**cine-oriented image** In micrographics, an image appearing on a roll of microfilm in such a manner that the top edge of the image is perpendicular to the long edge of the film. *Synonyms:* portrait image; motion picture display. *Contrast:* comic-strip oriented image. (C) 610.2-1987

**C interface** The C language binding, defined in terms of ISO/IEC 9899: 1990. (C/PA) 1328-1993w, 1327-1993w

**ciphertext** Data produced through the use of encipherment, the semantic content of which is not available. *Note:* Ciphertext may itself be input to encipherment, producing superenciphered data. (C/LM) 802.10-1998

**circadian rhythm** Oscillation of biological processes with an approximate 24 h period regulated by external stimuli. (PE/T&D) 539-1990

**circle diagram (A) (rotating machinery)** Circular locus describing performance characteristics (current, impedance, etc.) of a machine or system. In case of rotating machinery, the term "circle diagram" has, in addition, some specific usages: The locus of the armature current phasor of an induction machine, or of some other type of asynchronous machine, displayed on the complex plane, with the shaft speed as the variable (parameter), when the machine operates at a constant voltage and at a constant frequency. **(B) (rotating machinery)** The locus of the current vector(s) of a nonsalient-pole synchronous machine, displayed in a synchronously rotating reference frame (Park transform, *d-q* coordinates), with the active component of the load, hence with the rotor displacement angle, as the variable (parameter), when the machine operates at a constant field current. **(C) (rotating machinery)** The locus of the current phasor(s) of (2) *See also:* asynchronous machine. (PE) [9]

**circling guidance lights (illuminating engineering)** Aeronautical ground lights provided to supply additional guidance during a circling approach when the circling guidance furnished by the approach and runway lights is inadequate. (EEC/IE) [126]

**circuit (1) (A)** The physical medium on which signals are carried across the AUI. The data and control circuits consist of an A circuit and a B circuit forming a balanced transmission system so that the signal carried on the B circuit is the inverse of the signal carried on the A circuit. **(B) (data transmission)** A network providing one or more closed paths. **(C)** An arrangement of interconnected components that has at least one input and one output terminal, and whose purpose is to produce at the output terminals a signal that is a function of the signal at the input terminals. *Synonyms:* physical circuit; network. *See also:* expansion board; channel; telecommunication circuit. **(D)** An arrangement of interconnected electronic components that can perform specific functions upon application of proper voltages and signals. *See also:* logic circuit; integrated circuit.
(LM/C/COM/PE/TA) 8802-3-1990, 455-1985, 599-1985, 610.10-1994

**(2)** A conductor or system of conductors through which an electric current is intended to flow. (NESC/PE) C2-1997, 599-1985w

**(3) (machine winding)** The element of a winding that comprises a group of series-connected coils. A single-phase winding or one phase of a polyphase winding may comprise one circuit or several circuits connected in parallel. (PE) [9]

**(4)** An interconnection of electrical elements. *See also:* network. (CAS) [13]

**(5)** In networking, a means of communication of electrical or electronic signals between two points. *Synonym:* network. *See also:* telecommunication circuit; dial-up circuit; simplex circuit; four-wire circuit; two-wire circuit; foreign exchange circuit; leased circuit; channel. (C) 610.7-1995

**(6)** The physical medium on which signals are carried across the Attachment Unit Interface (AUI) for 10BASE-T or Media Independent Interface (MII) for 100BASE-T. For 10BASE-T, the data and control circuits consist of an A circuit and a B circuit forming a balanced transmission system so that the signal carrier on the B circuit is the inverse of the signal carried on the A circuit. (C/LM) 802.3-1998

**circuit analyzer (multimeter)** The combination in a single enclosure of a plurality of instruments or instrument circuits for use in measuring two or more electrical quantities in a circuit. *See also:* instrument. (EEC/PE) [119]

**circuit, balanced** *See:* balanced circuit.

**circuit board** A flat piece of insulating material, often multilayered, constituted of epoxy-glass or phenolic resin, on which electrical components are mounted and interconnected by etched copper foil so patterned as to form a circuit. *Note:* Sometimes referred to as a "board" or a "card." *See also:* printed circuit board. (C) 610.10-1994w

**circuit bonding jumper** The connection between portions of a conductor in a circuit to maintain required ampacity of the circuit. (NESC/NEC) [86]

**circuit breaker (1) (general) (thyristor)** A device designed to open and close a circuit by nonautomatic means, and to open the circuit automatically on a predetermined overload of current, without injury to itself when properly applied within its rating. *Notes:* 1. A circuit breaker is usually intended to operate infrequently, although some types are suitable for frequent operation.
(NESC/IA/IPC/PKG) 428-1981w, [86], 333-1980w

**(2)** A switching device capable of making, carrying, and breaking currents under normal circuit conditions and also making, carrying for a specified time, and breaking currents under specified abnormal conditions such as those of short circuit. (NESC) C2-1997

**(3) (packaging machinery)** An automatic device designed to open under abnormal conditions a current-carrying circuit without damage to itself. (IA/PKG) 333-1980w

**(4) (hydroelectric power plants)** A fast-acting switching device used to close and open an electric circuit and capable of interruption of fault currents. (PE/EDPG) 1020-1988r

**(5)** A mechanical switching device, capable of making, carrying, and breaking currents under normal circuit conditions and also, making and carrying for a specified time and breaking currents under specified abnormal circuit conditions such as those of short circuit. *Notes:* 1. A circuit breaker is usually intended to operate infrequently, although some types are for frequent operation. 2. The medium in which circuit interruption is performed may be designated by suitable prefix, that is, airblast circuit breaker, air circuit breaker, compressed-air circuit breaker, gas circuit breaker, oil circuit breaker, vacuum circuit breaker, oilless circuit breaker, etc. 3. Circuit breakers are classified according to their application or characteristics and these classifications are designated by the following modifying words or clauses delineating the several fields of application, or pertinent characteristics: High-voltage power—Rated above 1000 V ac. Molded-case—See separate definition. Low-voltage power—Rated 1000 V ac or below, or 300 V dc and below, but not including molded-case circuit breakers. Direct-current low-voltage power circuit breakers are subdivided according to their specified ability to limit fault-current magnitude by being called general purpose, high-speed, semi-high-speed, rectifier or anode. For specifications of these restrictions see latest revision of the applicable standard. (SWG/PE) C37.100-1992

**circuit-breaker compartment (1)** That portion of a switchgear assembly that contains one circuit breaker and the associated primary conductors and secondary control connection devices including current transformers. (SWG/PE) C37.20.1-1993r

**(2)** That portion of the switchgear assembly that contains one circuit breaker or other removable primary interrupting device and the associated primary conductors.
(SWG/PE) C37.20.2-1993

**circuit breaker downtime** Time from the discovery of the failure until the breaker is returned to service.
(SWG/PE) C37.10-1995

**circuit breaker, field discharge** A circuit breaker having main contacts for energizing and deenergizing the field of a generator, motor, synchronous condenser, or rotating exciter, and having discharge contacts for short-circuiting the field through the discharge resistor at the instant preceding the opening of the circuit-breaker main contacts. The discharge contacts also disconnect the field from the discharge resistor at the instant following the closing of the main contacts. For direct-current generator operation, the discharge contacts may open before the main contacts close. *Note:* When used in the main field circuit of an alternating- or direct-current generator, motor, or synchronous condenser, the circuit breaker is designated as a main field discharge circuit breaker. When used in the field circuit of the rotating exciter of the main machine, the circuit breaker is designated as an exciter field discharge circuit breaker. *See also:* field discharge circuit breaker. (SWG/PE) C37.100-1992, C37.18-1979r

**circuit breaker, general purpose low-voltage dc power** A circuit breaker that, during interruption, does not limit the current peak of the available (prospective) fault current and may not prevent the fault current from rising to its sustained value.
(SWG/PE) C37.100-1992, C37.14-1999

**circuit-breaker grouping** The three poles of a circuit breaker grouped in adjacent configuration along the line of the same row. (SWG/SUB/PE) C37.122-1983s, C37.100-1992

**circuit breaker, high-speed low-voltage dc power** A circuit breaker that, during interruption, limits the current peak to a value less than the available (prospective) fault current.
(SWG/PE) C37.100-1992, C37.14-1999

**circuit breaker interrupting rating** For an unfused circuit breaker, the designated limit of available (prospective) current at which the circuit breaker is required to perform its short-circuit current duty cycle at rated maximum voltage under the prescribed test conditions. This current is expressed as the rms symmetrical value envelope at a time 1/2 cycle after short-circuit is initiated. (For dc breakers, the rated interrupting current is the maximum value of direct current.).
(IA/MT) 45-1998

**circuit breaker, rectifier low-voltage dc power** A circuit breaker that carries the normal current output of one rectifier and that, during fault conditions, functions to withstand and/or interrupt abnormal current as required.
(SWG/PE) C37.100-1992, C37.14-1999

**circuit breaker, semi-high-speed low-voltage dc power** A circuit breaker that, during interruption, does not limit the current peak of the available (prospective) fault current on circuits with minimal inductance but that does limit current to a value less than the sustained current available on higher-inductance circuits.
(SWG/PE) C37.100-1992, C37.14-1999r

**circuit bypass means (bypass)** An assembly of parts which, when properly operated, closes the circuit between the line and load jaws. (ELM) C12.7-1993

**circuit-commutated turn-off time (thyristor)** The time interval between the instant when the principal current has decreased to zero after external switching of the principal voltage circuit and the instant when the thyristor is capable of supporting a specified principal voltage without turning on. *See also:* principal voltage-current characteristic.
(IA/ED) 223-1966w, [46], [62], [12]

**circuit components (thyristor)** Those electrical controller devices that may conduct current during some part of the cycle. Instrumentation is excluded. *Note:* This definition may include devices within the controller that are used for the suppression of voltage and current transients.
(IA/IPC) 428-1981w

**circuit controller** A device for closing and opening electric circuits. (EEC/PE) [119]

**circuit efficiency (output circuit of electron tubes)** The ratio of the power at the desired frequency delivered to a load at the output terminals of the output circuit of an oscillator or amplifier to the power at the desired frequency delivered by the electron stream to the output circuit. *See also:* network analysis. (ED) 161-1971w, [45]

**circuit element** A basic constituent part of a circuit, exclusive of interconnections. (EEC/PE) [119]

**circuit interrupter (packaging machinery)** A manually operated device designed to open under abnormal conditions a current-carrying circuit without damage to itself. (IA/PKG) 333-1980w

**circuit limiter** *See:* limiter circuit.

**circuit malfunction analysis (test, measurement, and diagnostic equipment)** The logical, systematic examination of circuits and their diagrams to identify and analyze the probability and consequence of potential malfunctions and for determining related maintenance and support requirements to investigate effects of failures. (MIL) [2]

**circuit, multipoint** *See:* multipoint circuit.

**circuit noise meter** An instrument for measuring circuit noise level. Through the use of a suitable frequency-weighting network and other characteristics, the instrument gives equal readings for noises that are approximately equally interfering. The readings are expressed as circuit noise levels in decibels above reference noise. *Synonym:* noise measuring set. *See also:* instrument. (EEC/PE) [119]

**circuit pack** A printed circuit board (PCB) populated with components, i.e., a PCB assembly. Also called a feature card. (SPD/PE) C62.38-1994r

**circuit properties (thyristor)** Those conditions which exist, or actions which take place, inside the controller during its operating cycle. (IA/IPC) 428-1981w

**circuit simulator** A software program that predicts a circuit's response to a given stimulus. (SCC20) 1445-1998

**circuit switch (data transmission)** A communications switching system which completes a circuit from sender to receiver at the time of transmission (as opposed to a message switch). (PE) 599-1985w

**circuit switcher (1)** A mechanical switching device with an integral interrupter, suitable for making, carrying, and interrupting currents under normal circuit conditions. It is also suitable for interrupting specified short-circuit current that may be less than its close and latch, momentary, and short-time current ratings. *Note:* This device may be suitable for transformer protection where the majority of faults are limited by the transformer and system impedance. (SWG/PE) C37.100-1992

**(2)** A circuit interrupting device with a limited interrupting rating as compared with a circuit breaker. It is often integrated with a disconnecting switch. Its design usually precludes the integration of current transformers (CTs). (PE/PSR) C37.113-1999

**circuit-switched network** A switched network having the capability to switch lines in different configurations to establish a continuous pathway between the sender and the recipient. (C) 610.7-1995

**circuit switching (1)** A method of communications where an electrical connection between calling and called stations is established on demand for exclusive use of the circuit until the connection is released. *See also:* store-and-forward switching; packet switching; message switching. (LM/COM) 168-1956w

**(2)** In data communications, a method of communication in which a dedicated communications path is set up between two devices through one or more intermediate switching nodes. *Synonym:* line switching. *See also:* message switching; space-division switching. (C) 610.7-1995

**circuit switching element (inverters)** A group of one or more simultaneously conducting thyristors, connected in series or parallel or any combination of both, bounded by no more than two main terminals and conducting principal current between these main terminals. *See also:* self-commutated inverters. (IA) [62]

**circuit switching system** (telephone switching systems) A switching system providing through connections for the exchange of messages. (COM) 312-1977w

**circuit transient recovery voltage** *See:* inherent transient recovery voltage.

**circuit voltage class (electric power system)** A phase-to-phase reference voltage that is used in the selection of insultation class designations for neutral grounding devices. (SPD/PE) 32-1972r

**circular array** An array of elements whose corresponding points lie on a circle. *Note:* Practical circular arrays may include arrangements of elements that are congruent under translation or rotation. *Synonym:* ring array. (AP/ANT) 145-1993

**circular Bayliss distribution** *See:* Bayliss distribution.

**circular electric wave (waveguide)** A transverse electric wave for which the lines of electric force form concentric circles. (MTT) 146-1980w

**circular grid array** An array of elements whose corresponding points lie on coplanar concentric circles. (AP/ANT) 145-1993

**circular interpolation (numerically controlled machines)** A mode of contouring control that uses the information contained in a single block to produce an arc of a circle. *Note:* The velocities of the axes used to generate this arc are varied by the control. (IA/EEC) [61], [74]

**circular list** *See:* circularly-linked list.

**circularly-linked list** A linked list in which the last item contains a pointer to the first item. *Synonyms:* circular list; ring; chain. (C) 610.5-1990w

**circularly polarized field vector** At a point in space, a field vector whose extremity describes a circle as a function of time. *Note:* Circular polarization may be viewed as a special case of elliptical polarization where the axial ratio has become equal to one. (AP/ANT) 145-1993

**circularly polarized plane wave** A plane wave whose electric field vector is circularly polarized. (AP/ANT) 145-1993

**circularly polarized wave (1) (general)** An elliptically polarized wave in which the ellipse is a circle in a plane perpendicular to the direction of propagation. *See also:* radiation. (PE/EEC) [119]

**(2)** An electromagnetic wave for which the locus of the tip of the instantaneous electric field vector is a circle in a plane orthogonal to the wave normal. This circle is traced at a rate equal to the angular frequency of the wave with a left-hand or right-hand sense of rotation. *See also:* left-hand polarized wave; right-hand polarized wave. (AP/PROP) 211-1997

**circular magnetic wave (waveguide)** A transverse magnetic wave for which the lines of magnetic force form concentric circles. (MTT) 146-1980w

**circular mil** A unit of area equal to $\pi/4$ of a square mil (0.7854 square mil). The cross-sectional area of a circle in circular mils is therefore equal to the square of its diameter in mils. A circular inch is equal to one million circular mils. *Note:* A mil is one-thousandth part of an inch. There are 1974 circular mils in a square millimeter. (SWG) 341-1980

**circular orbit (communication satellite)** An orbit of a satellite in which the distance between the centers of mass of the satellite and of the primary body is constant. (COM) [19]

**circular probable error (navigation aids)** In two-dimensional error distribution, the radius of a circle encompassing half of all errors. (AES/GCS) 172-1983w

**Circular Queue** A software array of message storage locations for which the last cell is logically adjacent to the first. It is a first-in-first-out (FIFO) queue where the producer leads the consumer through the array, wrapping back to the first cell when the end is reached. (C/MM) 1212.1-1993

**circular scanning (1) (radio)** Scanning in which the direction of maximum response generates a plane or a right circular

cone whose vertex angle is close to 180 degrees. (AP/ANT) [35]

**(2)** Scanning where the beam axis of the antenna generates a conical surface. *Note:* This can include the special case where the cone degenerates to a plane. (AP/ANT) 145-1993

**circular shift (mathematics of computing)** A variation of a logical shift in which the digits moved out of one end of a register, word, or numeral are returned at the other end. For example, + 231.702 shifted two places to the left becomes 3170.2+2. *Note:* A circular shift may be applied to the multiple precision representation of a number. *Synonyms:* end-around shift; cyclic shift; rotate; end-around carry shift; ring shift. (C) 1084-1986w

**circular Taylor distribution** *See:* circular Taylor distribution.

**circulating current** The current that flows through the transition impedance as a result of two taps being bridged during a tap change operation for resistance-type LTCs or being in the bridging position for reactance-type LTCs. (PE/TR) C57.131-1995

**circulating current fault (thyristor converter)** A circulating current in excess of the design value. *Note:* In a double converter precaution must be taken to control circulating direct current between the forward and reverse sections. (IA/IPC) 444-1973w

**circulating memory** *See:* circulating register.

**circulating-power test** Operation of a bipolar HVDC transmission system so that power flows in the opposite direction in each pole. High power levels up to system rating can be used for test purposes with losses and net reactive only being supplied from the ac network. *Synonym:* round-power test. (PE/SUB) 1378-1997

**circulating register (1) (data processing)** A register that retains data by inserting it into a delaying means, and regenerating and reinserting the data into the register. (C) 162-1963w

**(2)** Shift register in which data that are moved out of one end of the register are reentered into the other end, as in a closed loop. *See also:* cyclic shift. (C) [20], [85], 610.10-1994w

**circulating storage** Dynamic storage in the form of a closed loop. *Synonym:* cyclic storage. *See also:* regenerative track. (C) 610.10-1994w

**circulation of electrolyte** A constant flow of electrolyte through a cell to facilitate the maintenance of uniform conditions of electrolysis. *See also:* electrorefining. (EEC/PE) [119]

**circulator (waveguide system)** A passive waveguide junction of three or more arms in which the arms can be listed in such an order that when power is fed into any arm it is transferred to the next arm on the list, the first arm being counted as following the last in order. *See also:* transducer; waveguide. (AP/ANT) [35], [84]

**circulator coupled (isolated) port** (nonlinear, active, and nonreciprocal waveguide components) With reference to a particular port of the circulator, a port to which waves pass from the reference port with low (high) insertion loss. (MTT) 457-1982w

**circum-aural receiver** A receiver that surrounds and encloses the ear pinna without making intimate contact with it. (COM/TA) 1206-1994

**circumflex** The character "^". (C/PA) 9945-2-1993

**CISC** *See:* complex-instruction-set computer.

**CISPR** International Special Committee on Radio Interference.

**citizens bands** Frequency bands allocated for short-distance personal or business radio communication, radio signaling, and control of remote devices by radio. *Note:* The frequency bands may differ from country to country. The bands presently in use in the United States are 26.965–27.405 MHz; 72–76 MHz and 462.550–467.425 MHz. (T&D/PE) 539-1990

**CIU** *See:* computer interface unit.

**civil speed limit** The maximum speed authorized for each section of track, as determined primarily by the alignment, profile, and structure. (VT/RT) 1474.1-1999

**civil twilight (illuminating engineering)** (morning and evening) Civil twilight ends in the evening when the center of the sun's disk is six degrees below the horizon and begins in the morning when the center of the sun's disk is six degrees below the horizon. *See also:* night. (EEC/IE) [126]

**cladding (1) (fiber optics)** The dielectric material surrounding the core of an optical waveguide. *See also:* tolerance field; core; optical waveguide; normalized frequency. (Std100) 812-1984w

**(2)** A layer that surrounds the glass core of an optical fiber. (C) 610.7-1995

**cladding center (fiber optics)** The center of the circle that circumscribes the outer surface of the homogeneous cladding, as defined under tolerance field. *See also:* cladding; tolerance field. (Std100) 812-1984w

**cladding diameter (fiber optics)** The length of the longest chord that passes through the fiber axis and connects two points on the periphery of the homogeneous cladding. *See also:* core diameter; tolerance field; cladding. (Std100) 812-1984w

**cladding mode (fiber optics)** A mode that is confined by virtue of a lower index medium surrounding the cladding. Cladding modes correspond to cladding rays in the terminology of geometric optics. *See also:* mode; bound mode; leaky mode; unbound mode; cladding ray. (Std100) 812-1984w

**cladding mode stripper (fiber optics)** A device that encourages the conversion of cladding modes to radiation modes; as a result, the cladding modes are stripped from the fiber. Often a material having a refractive index equal to or greater than that of the waveguide cladding. *See also:* cladding mode; cladding. (Std100) 812-1984w

**cladding ray (fiber optics)** In an optical waveguide, a ray that is confined to the core and cladding by virtue of reflection from the outer surface of the cladding. Cladding rays correspond to cladding modes in the terminology of mode descriptors. *See also:* cladding mode; guided ray; leaky ray. (Std100) 812-1984w

**claiming** A ring state that occurs when a station detects that the active monitor functions are not being performed and at least one station is contending to become active monitor. (C/LM) 8802-5-1998

**clamp (converter circuit elements) (self-commutated converters)** An auxiliary circuit element or combination of elements employed to limit the peak voltage or current of a semiconductor device. *See also:* clamping circuit. (IA/SPC) 936-1987w

**clamp, cable** *See:* cable clamp.

**clamper (data transmission)** When used in broadband transmissions, it reinserts low frequency signal components that were not faithfully transmitted. (PE) 599-1985w

**clamp, grounding** *See:* grounding clamp.

**clamp, hose** *See:* strand restraining clamp.

**clamping (1) (control)** A function by which the extreme amplitude of a waveform is maintained at a given level. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**(2) (pulse operations)** A process in which a specified instantaneous magnitude of a pulse is fixed at a specified magnitude. Typically, after clamping, all instantaneous magnitudes of the pulse are offset, the pulse shape remaining unaltered.

**clamping circuit (1) (electronic circuits)** A circuit that adds a fixed bias to a wave at each occurrence of some predetermined feature of the wave so that the voltage or current of the feature is held at, or "clamped," to some specified level. The level may be fixed or adjustable. *See also:* clamp; clamper. (EEC/PE) [119]

**(2)** A circuit used in analog computers to provide automatic hold and reset action electronically for the purpose of switching or supplying repetitive operation. *See also:* limiter circuit. (C) 610.10-1994w, 165-1977w

**clamping-in** *See:* clipping-in.

**clamping screw** *See:* binding screw.

**clamping voltage (1) (low voltage varistor surge arresters)** Peak voltage across the varistor measured under conditions of a specified peak pulse current and specified waveform. *Note:* Peak voltage and peak current are not necessarily coincident in time. (PE) [8]

**(2)** The maximum magnitude of voltage across a surge-protective device during the passage of a specified surge current (e.g., 100 A, 8/20 μs waveshape). (T&D/PE) 1250-1995

**(3)** The peak voltage across the surge-protective device measured under conditions of a specified surge current and specified current waveform. (SPD/PE) C62.62-2000

**clamp, strand restraining** *See:* strand restraining clamp.

**clapper** An armature that is hinged or pivoted. (EEC/REE) [87]

**class (1)** A category into which objects are placed on the basis of both their purpose and their internal structure. (C/PA) 1238.1-1994w, 1224.1-1993w, 1224-1993w

**(2)** A template for the creation of an object instance. The class defines the properties of an object. (SCC20) 1226-1998

**(3)** An abstraction of the knowledge and behavior of a set of similar things. Classes are used to represent the notion of "things whose knowledge or actions are relevant." (C/SE) 1320.2-1998

**(4)** A collection of objects that share common characteristics and features. (IM/ST) 1451.1-1999

**(5)** *See also:* object class; pattern class; class of messages; OM class.

**Class** *See:* accuracy rating.

**Class 0 unplanned outage (electric generating unit reliability, availability, and productivity)** An outage that results from the unsuccessful attempt to place the unit in service. *See also:* starting failure. (PE/PSE) 762-1987w

**Class 1, Division 2 locations (auxiliary devices for motors)** Basically those in which there may be flammable gas present due to a failure of a process system. Under normal conditions a flammable mixture of gas is not present. (IA/PC) 303-1984s

**Class 1E** The safety classification of the electric equipment and systems that are essential to emergency reactor shutdown, containment isolation, reactor core cooling, and containment and reactor heat removal, or are otherwise essential in preventing significant release of radioactive material to the environment. (PE/NP) 603-1998

**Class 1E circuits** (design and installation of cable systems for Class 1E circuits in nuclear power generating stations) The safety classification of circuits that are essential to emergency reactor shutdown, containment isolation, reactor core cooling, and containment and reactor heat removal, or are otherwise essential in preventing a significant release of radioactive material to the environment. (PE/EDPG) 690-1984r

**Class 1E control board, panel, or rack** A control board, panel, or rack fitted with Class 1E equipment. (PE/NP) 420-1982

**Class 1E electric systems** *See:* nuclear power generating stations, class ratings.

**Class 1 electric equipment** *See:* nuclear power generating stations, class ratings.

**Class I equipment** Equipment in which protection against electric shock is achieved by using basic insulation, and providing a means of connecting the conductive parts, which are otherwise capable of assuming hazardous voltages if the basic insulation fails, to the protective ground conductor in the building wire. (EMC) 1140-1994r

**Class I repeater** A type of 100BASE-T repeater set with internal delay such that only one repeater set may exist between any two DTEs within a single collision domain when two maximum length copper cable segments are used. (C/LM) 802.3-1998

**Class 1 structures and equipment** *See:* nuclear power generating stations, class ratings.

**Class 1 termination** Provides electric stress control for the cable insulation shield terminus; provides complete external leakage insulation between the cable conductor(s) and ground; and provides a seal to the end of the cable against the entrance of the external environment and main tains the pressure, if any, of the cable system. (PE/IC) 48-1990s

**Class 1 unplanned outage (electric generating unit reliability, availability, and productivity)** (immediate) An outage that requires immediate removal from the existing state. *Note:* A Class 1 unplanned outage can be initiated from either the in-service or shutdown states. A Class 1 unplanned outage can also be initiated from the planned outage state. *See also:* extended planned outage. (PE/PSE) 762-1987w

**Class II equipment** Equipment in which protection against electric shock does not rely on basic insulation only, but also on the provision of additional safety precautions, such as double insulation or reinforced insulation. There is no provision for protective grounding or reliance upon installation conditions. (EMC) 1140-1994r

**Class II repeater** A type of IEEE 802.3 100BASE-T repeater set with internal delay such that only two or fewer such repeater sets may exist between any two DTEs within a single collision domain when two maximum length copper cable segments are used. (C/LM) 802.3-1998

**Class 2 structures and equipment** *See:* nuclear power generating stations, class ratings.

**Class 2 termination** Provides electric stress control for the cable insulation shield terminus; and provides complete external leakage insulation between the cable conductor (s) and ground. (PE/IC) 48-1990s

**Class 2 transformer (power and distribution transformers)** A step-down transformer of the low-secondary-voltage type, suitable for use in class 2 remote-control low-energy circuits. It shall be of the energy-limiting type, or of a non-energy-limiting type equipped with an overcurrent device. *Note:* "Low-secondary-voltage," as used here, has a value of approximately 24 V. (PE/TR) C57.12.80-1978r

**Class 2 unplanned outage (electric generating unit reliability, availability, and productivity)** (delayed) An outage that does not require immediate removal from the in-service state but requires removal within 6 hours. (PE/PSE) 762-1987w

**Class 3 structures and equipment** *See:* nuclear power generating stations, class ratings.

**Class 3 termination** Provides electric stress control for the cable insulation shield terminus. *Note:* Some cables do not have an insulation shield. Termination for such cables would not be required to provide electric stress control. In such cases, this provision would not be part of the definition. (PE/IC) 48-1990s

**Class 3 unplanned outage (electric generating unit reliability, availability, and productivity)** (postponed) An outage that can be postponed beyond six hours but requires that a unit be removed from the in-service state before the end of the next weekend. *Note:* Classes 2 and 3 can only be initiated from the in-service state. (PE/PSE) 762-1987w

**Class 4 unplanned outage (electric generating unit reliability, availability, and productivity)** (deferred) An outage that will allow a unit outage to be deferred beyond the end of the next weekend but requires that a unit be removed from the available state before the next planned outage. (PE/PSE) 762-1987w

**Class 90 insulation** *See:* class ratings insulation.

**Class 105 insulation** *See:* class ratings insulation.

**Class 105 insulation system** Materials or combinations of materials such as cotton, silk, and paper when suitably impregnated or coated or when immersed in a dielectric liquid. *Note:* Other materials or combinations may be included in this class if by experience or accepted tests the insulation system can be shown to have comparable themal life at 105°C. (PE/TR) C57.12.80-1978r

**Class 120 insulation system** Materials or combinations of materials such as cotton, silk, and paper when suitably impregnated or coated or when immersed in a dielectric liquid; and which possess a degree of thermal stability which allows them

to be operated at a temperature 15°C higher than temperature index 105 materials. *Note:* Other materials or combinations may be included in this class if by experience or accepted tests the insulation system can be shown to have comparable thermal life at 120°C. (PE/TR) C57.12.80-1978r

**Class 130 insulation** *See:* class ratings insulation.

**Class 150 insulation system** Materials or combinations of sealed dry-type transformer, self-cooled (class GA) (power and distribution transformer) materials such as mica, glass fiber, asbestos, etc., with suitable bonding substances. *Note:* Other materials or combinations of materials may be included in this class if by experience or accepted tests the insulation system can be shown to have comparable thermal life at 150°C. (PE/TR) C57.12.80-1978r

**Class 155 insulation** *See:* class ratings insulation.

**Class 180 insulation** *See:* class ratings insulation.

**Class 185 insulation system** Materials or combinations of materials such as silicone elastometer, mica, glass fiber, asbestos, etc, with suitable bonding substances such as appropriate silicone resins. *Note:* Other materials or combinations of materials may be included in this class if by experience or accepted tests the insulation system can be shown to have comparable thermal life at 220°C. (PE/TR) C57.12.80-1978r

**Class 220 insulation** *See:* class ratings insulation.

**Class 220 insulation system** Materials or combinations of materials such as silicone elastomer, mica, glass fiber, asbestos, etc, with suitable bonding substances such as appropriate silicone resins. *Note:* Other materials or combinations of materials may be included in this class if by experience or accepted tests, the insulation system can be shown to have comparable thermal life at 220°C. (PE/TR) C57.12.80-1978r

**Class A amplifier** *See:* amplifier class ratings.

**Class A component (seismic design of substations)** Any component or system whose failure, malfunction, or need for repair prevents the proper operation of the substation during or after the design earthquake. (SUB/PE) 693-1984s

**Class A modulator** A Class-A amplifier that is used specifically for the purpose of supplying the necessary signal power to modulate a carrier. *See also:* modulation. (AP/BT/ANT) 145-1983s, 182-1961w

**Class A operation** *See:* amplifier class ratings.

**Class A push-pull sound track** A Class-A push-pull photographic sound track consists of two single tracks side by side, the transmission of one being 180° out of phase with the transmission of the other. Both positive and negative halves of the sound wave are linearly recorded on each of the two tracks. *See also:* phonograph pickup. (SP) [32]

**Class A seismic component** A component or system whose failure, malfunction, or need for repair prevents the proper operation of the gas-insulated substation during or after the design earthquake. (SWG/SUB/PE) C37.122-1983s, C37.122.1-1993, C37.100-1992

**Class AB amplifier** *See:* amplifier class ratings.

**Class AB operation** *See:* amplifier class ratings.

**Class B amplifier** *See:* amplifier class ratings.

**Class B component (seismic design of substations)** Any component or system whose failure, malfunction, or need for repair does not prevent the operation of the substation during or after the design earthquake. (SUB/PE) 693-1984s

**Class B modulator** A class-B amplifier that is used specifically for the purpose of supplying the necessary signal power to modulate a carrier. *Note:* In such a modulator the class-B amplifier is normally connected in push-pull. *See also:* modulation. (AP/BT/ANT) 145-1983s, 182-1961w

**Class B operation** *See:* amplifier class ratings.

**Class B push-pull sound track** A class-B push-pull photographic sound track consists of two tracks side by side, one of which carries the positive half of the signal only, and the other the negative half. *Note:* During the inoperative half-cycle, each track transmits little or no light. *See also:* phonograph pickup. (SP) [32]

**Class B seismic component** A component or system whose failure, malfunction, or need for repair does not prevent the proper operation of the gas-insulated substation during or after the design earthquake. Class B components are designed to meet either normal building codes and national standards in force at the site or another lower-level design earthquake. Application of further design requirements is left to the discretion of the user. (SWG/SUB/PE) C37.122-1983s, C37.100-1992, C37.122.1-1993

**Class C amplifier** *See:* amplifier class ratings.

**Class C operation** *See:* amplifier class ratings.

**class designation (watthour meter)** The maximum of the load range in amperes. *See also:* load range; watthour meter—class designation. (ELM) C12.1-1981

**classes of grounding (neutral grounding in electrical utility systems)** A specific range of degree of grounding; for example, effectively and noneffectively. (PE/SPD) C62.92-1987r

**classes of insulation systems (insulation systems of synchronous machines)** The insulation systems usually employed in synchronous machines covered by this standard are defined below. These definitions, in general, correspond with the principles set forth in IEEE Std 1-1969, *IEEE Standard General Principles for Temperature Limits in the Rating of Electric Equipment and for the Evaluation of Electrical Insulation,* which is also the accepted basis for interpretation. (REM) [115]

**class hierarchy (1)** The tree-structured organization of classes. A widget class in this tree always supports all of the operations supported by its ancestor classes closer to the root of the tree, but might support them with different implementations and might also add new operations. (C) 1295-1993w

**(2)** An ordering of classes, in which a subclass is a specialization of its superclass. A class inherits attributes and relationships from its superclass and can define additional attributes and relationships of its own. (C/SE) 1420.1-1995

**classical maximum usable frequency** *See:* maximum usable frequency.

**Class ID** All classes have a descriptive header entry "Class ID," the value of which is the Class ID (note capitalization). For any object of class `IEEE1451_Root`, the operation `GetClassID` returns a value, `class_id`, that has the same value as Class ID. (IM/ST) 1451.1-1999

**classification (1)** A choice within a category. (C/SE) 1044-1993

**(2)** A choice within a category to describe the category (attribute) of an anomaly. (C/SE) 1044.1-1995

**(3)** A grouping of objects on the basis of common characteristics. This is the normal method for grouping objects within an object-oriented programming environment. (SCC20) 1226-1998

**(4)** The manner in which the assets are organized for ease of search and extraction within a reuse library. (C/SE) 1517-1999

**classification current (metal-oxide surge arresters for ac power circuits)** The designated current used to perform the classification tests. (SPD/PE) C62.11-1993s, C62.11-1987s

**classification lamp (classification light)** A signal lamp placed at the side of the front end of a train or vehicle, displaying light of a particular color to identify the class of service in which the train or vehicle is operating. (PE/NP) 344-1975s

**classification light** *See:* classification lamp.

**classification of arresters (1)** Arrester classification is determined by prescribed test requirements. These classifications are: station valve arrester, intermediate valve arrester, distri-

bution valve arrester, secondary valve arrester, protector tube. (PE/SPD) [8], C62.1-1981s

**(2)** Arrester classification is determined by prescribed test requirements. These classifications are: station, intermediate, distribution heavy duty, distribution normal duty, distribution light duty, secondary. (SPD/PE) C62.11-1993s

**classification of insulation** *See:* self-restoring insulation; internal insulation; external insulation; non-self-restoring insulation.

**classification process** The classification process is a series of activities, starting with the recognition of an anomaly through to its closure. The process is divided into four sequential steps interspersed with three administrative activities. The sequential steps are as follows: Step 1: Recognition; Step 2: Investigation; Step 3: Action; Step 4: Disposition. The three administrative activities applied to each sequential step are as follows: Recording; Classifying; Identifying impact. (C/SE) 1044-1993

**classification scheme** A scheme for the arrangement or division of entities into groups based on properties that the entities have in common. (SCC32) 1489-1999

**classifier** *See:* decision rule.

**classifying current** The designated current used to perform the classification tests. (SPD/PE) C62.11-1999

**class-level attribute** A mapping from the class itself to the instances of a value class. (C/SE) 1320.2-1998

**class-level operation** A mapping from the (cross product of the) class itself and the instances of the input argument types to the (cross product of the) instances of the other (output) argument types. (C/SE) 1320.2-1998

**class-level responsibility** A kind of responsibility that represents some aspect of the knowledge, behavior, or rules of the class as a whole. For example, the total `registeredVoterCount` would be a class-level property of the class `registeredVoter`; there would be only one value of `registeredVoterCount` for the class as a whole. *Contrast:* instance-level responsibility. (C/SE) 1320.2-1998

**Class Name** All classes have a descriptive header entry "Class," the value of which is the Class Name (note capitalization). For any Object, the operation `GetClassName` returns a value, `class_name`, that has the same value as Class Name. (IM/ST) 1451.1-1999

**class of messages** A group of messages having in the Command fields of their respective HEADER packets command codes of commands belonging to a single class of commands. The name, *C,* of a class of messages is the same as the name of the class of commands that defines the class *C*. (TT/C) 1149.5-1995

**class-of-service indication (telephone switching systems)** An indication of the features assigned to a switching network termination. (COM) 312-1977w

**class-of-service tone (telephone switching systems)** A tone that indicates to an operator that a certain class-of-service is appropriate to a call. (COM) 312-1977w

**Class O insulation** *See:* class ratings insulation.

**Class over-220 insulation** *See:* class ratings insulation.

**Class over-220 insulation system** Materials consisting entirely of mica, porcelain, glass quartz, and similar inorganic materials. *Note:* Other materials or combinations of materials may be included in this class if by experience or accepted tests the insulation system can be shown to have the required thermal life at temperatures over 220°C. (PE/TR) C57.12.80-1978r

**class ratings insulation** These temperatures are, and have been in most cases over a long period of time, benchmarks descriptive of the various classes of insulating materials, and various accepted test procedures have been or are being developed for use in their identification. They should not be confused with the actual temperatures at which these same classes of insulating materials may be used in the various specific types of equipment, nor with the temperatures on which specified temperature rise in equipment standards are based. **(A)** In the following definitions the words accepted tests are intended to refer to recognized test procedures established for the thermal evaluation of materials by themselves or in simple combinations. Experience or test data, used in classifying insulating materials, are distinct from the experience or test data derived for the use of materials in complete insulation systems. The thermal endurance of complete systems may be determined by test procedures specified by the responsible technical committees. A material that is classified as suitable for a given temperature may be found suitable for a different temperature, either higher or lower, by an insulation system test procedure. For example, it has been found that some materials suitable for operation at one temperature in air may be suitable for a higher temperature when used in a system operated in an inert gas atmosphere. Likewise some insulating materials when operated in dielectric liquids will have lower or higher thermal endurance than in air. **(B)** It is important to recognize that other characteristics, in addition to thermal endurance, such as mechanical strength, moisture resistance, and corona endurance, are required in varying degrees in different applications for the successful use of insulating materials. A) *class 90 insulation.* Materials or combinations of materials such as cotton, silk, and paper without impregnation. *Note:* Other materials or combinations of materials may be included in this class if by experience or accepted tests they can be shown to have comparable thermal life at 90 degrees Celsius. B) *class 105 insulation.* Materials or combinations of materials such as cotton, silk, and paper when suitably impregnated or coated or when immersed in a dielectric liquid. *Note:* Other materials or combinations may be included in this class if by experience or accepted tests they can be shown to have comparable thermal life at 105 degrees Celsius. **(C)** *class 130 insulation.* Materials or combinations of materials such as mica, glass fiber, asbestos, etc., with suitable bonding substances. *Note:* Other materials or combinations of materials may be included in this class if by experience or accepted tests they can be shown to have comparable thermal life at 130 degrees Celsius. **(D)** *class 155 insulation.* Materials or combinations of materials such as mica, glass fiber, asbestos, etc., with suitable bonding substances. *Note:* Other materials or combinations of materials may be included in this class if by experience or accepted tests they can be shown to have comparable thermal life at 155 degrees Celsius. **(E)** *class 180 insulation.* Materials or combinations of materials such as silicone elastomer, mica, glass fiber, asbestos, etc., with suitable bonding substances such as appropriate silicone resins. *Note:* Other materials or combinations of materials may be included in this class if by experience or accepted tests they can be shown to have comparable thermal life at 180 degrees Celsius. **(F)** *class 220 insulation.* Materials or combinations of materials which by experience or accepted tests can be shown to have the required thermal life at 220 degrees Celsius. **(G)** *class over-220 insulation.* Materials consisting entirely of mica, porcelain, glass, quartz, and similar inorganic materials. *Note:* Other materials or combinations of materials may be included in this class if by experience or accepted tests they can be shown to have comparable thermal life at 90 degrees Celsius. B) class 105 insulation. Materials or combinations of materials such as cotton, silk, and paper when suitably impregnated or coated or when immersed in a dielectric liquid. *Note:* Other materials or combinations may be included in this class if by experience or accepted tests they can be shown to have the required thermal life at temperatures over 220 degrees Celsius.

**(2) (A)** *class O insulation. See also:* Class 90 insulation. **(B)** *class A insulation.*

- Cotton, silk, paper, and similar organic materials when either impregnated or immersed in a liquid dielectric.
- Molded and laminated materials with cellulose filler, phenolic resins, and other resins of similar properties.
- Films and sheets of cellulose acetate and other cellulose derivatives of similar properties.
- Varnishes (enamel) as applied to conductors.

*Note:* An insulation is considered to be impregnated when a suitable substance replaces the air between its fibers, even if this substance does not completely fill the spaces between the insulated conductors. The impregnating substances, in order to be considered suitable, must have good insulating properties; must entirely cover the fibers and render them adherent to each other and to the conductor; must not produce interstices within itself as a consequence of evaporation of the solvent or through any other cause; must not flow during the operation of the machine at full working load or at the temperature limit specified; and must not unduly deteriorate under prolonged action of heat. **(C)** *class B insulation.* Mica, asbestos, glass fiber, and similar inorganic materials in built-up form with organic binding substances. *Note:* A small proportion of class A materials may be used for structural purposes only. Glass fiber or asbestos magnet-wire insulations are included in this temperature class. These may include supplementary organic materials, such as polyvinyl acetal or polyamide films. The electrical and mechanical properties of the insulated winding must not be impaired by application of the temperature permitted for class B material. (The word "impaired" is here used in the sense of causing any change that could disqualify the insulating material for continuous service.) The temperature endurance of different class B insulation assemblies varies over a considerable range in accordance with the percentage of class A materials employed, and the degree of dependence placed on the organic binder for maintaining the structural integrity of the insulation. **(D)** *class H insulation.* Insulation consisting of:

- mica, asbestos, glass fiber, and similar inorganic materials in built-up form with binding substances composed of silicone compounds or materials with equivalent properties.
- silicone compounds in rubbery or resinous forms or materials with equivalent properties.

*Note:* A minute proportion of class A materials may be used only where essential for structural purposes during manufacture. The electrical and mechanical properties of the insulated winding must not be impaired by the application of the hottest-spot temperature permitted for the specific insulation class. The word "impaired' is here used in the sense of causing any change that could disqualify the insulating materials for continuously performing its intended function, whether creepage spacing, mechanical support, or dielectric barrier action. **(E)** *class C insulation.* Insulation consisting entirely of mica, porcelain, glass, quartz, and similar inorganic materials. **(F)** *class F insulation.* Materials or combinations of materials such as mica, glass fiber, asbestos, etc., with suitable bonding substances. Other materials or combinations of materials, not necessarily inorganic, may be included in this class if by experienced or accepted tests they can be shown to be capable of operation at 155°C. (IA/MT) 45-1983

**cleaner (electroplating)** A compound or mixture, used in degreasing, that is usually alkaline. (PE/EEC) [119]

**cleaning (electroplating)** The removal of grease or other foreign material from a metal surface, chiefly by physical means. *See also:* electroplating. (EEC/PE) [119]

**cleanse instruction** A cleanse (cache-control) instruction converts a line to the clean state (the data in cache and memory are the same). (C/MM) 1596-1992

**cleanup data cycle** A data cycle that is not accompanied by data transfer but is for the purpose of turning off the slave's AD, PA, and PE drivers. (NID) 960-1993

**clear (1) (A)** To preset a storage or memory device to a prescribed state, usually that denoting zero. **(B)** To place a binary cell in the zero state. *See also:* nonlinear capacitor; reset. (C/ED) [46]

**(2) (software)** To set a variable, register, or other storage location to zero, blank, or other null value. *See also:* initialize; reset. (C) 610.12-1990

**(3)** To force the contents of one or more storage elements to the logic 0 state. (TT/C) 1149.5-1995

**(4)** To replace a variable, register, or other storage location with a zero, blank, or null value. (C) 610.10-1994w

**(5)** To preset a storage or memory device to a prescribed state, usually that denoting zero. *Note:* In the field of nonvolatile memories, "clear" conventionally means to set the outputs of the memory to the high logic level. (ED) 1005-1998

**(6)** Operator action to remove specific displays. (PE/NP) 692-1997

**(7)** The action that removes the outgoing signal from a link (i.e., clears the link) and prepares the Physical Medium Dependent (PMD) to receive a packet.local area networks. (C) 8802-12-1998

**clear algorithm** The timed sequence of signals necessary to clear the memory for a flash electrically erasable programmable read-only memory (EEPROM). (ED) 1005-1998

**clearance (1) (A) (navigation aids)** [instrument landing system (ILS)] The difference in depth of modulation (DDM) in excess of that required to produce full-scale deflection of the course-deviation indicator in flight areas outside the on-course sector; when the DDM is too low the indicator falls below full-scale deflection and the condition of low clearance exists. **(B) (navigation aids)** (air traffic control) Permission by a control facility to the pilot to proceed in a mutually understood manner. (AES/GCS) 172-1983

**(2)** The minimum separation between two conductors, between conductors and supports or other objects, or between conductors and ground. *See also:* tower. (PE/T&D) [10]

**(3) (fence safety clearances in electric-supply stations)** The separation between two conductors, between conductors and supports or other objects, or between conductors and ground. (PE/SUB) 1119-1988w

**(4) (A)** The condition in which a circuit has been deenergized to enable work to be performed more safely. A clearance is normally obtained on a circuit presenting a source of hazard prior to starting work. *Synonyms:* restriction; outage; permit. **(B)** The minimum separation between two conductors, between conductors and supports or other objects, or between conductors and ground or the clear space between any objects. (T&D/PE) 524-1992

**(5)** The clear distance between two objects measured surface to surface. (NESC) C2-1997

**(6) (maintenance of energized power lines)** *See also:* work permit. (T&D/PE) 516-1995

**clearance antenna array (directional localizer) (navigation aid terms)** The antenna array that radiates a localizer signal on a separate frequency within the pass band of the receiver and provides the required signals in the clearance sectors as well as a back course. (AES/GCS) 172-1983w

**clearance lamps (illuminating engineering)** Lighting devices for the purpose of indicating the width and height of a vehicle. (EEC/IE) [126]

**clearance point** The location on a turnout at which the carrier's specified clearance is provided between tracks. (EEC/PE) [119]

**clearances** The separation between two conductors, between conductors and supports or other objects, or between conductors and ground. (PE/SUB) 1268-1997

**clearance sector (instrument landing systems) (navigation aids)** The sector extending around either side of the localizer from the course sector to the back course sector, and within which the deviation indicator provides the required offcourse indication. (AES/GCS) 172-1983w

**clear area** In character recognition, a specified area that is to be kept free of printing or other markings that are not related to machine readings. (C) 610.2-1987

**clear channel assessment function** That logical function in the physical layer (PHY) that determines the current state of use of the wireless medium (WM). (C/LM) 8802-11-1999

**clear disturb** The corruption of data in one location caused by the clearing of data at another location. (ED) 1005-1998

**clearing (low-voltage air-gap surge-protective devices) (low voltage surge protective devices)** The characteristic of some

types of air gap surge arresters to exhibit a low resistance and then to revert to a high resistance state as a result of an external influence. (SPD/PE) C62.32-1981s, [8]

**clearing circuit** A circuit used for the operation of a signal in advance of an approaching train. (EEC/PE) [119]

**clearing-out drop (cord circuit or trunk circuit)** A drop signal that is operated by ringing current to attract the attention of the operator. (EEC/PE) [119]

**clearing source (low-voltage air-gap surge-protective devices) (low voltage surge protective devices)** A defined electrical source which is intentionally applied as a clearing stimulus to an air gap surge protective device under laboratory test conditions. This stimulus is intended to simulate conditions encountered during normal usage. (SPD/PE) C62.32-1981s, [8]

**clearing time (fuse)** The time elasping from the beginning of an overcurrent to the final circuit interruption. *Note:* The clearing time is equal to the sum of melting time and arcing time. *Synonym:* total clearing time. (SWG/PE) [56]
**(2) (A)** (mechanical switching device). The interval between the time the actuating quantity in the main circuit reaches the value causing actuation of the release and the instant of final arc extinction on all poles of the primary arcing contacts. *Note:* Clearing time is numerically equal to the sum of contact parting time and arcing time. **(B)** (total clearing time of a fuse). The time elapsing from the beginning of a specified overcurrent to the final circuit interruption, at rated maximum voltage. *Note:* The clearing time is equal to the sum of melting time and the arcing time. (SWG/PE/NP) C37.100-1992, 308-1980, C37.40-1993

**clearly discernable** Capable of being noticed easily and without close inspection. (SUB/PE) C37.123-1996

**clear packet** A packet used during initialization to empty linc buffers and initialize the linc. CSR state is unaffected; e.g., the node's address is unchanged by a "clear." Clear may be sent by any node that has lost synchronization in order to trigger reinitialization. (C/MM) 1596-1992

**clear sky (illuminating engineering)** A sky that has less than 30% cloud cover. (EEC/IE) [126]

**cleartext** Intelligible data, the semantic content of which is available. (LM/C) 802.10-1992

**cleat** An assembly of two pieces of insulating material provided with grooves for holding one or more conductors at a definite spacing from the surface wired over and from each other, and with screw holes for fastening in position. *See also:* raceway. (EEC/PE) [119]

**clerestory (illuminating engineering)** That part of a building which rises clear of the roofs or other parts and whose walls contain windows for lighting the interior. (EEC/IE) [126]

**CLI** *See:* cumulative leakage index.

**click (1)** A disturbance of a duration less than a specified value as measured under specified conditions. *See also:* electromagnetic compatibility. (EMC/IM) [53], C63.4-1991, [76]
**(2)** The act of pressing and releasing a mouse button without moving the mouse pointer. (C) 1295-1993w

**client (1) (MULTIBUS)** An agent that requests services of a server. *See also:* server. (C/MM) 1296-1987s
**(2)** Software that uses the interface. (C/PA) 1351-1994w, 1224-1993w, 1327-1993w, 1328-1993w
**(3)** In networking, a station or program requesting a service. *Contrast:* server. (C) 610.7-1995
**(4)** Software that uses an interface. (C/PA) 1224.1-1993w
**(5)** Refers to the software component on one device that uses the services provided by a server on another device. (C/MM) 1284.4-2000
**(6)** *See also:* batch client.
®MULTIBUS is a registered trademark of Intel Corporation.

**client application** An application program that makes use of Media Management System (MMS) services to manage its media. Examples of client applications include a backup program, a hierarchical storage manager, and an application that allows individual users to mount their own tapes. (C/SS) 1244.1-2000

**Client Cached Block Cookie** A particular Block Cookie associated with a Base Client. (IM/ST) 1451.1-1999

**client execution environment** The machine state that exists when a client program begins execution. (C/BA) 1275-1994

**client interface** A set of data and procedures giving a client program access to client interface services. (C/BA) 1275-1994

**client instance** A manifestation of the client that shares the input and output queues of the client with other instances. (C/PA) 1224.1-1993w

**client interface handler** A mechanism by which control and data are transferred from a client program to the firmware, and subsequently returned, for the purpose of providing client interface services. (C/BA) 1275-1994

**client layer** In the OSI model, refers to the data link and physical layers. *See also:* transport layer; network layer; presentation layer; physical layer; sublayer; data link layer; entity layer; application layer; session layer; logical link control sublayer; medium access control sublayer. (C) 610.7-1995

**client interface services** Those services that Open Firmware provides to client programs, including device tree access, memory allocation, mapping, console I/O, mass storage, and network I/O. (C/BA) 1275-1994

**Client object** Any object that invokes operations on other objects. (IM/ST) 1451.1-1999

**Client Port** An instance of the class `IEEE1451_ClientPort` or of a subclass thereof. (IM/ST) 1451.1-1999

**client program** A software program that is loaded and executed by Open Firmware (or a secondary boot program). (The client program may use services provided by the Open Firmware client interface.). (C/BA) 1275-1994

**client role** The location where the software is actually executed or used (as opposed to the target where it is actually installed). The configuration of software is performed by this role. (C/PA) 1387.2-1995

**client-server** In a communications network, the client is the requesting device and the server is the supplying device. For example, the user interface could reside in the client workstation while the storage and retrieval functions could reside in the server database. (C) 610.7-1995

**client-server communication** A communication pattern, where a specific object, the client, communicates in a one-to-one fashion with a specific server object, the server. (IM/ST) 1451.1-1999

**climber in training** A worker who is in training to become a qualified climber. (T&D/PE) 1307-1996

**climbing** The vertical movement (ascending and descending) and horizontal movement to access or depart the worksite. (NESC/T&D/PE) C2-1997, 1307-1996

**climbing space** The vertical space reserved along the side of a pole or structure to permit ready access for linemen to equipment and conductors located on the pole structure. (T&D/PE) 196-1951w, [10], C2.2-1960

**clinometer (navigation aids)** An instrument for indicating the degree of slope of the angle of roll or pitch of a vehicle, according to the plane in which it is mounted. (AES/GCS) 172-1983w

**clip (1) (charged-particle detectors) (x-ray energy spectrometers) (radiation detectors)** A limiting operation, such as the use of a high-pass filter or a nonlinear operation such as diode limiting of pulse amplitude. *Synonym:* clipping. *See also:* fuse clips; differentiated; contact clip. (NPS/NID) 325-1971w, 759-1984r, 301-1976s
**(2) (charged-particle detectors)** A limiting operation, such as the use of a high-pass filter (differentiator) or a nonlinear operation to limit the amplitude of a pulse. The first usage is archaic. *Synonym:* clipping. (NPS) 300-1988r
**(3)** *See also:* cable clamp. (PE/T&D) 524-1992r

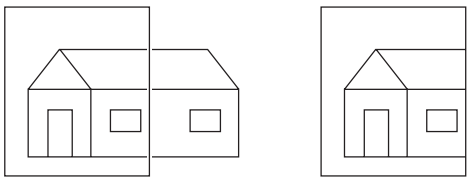
**clipboard** A software storage device that is used to store an object that is cut or copied from the screen and to retrieve an object that is pasted. (C) 1295-1993w

**clipper (data transmission)** A device that automatically limits the instantaneous value of the output to a predetermined maximum value. *Note:* The term is usually applied to devices which transmit only portions of an input wave lying on one side of an amplitude boundary. (PE) 599-1985w

**clipper limiter** A transducer that gives output only when the input lies above a critical value and a constant output for all inputs above a second higher critical value. *Synonym:* amplitude gate. *See also:* transducer. (AP/ANT) 145-1983s

**clipping (1) (voice-operated telephone circuit)** The loss of initial or final parts of words or syllables due to nonideal operation of the voice-operated devices. (EEC/PE) [119]

**(2) (computer graphics)** A computer graphics technique in which display elements lying totally outside a view area are made invisible and display elements lying partially inside a view area are scissored to remove the parts outside the view area before they are mapped to the display image. *Note:* In two-dimensional graphics, this view area is called the window; in three-dimensional graphics, it is called the view volume. *See also:* view volume; window; wrap-around; scissoring.




**clipping**

(C) 610.6-1991w

**(3)** *See also:* clip. (NPS) 300-1988r

**(4)** *See also:* clipping-in; semiconductor; chip. (PE/T&D) 524-1992r

**clipping-in (conductor stringing equipment)** The transferring of sagged conductors from the travelers to their permanent suspension positions and the installing of the permanent suspension clamps. *Synonyms:* clipping; clamping-in. (T&D/PE) 524a-1993r, 524-1992r

**clipping offset (conductor stringing equipment)** A calculated distance, measured along the conductor from the plumb mark to a point on the conductor at which the center of the suspension clamp is to be placed. When stringing in rough terrain, clipping offsets may be required to balance the horizontal forces on each suspension structure. (T&D/PE) 524-1992r

**clips** *See:* fuse clips; contact clips.

**CLIST** A command language used in the IBM MVS environment. (C) 610.13-1993w

**CLK** A fixed-frequency clock signal. The main SBus timing signal. (C/BA) 1496-1993w

**clock (1) (A)** A device that generates periodic signals used for synchronization. **(B)** A device that measures and indicates time. *See also:* timer; real-time clock; master clock; wall clock; time-of-day clock. **(C)** A register whose content changes at regular intervals in such a way as to measure time. (C) [20], 610.10-1994

**(2)** A signal, the transitions of which (between the low and high logic level [or vice versa]) are used to indicate when a stored-state device, such as a flip-flop or latch, may perform an operation. (TT/C) 1149.5-1995, 1149.1-1990

**(3)** An object that measures the passage of time. The current value of the time measured by a clock can be queried and, possibly, set to a value within the legal range of the clock. (C/PA) 9945-1-1996, 1003.5-1999

**(4) (A)** A device that generates periodic, accurately spaced signals used for such purposes as timing, regulation of the operations of a processor, or generation of interrupts. **(B)** To trigger a circuit to perform an operation, such as to accept data into a register. (C) 610.10-1994

**(5)** A device that generates periodic signals used for synchronization. A device that measures and indicates time. A register whose content changes at regular intervals in such a way as to measure time. (AMR/SCC31) 1377-1997

**(6)** *See also:* dynamometer. (T&D/PE) 516-1987s, 524-1992r

**clock accuracy** The deviation from absolute accuracy per unit of time. In a hierarchical, master-slave synchronization plan, with one primary and at least one backup reference being designated for each local digital switch, the clock rate of the local switch is controlled by the master. Under that method of operation, the local digital switch should operate at zero nominal slips. If the link connecting the master switch to the slave switch is broken, the number of slips will depend on clock accuracy. (COM/TA) 973-1990w

**clock cycle** One period of the CLK signal, beginning with the rising edge of the signal and ending on the following rising edge of the signal. (C/BA) 1496-1993w

**clocked data one (CD1)** A Manchester-encoded data 1. A CD1 is encoded as a LO for the first half of the bit-cell and a HI for the second half of the bit-cell. (C/LM) 802.3-1998

**clocked data zero (CD0)** A Manchester-encoded data 0. A CD0 is encoded as a HI for the first half of the bit-cell and a LO for the second half of the bit-cell. (C/LM) 802.3-1998

**clocked logic (power-system communication)** The technique whereby all the memory cells (flip-flops) of a logic network are caused to change in accordance with logic input levels but at a discrete time. *See also:* digital. (PE) 599-1985w

**clocked violation HI (CVH)** A symbol that deliberately violates Manchester-encoding rules, used as a part of the Collision Presence signal. A CVH is encoded as a transition from LO to HI at the beginning of the bit cell, HI for the entire bit cell, and a transition from HI to LO at the end of the bit cell. (C/LM) 802.3-1998

**clocked violation LO (CVL)** A symbol that deliberately violates Manchester-encoding rules, used as a part of the Collision Presence signal. A CVL is encoded as a transition from HI to LO at the beginning of the bit cell, LO for the entire bit cell, and a transition from LO to HI at the end of the bit cell. (C/LM) 802.3-1998

**clocking (data transmission)** The generation of periodic signals used for synchronization. *See also:* data processing. (COM) [49]

**clocking bit (1)** In asynchronous transmission, a bit that signals a synchronization event. (C) 610.7-1995

**(2)** A bit containing an encoded signal, preceding the data within a data stream, or on a separate channel; used for establishing timing intervals. *See also:* synchronization bit; clock track. (C) 610.10-1994w

**clock pulse** *See:* clock signal.

**clock reference (digital accelerometer)** Basic system timing reference. (MTT) 457-1982w

**clock, reference** *See:* reference clock.

**clock register** *See:* timer.

**clock signal** A periodic signal used for synchronizing events. *Synonyms:* clock pulse; timing pulse. (C) 610.10-1994w

**clockStrobe signal** A packet that causes a node to record its time-of-day registers (if any) when it is received, and to record the duration of the propagation of the packet within the node. Used for precisely synchronizing multiple time-of-day clocks within a system. (C/MM) 1596-1992

**clock tick** An interval of time. A number of these occur each second. Clock ticks are one of the units that may be used to express a value found in type *clock_t*. (C/PA) 9945-1-1996

**clock track** A track on which a pattern of signals, known as synchronization bits, is recorded to provide a timing reference. *Synonym:* timing track. *See also:* clocking bit. (C) 610.10-1994w

**clockwise arc (numerically controlled machines)** An arc generated by the coordinated motion of two axes in which curvature of the path of the tool with respect to the workpiece is clockwise when viewing the plane of motion in the negative direction of the perpendicular axis. (IA) [61]

**CLOS** *See:* Common LISP Object System.

**close** To destroy a package instance. (C/BA) 1275-1994

**close and latch** The capability of a switching device to close (allow current flow) and immediately thereafter latch (remain closed) and conduct a specified current through the device under specified conditions. (SWG/PE) C37.100-1992

**close coupling** Any degree of coupling greater than the critical coupling. *Synonym:* tight coupling. *See also:* critical coupling; coupling. (EEC/PE) [119]

**closed air circuit (rotating machinery)** A term referring to duct-ventilated apparatus used in conjunction with external components so constructed that while it is not necessarily airtight, the enclosed air has no deliberate connection with the external air. *Note:* The term must be qualified to describe the means used to circulate the cooling air and to remove the heat produced in the apparatus. (PE) [9]

**closed amortisseur** An amortisseur that has the end connections connected together between poles by bolted or otherwise separable connections. (EEC/PE) [119]

**closed architecture** An architecture for which design parameters and specifications are not available to anyone except the manufacturer of the system. *Contrast:* open architecture. (C) 610.10-1994w

**closed-circuit cooling (rotating machinery)** A method of cooling in which a primary coolant is circulated in a closed circuit through the machine and if necessary a heat exchanger. Heat is transferred from the primary coolant to the secondary coolant through the structural parts or in the heat exchanger. (PE) [9]

**closed-circuit principle** The principle of circuit design in which a normally energized electric circuit, on being interrupted or de-energized, will cause the controlled function to assume its most restrictive condition. (EEC/PE) [119]

**closed-circuit signaling (data transmission)** That type of signaling in which current flows in the idle condition, and a signal is initiated by increasing or decreasing the current. (PE) 599-1985w

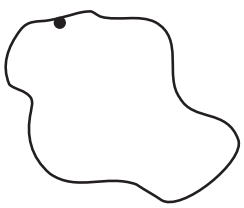
**closed-circuit transition** As applied to reduced-voltage controllers, including star-delta controllers, a method of starting in which the power to the motor is not interrupted during the starting sequence. *See also:* electric controller. (IA/ICTL/IAC) [60]

**closed-circuit transition auto-transformer starting (rotating machinery)** The process of auto-transformer starting whereby the motor remains connected to the supply during the transition from reduced to rated voltage. (PE) [9]

**closed-circuit voltage (batteries)** The voltage at its terminals when a specified current is flowing. *See also:* battery. (EEC/PE) [119]

**closed construction** Any building, building component, assembly or system manufactured in such a manner that all concealed parts of processes of manufacture cannot be inspected before installation at the building site without disassembly, damage, or destruction. (NESC/NEC) [86]

**closed curve (image processing and pattern recognition)** A curve whose beginning and ending points are the same point.



**closed curve**

(C) 610.4-1990w

**closed loop (1) (automatic control)** A signal path that includes a forward path, a feedback path, and a summing point and that forms a closed circuit. *See also:* feedback loop. (IA/ICTL/APP/IAC) [69], [60]

**(2) (software)** A loop that has no exit and whose execution can be interrupted only by intervention from outside the computer program or procedure in which the loop is located. *Contrast:* WHILE; UNTIL. (C) 610.12-1990

**closed-loop control (1) (station control and data acquisition)** A type of automatic control in which control actions are based on signals fed back from the controlled equipment or system. For example, RTUs can manage local voltage conditions by control of load tap changers and volt amperes reactive (VAR) control compensation equipment. (PE/SUB/SWG-OLD) C37.100-1992, C37.1-1994

**(2)** Pertaining to a control system in which the output is measured and compared with a standard representing the acceptable range, and any deviation from the standard is fed back into the system in a way that will reduce the deviation. *Synonym:* feedback control. *Contrast:* open-loop control. (C) 610.2-1987

**closed-loop control system (1) (control system feedback)** A control system in which the controlled quantity is measured and compared with a standard representing the desired performance. *Note:* Any deviation from the standard is fed back into the control system in such a sense that it will reduce the deviation of the controlled quantity from the standard. *See also:* control; network analysis. (PE/PEL/PSE/ET) 94-1970w, 111-1984w

**(2) (high-power wide-band transformers)** A system in which the controlled quantity is measured and compared with a standard representing the desired performance. Any deviation from the standard is fed back into the control system in such sense that it will reduce the deviation of the controlled quantity from the standard. (MAG) 264-1977w

**closed-loop gain (operational gain) (power supplies)** The gain, measured with feedback, is the ratio of voltage appearing across the output terminal pair to the causative voltage required at the input resistor. If the open-loop gain is sufficiently large, the closed-loop gain can be satisfactorily approximated by the ratio of the feedback resistor to the input resistor. *See also:* open-loop gain. (SP/EEC/PE) [32], [119]

**closed-loop series street lighting system** Street lighting system that employs two-wire series circuits in which the return wire is always adjacent. *See also:* alternating-current distribution; direct-current distribution. (EEC/PE) [119]

**closed-loop testing (test, measurement, and diagnostic equipment)** Testing in which the input stimulus is controlled by the equipment output monitor. (MIL) [2]

**closed network** A network that prevents outside access by eliminating external connections and external entry or use. *Contrast:* open network. (C) 610.7-1995

**closed-numbering plan (telephone switching systems)** A numbering plan in which a fixed number of digits is always dialed. (COM) 312-1977w

**closed subroutine (1)** A subroutine that can be stored at one place and can be connected to a routine by linkages at one or more location. *See also:* open subroutine. (C) [20], [85]

**(2) (software)** A subroutine that is stored at one given location rather than being copied into a computer program at each place that it is called. *Contrast:* open subroutine. (C) 610.12-1990

**closed user group** A specified group of network users who are permitted communications among themselves but not with other network users. (C) 610.7-1995

**close-open operation** (of a switching device) A close operation followed immediately by an open operation without purposely delayed action. *Note:* The letters CO signify this operation: Close-Open. (SWG/PE) C37.100-1992

**close operation** (of a switching device) The movement of the contacts from the normally open to the normally closed

position. *Note:* The letter C signifies this operation: Close. (SWG/PE) C37.100-1992

**close-talking microphone** A microphone designed particularly for use close to the mouth of the speaker. *See also:* microphone. (EEC/PE) [119]

**close-talking pressure-type microphones** An acoustic transducer that is intended for use in close proximity to the lips of the talker and is either hand-held or boom-mounted. *Notes:* 1. Various types of microphones are currently used for close-talking applications. These include carbon, dynamic, magnetic, piezoelectric, electrostrictive, and capacitor types. Each of these microphones has only one side of its diaphragm exposed to sound waves, and its electric output substantially corresponds to the instantaneous sound pressure of the impressed sound wave. 2. Since a close-talking microphone is used in the near sound field produced by a person's mouth, it is necessary when measuring the performance of such microphones to utilize a sound source that approximates the characteristics of the human sound generator. (SP) 258-1965w

**close-time delay-open operation** (of a switching device) A close operation followed by an open operation after a purposely delayed action. *Note:* The letters CTO signify this operation: Close-Time Delay-Open. (SWG/PE) C37.100-1992

**closing coil** (of a switching device) A coil used in the electromagnet that supplies power for closing the device. *Note:* In an air-operated, or other stored-energy-operated device, the closing coil may be the coil used to release the air or other stored energy that in turn closes the device. (SWG/PE) C37.100-1992

**closing operating time** The interval during which the contacts move from the fully open position to the fully closed position. (SWG/PE) C37.100-1992

**closing relay** A form of auxiliary relay used with an electrically operated device to control the closing and opening of the closing circuit of the device so that the main closing current does not pass through the control switch or other initiating device. (SWG/PE/PSR) C37.100-1992, [56], [6]

**closing time** (of a mechanical switching device) The interval of time between the initiation of the closing operation and the instant when metallic continuity is established in all poles. *Notes:* 1. It includes the operating time of any auxiliary equipment that is necessary to close the switching device, and that forms an integral part of the switching device. 2. For switching devices that embody switching resistors, a distinction should be made between the closing time up to the instant of establishing a circuit at the secondary arcing contacts, and the closing time up to the establishment of a circuit at the main or primary arcing contacts, or both. (SWG/PE) C37.100-1992

**cloud chamber smoke detector (fire protection devices)** A device which is a form of sampling detector. The air pump draws a sample of air into a high humidity chamber within the detector. After the air is in the humidity chamber, the pressure is lowered slightly. If smoke particles are present, the moisture in the air condenses on them forming a cloud in the chamber. The density of this cloud is then measured by the photoelectric principle. When the density is greater than a predetermined level, the detector responds to the smoke. (NFPA) [16]

**cloud pulse (charge-storage tubes)** The output resulting from space-charge effects produced by the turning on or off of the electron beam. *See also:* charge-storage tube. (ED) 158-1962w, 161-1971w

**clouds** *See:* fog.

**cloudy sky (illuminating engineering)** A sky that has more than 70% cloud cover. (EEC/IE) [126]

**CLR** *See:* trunk circuit, combined line and recording; combined-line-recording trunk; recording-completing trunk.

**cluster (1) (A)** In image processing, a set of pixels in a digital image that are close to one another and similar in some way. **(B)** In pattern recognition, a set of points in a feature space that are similar in some way. (C) 610.4-1990
**(2)** One or more contiguous sectors on a magnetic disk. *See also:* Remote Bridge. (C/LM) 610.10-1994w, 802.1G-1996
**(3)** *See also:* subclass cluster. (C/SE) 1320.2-1998
**(4)** A grouping of cell instances and/or clusters that are constrained to each other due to physical location or some other shared characteristic(s). It is not valid to have a cell instance explicitly made a member of more than one cluster. (C/DA) 1481-1999

**cluster analysis (A)** The detection and description of clusters in a digital image. **(B)** The detection and description of clusters in a feature space. (C) 610.4-1990

**clustered word processing** Word processing performed on a system composed of multiple work stations, each with its own memory but operating under the control of a master work station. *Contrast:* stand-alone word processing; shared-logic word processing; shared-resource word processing; dedicated word processing. (C) 610.2-1987

**clutter (1) (navigation aids)** Atmospheric noise, extraneous signals, etc., that tend to obscure the reception of a desired signal. (AES/GCS) 172-1983w
**(2)** Unwanted echoes, typically from the ground, sea, rain or other precipitation, chaff, birds, insects, meteors, and aurora. *Synonym:* background return. (AES) 686-1997

**clutter attenuation (CA)** In moving-target indication (MTI) or Doppler radar, the ratio of the clutter-to-noise ratio at the input to the processor, to the clutter-to-noise ratio at the output. *Note:* In MTI, a single value of CA will be obtained, while in Doppler radar the value will generally vary over the different target Doppler filters. In MTI, CA will be equal to MTI improvement factor if the targets are assumed uniformly distributed in velocity. *See also:* MTI improvement factor. (AES) 686-1997

**clutter cancellation** *See:* clutter attenuation.

**clutter detectability factor** The predetection signal-to-clutter ratio that provides stated probability of detection for a given false alarm probability in an automatic detection circuit. *Note:* In MTI systems, it is the ratio after cancellation or Doppler filtering. (AES) 686-1997

**clutter fence** A barrier surrounding a ground-based radar to serve as an artificial horizon and suppress ground clutter. (AES) 686-1997

**clutter filter** A filter or group of filters (filter bank) included in a radar for the purpose of rejecting clutter returns and passing target returns at Doppler frequencies different from the Doppler frequencies of clutter. *Note:* Moving-target indication (MTI) and pulsed-Doppler processors are examples. (AES) 686-1997

**clutter improvement factor** *See:* moving-target indication improvement factor.

**clutter map** Computer-stored values of radar-measured clutter for each range-azimuth resolution cell or local region, used to set thresholds for each cell in a constant-false-alarm rate (CFAR) detection system or to adjust other processing parameters. (AES) 686-1997

**clutter-referenced MTI** A type of noncoherent MTI that uses clutter as a reference. *See also:* noncoherent MTI. (AES/RS) 686-1990

**clutter reflectivity** The backscatter coefficient of clutter. *See also:* backscatter coefficient. (AES) 686-1997

**clutter residue** The uncanceled clutter power remaining at the output of an moving-target indication (MTI) or Doppler signal processor. *See also:* canceled video. (AES) 686-1997

**clutter visibility factor** The predetection signal-to-clutter ratio that provides stated probability of detection for a given false alarm probability on a display. *Note:* In moving-target indication (MTI) systems, it is the ratio after cancellation or Doppler filtering. (AES) 686-1997

**CM** *See:* configuration management.

**CMC** *See:* code for magnetic characters.

**C-Message noise** The noise on an idle channel or circuit, i.e., a channel or circuit with a termination and no signal (holding tone) at the transmitting end, measured through a C-Message weighting. The noise is expressed in dBrnC. (COM/TA) 743-1995

**C-Message weighting (1) (data transmission)** A noise weighting used in a noise measuring set to measure noise on a line that is terminated by a subset with a number 500 receiver or a similar subset. The meter scale readings are in dBrn (C-Message). (PE) 599-1985w

**(2) (voice-frequency electrical-noise test)** A weighting derived from listening tests to indicate the relative annoyance or speech impairment by an interfering signal of frequency $f$ as heard through a "500-type" telephone set. The result, called "C-Message waiting," is shown in the corresponding figure. (COM/TA) 469-1988w

**(3)** A frequency-weighting characteristic used for measurement of noise in voice-frequency communications circuits and designed to weight noise frequencies in proportion to their perceived annoyance effect in telephone service. The C-Message weighting is used to evaluate noise to the human ear, using a 500-type telephone set. (COM/TA) 743-1995

**CMI** *See:* computer-managed instruction.

**CMOS** *See:* complementary metal-oxide semiconductor.

**CMRR** *See:* common-mode rejection ratio.

**CNC** *See:* computer numerical control.

**C network** A network composed of three impedance branches in series, the free ends being connected to one pair of terminals, and the junction points being connected to another pair of terminals. *See also:* network analysis. (EEC/PE) [119]

**C-Notch (analog voice frequency circuits)** The measure of noise on a channel when a signal is present. A very narrow band-elimination filter (notch filter) is used with a C-Message filter to eliminate the holding tone at the measuring end of the circuit. *See also:* holding tone. (COM/TA) 743-1984s

**C-Notched filter (telephone loop performance)** A filter used in front of the noise detector in conjunction with the measurement of noise in certain systems. A tone is transmitted in these systems to activate signal-dependent noise sources, but the tone power should not be included in the measurement. The C-Notched filter has a C-Message weighting transfer function with a sharp notch which removes this tone from the received signal before its power is measured. (COM/TA) 820-1984r

**C-Notched noise** The noise power on a channel with a holding tone (signal) at the transmit end, measured through a C-Message weighting and a 1010 Hz notch filter in tandem. (COM/TA) 743-1995

**CO** *See:* central office; unit operation; close-open operation.

**coagulating current** *See:* Tesla current.

**coal cleaning equipment** Equipment generally electrically driven, to remove impurities from the coal as mined, such as slate, sulphur, pyrite, shale, fire clay, gravel, and bone. (EEC/PE) [119]

**coalesce** To combine two or more sets into one set. *See also:* merge; collate. (C) 610.5-1990w

**coarse change-over selector** A change-over selector that connects the tap winding to a coarse winding, a main winding, or to portions of the main winding. (PE/TR) C57.131-1995

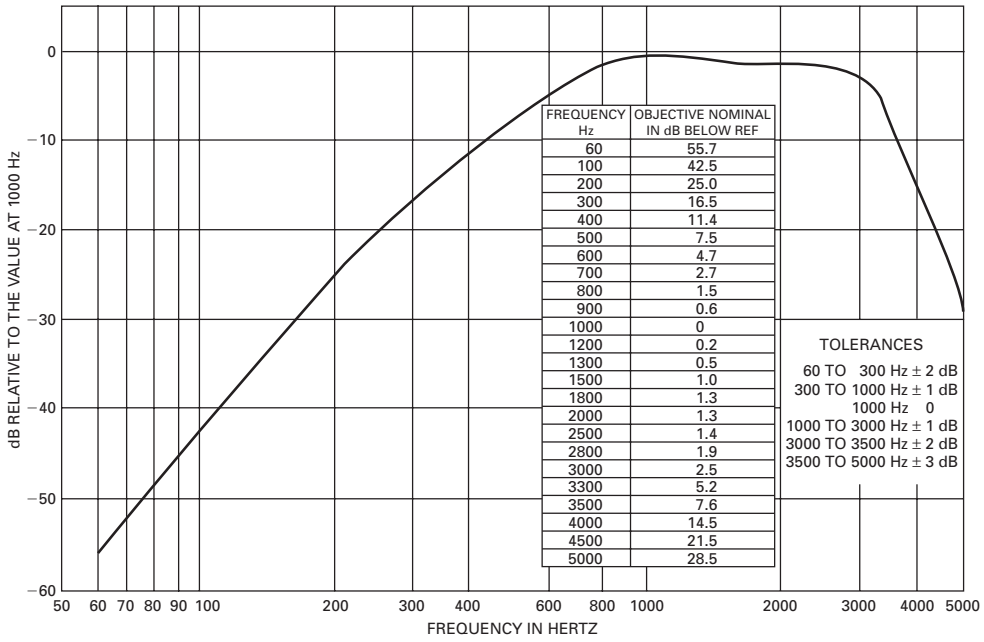
**coarse chrominance primary*** *See:* Q chrominance signal.
* Deprecated.

**coarse/fine operation** A winding arrangement in which a coarse change-over selector connects the tap winding to the coarse or main winding, and allows the use of the taps twice when travelling through the tapping range. (PE/TR) C57.131-1995

**coarse-fine control system** A control system that uses some elements to reduce the difference between the directly controlled variable and its ideal value to a small value and that uses other elements to reduce the remaining difference to a smaller value. (IA/ICTL/IAC) [60]

**coarse-grain parallel architecture** Parallel architecture that uses between 2 and 16 processors. *Contrast:* fine-grain parallel architecture; medium-grain parallel architecture. (C) 610.10-1994w

**coarse winding** A winding that extends the regulating range beyond the range of the finely tapped winding. (PE/TR) C57.131-1995




*Response in decibels indicating relative interfering effect, C-Message weighting.*

**C-Message weighting**

**coast (1)** The mode of operation of a vehicle or train in which both tractive effort from the propulsion system and braking effort from the propulsion and friction brake systems are zero. *Note:* The inherent design characteristics of some propulsion systems require that a negligible level of electric brake be present in the coast mode. (VT) 1475-1999

**(2)** A radar memory feature that causes the range or angle tracking systems to continue to move in the same direction and at the same rate that an original target was moving. *Note:* Coast is invoked manually or automatically when the tracked target approaches a stronger echo (target or clutter) to prevent capture of the track by that echo or to maintain track over brief periods of signal loss. (AES) 686-1997

**coast time** *See:* run-down time.

**coated card** *See:* edge-coated card.

**coated fabric** A fabric or mat in which the elements and interstices may or may not in themselves be coated or filled but that has a relatively uniform compound or varnish finish on either one or both surfaces. *Synonym:* coated mat. *See also:* stator; rotor. (PE) [9]

**coated magnetic tape (magnetic powder-coated tape)** A tape consisting of a coating of uniformly dispersed, powdered ferromagnetic material (usually ferromagnetic oxides) on a nonmagnetic base. *See also:* magnetic tape; phonograph pickup. (SP) [32]

**coated mat** *See:* coated fabric.

**coating (1) (electroplating)** The layer deposits by electroplating. *See also:* electroplating. (PE/EEC) [119]

**(2)** As defined by the Steel Structures Painting Council, a generic term for paints, lacquer, enamels, etc. A liquid, liquefiable, or mastic composition that has been converted to a solid protective, decorative, or functional adherent film after application as a thin layer. (SUB/PE) 1264-1993

**coax** A colloquial reference to coaxial cable. (C) 610.7-1995

**coaxial antenna** An antenna comprised of an extension to the inner conductor of a coaxial line and a radiating sleeve that in effect is formed by folding back the outer conductor of the coaxial line. *Contrast:* sleeve-dipole antenna. (AP/ANT) 145-1993

**coaxial cable (1)** A two-conductor (center conductor, shield system), concentric, constant impedance transmission line used as the trunk medium in the baseband system. (LM/C/LM/C) 802.3-1998, 8802-3-1990s

**(2) (broadband local area networks)** A cable with two conductors where one completely surrounds the other. Coax cables are unbalanced transmission lines that have an outer conductor that shields the center conductor from electrostatic interference. The two conductors are spaced by an insulating dielectric that, depending on the mechanical and material configuration, affects the speed, attenuation, and impedance of transmission. (LM/C) 802.7-1989r

**(3)** A cable consisting of a central conductor and an outer, concentric conductor. *Contrast:* twinaxial cable. *See also:* transceiver cable; trunk cable; shield; core; drop cable; attachment unit interface cable. (C) 610.7-1995

**coaxial cable interface** The electrical and mechanical interface to the shared coaxial cable medium either contained within or connected to the Medium Attachment Unit (MAU). Also known as the Medium Dependent Interface (MDI). (C/LM) 802.3-1998

**coaxial cable section** A single length of coaxial cable, terminated at each end with a male BNC connector. Cable sections are joined to other cable sections via BNC plug/receptacle barrel or Type T adapters. (LM/C) 8802-3-1990s, 802.3-1998

**coaxial cable segment (medium attachment units and repeater units)** A length of coaxial cable made up from one or more coaxial cable sections and coaxial connectors, and terminated at each end in its characteristic impedance. (LM/C) 8802-3-1990s, 802.3-1998

**coaxial conductor** An electric conductor comprising outgoing and return current paths having a common axis, one of the paths completely surrounding the other throughout its length. (IA) 54-1955w

**coaxial detector** A detector in which all or part of the two electrical contacts on the detector element are substantially coaxial. Typically one end of each contact configuration is closed (closed-ended coaxial detector), but both ends may be open (open-ended coaxial detector). (NPS) 325-1996

**coaxial detector, conventional-electrode geometry (germanium gamma-ray detectors)** Conventional-electrode geometry. A coaxial detector in which the outer contact is an n-type layer. (NPS) 325-1996

**coaxial detector, reverse-electrode geometry (germanium gamma-ray detectors)** A coaxial detector in which the outer contact is a p-type layer. (NPS) 325-1996

**coaxial relay** A relay that opens and closes an electric contact switching high-frequency current as required to maintain minimum losses. *See also:* relay. (SWG) 341-1986

**coaxial stop filter** A tuned movable filter set round a conductor in order to limit the radiating length of the conductor for a given frequency. *See also:* electromagnetic compatibility. (EMC/INT) [53], [70]

**coaxial stub** A short length of coaxial that is joined as a branch to another coaxial. *Note:* Frequently a coaxial stub is short-circuited at the outer end and its length is so chosen that a high or low impedance is presented to the main coaxial in a certain frequency range. *See also:* waveguide. (EEC/PE) [119]

**coaxial switch** A switch used with and designed to simulate the critical electric properties of coaxial conductors. (PE/PSE) 346-1973w

**coaxial transmission line (waveguide)** A transmission line consisting of two essentially concentric cylindrical conductors. (MTT) 146-1980w

**COBOL 85** A dialect of COBOL; developed as a standard language in 1985, and standardized by IEEE, ISO, and ANSI. (C) 610.13-1993w

**co-channel interference** Interference caused in one communication channel by a transmitter operating in the same channel. *See also:* radio transmission. (BT/AV) [34]

**cock** A pneumatic device having two positions, closed/shut and open/through. (VT) 1475-1999

**cocktail shaker sort** An exchange sort in which adjacent pairs of items are compared and exchanged, if necessary, and alternate passes through the set proceed in opposite directions. *Contrast:* bubble sort. (C) 610.5-1990w

**CODASYL** *See:* Conference on Data Systems Languages.

**CODASYL database** A database that adheres to the standards established by the Database Task Group of CODASYL. *Note:* A network database is generally accepted to be synonymous with a CODASYL database. (C) 610.5-1990w

**CODASYL model** A network database model defined by the CODASYL organization. The CODASYL model is based on sets that are used to specify associations between different record types that exist in a database. *Synonym:* flex model. (C) 610.5-1990w

**CODASYL set** *See:* set.

**code (microprocessor object modules)** Data or executable machine code. *See also:* relocatable code; absolute code. (MM/C) 695-1985s

**(2) (A) (computer terminology)** A character or bit pattern that is assigned a particular meaning; for example, a status code. **(B)** The characters or expressions of an originating or source language, each correlated with its equivalent expression in an intermediate or target language, for example, alphanumeric characters correlated with their equivalent six-bit expressions in a binary machine language. *Note:* For punched or magnetic tape; a predetermined arrangement of possible locations of holes or magnetized areas and rules for interpreting the various possible patterns. **(C)** Frequently, the set of expressions in the target language that represent the set of characters of the source language. **(D)** To encode is to express

given information by means of a code. **(E)** To translate the program for the solution of a problem on a given computer into a sequence of machine-language or pseudo instructions acceptable to that computer. (C) 610.5-1990, 610.12-1990, 162-1963

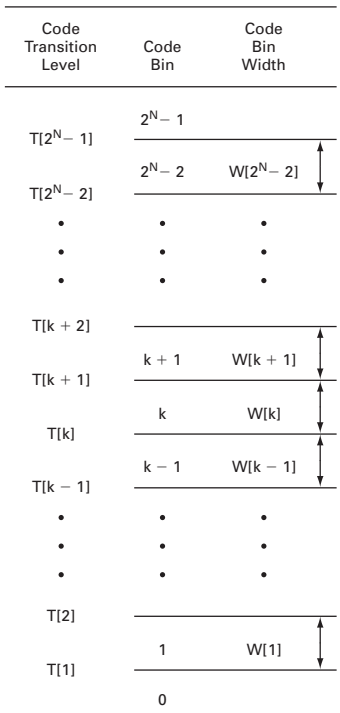
**(3) (A) (computer terminology)** In software engineering, computer instructions and data definitions expressed in a programming language or in a form output by an assembler, compiler, or other translator. *See also:* source code; machine code; object code; microcode. **(B) (computer terminology)** To express a computer program in a programming language. (C) 610.12-1990

**(4) (A) (computer terminology)** A set of rules used to convert data from one form of representation to another. *Synonym:* coding scheme; data element tag; data code. **(B) (computer terminology)** To represent data in symbolic form. **(C) (computer terminology)** Data that have been expressed in symbolic form. (C) 610.5-1990, 1084-1986

**(5) (A) (computer terminology)** Data that have been converted from one form of representation to another, using a set of rules as in definition (5A). *Synonym:* encoded data. *See also:* coded representation; symbol; code set. **(B) (computer terminology)** To convert data from one form of representation to another, using a set of rules as in definition (5A). *See also:* encode; decode. (C) 610.5-1990

**code audit (software)** An independent review of source code by a person, team, or tool to verify compliance with software design documentation and programming standards. Correctness and efficiency may also be evaluated. *See also:* tool; inspection; code; audit; efficiency; walk-through; correctness; static analysis. (C/SE) 729-1983s

**code bin *k*** A digital output that corresponds to a particular set of input values.




*Definitions pertaining to input quantization*

**code bin K**

(IM/WM&A) 1057-1994w

**code bin width *W[k]*** The difference of the code transition levels that delimit the bin.

$$W[k] = T[k + 1] - T[k]$$

(IM/WM&A) 1057-1994w

**code-bit** In 100BASE-T, the unit of data passed across the Physical Medium Attachment (PMA) service interface, and the smallest signaling element used for transmission on the medium. A group of five code-bits constitutes a code-group in the 100BASE-X Physical Coding Sublayer (PCS). (C/LM) 802.3-1998

**code breakpoint** A breakpoint that is initiated upon execution of a given computer instruction. *Synonym:* control breakpoint. *Contrast:* data breakpoint. *See also:* prolog breakpoint; dynamic breakpoint; static breakpoint; epilog breakpoint; programmable breakpoint. (C) 610.12-1990

**codec** A combination of a coder and decoder operating in different directions of transmission in the same equipment. (COM/TA) 1007-1991r

**code character** A particular arrangement of code elements representing a specific symbol or value. (COM/PE) [49], 599-1985w

**code classes (safety systems equipment in nuclear power generating stations)** Levels of structural integrity and quality commensurate with the relative importance of the individual mechanical components of the nuclear power generating station. *Note:* For the recognized code classes, refer to the following documents: ANSI N18.2-1973, *Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants;* ANSI/ANS 51.8, *Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants;* ANSI/ASME BPV-III, *Boiler and Pressure Vessel Cod* and its latest addenda, Section III; ANSI/ANS 52.1-1980, *Nuclear Safety Criteria for Design of Stationary BWR Plants.* (PE/NP) 627-1980r

**code conversion (telephone switching systems)** The substitution of a routing code for a destination code. (COM) 312-1977w

**code converter** A converter that changes the representation of data from one code to another. (C) 610.10-1994w, 610.5-1990w

**coded arithmetic data** Data stored in a form that is acceptable for arithmetic calculations without conversion to an intermediate form; for example, data stored in integer form. (C) 610.5-1990w

**coded character set** A set of characters for which coded representations exist. *Synonyms:* coded representation; code set. (C) 610.5-1990w

**coded decimal** *See:* binary coded decimal.

**coded-decimal code** The decimal number system with each decimal digit expressed by a code. (IA/EEC) [61], [74]

**code-decode table** A table that identifies a correspondence between encoded and decoded data items. *Synonym:* encode-decode table. (C) 610.5-1990w

**code density** The number of characters that can appear per unit of length. (PE/TR) C57.12.35-1996

**coded fire-alarm system** A local fire-alarm system in which the alarm signal is sounded in a predetermined coded sequence. *See also:* protective signaling. (EEC/PE) [119]

**code distance** *See:* hamming distance.

**coded pulse** A pulse compression waveform in which a long pulse is divided into many subpulses, with the phase of each subpulse assuming a discrete value (often 0 or $\pi$ radians) chosen in a deterministic manner (as in Barker codes, which result in all time sidelobes being equal) or chosen in a pseudorandom manner (such as with linear recursive or maximal-length sequences). *See also:* Barker code. (AES) 686-1997

**coded representation** The result of applying a code to a particular item of data. For example, the designation ORY for Paris International Airport, obtained by applying the international three-letter code for airports. *Synonym:* code value. *See also:* coded character set. (C) 610.5-1990w

**coded track circuit** A track circuit in which the energy is varied or interrupted periodically. (EEC/PE) [119]

**code element** One of the discrete conditions or events in a code, for example, the presence or absence of a pulse. *See also:* data processing; information theory. (COM) [49]

**code extension character** Any control character used to indicate that one or more of the succeeding coded representations are to be interpreted according to a different code or according to a different coded character set. (C) 610.5-1990w

**code for magnetic characters (CMC)** A set of rules used in magnetic ink character recognition. *See also:* magnetic ink character recognition. (C) 610.2-1987

**code generator (A) (software)** A routine, often part of a compiler, that transforms a computer program from some intermediate level of representation (often the output of a root compiler or parser) into a form that is closer to the language of the machine on which the program will execute. **(B) (software)** A software tool that accepts as input the requirements or design for a computer program and produces source code that implements the requirements or design. *Synonym:* source code generator. *See also:* application generator. (C) 610.12-1990

**code-group** A set of encoded symbols representing encoded data or control information. For 100BASE-T4, a set of six ternary symbols that, when representing data, conveys an octet. For 100BASE-TX and 100BASE-FX, a set of five code-bits that, when representing data, conveys a nibble. For 100BASE-T2, a pair of PAM5×5 symbols that, when representing data, conveys a nibble. For 1000BASE-X, a set of ten bits that, when representing data, conveys an octet. (C/LM) 802.3-1998

**code-group alignment** In 1000BASE-X, the receiver action that resets the existing code-group boundary to that of the comma or K28.5 character currently being received. (C/LM) 802.3-1998

**code-group slipping** In 1000BASE-X, the receiver action to align the correct receive clock and code-group containing a comma. (C/LM) 802.3-1998

**code, idle channel** *See:* idle channel code.

**code inspection** *See:* inspection.

**code letter (locked-rotor kilovolt-amperes)** A letter designation under the caption "code" on the nameplate of alternating-current motors (except wound-rotor motors) rated 1/20 horsepower and larger to designate the locked-rotor kilovolt-amperes per horsepower as measured at rated voltage and frequency. (PE) [9]

**code of ethics standard** A standard that describes the characteristics of a set of moral principles dealing with accepted standards of conduct by, within, and among professionals. (C) 610.12-1990

**code, peak** *See:* peak code.

**coder (1) (general)** A device that sets up a series of signals in code form. (EEC/PE) [119]
**(2) (code transmitter)** A device used to interrupt or modulate the track or line current periodically in various ways in order to establish corresponding controls in the other apparatus. (EEC/PE) [119]

**code review** A meeting at which software code is presented to project personnel, managers, users, customers, or other interested parties for comment or approval. *Contrast:* formal qualification review; test readiness review; design review. (C) 610.12-1990

**code ringing (telephone switching systems)** Ringing wherein the number of rings or the duration, or both, indicate which system on a party line is being called. (COM) 312-1977w

**Code Rule Violation (CRV)** An analog waveform that is not the result of the valid Manchester-encoded output of a single optical transmitter. The collision of two or more 10BASE-FB optical transmissions will cause multiple CRVs. The preamble encoding of a single 10BASE-FP optical transmission contains a single CRV. (C/LM) 802.3-1998

**coder offset** The difference between the code that is supposed to result from a zero-voltage input to the encoder and the code that actually occurs. (COM/TA) 1007-1991r

**code set** The complete set of coded representations used by a particular code. For example, the set of three-letter codes used to represent airports. (C) 610.5-1990w, 1084-1986w

**code symbol** A 4B/5B encoded sequence of five bits representing a unique pattern. (C/LM) 802.9a-1995w

**code system** A system of control of wayside signals, cab signals, train stop or continuous train control in which electric currents of suitable character are supplied to control apparatus, each function being controlled by its own distinctive code. *See also:* block-signal system. (EEC/PE) [119]

**code trace** *See:* execution trace.

**code transition level** The boundary between two adjacent code bins. (IM/WM&A) 1057-1994w

**code transition level *T[k]*** The value of the recorder input parameter at the transition point between two given, adjacent code bins. The transition point is defined as the input value that causes 50% of the output codes to be greater than or equal to the upper code of the transition, and 50% to be less than the upper code of the transition. The transition level *T[k]* lies between code bin $k-1$ and code bin $k$. *See also:* transition point. (IM/WM&A) 1057-1994w

**code translator** *See:* digital converter.

**code value** *See:* coded representation.

**code violation** Violation of a coding rule; e.g., the AMI coding rule where the code is corrupted by bipolar violation(s). (COM/TA) 1007-1991r

**code walk-through** *See:* walk-through.

**coding (1)** The process of transforming messages or signals in accordance with a definite set of rules. (COM) 270-1964w
**(2) (computers)** Loosely, a routine. *See also:* relative coding; straight-line coding; symbolic coding. (C) [20]
**(3) (test, measurement, and diagnostic equipment)** A part of the programming process in which a completely defined, detailed sequence of operation is translated into computer-entry language. (MIL) [2]
**(4) (A) (software)** In software engineering, the process of expressing a computer program in a programming language. **(B) (software)** The transforming of logic and data from design specifications (design descriptions) into a programming language. *See also:* software development process. (C) 610.12-1990
**(5)** Coding is the translation from the original set of bits (character) to a new set of bits (coded character) suitable for serial transmission. *See also:* decoding. (C/BA) 1355-1995

**coding delay*** **(navigation aids) (loran)** An arbitrary time delay in the transmission of pulse signals from the slave station to permit the resolution of ambiguities; the term "suppressed time delay" more accurately represents what is being accomplished and should be used instead of "coding delay." (AES/GCS) 172-1983w

* Deprecated.

**coding fan** *See:* electrode radiator.

**coding scheme** *See:* code.

**coding siren** A siren having an auxiliary mechanism to interrupt the flow of air through the device, thereby enabling it to produce a series of sharp blasts as required in code signaling. *See also:* protective signaling. (EEC/PE) [119]

**coefficient of attenuation (illuminating engineering)** The decrement in flux per unit distance in a given direction within a medium. It is defined by the relation: $\Phi_0 e - ux$ where $\Phi_x$ is the flux at any distance $x$ from a reference point having flux $\Phi_0$. (EEC/IE) [126]

**coefficient of beam utilization (illuminating engineering)** The ratio of the luminous flux (lumens) reaching a specified area directly from a floodlight or projector to the total beam luminous flux (lumens). (EEC/IE) [126]

**coefficient of coupling** *See:* coupling coefficient.

**coefficient of grounding (COG) (1) (surge arresters) (power and distribution transformers)** The ratio ($E_{LG}/E_{LL}$) expressed as a percentage, of the highest root-mean-square line-to-ground power-frequency voltage ($E_{LG}$) on a sound phase,

at a selected location, during a fault to earth affecting one or more phases to the line-to-line power-frequency voltage ($E_{LL}$) that would be obtained, at the selected location, with the fault removed. *Notes:* 1. Coefficients of grounding for three-phase systems are calculated from the phase-sequence impedance components as viewed from the selected location. For machines use the subtransient reactance. 2. The coefficient of grounding is useful in the determination of an arrester rating for a selected location. 3. A value not exceeding 80% is obtained approximately when for all system conditions the ratio of zero-sequence reactance to positive-sequence reactance is positive and less than three and the ratio of zero-sequence resistance to positive-sequence reactance is positive and less than one. (PE/TR) C57.12.80-1978r, [8]

**(2)** The ratio $E_{LG}/E_{LL}$, expressed as a percentage, of the highest root-mean-square line-to-ground power-frequency voltage $E_{LG}$ on a sound phase, at a selected location, during a fault to ground affecting one or more phases to the line-to-line power-frequency voltage $E_{LL}$ that would be obtained, at the selected location, with the fault removed. *Notes:* 1. Coefficients of grounding for three-phase systems are calculated from the phase-sequence impedance components as viewed from the selected location. For machines, use the subtransient reactance. 2. The coefficient of grounding is useful in the determination of an arrester rating for a selected location. 3. A value not exceeding 80 percent is obtained approximately when for all system conditions the ratio of zero-sequence reactance to positive-sequence reactance is positive and less than three, and the ratio of zero-sequence resistance to positive-sequence reactance is positive and less than one. 28-1974

**(3)** The ratio, ELG/ELL (expressed as a percentage), of the highest root-mean-square (rms) line-to-ground power-frequency voltage ELG on a sound phase, at a selected location, during a fault to ground affecting one or more phases to the line-to-line power-frequency voltage ELL that would be obtained at the selected location with the fault removed. (SPD/PE) C62.22-1997

**coefficient of performance (1) (A) (thermoelectric cooling couple)** The quotient of the net rate of heat removal from the cold junction by the thermoelectric couple by the electric power input to the thermoelectric couple. *Note:* This is an idealized coefficient of performance assuming perfect thermal insulation of the thermoelectric arms. *See also:* thermoelectric device. **(B) (thermoelectric cooling device)** The quotient of the rate of heat removal from the cooled body by the electric power input to the device. *See also:* thermoelectric device. **(C) (thermoelectric heating device)** The quotient of the rate of heat addition to the heated body by the electric power input to the device. *See also:* thermoelectric device. **(D) (thermoelectric heating couple)** The quotient of the rate of heat addition to the hot junction by the thermoelectric couple by the electric power input to the thermoelectric couple. *Note:* This is an idealized coefficient of performance assuming perfect thermal insulation of the thermoelectric arms. *See also:* thermoelectric device. (ED) [46], 221-1962

**(2) (heat pump)** Ratio of heating effect produced to the energy supplied. (IA/PSE) 241-1990r

**coefficient of performance, reduced (thermoelectric device)** The ratio of "a specified coefficient of performance" to "the corresponding coefficient of performance of a Carnot cycle." *See also:* thermoelectric device. (ED) [46], 221-1962w

**coefficient of trip point repeatability** *See:* trip-point repeatability coefficient.

**coefficient of utilization (1) (electric power systems in commercial buildings)** For a specific room, the ratio of the average lumens delivered by a luminaire to a horizontal work plane to the lumens generated by the luminaire's lamps alone. (IA/PSE) 241-1990r

**(2) (illuminating engineering)** The ratio of luminous flux (lumens) calculated as received on the work-plane to the rated luminous flux (lumens) emitted by the lamps alone. (It is equal to the product of "room utilization factor" and "luminaire efficiency."). (EEC/IE) [126]

**coefficient of variation** The standard deviation, expressed as a percentage of the mean [i.e., (standard deviation/$\overline{x}$)(100)]. (NI) N42.17B-1989r

**coefficient of zero error** *See:* environmental coefficient.

**coefficient potentiometer** A parameter potentiometer that is used to represent a coefficient. (C) 610.10-1994w

**coefficient sensitivity** *See:* sensitivity coefficient.

**coenetic variable** In modeling, a variable that affects both the system under consideration and that system's environment. (C) 610.3-1989w

**coerce** To treat an object of one type as an object of another type by using a different object. *Contrast:* cast. (C/SE) 1320.2-1998

**coercive field ($E_c$) (primary ferroelectric terms)** The electric field required to switch the polarization from $P = \pm P_R$ to $P = 0$. The coercive field of a ferroelectric crystal depends on its thermal and electrical history, temperature, pressure, type of electrodes, magnitude, and waveshape of the applied switching voltage (that is, $E_c$ increases as a function of the rate of polarization reversal). (UFFC) 180-1986w

**coercive force ($H_c$) (magnetic core testing)** The magnetic field strength at which the magnetic induction is zero, when the core material is in a symmetrically cyclically magnetized condition, with a specified maximum value of field strength (that is, loci of points on the hysteresis curve when $B = 0$). (MAG) 393-1977s

**cofactor** *See:* path factor.

**coffer (illuminating engineering)** A recessed panel or dome in the ceiling. (EEC/IE) [126]

**Coffing** *See:* hoist.

**Coffing hoist** *See:* hoist.

**coffin hoist** *See:* hoist.

**COG** *See:* coefficient of grounding.

**cogeneration** The generation of electric energy and commercial or industrial quality heat or steam from a single facility. (SUB/PE) 1109-1990w

**cogging (rotating machinery)** Variations in motor torque at very low speeds caused by variations in magnetic flux due to the alignment of the rotor and stator teeth at various positions of the rotor. *See also:* rotor; stator. (PE) [9]

**cognitive process** An internal human activity that receives, manipulates, and stores knowledge or information, or that controls actions according to this knowledge. (PE/NP) 1082-1997

**COGO** *See:* COordinate GeOmetry.

**cohered video** (in radar moving-target indicator) Video-frequency signal output employed in a coherent system. *See also:* navigation. (AES/RS) 686-1982s

**coherence (1) (metric practice)** A characteristic of a coherent system. In such a system the product or quotient of any two unit quantities is the unit of the resulting quantity. The SI base units, supplementary units, and derived units form a coherent set. (QUL) 268-1982s

**(2) (computer graphics)** The property that neighboring pixels tend to possess similar attributes. (C) 610.6-1991w

**(3)** The correlation between electromagnetic fields at points separated in space, time, or both. (AP/LEO/PROP) 211-1997, 586-1980w

**coherence area (1) (fiber optics)** The area in a plane perpendicular to the direction of propagation over which light may be considered highly coherent. Commonly the coherence area is the area over which the degree of coherence exceeds 0.88. *See also:* coherent; degree of coherence. (Std100) 812-1984w

**(2) (laser maser)** A quantitative measure of spatial coherence. The largest cross-sectional area of a light beam, such that light from this area (passing through any two pin holes placed in this area) will produce interference fringes. (LEO/PE) 586-1980w, [9]

**coherence domain (1)** A region in a multiple-cache system, inside of which, cache consistency measures are enforced. In a system that contains bus bridges, a coherence domain may or may not be extensible beyond the local bus through a bus bridge to remote buses. (C/BA) 10857-1994, 896.3-1993w, 896.4-1993w **(2)** A coherence domain is a region in a multiple-cache system in which cache consistency measures are enforced. (C/BA) 1014.1-1994w

**coherence function ($R(\vec{\Delta}, \tau)$) (1) (radio-wave propagation)** The expected value of the product of a component of the complex field ($F_x$) at a given location ($\vec{r}$) and time ($t$) and the complex conjugate of that field component ($F^*_x$) at a different location ($\vec{r} + \vec{\Delta}$) and time ($t + \tau$): *Notes:* 1. This definition assumes that the statistics of the fields are homogeneous and stationary. 2. The normalized coherence function, also called the mutual coherence function, is the coherence function divided by the expected value of the square of the magnitude of the field. (AP/PROP) 211-1997 **(2) (seismic qualification of Class 1E equipment for nuclear power generating stations)** Defines a comparative relationship between two time histories. It provides a statistical estimate of how much two motions are related, as a function of frequency. The numerical range is from zero for unrelated, to 1.0 for related motions. (PE/NP) 344-1987r

**coherence length (1) (fiber optics)** The propagation distance over which a light beam may be considered coherent. If the spectral linewidth of the source is $\Delta\lambda$ and the central wavelength is $\lambda_0$, the coherence length in a medium of refractive index $n$ is approximately $\lambda^2_0/n\Delta\lambda$. *See also:* degree of coherence; spectral width. (Std100) 812-1984w **(2)** The distance between two wavefronts of an electromagnetic wave, measured in the direction of propagation, over which the phase of these wavefronts remains sufficiently correlated to result in observable interference between them. (AP/PROP) 211-1997

**coherence line** A data block for which cache consistency attributes are maintained. (C/BA) 10857-1994, 896.4-1993w

**coherence time ($\tau_0$) (1) (fiber optics)** The time over which a propagating light beam may be considered coherent. It is equal to coherence length divided by the phase velocity of light in a medium; approximately given by $\lambda^2_0/c\Delta\lambda$, where $\lambda_0$ is the central wavelength, $\Delta\lambda$ is the spectral linewidth and $c$ is the velocity of light in vacuum. *See also:* phase velocity; coherence length. (Std100) 812-1984w **(2) (laser maser)** A quantitative measure of temporal coherence. The maximum delay time which can be introduced between the two beams in a Michelson interferometer before the interference fringes disappear. (LEO) 586-1980w **(3)** The time over which the mutual coherence function has decreased to $1/e$ at a given location. (AP/PROP) 211-1997

**coherent (1) (fiber optics)** Characterized by a fixed phase relationship between points on an electromagnetic wave. *Note:* A truly monochromatic wave would be perfectly coherent at all points in space. In practice, however, the region of high coherence may extend only a finite distance. The area on the surface of a wavefront over which the wave may be considered coherent is called the coherence area or coherence patch; if the wave has an appreciable coherence area, it is said to be spatially coherent over that area. The distance parallel to the wave vector along which the wave may be considered coherent is called the coherence length; if the wave has an appreciable coherence length, it is said to be phase or length coherent. The coherence length divided by the velocity of light in the medium is known as the coherence time; hence a phase coherent beam may also be called time (or temporally) coherent. *See also:* coherence time; coherence length; degree of coherence; coherence area; monochromatic. (Std100) 812-1984w **(2) (laser maser)** A light beam is said to be coherent when the electric vector at any point in it is related to that at any other point by a definite, continuous sinusoidal function. (LEO) 586-1980w

**coherent bandwidth** *See:* frequency selective bandwidth.

**coherent bundle** *See:* aligned bundle.

**coherent data-access operation** A data-access operation, when used to access coherently cached data. (C/MM) 1596.5-1993

**coherent field** In situations where the magnitude, phase, and/or vector direction of an electromagnetic field are random variables, the result of averaging the field over all random characteristics. Also called the mean or average field. (AP/PROP) 211-1997

**coherent integration** Integration of radio frequency (RF), intermediate frequency (IF), or bipolar envelope signals over an interval in which phase or polarity is preserved. *Note:* Sometimes called "predetection integration." *See also:* integration. (AES) 686-1997

**coherent interrupted waves** Interrupted continuous waves occurring in wave trains in which the phase of the waves is maintained through successive wave trains. *See also:* wavefront. (EEC/PE) [119]

**coherent moving-target indication** The usual form of MTI in which a moving target is separated from large clutter echoes as a result of a pulse-to-pulse change in echo phase relative to the phase of a coherent reference oscillator. *See also:* moving-target indication. (AES) 686-1997

**coherent MTI** *See:* coherent moving-target indication.

**coherent processing interval** The time during which the radar signal is received and processed coherently. *Note:* Such processing is usually for Doppler filtering. (AES) 686-1997

**coherent pulse operation** The method of pulse operation in which a fixed phase relationship is maintained from one pulse to the next. *See also:* pulse. (EEC/PE) [119]

**coherent radiation** *See:* coherent.

**coherent sampling** Sampling of a periodic waveform in which there is an integer number of cycles in the data record. In other words, coherent sampling occurs when the following relationship exists:

$$f_s \cdot M_c = f_0 \cdot M$$

where
$f_s$ is the sampling frequency.
$M_c$ is the integer number of cycles in the data record.
$f_0$ is the frequency of the input.
$M$ is the number of samples in the record.

(IM/WM&A) 1057-1994w

**coherent signal processing** Integration, filtering, or detection of an echo signal using the amplitude of the received signal and its phase referred to that of a reference oscillator or to the transmitted signal. (AES) 686-1997

**coherent transaction** A transaction (typically read or write) that provides protocols for checking and maintaining consistency with other caches. Coherent transactions are expected to address a cache-line. For example, tightly coupled multiprocessors are expected to use coherent transactions when accessing shared-memory resident data. (C/MM) 1212-1991s

**coherent video** Bipolar video obtained from a synchronous (coherent) detector. (AES) 686-1997

**cohesion (software)** The manner and degree to which the tasks performed by a single software module are related to one another. Types include coincidental, communicational, functional, logical, procedural, sequential, and temporal. *Synonym:* module strength. *Contrast:* coupling. (C) 610.12-1990

**coho** A term derived from coherent oscillator, coho designates an oscillator used in a coherent radar to provide a reference phase by which changes in the phase of successively received pulses may be recognized. *Note:* In practice, a coho usually operates at the receiver intermediate frequency. (AES) 686-1997

**coil (1) (general)** An assemblage of successive convolutions of a conductor.
**(2) (rotating machinery)** A unit of a winding consisting of one or more insulated conductors connected in series and surrounded by common insulation, and arranged to link or produce magnetic flux. *See also:* rotor; stator. (PE) [9]

**coil brace (1)** A structure for the support or restraint for one or more coils. *Synonym:* coil support.
**(2) (v wedge, salient-pole construction)** A trapezoidal insulated insert clamped between field poles, to provide radial restraint for the field coil turns against centrifugal force and to brace the coils tangentially. *See also:* stator. (PE) [9]

**coil end-bracing** *See:* stator; end-winding support; rotor.

**coil insulation (rotating machinery)** The main insulation to ground or between phases surrounding a coil, additional to any conductor or turn insulation. *See also:* rotor; stator. (PE) [9]

**coil insulation with its accessories (1) (insulation systems of synchronous machines)** The coil insulation comprises all of the insulating materials that envelope the current-carrying conductors and their component turns and strands and form the insulation between them and the machine structure, and includes the armor tape, the tying cord, slot fillers, slot tube insulation, pole body insulation, and rotor-retaining ring insulation. (REM) [115]
**(2) (repair and rewinding of motors)** Comprises all of the insulating materials that envelop and separate the current-carrying conductors and their component turns and strands and form the insulation between them and the machine structure; includes wire coatings, varnish, encapsulants, slot insulation, slot fillers, tapes, phase insulation, pole-body insulation, and retaining ring insulation when present. *See also:* insulation system. (IA/PC) 1068-1996

**coil lashing (rotating machinery)** The binding used to attach a coil end to the supporting structure. *See also:* rotor; stator. (PE) [9]

**coil loading** Loading in which inductors, commonly called loading coils, are inserted in a line at intervals. *Note:* The loading coils may be inserted either in series or in shunt. As commonly understood, coil loading is a series loading in which the loading coils are inserted at uniformly spaced recurring intervals. *See also:* loading. (EEC/PE) [119]

**coil pitch (rotating machinery)** The distance between the two active conductors (coil sides) of a coil, usually expressed as a percentage of the pole pitch. *See also:* armature. (PE) [9]

**coil probe** A magnetic flux density sensor comprised of a coil of wire that produces an induced voltage proportional to the time derivative of the magnetic flux density. *Notes:* 1. To eliminate effects due to electric field induction, it is essential that the coil of wire be shielded. 2. Since the induced voltage is proportional to the time derivative of the magnetic flux density, the detector circuit of the sensor often contains an integrating stage to recover the waveform of the magnetic field. The integrating stage is also desirable, particularly for measurements of magnetic field strength with harmonic content, since this stage (i.e., its integrating property) eliminates the excessive weighting of the harmonic components in the voltage signal produced by the probe. 3. This probe can also be used to measure static (dc) magnetic flux density if the probe is rotated at a known rate. (T&D/PE) 539-1990, 1308-1994

**coil *Q* (dielectric heating)** Ratio of reactance to resistance measured at the operating frequency. *Note:* The loaded-coil *Q* is that of a heater coil with the charge in position to be heated. Correspondingly, the unloaded-coil *Q* is that of a heater coil with the charge removed from the coil. (IA) 54-1955w

**coil Q power factor** *See:* coil *Q*.

**coil section (rotating machinery)** The basic electrical element of a winding comprising an assembly of one or more turns insulated from one another. (PE) [9]

**coil shape factor (dielectric heating)** A correction factor for the calculation of the inductance of a coil based on its diameter and length. (IA) 54-1955w

**coil side (rotating machinery)** Either of the two normally straight parts of a coil that lie in the direction of the axial length of the machine. *See also:* rotor; stator. (PE) [9]

**coil-side separator (rotating machinery)** Additional insulation used to separate embedded coil sides. *See also:* rotor; stator. (PE) [9]

**coil space factor** The ratio of the cross-sectional area of the conductor metal in a coil to the total cross-sectional area of the coil. *Note:* If the overall insulation, such as spool bodies or stop linings, is omitted from consideration when the space factor is calculated, the omission should be specifically stated. *See also:* asynchronous machine. (EEC/PE) [119]

**coil span** *See:* stator; coil pitch; rotor.

**coil support** *See:* coil brace.

**coil support bracket (rotating machinery)** A bracket used to mount a coil support ring or binding band. *See also:* stator; rotor. (PE) [9]

**coin box** A telephone set equipped with a device for collecting coins in payment for telephone messages. *See also:* telephone station. (EEC/PE) [119]

**coin call (telephone switching systems)** A call in which a coil collection device is used. (COM) 312-1977w

**coincidence (radiation counters)** The practically simultaneous production of signals from two or more counter tubes. *Note:* A genuine or true coincidence is due to signals from related events (passage of one particle or of two or more related particles through the counter tubes); an accidental, spurious, or chance coincidence is due to unrelated signals that coincide accidentally. *See also:* anticoincidence. (ED) [45]

**coincidence circuit** A circuit that produces a specified output pulse when and only when a specified number (two or more) or a specified combination of input terminals receives pulses within an assigned time interval. *See also:* anticoincidence; pulse. (NPS) 398-1972r

**coincidence factor (electric power utilization)** The ratio of the maximum coincident total demand of a group of consumers to the sum of the maximum power demands of individual consumers comprising the group both taken at the same point of supply for the same time. *See also:* generating station. (T&D/PE) [10]

**coincidence summing** *See:* cascade summing of X and gamma rays.

**coincidental cohesion** A type of cohesion in which the tasks performed by a software module have no functional relationship to one another. *Contrast:* temporal cohesion; sequential cohesion; procedural cohesion; logical cohesion; communicational cohesion; functional cohesion. (C) 610.12-1990

**coincident-current selection** The selection of a magnetic cell for reading or writing, by the simultaneous application of two or more currents. (C) [20]

**coincident demand (1) (A) (radio-wave propagation)** Any demand that occurs simultaneously with any other demand.
**(B) (radio-wave propagation)** The sum of any set of coincident demands. (IA/PE/PSE) 241-1990, 858-1993
**(2)** Any demand that occurs simultaneously with any other demand, also the sum of any set of coincident demands. Information on these factors for the various loads and groups of loads is useful in designing the system. For example, the sum of the connected loads on a feeder, multiplied by the demand factor of these loads, will give the maximum demand that the feeder must carry. The sum of the individual maximum demands on the circuits associated with a load center or panelboard, divided by the diversity factor of those circuits, will give the maximum demand at the load center and on the circuit supplying it. The sum of the individual maximum demands on the circuits from a transformer, divided by the diversity factor of those circuits, will give the maximum demand on the distribution transformer. The sum of the maximum demand on all distribution transformers, divided

by the diversity factor of the transformer loads, will give the maximum demand on their primary feeder. By the use of the proper factors, as outlined, the maximum demands on the various parts of the system from the load circuits to the power source can be estimated. Allowances should also be made for future load expansion in these calculations. (IA/PSE) 141-1993r

**(3) (electric power utilization)** Any demand that occurs simultaneously with any other demand; also the sum of any set of coincident demands. *See also:* alternating-current distribution. (PE/PSE) 346-1973w

**coin-control signal (telephone switching systems)** On a coin call, one of the signals used for collecting or returning coins. (COM) 312-1977w

**coin-denomination tone (telephone switching systems)** The tone that indicates the value of coins when they are deposited in a coin telephone. (COM) 312-1977w

**coin tone (telephone switching systems)** A class-of-service tone that indicates to an operator that the call has originated from a coin telephone. (COM) 312-1977w

**cold cathode** A cathode that functions without the application of heat. *See also:* electrode. (EEC/PE) [119]

**cold-cathode glow-discharge tube (glow tube)** A gas tube that depends for its operation on the properties of a glow discharge. (ED) [45]

**cold-cathode lamp (illuminating engineering)** An electric-discharge lamp whose mode of operation is that of a glow discharge, and which has electrodes so spaced that most of the light comes from the positive column between them. (EEC/IE) [126]

**cold-cathode stepping tube** A glow discharge tube having several main gaps with or without associated auxiliary gaps, and in which the main discharge has two or more stable positions and can be made to step in sequence, when a suitable shaped signal is applied to an input electrode, or a group of input electrodes. (ED) [45]

**cold-cathode tube** An electron tube containing a cold cathode. (ED) 161-1971w

**cold-end termination (electrical heat tracing for industrial applications)** The termination applied to the end of a heating cable where the power is supplied. (BT/AV) 152-1953s

**cold lead (electrical heat tracing for industrial applications)** An electrically insulated conductor used to connect a heating conductor to the branch-circuit conductors and designed so as not to produce any appreciable heat. (BT/AV) 152-1953s

**cold-lead connection** An electrically insulated conductor used to connect a heating conductor to the branch-circuit conductors and designed so as not to produce appreciable heat. (IA) 515-1997

**cold reserve** Thermal generating capacity available for service but not maintained at operating temperature. (T&D/PE) [10]

**cold shrink** A joint that consists of a tube or a series of tubes that are applied over the conductor and reduced in diameter over the cable without the use of heat. (PE/IC) 404-1993

**cold side** *See:* unexposed side.

**"cold" standby redundant UPS configuration** Consists of two independent, nonredundant modules with either individual module batteries or a common battery. (IA/PSE) 241-1990r

**cold-start** A sequence of events performed on the application of power that ensures a uniform initialization period for all agents, giving them the ability to begin operation from a known state. (C/MM) 1296-1987s

**cold test** *See:* passive test.

**collaboration** The cooperative exchange of requests among classes and instances in order to achieve some goal. (C/SE) 1320.2-1998

**collapsing loss** The increase in required input signal-to-noise ratio to maintain given probability of detection for a given false alarm probability when resolution cells or samples containing only noise are integrated along with those containing signal and noise. *Note:* This type of loss occurs, for example, when radar returns containing range, azimuth, and elevation information are constrained to a two-dimensional display. (AES) 686-1997

**collapsing ratio** The ratio

$$(m + n)/n$$

where

$m$ = number of noise-only samples

$n$ = number of signal-plus-noise samples

(AES) 686-1997

**collar (rotating machinery)** (washer) Insulation between the field coil and the pole shoe (top collar) and between the field coil and the member carrying the pole body (bottom collar). *See also:* rotor; field-coil flange. (PE) [9]

**collate (1) (mathematics of computing)** To compare and merge two or more similarly ordered or sequenced sets onto one ordered set. For example, to arrange the set 1, 4, 9, 12, 18 and the set 2, 5, 10, 19 as the single set 1, 2, 4, 5, 9, 10, 12, 18, 19. (C) [20], [85], 1084-1986w

**(2) (data management)** To arrange items from two or more ordered subsets into one or more other subsets. The resulting subsets will commonly contain at least one item from each of the original subsets and may be ordered in some specified order that is not necessarily the order of any of the original subsets. *Contrast:* decollate. *See also:* merge; collating sequence; coalesce. (C) 610.5-1990w

**collating element** The smallest entity used to determine the logical ordering of strings. A collating element shall consist of either a single character, or two or more characters collating as a single entity. The value of the LC_COLLATE category in the current locale determines the current set of collating elements. *See also:* collation sequence. (C/PA) 9945-2-1993

**collating sequence** An ordering assigned to a set of items, such that any two sets in that assigned order can be collated. (C) [20], [85]

**(2) (A) (data management)** A sequence assigned to a set of items such that any two sets that are in that assigned order can be collated. **(B) (data management)** A specified arrangement of the items in a set used in sequencing. *Synonym:* sequence. *See also:* order. (C) 610.5-1990

**collating significance** Any attribute of a set that may be used to define a specified arrangement to be used in collating. (C) 610.5-1990w

**collation** *See:* AND.

**collation sequence** The relative order of collating elements as determined by the setting of the LC_COLLATE category in the current locale. The character order, as defined for the LC_COLLATE category in the current locale defines the relative order of all collating elements such that each element occupies a unique position in the order. This is the order used in ranges of characters and collating elements in REs and pattern matching. In addition, the definition of the collating weights of characters and collating elements uses collating elements to represent their respective positions within the collation sequence. Multilevel sorting is accomplished by assigning one or more collation weights to elements, up to the limit

$$\left\{\text{COLL\_WEIGHTS\_MAX}\right\}.$$

On each level, elements may be given the same weight (at the primary level, this is called an *equivalence class*) or may be omitted from the sequence. Strings that collate equally using the first assigned weight (primary ordering) are then compared using the next assigned weight (secondary ordering), and so on. (PA/C) 9945-2-1993

**collator (1)** A device to collate sets of punched cards or other documents into a sequence. (C) [20], [85]

**(2)** A device that compares and merges sets of punch cards or other documents into a sequence. (C) 610.10-1994w

**collect call (telephone switching systems)** A call for which the called customer agrees to pay. (COM) 312-1977w

**collecting pit** A pit built under oil-filled equipment to collect any accidental discharge of oil from that piece of equipment. (SUB/PE) 980-1994

**collection cardinality** A specification, for a collection-valued property, of how many members the value of the property, i.e., the collection, may or must have for each instance. *See also:* cardinality constraint. (C/SE) 1320.2-1998

**collection class** A kind of class in which each instance is a group of instances of other classes. (C/SE) 1320.2-1998

**collection configuration** In a collection of objects, the configuration is the enumeration of the members of the collection, and the specification of the allowed communications between the members. To configure a collection means to make the necessary changes to the collection and its members to make real the defined enumeration of members and the specification of allowed communication between members. (IM/ST) 1451.1-1999

**collection efficiency (quantum yield)** The number of carriers crossing the p-n junction per incident photon. (AES/SS) 307-1969w

**collection property** *See:* collection-valued property.

**collection-valued** A value that is complex, i.e., having constituent parts. *Contrast:* scalar. (C/SE) 1320.2-1998

**collection-valued class** A class in which each instance is a collection of values. *Contrast:* scalar-valued class. (C/SE) 1320.2-1998

**collection-valued property** A property that maps to a collection class. *Contrast:* scalar-valued property. (C/SE) 1320.2-1998

**collector (1) (rotating machinery)** An assembly of collector rings, individually insulated, on a supporting structure. *See also:* asynchronous machine. (PE) [9]

**(2) (electron tube)** An electrode that collects electrons or ions that have completed their functions within the tube. *See also:* electrode. (ED) 161-1971w

**(3) (transistor)** A region through which primary flow of charge carriers leaves the base. (ED) 216-1960w

**collector grid (solar cells)** A pattern of conducting material making ohmic contact to the active surface of a solar cell to reduce the series resistance of the device by reducing the mean path of the current carriers within the semiconductor. (AES/SS) 307-1969w

**collector junction (semiconductor devices)** A junction normally biased in the high-resistance direction, the current through which can be controlled by the introduction of minority carriers. *Note:* The polarity of the voltage across the junction reverses when a switching occurs. *See also:* semiconductor; transistor; semiconductor device. (ED/IA) 216-1960w, 270-1966w, [12]

**collector plates** Metal inserts embedded in the cell lining to minimize the electric resistance between the cell lining and the current leads. *See also:* fused electrolyte. (EEC/PE) [119]

**collector ring (1)** A metal ring suitably mounted on an electric machine that (through stationary brushes bearing thereon) conducts current into or out of the rotating member. *Synonym:* slip ring. *See also:* asynchronous machine. (EEC/PE) [119]

**(2)** An assembly of slip rings for transferring electrical energy from a stationary to a rotating member. (NESC/NEC) [86]

**collector-ring lead insulation (rotating machinery)** Additional insulation, applied to the leads that connect the collector rings to the windings of the rotating member, to prevent grounding to the metallic parts of the rotating members, and to provide electrical separation between leads. *See also:* rotor. (PE) [9]

**collector-ring shaft insulation (rotating machinery)** The combination of insulating members that insulate the collector rings from the parts of the structure that are mounted on the shaft. *See also:* rotor. (PE) [9]

**collimate (storage tubes)** To modify the paths of electrons in a flooding beam or of various rays of a scanning beam in order to cause them to become more nearly parallel as they approach the storage assembly. *See also:* storage tube. (ED) 158-1962w

**collimated beam (laser maser)** Effectively, a parallel beam of light with very low divergence or convergence. (LEO) 586-1980w

**collimating lens (storage tubes)** An electron lens that collimates an electron beam. *See also:* storage tube. (ED) 158-1962w

**collimation (fiber optics)** The process by which a divergent or convergent beam of radiation is converted into a beam with the minimum divergence possible for that system (ideally, a parallel bundle of rays). *See also:* beam divergence. (Std100) 812-1984w

**collimator (laser maser)** An optical device for converting a diverging or converging beam of light into a collimated or parallel one. (LEO) 586-1980w

**collinear array antenna** A linear array of radiating elements, usually dipoles, with their axes lying in a straight line. (AP/ANT) 145-1993

**collision (1)** An unwanted condition that results from concurrent transmission on the physical medium. (LM/C) 8802-3-1990s

**(2) (data management)** In hashing, the occurrence of the same hash value for two or more different keys. *Synonym:* hash clash. *See also:* synonym. (C) 610.5-1990w

**(3)** The condition occurring when two MTM-Bus modules are simultaneously MTM-Bus drivers and are attempting to drive a MTM-Bus signal to complementary values (one driving logic 1, one driving logic 0). (TT/C) 1149.5-1995

**(4)** The condition when multiple packets/signals are observed simultaneously at a single point on the medium where the "listening" station is unable to function properly due to multiple signals being present. *See also:* forced collision; collision detect signal; contention; collision detection. (C) 610.7-1995

**(5)** A condition that results from concurrent transmissions from multiple data terminal equipment (DTE) sources within a single collision domain. (LM/C) 802.3-1998, 610.7-1995

**collision-avoidance system (navigation aids)** A system providing the means of detection and prevention of impending collision between vehicles. The system performs one or more of the following functions: detection of intruders in surrounding vicinity, evaluation of miss distance of a collision hazard, determination of precise maneuver needed to avoid the hazard, and specification of when an avoidance maneuver should be initiated. (AES/GCS) 172-1983w

**collision chain** A list used in hashing to hold all the keys for which the hash address is identical. *Synonym:* calc chain. (C) 610.5-1990w

**collision detection** The ability of a node to detect collision. *Note:* This term is contextually specific to IEEE Std 802.3. (C) 610.7-1995

**collision detect signal** A signal provided by the physical layer to the data link layer, to indicate collision detection. *Note:* This term is contextually specific to IEEE Std 802.3. (C) 610.7-1995

**collision enforcement** The emission of an encoded sequence by the transmitting node after a collision is detected, to ensure that all other transmitting nodes detect the collision. *Note:* This term is contextually specific to IEEE Std 802.3. (C) 610.7-1995

**collision domain** A single, half duplex mode CSMA/CD network. If two or more Media Access Control (MAC) sublayers are within the same collision domain and both transmit at the same time, a collision will occur. MAC sublayers separated by a repeater are in the same collision domain. MAC sublay-

ers separated by a bridge are within different collision domains. (C/LM) 802.3-1998

**collision error** In networking, an indication that two or more nodes have attempted to transmit within the same time slot. *Note:* This term is contextually specific to IEEE Std 802.3. (C) 610.7-1995

**collision frequency** In a plasma, the average number of collisions per second of a particle of a given species with particles of another or of the same species. (AP/PROP) 211-1997

**collision presence (1)** The signal provided by the physical signaling sublayer to the physical medium attachment sublayer (within the data link layer) to indicate that multiple stations are contending for access to the transmission medium. (C) 610.7-1995

**(2)** A signal generated within the Physical Layer by an end station or hub to indicate that multiple stations are contending for access to the transmission medium. (C/LM) 802.3-1998

**collision resolution** In hashing, the process of applying further calculations or other means to resolve a collision. Methods include open-address hashing, separate chaining, and the use of buckets. *Synonym:* rehashing. (C) 610.5-1990w

**colloidal ions** Ions suspended in a medium, that are larger than atomic or molecular dimensions but sufficiently small to exhibit Brownian movement. (EEC/PE) [119]

**colon definition** A command defined as a sequence of previously existing commands. (C/BA) 1275-1994

**color (1) (television)** That characteristic of visual sensation in the photopic range that depends on the spectral composition of light entering the eye. (BT/AV) 201-1979w

**(2) (illuminating engineering)** (of a physical stimulus) One of the ways in which the word "color" may be used is to designate the property of light falling on the retina which causes it to generate an impression perceived as having or lacking a quality such as whiteness, redness, greenness, and the like. This property of light is determined by its spectral power distribution and may be specified in terms of its chromaticity and luminance. This same property of light may be imputed to a to a beam of light being propagated through space or originating at a distal stimulus. The distal stimulus itself may be described as colored because it gives off colored light. (EEC/IE) [126]

**color breakup (color television)** Any transient or dynamic distortion of the color in a television picture. *Note:* This effect may originate in videotape equipment, in a television camera, or in a receiver. In videotape recording or playback, it occurs as intermittent misphasing or loss of the chrominance signal. In a field-sequential system, it may be caused at the camera by rapid motion of the image on the camera sensor through motion of either the camera or the subject. It may be caused at the receiver by rapid changes in viewing conditions such as blinking or motion of the eyes. (BT/AV) 201-1979w

**color burst (color television)** The portion of the composite or noncomposite color-picture signal, comprising a few cycles of a sine wave of chrominance subcarrier frequency, that is used to establish a reference for demodulating the chrominance signal. (BT/AV) 201-1979w

**color-burst flag keying signal (television)** A keying signal used to form the color burst from a color-subcarrier signal source. *See also:* burst flag. (EEC/PE) [119]

**color-burst gate (television)** A keying or gating signal used to extract the color burst from a color-television signal. *See also:* television; burst gate. (PE/EEC) [119]

**color-burst keying signal** *See:* color-burst flag keying signal.

**color carrier** *See:* chrominance subcarrier.

**color cell** (repeating pattern of phosphors on the screen of a color-picture tube) The smallest area containing a complete set of all the primary colors contained in the pattern. *Note:* If the cells are described by only one dimension as in the line type of screen, the other dimension is determined by the resolution capabilities of the tube. (ED) 161-1971w

**color center (color picture tubes)** A point or region (defined by a particular color-selecting electrode and screen configuration) through which an electron beam must pass in order to strike the phosphor array of one primary color. *Note:* This term is not to be used to define the color-triad center of a color-picture tube screen. (ED) 161-1971w

**color code (1) (electrical)** A system of standard colors adopted for identification of conductors for polarity, etc., and for identification of external terminals of motors and starters to facilitate making power connections between them. *See also:* mine feeder circuit. (EEC/PE) [119]

**(2) (communication and control cables)** A system of standard colors used for identification of conductors. Colors identify the tip and ring conductors in pairs of a communications cable. Combinations of colors identify the pair numbers. Pair groups are bound with threads or tapes that are identified with color bands or with unit numbers and the names of the colors. (PE/PSC) 789-1988w

**color coder** *See:* color encoder.

**color comparison (illuminating engineering)** The judgement of equality, or of the amount and character of difference, of the color of two objects viewed under identical illumination. *Synonym:* color grading. (EEC/IE) [126]

**color contamination (color television)** An error of color rendition caused by incomplete separation of paths carrying different color components of the picture. *Note:* Such errors can arise in the optical, electronic, or mechanical portions of a color television system as well as in the electrical portions. (BT/AV) 201-1979w

**color coordinate transformation (color television)** Computation of the tristimulus values of colors in terms of one set of primaries from the tristimulus values of the same colors in another set of primaries. *Note:* This computation may be performing electrically in a color television system. (BT/AV) 201-1979w

**color correction (illuminating engineering)** (of a photograph or printed picture) The adjustment of a color reproduction process to improve the perceived-color conformity of the reproduction to the original. (EEC/IE) [126]

**color decoder (color television)** An apparatus for deriving the signals for the color display device from the color picture signal and the color burst. (BT/AV) 201-1979w

**color-difference signal (color television)** An electrical signal that, when added to the luminance signal, produces a signal representative to one of the tristimulus values (with respect to a stated set of primaries) of the transmitted color. (BT/AV) 201-1979w

**color difference thresholds (illuminating engineering)** The difference in chromaticity or luminance or both, between two colors, that makes them just perceptibly different. The difference may be a difference in hue, saturation, or brightness (lightness for surface colors), or a combination of the three. (EEC/IE) [126]

**color discrimination (illuminating engineering)** The perception of differences between two or more colors. (EEC/IE) [126]

**color display device** A display device that can display more than one color, in addition to the background color. *Contrast:* monochrome display device. *See also:* red, green, blue display device. (C) 610.6-1991w, 610.10-1994w

**color encoder (National Television System Committee color television)** An apparatus for generating either the noncomposite or the composite color picture signal and the color burst from camera signals (or equivalents) and the chrominance subcarrier. (BT/AV) 201-1979w

**color-field corrector (electron tube)** A device located external to the tube producing an electric or magnetic field that affects the beam after deflection as an aid in the production of uniform color fields. (ED) 161-1971w

**color flicker (television)** The flicker that results from fluctuation of both chromaticity and luminance. (BT/AV) 201-1979w

**color fringing (color television)** Spurious chromaticity at boundaries of objects in the picture. *Note:* Color fringing can be caused by a change in relative position of the televised object from field to field (in a field-sequential system), or by misregistration in either camera or receiver; in the case of small objects, it may cause them to appear separated into different color. (BT/AV) 201-1979w

**colorfulness (illuminating engineering)** (of a perceived color) The attribute according to which it appears to exhibit more or less chromatic color. For a stimulus of a given chromaticity, colorfulness normally increases as the absolute luminance is increased. (EEC/IE) [126]

**color grading** *See:* color comparison.

**colorimetric purity (illuminating engineering)** (of a light) The ratio $L_1/L_2$, where $L_1$ is the luminance of the single frequency component which must be mixed with a reference standard to match the color of the light and $L_2$ is the luminance of the light. (EEC/IE) [126]

**colorimetric shift (illuminating engineering)** The change of chromaticity and luminance factor of an object color due to change of the light source. *See also:* resultant color shift; adaptive color shift. (EEC/IE) [126]

**colorimetry (1) (illuminating engineering)** The measurement of color. (EEC/IE) [126]
**(2) (television)** The techniques for the measurement of color and for the interpretation of the results of such measurements. *Note:* The measurement of color is made possible by the properties of the eye, and is based on a set of conventions. (BT/AV) 201-1979w

**coloring (1) (electroplating) (chemical)** The production of desired colors on metal surfaces by appropriate chemical action. *See also:* electroplating. (PE/EEC) [119]
**(2) (buffing)** Light buffing of metal surfaces, for the purpose of producing a high luster. *See also:* electroplating. (EEC/PE) [119]

**color light signal** A fixed signal in which the indications are given by the color of a light only. (EEC/PE) [119]

**color look-up table** A workstation-dependent table in which the entries specify the red, green, and blue intensity values that define the color of a pixel on the display surface. *Synonyms:* video look-up table; color map. *See also:* color mapping. (C) 610.6-1991w

**color map** *See:* color look-up table.

**colormap** A set of entries *(colorcells)* controlling the display of colors for a pixel by assigning numeric intensity values to each of red, blue, and green attributes of the pixel. (C) 1295-1993w

**color mapping** The use of the color look-up table to produce color output on the screen of a cathode ray tube. (C) 610.6-1991w

**color match (colorimetry) (television)** The condition in which the two halves of a structureless photometric field are judged by the observer to have exactly the same appearance. *Note:* A color match for the standard observer may be calculated. (BT/AV) 201-1979w

**color matching (illuminating engineering)** Action of making a color appear the same as a given color. (EEC/IE) [126]

**color matching functions (illuminating engineering)** (spectral tristimulus values) The tristimulus value per unit wavelength interval and unit spectral radiant flux. *Notes:* 1. Color-matching functions have been adopted by the International Commission on Illumination. They are tabulated as functions of wavelength throughout the spectrum and are the basis for the evaluation of radiant energy as light and color. The $\bar{y}$ values are identical with the values of spectral luminous efficiency for photopic vision. 2. The $\bar{x}$, $\bar{y}$, and $\bar{z}$ values for the 1931 Standard Observer are based on a two degree bipartite field, and are recommended for predicting matches for stimuli subtending between one degree and four degrees. Supplementary data based on a ten-degree bipartite field were adopted in 1964 for use for angular subtenses greater than four degrees. *See also:* values of spectral luminous efficiency for photopic vision. (EEC/IE) [126]

**color mixture (television)** Color produced by the combination of lights of different colors. *Notes:* 1. The combination may be accomplished by successive presentation of the components, provided the rate of alternation is sufficiently high; or the combination may be accomplished by simultaneous presentation, either in the same area or on adjacent areas, provided they are small enough and close enough together to eliminate pattern effects. 2. A color mixture as here defined is sometimes denoted as an additive color mixture to distinguish it from combinations of dyes, pigments, and other absorbing substances. Such mixtures of substances are sometimes called subtractive color mixtures, but might more appropriately be called colorant mixtures. (BT/AV) 201-1979w

**color mixture data** *See:* tristimulus values.

**color picture signal*** *See:* noncomposite color picture signal; composite color picture signal.
* Deprecated.

**color-picture tube** An electron tube used to provide an image in color by the scanning of a raster and by varying the intensity of excitation of phosphors to produce light of the chosen primary colors. (ED) 161-1971w

**color plane (multibeam color-picture tubes)** A surface approximating a plane containing the color centers. (ED) 161-1971w

**color-position light signal** A fixed signal in which the indications are given by the color and the position of two or more lights. (EEC/PE) [119]

**color preference index (illuminating engineering)** (of a light source) Measure appraising a light source for enhancing the appearance of an object or objects by making their colors tend toward people's preferences. Judd's flattery index is an example. (EEC/IE) [126]

**color printer** A printer that utilizes multi-colored ribbons, pens, or ink supplies, allowing it to print in more than one color. (C) 610.10-1994w

**color-purity magnet** A magnet in the neck region of a color-picture tube to alter the electron beam path for the purpose of improving color purity. (ED) 161-1971w

**color rendering index (illuminating engineering)** (of a light source) Measure of the degree of color shift objects undergo when illuminated by the light source as compared with the color of those same objects when illuminated by a reference source of comparable color temperature. (EEC/IE) [126]

**color-selecting-electrode system** A structure containing a plurality of openings mounted in the vicinity of the screen of a color-picture tube (electron tubes), the function of this structure being to cause electron impingement on the proper screen area by using either masking, focusing, deflection, reflection, or a combination of these effects. *See also:* shadow mask. (ED) 161-1971w

**color-selecting-electrode system transmission (electron tube)** The fraction of incident primary electron current that passes through the color-selecting-electrode system. (ED) 161-1971w

**color signal (color television)** Any signal at any point for wholly or partially controlling the chromaticity values of a color television picture. *Note:* This is a general term that encompasses many specific connotations such as those conveyed by the words "color picture signal" (either composite or noncomposite), "chrominance signal color carrier signal," "luminance signal" (in color television). (BT/AV) 201-1979w

**color sync signal (color television)** A signal used to establish and maintain the same color relationships that are transmitted. *Note:* In Rules Governing Radio Broadcast Services, Part 3, of the Federal Communications Commission, the color sync signal consists of a sequence of color bursts that recur every line except for a specified time interval during the vertical

interval, each burst occurring on the back porch. (BT/AV) 201-1979w

**color temperature (1) (television)** The absolute temperature of the full (blackbody) radiator for which the ordinates of the spectral distribution curve of emission are proportional (or approximately so) in the visible regions, to those of the distribution curve of the radiation considered, so that both radiations have the same chromaticity. *Note:* In certain countries, by extension, the term "color temperature" is used in the case of a selective radiator when, for the colorimetric standard observer, this radiator has the same color (or at least approximately the same color) as a full radiator at a certain temperature; this temperature is then called the color temperature of the selective radiator. (BT/AV) 201-1979w

**(2) (illuminating engineering)** (of a light source) The absolute temperature of a blackbody radiator having a chromaticity equal to that of the light source. (EEC/IE) [126]

**color tracking (television) (A)** The degree to which color balance is maintained over the complete range of the achromatic (neutral gray) scale. **(B)** A qualitative term indicating the degree to which constant chromaticity within the achromatic region in the chromaticity diagram is achieved on a color-display device over the range of luminances produced from a monochrome signal. *See also:* television. (BT/AV) [34]

**color transmission (color television)** The transmission of a signal wave for controlling both the luminance values and the chromaticity values in a picture. (BT/AV) 201-1979w

**color triad (phosphor-dot screen)** A color cell of a three-color phosphor-dot screen. (ED) 161-1971w

**color triangle (television)** A triangle drawn on a chromaticity diagram, representing the entire range of chromaticities obtainable as additive mixtures of three prescribed primaries represented by the corners of the triangle. (BT/AV) 201-1979w

**Colpitts oscillator** An electron tube or solid state circuit in which the parallel-tune tank circuit is connected between grid and plate, the capacitive portion of the tank circuit being comprised of two series elements, the connection between the two being at cathode potential with the feedback voltage obtained across the grid-cathode portion of the capacitor. *See also:* radio-frequency generator. (BT) 182A-1964w

**column (1) (A) (positional notation)** A vertical arrangement of characters or other expressions. **(B)** Loosely, a digital place. *See also:* place. **(C) (test pattern language)** A group of words or bits in a memory, identified by a common *Y*-address. **(D) (metal nitrite oxide semiconductor arrays)** A group of memory cells having a common sense amplifier that detects the state of the cell being addressed. **(E) (data management)** A vertically corresponding set of entries in a table. *Contrast:* row. *See also:* attribute. (ED/C/TT) 641-1987, 610.5-1990, 660-1986, 162-1963

**(2)** In a Physical Design Exchange Format (PDEF) datapath cluster, a cluster of cell, spare_cell, and/or cluster instances placed or constrained to be placed in the vertical (*Y*-axis) direction. *See also:* datapath; row. (C/DA) 1481-1999

**column binary (1)** Pertaining to the binary representation of data on punched cards in which adjacent positions in a column correspond to adjacent bits of data, for example, each column in a 12-row card may be used to represent 12 consecutive bits of a 36-bit word. (C) [20], [85]

**(2) (mathematics of computing)** Pertaining to the binary representation of data in which adjacent positions in a column correspond to adjacent binary digits. For example, each column in a 12-row card may be used to represent 12 consecutive bits of a binary word. *Synonym:* Chinese binary. *Contrast:* row binary. (C) 1084-1986w

**(3)** Pertaining to the binary representation of data on punch cards in which the weights of punch positions are assigned along card columns, for example, each column in a 12-row card may be used to represent 12 consecutive bits. *Synonym:* Chinese binary. *Contrast:* row binary. *See also:* binary card. (C) 610.10-1994w

**column enable (semiconductor memory)** The input used to strobe in the column address in multiplexed address random access memories (RAM). (TT/C) 662-1980s

**column-major order** A method for storing the elements of a matrix in computer memory, in which elements are ordered in a column-by-column manner; that is, all elements of column 1, followed by all elements of column 2, etc. *Contrast:* row-major order. (C) 610.5-1990w

**column position** A unit of horizontal measure related to characters in a line. It is assumed that each character in a character set has an intrinsic column width independent of any output device. Each printable character in the portable character set has a column width of one. The standard utilities, when used as described in this standard, assume that all characters have integral column widths. The column width of a character is not necessarily related to the internal representation of the character (numbers of bits or octets). The column position of a character in a line is defined as one plus the sum of the column widths of the preceding characters in the line. Column positions are numbered starting from 1. (C/PA) 9945-2-1993

**column, positive** *See:* positive column.

**column select line** The line that is determined by the column addresses (output of the Y decoder) that are used to select the appropriate access transistors during a read or write. (ED) 1005-1998

**column select transistor** The transistor, controlled by the column select line, that accesses the appropriate bit-line during a read or write cycle. (ED) 1005-1998

**column sort** *See:* distribution sort.

**column split** The capability of a punch card device to read or punch two parts of a card column independently. (C) 1084-1986w

**column vector** A matrix with only one column. That is, a matrix of size *m*-by-1. *Contrast:* row vector. (C) 610.5-1990w

**COM** *See:* computer output microfilm.

**comb filter** A filter whose insertion loss forms a sequence of narrow pass bands or narrow stop bands centered at multiples of some specified frequency. (CAS) [13]

**combination** An unordered sequence of items chosen from a set. *Contrast:* permutation. *See also:* forbidden combination. (C) 610.5-1990w

**combinational** Pertaining to a logic whose output values at any given instant depend only upon the input values at that time. *Contrast:* sequential. (C) 610.10-1994w

**combinational circuit** A logic circuit whose output values at any given instant depend only upon the input values at that time. *Synonym:* combinatorial circuit. *Contrast:* sequential circuit. *See also:* gate. (C) 610.10-1994w

**combinational logic element (A)** A device having zero or more input channels and one output channel, each of which is always in one of exactly two possible physical states, except during switching transients. *Note:* On each of the input channels and the output channel, a single state is designated arbitrarily as the "one" state, for that input channel or output channel, as the case may be. For each input channel and output channel, the other state may be referred to as the "zero" state. The device has the property that the output channel state is determined completely by the comtemporaneous input-channel-state combination, to within switching transients. **(B)** By extension, a device similar to that in definition (A), except that one or more of the input channels or the output channel, or both, have a finite number, but more than two, possible physical states each of which is designated as a distinct logic state. The output channel state is determined completely by the contemporaneous input-channel-state combination, to within switching transients. **(C)** A device similar to that of definition (A) or (B), except that it has more than one output channel. *See also:* OR gate; AND gate. (C) 162-1963

**combinational logic function** A logic function in which there exists one and only one resulting combination of states of the

outputs for each possible combination of input states. *Note:* The terms "combinative" and "combinatorial" have also been used to mean "combinational." (GSD) 91-1984r

**combination buoy (navigation aids)** A buoy that has more than one means of conveying intelligence. *See also:* buoy. (AES/GCS) 172-1983w

**combination controller** A full magnetic or semimagnetic controller with additional externally operable disconnecting means contained in a common enclosure. The disconnecting means may be a circuit breaker or a disconnect switch. *See also:* electric controller. (IA/ICTL/IAC) [60]

**combination current and voltage regulation** That type of automatic regulation in which the generator regulator controls both the voltage and current output of the generator. *Note:* This type of control is designed primarily for the purpose of ensuring proper charging of storage batteries on cars or locomotives. *See also:* axle-generator system. (EEC/PE) [119]

**combination detector (fire protection devices)** A device that either responds to more than one of fire phenomena (heat, smoke, or flame) or employs more than one operating principle to sense one of these phenomena. (NFPA) [16]

**combination effect** An electric disturbance not caused by one of the following mechanisms, but to some extent by a combination of them: normal-mode noise (transverse or differential), common-mode noise (longitudinal), and common-mode to normal-mode conversions. *See also:* normal-mode. (PE/IC) 1143-1994r

**combination electric locomotive** An electric locomotive, the propulsion power for which may be drawn from two or more sources, either located on the locomotive of elsewhere. *Note:* The prefix "combination" may be applied to cars, buses, etc., of this type. *See also:* electric locomotive. (EEC/PE) [119]

**combination lighting and appliance branch circuit** A circuit supplying energy to one or more lighting outlets and to one or more appliance outlets. *See also:* branch circuit. (EEC/PE) [119]

**combination microphone** A microphone consisting of a combination of two or more similar or dissimilar microphones. Examples: Two oppositely phased pressure microphones acting as a gradient microphone; a pressure microphone and velocity microphone acting as a unidirectional microphone. *See also:* microphone. (EEC/PE) [119]

**combination monopulse** A form of monopulse employing amplitude comparison in one angular coordinate plane and phase comparison in the orthogonal coordinate plane. (AES) 686-1997

**combination rubber tape** The assembly of both rubber and friction tape into one tape that provides both insulation and mechanical protection for joints. (EEC/PE) [119]

**combinations of pulses and waveforms** *See:* bipolar pulse; double pulse; staircase.

**combination starter (packaging machinery)** A starter having manually operated disconnecting means built into the same enclosure with the magnetic contactor. (IA/PKG) 333-1980w

**combination support (raceway systems for Class 1E circuits for nuclear power generating stations)** A support that serves either raceways or different types of raceway(s) and other mechanical or electric systems such as heating, ventilating, and air-conditioning (HVAC) ducts, piping, and lighting fixtures. (PE/NP) 628-1987r

**combination surge** *See:* combination wave.

**combination thermoplastic tape** An adhesive tape composed of a thermoplastic compound that provides both insulation and mechanical protection for joints. (EEC/PE) [119]

**combination-type surge protective device** A surge protective device that incorporates both voltage-switching-type components and voltage-limiting-type components may exhibit voltage switching, voltage limiting, or both voltage-switching and voltage-limiting behavior, depending upon the characteristics of the applied voltage. (SPD/PE) C62.48-1995

**combination watch-report and fire-alarm system** A coded manual fire-alarm system, the stations of which are equipped to transmit a single watch-report signal or repeated fire-alarm signals. *See also:* protective signaling. (EEC/PE) [119]

**combination wave (1)** The combination wave is delivered by a generator that applies a 1.2/50 voltage impulse across an open circuit and an 8/20 impulse current into a short circuit. The voltage and current and wave forms that are delivered to the surge protective device (SPD) are determined by the generator and the impedance of the SPD to which the surge is applied. The ratio of open-circuit voltage to peak short-circuit current is 2 ω. (PE) C62.34-1996

**(2)** A surge delivered by an instrument that has the inherent capability of applying a 1.2/50-voltage wave across an open-circuit, and delivering an 8/20-current wave into a short circuit. The instantaneous impedance to which the combination wave is applied determines the exact wave that is delivered. The peak magnitudes of the voltage or current wave shall be specified. *Synonym:* combination surge. (SPD/PE) C62.62-2000

**combinatorial circuit** *See:* combinational circuit.

**combined head** *See:* read/write head.

**combined-line-recording trunk (CLR) (telephone switching)** A one-way trunk for operator recording and extending of toll calls. (COM) 312-1977w

**combined mechanical and electrical strength (insulators)** The loading in pounds at which the insulator fails to perform its function either electrically or mechanically, voltage and mechanical stress being applied simultaneously. *Note:* The value will depend upon the conditions under which the test is made. *See also:* insulator; tower. (T&D/PE) [10]

**combined-stress aging** A form of accelerated aging in which several stresses are applied simultaneously. Ideally, the relative levels of the stresses are adjusted to produce the anticipated effects of the operational and environmental stresses in service. (DEI/RE) 775-1993w

**combined telephone set** A telephone set including in a single housing all the components required for a complete telephone set except the handset which it is arranged to support. *Note:* Wall hand telephone sets are of this type, but the term is usually reserved for a self-contained desk telephone set to distinguish it from desk telephone sets requiring an associated bell box. A desk local-battery telephone set may be referred to as a combined set if it includes in its mounting all components except its associated local batteries. *See also:* telephone station. (EEC/PE) [119]

**combined uncertainty** The uncertainty resulting from combining category A and category B uncertainties, as defined by the Bureau International des Poids et Mésures (BIPM), using standard statistical methods. Category A uncertainties are evaluated by applying statistical methods to a series of repeated measurements and are characterized by the estimated standard deviation, $s_A$; category B uncertainties are assigned to quantities whose variation is not explicitly observed. Category B uncertainties are determined by estimating from other information an approximation to a corresponding "standard deviation," $s_B$, whose existence is assumed. They are combined as if they are all standard deviations. (NI) N42.14-1991

**combined voltage and current influence (wattmeter)** The percentage change (of full-scale value) in the indication of an instrument that is caused solely by a voltage and current departure from specified references while constant power at the selected scale point is maintained. *See also:* accuracy rating. (EEC/AII) [102]

**combustible** Capable of undergoing combustion in air, at pressures and temperatures that might occur during a fire in a building, or in a more severe environment when specified. (DEI) 1221-1993w

**combustible materials (power and distribution transformers)** Materials which are external to the apparatus and made of or surfaced with wood, compressed paper, plant fibers, or other materials that will ignite and support flame. (PE/TR) C57.12.80-1978r

**combustion** A chemical process of oxidation that occurs at a rate fast enough to produce heat and usually light, either as a glow or flame. (DEI) 1221-1993w

**combustion control** The regulation of the rate of combination of fuel with air in a furnace. (T&D/PE) [10]

**COM device** *See:* computer output microfilmer.

**come-along** *See:* conductor grip.

**comic-strip oriented image** In micrographics, an image appearing on a roll of microfilm in such a manner that the top edge of the image is parallel to the long edge of the film. *Synonym:* landscape image. *Contrast:* cine-oriented image. (Std100) 10.2-1987

**COMIT** One of the first languages designed to manipulate text strings; provides pattern matching and substitution capabilities. (C) 610.13-1993w

**Comité Consultatif Internationale Télégraphique et Téléphone (CCITT) (1) (data transmission)** An advisory committee established under the United Nations in accordance with the International Tele-Communications Convention (Geneva 1959) Article 13, to study and recommend solutions for questions on technical operation and tariffs. The organization is attempting to establish standards for intercountry operation on a worldwide basis. (PE) 599-1985w

**(2)** An international organization that studies and issues recommendations on issues related to communication technology. *Note:* Also know in English as International Telegraph and Telephone Consultative Committee. (C) 610.10-1994w

**comma** In 1000BASE-X, the seven-bit sequence that is part of an 8B/10B code-group that is used for the purpose of code-group alignment. (C/LM) 802.3-1998

**comma-** In 1000BASE-X, the seven-bit sequence (1100000) of an encoded data stream. (C/LM) 802.3-1998

**comma+** In 1000BASE-X, the seven-bit sequence (0011111) of an encoded data stream. (C/LM) 802.3-1998

**command (1) (logical link control)** In data communications, an instruction represented in the control field of a protocol data unit (PDU) and transmitted by a logical link control (LLC). It causes the addressed LLC(s) to execute a specific data link control function. (LM/PE/C/TR/CC) 799-1987w, 8802-2-1998

**(2) (A) (electronic computation)** One of a set of several signals (or groups of signals) that occurs as a result of interpreting an instruction; the commands initiate the individual steps that form the process of executing the instruction's operation. **(B) (electronic computation)** Loosely: an instruction in machine language. **(C) (electronic computation)** Loosely: a mathematical or logic operator. **(D) (electronic computation)** Loosely: an operation. (MIL/C/Std100) [2], [20], [85], 162-1963

**(3)** An input variable established by means external to, and independent of, the feedback (automatic) control system. It sets, is equivalent to, and is expressed in the same units as the ideal value of the ultimately controlled variable. *See also:* feedback control system; set point. (IA/ICTL/IAC) [60]

**(4) (software)** An expression that can be input to a computer system to initiate an action or affect the execution of a computer program; for example, the "log on" command to initiate a computer session. (C) 610.12-1990

**(5)** A pulse, signal, or set of signals initiating one step in the performance of a controlled operation. (SUB/PE) 999-1992w

**(6)** A procedure in the Forth programming language. The execution of a command performs some operation, usually affecting the state of one or more system resources in a predefined way. (New commands may be defined as sequences of previously defined commands. Most commands have human-readable names expressed as a sequence of textual characters.) *See also:* word name; Forth word. (C/BA) 1275-1994

**(7)** Any communication from a commander to a message-based servant, consisting of a write to the servant's data low register, possibly preceded by a write to the data high or data high and data extended registers. (C/MM) 1155-1992

**(8)** A directive to the shell to perform a particular task. (C/PA) 9945-2-1993

**(9) (A)** In hardware, a control signal. **(B)** An expression that can be input to a computer system to initiate aan action or affect the execution of a computer program; for example, the (log on( command to initiate a computer session. **(C)** Loosely, a mathematical or logic operator. **(D)** Loosely, a computer instruction. (C) 610.10-1994

**(10)** A message from the host directed to the printer that may or may not include print data. (C/MM) 1284.1-1997

**(11)** A package of information transmitted from the roadside to the vehicle that requests that the transponder on the vehicle perform a specific action. (SCC32) 1455-1999

**(12)** The instruction sent from an initiator to a target directing the target to execute a specified process. (C/MM) 1284.4-2000

**command character** *See:* control character.

**command control (electric power system)** An automatic generation control methodology that reduces unit control error irrespective of area control error. (PE/PSE) 94-1991w

**command-driven** Pertaining to a system or mode of operation in which the user directs the system through commands. *Contrast:* menu-driven. (C) 610.12-1990

**commander** A message-based device that is also a bus master and can control one or more servants. (C/MM) 1155-1992

**command group** A set of commands with defined behaviors, the group as a whole providing some particular capability (for example, one command group is concerned with client program debugging). (C/BA) 1275-1994

**command guidance (navigation aid terms)** Guidance in which information transmitted to a craft from an outside source causes it to follow a prescribed path. (AES/GCS) 172-1983w

**command interpreter** The portion of a Forth system that processes user input and Forth language source code by accepting a sequency of textual characters representing Forth word names and executing the corresponding Forth words. (C/BA) 1275-1994

**command key** Any control key on a keyboard used to represent a particular machine command. (C) 610.10-1994w

**command language (1) (software)** A language used to express commands to a computer system. *See also:* command-driven. (C) 610.12-1990

**(2)** A computer language used to express commands to a computer system and to control their execution. For example, job control language, or REXX. *Synonym:* command-level language. *See also:* interactive language; declarative language; rule-based language. (C) 610.13-1993w

**(3)** A type of dialog in which a user composes entries to evoke a system response. (PE/NP) 1289-1998

**command language interpreter** *See:* shell.

**command-level language** *See:* command language.

**command line interface** A means of invoking utilities by issuing commands from within a POSIX.2 shell, implying that neither graphics nor windows are required. (C/PA) 1387.2-1995

**command link (communication satellite)** A data transmission link (generally earth to spacecraft or satellite) used to command a satellite or spacecraft in space. (COM) [24]

**command protocol data unit (PDU) (1) (logical link control)** All PDU's transmitted by a logical link control (LLC) in which the C/R (command/response) bit is equal to "O." (PE/TR) 799-1987w

**(2)** All PDUs sent by an LLC in which the C/R bit in the SSAP address field is equal to "0."
(C/LM/CC) 8802-2-1998

**command rate (gyros)** The input rate equivalent of a torquer command signal. (AES/GYAC) 528-1994

**command readout (numerically controlled machines)** Display of absolute position as derived from position command. *Note:* In many systems the readout information may be taken directly from the dimension command storage. In others it may result from the summation of command departures.
(IA) [61]

**command reference (power supplies) (servo or control system)** The voltage or current to which the feedback signal is compared. As an independent variable, the command reference exercises complete control over the system output. *See also:* operational programming. (AES) [41]

**command_reset** An initialization event that is initiated by a write to the RESET_START CSR.
(C/BA) 896.2-1991w, 896.10-1997

**Command Resource Unavailable (CRU) bit** A bit in the Bus Error register of all S-modules. An S-module sets this bit to indicate that resources required to complete execution of a command were not available and that the command was not executed. (TT/C) 1149.5-1995

**commands, class of** One of the groups of MTM-Bus commands. Every MTM-Bus command is assigned to a command class. (TT/C) 1149.5-1995

**Command Sequence Error (CSE) bit** A bit in the Bus Error register of all S-modules. An S-module sets this bit to indicate that the module has received a command that requires a previous enabling command without receipt of such an enabling command. (TT/C) 1149.5-1995

**command set** A field in the Device ID message identifying the type of data expected by the peripheral. For example, a printer might use this field to report which page description language(s) it supports. (C/MM) 1284-1994

**command transfer** The passing of command information over the system control signal group, from the bus owner to the replying agent(s), during the request phase of a transfer operation. Command information includes parameters for the impending transfer operation, as well as additional address space information not transmitted with the address transfer. *See also:* system control signal group; request phase.
(C/MM) 1296-1987s

**command & US core;_reset** An initialization event that is initiated by a write to the RESET_START register.
(C/MM) 1212-1991s

**command *X*, receipt of** Error-free receipt of the HEADER packet containing in its Command field the command code of *X*. (TT/C) 1149.5-1995

**comment (software)** Information embedded within a computer program, job control statements, or a set of data, that provides clarification to human readers but does not affect machine interpretation. (C) 610.12-1990

**comment source statements** Source statements that provide information to people reading the software source code and are ignored by the compiler. (C/SE) 1045-1992

**commercial character (A)** One of the set of characters used commonly in commercial operations; for example, CR (credit) and DB (debit). **(B)** A character within a picture specification that represents one of the characters as in (A).
(C) 610.5-1990

**commercial data processing** Data processing performed to support a commercial organization or function.
(C) 610.2-1987

**commercial grade dedication** A process of evaluating (which includes testing) and accepting commercial grade items to obtain adequate confidence of their suitability for safety application. (PE/NP) 7-4.3.2-1993

**commercial grade item** An item satisfying a), b), and c) below:

a) Not subject to design or specification requirements that are unique to nuclear facilities
b) Used in applications other than nuclear facilities
c) Ordered from the manufacturer/supplier on the basis of specifications set forth in the manufacturer's published product description (for example, catalog)

. (PE/NP) 7-4.3.2-1993

**commercial grade part** (replacement parts for Class 1E equipment in nuclear power generating stations) A part that is:

a) Not subject to design or specification requirements that are unique to nuclear power plants;
b) Used in applications other than nuclear power plants;
c) Ordered from the manufacturer/supplier on the basis of specifications set forth in the manufacturer's published product description (for example, a catalog).

(PE/NP) 934-1987w

**commercial-off-the-shelf (COTS)** Software defined by a market-driven need, commercially available, and whose fitness for use has been demonstrated by a broad spectrum of commercial users. (C/SE) 1062-1998

**commercial operation** The acceptance, by the user, of the static var compensator (SVC) from the supplier.
(PE/SUB) 1031-2000

**commercial power (1) (emergency and standby power)** Power furnished by an electric power utility company; when available, it is usually the prime power source. However, when economically feasible, it sometimes serves as an alternative or standby source. *Synonym:* utility power.
(IA/PSE) 446-1995

**(2)** Power furnished by an electric power utility company.
(IA/PSE) 1100-1999

**commercial, residential, and institutional buildings** All buildings other than industrial buildings and residential dwellings.
(IA/PSE) 241-1990r

**commercial tank (electrorefining)** An electrolytic cell in which the cathode deposit is the ultimate electrolytically refined product. *See also:* electrorefining. (EEC/PE) [119]

**commercial zone** A zone that includes offices, shops, hotels, motels, service establishments, or other retail/commercial facilities as defined by local ordinances.
(PE/SUB) 1127-1998

**commissioning** The process of providing to the appropriate components, the information necessary for the designed communication between components. (IM/ST) 1451.1-1999

**Commission Internationale de l'Eclairage** The initials CIE are the initials of the official French name of the International Commission on Illumination. This translated name is approved for usage in English-speaking countries, but at its 1951 meeting the Commission recommended that only the initials of the French name be used. The initials ICI, which have been used commonly in this country, are deprecated because they conflict with an important trademark registered in England and because the initials of the name translated into other languages are different. (BT/AV) 201-1979w

**commissioning tests (rotating machinery)** Tests applied to a machine at site under normal service conditions to show that the machine has been erected and connected in a correct manner and is able to work satisfactorily. *See also:* asynchronous machine. (PE) [9]

**common** *See:* common storage.

**common ancestor constraint** A kind of constraint that involves two or more relationship paths to the same ancestor class and states either that a descendent instance must be related to the *same* ancestor instance through each path or that it must be related to a *different* ancestor instance through each path.
(C/SE) 1320.2-1998

**common area** *See:* common storage.

**common-battery central office** *See:* common-battery office.

**common-battery office (telephone switching systems)** A central office that supplies transmitter and signaling currents for its associated stations and current for the central office equipment from a power source located in the central office.
(COM) 312-1977w

**common-battery signaling (data transmission)** A method of actuating a line or supervisory signal at the distant end of a telephone line by the closure of a direct-current (dc) circuit with the exchange providing the feeding current. (PE) 599-1985w

**common-battery switchboard** A telephone switchboard for serving common-battery telephone sets. (COM) [48]

**common block** *See:* common storage.

**common bonding network (CBN) (A)** The principal means for affecting bonding and earthing inside a building. **(B)** The set of metallic components that are intentionally or incidentally interconnected to form the (earthed) bonding network (a mesh) in a building. These components include structural steel or reinforcing rods, metallic plumbing, ac power conduit, equipment grounding conductors, cable racks, and bonding conductors. The CBN always has a mesh topology and is connected to the grounding electrode system. *Note:* The CBN may also be known in the public telephone network as an integrated ground plane. (IA/PSE) 1100-1999

**COmmon Business-Oriented Language (COBOL)** A high-order programming language standardized by ANSI and ISO, designed for business applications. *See also:* common language; general-purpose programming language; IDS/1. (C) 610.13-1993w

**common carrier (1)** In telecommunications, a public utility company that is recognized by an appropriate regulatory agency as having a vested interest and responsibility in furnishing communication services to the general public. *See also:* value-added service; specialized common carrier. (LM/COM) 168-1956w

**(2)** *See also:* communications common carrier. (C) 610.7-1995

**common-cause failure (1) (reliability data for pumps and drivers, valve actuators, and valves)** Two or more redundant component failures due to a single cause. The common-cause events that cause multiple failures are usually secondary events or events that exceed the design envelope of the component. (PE/NP) 500-1984w

**(2) (nuclear power generating station safety systems)** Multiple failures attributable to a common cause. (PE/NP) 379-1994, 603-1998, 933-1999

**common-channel interoffice signaling (telephone switching systems)** The use of separate paths between switching entities to carry the signaling associated with a group of communication paths. (COM) 312-1977w

**common class** Defines those aspects of different software objects that are the same. The common classes for this standard are software_collections, software, and software_files. The names of these classes are also used to generically describe any object that shares that common class. (C/PA) 1387.2-1995

**common control (telephone switching systems)** An automatic switching arrangement in which the control equipment necessary for the establishment of connections is shared, being associated with a given call only during the period required to accomplish the control function. (COM) 312-1977w

**common coupling** *See:* common-environment coupling.

**common data** *See:* global data.

**common device** (of a supervisory system) A device in either the master or remote station that is required for the basic operation of the supervisory system and is not part of the equipment for the individual points. *Synonym:* basic device. (SWG/PE) C37.100-1992

**common-environment coupling** A type of coupling in which two software modules access a common data area. *Synonym:* common coupling. *Contrast:* pathological coupling; content coupling; data coupling; control coupling; hybrid coupling. (C) 610.12-1990

**common equipment** That complement of either the master or remote station supervisory equipment that interfaces with the interconnecting channel and is otherwise basic to the operation of the supervisory system, but is exclusive of those elements that are peculiar to and required for the particular applications and uses of the equipment. (SWG/PE/SUB) C37.100-1992, C37.1-1987s

**common language** Any programming language that is used widely on a variety of computers; For example, BASIC, C, COBOL, and FORTRAN. *See also:* general-purpose programming language. (C) 610.13-1993w

**Common LISP** A dialect of LISP that is widely accepted as the standard language for LISP. *See also:* CLOS. (C) 610.13-1993w

**Common LISP Object System** An object-oriented language based on Common LISP. (C) 610.13-1993w

**common-mode (1) (general)** The instantaneous algebraic average of two signals applied to a balanced circuit, both signals referred to a common reference. *See also:* oscillograph. (IM/HFIM) [40]

**(2) (medical electronics)** (in-phase signal) A signal applied equally and in phase to the inputs of a balanced amplifier or other differential device. (EMB) [47]

**common-mode conversion (interference terminology)** The process by which differential-mode interference is produced in a signal circuit by a common-mode interference applied to the circuit.Common-mode currents are converted to differential-mode voltages by impedances $R_1$, $R_2$, $R_3$, $R_4$, $R_S$, $R_R$, and $c$. The differential-mode voltage at the receiver resulting from the conversion is the algebraic summation of the voltage drops produced by the various currents in these impedances. Various of the impedances may be neglected at particular frequencies. At direct current,

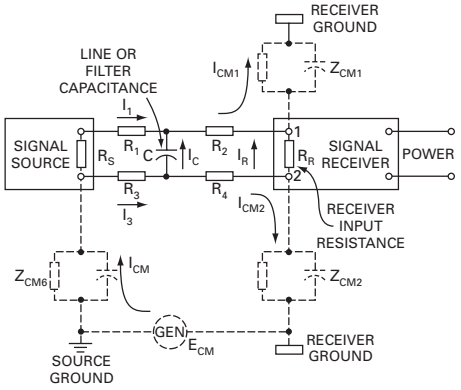
$$V_{CM} = I_r R_r \approx I_{CM1}\,(R_S + R_1 + R_2) - I_{CM2}\,(R_3 + R_4)$$

At

$$f > \frac{I}{c(R_1 + R_3 + R_S)}$$

$$V_{CM} \approx I_c X_c \frac{R_R}{R_2 + R_4 + R_R}$$

*See also:* interference.



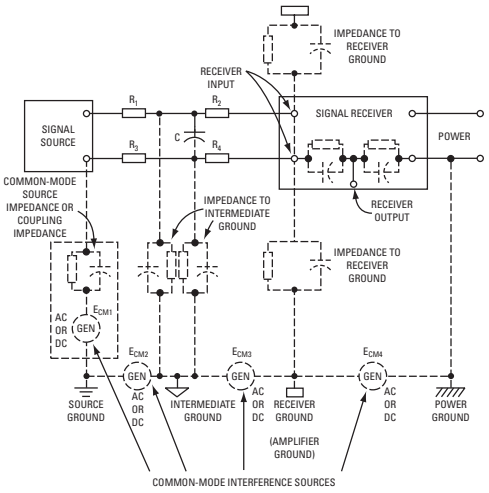

**common-mode conversion**

(IE) [43]

**common-mode failure (nuclear power generating station) (safety systems equipment in nuclear power generating stations)** Multiple failures attributable to a common cause. (SWG/PE/NP) 627-1980r, 650-1979s, 649-1980s, 308-1980s, C37.100-1992

**common-mode interference (1) (automatic null-balanced electrical instruments)** Interference that appears between both signal leads and a common reference plane (ground) and causes the potential of both sides of the transmission path to be changed simultaneously and by the same amount relative to the common reference plane (ground). *See also:* interference. (IE/EMC/PE/SUB) [43], C63.13-1991, C37.1-1994

**(2)** A form of interference that appears between any measuring circuit terminal and ground. *See also:* accuracy rating.




Common-mode interference sources and current paths. The common-mode voltage $V_{CM}$ in any path is equal to the sum of the common-mode generator voltages in that path; for example, in the source-receiver path.

$$V_{CM} = E_{CM1} + E_{CM2} + E_{CM3}.$$

**common-mode interference** (EEC/SUB/PE/EMI) [112], C37.1-1994

**common-mode noise (longitudinal)** The noise voltage that appears equally, and in phase, from each current carrying conductor to ground. (IA/PSE) 1100-1999

**common-mode outage** *See:* common-mode outage event.

**common-mode outage event** A related multiple outage event consisting of two or more primary outage occurrences initiated by a single incident or underlying cause where the outage occurrences are not consequences of each other. *Note:* Primary outage occurrences in a common-mode outage event are referred to as common-mode outage occurrences or simply common-mode outages. Examples of common-mode outage events are a single lightning stroke causing tripouts of both circuits on a common tower, and an external object causing the outage of two circuits on the same right-of-way. *See also:* related multiple outage event. (PE/PSE) 859-1987w

**common-mode overvoltage** A signal level whose magnitude is less than the specified maximum safe common-mode signal but greater than the maximum operating common-mode signal. (IM/WM&A) 1057-1994w

**common-mode overvoltage recovery time** The time required for the recorder to return to its specified characteristics after the end of a common-mode overvoltage pulse. (IM/WM&A) 1057-1994w

**common-mode radio noise** Conducted radio noise that appears between a common reference plane (ground) and all wires of a transmission line causing their potentials to be changed simultaneously and by the same amount relative to the common reference plane (ground). (EMC) C63.4-1991

**common-mode rejection** (in-phase rejection) The ability of certain amplifiers to cancel a common-mode signal while responding to an out-of-phase signal. (EMB) [47]

**common-mode rejection quotient** (in-phase rejection quotient) The quotient obtained by dividing the response to a signal applied differentially by the response to the same signal applied in common mode, or the relative magnitude of a common-mode signal that produces the same differential response as a standard differential input signal. (EMB) [47]

**common-mode rejection ratio (CMRR) (1) (signal-transmission signal)** The ratio of the common-mode interference voltage at the input terminals of the system to the effect produced by the common-mode interference, referred to the input terminals for an amplifier. For example,

$$\text{CMRR} = \frac{V_{CM}\text{ (root-mean-square) at input}}{\text{effect at output/amplifier gain}}$$

*See also:* interference. (IE) [43]

**(2) (oscilloscopes)** The ratio of the deflection factor for a common-mode signal to the deflection factor for a differential signal applied to a balanced-circuit input. *See also:* oscillograph.

**(3)** The ratio of the input common-mode signal to the effect produced at the output of the recorder in units of the input. (IM/WM&A) 1057-1994w

**common mode signal** The average value of the signals at the positive and negative inputs of a differential input waveform recorder. If the signal at the positive input is designated $V_+$, and the signal at the negative input is designated $V_-$, then the common mode signal ($V_{cm}$) is

$$V_{cm} = \frac{V+ + V-}{2}$$

(IM/WM&A) 1057-1994w

**common-mode to normal-mode conversion** In addition to the common-mode voltages which are developed in the single conductors by the general environmental sources of electrostatic and electromagnetic fields, differences in voltage exist between different ground points in a facility due to the flow of ground currents. These voltage differences are considered common mode when connection is made to them either intentionally or accidentally, and the currents they produce are common mode. These common-mode currents can develop normal-mode noise voltage across unequal circuit impedances. (PE/SUB/EDPG) 422-1977, 525-1992r

**common-mode voltage (1)** The voltage that, at a given location, appears equally and in phase from each signal conductor to ground. (PE/PSR) C37.90.1-1989r

**(2)** The instantaneous algebraic average of two signals applied to a balanced circuit, with both signals referenced to a common reference. *Synonym:* longitudinal voltage. (LM/C) 802.3-1998

**(3) (surge withstand capability tests)** The voltage common to all conductors of a group as measured between that group at a given location and an arbitrary reference (usually earth). (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**(4)** The instantaneous algebraic mean of two signals applied to a balanced circuit, where both signals are referred to a common reference.local area networks. (C) 8802-12-1998

**common return** A return conductor common to several circuits. *See also:* center of distribution. (T&D/PE) [10]

**common services** Data type and functional declarations defining an application procedural interface used to access and manipulate numerical and digital data, physical data units, mathematical functions and constants, unit conversion factors, and functions used by two or more interfaces. (SCC20) 1226-1998

**common spectrum multiple access (communication satellite)** A method of providing multiple access to a communication satellite in which all of the participating earth stations use a common time-frequency domain. Signal processing is employed to detect a wanted signal in the presence of others. Three typical approaches utilizing these techniques are spread spectrum, frequency-time matrix, and frequency-hopping. (COM) [19]

**common storage** A portion of main storage that can be accessed by two or more modules in a software system. *Synonyms:* common area; common block. *See also:* global data. (C) 610.12-1990, 610.10-1994w

**common trunk (telephone switching systems)** A trunk, link, or junctor accessible from all input groups of a grading. (COM) 312-1977w

**common use** Simultaneous use by two or more utilities of the same kind. (NESC) C2-1997

**common winding (power and distribution transformers) (autotransformer)** That part of the autotransformer winding that is common to both the primary and secondary circuits. *Synonym:* shunt winding. (PE/TR) C57.15-1999, C57.12.80-1978r

**communication (1) (data transmission) (electric systems) (telecommunications)** The transmission of information from one point to another by means of electromagnetic waves. (PE) 599-1985w

**(2)** The flow of information from one point, known as the source, to another, the receive. (C) 610.10-1994w

**communication access** Passive and active attacks on information transmitted over communication channels and on the system's communication services themselves. This threat area assumes that an intruder has access to the communication media or the components (both hardware and software) that provide the communication services. (C/BA) 896.3-1993w

**communication channel** A facility that permits signaling between terminals. (SUB/PE) 999-1992w

**communicational cohesion** A type of cohesion in which the tasks performed by a software module use the same input data or contribute to producing the same output data. *Contrast:* coincidental cohesion; functional cohesion; temporal cohesion; sequential cohesion; procedural cohesion; logical cohesion. (C) 610.12-1990

**communication band** *See:* frequency band of emission.

**communication circuits** Electrical circuits supplying equipment and systems for voice, sound, or data transmission, such as telephone, engine order telegraph, data communication, interior communication, paging systems, wired music systems, fire and general alarm systems, smoke and fire detection systems, closed circuit television, navigational equipment, and microprocessor based automated alarm and control systems. (IA/MT) 45-1998

**communication conductor** (measuring longitudinal balance of telephone equipment operating in the voice band) A conductor used in a communication network. (COM/TA) 455-1985w

**communication control character (1)** A functional character intended to control or facilitate transmission over data networks. Control characters form the basis for character-oriented communications control procedures. (LM/COM) 168-1956w

**(2) (data management)** *See also:* transmission control character. (C) 610.5-1990w

**communication facility (data transmission)** Anything used or available for use in the furnishing of communication service. (PE) 599-1985w

**communication interface** That part of the API devoted to communications with other application software, external data transport facilities, and devices. (C/PA) 14252-1996

**communication line** *See:* telecommunication line.

**communication lines (1)** The conductors and their supporting or containing structures that are used for public or private signal or communication service, and which operate at potentials not exceeding 400 V to ground or 750 V between any two points of the circuit, and the transmitted power of which does not exceed 150 W. When operating at less than 150 V, no limit is place on the transmitted power of the system. Under specified conditions, communication cables may include communication circuits exceeding the preceding limitation where such circuits are also used to supply power solely to communication equipment. *Note:* Telephone, telegraph, railroad-signal, data, clock, fire, police-alarms, cable television and other systems conforming with the above are included. Lines used for signaling purposes, but not included under the above definition, are considered as supply lines of the same voltage and are to be so installed. *See also:* electric supply lines. (NESC/T&D) C2.2-1960

**(2)** The conductors and their supporting or containing structures that are used for public or private signal or communications service, and which operate at potentials not exceeding 400 V to ground or 750 V between any two points of the circuit, and the transmitted power of which does not exceed 150 W. When operating at less than a nominal voltage of 90 V, no limit is placed on the transmitted power of the system. Under specified conditions, communication cables may include communication circuits exceeding the preceding limitation where such circuits are also used to supply power solely to communications equipment. *Note:* Telephone, telegraph, railroad-signal, data, clock, fire, police-alarm, cable-television, and other systems conforming with the above are included. Lines used for signaling purposes, but not included under the above definition, are considered as supply lines of the same voltage and are to be so installed. (NESC) C2-1997

**communication provider** A component of the system that provides the communications service through an endpoint. (C) 1003.5-1999

**communication reliability (mobile communication)** A specific criterion of system performance related to the percentage of times a specified signal can be received in a defined area during a given interval of time. *See also:* mobile communication system. (VT) [37]

**communications architecture** The hardware and software structure that facilitates the communications operations. (C) 610.7-1995

**communication satellite** A satellite used for communication between two or more ground points by transmitting the messages to the satellite and retransmitting them to the participating ground station. (COM) [24]

**communications-based train control** A continuous automatic train control system utilizing high-resolution train location determination, independent of track circuits; continuous, high capacity, bidirectional train-to-wayside data communications; and trainborne and wayside processors capable of implementing vital functions. (VT/RT) 1474.1-1999

**communications cable** A cable that carries a low level of electric energy used for the transmission of communication frequencies. A telephone-type cable consists of two or more solid, insulated, twisted, paired and/or quadded, shielded or unshielded conductors ranging from No 19 to No 26 AWG, with either a shielded or unshielded sheath. (PE/PSC) 789-1988w

**communications common carrier (1) (data transmission)** A company recognized by an appropriate regulatory agency as having a vested interest in furnishing communications services to the public at large. (PE) 599-1985w

**(2)** In telecommunication, a public utility company that is recognized by an appropriate regulatory agency as having a vested interest in and responsibility for furnishing communications services to the general public. *Synonym:* common carrier. (C) 610.7-1995

**communications computer** A computer that is specially designed to be an interface between another computer or terminal and a network, or to control data flow in a network. *See also:* switching computer; front-end computer; concentrator. (C/COM) 610.7-1995, 168-1956w, 610.10-1994w

**communications controller** A dedicated computer that checks and manages data traffic through a network. (C) 610.7-1995

**communication security** Protective measures for information transmitted between system components, over telecommunication links, and through networks to provide data confidentiality, integrity, andauthenticity. (C/BA) 896.3-1993w

**communications endpoint** *See:* endpoint.

**communication services interface (CSI)** The boundary across which access to services for interaction between internal application software entities and application platform external entities is provided. (C/PA) 14252-1996

**communications interface equipment (relays and relay systems associated with electric power apparatus)** A portion of a relay system that transmits information from the relay logic to a communications link, or conversely to logic, for

example, audio tone equipment, a carrier transmitter-receiver when an integral part of the relay system. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**communications link (relays and relay systems associated with electric power apparatus)** Any of the communications media, for example, microwave, power line carrier, wire line. (PE/PSR) C37.90-1978s

**communications network** A network of communication circuits managed as a single unit. *See also:* computer network; value-added network. (C) 610.7-1995

**communications processor** A computer that performs protocol (terminates one or more protocols layers) or network management functions. (C) 610.7-1995

**communications user** An application that uses process-to-process communication services. (C) 1003.5-1999

**communications zone** The area of space within which a beacon can communicate with transponders in or on passing vehicles. (SCC32) 1455-1999

**communications security** The use of administrative, technical, or physical measures to deny unauthorized persons information from a computer or a communications network and to ensure the authenticity and integrity of such communications. (C) 610.7-1995

**communication theory (data transmission)** The mathematical theory underlying the communication of messages from one point to another. (PE) 599-1985w

**community antenna television (CATV)** *See:* cable TV.

**community antenna television (CATV)-type broadband medium** A broadband system comprising coaxial cables, taps, splitters, amplifiers, and connectors the same as those used in CATV or cable television installations. (C/LM) 802.3-1998

**community dial office (telephone switching systems)** A small automatic central office that serves a separate exchange area that ordinarily has no permanently assigned central office operating or maintenance forces. (COM) 312-1977w

**community-of-interest (telephone switching systems)** A characteristic of traffic resulting from the calling habits of the customers. (COM) 312-1977w

**commutated antenna direction finder (CADF) (navigation aid terms)** A system using a multiplicity of antennas in a circular array and a receiver which is connected to the antennas in sequence through a commutating device for finding the direction of arrival of radio waves; the directional sensing is related to phase shift that occurs as a result of the communication. (AES/GCS) 172-1983w

**commutating angle (1) (rectifier circuits)** The time, expressed in degrees, during which the current is commutated between two rectifying elements. *See also:* rectifier circuit element; rectification. (IA) [62]

**(2) (thyristor converter circuit)** ($\mu$) The time, expressed in degrees (one cycle of the ac wave form—360°), during which the current is commutated between two thyristor converter circuit elements. (IA/IPC) 444-1973w

**commutating capacitor (converter circuit elements) (self-commutated converters)** A capacitor that provides commutating voltage for circuit-commutated thyristors in a self-commutated converter. (IA/SPC) 936-1987w

**commutating-field winding** An assembly of field coils, located on the commutating poles, that produces a field strength approximately proportional to the load current. The commutating field is connected in direction and adjusted in strength to assist the reversal of current in the armature coils for successful commutation. This field winding is used along, or supplemented by, a compensating winding. *See also:* asynchronous machine. (EEC/PE) [119]

**commutating group (1) (rectifier circuits)** A group of rectifier-circuit elements and the alternating-voltage supply elements conductively connected to them in which the direct current of the group is commutated between individual elements that conduct in succession. *See also:* rectifier; rectification; circuit element. (IA) [62]

**(2)** A group of thyristor converter circuit elements and the alternating-voltage supply elements conductively connected to them in which the direct current of the group is commutated between individual elements that conduct in succession. (IA/IPC) 444-1973w

**commutating impedance (1) (rectifier transformer)** The impedance that opposes the transfer of current between two direct-current winding terminals of a commutating group, or a set of commutating groups. *See also:* rectifier transformer. (Std100) C57.18-1964w

**(2) (rectifier transformer)** The impedance that opposes the transfer of current between two secondary winding terminals of a commutating group, or a set of commutating groups. (PE/TR) C57.18.10-1998

**commutating period (inverters)** The time during which the current is commutated. *See also:* self-commutated inverters. (IA) [62]

**commutating pole (interpole)** An auxiliary pole placed between the main poles of a commutating machine. Its exciting winding carries a current proportional to the load current and produces a flux in such a direction and phase as to assist the reversal of the current in the short-circuited coil. (EEC/PE) [119]

**commutating reactance (thyristor converter)** The reactance that effectively opposes the transfer of current between thyristor converter circuit elements of a commutating group or set of commutating groups. *Note:* For convenience, the reactance from phase to neutral, or one half the total reactance in the commutating circuit, is the value usually employed in computations, and is designated as the commutating reactance. (IA/IPC) 444-1973w

**commutating reactance factor (rectifier circuits)** The line-to-neutral commutating reactance in ohms multiplied by the direct current commutated and divided by the effective (root-mean-square) value of the line-to-neutral voltage of the transformer direct-current winding. *See also:* circuit element; rectification. (IA) [62]

**commutating reactance transformation constant** A constant used in transforming line-to-neutral commutating reactance in ohms on the direct-current winding to equivalent line-to-neutral reactance in ohms referred to the alternating-current winding. *See also:* rectification. (IA) [62]

**commutating reactor (1) (converter circuit elements) (commutating inductor) (self-commutated converters)** An inductor having one or more windings that modifies or couples the transient current produced by the commutating voltage. (IA/SPC) 936-1987w

**(2) (power and distribution transformers)** A reactor used primarily to modify the rate of current transfer between rectifying elements. (PE/TR) C57.12.80-1978r

**commutating resistance (rectifier transformer)** The resistance component of the commutating impedance. *See also:* rectifier transformer. (Std100) C57.18-1964w

**commutating voltage (1) (self-commutated converters) (circuit properties)** The voltage that causes the current to commutate from one switching branch to another. *Notes:* 1. In an internally commutated converter, the commutating voltage is supplied by an ac (alternating current) source outside the converter. 2. In a self-commutated converter using switching devices that have turn-off capability, such as power transistors or gate turn-off thyristors, the commutating voltage results from the interruption of current in the outgoing device branch. 3. In a self-commutated converter using circuit-commutated thyristors, the commutating voltage is usually supplied by capacitors. (IA/SPC) 936-1987w

**(2) (ac adjustable-speed drives)** The voltage that causes the current to commutate from one switching branch to another. *Note:* In an externally commutated converter, the commutating voltage is supplied by an ac source outside the converter. (IA/ID) 995-1987w

**commutation (1) (circuit properties) (ac adjustable-speed drives) (self-commutated converters)** The transfer of

current from one converter switching branch to another. (IA/SPC/ID) 936-1987w, 995-1987w

**(2) (harmonic control and reactive compensation of static power converters)** The transfer of unidirectional current between thyristor (or diode) converter circuit elements that conduct in succession. (IA/IPC/SPC) 428-1981w, 519-1992, 444-1973w

**commutation elements (semiconductor rectifiers)** The circuit elements used to provide circuit-commutated turnoff time. *See also:* semiconductor rectifier stack. (IA) [62]

**commutation factor (1) (rectifier circuits)** The product of the rate of current decay at the end of conduction, in amperes per microsecond, and the initial reverse voltage, in kilovolts. *See also:* element; rectification. (IA) [62]

**(2) (gas tube)** The product of the rate of current decay and the rate of the inverse voltage rise immediately following such current decay. *Note:* The rates are commonly stated in amperes per microsecond and volts per microsecond. *See also:* rectification; heterodyne conversion transducer; gas tube. (ED) 161-1971w

**commutation interval (self-commutated converters) (circuit properties)** The time interval between the application of commutating voltage to a pair of commutating branches and the cessation of the resulting transient currents. *Note:* The commutation interval is the same as the overlap interval in an externally commutated converter in which the commutating voltage is supplied by the ac (alternating current) line. (IA/SPC) 936-1987w

**commutation shrink ring** A member that holds the commutator-segment assembly together and in place by being shrunk on an outer diameter of and insulated from the commutator-segment assembly. *See also:* commutator. (EEC/PE) [119]

**commutator (rotating machinery)** An assembly of conducting members insulated from one another, in the radial-axial plane, against which brushes bear, used to enable current to flow from one part of the circuit to another by sliding contact. (PE) [9]

**commutator bars** *See:* commutator segments.

**commutator bore** Diameter of the finished hole in the core that accommodates the armature shaft. *See also:* commutator. (EEC/PE) [119]

**commutator brush track diameter** That diameter of the commutator segment assembly that after finishing on the armature is in contact with the brushes. *See also:* commutator. (EEC/PE) [119]

**commutator core** The complete assembly of all of the retaining members of a commutator. *See also:* commutator. (EEC/PE) [119]

**commutator-core extension** That portion of the core that extends beyond the commutator segment assembly. *See also:* commutator. (EEC/PE) [119]

**commutator inspection cover** A hinged or otherwise attached part that can be moved to provide access to commutator and brush rigging for inspection and adjustment. *See also:* commutator. (EEC/PE) [119]

**commutator insulating segments (rotating machinery)** The insulation between commutator segments. (PE) [9]

**commutator insulating tube (rotating machinery)** The insulation between the underside of the commutator segment assembly and the core. *See also:* commutator. (PE) [9]

**commutator motor meter** (seismic qualification of Class 1E equipment for nuclear Power generating stations) A motor type of meter in which the rotor moves as a result of the magnetic reaction between two windings, one of which is stationary and the other assembled on the rotor and energized through a commutator and brushed. *See also:* electricity meter. (PE/NP) 344-1975s

**commutator nut** The retaining member that is used in combination with a vee ring and threaded shell to clamp the segment assembly. *See also:* commutator. (EEC/PE) [119]

**commutator riser (rotating machinery)** A conducting element for connecting a commutator segment to a coil. *See also:* commutator. (PE) [9]

**commutator-segment assembly** A cylindrical ring or disc assembly of commutator segments and insulating segments that are bound and ready for installation. *Note:* The binding used may consist of wire, temporary assembly rings, shrink rings, or other means. *See also:* commutator. (EEC/PE) [119]

**commutator segments (commutator bars)** Metal current-carrying members that are insulated from one another by insulting segments and that make contact with the brushes. *See also:* commutator. (EEC/PE) [119]

**commutator shell** The support on which the component parts of the commutator are mounted. *Note:* The commutator may be mounted on the shaft, on a commutator spider, or it may be integral with a commutator spider. *See also:* commutator. (EEC/PE) [119]

**commutator-shell insulation (rotating machinery)** The insulation between the under (or in the case of a disc commutator, the back) side of the commutator assembled segments and the commutator shell. *See also:* commutator. (PE) [9]

**commutator vee ring** The retaining member that, in combination with a commutator shell, clamps or binds the commutator segments together. *See also:* commutator. (EEC/PE) [119]

**commutator vee ring insulation (rotating machinery)** The insulation between the V-ring and the commutator segments. (PE) [9]

**commutator vee-ring insulation extension (rotating machinery)** The portion of the vee-ring insulation that extends beyond the commutator segment assembly. *See also:* commutator. (PE) [9]

**commuter rail** A passenger railroad service that operates within metropolitan areas on trackage that usually is part of the general railroad system. The operations, primarily for commuters, are generally run as part of a regional system that is publicly owned, or by a railroad company as part of its overall service. (VT/RT) 1474.1-1999

**compact disc** An optical disk that is compact in size, generally 4 to 5 inches in diameter. *See also:* CD-ROM storage; laser disk. (C) 610.10-1994w

**compact disc read-only memory** *See:* CD-ROM storage.

**compact disc storage** *See:* CD-ROM storage.

**compaction (software)** In microprogramming, the process of converting a microprogram into a functionally equivalent microprogram that is faster or shorter than the original. (C) 610.12-1990

**companding (data transmission)** A process in which compression is followed by expansion. *Note:* Companding is often used for noise reduction, in which case the compression is applied before the noise exposure and the expansion after the exposure. (PE) 599-1985w, 270-1964w

**compandor (data transmission)** A combination of a compressor at one point in a communication path for reducing the amplitude range of signals followed by an expander at another point for a complementary increase in the amplitude range. *Note:* The purpose of a compandor is to improve the ratio of the signal to the interference entering in the path between the compressor and expander. (PE) 599-1985w

**company_id** A 24-bit binary value used to identify a company within the context of the CSR Architecture. The company_id values are expected to be uniquely assigned to each company. (C/MM) 1212-1991s

**comparative tests (test, measurement, and diagnostic equipment)** Comparative tests compare end item signal or characteristic values with a specified tolerance band and present the operator with a go/no-go readout; a go for signals within tolerances, and a no-go for signals out of tolerance. (MIL) [2]

**comparator (1)** A circuit for performing amplitude selection between either two variables or between a variable and a constant. (C) [20]

**(2) (test, measurement, and diagnostic equipment)** A device capable of comparing a measured value with predetermined limits to determine if the value is within these limits. (MIL) [2]

**(3) (analog computer)** A circuit, having only two logic output states, for comparing the relative amplitudes of two analog variables, or of a variable and a constant, such that the logic signal output of the comparator uniquely determines which variable is the larger at all times. (C) 165-1977w

**(4) (software)** A software tool that compares two computer programs, files, or sets of data to identify commonalities or differences. Typical objects of comparison are similar versions of source code, object code, data base files, or test results. (C) 610.12-1990

**compare (1) (mathematics of computing)** To examine a quantity for the purpose of determining its relationship to zero. (C) 1084-1986w

**(2) (data management)** To examine two items to determine their relative magnitudes, their relative positions in a given sequence, or whether they are identical. (C) 610.5-1990w

**comparer** A signal element that performs an AND logic function. (SWG/PE) C37.100-1992

**compare&swap** A data-access operation that conditionally stores a *next* value to a specified data type and returns the previous data value. The store occurs when the addressed memory value and a second *test* value are equal. When accessing uncached data, this data-access operation generates a compareSwap bus transaction. (C/MM) 1596.5-1993

**compare_swap** A bus transaction that takes a test value and a new value as inputs, compares the test value to the current contents of an address and, if equal, atomically writes the new value to the address and returns the old. (C/MM) 1212.1-1993

**compareSwap** A bus that conditionally stores a next argument to a specified data address and returns the previous data value from that address. The store occurs when the addressed memory value and a second *test* value are equal. In the CSR Architecture, this is called a compare_swap transaction. (C/MM) 1596.5-1993

**comparison (A) (data management)** The process of examining two or more items for identity, similarity, equality, relative magnitude, or for order in a sequence. **(B) (data management)** The result of such an examination as in (A). (C) 610.5-1990

**comparison amplifier (power supplies)** A high-gain non-inverting direct-current amplifier that, in a bridge-regulated power supply, has as its input the voltage between the null junction and the common terminal. The output of the comparison amplifier drives the series pass elements. (AES) [41]

**comparison bridge (power supplies)** A type of voltage-comparison-circuit whose configuration and principle of operation resemble a four-arm electric bridge. *See also:* error signal. (AES) [41]

**comparison lamp (luminous standards) (illuminating engineering)** A light source having a constant, but not necessarily known, luminous intensity with which standard and test lamps are successively compared. (IE/EEC) [126]

**compartment (GIS) (1) (packaging machinery)** A space within the base, frame, or column of the industrial equipment. (IA/PKG) 333-1980w

**(2)** Any gas section of the gas-insulated substation assembly that provides gas isolation. (SUB/PE) C37.122-1993, C37.122.1-1993

**(3)** Any gas section of the gas-insulated substation assembly that can be isolated from the system by internal or external means. (SWG/PE) C37.100-1992

**compass (navigation aid terms)** An instrument for indicating a horizontal reference direction relative to the earth. (AES/GCS) 172-1983w

**compass bearing (navigation aid terms)** Bearing relative to compass north. (AES/GCS) 172-1983w

**compass-controlled directional gyro** A device that uses the earth's magnetic field as a reference to correct a directional gyro. *Note:* The direction of the earth's field is sensed by a remotely located compass that is connected electrically to the gyro. (EEC/PE) [119]

**compass course (navigation aid terms)** Course relative to compass north. (AES/GCS) 172-1983w

**compass declinometer** *See:* declinometer.

**compass deviation** *See:* magnetic deviation.

**compass heading (navigation aid terms)** Heading relative to compass north. (AES/GCS) 172-1983w

**compass locator** *See:* nondirectional beacon.

**compass north (navigation aid terms)** The direction north as indicated by a magnetic compass. (AES/GCS) 172-1983w

**compass repeater (navigation aid terms)** That part of a remote-indicating compass system which repeats, at a distance, the indications of the master compass. (AES/GCS) 172-1983w

**compass rose (navigation aid terms)** A compass used to assist in aircraft magnetic compass compensation. (AES/GCS) 172-1983w

**compatibility (1) (696 interface devices) (general system)** The degree to which devices may be interconnected and used without modification, when designed to conform to IEEE Std 696-1983. (MM/C) 696-1983w

**(2) (microcomputer system bus)** The degree to which devices may be interconnected and used without modification, when designed as defined in IEEE Std 796-1983. (C/MM) 796-1983r

**(3) (color television)** The property of a color television system that permits substantially normal monochrome reception of the transmitted signal by typical unaltered monochrome receivers. (BT/AV) 201-1979w

**(4) (programmable instrumentation)** The degree to which devices may be interconnected and used, without modification, when designed as defined throughout IEEE Std 488.1-1987 (for example, mechanical, electrical, or functional compatibility). (IM/AIN) 488.1-1987r

**(5) (A) (software)** The ability of two or more systems or components to perform their required functions while sharing the same hardware or software environment. **(B) (software)** The ability of two or more systems or components to exchange information. *See also:* interoperability. (C) 610.12-1990

**(6) (SBX bus)** The degree to which devices may be interconnected and used without modification. (C/MM) 959-1988r

**(7) (STEbus)** The degree to which boards may be interconnected and used without modification when designed according to the specifications contained within IEEE Std 1000-1987. (C/MM) 1000-1987r

**compatibility interfaces (1) (medium attachment units and repeater units)** The medium dependent interface (MDI) coaxial cable interface and the attachment unit interface (AUI) branch cable interface, the two points at which hardware compatibility is defined to allow connection of independently designed and manufactured components to the baseband transmission system. (LM/C) 8802-3-1990s

**(2)** The Medium Dependent Interface (MDI) cable, the Attachment Unit Interface (AUI) branch cable, and the Media Independent Interface (MII); the three points at which hardware compatibility is defined to allow connection of independently designed and manufactured components to a baseband transmission medium. (C/LM) 802.3-1998

**Compatibility Mode** An asynchronous, byte-wide forward (host-to-peripheral) channel with data and status lines used according to their original definitions. Compatibility Mode is backward compatible with many existing devices, including the PC parallel port, and is the base mode common to all compliant interfaces. (C/MM) 1284-1994

**Compatibility Mode forward data transfer phase** Begins when the host asserts nStrobe and ends following data hold time and nStrobe de-assertion. (Note that the host is not free

to send the next data byte until the peripheral acknowledges the transfer using nAck.) The host may not initiate negotiation to a new operating mode until the interface returns to Compatibility Mode forward idle phase. (C/MM) 1284-1994

**Compatibility Mode forward idle phase** When the interface is in Compatibility Mode with no data transfer in progress. The host may initiate a data transfer in Compatibility Mode or may initiate negotiation to a new operating mode. (C/MM) 1284-1994

**compatible** Pertaining to a computer system or system component that is capable of handling data and programs intended for use with some other system or component. *See also:* downward compatible; upward compatible. (C) 610.10-1994w

**compatible device** A device that supports any of a specified range of popular variants of the "Centronics" interface. Compatible devices will interoperate with compliant devices in Compatibility Mode only. (C/MM) 1284-1994

**compelled data transfer protocol** A technology-independent transfer mechanism in which the slave is compelled to provide a response before the master proceeds to the next transfer. (C/BA) 10857-1994, 1014.1-1994w, 896.4-1993w

**compensated control system (control systems for steam turbine-generator units)** An interconnected system that controls two or more variables (speed, load, pressure, etc.) with compensation designed to minimize the interaction between the controlled variables. (PE/EDPG) 122-1985s

**compensated-loop direction-finder** A direction-finder employing a loop antenna and a second antenna system to compensate polarization error. *See also:* radio receiver. (EEC/PE) [119]

**compensated repulsion motor** A repulsion motor in which the primary winding on the stator is connected in series with the rotor winding via a second set of brushes on the commutator in order to improve the power factor and commutation. (PE) [9]

**compensated semiconductor (charged-particle detectors) (germanium gamma-ray detectors) (x-ray energy spectrometers)** A semiconductor in which one type of impurity or imperfection (for example, donor) partially cancels the electric effects of the other type of impurity or imperfection (for example, acceptor). (IM/NPS/ED/HFIM/NID) 314-1971w, 325-1996, 300-1988r, 301-1976s, 216-1960w

**compensated series-wound motor** A series-wound motor with a compensating-field winding. The compensating-field winding and the series-field winding may be combined into one field winding. *See also:* asynchronous machine. (PE) 224-1965w, [9]

**compensating-field winding (rotating machinery)** Conductors embedded in the pole shoes and their end connections. It is connected in series with the commutating-field winding and the armature circuit. *Note:* A compensating-field winding supplements the commutating-field winding, and together they function to assist the reversal of current in the armature coils for successful commutation. *See also:* asynchronous machine. (PE/EEC) [119]

**compensating-rope sheave switch** A device that automatically causes the electric power to be removed from the elevator driving-machine motor and brake when the compensating sheave approaches its upper or lower limit of travel. *See also:* hoistway. (EEC/PE) [119]

**compensation (control system feedback)** A modifying of supplementary action (also, the effect of such action) intended to improve performance with respect to some specified characteristic. *Note:* In control usage, this characteristic is usually the system deviation. Compensation is frequently qualified as series, parallel, feedback, etc., to indicate the relative position of the compensating element. *See also:* equalization; feedback control system. (PE/EDPG) 421-1972s, [3]

**compensation theorem** States that if an impedance is inserted in a branch of a network, the resulting current increment produced in any branch in the network is equal to the current that would be produced at that point by a compensating voltage, acting in series with the modified branch, whose values is, where I is the original current that flowed where the impedance was inserted before the insertion was made. (EEC/PE) [119]

**compensator (1) (rotating machinery)** An element or group of elements that acts to modify the functioning of a device in accordance with one or more variables. *See also:* asynchronous machine. (PE) [9]

**(2) (radio direction-finders)** That portion of a direction-finder that automatically applies to the direction indication all or a part of the correction for the deviation. *See also:* radio receiver. (EEC/PE) [119]

**(3) (excitation systems)** A feedback element of the regulator that acts to compensate for the effect of a variable by modifying the function of the primary detecting element. *Notes:*
1. Examples are reactive current compensator and active current compensator. A reactive current compensator is a compensator that acts to modify the function of a voltage regulator in accordance with reactive current. An active current compensator is a compensator that acts to modify the function of a voltage regulator in accordance with active current.
2. Historically, terms such as equalizing reactor and cross-current compensator have been used to describe the function of a reactive compensator. These terms are deprecated.
3. Reactive compensators are generally applied with generator voltage regulators to obtain reactive current sharing among generators operating in parallel. They function in the following two ways.

1) Reactive droop compensation is the more common method. It creates a droop in generator voltage proportional to reactive current and equivalent to that which would be produced by the insertion of a reactor between the generator terminals and the paralleling point.
2) Reactive differential compensation is used where droop in generator voltage is not wanted. It is obtained by a series differential connection of the various generator current transformer secondaries and reactive compensators. The difference current for any generator from the common series current creates a compensating voltage in the input to the particular generator voltage regulator which acts to modify the generator excitation to reduce to minimum (zero) its differential reactive current.
3) Line drop compensators modify generator voltage by regulator action to compensate for the impedance drop from the machine terminals to a fixed point. Action is accomplished by insertion within the regulator input circuit of a voltage equivalent to the impedance drop. The voltage drops of the resistance and reactance portions of the impedance are obtained, respectively, in per unit quantities by an active compensator and a reactive compensator.

(PE/EDPG) 421-1972s

**(4)** (as applied to relaying) A transducer with an air-gapped core that produces an output voltage proportional to input current. The voltage modifies (or *compensates*) the voltage applied to the relay. (SWG/PE) C37.100-1992

**compensatory leads** Connections between an instrument and the point of observation so contrived that variations in the properties of leads, such as variations of resistance with temperature, are so compensated that they do not affect the accuracy of the instrument readings. *See also:* auxiliary device to an instrument. (EEC/PE) [119]

**compensatory wiring techniques (coupling in control systems)** Those writing techniques which result in a substantial cancellation or counteracting of the effects of rates of change of electric or magnetic fields, without actually obstructing or altering the intensity of the fields. If the signal wires are considered to be part of the control circuit, these techniques change the susceptibility of the circuit. Example: twisting of signal and return wires associated with a susceptable instrument so as to cancel the voltage difference between wires

caused by an existing varying magnetic field. *See also:* suppressive wiring techniques; barrier wiring techniques.
(IA/ICTL) 518-1982r

**competent person** One who, because of training, experience, and authority is capable of identifying and correcting hazardous or dangerous conditions in the fall arrest system or any component thereof under consideration, as well as its application and use with related equipment.
(T&D/PE) 1307-1996

**competitor (1) (NuBus)** A master that participates in a particular arbitration contest. (C/MM) 1196-1987w
**(2)** A module actively participating in the current control acquisition cycle of the arbitration process.
(C/BA) 10857-1994, 896.3-1993w, 896.4-1993w

**compile (software)** To translate a computer program expressed in a high-order language into its machine language equivalent. *Contrast:* interpret; assemble; decompile.
(C) 610.12-1990

**compile-and-go (software)** An operating technique in which there are no stops between the compiling, linking, loading, and execution of a computer program. (C) 610.12-1990

**compiler (software)** A computer program that translates programs expressed in a high-order language into their machine language equivalents. *Contrast:* interpreter; assembler. *See also:* incremental compiler; cross-compiler; root compiler.
(C) 610.12-1990

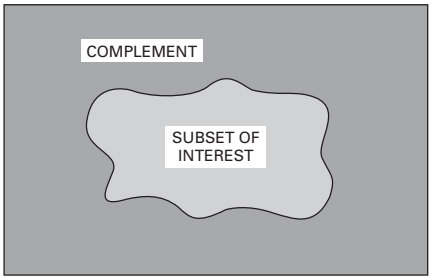
**compiler code (software)** Computer instructions and data definitions expressed in a form that can be recognized and processed by a compiler. *Contrast:* interpretive code; machine code; assembly code. (C) 610.12-1990

**compiler directive source statements** Source statements that define macros, or labels, or direct the compiler to insert external source statements (for example, an *include* statement), or direct conditional compilation, or are not described by one of the other type attributes. (C/SE) 1045-1992

**compiler generator (software)** A translator or interpreter used to construct part or all of a compiler. *Synonym:* metacompiler.
(C) 610.12-1990

**compiler specification language** A specification language used to develop compilers. *See also:* LEX. (C) 610.13-1993w

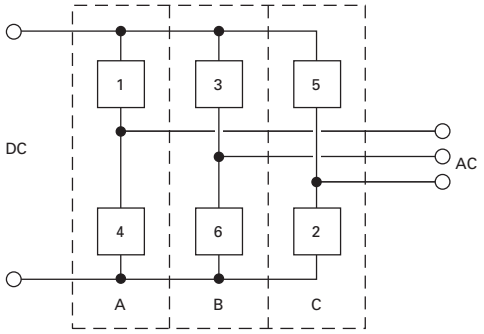
**complement (1) (mathematics of computing)** A numeral derived from a given numeral by a specified subtraction rule. Often used to represent the negative of the number represented by the given numeral. *See also:* radix complement; diminished-radix complement. (C) 1084-1986w
**(2) (image processing and pattern recognition)** All points in an image that do not belong to a given subset of the image.




**complement**

(C) 610.4-1990w
**(3) (test pattern language)** Another number in which each zero bit has been replaced by a one and each one bit has been replaced by a zero. Ones complement is formed by interchanging all ones and zeros. This is equivalent to logical inversion. (TT/C) 660-1986w

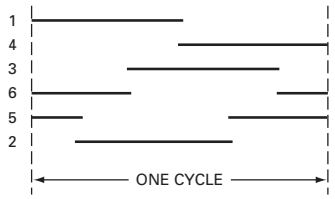
**complementary commutation (circuit properties) (self-commutated converters)** Commutation occurs from one to the other of a complementary pair of principal switching branches arranged as a two-pulse group that conduct in alternate but not necessarily equal time intervals. The commutation may be direct or indirect. *Note:* An example of a converter employing complementary commutation is given in the figures below.




*Note:* The principle switching branches 1–6 are numbered in the order in which they begin conduction.

*a) Three 2-pulse commutating groups: A, B, C*

**complementary commutation**




*b) Conducting intervals of principle switching branches 1-6*

(IA/SPC) 936-1987w

**complementary function (automatic control)** The solution of a homogeneous differential equation, representing a system or element, which describes a free motion. (PE/EDPG) [3]

**complementary functions** Two driving-point functions whose sum is a positive constant. (CAS) 156-1960w

**complementary metal-oxide semiconductor** A semiconductor technology in which circuits are composed of paired NMOS and PMOS devices; characterized by extremely low power dissipation when not changing states. (C) 610.10-1994w

**complementary operation** Two Boolean operations are complementary if the result of one operation is the negation of the result of the other, for all combinations of operands. For example, the AND and NAND operations are complementary. *Contrast:* dual operation. (C) 1084-1986w

**complementary operator** *See:* NOT.

**complementary tracking (power supplies)** A system of interconnection of two regulated supplies in which one (the master) is operated to control the other (the slave). The slave supply voltage is made equal (or proportional) to the master supply voltage and of opposite polarity with respect to a common point. (AES) [41]

**complementary wavelength (1) (television) (color)** The wavelength of a spectrum light that, when combined in suitable proportions with the light considered, yields a match with the specified achromatic light. *See also:* dominant wavelength.
(BT/AV) 201-1979w
**(2) (illuminating engineering)** (of a light) The wavelength of radiant energy of a single frequency that, when combined in suitable proportion with the light, matches the color of a reference standard. (EEC/IE) [126]

**complementation** The process of obtaining a complement.
(C) 1084-1986w

**complement base** The numeral from which a given numeral is subtracted to obtain its complement. (C) 1084-1986w

**complemented representation** A positional notation system in which negative numbers are represented by their complements and positive numbers are represented in their usual

form. *See also:* twos-complement notation. (C) 1084-1986w

**complementer** A device whose output data are a representation of the complements of the numbers represented by its input data. (C) 610.10-1994w

**complement on *n*** *See:* radix complement.

**complement on nine** *See:* nines complement.

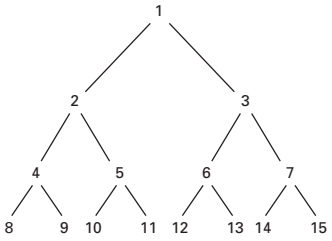
**complement on $n - 1$** *See:* diminished-radix complement.

**complement on one** *See:* ones complement.

**complement on ten** *See:* tens complement.

**complement on two** *See:* twos complement.

**complete binary tree** A complete tree of order 2. *Note:* The nodes in the tree can be read sequentially from left to right; top to bottom. *Synonym:* full binary tree.




**complete binary tree**

(C) 610.5-1990w

**complete carry (1)** A carry process in which a carry resulting from addition of carries is allowed to propagate. Contrasted with partial carry. *See also:* carry. (C) 162-1963w

**(2) (mathematics of computing)** A carry process in which the carry digits are transferred and processed as they occur. *Contrast:* partial carry. (C) 1084-1986w

**complete checkback message** Message from the initiating end is interpreted by the receiving end. A new message is sent to the initiating end to verify error-free transmission and proper interpretation of the message. (SWG/PE/SUB) C37.100-1992, C37.1-1987s

**complete cluster** *Contrast:* incomplete cluster. *See also:* total cluster. (C/SE) 1320.2-1998

**complete connection** An association of channels, switching systems, other functional units, and telephone sets set up to provide means to allow telephone users to converse. (COM/TA) 823-1989w

**completed call (telephone switching systems)** An answered call that has been released. (COM) 312-1977w

**complete diffusion (illuminating engineering)** That in which the diffusing medium completely redirects the incident flux by scattering, that is, no incident flux can remain in an image-forming state. (EEC/IE) [126]

**complete failure (1)** Failure of equipment that is both sudden and total. *Synonym:* catastrophic failure. (PE/NP) 933-1999

**(2)** *See also:* failure.

**complete ICOM code** A diagram feature reference in which dot notation joins an ICOM code to a diagram reference. (C/SE) 1320.1-1998

**completely immersed bushing** A bushing in which both ends are intended to be immersed in an insulating medium such as oil or gas. (PE/TR) C57.19.03-1996

**completely polarized wave** A wave with no randomly polarized content. (AP/PROP) 211-1997

**complete operating test equipment (test, measurement, and diagnostic equipment)** Equipment together with the necessary detail parts, accessories, and components, or any combination thereof, required for the testing of a specified operational function. (MIL) [2]

**complete outage state** The component or unit is completely de-energized or is connected so that it is not serving any of its functions within the power system. (PE/PSE) 859-1987w

**complete reference designation (electric and electronics parts and equipment)** A reference designation that consists of a basic reference designation and, as prefixes, all the reference designations that apply to the subassemblies or assemblies within which the item is located, including those of the highest level needed to designate the item uniquely. The reference designation for a unit consists of only a number. (GSD) 200-1975w

**complete tree** A tree of order $n$ in which each node has exactly $n$ subtrees. *Synonym:* full tree. *See also:* heap. (C) 610.5-1990w

**completion code** A code communicated to a job stream processor by a batch program to influence the execution of succeeding steps in the input stream. (C) 610.12-1990

**completion of a call** The execution of a construct or entity is complete when the end of that execution has been reached, or when a transfer of control causes it to be abandoned. Completion due to reaching the end of execution, or due to the transfer of control of an `exit, return, goto, requeue,` or of the selection of a `terminate` alternative is normal completion. Completion is abnormal when control is transferred out of a construct due to abort or the raising of an exception. (C) 1003.5-1999

**completion queue** A DMA queue that is used primarily to pass I/O transaction-completion messages. (C/MM) 1212.1-1993

**complex capacitivity** *See:* relative complex dielectric constant.

**complex conductivity** For isotropic media, at a particular point, and for a particular frequency, the ratio of the complex amplitude of the total electric current density to the complex amplitude of the electric field strength. *Note:* The electric field strength and total current density are both expressed as phasors, with the latter composed of the conduction current density plus the displacement current density. (AP/ANT) 145-1993

**complex data** Numeric data used to represent complex numbers. (C) 610.5-1990w

**complex data structure** *See:* nonprimitive data structure.

**complex dielectric constant** The complex permittivity of a physical medium in ratio to the permittivity of free space. *See also:* relative complex dielectric constant. (AP/ANT) 145-1993

**complex electrical ground and test device** A device with two terminal sets and a manually operated terminal selector switch for connecting either terminal set to the device ground connection system through a power-operated ground-making switch, complete with necessary isolation barriers and suitable interlocking. Voltage test ports may be provided. (SWG/PE) C37.20.6-1997

**complex-instruction-set computer** A computer with a very expansive and robust instruction set, incorporating several types of addressing modes and varying length instruction words. *Note:* Such instructions are usually stored in microcode. (C) 610.10-1994w

**complexity (1) (A) (software)** The degree to which a system or component has a design or implementation that is difficult to understand and verify. *Contrast:* simplicity. **(B) (software)** Pertaining to any of a set of structure-based metrics that measure the attribute in definition (A). (C) 610.12-1990

**(2) (magnetic core testing)** Under stated conditions, the complex quotient of vectors representing induction and field strength inside the core material. One of the vectors is made to vary sinusoidally and the other referenced to it. (MAG) 393-1977s

**complex number** A number consisting of a real part ($a$) and an imaginary part ($b$), expressed in the form $a + bi$, where $i^2 = -1$. (C) 610.5-1990w, 1084-1986w

**complex permeability ($\mu$)** A macroscopic material property of a medium that relates the magnetic flux density, $\vec{B}$, to the magnetic field, $\vec{H}$, in the medium. For a monochromatic wave

in a linear medium, that relationship is described by the (phasor) equation:

$$\vec{B} = \overline{\mu} \cdot \vec{H}$$

where $\mu'$, the complex permeability, is a tensor that is generally frequency dependent. For an isotropic medium, the tensor reduces to a complex scalar:

$$\mu = \mu' - j\mu''$$

where $\overline{\mu}$ is the real part of the permeability and $\mu''$ accounts for losses.

(AP/PROP) 211-1990s

**complex permittivity (1)** For isotropic media, the ratio of the complex amplitude of the electric displacement density to the complex amplitude of the electric field strength. *See also:* relative complex dielectric constant. (AP/ANT) 145-1993

**(2)** A macroscopic material property of the medium that relates the electric field, $\vec{E}$ to the electric flux density, $\vec{D}$, in the medium. For a monochromatic wave in a linear medium, that relationship is described by the (phasor) equation:

$$\vec{D} = \overline{\varepsilon} \cdot \vec{E}$$

where $\overline{\varepsilon}$, the complex permittivity, is a complex-valued tensor, generally frequency dependent. For an isotropic medium, the tensor reduces to a complex scalar:

$$\varepsilon = \varepsilon' - j\varepsilon''$$

where $\varepsilon'$ is the real part of the permittivity and $\varepsilon''$ accounts for losses. (AP/PROP) 211-1990s

**complex plane (automatic control)** A plane defined by two perpendicular reference axes, used for plotting a complex variable or functions of this variable, such as a transfer function. (PE/EDPG) [3]

**complex polarization ratio** For a given field vector at a point in space, the ratio of the complex amplitudes of two specified orthogonally polarized field vectors into which the given field vector has been resolved. *Note:* For these amplitudes to define definite phase angles, particular unitary vectors (basis vectors) must be chosen for each of the orthogonal polarizations. *See also:* plane wave; polarization vector.

(AP/ANT) 145-1993

**complex power** *See:* phasor power.

**complex refractive index** A dimensionless complex quantity, characteristic of a medium and so defined that its real part is the ratio of the phase velocity in free space to the phase velocity in the medium. The product of the imaginary part of the refractive index and the free space propagation constant is the attenuation constant in the medium.

(AP/PROP) 211-1990s

**complex target** A target composed of more than one scatterer within a single radar resolution cell. A target may be both complex and distributed. *See also:* distributed target.

(AES) 686-1997

**complex tone (A)** A sound containing simple sinusoidal components of different frequencies. **(B)** A sound sensation characterized by more than one pitch. (SP) [32]

**complex variable (automatic control)** A convenient mathematical concept having a complex value, that is having a real part and an imaginary part. *Note:* In control systems, the pertinent independent variable is a generalized frequency $s = \sigma + j\omega$ used in the Laplace transform. (PE/EDPG) [3]

**complex waveforms** *See:* waveforms produced by continuous time superposition of simpler waveforms; waveforms produced by operations on waveforms; waveforms produced by noncontinuous time superposition of simpler waveforms; combinations of pulses and waveforms; waveforms produced by magnitude superposition.

**compliance** A property reciprocal to stiffness. *See also:* control system, feedback; feedback control system.

(IA/ICTL/IAC) [60]

**compliance extension (power supply)** A form of master/slave interconnection of two or more current-regulated power supplies to increase their compliance voltage range through series connection. *See also:* compliance voltage. (AES) [41]

**compliance voltage (power supplies)** The output voltage of a direct-current power supply operating in constant-current mode. *Note:* The compliance range is the range of voltages needed to sustain a given value of constant current throughout a range of load resistances. (AES) [41]

**compliant device** A device that supports either the Level 1 or Level 2 electrical interface, plus Compatible and Nibble Mode operation, as well as the negotiation phases necessary to transition between these two modes.

(C/MM) 1284-1994

**Component** An instance of a subclass of `IEEE1451_Component`. (IM/ST) 1451.1-1999

**component (1) (reliability data for pumps and drivers, valve actuators, and valves)** The largest entity of hardware for which data are most generally collected and expected to be reliable (for example, pump with motor, valve with operator, amplifier, pressure transmitter). It is generally an off-the-shelf item procured by the system designer as a basic building block for his system. It should be distinguished from seals, materials, nuts, bolts, and other piece parts from which the component is made. (PE/NP) 500-1984w

**(2) (seismic design of substations)** The devices and equipment which are assembled at the erection site, or readily removed or accessed for maintenance, and which perform a function (for example, power circuit breakers, disconnect switches, relays, sensors). (SUB/PE) 693-1984s

**(3) (unique identification in power plants)** A part or assembly of parts that is viewed as an entity for purposes of design, operation, and reporting. (PE/EDPG) 803-1983r

**(4) (unique identification in power plants and related facilities)** A part or assembly of parts considered an entity for purpose of design, operation, and reporting.

(PE/EDPG) 804-1983r

**(5) (software)** One of the parts that make up a system. A component may be hardware or software and may be subdivided into other components. *Notes:* 1. The terms "module," "component," and "unit" are often used interchangeably or defined to be subelements of one another in different ways depending upon the context. The relationship of these terms is not yet standardized. (C) 610.12-1990, 610.10-1994w

**(6)** Any part, assembly, or subdivision of a computer, such as a resistor, amplifier, power supply or rack.

(C) 610.10-1994w

**(7) (electrical transmission facilities)** A device that performs a major operating function and that is regarded as an entity for purposes of recording and analyzing data on outage occurrences. *Notes:* 1. Some examples of components are line sections, transformers, ac/dc converters, series capacitors or reactors, shunt capacitors or reactors, circuit breakers, line protection systems, and bus sections. 2. Sometimes it is necessary to subdivide a line section into segments to allow proper calculation of failure rates and exposure data. For example, if a line section is composed of an overhead line segment and an underground line segment, failure and exposure data for each line segment may be recorded separately.

(PE/PSE) 859-1987w

**(8) (electric utility power systems)** A part within or associated with a transformer that is viewed as an entity. This is usually a replaceable part; for example, main winding, tap changer motor, etc. (PE/TR) C57.117-1986r

**(9)** A piece of electrical or mechanical equipment, a line or circuit, or a section of a line or circuit, or a group of items that is viewed as an entity for the purposes of reliability evaluation. (IA/PSE) 493-1997

**(10)** A model, simulation, or database used or considered for use in a Distributed Interactive Simulation (DIS) exercise.

(C/DIS) 1278.4-1997

**(11)** A piece of equipment, a line or circuit, or a section of a line or circuit, or a group of items that is viewed as an entity for purposes of reliability evaluation. (IA) 399-1997

**component assembly (1) (unique identification in power plants)** An assembly of components, physically contiguous, which is viewed as a single entity for purposes of procurement, for example, boric-acid control panel. (PE/EDPG) 803-1983r

**(2) (unique identification in power plants and related facilities)** An assembly of contiguous components, considered as a single entity for purpose of procurement, that is, boric acid control panel. (PE/EDPG) 804-1983r

**component data element** A component of a data structure. *Synonym:* element. (C) 610.5-1990w

**component failure** Malfunctions in the system hardware (e.g., failures in equipment, electronics, input/output device, distribution system), software (e.g., due to deadlock conditions, exceptions, error conditions), or media that are not precipitated through design flaws. Component failures could be manifested because of faulty equipment, unanticipated system events, or environmental effects (e.g., power surge, humidity, heat), and could result in denial of service conditions. However, failure of components that implement security mechanisms could result in the violation of the system security policy through unauthorized disclosure or modification of information, unauthorized receipt of services, or denial of service to legitimate users or critical functions. (C/BA) 896.3-1993w

**component function (1) (unique identification in power plants)** The action performed by a component within a system. (PE/EDPG) 803-1983r

**(2) (unique identification in power plants and related facilities)** The primary function performed by a component (element) within a system. (PE/EDPG) 804-1983r

**component function identifier (1) (unique identification in power plants and related facilities)** A one to four character alpha-numeric code that identifies the function the component performs within the system. (PE/EDPG) 804-1983r

**(2)** A one to four (1 to 4) character alphanumeric code that identifies the function that will be performed by a component. (Reference codes have been established for the basic functions performed by the principal components currently in use in nuclear and fossil-fueled power plants and related facilities.). (PE/EDPG) 803.1-1992

**Component Group** An instance of the class `IEEE1451_ComponentGroup` or of a subclass thereof. (IM/ST) 1451.1-1999

**component hazard (reliability data)** The instantaneous failure rate of a component or its conditional probability of failure versus time. (PE/NP) 500-1977s

**component profile** A profile that is made up of a formally defined subset of a single standard. (C/PA) 14252-1996

**components (1) (safety systems equipment in nuclear power generating stations)** Items from which equipment is assembled (for example, attachments, bearings, bolts, capacitors, connectors, governors, inspection access ports, instrument sensors, locking devices, position indicators, resistors, seals, sight glasses, springs, switches, transistors, tubes, wires, etc. *Note:* Certain items, for example, instrument sensors, may satisfy the definition of the term component or the term equipment as used in IEEE Std 627-1980. Where such items are included within defined boundaries of equipment items, they are correctly referred to as components. Where such items are installed outside of defined boundaries for equipment items and perform independent functions, they are correctly referred to as equipment. (PE/NP) 627-1980r

**(2) (switchgear assemblies for Class 1E applications in nuclear power generating stations)** Items from which the switchgear assemblies are made (for example, power circuit breakers, instrument transformers, protective relays, control switches, primary insulation, etc.). (SWG/PE) C37.100-1992, C37.82-1971s

**(3) (accident monitoring instrumentation)** Discrete items from which a system is assembled. (PE/NP) 497-1981w

**(4) (electric heat tracing systems)** Items from which a system is assembled; for example, resistors, capacitors, wires, connectors, transistors, switches, etc. (PE/EDPG/NP) 622B-1988r, 650-1979s, 622A-1984r, 323-1974s

**(5) (nuclear power generating station)** Items from which equipment is assembled. (For example, a component is a resistor, capacitor, wire, connector, spring, terminal block, bus support, etc.). (PE/NP) 649-1980s

**(6)** Items from which the equipment is assembled. (For motors, typical components include slator coils, rotor bars, bearings, bolts, capacitors, internal thermal overload relays, connectors, instrument sensors, locking devices, seals, sight glasses, springs, switches, etc.). (PE/NP) 334-1994r

**(7)** Discrete items from which a system is assembled. *Note:* Examples of components are: wires, transistors, switches, motors, relays, solenoids, pipes, fittings, pumps, tanks, valves, computer programs, computer hardware, or computer firmware. (PE/NP) 603-1998

**(8)** Items from which the system is assembled. (PE/NP) 933-1999

**component side** By convention, the side of the module seen furthest from row A of the connector. On single-sided modules, this is the side populated with circuit components. This is the right side when looking at an IEEE 1101.1 system through the front door. (C/MM) 1101.2-1992

**component standard (1) (software)** A standard that describes the characteristics of data or program components. (C) 610.12-1990

**(2)** One standard, within a set of standards, that is developed in accordance with the architecture, terminology, guidelines, and requirements set forth in the base document of the same set of standards, and that provides a detailed definition of a component part of the architecture. (ATLAS) 1232-1995

**component testing (1) (software)** Testing of individual hardware or software components or groups of related components. *Synonym:* module testing. *See also:* system testing; integration testing; interface testing; unit testing. (C) 610.12-1990

**(2)** Testing conducted to verify the correct implementation of the design and compliance with program requirements for one software element (e.g., unit, module) or a collection of software elements. (C/SE) 1012-1998

**composite bushing (outdoor apparatus bushings)** A bushing in which the major insulation consists of several coaxial layers of different insulation materials. (PE/TR) 21-1976

**composite cable (communication practice)** A cable in which conductors of different gauges or types are combined under one sheath. *Note:* Differences in length of twist are not considered here as constituting different types. *See also:* cable. (PE/EEC) [119]

**composite color picture signal (National Television System Committee color television)** The electric signal that represents complete color picture information and all sync signals. (BT/AV) 201-1979w

**composite color signal (color television)** The color-picture signal plus blanking and all synchronizing signals. (BT/AV) 201-1979w

**composite color sync** [National Television System Committee (NTSC) color television] The signal comprising all the sync signals necessary for proper operations of a color receiver. *Note:* This includes the deflection sync signals to which the color sync signal is added in the proper time relationship. (BT/AV) 201-1979w

**composite conductor** A composite conductor consists of two or more strands consisting of two or more materials. *See also:* conductor. (T&D/PE) [10]

**composite controlling voltage (electron tube)** The voltage of the anode of an equivalent diode combining the effects of all individual electrode voltages in establishing the space-charge-limited currents. *See also:* excitation. (ED) 161-1971w, [45]

**composite data element** A data element that contains two or more data elements that can be referred to either collectively or individually; for example, a data element named "date of birth" containing data elements "year," "month," and "day." *Synonyms:* molecular data element; data chain. *Contrast:* atomic data element. *See also:* data aggregate. (C) 610.5-1990w

**composited circuit** A circuit that can be used simultaneously for telephony and direct-current telegraphy or signaling, separation between the two being accomplished by frequency discrimination. *See also:* transmission line. (EEC/PE) [119]

**composite error** The maximum deviation of the output data from a specified output function. Composite error is due to the composite effects of hysteresis, resolution, nonlinearity, nonrepeatability, and other uncertainties in the output data. It is generally expressed as a percentage of half the output span. (AES/GYAC) 528-1994

**composite key** A key comprised of two or more attributes. (C/SE) 1320.2-1998

**composite lens characteristic** A modification of an impedance or mho characteristic in which the operating area on an *R-X* diagram is inherently restricted in the plus and minus *R* directions. The common area between two overlapping circles produces such a characteristic. (SWG/PE) C37.100-1992

**composite level** (measuring the performance of tone address signaling systems) In two-tone signaling systems, the total power of the two tones comprising a specific signal present condition. (COM/TA) 752-1986w

**composite overhead groundwire with optical fibers (OPGW)** Concentric-lay-stranded composite conductor for use as overhead groundwire with telecommunication capability. The conductor is constructed with a central optical fiber core surrounded by helically laid aluminum-clad wires, aluminum alloy wires, galvanized steel wires, or combinations thereof. (T&D/PE) 524-1992r

**composite picture signal (television)** The signal that results from combining a blanked picture signal with the asynchronizing signal. *See also:* television. (BT/AV) [34]

**composite plate (electroplating)** An electrodeposit consisting of two or more layers of metals deposited separately. *See also:* electroplating. (PE/EEC) [119]

**composite pulse (navigation aid terms) (pulse navigational systems)** A pulse composed of a series of overlapping pulses received from the same signal source but by way of different paths. (AES/GCS) 172-1983w

**composite set** An assembly of apparatus designed to provide one end of a composited circuit. (EEC/PE) [119]

**composite signal** A signal that is composed of both ac and dc components. (PEL) 1515-2000

**composite signaling (telephone switching systems)** A form of polar-duplex signaling capable of simultaneously serving a number of circuits using low-pass filters to separate the signaling currents from the voice currents. (COM) 312-1977w

**composite supervision** The use of a composite signaling channel for transmitting supervisory signals between two points in a connection. (EEC/PE) [119]

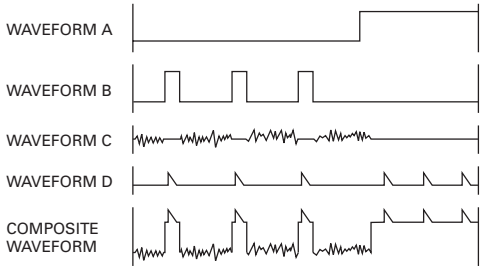
**composite tomato characteristic** A modification of an impedance or mho characteristic in which the operating area on an *R-X* diagram is inherently expanded in the plus and minus direction. The total area of two overlapping circles produces such a characteristic. (SWG/PE) C37.100-1992

**composite triple beat distortion** The combination of all possible third-order beat frequencies ($F_1 \pm F_2 \pm F_3$) that occurs within a channel of the cable plant. *See also:* intermodulation distortion. (LM/C) 802.7-1989r

**composite type** A data type each of whose members is composed of multiple data items. For example, a data type called PAIRS whose members are ordered pairs (*x*,*y*). *Contrast:* atomic type. (C) 610.12-1990

**composite video signal** The complete video signal. For monochrome systems, it comprises the picture, blanking, and synchronizing signals. For color systems it includes additional color synchronizing signals and color picture information. (LM/C) 802.7-1989r

**composite waveform (pulse terminology)** A waveform that is, or that for analytical or descriptive purposes is treated as, the algebraic summation of two or more waveforms.




**composite waveform**

(IM/WM&A) 194-1977w

**composite widget** A parent widget that physically contains other widgets. (C) 1295-1993w

**compound (A) (rotating machinery)** A definite substance resulting from the combination of specific elements or radicals in fixed proportions: distinguished from mixture. **(B) (rotating machinery)** The intimate admixture of resin with ingredients such as fillers, softeners, plasticizers, catalysts, pigments, or dyes. *See also:* rotor. (PE) [9]

**compound cartridge** An ordered set of cartridges that may be treated atomically. (C/SS) 1244.1-2000

**compound circular horn antenna** A horn antenna of circular cross section with two or more abrupt changes of flare angle or diameter. (AP/ANT) 145-1993

**compound-filled (grounding device) (reactor, transformer)** Having the coils/windings encased in an insulating fluid that becomes solid or remains slightly plastic at normal operating temperatures. *See also:* instrument transformer; reactor. (SPD/PE) 32-1972r

**compound-filled bushing (outdoor electric apparatus)** A bushing in which the space between the inside surface of the porcelain/weather casing and the major insulation (or conductor where no major insulating is used) is filled with compound. (PE/TR) 21-1976

**compound filled joints (power cable joints)** Joints in which the joint housing is filled with an insulating compound that is non-fluid at normal operating temperatures. (PE/IC) 404-1986s

**compound-filled transformer (power and distribution transformers)** A transformer in which the windings are enclosed with an insulating fluid which becomes solid, or remains slightly plastic, at normal operating temperatures. *Note:* The shape of the compound-filled transformer is determined in large measure by the shape of the contain or mold used to contain the fluid before solidification. (PE/TR) C57.12.80-1978r

**compound horn antenna** *See:* compound circular horn antenna; compound rectangular horn antenna.

**compounding curve (direct-current generator)** A regulation curve of a compound-wound direct-current generator. *Note:* The shunt field may be either self or separately excited. *See also:* direct-current commutating machine. (EEC/PE) [119]

**compound interferometer system** An antenna system consisting of two or more interferometer antennas whose outputs are combined using nonlinear circuit elements such that grating lobe effects are reduced. (AP/ANT) 145-1993

**compound key** A candidate key consisting of more than one attribute. (C) 610.5-1990w

**compound list** *See:* list structure.

**compound microstrip** A microstrip line in which the substrate consists of two or more layers of different electromagnetic properties. (MTT) 1004-1987w

**compound rectangular horn antenna** A horn antenna of rectangular cross section in which at least one pair of opposing sides has two or more abrupt changes of flare angle or spacing. (AP/ANT) 145-1993

**compound source-rectifier exciter (1) (excitation systems for synchronous machines)** An exciter whose energy is derived from the currents and potentials of the ac terminals of the synchronous machine and converted to direct current by rectifiers. The exciter included the power transformers (current and potential), reactors, and rectifiers which may be either noncontrolled or controlled, including gate circuitry. It is exclusive of input control elements. (PE/EDPG) 421.1-1986r

**(2) (synchronous machines)** An exciter whose energy is derived from the currents and potentials of the alternating current terminals of the synchronous machine and converted to direct current by rectifiers. *Notes:* 1. The exciter includes the power transformers (current and potential), power reactors, and power rectifiers which may be either noncontrolled or controlled, including gate circuitry. 2. It is exclusive of input control elements. (PE/EDPG) 421-1972s

**compound target*** This term has been used to mean either complex target or distributed target. Because of its ambiguity, it is deprecated. (AES/RS) 686-1990

* Deprecated.

**compound-wound** A qualifying term applied to a direct-current machine to denote that the excitation is supplied by two types of windings, shunt and series. *Note:* When the electromagnetic effects of the two windings are in the same direction, it is termed cumulative compound wound; when opposed, differential compound wound. *See also:* direct-current commutating machine. (EEC/PE) [119]

**compound-wound generator** A dc generator that has two separate field windings. One supplies the predominating excitation, and is connected in parallel with the armature circuit. The other supplies only partial excitation and is connected in series with the armature circuit. It is proportioned to require an equalizer connection for satisfactory parallel operation. (IA/MT) 45-1998

**compound-wound motor** A dc motor that has two separate field windings: one, usually the predominating field, connected in parallel with the armature circuit, and the other connected in series with the armature circuit. Speed and torque characteristics are between those of shunt and series motors. (IA/MT) 45-1998

**compressed-air circuit breaker** *See:* circuit breaker.

**compressed file** A file that has been transformed in a manner intended to reduce its size without loss of information. (C/PA) 1387.2-1995

**compression (1) (data transmission)** A process in which the effective gain applied to a signal is varied as a function of the signal magnitude, the effective gain being greater for small rather than for large signals. (PE) 599-1985w

**(2) (television)** The reduction in gain at one level of a picture signal with respect to the gain at another level of the same signal. *Note:* The gain referred to in the definition is for a signal amplitude small in comparison with the total peak-to-peak picture signal involved. A quantitative evaluation of this effect can be obtained by a measurement of differential gain. *See also:* white compression; black compression; television. (BT/AV) [34]

**(3) (oscillography)** An increase in the deflection factor usually as the limits of the quality area are exceeded. *See also:* oscillograph. (IM/HFIM) [40]

**(4) (image processing and pattern recognition)** *See also:* image compression. (C) 610.4-1990w

**compressional wave** A wave in an elastic medium that is propagated by fluctuations in elemental volume, accompanied by velocity components along the direction of propagation only. *Note:* A compressional plane wave is a longitudinal wave. (SP) [32]

**compression gain** 10log of the ratio of the magnitude of the peak power of a compressed pulse to the RMS noise power measured. For an unweighted chirp pulse compression system, the value is 10log (TB), where TB is the time bandwidth product (in decibels). (UFFC) 1037-1992w

**compression joint (conductor stringing equipment)** A tubular compression fitting designed and fabricated from aluminum, copper, or steel to join conductors or overhead ground wires. It is usually applied through the use of hydraulic or mechanical presses. However, in some cases, automatic, wedge, and explosive type joints are utilized. *Synonyms:* splice; sleeve; conductor splice. (T&D/PE) 524a-1993r, 524-1992r

**compression point (nonlinear, active, and nonreciprocal waveguide components)** The level of the output signal at which the gain of a device is reduced by a specified amount, usually expressed in decibels, as in the 1 dB compression point. (MTT) 457-1982w

**compression ratio (gain or amplification)** The ratio of (1) the magnitude of the gain (or amplification) at a reference signal level to (2) its magnitude at a higher stated signal level. *See also:* amplifier. (ED) 161-1971w

**compressor (data transmission)** A transducer, which for a given amplitude range of input voltages, produces a smaller range of output voltages. One important type of compressor employs the envelope of speech signals to reduce their volume range by amplifying weak signals and attenuating strong signals. (PE) 599-1985w

**compressor-stator-blade-control system (gas turbines)** A means by which the turbine compressor stator blades are adjusted by vary the operating characteristics of the compressor. *See also:* speed-governing system. (PE/EDPG) [5]

**COM printer** *See:* computer output microfilm printer.

**compromise** A violation of the security of a system such that an unauthorized disclosure of sensitive information may have occurred. (LM/C) 802.10-1992

**computation** *See:* implicit computation.

**computational bandwidth** The maximum number of operations per second a machine can perform. (C) 610.10-1994w

**computational data** *See:* fixed-point data.

**computational model** A model consisting of well-defined procedures that can be executed on a computer; for example, a model of the stock market, in the form of a set of equations and logic rules. (C) 610.3-1989w

**compute-bound** Pertaining to programs that have an abundance of computations. *Synonym:* process bound. *Contrast:* input-output bound. (C) 610.10-1994w

**computed tomography (CT)** A medical diagnostic technique in which a computer is used to produce an image of cross-sections of the human body by using measured attenuation of X rays through a cross-section of the body. *Synonym:* computer-assisted tomography. *See also:* computer-aided testing; computerized axial tomography. (C) 610.2-1987

**computer (1) (A) (emergency and standby power)** A machine for carrying out calculations. **(B) (emergency and standby power)** By extension, a machine for carrying out specified transformations on information. (IA/C/PSE) 446-1987, 165-1977

**(2) (A) (software)** A functional unit that can perform substantial computation, including numerous arithmetic operations, or logic operations without intervention by a human operator during a run. **(B) (software)** A functional programmable unit that consists of one or more associated processing units and peripheral equipment, that is controlled by internally stored programs, and that can perform substantial computation, including numerous arithmetic operations or logic operations, without human intervention. *See also:* program. (C/SE) 729-1983

**(3)** A device that consists of one or more associated processing units and peripheral units, that is controlled by internally

stored programs, and that can perform substantial computations, including numerous arithmetic operations, or logic operations, without human intervention during a run. *Note:* May be stand alone, or may consist of several interconnected units. (C) 610.10-1994w

**computer-aided design (CAD) (computer graphics)** The use of computers to aid in design layout and analysis. May include modeling, analysis, simulation, or optimization of designs for production. Often used in combinations such as CAD/CAM. *See also:* computer-aided engineering; computer-aided manufacturing; computer-aided design and drafting; design automation. (C) 610.2-1987, 610.6-1991w

**computer-aided design and drafting (CADD)** The use of computers to aid in design layout, drafting, and analysis. Often used as a synonym for computer-aided design. (C) 610.6-1991w

**computer-aided education (CAE)** *See:* computer-assisted instruction.

**computer-aided engineering (CAE) (1) (computer graphics)** The use of computers to aid in engineering analysis and design. May include solution of mathematical problems, process control, numerical control, and execution of programs performing complex or repetitive calculations. *See also:* computer-aided manufacturing; computer-aided design. (C) 610.2-1987, 610.6-1991w

**(2)** The application of computers to the engineering process. The term now commonly applies to any computer system or program that manipulates data for the purpose of assisting engineering, design, procurement, maintenance, etc. (PE/EDPG) 1150-1991w

**(3)** A computer-based set of tools to assist in the design and development of integrated circuits. (C/TT) 1450-1999

**computer-aided inspection (CAI)** The use of computers to inspect manufactured parts. *Synonym:* mechanical inspection. (C) 610.2-1987

**computer-aided instruction (CAI)** The use of computers to present instructional material and to accept and evaluate student responses. *See also:* computer-assisted instruction; computer-based instruction. (C) 610.2-1987

**computer-aided management (CAM)** The application of computers to business management activities. For example, database management, control reporting, and information retrieval. *See also:* decision support system; management information system. (C) 610.2-1987

**computer-aided manufacturing (CAM) (computer graphics)** The use of computers and numerical control equipment to aid in manufacturing processes. May include robotics, automation of testing, management functions, control, and product assembly. Often used in combinations such as CAD/CAM. *See also:* computer-aided design; computer-aided engineering. (C) 610.2-1987, 610.6-1991w

**computer-aided page makeup** The use of computers to automate the formation of text and graphics into discrete camera-ready pages. *See also:* computer-aided typesetting; photocomposition. (C) 610.2-1987

**computer-aided software engineering (CASE)** The use of computers to aid in the software engineering process. May include the application of software tools to software design, requirements, tracing, code production, testing, document generation, and other software engineering activities. (C/SE) 1348-1995, 610.12-1990

**computer-aided testing (CAT)** The use of computers to test manufactured parts. (C) 610.2-1987

**computer-aided typesetting** The use of computers at any stage of the document composition process. This may involve text formatting, input from a word processing system, or computer-aided page makeup. *Synonym:* computer typesetting. (C) 610.2-1987

**Computer and Business Equipment Manufacturers Association** The Secretariat for ASC X3-series standards on information technology. (C) 610.7-1995, 610.10-1994w

**computer architecture** The organizational structure of a computer system, including the hardware and the software. *Contrast:* computer network architecture. (C) 610.10-1994w

**computer-assisted instruction (CAI)** The use of computers to present instructional material and to accept and evaluate student responses. *Synonyms:* computer-assisted learning; computer-aided instruction; computer-aided education; computer-augmented learning. *See also:* computer-based instruction. (C) 610.2-1987, 610.6-1991w

**computer-assisted learning (CAL)** *See:* computer-assisted instruction.

**computer-assisted system** A system that utilizes separate and standalone computers or processors for arithmetic computational and logic functions. All data manipulation and evaluation (e.g., alarm condition annunciation) functions are performed by the system. (IA/MT) 45-1998

**computer-assisted tester (test, measurement, and diagnostic equipment)** A test not directly programmed by a computer but that operates in association with a computer by using some arithmetic functions of the computer. (MIL) [2]

**computer-assisted tomography (CAT)** *See:* computed tomography.

**computer-augmented learning (CAL)** *See:* computer-assisted instruction.

**computer automated measurement and control (CAMAC)** **(1)** A standard modular instrumentation and digital interface system. (NPS) 583-1982r

**(2) (FASTBUS acquisition and control)** An internationally standardized modular instrumentation and digital interface system as defined in IEEE Std 583-1982, *IEEE Standard Modular Instrumentation and Digital Interface System (CAMAC),* and the corresponding documents EUR 4100-1972, *CAMAC: A Modular Instrumentation System for Data Handling,*and IEC Pub 516-1975, *A Modular Instrumentation System for Data Handling; CAMAC System.*; Compiler Automated Measurement and Control. (NID) 960-1986s

**computer-based education (CBE)** *See:* computer-based instruction.

**computer-based instruction** The use of computers to support any process involving human learning. *Synonyms:* computer-based education; computer-based learning. (C) 610.2-1987

**computer-based learning (CBL)** *See:* computer-based instruction.

**computer-based simulation** A simulation that is executed on a computer. *Synonym:* machine-centered simulation. *Contrast:* human-centered simulation. (C) 610.3-1989w

**computer-based system** A system that utilizes one or more embedded computers or processors to perform its functions. (IA/MT) 45-1998

**computer channel** *See:* input-output channel.

**computer code** A machine code for a specific computer. (C) [20], [85]

**computer component (analog computer)** Any part, assembly, or subdivision of a computer, such as resistor, amplifier, power supply, or rack. (C) 165-1977w

**computer conferencing** A form of teleconferencing that allows one or more users to exchange messages on a computer network. *See also:* video conferencing. (C) 610.2-1987

**computer control (electric power system) (physical process)** A mode of control wherein a computer, using as input the process variables, produces outputs that control the process. *See also:* power system. (PE/PSE) [54]

**computer-control state (1) (analog computer)** One of several distinct and selectable conditions of the computer-control circuits. *See also:* potentiometer set; hold; reset; operate; balance check; static test. (C) 165-1977w

**(2)** In an analog computer, one of several distinct and selectable conditions of the control circuit. *See also:* operate; balance check; static test; hold; reset; potentiometer set. (C) 610.10-1994w

**computer control unit** *See:* instruction control unit.

**computer data (software)** Data available for communication between or within computer equipment. Such data can be external (in computer-readable form) or resident within the computer equipment and can be in the form of analog or digital signals. *See also:* computer. (C/SE) 729-1983s

**computer database** *See:* database.

**computer description language** *See:* hardware description language.

**Computer Design Language** A design language for describing or designing computer architectures at the register level. (C) 610.13-1993w

**computer diagram (analog computer)** A functional drawing showing interconnections between computing elements, such interconnections being specified for the solution of a particular set of equations. *See also:* computer program; problem board. (C) 165-1977w

**computer equation (machine equation) (analog computer)** An equation derived from a mathematical model for use on a computer which is equivalent or proportional to the original equation. *See also:* scale factor. (C) 165-1977w

**computer generated force (CGF)** Simulation of entities on the virtual battlefield. CGF entities may be fully autonomous (needing no human direction) or semi-autonomous (requiring some direction by a human controller who is not a participant in the virtual events). CGF entities represent friendly, opposing forces (OPFOR), and neutral battlefield participants not portrayed by manned simulators. (DIS/C) 1278.3-1996

**computer graphics (A)** The branch of computer science concerned with methods of creating, modifying, or analyzing pictorial data. **(B)** The use of a computer in any discipline to create, modify, or analyze images. (C) 610.6-1991

**Computer Graphics Interface (CGI) (A)** A computer graphics standard that provides a method for exchanging device-independent data between graphics systems or device-dependent parts of a graphics system. It is under development by the American National Standards Institute (ANSI) and the International Standards Organization (ISO). **(B)** A method for exchanging device-independent data between graphics systems or device-dependent parts of a graphics system. (C) 610.6-1991

**Computer Graphics Metafile (CGM) (A)** A computer graphics standard that provides a method for recording graphical information in a metafile. It was developed by the American National Standards Institute (ANSI) and the International Standards Organization (ISO). **(B)** A method for recording graphical information in a metafile. (C) 610.6-1991

**computer hardware** Devices capable of accepting and storing computer data, executing a systematic sequence of operations on computer data, or producing control outputs. Such devices can perform substantial interpretation, computation, communication, control, or other logical functions. (C/SE) J-STD-016-1995

**computer hardware description language** *See:* hardware description language.

**computer input microfilm (CIM)** The input to a process that converts data contained on microform into machine-readable data. (C) 610.2-1987

**computer instruction** A machine instruction for a specific computer. (C) [20], [85]

**(2) (A) (software)** A statement in a programming language, specifying an operation to be performed by a computer and the addresses or values of the associated operands; for example, Move A to B. *See also:* instruction set; instruction format. **(B) (software)** Loosely, any executable statement in a computer program. (C) 610.12-1990, 610.10-1994

**(3) (A)** A statement in a computer language; specifying an operation to be performed by a computer and the address or values of the associated operands; for example, MOVE A to B. *See also:* machine instruction; operation field; operand field; address field. **(B)** An instruction expressed in machine language. (C) 610.10-1994

**computer instruction code** A code used to represent the instruction within an instruction set. *See also:* machine code. (C) 610.10-1994w

**computer instruction set** The collection of computer instructions possible on a given computer. *Synonym:* machine instruction set. (C) 610.10-1994w

**computer-integrated manufacturing (CIM)** Use of an integrated system of computer-controlled manufacturing centers. The centers may use robotics, design automation, or CAD/CAM (computer-aided design/computer-aided manufacturing) technologies. *See also:* flexible manufacturing system. (C) 610.2-1987

**computer interface equipment (1) (surge withstand capability)** A device that interconnects a protective relay system to an independent computer, for example, an analog to digital converter, a scanner, a buffer amplifier. (PE/PSR) C37.90-1978s

**(2)** A device that interconnects a protective relay system to an independent computer, for example, a scanner or a buffer amplifier. (SWG/PE) C37.100-1992

**computer interface unit** A device used to connect peripheral devices with a computer. (C) 610.10-1994w

**computerized axial tomography (CAT)** *See:* computed tomography.

**computerized healthcare information systems** *See:* patient care information system.

**computer language** A language designed to enable humans to communicate with computers. *See also:* system profile; workload model; programming language; design language. (C) 610.12-1990

**(2) (A)** A language designed to enable humans to communicate with computers and computer systems. **(B)** A language that is used to control, design, or define a computer or computer program. (C) 610.13-1993, 610.10-1994

**computer literacy** An understanding of the capabilities, operation, and applications of computers. (C) 610.2-1987

**computer-managed instruction (CMI)** The use of computers for management of student progress. Activities may include record keeping, progress evaluation, and lesson assignment. *See also:* computer-based instruction. (C) 610.2-1987

**computer network (1) (software)** A complex consisting of two or more interconnected computers. *See also:* computer. (C/SE) [20], 729-1983s, [85]

**(2)** An interconnection of assemblies of computer systems, terminals and communications facilities. (LM/COM) 168-1956w

**(3)** A structured connection of computer systems and peripheral devices that exchange data as necessary to perform the specific function of the network. *See also:* hierarchical computer network; homogeneous computer network; heterogeneous computer network; centralized computer network; decentralized computer network; distributed computer network. (C) 610.7-1995, 610.10-1994w

**computer network architecture** The logical structure and the operating principles, including those concerning services, functions, nd protocols, of a computer network. *Contrast:* computer architecture. (C) 610.7-1995, 610.10-1994w

**computer numerical control (CNC)** Numerical control in which one or more machines that produce manufactured parts are linked together via a single computer. (C) 610.2-1987

**computer operation (A)** An operation which can be performed by a computer with a single instruction. **(B)** An operation performed by a functional unit within a computer. For example: an instruction fetch, or an addition. *Synonym:* machine operation. (C) 610.10-1994

**computer output microfilm (COM)** The end result of a process that converts and records data from a computer directly to a microform. (C) 610.2-1987

**computer output microfilmer** A device for producing computer output microfilm. *Synonym:* COM device. (C) 610.2-1987

**computer output microfilm printer** A page printer that produces a microimage of each page on a photographic film. (C) 610.10-1994w

**computer performance evaluation (software)** An engineering discipline that measures the performance of computer systems and investigates methods by which that performance can be improved. *See also:* throughput; utilization. (C) 610.12-1990

**computer program (1) (general)** A plan or routine for solving a problem on a computer, as contrasted with such terms as fiscal program, military program, and development program. (MIL/C) [2], [20], [85]

**(2) (analog computer)** That combination of computer diagram, potentiometer list, amplifier list, trunk list, switch list, scaled equations, and any other documentation that defines the analog configuration for the particular problem to be solved. This term sometimes is used to include the problem patch board as well, and, in some loose usage, the computer program may be (incorrectly) used to refer solely to the program patch panel. (C) 165-1977w

**(3) (programmable digital computer systems in safety systems of nuclear power generating stations)** A schedule or plan that specifies actions that may or may not be taken, expressed in a form suitable for execution by a programmable digital computer. 7432-1982w

**(4) (computer terminology)** A combination of computer instructions and data definitions that enable computer hardware to perform computational or control functions. *See also:* software. (C/SE) J-STD-016-1995, 610.12-1990, 610.5-1990w, 610.10-1994w

**computer program abstract (software)** A brief description of a computer program that provides sufficient information for potential users to determine the appropriateness of the program to their needs and resources. (C) 610.12-1990

**computer program annotation** *See:* comment.

**computer program certification** *See:* certification.

**computer program component* (CPC)** *See:* computer software component.

* Deprecated.

**computer program configuration identification** *See:* configuration identification.

**computer program configuration item (CPCI)** *See:* computer software configuration item.

**computer program development plan** *See:* software development plan.

**computer program validation** *See:* validation.

**computer program verification** *See:* verification.

**computer resource allocation** The assignment of computer resources to current and waiting jobs; for example, the assignment of main memory, input/output devices, and auxiliary storage to jobs executing concurrently in a computer system. *See also:* dynamic resource allocation; storage allocation. (C) 610.12-1990

**computer resources** The computer equipment, programs, documentation, services, facilities, supplies, and personnel available for a given purpose. *See also:* computer resource allocation. (C) 610.12-1990, 610.10-1994w

**computer security** Protection of information, system resources, and system services through controls provided by hardware and software mechanisms, including access controls, user authentication mechanisms, and audit facilities. (C/BA) 896.3-1993w

**computer security object** An information object used to maintain a condition of security in computerized environments. Examples include: representations of computer or communications systems resources, security label semantics, modes of operation for cryptographic algorithms, and one-way hashing functions. (C/LM) 802.10g-1995

**computer simulation** A simulation of the operation of a computer. *See also:* computer-based simulation. (C) 610.3-1989w

**computer software** *See:* software.

**computer software component (CSC)** A functionally or logically distinct part of a computer software configuration item, typically an aggregate of two or more software units. (C) 610.12-1990

**computer software configuration item (CSCI)** An aggregation of software that is designated for configuration management and treated as a single entity in the configuration management process. *Contrast:* hardware configuration item. *See also:* configuration item. (C) 610.12-1990

**computer system (1) (software)** A system containing one or more computers and associated software. (C) 610.12-1990

**(2)** A system containing one or more computers, peripheral devices and associated software. *Synonym:* computing system. (C) 610.7-1995, 610.10-1994w

**Computer System Simulation II (CSS/II)** A simulation language that is based on the concepts used in GPSS, but specialized for use in modeling computer systems. (C) 610.13-1993w

**computer time** *See:* time.

**computer typesetting (CTS)** *See:* computer-aided typesetting.

**computer variable (1)** A dependent variable as represented on the computer. *See also:* time. (C) 165-1977w

**(2) (machine variable)** *See also:* scale factor. (C) 165-1977w

**computer word (1)** A sequence of bits or characters treated as a unit and capable of being stored in one computer location. (C) [20], [85]

**(2)** A unit of storage, typically a set of bits, that is suitable for processing by a given computer; for example, two bytes. *Synonyms:* machine word; fullword. *See also:* double word; word. (C) 610.10-1994w

**(3) (computer terminology)** *See also:* word. (C) 610.5-1990w, 610.12-1990, 1084-1986w

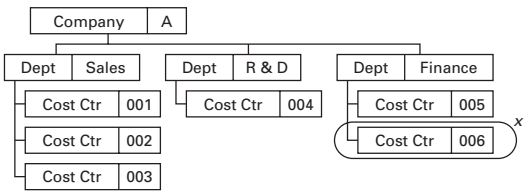
**computing center** A facility designed to provide computer services to a variety of users through the operation of computers and auxiliary hardware and through services provided by the facility's staff. (C) 610.12-1990

**computing elements (analog computer)** A computer component that performs a mathematical operation required for problem solution. It is shown explicitly in computer diagrams, or computer programs. (C) 165-1977w

**computing system** *See:* computer system.

**concatenate** To append one item to the end of another so as to form a single unit in a contiguous pattern. For example, if we concatenate 'AP' with 'PLE,' the result is 'APPLE.' *Synonym:* catenate. (C) 610.5-1990w

**concatenated key (A) (data management)** A key derived from the concatenation of two or more keys. *Synonyms:* multifield key; fully concatenated key. **(B) (data management)** A concatenation of the keys for the first *N*segments found in a hierarchical path. For example, in the structure below, the concatenated key for segment *x*is "AFINANCE006."




**concatenated key**

(C) 610.5-1990

**concatenated transaction (1)** A transaction where the request and response subactions are directly concatenated without a gap between the acknowledge of the request and the response packet. (C/MM) 1394-1995

**(2)** A split transaction comprised of concatenated subactions. (C/MM) 1394a-2000

**concatenation (fiber optics)** (of optical waveguides) The linking of optical waveguides, end to end. (Std100) 812-1984w

**concave (image processing and pattern recognition)** Pertaining to a region for which at least one straight line segment between two points of the region is not entirely contained within the region. *Contrast:* convex.

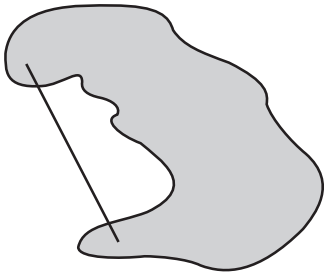


**illustration of concave**

(C) 610.4-1990w

**concealed** Rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them. (NESC/NEC) [86]

**concealed knob-and-tube wiring** A wiring method using knobs, tubes, and flexible nonmetallic tubing for the protection and support of single insulated conductors concealed in hollow spaces of walls and ceilings of buildings. (NESC/NEC) [86]

**concentrate (metallurgy)** The product obtained by concentrating disseminated or lean ores by mechanical or other processes thereby eliminating undesired minerals or constituents. *See also:* electrowinning. (EEC/PE) [119]

**concentrated winding (rotating machinery)** A winding, the coils of which occupy one slot pole: or a field winding mounted on salient poles. *See also:* direct-current commutating machine; asynchronous machine. (PE) [9]

**concentration** The quantity of radioactive material stated in terms of activity (or mass) per unit of volume or mass of a medium. (NI) N42.23-1995

**concentration cell (1)** An electrolyte cell, the electromotive force of which is due to differences in composition of the electrolyte at anode and cathode areas. (IA) [59]
**(2)** A cell of the two-fluid type in which the same dissolved substance is present in differing concentrations at the two electrodes. *See also:* electrochemistry. (EEC/PE) [119]

**concentration polarization (1)** That part of the total polarization that is caused by changes in the activity of the potential-determining components of the electrolyte. *See also:* electrochemistry. (EEC/PE) [119]
**(2)** That portion of the polarization of an electrode produced by concentration changes at the metal-environment interface. (IA) [59]

**concentrator (1) (telephone switching systems)** A switching entity for connecting a number of inlets to a smaller number of outlets. (COM) 312-1977w
**(2)** A device that provides communications capability between many low-speed, usually asynchronous channels and fewer high-speed, usually synchronous channels the sum of whose data rates is (usually) less than the sum of the data rates of the low-speed channels. (LM/COM) 168-1956w
**(3) (A)** A device that combines incoming messages into a single message or that extracts individual messages from the data set in a single transmission sequence. *Note:* The former process is called "concentration" and the latter, "deconcentration." **(B)** A communications computer that provides communications capability between many low speed asynchronous channels and one or more high-speed synchronous channels. *See also:* multiplexer; data concentrator. **(C)** A device in token ring networks that contains multiple interconnected trunk coupling units. (C) 610.7-1995, 610.10-1994
**(4)** A device that contains multiple interconnected trunk coupling units (TCUs). The concentrator contains two ports, referred to as *ring in* and *ring out*, to interface trunk cable. (C/LM) 8802-5-1998

**concentrator concentric electrode system (coaxial electrode system) (electrobiology)** An electrode system that is geometrically coaxial but electrically unsymmetrical. Example: One electrode may have the form of a cylindrical shell about the other so as to afford electrical shielding. *See also:* electrobiology. (EMB) [47]

**concentricity error (fiber optics)** When used in conjunction with a tolerance field to specify core/cladding geometry, the distance between the center of the two concentric circles specifying the cladding diameter and the center of the two concentric circles specifying the core diameter. *See also:* core diameter; cladding diameter; tolerance field; core; cladding. (Std100) 812-1984w

**concentricity of coaxial connectors (fixed and variable attenuators)** Total indicator runout between the diameter of outer conductor and that diameter of that portion of inner conductor which engages with the corresponding diameters of mating connector. *Note:* This does not apply to precision connectors with only butt contacts. (IM/HFIM) 474-1973w

**concentric-lay cable** A multiple-conductor cable composed of a central core surrounded by one or more layers of helically laid insulated conductors. *See also:* concentric-lay conductor. (T&D/PE) [10]

**concentric-lay conductor** A conductor composed of a central core surrounded by one or more layers of helically laid wires. *Note:* In the most common type of concentric-lay conductor, all wires are of the same size and the central core is a single wire. *See also:* conductor. (T&D/PE) [10]

**concentric resonator (laser maser)** A beam resonator comprising a pair of spherical mirrors having the same axis of rotational symmetry and positioned so that their centers of curvature coincide on this axis. (LEO) 586-1980w

**concentric winding (rotating machinery)** A winding in which the two coil sides of each coil of a phase belt, or of a pole of a field winding, are symmetrically located so as to be equidistant from a common axis. *See also:* asynchronous machine. (PE) [9]

**concentric windings (power and distribution transformers)** (of a transformer) An arrangement of transformer windings where the primary and secondary windings, and the tertiary winding, if any, are located in radial progression about a common core. (PE/TR) C57.12.80-1978r

**concentric-wound relay coil** A coil with two or more insulated windings, wound one over the other. (EEC/REE) [87]

**concept** A unit of thought constituted through abstraction on the basis of characteristics common to a group of entities. (SCC32) 1489-1999

**concept analysis** The derivation of a system concept through the application of analysis. *See also:* analysis. (C/SE) 1362-1998

**concept level** The level of verification activities at which vital functions and vital implementation requirements, imposed on the system's design and implementation by the safety assurance concept selected, are determined and identified. (VT/RT) 1483-2000

**concept of operations document (ConOps document)** A user-oriented document that describes a system's operational characteristics from the end user's viewpoint. *Synonym:* operational concept description. (C/SE) 1362-1998

**concept phase (software)** The period of time in the software development cycle during which the user needs are described and evaluated through documentation (for example, statement of needs, advance planning report, project initiation memo, feasibility studies, system definition, documentation, regulations, procedures, or policies relevant to the project). (C/SE) 1012-1986s, 610.12-1990, 982.1-1988, 982.2-1988

**conceptual data definition language** A data definition language used to describe the format layout and contents of all data stored in a database, the result of which is a conceptual schema. *Note:* May also include authorization levels and validation procedures. (C) 610.5-1990w

**conceptual design** The process of developing a conceptual schema for a database. (C) 610.5-1990w

**conceptual model (1)** A simulation implementation-independent representation of the exercise architect's understanding of the exercise objectives, requirements, and environment. The model includes logic and algorithms and explicitly recognizes assumptions and limitations. (C/DIS) 1278.4-1997 **(2)** A model of the concepts relevant to some endeavor. (C/SE) 1320.2-1998

**conceptual population (results from a measurement process)** The set of measurements that would result from infinite repetition of a measurement process in a state of statistical control. (IM) 470-1972w

**conceptual record** A record within a conceptual view. (C) 610.5-1990w

**conceptual schema (A)** A description of the format and layout of the entire data contents of a database. *Note:* The schema is written using a conceptual data definition language. It may include authorization levels and validation procedures. **(B)** The comprehensive, logical description of the information environment in which an enterprise exists, free of both the physical structure and application systems considerations. *Synonym:* enterprise view; conceptual model. *Contrast:* internal schema; external view. (C) 610.5-1990

**conceptual switch** A circuit feature, acting under the control of a digital control signal, that allows two circuit nodes to be electrically connected or isolated, as though there were a switch between them. *Note:* Depending on physical constraints, such as size, power consumption, and electrical characteristics, it may be possible in any particular application to implement all, some, or none of the conceptual switches by conventional complimentary metal oxide silicon (CMOS) transmission gates. *See also:* switch. (C/TT) 1149.4-1999

**conceptual view** The format and layout of the entire data content of a database, as described in a conceptual schema. *Note:* There may be many external views of a database, but only one conceptual view. (C) 610.5-1990w

**concrete** A class, instances of which are permitted either by direct instantiation or the instantiation of its concrete subclasses. (C/PA) 1328-1993w, 1224.1-1993w, 1327-1993w, 1238.1-1994w, 1224-1993w

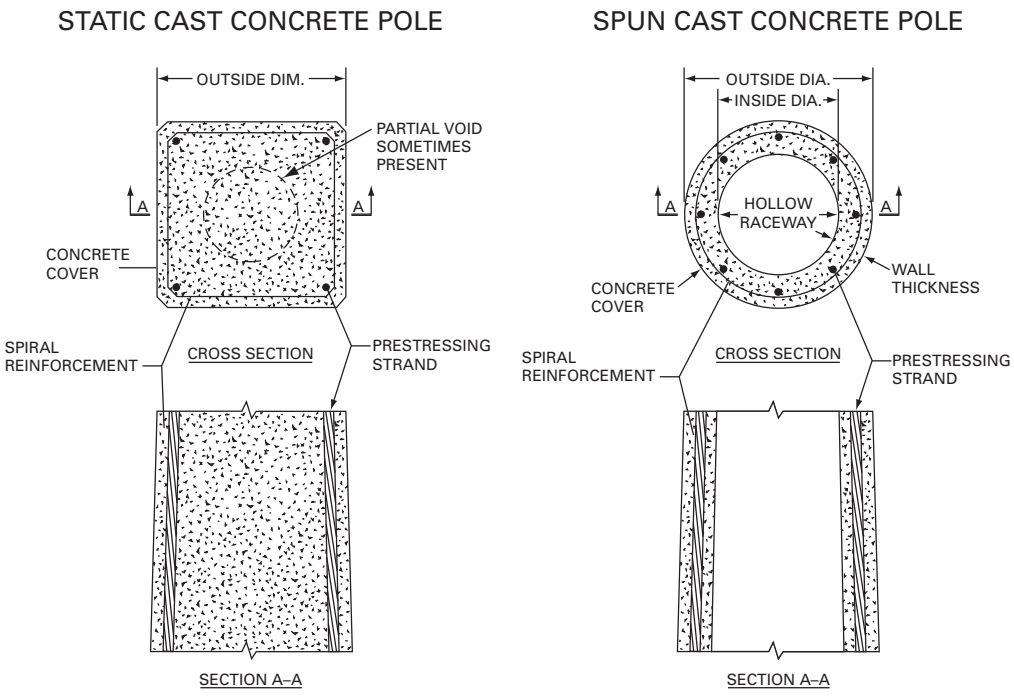
**concrete class (1)** An OM class of which instances are permitted. (C/PA) 1328.2-1993w, 1326.2-1993w, 1327.2-1993w, 1224.2-1993w **(2)** A class, instances of which are permitted either by direct instantiation or the instantiation of its concrete subclasses. (C/PA) 1327-1993w, 1224.1-1993w, 1328-1993w, 1224-1993w, 1238.1-1994w

**concrete-encased ground electrode** A grounding electrode completely encased within concrete, located within, and near the bottom of, a concrete foundation or footing or pad, that is in direct contact with the earth. *Synonym:* ufer ground. (IA/PSE) 1100-1999

**concrete model** A model in which at least one component represented is a tangible object; for example, a physical replica of a building. (C) 610.3-1989w

**concrete pole structures** Structures consisting of one or more concrete poles. Other members of the structure may be reinforced concrete or other materials (i.e., wood, steel, aluminum). These structures are prefabricated, as opposed to being cast-in-place. Concrete pole structures may be manufactured in a variety of ways. A few examples are: Hollow or solid members; Different cross-sectional shape (i.e., round or square); Spun or statically cast (see figure below); Pretensioned, posttensioned, or nontensioned reinforcing steele); and Single-piece or multipiece poles. Combination of the above may be used to achieve the desired results (see figure below). (T&D/PE) 1025-1993r

**concrete quantity** *See:* physical quantity.




**various concrete pole sections**

**concrete-tight fitting** (for conduit) A fitting so constructed that embedment in freshly mixed concrete will not result in the entrance of cement into the fitting. (EEC/REWS) [113]

**concurrency** The process of multiple users accessing and manipulating a data item simultaneously, with the data-base management system linking the transaction of each user so that the access appears to be sequential. (PE/EDPG) 1150-1991w

**concurrent (software)** Pertaining to the occurrence of two or more activities within the same interval of time, achieved either by interleaving the activities or by simultaneous execution. *Synonym:* parallel. *Contrast:* simultaneous. (C) 610.12-1990

**concurrent bus operation** In dual bus systems, "concurrent bus operation capable" describes buses capable of conducting simultaneous unrelated bus transactions. "Non-concurrent bus operation capable" describes buses capable of conducting a transaction on only one bus at a time. (C/BA) 14536-1995

**concurrent engineering** The simultaneous engineering of products and life cycle processes to ensure usability, producibility, and supportability, and to control life cycle and total ownership costs. (C/SE) 1220-1998

**concurrent execution** Functions that suspend the execution of the calling thread shall not cause the execution of other threads to be indefinitely suspended. (C/PA) 9945-1-1996

**concurrent processes (software)** Processes that may execute in parallel on multiple processors or asynchronously on a single processor. Concurrent processes may interact with each other, and one process may suspend execution pending receipt of information from another process or the occurence of an external event. *See also:* sequential processes; execution. (C/SE) 729-1983s

**concurrent reorganization (data management)** Database reorganization in which users have access to the reorganized portion of the database while one or more reorganization processes are modifying other portions of the database. (C) 610.5-1990w

**condensed-mercury temperature (mercury-vapor tube)** The temperature measured on the outside of the tube envelope in the region where the mercury is condensing in a glass tube or at a designated point on a metal tube. *See also:* gas tube. (ED) [45]

**condenser** *See:* capacitor; fuse condenser.

**condenser antenna** *See:* capacitor antenna.

**condenser box** *See:* subdivided capacitor.

**condenser bushing** *See:* capacitor bushing.

**condenser loudspeaker** *See:* electrostatic loudspeaker.

**condenser microphone** *See:* electrostatic microphone.

**condition (1) (modeling and simulation)** The values assumed at a given instant by the variables in a system, model, or simulation. *See also:* initial condition; boundary condition; state; final condition. (C) 610.3-1989w

**(2) (data management)** *See also:* item condition; record condition; atomic condition. (C) 610.5-1990w

**(3)** *See also:* initial condition. (C)

**condition adverse to quality** An all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items and non-conformances. A significant condition adverse to quality is one which, if uncorrected, could have a serious effect on safety, quality, or operability. (NI/PE/NP) N42.23-1995, [124]

**conditional branch*** *See:* conditional jump.

* Deprecated.

**conditional branch instruction** A branch instruction that specifies conditions and, if those conditions are met, changes the program flow to a new location. *See also:* branch instruction; conditional jump instruction. (C) 610.10-1994w

**condition code register** A flag register used to hold the status bits used to decide conditional branches. *Note:* These bits generally include: zero, negative, and overflow. (C) 610.10-1994w

**conditional control structure** A programming control structure that allows alternative flow of control in a program depending upon the fulfillment of specified conditions, for example, case, if. . .then. . .else. . . . *See also:* program; flow of control; case; control structure. (C/SE) 729-1983s

**conditional control transfer instruction** *See:* conditional jump instruction.

**conditional event** A sequentially dependent event that will occur only if some other event has already taken place. *See also:* time-dependent event. (C) 610.3-1989w

**conditional feature** A feature or behavior referred to in a POSIX standard that need not be present on all conforming implementations. (C/PA) 13210-1994, 2003.1-1992

**conditional implication** *See:* implication.

**conditional jump (1)** To cause, or an instruction that causes, the proper one of two (or more) addresses to be used in obtaining the next instruction, depending upon some property of one or more numerical expressions or other conditions. *Synonym:* branch. *See also:* jump. (C) 162-1963w

**(2) (software)** A jump that takes place only when specified conditions are met. *Contrast:* unconditional jump. (C) 610.12-1990

**conditional jump instruction** A jump instruction that specifies conditions and, if those conditions are met, changes program flow to a new location. *Contrast:* unconditional jump instruction. *See also:* conditional branch instruction. (C) 610.10-1994w

**conditionally invalid date-component value** A date-component value that is improperly produced or improperly accepted by a system element dependent on other date-component values. *Note:* In the Gregorian calendar, the following are the conditionally invalid date-component values for dates following the adoption of the calendar:

— Values of the day-of-month equal to 29, 30, or 31 in February in years that are not leap years.
— Values of the day-of-month equal to 30 or 31 in February in years that are leap years.
— Values of the day-of-month equal to 31 in April, June, September, and November.
— Values of the day-of-year equal to 366 in years that are not leap years.

Normalization of invalid date-component values to valid date-component values does not constitute improper acceptance of a date-component. (C/PA) 2000.1-1999

**conditional stability (linear feedback control system)** A property such that the system is stable for prescribed operating values of the frequency-invariant factor of the loop gain and becomes unstable not only for higher values, but also for some lower values. *See also:* feedback control system. (PE/EDPG) 421A-1978s

**conditional transfer instruction** *See:* conditional jump instruction.

**condition code** *See:* status code.

**conditioning (1)** The addition of equipment to or selection of communication facilities to provide the performance characteristics required for certain types of data transmission. (LM/COM) 168-1956w

**(2) (replacement parts for Class 1E equipment in nuclear power generating stations)** Any additional work or process imposed upon a part that makes it different from nominally similar parts. *Note:* Conditioning may include calibration, adjustment, tuning, selection testing, "burn-in," heat treatment, machining, and similar processes. For example, if several parts are selected to test one that displays a special characteristic, the selected part is conditioned because it then displays a characteristic that makes it unique from parts with the same nominal description. (PE/NP) 934-1987w

**(3)** In telecommunication, a means to improve the performance of a line by reducing distortion and amplifying weak signals. For example, in telecommunication, line conditioning will bring attenuation, impedance, and delay characteristics

to within set limits. *Synonym:* line conditioning. *See also:* D conditioning; C conditioning. (C) 610.7-1995

**conditioning stimulus (medical electronics)** A stimulus of given configuration applied to a tissue before a test stimulus. (EMB) [47]

**condition monitoring** Observation, measurement, or trending of condition or functional indicators with respect to some independent parameter (usually time or cycles) to indicate the current and future ability to function within acceptance criteria. (PE/NP) 933-1999

**condition variable (1)** A synchronization object that allows a thread to suspend execution, repeatedly, until some associated predicate becomes true. A thread whose execution is suspended on a condition variable is said to be *blocked on* the condition variable. (C/PA) 9945-1-1996

**(2)** A synchronization object that allows a task to become blocked until it is unblocked by some event. The unblocking may occur spontaneously or as a result of a timeout or another task performing a condition-signaling operation on the condition variable. In use, condition variables are always associated with mutexes. (C) 1003.5-1999

**Condition Variable Service** An instance of the class `IEEE1451_ConditionVariableService` or of a subclass thereof. (IM/ST) 1451.1-1999

**conductance (A)** That physical property of an element, device, branch, network or system, that is the factor by which the mean square voltage must be multiplied to give the corresponding power lost by dissipation as heat or as other permanent radiation or loss of electromagnetic energy from the circuit. **(B)** The real part of admittance. *Note:* (A) and (B) are not equivalent but are supplementary. In any case where confusion may arise, specify the definition being used. (IM/HFIM) [40]

**conductance coupling (interference terminology)** The type of coupling in which the mechanism is conductance between the interference source and the signal system. *See also:* raceway; interference.

**conductance, electrode** *See:* electrode conductance.

**conductance for rectification (electron tube)** The quotient of (A) the electrode alternating current of low frequency by (B) the in-phase component of the electrode alternating voltage of low frequency, a high frequency sinusoidal voltage being applied to the same or another electrode and all other electrode voltages being maintained constant. *See also:* rectification factor. (ED) [45]

**conductance relay** A mho relay for which the center of the operating characteristic on the *R*-*X* diagram is on the *R*-axis. *Note:* The equation that describes such a characteristic is

$$Z - K\cos\theta$$

where $K$ is a constant and $\theta$ is the phase angle by which the input voltage leads the input current. (SWG/PE) C37.100-1992

**conducted emissions test site** A site meeting specified requirements suitable for measuring radio interference voltages and currents emitted by an equipment under test (EUT). (EMC) C63.4-1991

**conducted heat** The thermal energy transported by thermal conduction. *See also:* thermoelectric device. (ED) [46]

**conducted interference** Interference resulting from conducted radio noise or unwanted radio signals entering a transducer (receiver) by direct coupling. *See also:* electromagnetic compatibility. (EMC/T&D/PE) [53], 539-1990

**conducted radio noise (1)** Radio noise produced by equipment operation, which exists on the power line of the equipment and is measurable under specified conditions as a voltage or current. (EMC) C63.4-1988s

**(2)** Radio noise propagated along circuit conductors. *Note:* It may enter a transducer (receiver) by direct coupling or by an antenna as by subsequent radiation from some circuit element. *See also:* electromagnetic compatibility. (EMC) [53]

**(3) (overhead power lines)** Radio noise that is propagated by conduction from a source through electrical connections. (T&D/PE) 539-1990

**conducted spurious emission power (land-mobile communications transmitters)** Any part of the spurious emission power output conducted over a tangible transmission path. Radiation is not considered a tangible path. (EMC) 377-1980r

**conducted spurious transmitter output (land-mobile communications transmitters)** Any spurious output of a radio transmitter conducted over a tangible transmission path. *Note:* Power lines, control leads, radio frequency transmission lines and waveguides are all considered as tangible paths in the foregoing definition. Radiation is not considered a tangible path in this definition. (EMC) 377-1980r

**conducting (conduction) period (1) (rectifier circuit element) (semiconductor)** That part of an alternating voltage cycle during which the current flows in the forward direction. *Note:* The forward period is not necessarily the same as the conducting period because of circuit parameters and semiconductor rectifier diode characteristics. (IA) [12]

**(2) (gas tube)** That part of an alternating-voltage cycle during which a certain arc path is carrying current. (ED) [45]

**conducting element** (of a fuse) The conducting means, including the current-responsive element, for completing the electric circuit between the terminals of a fuse-holder or fuse unit. *Synonym:* fuse link. (SWG/PE) C37.100-1992, C37.40-1993

**conducting ground plane** A conducting flat surface or plate that is used as a common reference point for circuit returns and electric or signal potentials, and that reflects electromagnetic waves. (EMC) C63.4-1991

**conducting interval (self-commutated converters) (circuit properties)** An interval during which the principal current flows through a blocking element. (IA/SPC) 936-1987w

**conducting material** A material, such as a metal, that has a very large number of free electrons that can easily be put into motion to create an electric current. *Contrast:* insulating material; semiconducting material. (C) 610.10-1994w

**conducting mechanical joint** The juncture of two or more conducting surfaces held together by mechanical means. *Note:* Parts jointed by fusion processes, such as welding, brazing, or soldering, are excluded from this definition. (SWG/PE) C37.100-1992

**conducting paint (rotating machinery)** A paint in which the pigment or a portion of pigment is a conductor of electricity and the composition is such that when it is converted to a solid film, the electric conductivity of the film approaches that of metallic substances. (PE) [9]

**conducting parts** The parts that are designed to carry current or that are conductively connected therewith. (IA/ICTL/IAC) [60]

**conducting salts** Salts that, when added to a plating solution, materially increase its conductivity. *See also:* electroplating. (EEC/PE) [119]

**conduction band (semiconductor)** A range of states in the energy spectrum of a solid in which electrons can move freely. *See also:* semiconductor. (ED) 216-1960w

**conduction current ($I_G$) (1) (A)** The component of the measured current in phase with the applied voltage that is delivered to the volume of the tool or equipment, due to the physical resistance of the material comprising the tool or equipment. **(B) (electric submersible pump cable) (leakage current)** Current resulting from conduction through the cable insulating medium or over surfaces. Corona discharge from external energized elements will be indicated as conduction current. (IA/PE/T&D/PC/IC) 1017-1985, 516-1995, 400-1991

**(2)** Current in the specimen under steady-state conditions. *Notes:* 1. This is sometimes called "leakage" current. 2. Absorption and capacitive effects are assumed to have been made negligible under steady-state conditions. 3. Surface

leakage current is assumed excluded from the measured current. (PE) 402-1974w

**(3)** A current that is constant in time, that passes through the bulk insulation from the grounded surface to the high-voltage conductor, and that depends on the type of bonding material used in the insulation system. (PE/EM) 43-2000

**conduction electrons (semiconductor)** The electrons in the conduction band of a solid that are free to move under the influence of an electric field. *See also:* semiconductor. (AES) [41]

**conduction-through (thyristor converter)** The failure to achieve forward blocking, during inverter operation, of an arm of a thyristor connection at the end of the normally conducting period, thus enabling the direct current to continue to pass during the period when the thyristor is normally in the off state. *Note:* A conduction-through occurs, for example, when the margin angle is too small or because of a misgating in the succeeding arm. (IA/IPC) 444-1973w

**conductive (health care facilities)** Adjective describing not only those materials, such as metals, which are commonly considered as electrically conductive, but also that class of materials which, when tested in accordance with NFPA standard 56A, 1978, have a resistance not exceeding 1 000 000 ohms. Such materials are required where electrostatic interconnection is necessary. (EMB) [47]

**conductive clothing** Clothing made of natural or synthetic material that is either conductive or interwoven with conductive thread to provide mitigation of effects of the electric fields of high-voltage energized electrical conductors and equipment. (T&D/PE) 516-1995

**conductive coating (rotating machinery)** Conducting paint applied to the slot portion of a coil-side, to carry capacitive and leakage currents harmlessly between insulation and grounded iron. (PE) [9]

**conductive coupling (1) (overhead power lines)** The process of generating voltages and/or currents in conductive objects and electric circuits, otherwise unenergized, due to deposition of charge. (T&D/PE) 539-1990

**(2) (interference terminology)** *See also:* coupling; conductance coupling.

**conductive heat release** The energy released from a burning material to whatever is in direct contact with it. (DEI) 1221-1993w

**conductivity ($\sigma$) (1) (material)** A factor such that the conduction-current density is equal to the electric-field intensity in the material multiplied by the conductivity. *Note:* In the general case it is a complex tensor quantity. *See also:* transmission line. (IM/HFIM) [40]

**(2)** A macroscopic material property that relates the conduction current density ($J$) to the electric field ($\vec{E}$) in the medium. *Note:* For a monochromatic wave in a linear medium, that relationship is described by the (phasor) equation:

$$\vec{J} = \sigma = \cdot \vec{E}$$

where

$\sigma =$ = a tensor, generally frequency dependent

$\vec{J}$ = in phase with $\vec{E}$

For an isotropic medium, the tensor conductivity reduces to a complex scalar conductivity $\sigma$, in which case $\vec{J} = \sigma\vec{E}$. (AP/PROP) 211-1997

**conductivity chamber** An instrument that determines the conductivity of the air. (T&D/PE) 539-1990

**conductivity in physical media** The real part of the complex conductivity. *See also:* complex permittivity. (AP/ANT) 145-1983s

**conductivity modulation (semiconductor)** The variation of the conductivity of a semiconductor by variation of the charge-carrier density. *See also:* semiconductor device; semiconductor. (ED) 216-1960w

**conductivity-modulation transistor** A transistor in which the active properties are derived from minority-carrier modulation of the bulk resistivity of a semiconductor. *See also:* semiconductor; transistor. (ED) 216-1960w

**conductivity, *n*-type (semiconductor)** The conductivity associated with conduction electrons in a semiconductor. *See also:* semiconductor. (ED) 216-1960w

**conductivity, *p*-type (semiconductor)** The conductivity associated with holes in a semiconductor. *See also:* semiconductor. (AES/IA/ED) [41], [12], 270-1966w, 216-1960w

**conductivity, thermal** *See:* thermal conductivity.

**conductor (1) (A) (general)** A substance or body that allows a current of electricity to pass continuously along it. **(B) (general)** The portion of a lightning-protection system designed to carry the lightning discharge between air terminal and ground. (PE/NFPA) [9], [114]

**(2)** A material, usually in the form of a wire, cable, or bus bar, suitable for carrying an electric current. *See also:* open conductor; bundled conductor; covered conductor; grounded conductor; lateral conductor; insulated conductor; grounding conductor. (NESC/T&D) C2-1997, C2.2-1960

**(3) (power line maintenance)** A wire or combination of wires not insulated from one another, suitable for carrying an electrical current. However, it may be bare or insulated. *Synonyms:* wire; cable. (T&D/PE) 524a-1993r, 30-1937w, 516-1995, 524-1992r, 1048-1990

**(4) (substation grounding)** A metallic substance that allows a current of electricity to pass continuously along it. As used in IEEE Std 837-1989, a conductor includes cable (wire), rods (electrodes), and metallic structures. (SUB/PE) 837-1989r

**(5)** A device made from conducting material; for example, a metal wire. (C) 610.10-1994w

**conductor, bare** *See:* bare conductor.

**conductor car (conductor stringing equipment)** A device designed to carry workmen and ride on sagged bundle conductors, thus enabling them to inspect the conductors for damage and install spacers and dampers where required. These devices may be manual or powered. *Synonyms:* cable buggy; cable car; spacer cart; spacing bicycle; spacer buggy. (PE/T&D) 524-1992r

**conductor, coaxial** *See:* coaxial conductor.

**conductor combination (substation grounding)** The various conductors that may be joined by a connector. (SUB/PE) 837-1989r

**conductor-cooled (rotating machinery)** A term referring to windings in which coolant flows in close contact with the conductors so that the heat generated within the principal portion of the windings reaches the cooling medium without flowing through the major ground insulation. (Std100) [84]

**conductor cover** Electrical protection equipment designed specifically to cover conductors *Synonyms:* hose; hard cover; eel; snake. *See also:* cover-up equipment. (T&D/PE) 516-1995

**conductor, covered** *See:* covered conductor.

**conductor current connection interface** The connection for transfer of conductor current from the GIS conductor to the cable termination. (PE/IC) 1300-1996

**conductor grip** A device designed to permit the pulling of a conductor without splicing on fittings, eyes, etc. It permits the pulling of a continuous conductor where threading is not possible. The designs of these grips vary considerably. Grips such as the Klein (Chicago) and Crescent utilize an open-sided, rigid body with opposing jaws and swing latch. In addition to pulling conductors, this type of grip is commonly used to tension guys and, in some cases, to pull wire rope. The design of the come-along (pocket-book, suitcase, four bolt, etc.) incorporates a bail attached to the body of a clamp that folds to completely surround and envelop the conductor. Bolts are then used to close the clamp and obtain a grip *Synonyms:* buffalo; six bolt; crescent; Kellem grip; four bolt; Kellem; Klein; seven bolt; suitcase; slip-grip; grip; pocketbook; Chicago grip; come-along. *See also:* conductor grip. (T&D/PE) 524a-1993r, 524-1992r, 516-1995

**conductor hook** *See:* conductor lifting hook.

**conductor insulation (rotating machinery)** The insulation on a conductor or between adjacent conductors. (PE) [9]

**conductor lifting hook (power line maintenance)** A device resembling an open boxing glove designed to permit the lifting of conductors from a position above the conductors. Normally used during clipping-in operations. Suspension clamps are sometimes used for this purpose. (T&D/PE) 516-1987s

**conductor loading (mechanical)** The combined load per unit length of a conductor due to the weight of the wire plus the wind and ice loads. *See also:* tower. (T&D/PE) [10]

**conductor-loop resistance (telephone switching systems)** The series resistance of the conductors of a line or trunk loop, excluding terminal equipment or apparatus. (COM) 312-1977w

**conductor loss** That contribution to the attenuation constant of a propagating mode on a planar transmission line that represents losses attributed to the finite conductivity of the conductors involved. (MTT) 1004-1987w

**conductor payout station** *See:* tension site.

**conductor safety** A sling arranged in a vertical basket configuration, with both ends attached to the supporting structure and passed under the clipped-in conductor(s). These devices, when used, are normally utilized with bundled conductors to act as a safety device in case of insulator failure while workers in conductor cars are installing spacers between the subconductors, or as an added safety measure when crossing above energized circuits. These devices may be fabricated from synthetic fiber rope or wire rope. (T&D/PE) 524-1992r

**conductor shielding (1) (power distribution, underground cables)** A conducting or semiconducting element in direct contact with the conductor and in intimate contact with the inner surface of the insulation so that the potential of this element is the same as the conductor. Its function is to eliminate ionizable voids at the conductor and provide uniform voltage stress at the inner surface of the insulating wall. (PE) [4]

**(2) (cable systems)** A conducting material applied in manufacture directly over the surface of the conductor and firmly bonded to the inner surface of the insulation. (PE/EDPG) 422-1977

**(3)** An envelope that encloses the conductor of a cable and provides an equipotential surface in contact with the cable insulation. (NESC) C2-1997

**conductor splice** *See:* compression joint.

**conductor support box** A box that is inserted in a vertical run of raceway to give access to the conductors for the purpose of providing supports for them. *See also:* cabinet. (EEC/PE) [119]

**conductor temperature (1) (electrical heat tracing for industrial applications)** The temperature of the heat-producing element. (BT/AV) 152-1953s

**(2)** The temperature of a conductor. *Note:* The conductor is assumed to be isothermal (i.e., no axial or radial temperature variation) for all steady-state calculations and for all transient calculations where the time period of interest exceeds 1 min or the conductor consists of a single material. With transient calculations for times less than 1 min with nonhomogeneous ACSR conductors (i.e., aluminum conductor steel reinforced), the aluminum strands are isothermal; but the heat capacity of the steel core is assumed to be zero. (T&D/PE) 738-1993

**conduit (1) (aircraft)** An enclosure used for the radio shielding or the mechanical protection of electric wiring in an aircraft. *Note:* It may consist of either rigid or flexible, metallic or nonmetallic tubing. Conduit differs from pipe and metallic tubing in that it is not normally used to conduct liquids or gases. *See also:* flexible metal conduit; rigid metal conduit. (EEC/PE) [119]

**(2) (packaging machinery)** A tubular raceway for holding wires or cables, which is designed expressly for, and used solely for, this purpose. (IA/PKG) 333-1980w

**(3)** A structure containing one or more ducts. *Note:* Conduit may be designated as iron-pipe conduit, tile conduit, etc. If it contains only one duct it is called *single-duct conduit;* if it contains more than one duct it is called *multiple-duct conduit,* usually with the number of ducts as a prefix, for example, *two-duct multiple conduit.* (NESC/T&D/PE) C2-1997, C2.2-1960, [10]

**conduit body** A separate portion of a conduit or tubing system that provides access through a removable cover(s) to the interior of the system at a junction of two or more sections of the system or at a terminal point of the system. (NESC/NEC) [86]

**conduit fitting** An accessory that serves to complete a conduit system, such as bushings and access fittings. *See also:* raceway. (EEC/REWS) [113]

**conduit knockout** *See:* knockout.

**conduit run** *See:* duct bank.

**conduit system (raceway systems for Class 1E circuits for nuclear power generating stations)** Any assembly of conduit sections, fittings, supports, anchorages, and accessories that form a structural system to support wire and cable. . (PE/NP) 628-1987r

**(2)** Any combination of duct, conduit, conduits, manholes, handholes, and vaults joined to form an integrated whole. (NESC) C2-1997

**cone (1) (cathode-ray tubes)** The divergent part of the envelope of the tube. *See also:* cathode-ray tube. (ED) [45]

**(2) (vision)** Retinal elements that are primarily concerned with the perception of detail and color by the light-adapted eye. *See also:* retina. (EEC/IE) [126]

**cone of ambiguity (navigation aid terms)** A generally conical volume of airspace above a navigation aid within which navigational information from that facility is unreliable. (AES/GCS) 172-1983w

**cone of nulls** A conical surface formed by directions of negligible radiation. *See also:* antenna. (AP/ANT) [35]

**cone of protection (lightning)** The space enclosed by a cone formed with its apex at the highest point of a lightning rod or protecting tower, the diameter of the base of the cone having a definite relation to the height of the rod or tower. *Note:* This relation depends on the height of the rod and the height of the cloud above the earth. The higher the cloud, the larger the radius of the base of the protecting cone. The ratio of radius of base to height varies approximately from one to two. When overhead ground wires are used, the space protected is called a zone of protection or protected zone. (T&D/PE) [10]

**cone of silence (navigation aid terms)** A conically shaped region above an antenna where the field strength is relatively weak because of the configuration of the antenna system. (AES/GCS) 172-1983w

**cone, leader** *See:* leader cone.

**cones (illuminating engineering)** Retinal receptors which dominate the retinal response when the luminance level is high and provide the basis for the perception of color. (EEC/IE) [126]

**conference call (telephone switching systems)** A call in which communication is provided among more than two main stations. (COM) 312-1977w

**conference connection** A special connection for a telephone conversation among more than two stations. (EEC/PE) [119]

**Conférence Internationale Des Grands Réseaux Electriques** An international organization concerned with large high voltage electric power systems. (PE) 599-1985w

**Conference on Data Systems Languages (CODASYL)** An organization that establishes industry standards for database structures. (C) 610.5-1990w

**confidence limit** The uncertainty associated with the estimate of a time- or frequency-domain instability measure from a finite number of measurements. (SCC27) 1139-1999

**confidence test (test, measurement, and diagnostic equipment)** A test primarily performed to provide a high degree of certainty that the unit under test is operating acceptably. (MIL) [2]

**confidence tester (test, measurement, and diagnostic equipment)** Any test equipment, either automatic, semiautomatic, or manual, which is used expressly for performing a test or series of tests to increase the degree of certainty that the unit under test is operating acceptably. (MIL) [2]

**confidentiality** The property of information that is not made available or disclosed to unauthorized individuals, entities, or processes. (C/LM) 8802-11-1999

**Configurable Startup Set** A Component Group Object owned by an NCAP Block Object for use in bringing the system to a known state. (IM/ST) 1451.1-1999

**configuration (1) (A) (software)** The arrangement of a computer system or component as defined by the number, nature, and interconnections of its constituent parts. **(B) (software)** In configuration management, the functional and physical characteristics of hardware or software as set forth in technical documentation or achieved in a product. *See also:* version. **(C)** The physical and logical elements of an information processing system, the manner in which they are organized and connected, or both. *Note:* May refer to hardware configuration or software configuration. (C) 610.7-1995, 610.12-1990, 610.10-1994
**(2)** A collection of capability modules. (C/MM) 855-1990
**(3)** A process often synonymous with commissioning. Often includes the selection of attributes of an object that change its appearance or performance characteristics as opposed to its communication properties. (IM/ST) 1451.1-1999

**configuration audit** *See:* physical configuration audit; functional configuration audit.

**configuration baseline** The configuration at a point in time recorded in documentation that fully describes the functional, performance, usability, interface requirement, and design characteristics, as appropriate to the stage of the life cycle. (C/SE) 1220-1998

**configuration control (software)** An element of configuration management, consisting of the evaluation, coordination, approval or disapproval, and implementation of changes to configuration items after formal establishment of their configuration identification. *Synonym:* change control. *Contrast:* configuration status accounting; configuration identification. *See also:* engineering change; interface control; notice of revision; waiver; configuration item; deviation; specification change notice. (C) 610.12-1990

**configuration control board (software)** A group of people responsible for evaluating and approving or disapproving proposed changes to configuration items, and for ensuring implementation of approved changes. *Synonym:* change control board. *See also:* configuration control. (C) 610.12-1990

**configuration control function** The function that ensures that the resources of all *nodes* of a DQDB *subnetwork* are configured into a correct Dual Bus topology. The resources that are managed are the Head of Bus function, the *External Timing Source function,* and the *Default Slot Generator function.* (LM/C) 8802-6-1994

**configuration diagram** *See:* block diagram.

**configuration factor (illuminating engineering)** The ratio of illuminance on a surface at point 2 (due to flux directly received from lambertian surface 1) to the exitance of surface 1. It is used in flux transfer theory $C_{1-2} = (E_2)/(M_1)$. (EEC/IE) [126]

**configuration identification (A) (software)** An element of configuration management, consisting of selecting the configuration items for a system and recording their functional and physical characteristics in technical documentation. *Contrast:* configuration status accounting; configuration control. **(B) (software)** The current approved technical documentation for a configuration item as set forth in specifications, drawings, associated lists, and documents referenced therein. *See also:* functional configuration identification; allocated configuration identification; product configuration identification; baseline. (C) 610.12-1990

**configuration index** A document used in configuration management, providing an accounting of the configuration items that make up a product. *See also:* configuration item development record; configuration status accounting. (C) 610.12-1990

**configuration information** The data or information that defines the operational limits and characteristics of a particular device. Depending on the device, this information is either manually downloaded into NVRAM or EEPROM, or is pre-programmed into EPROM. (PE/SUB) 1379-1997

**configuration item (software)** An aggregation of hardware, software, or both, that is designated for configuration management and treated as a single entity in the configuration management process. *See also:* configuration identification; hardware configuration item; critical item; computer software configuration item. (C) 610.12-1990

**configuration item development record** A document used in configuration management, describing the development status of a configuration item based on the results of configuration audits and design reviews. *See also:* configuration index; configuration status accounting. (C) 610.12-1990

**configuration management (1) (software)** A discipline applying technical and administrative direction and surveillance to: identify and document the functional and physical characteristics of a configuration item, control changes to those characteristics, record and report change processing and implementation status, and verify compliance with specified requirements. *See also:* configuration control; configuration status accounting; configuration audit; configuration identification; baseline. (C) 610.12-1990
**(2)** In networking, a management function that identifies, controls, collects data from, and provides data to, open network systems. (C) 610.7-1995

**configuration registers** A device's A16 registers that are required for the system configuration process. (C/MM) 1155-1992

**configuration report server (CRS)** A function that monitors and controls the stations of the ring. It receives configuration information from the stations on the ring and either forwards it to the network manager or uses it to maintain a configuration of the ring. It can also, when requested by a network manager, check the status of stations on the ring, change operational parameters of stations on the ring, and request that a station remove itself from the ring. (C/LM) 8802-5-1998

**configuration status accounting (software)** An element of configuration management, consisting of the recording and reporting of information needed to manage a configuration effectively. This information includes a listing of the approved configuration identification, the status of proposed changes to the configuration, and the implementation status of approved changes. *Contrast:* configuration identification; configuration control. *See also:* configuration item development record; configuration index. (C) 610.12-1990

**configuration variable** A named parameter, whose value is stored in nonvolatile memory, that controls some aspect of the firmware's behavior. (C/BA) 1275-1994

**configure** To initialize a device so that it operates in a particular way. For instance, a customer may configure a device so the device never requests data link confirmations, using a variety of mechanisms (e.g., parameters in NVRAM, parameters in ROM, dip switches, or hardware jumpers). (PE/SUB) 1379-1997

**confinement (A) (software)** Prevention of unauthorized alteration, use, destruction, or release of data during authorized access. **(B) (software)** Restriction on programs and processes so that they do not access or have influence on data, programs, or processes other than that allowed by specific authorization. *See also:* data; integrity. (C/SE) 729-1983

**confirm** A primitive provided from one layer entity to another layer entity to verify that the entity generating the confirm primitive responded to a request primitive originating from the entity that received the confirm primitive. (EMB/MIB) 1073.4.1-2000

**conflict_error** An error-status code that is returned when a transaction has been transmitted successfully, but a queue or usage conflict inhibits the transaction completion. A conflict _error status is returned to the original requester, which is expected to retry the transaction. This is different than a bus-dependent delay (wait or busy status), which delays the forwarding of a transaction or subaction across the bus. (C/MM) 1212-1991s

**confocal resonator (laser maser)** A beam resonator comprising a pair of spherical mirrors having the same axis of rotational symmetry and positioned so that their focal points coincide on this axis. (LEO) 586-1980w

**conformal antenna** An antenna (an array) that conforms to a surface whose shape is determined by considerations other than electromagnetic; for example, aerodynamic or hydrodynamic. *Synonym:* conformal array. (AP/ANT) 145-1993

**conformal array** *See:* conformal antenna.

**conformance document (CD) (1)** A document provided by an implementor that contains implementation details. (C/PA) 1003.5b-1995

**(2)** The conformance document required by a standard that meets the requirements specified in that standard for such a document. (C/PA) 2003-1997

**Conformance Documentation Audit** The process of reviewing a conformance document to ascertain that it meets the requirements of a base standard as specified by documentation assertions. (C/PA) 2003-1997

**conformance requirement** A requirement stated in a base standard that identifies a specific requirement in a finite, measurable, and unambiguous manner. A conformance requirement by itself or in conjunction with other conformance requirements corresponds to an assertion. *Note:* Behavior and/or capabilities imposed upon an implementation by the base standard for the implementation to conform to that base standard. (C/PA) 2003-1997

**conformance test interface connector (CTIC)** A defined connector for the purpose of conformance testing. (C/LM) 11802-4-1994

**Conformance Test Procedure (CTP)** Manual procedures used in conjunction with other test methods to measure conformance. (C/PA) 2003-1997

**conformance tests (1) (power and distribution transformers) (general)** Tests that are specifically made to demonstrate conformity with applicable standards. (SWG/PE) [56]

**(2) (mechanical switching device)** (X-radiation limits for ac high-voltage power vacuum interrupters used in power switchgear). Those tests that are specifically made to demonstrate the conformity of switchgear or its component parts with applicable standards. (SWG/PE) C37.40-1981s, C37.85-1972w, C37.60-1981r

**(3)** Tests that are made by agreement between the manufacturer and the purchaser at the time the order is placed. In some cases, by mutual agreement, certain Design Tests may be made as Conformance Tests. (PE/TR) C57.12.80-1978r

**(4)** Tests that demonstrate compliance with the applicable standards. The test specimen is normally subjected to all planned production tests prior to initiation of the conformance test program. *Note:* The conformance tests may, or may not, be similar to certain design tests. Demonstration of margin (capabilities) beyond the standards is not required. (SWG/PE) C37.20.1-1993r, C37.20.4-1996, C37.20.2-1993, C37.20.3-1996, C37.100-1992

**(5)** Tests made, when required, to demonstrate selected performance characteristics of a product or representative samples thereof. (SPD/PE) C62.11-1999

**(6) (instrument transformers)** A performance test to demonstrate compliance with the applicable standard(s). The test specimen is normally subjected to all planned routine tests prior to initiation of the conformance test program. *Note:* The conformance tests may, or may not, be similar to certain design tests. Demonstration of margin (capabilities beyond the standard) is not required. (SWG/PE/TR) C57.13.2-1986s, C37.21-1985r

**(7)** A test that is specifically made to demonstrate the continuing conformance of equipment with the applicable standard. (SUB/PE) C37.122-1983s

**Conformance Test Software (CTS)** Test software used to ascertain conformance to standards. (C/PA) 2003-1997

**conforming test result codes** The complete list of test result codes associated with each assertion that a CTS can report for a conforming implementation. (C/PA) 2003-1997

**conformity (1) (potentiometer)** The accuracy of its output: used especially in reference to a function potentiometer. (C) 165-1977w, 166-1977w

**(2) (automatic control) (curve)** The closeness with which it approximates the specified functional curve (for example logarithmic, parabolic, cubic, etc.). *Note:* It is usually expressed in terms of a nonconformity, for example the maximum deviation. For "independent conformity," any shift or rotation is permissible to reduce this deviation. For "terminal conformity," the specified functional curve must be drawn to give zero output at zero input and maximum output at maximum input, but the actual deviation at these points is not necessarily zero. (PE/EDPG) [3]

**confounding variable** *See:* uncontrolled variable.

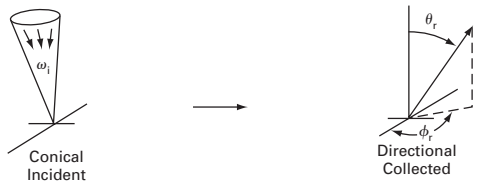
**congenital effect** Existing at or from birth. (T&D/PE) 539-1990

**congestion** In networking, a condition that occurs when the traffic exceeds the capacity of the network. *See also:* source quench; fair queuing. (C) 610.7-1995

**congruencing** An image processing technique in which two images of the same scene are transformed so that the size, shape, position, and orientation of all objects in one image are the same as those in the other image. (C) 610.4-1990w

**conical array** A two-dimensional array of elements whose corresponding points lie on a conical surface. (AP/ANT) 145-1993

**conical-directional reflectance** Ratio of reflected flux collected over an element of solid angle surrounding the given direction to the incident flux limited to a conical solid angle. See the corresponding figure. *Note:* The direction and extent of the cone must be specified and the direction of collection and size of the solid angle "element" must be specified.




**conical-directional reflectance**

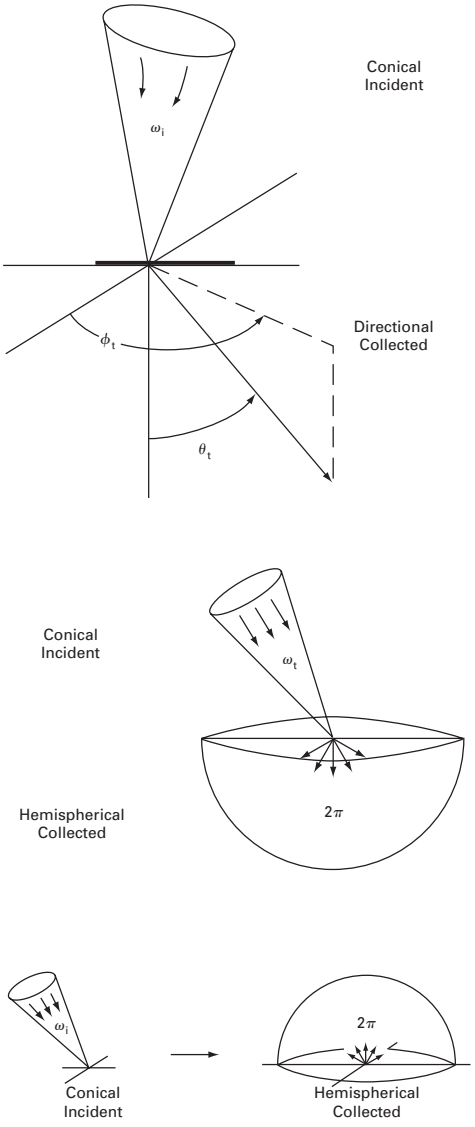
(EEC/IE) [126]

**conical-directional transmittance** Ratio of transmitted flux, collected over an element of solid angle surrounding the direction, to the incident flux to a conical solid angle. *Note:* The direction and extent of the cone must be specified and the direction of collection and size of the solid angle "element" must be specified. (EEC/IE) [126]

**conical-hemispherical reflectance, $\rho(\omega_i; 2\pi)$ (illuminating engineering)** Ratio of reflected flux collected over the entire hemisphere to the incident flux limited to a conical solid angle. *Note:* The direction and extent of the cone must be specified. (EEC/IE) [126]

**conical-hemispherical transmittance, $\tau(\omega_t; 2\pi)$ (illuminating engineering)** Ratio of transmitted flux collected over the entire hemisphere to the incident flux limited to a conical solid

angle. (See the corresponding figure.). *Note:* The direction and extent of the cone must be specified.




**conical-hemispherical transmittance**

(EEC/IE) [126]

**conical horn** A horn whose cross-sectional area increases as the square of the axial length. (SP) [32]

**conical scanning (1)** A form of sequential lobing in which the direction of maximum radiation generates a cone whose vertex angle is of the order of the antenna half-power beamwidth. *Note:* Such scanning may be either rotating or nutating according to whether the direction of polarization rotates or remains unchanged. *See also:* antenna. (AP/ANT) 149-1979r, 145-1993

**(2)** A form of angular tracking in which the antenna beam is offset from the tracking axis of the antenna. Rotation of the beam about the axis generates a cone whose vertex angle is of the order of the beamwidth. *Note:* Such scanning may be either rotating or nutating, according to whether the direction of polarization rotates or remains unchanged. The variation of signal amplitude as the beam scans provides information on the amount and direction of displacement of the target from the axis of rotation. (AES) 686-1997

**conical-scan-on-receive-only (COSRO)** A method of angle tracking in which only the receiving beam is conically scanned. (AES) 686-1997

**conical wave (radio-wave propagation)** A wave whose equiphase surfaces asymptotically form a family of coaxial circular cones. (AP) 211-1977s

**coning effect (gyros)** The apparent drift rate caused by motion of an input axis in a manner that generally describes a cone. This usually results from a combination of oscillatory motions about the gyro principal axes. The apparent drift rate is a function of the amplitudes and frequencies of oscillations present and the phase angles between them. (AES/GYAC) 528-1994

**conjugate bridge** The detector circuit and the supply circuit are interchanged as compared with a normal bridge of the given type. *See also:* bridge. (EEC/PE) [119]

**conjugate impedance** An impedance the value of which is the complex conjugate of a given impedance. *Note:* For an impedance associated with an electric network, the complex conjugate is an impedance with the same resistance component and a reactance component the negative of the original. (SP/IM/HFIM) 151-1965w, 270-1966w, [40]

**conjugate termination** A termination whose input impedance is the complex conjugate of the output impedance of the source or network to which it is connected. *See also:* transmission line. (IM/HFIM) [40]

**conjunction (1)** The logical 'AND' operator. (C) 610.5-1990w, 1084-1986w

**(2)** The result of joining two conditions by the logical 'AND' operator. *Contrast:* disjunction. *See also:* conjunctive query. (C) 610.5-1990w

**(3)** The Boolean operation whose result has the value 1 if and only if each operand has the value 1. *Contrast:* nonconjunction. *See also:* AND gate. (C) 610.10-1994w

**conjunctive query** A database query formed by using one of the logical operators 'AND' and 'OR.'. (C) 610.5-1990w

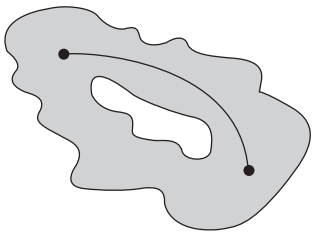
**connect (1)** The capability for communication, across a Group or LAN, between adjacent Bridges, or between the Bridge Ports of adjacent Bridges. *Contrast:* attach. (C/LM) 802.1G-1996

**(2)** Indicates that a device communications controller (DCC) has been physically attached to a bedside communications controller (BCC) port, by means of an interconnecting cable. Connect does not necessarily imply that communications have been logically established between the BCC and the DCC. (EMB/MIB) 1073.4.1-2000

**connected (1) (networks)** A network is connected if there exists at least one path, composed of branches of the network, between every pair of nodes of the network. *See also:* network analysis. (BT) 153-1950w

**(2) (graph)** A graph is connected if there exists at least one path between every pair of its vertices. (CAS) [13]

**(3) (image processing and pattern recognition)** Pertaining to a subset of an image, any two points of which can be joined by an arc that is entirely contained within the subset.



**connected**

(C) 610.4-1990w

**(4) (maintenance of energized power lines)** *See also:* bonded. (T&D/PE) 516-1987s, 524-1992r

**connected load (1)** The sum of the continuous ratings of the load-consuming apparatus connected to the system or any part thereof. *See also:* generating station. (T&D/PE) [10]

**(2) (electric power systems in commercial buildings)** The sum of the continuous ratings of the power consuming ap-

paratus connected to the system or any part thereof in watts, kilowatts, or horsepower. (IA/PSE) 241-1990r

**(3)** The connected transformer kVA, peak load, or metered demand (to be clearly specified when reporting) on the circuit or portion of circuit that is interrupted. When reporting, the report should state whether it is based on an annual peak or on a reporting period peak. (PE/T&D) 1366-1998

**connected PHY** A peer cable PHY at the other end of a particular physical connection from the local PHY. (C/MM) 1394-1995

**connected position** (of a switchgear-assembly removable element) That position of the removable element in which both primary and secondary disconnecting devices are in full contact. (SWG/PE) C37.100-1992

**connected slave** A slave that is permitted to participate actively in the data transfer handshake. A selected slave that is not disabled (including a diverted slave), a reflecting slave, and an intervening slave are connected slaves. A disabled slave or, an unselected slave that is not intervening or reflecting, is not a connected slave. (MM/C) 896.1-1987s

**connected system** All segments of a connected system are capable of communicating directly with one another through SIs. Note that because of the route map table implementation of message paths, segments of a system that are connected electrically by SIs are not necessarily also logically connected in the sense used here. (NID) 960-1993

**connected transaction** A transaction in which both the request and response are performed within the same bus transaction. (C/BA) 1014.1-1994w, 896.4-1993w, 10857-1994, 896.3-1993w

**connecting rod (high voltage air switches, insulators, and bus supports)** A component of a switch operating mechanism designed to transmit motion from an offset bearing or bell crank to a switch pole unit. *Synonym:* connecting shaft. (SWG/PE) C37.30-1971s, C37.100-1992

**connecting shaft** *See:* connecting rod.

**connecting wire** A wire generally of smaller gauge than the shot-firing cord and used for connecting the electric blasting-cap wires from one drill hole to those of an adjoining one in mines, quarries, and tunnels. *See also:* mine feeder circuit. (EEC/PE/MIN) [119]

**connection (1) (rotating machinery)** Any low-impedance tie between electrically conducting components. (PE) [9]

**(2) (nuclear power generating station) (cable, field splice, and connection qualification)** (design and installation of cable systems for Class 1E circuits in nuclear power generating stations) A cable terminal, splice, or hostile environment boundary seal at the interface of cable and equipment. (PE/NP/EDPG) 383-1974r, 690-1984r

**(3) (A) (software)** A reference in one part of a program to the identifier of another part (that is something found elsewhere). **(B) (software)** An association established between functional units for conveying information. *See also:* functional unit; identifier; program. (C/SE) 729-1983

**(4)** An association of channels, switching systems, and other functional units set up to provide means for a transfer of information between two or more points in a telecommunications network. *Notes:* 1. A connection can also be one channel or a series of two or more channels regardless of the method used to interconnect them. 2. A transmission path that is considered as a connection by one vendor may be resold as a channel to the vendor's customers.

**(5)** An association established by a *layer* between two or more users of the layer service for the transfer of information. (C) 8802-6-1994

**(6)** A parallel interface state that is outside the scope of this standard and is not defined herein. This state is indicative of the state of the physical or logical connection between a host and the printer. Only in this state can data be transferred between a host and the printer. (C/MM) 1284.1-1997

**(7)** An association established between two or more endpoints or the transfer of data. (C) 1003.5-1999

**(8)** A persistent communications path between two endpoints. (C/MM) 1284.4-2000

**connection and winding support insulation (1) (insulation systems of synchronous machines)** The connection and winding support insulation includes all of the insulation materials that envelope the connections, which carry current from coil to coil or from bar to bar, and from field and armature coil terminals to the points of external circuit and attachment; and also the insulation of metallic supports for the winding. (REM) [115]

**(2) (repair and rewinding of motors for the petroleum and chemical industry)** Includes all of the insulation materials that envelop the connections that carry current from coil to coil, and from stationary or rotating coil terminals to the points of external circuit attachment; and the insulation of any metallic supports for the winding. *See also:* insulation system. (IA/PC) 1068-1996

**connection assembly (Class 1E connection assemblies)** Any connector or termination combined with related cables or wires as an assembly. This assembly may include environmental seals, but excludes fire stops, in-line splices, and containment electric penetration assemblies. (PE/NP) 572-1985r

**connection charge (power operations)** The amount paid by a customer for connecting the customer's facilities to the supplier's facilities. (PE/PSE) 858-1987s, 346-1973w

**connection diagram (1)** A diagram that shows the connection of an installation or its component devices, controllers, and equipment. *Notes:* 1. It may cover internal or external connections, or both, and shall contain such detail as is needed to make or trace connections that are involved. It usually shows the general physical arrangement of devices and device elements and also accessory items such as terminal blocks, resistors, etc. 2. A connection diagram excludes mechanical drawings, commonly referred to as wiring templates, wiring assemblies, cable assemblies, etc. (PE/IA/TR/IAC) [116], [60]

**(2) (packaging machinery)** A diagram showing the electrical connections between the parts comprising the control and indicating the external connections. (IA/PKG) 333-1980w

**(3)** A diagram showing the relation and connections of devices and apparatus of a circuit or a group of circuits. (SWG/PE) C37.100-1992

**connection insulation (rotating machinery) (joint insulation)** The insulation at an electric connection such as between turns or coils or at a bushing connection. *See also:* stator. (PE) [9]

**connectionless confidentiality** The protection of (N)-service data units from unauthorized disclosure during transmission from one (N+1)-entity to one or more (N+1)-entities, where each entity has an association with the physical layer, and no association is established for the transmission of data or for the application of the confidentiality service between the layer peer-entities themselves. (C/LM) 802.10-1998

**connectionless integrity** A service providing for the integrity of a single SDU. It may take the form of determining whether or not the received SDU has been modified. (C/LM) 802.10-1998

**connectionless mode** The transfer of data other than in the context of a connection. *See also:* connection mode; datagram. (C) 1003.5-1999

**connectionless service (1)** A kind of delivery service that treats each packet as a separate entity. Each packet contains all protocol layers and destination address at each intermediate node in the network. *Note:* Order of arrival of packets is not necessarily the same as order of transmission. *Synonym:* datagram. (C) 610.7-1995

**(2)** A kind of delivery service offered by most hardware that treats each packet or datagram as a separate entity containing the source and destination address. (C) 610.10-1994w

**connection mode** The transfer of data in the context of a connection. *See also:* connectionless mode. (C) 1003.5-1999

**connection-oriented confidentiality** The protection of all (N)-service data units from unauthorized disclosure during communications from one (N+1)-entity to one or more (N+1)-entities for which a security association is established for the transfer of data and for the application of confidentiality service between the entities themselves and between each entity and the physical layer. (C/LM) 802.10-1998

**connection-oriented integrity** A service providing for the integrity of all (N)-service data on a security association and detecting any modification, insertion, deletion, or replay of any data within an entire SDU sequence. (C/LM) 802.10-1998

**connection-oriented service** A kind of delivery service where different virtual circuit configurations are used to transmit messages. *Synonym:* virtual circuit service. (C) 610.7-1995

**connection phase** A beat that begins with the assertion of the address synchronization line followed by the release of an address acknowledge line. It is used to broadcast the address and command information. Modules determine whether they wish to take part in the transaction based on this information. (C/BA) 10857-1994, 896.4-1993w, 896.3-1993w

**connections** In-line and tee splices that are designed to join heating cables or heating cables and power leads. (IA/PC) 515.1-1995

**connections of polyphase circuits** *See:* star-connected circuit; zig-zag connection of polyphase circuits; mesh-connected circuit.

**connector (1)** A coupling device employed to connect conductors of one circuit or transmission element with those of another circuit or transmission element. *See also:* auxiliary device to an instrument. (IM/ELM/HFIM) [40], C12.8-1981r

**(2) (wires)** A device attached to two or more wires or cables for the purpose of connecting electric circuits without the use of permanent splices. (VT/LT) 16-1955w

**(3) (splicing sleeve)** A metal sleeve, that is slipped over and secured to the butted ends of the conductors in making up a joint. (T&D/PE) [10]

**(4) (waveguides)** A mechanical device, excluding an adapter, for electrically joining separable parts of a waveguide or transmission-line system. (AP/ANT) [35]

**(5) (power cable joints)** A metallic device of suitable electric conductance and mechanical strength, used to splice the ends of two or more cable conductors, or as a terminal connector on a single conductor. Connectors usually fall into one of the following types: solder, welded, mechanical, and compression or indent. Conductors are sometimes spliced without connectors, by soldering, brazing or welding. (PE/IC) 404-1986s

**(6) (substation grounding)** A metallic device of suitable electric conductance and mechanical strength used to connect conductors. (SUB/PE) 837-1989r

**(7) (fiber optics)** *See also:* optical waveguide connector. 812-1984w

**(8)** *See also:* connector link. (PE/T&D) 524-1992r

**connector base (motor plug) (motor attachment plug cap)** A device, intended for flush or surface mounting on an appliance, that serves to connect the appliance to a cord connector. (EEC/PE) [119]

**connector insertion loss** *See:* insertion loss.

**connector link (conductor stringing equipment)** A rigid link designed to connect pulling lines and conductors together in series. It will not spin and relieve torsional forces. *Synonyms:* bullet; link; link; slug; connector; connector. (T&D/PE) 524-1992r

**connector, precision** *See:* precision connector.

**connector, rope** *See:* rope connector.

**connector switch (connector)** A remotely controlled switch for connecting a trunk to the called line. (EEC/PE) [119]

**connector thermal capacity (substation grounding)** The ability of a connector to withstand the amount of current required to produce a specified temperature on the control conductor without increasing the resistance of the connector beyond that specified in IEEE Std 837-1989. (SUB/PE) 837-1989r

**connector, waveguide** *See:* waveguide connector.

**connect time** In time-sharing computer systems, the time that a terminal or user is connected and able to communicate with a computer. *See also:* CPU time. (C) 610.10-1994w

**conopulse** A tracking radar that uses two simultaneous squinted beams that are rotated around the antenna boresight to produce, on a time-shared basis, monopulse angle-error signals in two orthogonal coordinates (such as azimuth and elevation). *Notes:* 1. Only two receivers are required rather than three as in the usual monopulse tracker. 2. Also called "konopulse" and "scan with compensation." (AES) 686-1997

**consecutive** Pertaining to the occurrence of two sequential events or items without the intervention of any other event or item; that is, one immediately after the other. (C) 610.12-1990

**consecutive sequence computer** A type of computer in which instructions are executed in an implicitly defined sequence unless a jump instruction specifies the storage location of the next instruction to be executed. *Contrast:* arbitrary sequence computer. (C) 610.10-1994w

**consecutive spill method** *See:* linear probing.

**consequences** The result(s) of (i.e., events that follow and depend upon) a specified event. (PE/NP) 1082-1997

**conservation of radiance (fiber optics)** A basic principle stating that no passive optical system can increase the quantity $Ln^{-2}$ where $L$ is the radiance of a beam and n is the local refractive index. Formerly called "conservation of brightness" or the "brightness theorem." *See also:* brightness; radiance. (Std100) 812-1984w

**conservator (expansion tank system) (power and distribution transformers)** A system in which the oil in the main tank is sealed from the atmosphere, over the temperature range specified, by means of an auxiliary tank partly filled with oil and connected to the completely filled main tank. (PE/TR) C57.12.80-1978r

**conservator/diaphragm system (power and distribution transformers)** A system in which the oil in the main tank is completely sealed from the outside atmosphere, and is connected to an elastic diaphragm tank contained inside a tank mounted at the top of the transformer. As oil expands and contracts within a specified temperature range the system remains completely sealed with an approximately constant pressure. (PE/TR) C57.12.80-1978r

**conservator system** An oil preservation system in which the oil in the main tank is sealed from the atmosphere, over the temperature range specified, by means of an ancillary tank partly filled with oil and connected to the completely filled main tank. *Synonym:* expansion tank system. (PE/TR) C57.15-1999

**consist** The makeup or composition (number and specific identity) of individual units on a train. (VT/RT) 1477-1998, 1475-1999, 1474.1-1999

**consistency (software)** The degree of uniformity, standardization, and freedom from contradiction among the documents or parts of a system or component. *See also:* traceability. (C) 610.12-1990

**consistency check** A check that verifies that an item of data is compatible with certain rules specified for that data. For example, one might wish to check the consistency between two data elements ORDER-DATE and DELIVER-DATE such that DELIVER-DATE may not be earlier than ORDER-DATE. *See also:* limit check; crossfooting check; range check; validity check. (C) 610.5-1990w

**consol (navigation aid terms)** A keyed C-W (continuous wave) short-baseline-radio navigation system operating in the L/MF (low- and medium frequency) band, generally useful to about 1500 nmi (nautical miles) (2800 kilometers [km]), and using three radiators to provide a multiplicity of overlapping lobes of dot-and-dash patterns which form equisignal hyperbolic

lines of position. These lines of position are moved slowly in azimuth by changing rf (radio frequency) phase, thus allowing a simple listening and counting of timing operation to be used to determine a line of position within the sector bounded by any pair of equisignal lines. (AES/GCS) 172-1983w

**consolan (navigation aid terms)** A form of consol using two radiators instead of three. (AES/GCS) 172-1983w

**console (1) (telephony)** A control cabinet located apart from the associated switching equipment arranged to control those functions for which an attendant or an operator is required. (SWG/COM) [48]

**(2) (telephony)** The part of a computer used for communication between the operator or maintenance engineer and the computer. (C) [85]

**(3) (telephone switching systems) (telephony)** A desk or desk-top cordless switchboard which may include display elements in addition to those required for supervisory purposes is required. (COM) 312-1977w

**(4) (supervisory control, data acquisition, data control) (station control and data acquisition) (telephony)** That component of the system that provides facilities for observation and control of the system (e.g., operator's console, maintenance console). *See also:* control panel; control; panel. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**(5)** A device used as the primary means of communication with a human being, consisting of an input device, used for receiving information supplied by the human, and an output device, used for sending information to the human. (Typically, a console is either an ASCII terminal connected to a serial port or the combination of a text/graphics display device and a keyboard.). (C/BA) 1275-1994

**(6)** A functional unit used for communication between the computer operator and the computer. *Note:* May provide special-purpose keys, input devices, and display devices employed to operate and control the computer. *Synonyms:* console display; display console. *See also:* control panel. (C) 610.10-1994w

**console display** *See:* console.

**console language** The human language in which information is to be displayed on local or remote consoles. (C/MM) 1284.1-1997

**consonant articulation (percent consonant articulation)** The percent articulation obtained when the speech units considered are consonants (usually combined with vowels into meaningless syllables). *See also:* volume equivalent. (EEC/PE) [119]

**conspicuity (illuminating engineering)** The capacity of a signal to stand out in relation to its background so as to be readily discovered by the eye. (EEC/IE) [126]

**constancy** *See:* residual probe pickup.

**constant (1) (computers)** A quantity or data item whose value cannot change; for example, the data item FIVE, with an unchanging value of 5. *Contrast:* variable. *See also:* literal; figurative constant. (C) 610.12-1990

**(2) (A)** (As a noun) An instance whose identity is known at the time of writing. The identity of a constant state class instance is represented by #K, where K is an integer or a name. **(B)** (As an adjective) The specification that an attribute or participant property value, once assigned, may not be changed, or that an operation shall always provide the same output argument values given the same input argument values. (C/SE) 1320.2-1998

**(3)** *See also:* time constant of integrator.

**constant address** *See:* base address.

**constant-amplitude recording (mechanical recording)** A characteristic wherein, for a fixed amplitude of a sinusoidal signal, the resulting recorded amplitude is independent of frequency. *See also:* phonograph pickup. (SP) [32]

**constant available power source (transmission performance of telephone sets)** A signal source with a purely resistive internal impedance and a constant open-circuit terminal voltage, independent of frequency. *Note:* Receiving is tested under conditions of constant available power. A generator having an open-circuit voltage, $E$, and an internal voltage, $R_\theta$, both constant with frequency, provides a constant available power of $E^2/4R_\theta$. When the load impedance is a resistance equal to $R_\theta$, an impedance match exists and the maximum available power of $E^2/4R_\theta$, is dissipated in the load. When a generator with a constant open-circuit voltage and a constant internal resistance of the required value is not available, suitable test conditions for this type of measurement can be provided by a generator whose voltage is maintained at a constant value, $E_\theta$, across its terminals in series with a resistance, $R_\theta$. The generator and the resistance, $R_\theta$, in series are then equivalent to a source of constant available power. (COM/TA) 269-1983s

**constant-current (Heising) modulation** A system of amplitude modulation wherein the output circuits of the signal amplifier and the carrier-wave generator or amplifier are directly and conductively coupled by means of a common inductor that has ideally infinite impedance to the signal frequencies and that therefore maintains the common plate-supply current of the two devices constant. *Note:* The signal-frequency voltage thus appearing across the common inductor appears also as modulation of the plate supply to the carrier generator or amplifier with corresponding modulation of the carrier output. (AP/ANT) 145-1983s

**constant-current arc-welding power supply** A power supply that has characteristically drooping volt-ampere curves producing relatively constant current with a limited change in load voltage. *Note:* This type of supply is conventionally used in connection with manual-stick-electrode or tungsten-inert-gas arc welding. (EEC/AWM) [91]

**constant-current characteristic (electron tube)** The relation, usually represented by a graph, between the voltages of two electrodes, with the current to one of them as well as all other voltages maintained constant. (ED) 161-1971w

**constant-current charge (storage battery) (storage cell)** A charge in which the current is maintained at a constant value. *Note:* For some types of lead-acid batteries this may involve two rates called the starting and finishing rates. *See also:* charge. (EEC/PE) [119]

**constant-current (series) incandescent filament lamp transformer** *See:* incandescent-filament-lamp transformer.

**constant current loads** A load that demands constant current even when the input voltage varies. *Note:* Typical of such loads is lighting when driven from an inverter ballast configuration. (VT) 1476-2000

**constant-current (series) mercury-lamp transformer** A transformer that receives power from a current-regulated series circuit and transforms the power to another circuit at the same or different current from that in the primary circuit. *Note:* It also provides the required starting and operating voltage and current for the specified lamp. Further, it provides protection to the secondary circuit, casing, lamp, and associated luminaire from the high voltage of the primary circuit. (EEC/LB) [98]

**constant-current power supply** A power supply that is capable of maintaining a preset current through a variable load resistance. *Note:* This is achieved by automatically varying the load voltage in order to maintain the ratio $V_{load}/R_{load}$ constant. (AES) [41]

**constant-current regulation (generator)** That type of automatic regulation in which the regulator maintains a constant-current output from the generator. *See also:* axle-generator system. (EEC/PE) [119]

**constant current retention (metal-nitride-oxide field-effect transistor)** Retention inherent in the metal-nitride-oxide-semiconductor (MNOS) transistor when gate and drain are biased to result in a constant drain current during information storage. The time period is defined by the intersection of the high conduction (HC) threshold voltage curve obtained under constant current condition, with the low conduction (LC) threshold voltage curve obtained under zero bias condition,

when both are plotted against the logarithm of trd, the time elapsed between writing and the threshold voltage measurement. (ED) 581-1978w

**constant-current street-lighting system (series street-lighting system)** A street-lighting system employing a series circuit in which the current is maintained substantially constant. *Note:* Special generators or rectifiers are used for direct current while suitable regulators or transformers are used for alternating current. *See also:* alternating-current distribution; direct-current distribution. (T&D/PE) [10]

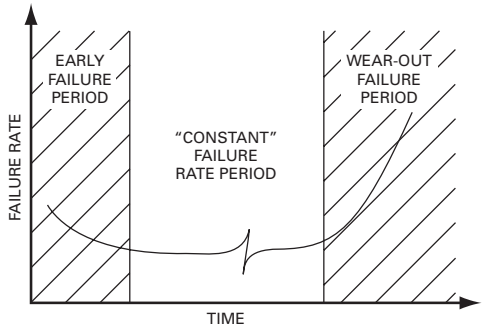
**constant-current transformer (power and distribution transformers)** A transformer that automatically maintains an approximately constant current in its secondary circuit under varying conditions of load impedance when supplied from an approximately constant-voltage source. *See also:* rated primary voltage of a constant current transformer; rated kilowatts; rated secondary current of a constant-current transformer; current regulation. (PE/TR) C57.12.80-1978r

**constant cutting speed (numerically controlled machines)** The condition achieved by varying the speed of rotation of the workpiece relative to the tool inversely proportional to the distance of the tool from the center of rotation. (EEC) [74]

**constant-delay discriminator** *See:* pulse decoder.

**constant-failure period (software)** The period of time in the life cycle of a system or component during which hardware failures occur at an approximately uniform rate. *Contrast:* wearout-failure period; early-failure period. *See also:* bathtub curve. (C) 610.12-1990

**constant failure rate period** That possible period during which the failures occur at an approximately uniform rate. *Note:* The curve in the figure below shows the failure rate pattern when the terms of minor failure, early failure period, and constant failure rate period all apply to the item.




**constant failure rate period**

(R/VT) [37]

**constant-false-alarm rate** A property of threshold or gain control devices that maintain an approximately constant rate of false target detections when the noise, and/or clutter levels, and/or ECM (electronic countermeasures) into the detector are variable. (AES/RS) 686-1990

**constant-false-alarm rate receiver** A radar receiver that maintains the output false-alarm rate constant in spite of the varying nature of the receiver noise level, echoes from the clutter environment, or from electronic countermeasures. *Note:* CFAR is usually achieved by establishing a threshold level that varies according to the local noise and/or clutter environment measured in the near vicinity of the target echo. (AES) 686-1997

**constant-fraction discriminator (1)** A discriminator in which the threshold is set at a fixed fraction of the input signal (instead of to a fixed amplitude). This is one of a class of timing discriminators. (NPS) 325-1996

**(2)** An amplitude discriminator in which the triggering threshold is set at a constant percentage of the input pulse amplitude independent of its size. (NPS) 300-1988r

**constant-frequency control (power system)** For a power system, a mode of operation under load-frequency control in which the area control error is directly proportional to the frequency error. (PE/PSE) 94-1991w

**constant-horsepower motor** *See:* constant-power motor.

**constant-horsepower range (electric drive)** The portion of its speed range within which the drive is capable of maintaining essentially constant horsepower. *See also:* electric drive. (IA/IAC) [60]

**constant-linear-bit recording** A method for recording information on a storage device whereby the rotational speed is kept constant, but the data rate (density) is varied with the track to ensure that data is stored with the same number of bits per inch in all tracks. *Contrast:* constant-linear-velocity recording. (C) 610.10-1994w

**constant-linear-velocity recording** A method for recording information on a circular disk whereby the rotational speed is varied so that the speed of the storage medium past the recording head is constant for all tracks on the disk. *Note:* Since the outer-most tracks are longer than the inner-most tracks, this allows the device to store more information there. *Synonym:* group code recording. *Contrast:* constant-linear-bit recording. (C) 610.10-1994w

**constant-luminance transmission (color television)** A type of transmission in which the sole control of luminance is provided by the luminance signal, and no control of luminance is provided by the chrominance signal. *Notes:* 1. In such a system, noise signals falling within the bandwidth of the chrominance channel produce only chromaticity variations at the outputs of the chromiance demodulators. Coarse-structured chromaticity variations thus produced are subjectively less objectionable than correspondingly coarse-structured luminance variations. 2. Because of the use of gamma correction in the camera, these ideal conditions are not completely realized, especially for colors of high saturation. (BT/AV) 201-1979w, [34]

**constant multiplier (computers)** A computing element that multiplies a variable by a constant factor. *See also:* electronic analog computer; multiplier. (C) 165-1977w, 166-1977w

**constant-net-interchange control (power system)** A mode of operation under load-frequency control in which the area control error is proportional to the net interchange error. (PE/PSE) 94-1991w

**constant potential charge** A charge in which the voltage at the output terminals of the charger is held to a constant value. (IA/PSE) 602-1996

**constant power load** A load that demands constant power from the source even when the voltage value drops such as when switching from the low-voltage power supply to the battery. *Note:* Typical of such loads are those that have their own built-in regulator such as propulsion control power supplies. (VT) 1476-2000

**constant-power motor (constant-horsepower motor)** A multispeed motor that develops the same related power output at all operating speeds. The torque then is inversely proportional to the speed. *See also:* asynchronous machine. (PE) [9]

**constant-resistance (conductance) network** A network having at least one driving-point impedance (admittance) that is a positive constant. (EEC/PE) [119]

**constant-speed motor (electric installations on shipboard)** A motor, the speed of normal operation of which is constant or practically constant. For example, a synchronous motor, an induction motor with small slip, or an ordinary dc shunt-wound motor. (IA/MT) 45-1983s

**constant-torque motor** Multispeed motor that is capable of developing the same torque for all design speeds. The rated power output varies directly with the speed. *See also:* asynchronous machine. (PE) [9]

**constant-torque range (electric drive)** The portion of its speed range within which the drive is capable of maintaining essentially constant torque. *See also:* electric drive. (IA/IAC) [60]

**constant-torque resistor** A resistor for use in the armature or rotor circuit of a motor in which the current remains practically constant throughout the entire speed range. (IA/MT) 45-1998

**constant-torque speed range** The portion of the speed range of a drive within which the drive is capable of maintaining essentially constant torque. (IA/ICTL/IAC) [60]

**constant-velocity recording (mechanical recording)** A characteristic wherein for a fixed amplitude of a sinusoidal signal, the resulting recorded amplitude is inversely proportional to the frequency. *See also:* phonograph pickup. (SP) [32]

**constant-voltage arc-welding power supply** Power supply (arc welder) that has characteristically flat volt-amperer curves producing relatively constant voltage with a change in load current. This type of power supply is conventionally used in connection with welding processes involving consumable electrodes fed at a constant rate. (EEC/AWM) [91]

**constant-voltage charge (storage battery) (storage cell)** A charge in which the voltage at the terminals of the battery is held at a constant value. *See also:* charge. (PE/EEC) [119]

**constant-voltage regulation (generator)** That type of automatic regulation in which the regulator maintains constant voltage of the generator. (PE/EEC) [119]

**constant voltage retention (metal-nitride-oxide field-effect transistor)** Retention inherent in the metal-nitride-oxide-semiconductor (MNOS) transistor when source, drain, and substrate are grounded, and a fixed read bias VGR is maintained at the gate. The time period is defined by the intersection of the two high conduction (HC) and low conduction (LC) threshold voltage curves obtained under this condition when plotted versus the logarithm of $t_{rd}$, the time elapsed between writing and threshold voltage measurement. (ED) 581-1978w

**constant-voltage transformer (power and distribution transformers)** A transformer that maintains an approximately constant voltage ratio over the range from zero to rated output. (PE/TR) C57.12.80-1978r

**constitutive parameters** The permittivity and permeability of a medium. *See also:* permeability; permittivity. (AP/PROP) 211-1997

**constitutive relations (radio-wave propagation)** Constraints imposed by the medium on the relationships between electric and magnetic field vectors and their respective flux density vectors. (AP) 211-1977s

**constrained painting** *See:* grid constraint.

**constraint (1)** A restriction on software life cycle process (SLCP) development. (C/SE) 1074-1997

**(2)** A limitation or implied requirement that constrains the design solution or implementation of the systems engineering process, is not changeable by the enterprise, and is generally nonallocable. (C/SE) 1220-1998

**(3)** An externally imposed limitation on system requirements, design, or implementation or on the process used to develop or modify a system. (C/SE) 1362-1998

**(4)** A statement that expresses measurable bounds for an element or function of the system. That is, a constraint is a factor that is imposed on the solution by force or compulsion and may limit or modify the design changes. (C/SE) 1233-1998

**(5) (A)** A kind of **responsibility** that is a statement of facts that are required to be true in order for the constraint to be met. Classes have constraints, expressed in the form of logical sentences about property values. An instance conforms to the constraint if the logical sentence is true. Some constraints are inherent in the modeling constructs; other constraints are specific to a particular model and are stated in the specification language. **(B)** A rule that specifies a valid condition of data. (C/SE) 1320.2-1998

**(6)** A timing property of a design that is supplied as a goal or objective to an electronic design automation (EDA) tool, such as logic synthesis, floorplanning, or layout. The tool shall not start out with a fixed design implementation; it shall build or modify the design to meet the constraint. *See also:* timing check. (C/DA) 1481-1999

**constraints (1)** Limits on the ranges of variables or system parameters because of physical or system requirements. *See also:* system. (SMC) [63]

**(2)** A restriction placed on the control signal, control law, or state variables. *See also:* control system. (CS/IM) [120]

**(3)** Conditions and/or resource requirement limitations affecting the process. (C/SE) 1209-1992w

**(4)** Restrictions, resources, rules, etc., that limit Software Life Cycle Model selection, project planning, and management. (C/SE) 1074.1-1995

**construction** The process of writing, assembling, or generating assets. (C/SE) 1517-1999

**construction agency** *See:* constructor.

**construction department** *See:* constructor.

**construction diagram** A diagram that shows the physical arrangement of parts, such as wiring, buses, resistor units, etc. Example: A diagram showing the arrangement of grids and terminals in a grid-type resistor. (IA/ICTL/IAC) [60]

**construction stage** The time related to the installation or modification of fixtures or structures, including services, foundations, steel, conductors, buildings, and grounding. (PE/SUB) 1402-2000

**construction test (Class 1E power systems and equipment)** A test to verify proper installationand operation of individual components in a system prior to operation of the system as an entity. It is assumed that the construction test does not verify the interconnected-system equipment external to that component. For example, the protective relays are bench tested by simulating fault conditions to verify conformance with approved characteristics. During bench tests the alarm, trip, and permissive-interlock functions that the protective relay circuits are to perform are not verified. (PE/NP) 415-1986w

**construction testing** Performing required inspections and tests to ensure that completed installations are in accordance with contract requirements and the latest engineering and design information. (PE/EDPG) 1248-1998

**constructor (1)** A party who undertakes the assembly and erection of a transmission structure for an owner, or an owner who undertakes all or part of a project alone. *Synonyms:* installer; contractor; construction department; construction agency. (T&D/PE) 1025-1993r

**(2)** A party who undertakes the assembly and erection of a transmission structure. The constructor can be an owner or an agent acting for an owner. *Synonym:* construction department; construction agency; installer; contractor. (T&D/PE) 951-1996

**Consultative Committee on International Telegraphy and Telephony (CCITT)** An international organization that studies and issues recommendations on issues related to communication technology. *Note:* In March 1993, the CCITT was reorganized and renamed to be the International Telecommunication Union (ITU) Telecommunications Standardization Sector (TSS). (C) 610.7-1995

**consumer (1)** The node on a ringlet that strips a send packet from the ringlet and creates the echo packet that is returned to the producer. (C/MM) 1596-1992

**(2)** A unit that removes messages from a DMA queue. (C/MM) 1212.1-1993

**consumption of idles** Idle symbols arriving at a node may be discarded (after saving certain information) while other symbols that arrived earlier and were stored in the bypass FIFO are being transmitted. Consuming idles thus reduces the number of symbols stored in the bypass FIFO. (C/MM) 1596-1992

**consumer product** An end item delivered to a customer. (C/SE) 1220-1994s

**contact (A)** (general). A conducting part that co-acts with another conducting part to make or break a circuit. **(B)** (of a relay). A conducting part that acts with another conducting

part to make or break a circuit.
(SWG/SWG/PE/PSR) C37.30-1971, C37.100-1992, C37.90-1978

**contact area (1) (photoelectric converter)** The area of ohmic contact provided on either the p or n faces of a photoelectric converter for electric circuit connections. *See also:* semiconductor. (AES) [41]
**(2) (solar cells)** That area of ohmic contact provided on either the p or n surface of a solar cell for electric circuit connections. (AES/SS) 307-1969w

**contact bounce (dial-pulse address signaling systems) (telephony)** The intermittent and undesired opening of contacts during the closure of open contacts or opening of closed contacts. An irregular wavefront during transition from one state to the other is implied. (COM/TA) 753-1983w

**contact chatter, relay** *See:* relay contact chatter.

**contact clip** (of a mechanical switching device) The clip that the blade enters or embraces. (SWG/PE) C37.100-1992

**contact clips** *See:* fuse clips.

**contact conductor (electric traction)** The part of the distribution system other than the track rails, that is in immediate electric contact with current collectors of the cars or locomotives. *See also:* contact wire; trolley; underground collector or plow; multiple-unit control. (VT/LT) 16-1955w

**contact converter** (as applied to relaying) A buffer element used to produce a prescribed output as the result of the opening or closing of a contact. (SWG/PE) C37.100-1992

**contact corrosion** *See:* crevice corrosion.

**contact current-carrying rating** (of a relay) The current that can be carried continuously or for stated periodic intervals without impairment of the contact structure or interrupting capability. (SWG/PE/PSR) C37.100-1992, C37.90-1989r

**contact current-closing rating** (of a relay) The current that the device can close successfully with prescribed operating duty and circuit conditions without significant impairment of the contact structure. (SWG/PE) C37.100-1992

**contact discharge method (1)** A method of ESD testing in which the electrode of the ESD simulator is in firm contact with a conductive surface of the EUT or coupling plane prior to discharge. The discharge is actuated by a switching device (i.e., a relay) within the simulator. (EMC) C63.16-1993
**(2)** A method of ESD testing in which the electrode of the ESD simulator is in firm conductive contact with the UUT or coupling plane prior to and during the discharge. The discharge is actuated by a switching device, such as a relay, within the simulator. (SPD/PE) C62.38-1994r

**contact flange (waveguide components)** A flat flange used in conjunction with another flat flange to provide a contact joint. (MTT) 147-1979w

**contact follow-up (relays, switchgear, and industrial control)** The distance between the position one contact face would assume, were it not blocked by the second (mating) contact, and the position the second contact removed, when the actuating member is fixed in its final contact-closed position. *See also:* electric controller.
(IA/ICTL/IAC) 74-1958w, [60]

**contact gap (break)** The final length of the isolating distance of a contact in the open position. *See also:* contactor.
(IA/ICTL/IAC) [84], [60]

**contact high recombination rate (semiconductor)** A semiconductor-semiconductor or metal-semiconductor contact at which thermal equilibrium charge-carrier concentrations are maintained substantially independent of current density. *See also:* semiconductor device; semiconductor.
(ED) 216-1960w

**contact interrupting rating** (of a relay) The current that the device can interrupt successfully with prescribed operating duty and circuit conditions without significant impairment of the contact structure.
(SWG/PE/PSR) C37.100-1992, C37.90-1978s

**contact, ion implanted** *See:* ion-implanted contact.

**contact joint (waveguide components) (contact coupling)** A connection designed for essentially complete transfer of power between two waveguides by means of metallic contact between the inner walls of the waveguides. It typically consists of two contact flanges. (MTT) 147-1979w

**contactless vibrating bell** A vibrating bell whose continuous operation depends upon application of alternating-current power without circuit-interrupting contacts. *See also:* protective signaling. (EEC/PE) [119]

**contact-making clock demand meter (metering)** A device designed to close momentarily an electric circuit to a demand meter at periodic intervals. (ELM) C12.1-1982s

**contact mechanism (demand meter)** A device for attachment to an electricity meter or to a demand-totalizing relay for the the purpose of providing electric impulses for transmission to a demand meter relay. *See also:* demand meter.
(EEC/PE) [119]

**contact, ohmic** *See:* ohmic contact.

**contact opening time** (of a relay) The time a contact remains closed while in process of opening following a specified change of input. (SWG/PE) C37.100-1992

**contactor (1) (thyristor)** A device for repeatedly establishing and interrupting an electric power circuit.
(IA/PE/IPC/TR) 428-1981w, C57.12.80-1978r
**(2)** A device which upon receipt of an electrical signal establishes or opens repeatedly an electrical circuit with a nominal current rating of 5 amperes minimum for its main contacts.
(VT/LT) 16-1955w

**contactor, load** *See:* load switch or contactor.

**contactor or unit switch** A device operated other than by hand for repeatedly establishing and interrupting an electric power circuit under normal conditions. *See also:* control switch.
(VT/LT) 16-1955w

**contact parting time** (of a mechanical switching device) The interval between the time when the actuating quantity in the release circuit reaches the value causing actuation of the release and the instant when the primary arcing contacts have parted in all poles. *Note:* Contact parting time is the numerical sum of release delay and opening time.
(SWG/PE) C37.100-1992

**contact piston (waveguide) (contact plunger)** A piston with sliding metallic contact with the walls of a waveguide. *See also:* waveguide. (AP/ANT) [35]

**contact plating** The deposition, without the application of an external electromotive force, of a metal coating upon a base metal, by immersing the latter in contact with another metal in a solution containing a compound of the metal to be deposited. *See also:* electroplating. (EEC/PE) [119]

**contact plunger** *See:* contact piston.

**contact position indicator** A device that is located at or near the operating mechanism to indicate whether the main contacts are in the closed or open position. Typically, colors are used to indicate a closed or open position; red shall signify closed and green shall signify open.
(SWG/PE) C37.100-1992

**contact potential** The difference in potential existing at the contact of two media or phases. *See also:* positive after-potential; negative after-potential; depolarization; electrolytic cell; depolarization front. (EEC/PE) [119]

**contact-potential difference** The difference between the work functions of two materials divided by the electronic charge.
(ED) 161-1971w

**contact pressure, final** *See:* final contact pressure.

**contact pressure, initial** *See:* initial contact pressure.

**contact race** A circuit design condition wherein two or more independently operated contacts compete for the control of a circuit which they will open and close. (PE/PSR) [6]

**contact rectifier** A rectifier consisting of two different solids in contact, in which rectification is due to greater conductivity across the contact in one direction than in the other. *See also:* rectifier. (AP/ANT) 145-1983s

**contacts** Conducting parts which co-act to complete or to interrupt a circuit. (EEC/PE) [119]
**(2) (A) (nonoverlapping)** Combinations of two sets of contacts, actuated by a common means, each set closing in one of two positions, and so arranged that the contacts of one set open before the contacts of the other set close. *See also:* electric controller. **(B) (switching device) (auxiliary)** Contacts in addition to the main circuit contacts that function with the movement of the latter. *See also:* contactor. **(C) (overlapping, industrial control)** Combinations of two sets of contacts, actuated by a common means, each set closing in one of two positions, and so arranged that the contacts of one set open after the contacts of the other set have been closed. *See also:* electric controller. (IA/ICTL/IAC) [60]

**contact surface** That surface of a contact through which current is transferred to the coacting contact. (SWG/PE) C37.100-1992

**contact voltage (human safety)** A voltage accidentally appearing between two points with which a person can simultaneously make contact. (PE) [8], [84]

**contact-wear allowance** The total thickness of material that may be worn away before the co-acting contacts cease to perform adequately. *See also:* contactor. (SWG/PE/ICTL) C37.30-1971s, C37.100-1992

**contact wire (trolley wire)** A flexible contact conductor, customarily supported above or to one side of the vehicle. *See also:* contact conductor. (VT/LT) 16-1955w

**container (1)** A parent widget that defines a region containing zero or more subobjects of a given type. (C) 1295-1993w
**(2)** An ordered set of 1, 2, 4, or 8 contiguous bytes fully packed with one or more signed or unsigned field formats. (C/MM) 1596.5-1993

**container class** A class that defines an object that holds other objects. (SCC20) 1226-1998

**containment (1) (valve actuators) (safety systems equipment in nuclear power generating stations)** That portion of the engineered safety features designed to act as the principal barrier, after the reactor system pressure boundary, to prevent the release, even under conditions of a reactor accident, of unacceptable quantities of radioactive material beyond a controlled zone. (PE/NP) 382-1985, 627-1980r, 323-1974s, 383-1974r, 334-1974s, 650-1979s
**(2) (radiological monitoring instrumentation)** A structure or vessel which encloses the components of the reactor coolant pressure boundary or which serves as a leakage limiting barrier to radioactive material that could be released from the reactor coolant pressure boundary, or both. (NI) N320-1979r
**(3) (data management)** The result of placing all occurrences of a repeating group within the same logical record. (C) 610.5-1990w
**(4)** A relationship between two objects such that one is said to belong to, or form part of, the other. All objects except software_collection objects shall be contained within exactly one object. (C/PA) 1387.2-1995

**contamination (rotating machinery)** This deteriorates electrical insulation by actually conducting current over insulated surfaces, or by attacking the material reducing its electrical insulating quality or its physical strength, or by thermally insulating the material forcing it to operate at higher than normal temperatures. *Note:* Included here are: wetness or extreme humidity, oil or grease, conducting dusts and particles, non-conducting dusts and particles, and chemicals of industry. (PE/EM) 432-1976s

**contend** To actively and simultaneously vie for the attention of the MTM-Bus Master module (said of a group or one or more S-modules). (TT/C) 1149.5-1995

**contending requester** *See:* requester.

**contending slave** *See:* interrupt-acknowledge cycle.

**content addressable storage** *See:* associative memory.

**content addressed storage** *See:* associative storage.

**content, average information** *See:* information theory; average information content, per symbol.

**content, conditional information** *See:* information theory.

**content coupling** A type of coupling in which some or all of the contents of one software module are included in the contents of another module. *Contrast:* control coupling; hybrid coupling; common-environment coupling; data coupling; pathological coupling. (C) 610.12-1990

**contention (1) (data transmission)** A condition on a multipoint communication channel when two or more locations try to transmit at the same time. (PE) 599-1985w
**(2) (station control and data acquisition)** An operational condition in which two or more devices simultaneously try to use the same resource (e.g., communication channel, disk, memory). (SUB/PE) C37.1-1994
**(3)** A condition on a communications channel when two or more stations may try to seize the channel at the same time. (LM/COM) 168-1956w
**(4)** A condition that occurs when two or more devices simultaneously request the services of another device, network medium, or resource that can handle only one request at a time. *See also:* collision. (C) 610.7-1995
**(5)** An operational condition on a data communication channel in which no station is designated a master station. In contention, each station on the channel shall monitor the signals on the channel and wait for a quiescent condition before initiating a bid for circuit control. (SWG/PE) C37.100-1992

**contention interval** *See:* slot time.

**contention resolution** The management of contention for a communications resource so as to minimize collisions, resolve access order, and maximize utilization. (C) 610.7-1995

**contents list** In word processing, a list of stored information available for user selection. (C) 610.2-1987

**context (1)** Reflects the intended scope of a set of tests. Examples of context include manufacturing process test, maintenance test, design verification test, screening test, etc. (SCC20) 1226-1998
**(2)** The immediate environment in which a function (or set of functions in a diagram) operates. (C/SE) 1320.1-1998

**context diagram** A diagram that presents the context of the top-level function of an IDEF0 model, whose diagram number is ***A-n***, where ***0≤n≤9***. The one-box A-0 context diagram is a required context diagram; those with diagram numbers ***A-1, A-2, . . ., A-9*** are optional context diagrams. (C/SE) 1320.1-1998

**context editing** A method of line editing in which the line to be viewed or altered is identified by specifying part or all of its contents. (C) 610.2-1987

**context free** The mode of API operation in which the underlying FTAM initiator establishes an FTAM Regime for the sole purpose of executing the requested operation, closing the regime once the operation is complete. (C/PA) 1238.1-1994w

**context sensitive** The mode of API operation in which the underlying FTAM initiator performs the requested operation, using a pre-existing FTAM Regime that is established and maintained independently of individual operation invocations. (C/PA) 1238.1-1994w

**contiguous allocation** A storage allocation technique in which programs or data to be stored are allocated a block of storage of equal or greater size, so that logically contiguous programs and data are assigned physically contiguous storage locations. *Contrast:* paging. (C) 610.12-1990

**contiguous memory** An area of storage that occupies consecutive or adjacent address locations. (C) 610.10-1994w

**contingency** The unexpected failure or outage of a system component(s) (generator, transmission line, breaker, switch, etc.). (PE/PSE) 858-1993w

**continuation reference** A reference that describes how the performance of all or part of a directory operation can be

continued at a different DSA or DSAs. *See also:* referral. (C/PA) 1328.2-1993w, 1327.2-1993w, 1326.2-1993w, 1224.2-1993w

**continuous rating (of diesel-generator unit)** (of diesel-generator unit) The electric power output capability that the diesel-generator unit can maintain in the service environment for 8760 h of operation per year with only scheduled outages for maintenance. (PE/NP) 387-1995

**continuing current (lightning)** The low-magnitude current that may continue to flow between components of a multiple stroke. *See also:* direct-stroke protection. (T&D/PE) [10]

**continuity cable bond** A cable bond used for bonding of cable sheaths and armor across joints between continuous lengths of cable. *See also:* cable bond; cross cable bond. (T&D/PE) [10]

**continuity test (1) (test, measurement, and diagnostic equipment)** A test for the purpose of detecting broken or open connections and ground circuits in a network or device. (MIL) [2]

**(2) (battery)** A test on a cell/unit or battery to determine the integrity of its conduction path. (SB) 1188-1996

**continuity tester (test, measurement, and diagnostic equipment)** An electrical tester used to determine the presence and location of broken or open connections and grounded circuits. (MIL) [2]

**continuity transfer relay contacts** Sometimes used for relay contacts, make-break. (EEC/REE) [87]

**continuous air monitor (cam)** An instrument used to continuously sample and measure airborne radioactivity concentrations. (NI) N42.17B-1989r

**continuous change model** *See:* continuous model.

**continuous corona (1) (corona measurement)** Corona discharges that recur at regular intervals; for example, on approximately every cycle of an applied alternating voltage or at least once per minute for an applied direct voltage. (MAG/ET) 436-1977s

**(2) (overhead-power-line corona and radio noise)** Corona discharge that is either steady or recurring at regular intervals (approximately every cycle of an applied alternating voltage or at least several times per minute for an applied direct voltage). (T&D/PE) 539-1990

**continuous cumulative demand** The sum of (A) all previous billing period maximum demands, and (B) the highest demand to date for the present billing period. (ELM) C12.15-1990

**continuous current (1)** The maximum constant rms power frequency current that can be carried continuously without causing further measurable increase in temperature rise under prescribed conditions of test, and within the limitations of established standards. (PE/TR) C57.16-1996

**(2)** A current that is expected to continue for three hours or more. (IA/PSP) 1015-1997

**continuous current rating** The designated rms alternating or direct current that the connector can carry continuously under specified conditions. (T&D/PE) 386-1995

**continuous-current tests** Tests made at rated current, until temperature rise ceases, to determine that the device or equipment can carry its rated continuous current without exceeding its allowable temperature rise. (SWG/PE) C37.100-1992

**continuous data** Data of which the information content can be ascertained continuously in time. (IA) [61]

**continuous duty (1)** Operation at a substantially constant load for an indefinitely long time. (NESC/NEC) [86]

**(2)** Operation at a substantially constant load for an indefinitely long time. (For motors, the constant load is to be within the nameplate rating of the motor.) (PE/NP) 334-1994r

**(3)** A requirement of service that demands operation at a substantially constant current for an extended period of time. (PE/TR) C57.16-1996

**(4)** A requirement of service that demands operation at a constant load for an indefinite period of time. (IA/MT) 45-1998

**continuous-duty current rating** The rating in amperes that a meter socket will carry continuously under stated conditions, without exceeding the allowable temperature rise. A multiposition trough socket has an additional current rating that denotes the maximum ampere capacity of the line buses. (ELM) C12.7-1993

**continuous-duty rating** The rating applying to operation for an indefinitely long time. (AP/ANT) 145-1983s

**continuous electrode** A furnace electrode that receives successive additions in lengths at the end remote from the active zone of the furnace to compensate for the length consumed therein. *See also:* electrothermics. (EEC/PE) [119]

**continuous enclosure (1) (generating station grounding)** A type of isolated-phase bus in which the enclosure is electrically continuous over the full length of the bus. All enclosures are electrically tied together at each end of the bus. (PE/EDPG) 665-1987s

**(2)** A bus enclosure in which the consecutive sections of the enclosure are electrically bonded together to provide a continuous current path through the entire enclosure length. (SUB/PE) C37.122-1993, C37.122.1-1993

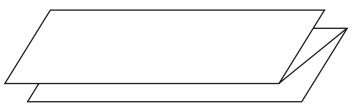
**(3)** A bus enclosure in which the consecutive sections of the enclosure for the same phase conductor are electrically bonded together to provide a continuous current path throughout the entire enclosure length. *Note:* Cross-connections to the other phase enclosures are made only at the extremities of the installation and at selected intermediate points. (SWG/PE) C37.100-1992

**(4)** A bus enclosure in which the consecutive sections of the housing along the same phase conductor are bonded together to provide an electrically continuous current path throughout the entire enclosure length. Cross-bondings, connecting the other phase enclosures, are made only at the extremities of the installation and at a few selected intermediate points. (PE/SUB) 80-2000

**continuous exposure** Exposure for durations exceeding the corresponding averaging time. Exposure for less than the averaging time is called *short-term exposure*. (NIR) C95.1-1999

**continuous feed** A mechanism enabling a printer to employ continuous form paper using friction feed or tractor feed. *Contrast:* single-sheet feed. (C) 610.10-1994w

**continuous form (A)** A series of connected paper forms, each divided by a tear-off perforation, that feeds continuously through a printing device. *Synonym:* Z-fold paper. *Contrast:* cut form. *See also:* burst. **(B)** Pertaining to a series of cards or paper as in (A). For example, continuous form cards or continuous form paper.



**continuous form**

(C) 610.10-1994

**continuous inductive train control** *See:* continuous train control.

**continuous iteration** A loop that has no exit. (C) 610.12-1990

**continuous lighting (railway practice)** An arrangement of circuits so that the signal lights are continuously energized. (EEC/PE) [119]

**continuous load** A load where the current continues for 3 h or more. (ELM) C12.7-1993

**continuous load rating (power inverter unit)** Defines the maximum load that can be carried continuously without exceeding established limitations under prescribed conditions of test, and within the limitations of established standards. *See also:* self-commutated inverters. (IA) [62]

**continuously acting regulator (synchronous machines)** A regulator that initiates a corrective action for a sustained infinitesimal change in the controlled variable. (PE/EDPG) 421.1-1986r, 421-1972s

**continuously adjustable inductor** An adjustable inductor in which the inductance can have every possible value within its range. *Synonym:* variable inductor. (Std100) 270-1966w

**continuous model (A)** A mathematical or computational model whose output variables change in a continuous manner; that is, in changing from one value to another, a variable can take on all intermediate values; for example, a model depicting the rate of air flow over an airplane wing. *Synonym:* continuous-variable model. **(B)** A model of a system that behaves in a continuous manner. *Contrast:* discrete model. (C) 610.3-1989

**continuous monitoring (1)** The process of sampling the state of some phenomenon at a time interval shorter than the time constant of the phenomenon. (SUB/PE) C37.122-1993, C37.122.1-1993

**(2)** The process of sampling the state of some phenomenon either continuously or at a sample interval of one second or less. (SWG/PE) C37.100-1992

**continuous noise** Noise, the effect of which is not resolvable into a succession of discrete impulses. *See also:* electromagnetic compatibility. (EMC) [53]

**continuous operating current** The current flowing through the surge protective device when energized at the maximum continuous operating voltage. (PE) C62.34-1996

**continuous periodic rating** The load that can be carried for the alternate periods of load and rest specified in the rating and repeated continuously without exceeding the specified limitation. (IA/ICTL/IAC) [60]

**continuous-pressure operation (elevators)** Operation by means of buttons or switches in the car and at the landings, any one of which may be used to control the movement of the car as long as the button or switch is manually maintained in the actuating position. *See also:* control. (PE/EEC) [119]

**continuous-progression code** *See:* unit-distance code.

**continuous pulse (thyristor)** A gate signal applied during the desired conducting interval, or parts thereof, as a dc signal. (IA/IPC) 428-1981w

**continuous rating (1) (nuclear power generating station)** (of diesel-generator unit) The electric power output capability that the diesel-generator unit can maintain in the service environment for 8760 hours of operation per (common) year with only scheduled outages for maintenance. (PE/NP) 387-1984s

**(2) (packaging machinery)** The rating that defines the load that can be carried continuously without exceeding the temperature rating. (IA/PKG) 333-1980w

**(3) (power and distribution transformers) (electric equipment)** The maximum constant load that can be carried continuously without exceeding established temperature-rise limitations under prescribed conditions. *See also:* rectification; duty. (PE/TR) C57.12.80-1978r, C57.15-1968s

**(4) (rotating electric machinery)** The output that the machine can sustain for an unlimited period under the conditions of IEEE Std 11-1980 without exceeding the limits of temperature rise. (PE/EM) 11-1980r

**continuous service current (A)** (thyristor converter) The value of direct current that a converter unit or section can supply to its load for unlimited time periods under specified conditions. **(B)** (long-time) The rms value and duration (minutes) of direct current which may be applied to the converter unit or section within the service current profile. *Note:* This value establishes point B on the service current profile and it may be identical to the long-time test current. **(C)** (profile) The time-current profile that defines the allowable rms currents the converter section can sustain. *Note:* The profile is defined for times from zero to infinity, and the rms current derived from any current-time diagram must not exceed this profile. **(D)** (short time) The peak rms value and duration (seconds) of direct current which may be applied to the converter unit or section within the service current profile. *Note:* This value establishes point C on the service current profile. (IA/IPC) 444-1973

**continuous simulation** A simulation that uses a continuous model. (C) 610.3-1989w

**continuous simulation language** A simulation language designed for use in describing continuous simulations. (C) 610.13-1993w

**continuous-speed adjustment** Refers to an adjustable-speed drive capable of being adjusted with small increments, or continuously, between minimum and maximum speed. *See also:* electric drive. (IA/ICTL/IAC) [60]

**continuous-stream printer** A printer that can print processed data off-line in a continuous form. (C) 610.10-1994w

**Continuous System Modeling Program III (CSMP III)** A simulation language used to simulate the dynamics of continuous systems that use ordinary differential equations. (C) 610.13-1993w

**Continuous Systems Simulation Language (CSSL)** A statement-oriented simulation language used to simulate the dynamics of continuous systems that are describable by ordinary differential equations. (C) 610.13-1993w

**continuous test (batteries)** A service test in which the battery is subjected to an uninterrupted discharge until the cutoff voltage is reached. *See also:* battery; cutoff voltage. (EEC/PE) [119]

**continuous test current (thyristor converter)** The value of direct current that a converter unit or section can supply to its load for unlimited time periods under specified conditions. (IA/IPC) 444-1973w

**continuous thermal burden (metering) (voltage transformer)** The volt-ampere burden that the voltage transformer will carry continuously at rated voltage and frequency without causing the specified temperature limitations to be exceeded. (ELM) C12.1-1982s

**continuous thermal current rating factor (1) (instrument transformers)** (RF) The factor by which the rated primary current of a current transformer is multiplied to obtain the maximum primary current that can be carried continuously without exceeding the limiting temperature rise from 30°C average ambient air temperature. The RF of tapped-secondary or multi-ratio current transformers applies to the highest ratio, unless otherwise stated. (When current transformers are incorporated internally as parts of larger transformers or power circuit breakers, they shall meet allowable average winding and hot spot temperature limits under the specific conditions and requirements of the larger apparatus). (PE/TR) [57], C57.13-1993

**(2) (power and distribution transformers)** (RF) The specified factor by which the rated primary current of a current transformer can be multiplied to obtain the maximum primary current that can be carried continuously without exceeding the limiting temperature rise from 30°C ambient air temperature. (When current transformers are incorporated internally as parts of larger transformers or power circuit breakers, they shall meet allowable average winding and hot-spot temperatures under the specific conditions and requirements of the larger apparatus.). (PE/PSR/TR) C37.110-1996, C57.12.80-1978r

**continuous train control (continuous inductive train control)** A type of train control in which the locomotive apparatus is constantly in operative relation with the track circuit and is immediately responsive to a change in the character of the current flowing in the track circuit of the track on which the locomotive is traveling. *See also:* automatic train control. (EEC/PE) [119]

**continuous-type control (electric power system)** A control mode that provides a continuous relation between the deviation of the controlled variable and the position of the final

controlling element. *See also:* speed-governing system. (PE/PSE) 94-1970w

**continuous update** *See:* supervisory control.

**continuous update supervisory system (station control and data acquisition)** A system in which the remote station continuously updates indication and telemetering to the master station regardless of action taken by the master station. The remote station may interrupt the continuous data updating to perform a control operation. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**continuous-variable model** *See:* continuous model.

**continuous-voltage-rise test (rotating machinery)** A controlled overvoltage test in which voltage is increased in continuous function of time, linear or otherwise. *See also:* asynchronous machine. (PE) [9]

**continuous wave (CW) (1) (data transmission)** Waves, the successive oscillations of which are identical under steady-state conditions. (PE) 599-1985w

**(2) (laser maser)** The output of a laser which is operated in a continuous rather than pulsed mode. In this standard, a laser operating with a continuous output for a period greater than 0. 25 s is regarded as a CW laser. (LEO) 586-1980w

**(3)** A sinusoidal wave that has reached a steady state value. Continuous wave noise would be noise at a single frequency (e.g., 60 Hz "hum"). (PE/IC) 1143-1994r

**(4)** A carrier that is not modulated or switched. (C/LM) 802.3-1998

**continuous wave Doppler radar** A radar that transmits a continuous-wave signal and discriminates desired targets from other targets or clutter on the basis of the Doppler shift due to radial motion. *See also:* Doppler radar; continuous wave radar. (AES) 686-1997

**continuous wave radar** A radar that transmits a continuous-wave signal. *See also:* continuous wave Doppler radar. (AES) 686-1997

**continuum** *See:* baseline.

**contour analysis** In optical character recognition, a technique for locating the outline of a character by searching around its exterior edges with a spot of light. (C) 610.2-1987

**contoured beam antenna** A shaped-beam antenna designed in such a way that when its beam intersects a given surface, the lines of equal power flux density incident upon the surface form specified contours. *See also:* footprint. (AP/ANT) 145-1993

**contour encoding** An image compression technique in which a region that has a constant gray level is encoded by specifying only its border. (C) 610.4-1990w

**contouring control system (numerically controlled machines)** A system in which the controlled path can result from the coordinated, simultaneous motion of two or more axes. (EEC) [74]

**contract (1) (diode-type camera tube)** The ratio of the difference between the peak and minimum values of irradiance to the peak irradiance of an image or specified portion of an image.

$$C = \frac{E_p - E_m}{E_p} \times 100 \text{ (percent)}$$

(ED) 503-1978w

**(2)** A legally binding document agreed upon by the customer and supplier. This includes the technical and organizational requirements, cost, and schedule for a product. A contract may also contain informal but useful information such as the commitments or expectations of the parties involved. (C/SE) 830-1998

**(3)** In project management, a legally binding document agreed upon by the customer and the hardware or software developer or supplier; includes the technical, organizational, cost, and/or scheduling requirements of a project. (C/SE) 1362-1998

**(4)** A binding agreement between two parties, especially enforceable by law or similar internal agreement wholly within an organization, for supply of service or for the supply, development, production, operation, or maintenance of a software product. (C/SE) 1062-1998

**contract curve (rotating electric machinery)** A specified machine characteristic curve that becomes part of the contract. (PE/EM) 11-1980r

**contract demand (power operations)** The demand that the supplier of electric service agrees to have available for delivery. *See also:* alternating-current distribution. (PE/PSE) 858-1993w, 346-1973w

**contractor (1) (hydroelectric power plants)** A device used for repetitive opening and closing operation of an electric circuit, and that has load-current interrupting capability. It has no fault-current interrupting capability. (PE/EDPG) 1020-1988r

**(2) (metal transmission structures)** *See also:* constructor. (T&D/PE) 951-1988s

**(3) (power and distribution transformers)** A device for repeatedly establishing and interrupting an electric power circuit. (PE/TR) C57.12.80-1978r

**contract start** The date a contract to supply a static var compensator (SVC) becomes effective, and the user has given notice to proceed. (PE/SUB) 1031-2000

**contractual requirements** Customer-imposed performance, logistics, and other requirements and commitments governing the scope of software development, delivery, or support. (C/SE) 1074-1995s

**contrast (1) (image processing and pattern recognition)** The difference between the average brightness of two subsets of an image. (C) 610.4-1990w

**(2) (computer graphics)** The relationship between the highest and lowest intensity levels of a display image, usually expressed as the ratio of light to dark. (C) 610.6-1991w

**(3) (display presentation)** The subjective assessment of the difference in appearance of two parts of a field of view seen simultaneously or successively. (Hence: luminosity contrast, lightness contrast, color contrast, simultaneous contrast, successive contrast). *See also:* television; photometry. (BT/AV) [34], [84]

**(4) (electric power systems in commercial buildings)** Indicates the degree of difference in light reflectance of the details of a task compared with its background. (IA/PSE) 241-1990r

**contrast control** A control, associated with a picture-display device, for adjusting the contrast ratio of the reproduced picture. *Note:* The contrast control is normally an amplitude control for the picture signal. In a monochrome-television system, both average luminance and the contrast ratio are affected. In a color-television system, saturation and hue also may be affected. *See also:* television. (EEC/PE) [119]

**contrast ratio (1) (television)** The ratio of the maximum to the minimum luminance values in a television picture or a portion thereof. *Note:* Generally, the entire area of the picture is implied, but smaller areas may be specified as in detail contrast. (BT/AV) 201-1979w

**(2) (amplitude, frequency, and pulse modulation)** For any diffraction order, the ratio of the maximum light intensity to the minimum light intensity in the order, so that $C = I_{max}/I_{min}$, where $C$ is the contrast ratio. *Note:* In the limiting case when the depth of modulation is equal to 1, the minimum light intensity is due to background light, so that $C = I_{max}/I_b$. In the other extreme, when $m = 0$, the contrast ratio is equal to 1. (UFFC) [17]

**(3) (acoustically tunable optical filter)** The ratio of the dynamic transmission at a given acoustic frequency and power level to the dynamic transmission with no applied acoustic power. *Note:* The contrast ratio is a measure of light leakage through the device. It should be specified for either a monochromatic or white light source input, and the angular spread of the input light. (UFFC) [17]

**contrast rendition factor (illuminating engineering)** The ratio of visual task contrast with a given lighting environment to the contrast with sphere illumination. (EEC/IE) [126]

**contrast sensitivity (illuminating engineering)** The ability to detect the presence of luminance differences. Quantitatively, it is equal to the reciprocal of the brightness contrast threshold. *See also:* brightness contrast threshold. (EEC/IE) [126]

**contrast stretching** An image enhancement technique in which the contrast between image subsets and their complements is increased. (C) 610.4-1990w

**contrast transfer function square-wave response (diode-type camera tube)** The contrast transfer function or CTF represents the response of the imaging system in the spatial frequency domain to a square-wave input. A bar pattern represents a one-dimensional input to a two-dimensional imaging sensor. CTF is synonymous with the square-wave amplitude response, $R_{sq}(N)$. (ED) 503-1978w

**contravariance** A rule governing the overriding of a property and requiring that the set of values acceptable for an input argument in the overriding property shall be a superset (includes the same set) of the set of values acceptable for that input argument in the overridden property, and the set of values acceptable for an output argument in the overriding property shall be a subset (includes the same set) of the set of values acceptable for that output argument in the overridden property. (C/SE) 1320.2-1998

**contributing cause** A cause that, of itself, may not result in failure. (SWG/PE) C37.10-1995

**control (1) (A) (electronic computation)** Usually, those parts of a digital computer that effect the carrying out of instructions in proper sequence, the interpretation of each instruction, and the application of the proper signals to the arithmetic unit and other parts in accordance with this interpretation. **(B) (electronic computation)** In some business applications of mathematics, a mathematical check. (C) 162-1963

**(2) (cryotron)** An input element of a cryotron. (ED) [46]

**(3) (packaging machinery)** A device or group of devices that serves to govern in some predetermined manner the electric power delivered to the apparatus to which it is connected. (IA/PKG) 333-1980w

**(4) (electric power systems in commercial buildings)** Any device used for regulation of a system or component. (IA/PSE) 241-1990r

**(5) (overhead power lines)** In experiments, establishment of an untreated group of animals, plants, cells, etc., that serve as the basis for comparing responses of a similar, but treated, group that has been subjected (exposed) to some agent (i.e., an electric field). (T&D/PE) 539-1990

**(6)** A visual user interface element that is defined by IEEE Std 1295-1993. (C) 1295-1993w

**(7)** The execution of a system change by manual means, remote means, automatic means, or partially automatic means. (SWG/PE/SUB) C37.100-1992, C37.1-1987s

**(8)** In an IDEF0 model, a condition or set of conditions required for a function to produce correct output. (C/SE) 1320.1-1998

**control accuracy** The degree of correspondence between the final value and the ideal value of the directly controlled variable. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**control action (automatic control)** Of a control element or a controlling system, the nature of change of the output effected by the input. *Note:* The output may be a signal or the value of a manipulated variable. The input may be the control loop feedback signal when the command is constant, an actuating signal, or the output of another control element. One use of control action is to effect compensation. *See also:* compensation. (PE/EDPG) [3]

**control acquisition (1)** The total of all bus activity associated with acquiring exclusive control of the bus by a module. (C/BA) 896.3-1993w

**(2)** The total of all bus activity associated with acquiring exclusive control of the bus. (C/BA) 10857-1994, 896.4-1993w

**control action, derivative** *See:* derivative control action.

**control action, proportional (1)** Control action in which there is a continuous linear relation between the output and the input. *Note:* This condition applies when both the output and input are within their normal operating ranges. (IA/ICTL/IAC) [60]

**(2) (automatic control)** Action in which there is a linear relation between the output and the input of the controller. *Note:* The ratio of the change in output produced by the proportional control action to the change in input is defined as the proportional gain. (PE/PSE) 94-1970w

**control action, proportional plus derivative** Control action in which the output is proportional to a linear combination of the input and the time rate-of-change of input. *Note:* In the practical embodiment of proportional plus derivative control action the relationship between output and input, neglecting high frequency terms, is

$$\frac{Y}{X} = \pm P \frac{\frac{I}{s} + 1 + Ds}{\frac{bI}{s} + 1 + \frac{Ds}{a}} \quad \begin{matrix} a > 1 \\ 0 \le b \ll 1 \end{matrix}$$

where

$a$ = derivative action gain
$D$ = derivative action time constant
$P$ = proportional gain
$s$ = complex variable
$X$ = input transform
$Y$ = output transform

*Synonym:* P.D. (CS/PE/EDPG) [3]

**control action, proportional plus integral** *See:* proportional plus integral control action.

**control action, proportional plus integral plus derivative** *See:* proportional plus integral plus derivative control action.

**control and instrumentation cables (cable systems in substations)** Insulated electrical conductors utilized to convey information or to intermittently operate devices controlling power switching or conversion equipment. The cross-sectional areas of the conductors are generally No. 6 American Wire Gage (AWG) or smaller, and the duty cycle is such that conductor heating is insignificant. 382

**control and status register (CSR) (1)** A memory-mapped register that is accessed through read and write transactions and is used to observe the state of a node or to control its operation. (C/BA) 896.9-1994w

**(2)** A register used to control the operation of a device and/or record the status of an operation. It is accessible through a separate address space in a FASTBUS device. CSR#0, mandatory for all devices, contains the manufacturer's ID for the device and a number of device status bits as well as some user-defined bits. (NID) 960-1993

**(3)** A register, storage location, or address that is used to control buses, interconnects, and multiple processor systems. (C/BA) 14536-1995

**control and status registers (CSR)** A set of registers, storage locations, and addresses that are used to control buses, interconnects, and multiple processor systems. (C/BA) 896.5-1993s

**control and status register space (FASTBUS acquisition and control)** A FASTBUS primary address cycle may specify with a code on the mode select (MS) control lines one of two separate address spaces in a device; CSR space and data space. CSR space contains registers for control of and status reporting registers for the device. Its allocation and usage is part of the FASTBUS specification. *Synonym:* CSR space. *See also:* data space. (NID) 960-1986s

**control apparatus** A set of control devices used to accomplish the intended control functions. *See also:* control. (IA/IAC) [60]

**control area (1) (electric power)** A power system, a part of a power system, or a combination of several power systems under common control for which a single area control error is defined. (PE/PSE) 94-1991w

**(2)** A storage area used to hold information necessary for the control of a task, function, or operation. (C) 610.10-1994w

**(3)** A power system, a part of a power system, or a combination of several power systems under common control, that uses tie-line bias control if it is part of an interconnected system. (PE/PSE) 858-1993w

**control arrow** An arrow or arrow segment that expresses IDEF0 control, i.e., an object type set whose instances establish a condition or set of conditions required for a function to produce correct output. The arrowhead of a control arrow is attached to the top side of a box. (C/SE) 1320.1-1998

**control ball** An input device consisting of a ball, rotatable about its center and recessed into a surface, used as a locator. *Synonym:* track ball. (C) 610.6-1991w

**control battery** A battery used as a source of energy for the control of an electrically operated device. (IA/ICTL/IAC) [60]

**control block (1) (subroutines for CAMAC)** The symbol *cb* represents an integer array having four elements. The contents of these elements are:

| | |
|---|---|
| element 1 | Repeat Count |
| element 2 | Tally |
| element 3 | LAM Identification |
| element 4 | Channel Identification |

The repeat count specifies the number of individual CAMAC actions or the maximum number of data words to be transferred. Some multiple action and block transfer subroutines permit termination of the sequence upon a signal from the addressed module. In such cases the repeat count represents an upper limit. The tally is the number of actions usually performed or the number of CAMAC data words actually transferred. If the block transfer or multiple action is terminated by the controller due to exhaustion of the repeat count, the tally will be equal to the repeat count; otherwise it may be less. The LAM identification is an integer value having the same form and information content as the variable *lam*. The channel identification is an integer value which identifies system-dependent facilities which may be necessary to perform the block transfer or multiple action. This number, if it is required, has the same form and content as the parameter *chan* and can be created by the subroutine CDCHN. (NPS) 758-1979r

**(2)** The circuitry within a computer that performs control functions such as decoding microinstructions and generating the internal control signals that perform requested operations. (C) 610.10-1994w

**control board (control boards, panels, and racks)** An assembly of panels on which are installed components and modules for monitoring, measuring, and controlling remotely operated systems and equipment. It provides a visual and physical interface between the operator and the systems. *Synonyms:* control switchboard; console; benchboard; control panel. (PE/NP) 420-1982

**control breakpoint** *See:* code breakpoint.

**control bus (1)** A bus that carries signals that regulate system operations. (C) 610.10-1994w

**(2)** A bus used to distribute power for operating electrically controlled devices. (SWG/PE) C37.100-1992

**control cable (1) (cable systems in power generating stations)** Cable applied at relatively low current levels or used for intermittent operation to change the operating status of a utilization device of the plant auxiliary system. (PE/EDPG) 422-1977

**(2) (communication and control cables)** A cable that usually carries relatively low current levels used for indication purposes to change the operating status of a utilization device of a plant auxiliary system. A control cable usually consists of two or more insulated, unpaired, shielded or unshielded conductors. Sizes may be No 22, 20, 19, 18, or 16 AWG solid and No 14, 12, 10, or 9 AWG stranded or solid conductor. Control cable conductor insulation usually has voltage ratings of 300, 600, or 1000 V rms, 50–60 Hz. (PE/PSC) 789-1988w

**(3)** Cable used in a control function application, e.g., interconnection of control switches, indicating lights, relays, solenoids, etc. Generally the cable construction is 600 V or 1000 V, single or multiple conductors, typically in wire sizes 14 AWG (2.08 $mm^2$), 12 AWG (3.31 $mm^2$), 10 AWG (5.26 $mm^2$), 9 AWG (6.63 $mm^2$), or 8 AWG (8.37 $mm^2$). (PE/IC) 1185-1994

**control capacitor** The element by which voltage is coupled to the floating gate for reading or writing. (ED) 1005-1998

**control card** A punch card containing input parameters for controlling the execution of a program or job. (C) 610.10-1994w

**control center (1) (generating stations electric power system)** An assembly of devices for the purpose of switching and protecting a number of load circuits. The control center may contain transformers, contactors, circuit breakers, protective and other devices intended primarily for energizing and de-energizing load circuits. (PE/EDPG) 505-1977r

**(2)** The facility from which instructions and signals are issued for controlling the bulk electric system, and, in some instances, the distribution system as well. (PE/PSE) 858-1993w

**control character (1)** A character whose occurrence in a particular context initiates, modifies, or stops a control operation, for example, a character to control carriage return. (C) [20], [85]

**(2) (A) (data management)** A character whose occurrence in a particular context initiates, modifies, or stops a control operation. A control character may be recorded for use in a subsequent action, and it may have a graphic representation in some circumstances. *Synonyms:* operational character; functional character; command character. *See also:* transmission control character; accuracy control character; print control character; device control character. **(B) (data management)** A character that initiates some kind of physical control action but is not printed on the output page. For example, line feed, tab, form feed. (C) 610.5-1990

**(3)** A character used for signaling purposes by the exchange, packet or transaction layers of the stack. Both N_chars and L_chars are used as control characters. *See also:* link character; normal character. (C/BA) 1355-1995

**control characteristic (gas tube)** A relation, usually shown by a graph, between critical grid voltage and anode voltage. *See also:* gas tube. (ED) 161-1971w

**control circuit (1) (packaging machinery)** The circuit that carries the electric signals directing the performance of the controller but does not carry the main power circuit. (IA/PKG) 333-1980w

**(2)** The circuit that carries the electric signals of a control apparatus or system directing the performance of the controller but that does not carry the main power circuit. (IA/MT) 45-1998

**control circuit failure** Failure attributed to the inability of the electrical control circuit to perform its function. (SWG/PE) C37.10-1995

**control-circuit limit switch** A limit switch the contacts of which are connected only into the control circuit. *See also:* control; switch. (IA/IAC) [60]

**control circuit transformer (packaging machinery)** A voltage transformer utilized to supply a voltage suitable for the operation of control devices. (IA/PKG) 333-1980w

**control circuit voltage (packaging machinery)** The voltage provided for the operation of shunt coil magnetic devices. (IA/PKG) 333-1980w

**control compartment (packaging machinery)** A space within the base, frame, or column of the machine, used for mounting the control panel. (IA/PKG) 333-1980w

**control conductor (substation grounding)** The conductor that is utilized to measure equivalent changes in temperature, size, etc., that are occurring in at least one of the conductors joined by the connector under test. (PE/SUB) 837-1989r

**control coupling** A type of coupling in which one software module communicates information to another module for the explicit purpose of influencing the latter module's execution. *Contrast:* hybrid coupling; data coupling; pathological coupling; content coupling; common-environment coupling. (C) 610.12-1990

**control current (Hall effect devices)** The current through the Hall plate that by its interaction with a magnetic flux density generates the Hall voltage. (MAG) 296-1969w

**control current sensitivity (Hall effect devices)** The ratio of the voltage across the Hall terminals to the control current for a given magnitude of magnetic flux density. (MAG) 296-1969w

**control current terminals (Hall effect devices)** The terminals through which the control current flows. (MAG) 296-1969w

**control cut-out switch (land transportation vehicles)** An isolating switch that isolates the control circuits of a motor controller from the source of energy. (VT/LT) 16-1955w

**control data (software)** Data that select an operating mode, direct the sequential flow of a program, or otherwise directly influence the operation of software; for example, a loop control variable. (C) 610.12-1990

**control designation symbol** A symbol that identifies the particular manner, permissible or required, in which an input variable (possibly in combination with other variables) causes the logic element to perform according to its defined function. (GSD) 91-1973s

**control desk (console)** A control switchboard consisting of one or more relatively short horizontal or inclined panels mounted on an assembly of such a height that the panel-mounted devices are within convenient reach of an attendant. (SWG/PE) C37.100-1992, C37.21-1985r

**control device** An individual device used to execute a control function. *See also:* control. (IA/IAC) [60]

**control dial** An input device, consisting of one or more rotating knobs or levers, that provides coordinate input data. (C) 610.6-1991w

**control direction** In T101, control direction is transmission from the controlling station (master/RTU) to the controlled station (RTU/IED). (PE/SUB) 1379-1997

**control directory** The directory below which the control_files for filesets and products are stored within exported catalogs for distributions and installed software. (C/PA) 1387.2-1995

**control electrode (electron tube)** An electrode used to initiate or vary the current between two or more electrodes. *See also:* electrode. (ED) 161-1971w

**control-electrode discharge recovery time (attenuator tubes)** The time required for the control-electrode discharge to deionize to a level such that a specified fraction of the critical high-power level is required to ionize the tube. *See also:* gas tube. (ED) 161-1971w

**control enclosure (packaging machinery)** The metal housing for the control panel, whether mounted on the industrial equipment or separately mounted. (IA/PKG) 333-1980w

**control exciter (rotating machinery)** An exciter that acts as a rotary amplifier in a closed-loop circuit. *See also:* asynchronous machine. (PE) [9]

**control field (C) (1)** The sequence of eight (or sixteen, if extended) bits immediately following the address field of a frame. This octet identifies the HDLC frame type. (EMB/MIB) 1073.3.1-1994

**(2)** A sequence of bits that identifies the type of frame being transmitted, and optionally, contains sequence or acknowledgment numbers. (C) 610.7-1995

**(3)** The field immediately following the DSAP and SSAP address fields of a PDU. The content of the control field is interpreted by the receiving destination LLC(s) designated by the DSAP address field:

1) As a command, from the source LLC designated by the SSAP address field, instructing the performance of some specific function; or
2) As a response, from the source LLC designated by the SSAP address field.

(C/LM/CC) 8802-2-1998

**control_files** The control scripts executed by the utilities, the INFO file describing the files in a fileset, and other files associated with a software object. (C/PA) 1387.2-1995

**control flow** The sequence in which operations are performed during the execution of a computer program. *Synonym:* flow of control. *Contrast:* data flow. (C) 610.12-1990

**control flow architecture** A computer architecture in which execution is controlled by the need for a particular result; that is, an instruction is executed only when its result is needed by another process. *Synonym:* Von Neumann architecture. *Contrast:* data flow architecture; Harvard class architecture. (C) 610.10-1994w

**control flow diagram** A diagram that depicts the set of all possible sequences in which operations may be performed during the execution of a system or program. Types include box diagram, flowchart, input-process-output chart, state diagram. *Contrast:* data flow diagram. *See also:* call graph; structure chart. (C) 610.12-1990

**control flow trace** *See:* execution trace.

**control function** *See:* supervisory control functions.

**control function check** Control and indication from a control-check relay. A check of master and remote station equipment by exercising a predefined component or capability. (SUB/PE) C37.1-1994

**control gate** A form of the control capacitor in which the top polysilicon gate, above the floating gate, of the memory transistor is connected to the word-line or control line. (ED) 1005-1998

**control generator** A generator, commonly used on electric motive power units for the generation of electric energy in proportion to vehicle speed, prime mover speed, or some similar function, thereby serving as a guide for initiating appropriate control functions. *See also:* traction motor. (EEC/PE) [119]

**control grid (electron tube)** A grid, ordinarily placed between the cathode and an anode, for use as a control electrode. *See also:* electrode; grid. (ED) 161-1971w

**control hole** *See:* designation hole.

**control host** The spaceborne fiber-optic data bus (SFODB) network management node. (C/BA) 1393-1999

**control initiation** The function introduced into a measurement sequence for the purpose of regulating any subsequent control operations in relation to the quantity measured. *Note:* The system element comprising the control initiator is usually included in the end device but may be associated with the primary detector or the intermediate means. *See also:* measurement system. (EEC/PE) [119]

**control interaction factors** In a proportional plus integral plus derivative control action unit, the ratio of the effective values to the values that would be measured when the product (integral action rate) (derivative action time constant) is zero. Example: Assume a control unit composed of elements whose ratios of output to input are $1 + D's$ and $P'(l'/s + 1)$ connected so that the output of one is the input of the other. The ratio of output to input of the combination is

$$\frac{Y}{X} = P'(1 + l'D')\left[\frac{l'/s}{1 + l'D'} + 1 + \frac{D's}{1 + l'D'}\right]$$

By comparison with the equation

$$\frac{Y}{X} = P\left[\frac{1}{s} + 1 + Ds\right]$$

it is seen that the effective values are

$P = P'(1 + l'D') =$ proportional gain
$l = l'/(1 + l'D') =$ integral action rate
$D = D'/(1 + l'D') =$ derivative action time constant.

When either $l'$ or $D'$ is set equal to zero the factor $1 + l'D'$ equals unity and the measured values are $P'$, $l'$ and $D'$. Consequently, $1 + l'D'$ is the "proportional interaction factor" and $1/(1 + l'D')$ is both the "integral action rate interaction factor" and "derivative action time interaction factor. ". (CS/PE/EDPG) [3]

**control interface** The interface to a device through which the operation and response of the device is controlled either by manual operation or by a system controller. (SCC20) 993-1997

**control key (CTRL)** Any key on a keyboard that is used to control a process. *Note:* The control key, usually labelled "CTRL" is said to represent a control character, and when used in conjunction with another key, such as "C", the combination is said to represent the control character "CONTROL C" or "C". *Contrast:* typing key. *See also:* attention key; alternate key; cursor control key; escape key; enter key; shift key; function key; command key. (C) 610.10-1994w

**controllability** In comparison of processes, a qualitative term indicating the relative ease with which they can be controlled. *Note:* The type of disturbance for which the comparison is made should be specified. (CS/PE/EDPG) [3]

**controllable** A property of a component of a state whereby, given an initial value of the component at a given time, there exists a control input that can change this value to any other value at a later time. *See also:* control system. (IM) [120]

**controllable, completely** The property of a plant whereby all components of the state are controllable within a given time interval. *See also:* control system. (IM) [120]

**control language** *See:* job control language.

**control law** A function of the state of a plant and possibly of time, generated by a controller to be applied as the control input to a plant. *See also:* control system. (IM) [120]

**control law, closed-loop** A control law specified in terms of some function of the observed state. *See also:* control system. (IM) [120]

**control law, open-loop** A control law specified in terms of the initial state only and possibly of time. *See also:* control system. (IM) [120]

**controlled access (communication satellite)** A mode of operation of a communication satellite in which an earth station desiring access to the system must request and obtain access to the system via a network management facility. (COM) [19]

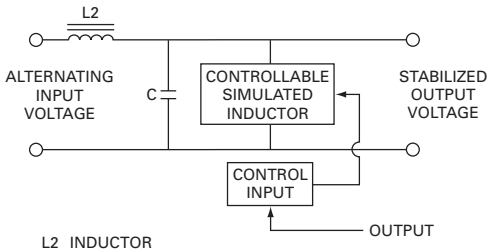
**controlled area (laser maser)** An area where the occupancy and activity of those within is subject to control and supervision for the purpose of protection from radiation hazards. (LEO) 586-1980w

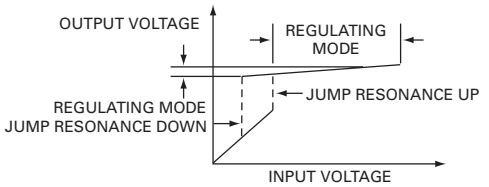
**controlled-avalanche rectifier diode (semiconductor)** A rectifier diode that has specified maximum and minimum breakdown-voltage parameters and is specified to operate under steady-state conditions in the breakdown region of its reverse characteristic. *See also:* breakdown. (IA) [12]

**controlled carrier (floating carrier) (variable carrier)** A system of compound modulation wherein the carrier is amplitude modulated by the signal frequencies in any conventional manner, and, in addition, the carrier is simultaneously amplitude modulated in accordance with the envelope of the signal so that the percentage of modulation, or modulation factor, remains approximately constant regardless of the amplitude of the signal. (AP/BT/ANT) 145-1983s, 182A-1964w

**controlled ESD environment** One in which an attempt is made to maintain charge levels on humans and objects below a certain level. Typical control measures include humidity controls, equipment earth grounding, use of antistatic materials, ionized air, and high-resistance discharge paths for humans. (EMC) C63.16-1993

**controlled ferroresonant regulators** A regulator consisting basically of an inductor connected in series with a parallel combination of a capacitor and controllable simulated inductor. This combination is connected across the source as shown in the figure below. Stabilized output voltage is derived by inductive or conductive coupling to the parallel combination of C and the controllable simulated inductor. In a controlled ferroresonant regulator the controllable simulated inductor can be a combination of switching devices (such as thyristors or transistors) and linear or saturating inductors. This circuit, in combination with a control input to the simulated inductor, controls the flux swing (or simulated flux swing) in the saturated (or simulated saturating) inductor, thereby controlling the stabilized output voltage.




*Controlled ferroresonant regulator schematic*

**Controlled ferroresonant regulators**

(PEL) 449-1998

**controlled list (A)** A list whose access is controlled in some way; for example, access to an array is controlled by its index variable. **(B)** A list that can contain a finite number of entries. (C) 610.5-1990

**controlled list data element** A data element that is contained in a controlled list. (C) 610.5-1990w

**controlled manual block signal system** A series of consecutive blocks governed by block signals, controlled by continuous track circuits, operated manually upon information by telegraph, telephone, or other means of communication, and so constructed as to require the cooperation of the signalmen at both ends of the block to display a clear or permissive block signal. *See also:* block-signal system. (EEC/PE) [119]

**controlled overvoltage test (rotating machinery)** (dc leakage, measured current, or step voltage test) A test in which the increase of applied direct voltage is controlled and measured currents are continuously observed for abnormalities with the intention of stopping the test before breakdown occurs. (PE/EM) 95-1977r

**controlled plasma switch** (nonlinear, active, and nonreciprocal waveguide components) A triggered gas switch that uses an electron-beam-excited gaseous plasma in a waveguide to limit or switch radio frequency (rf) power. (MTT) 457-1982w

**controlled rectifier** A rectifier in which means for controlling the current flow through the rectifying devices is provided. *See also:* rectification; electronic controller. (EEC/PE) [119]

**controlled slip** The occurrence of a replication or deletion of all the information bits in a frame at the receiving terminal. (COM/TA) 1007-1991r

**controlled-speed axle generator** An axle generator in which the speed of the generator is maintained approximately constant at all vehicle speeds above a predetermined minimum. *See also:* axle-generator system. (EEC/PE) [119]

**controlled system (automatic control)** The apparatus, equipment, or machine used to effect changes in the value of the ultimately controlled variable. *See also:* control system. (PE/EDPG) [3]

**controlled vented power fuse** (installations and equipment operating at over 600 volts, nominal) A fuse with provision for controlling discharge circuit interruption such that no solid material may be exhausted into the surrounding atmosphere. The discharge gases shall not unite or damage insulation in the path of the discharge nor shall these gases propagate a flashover to or between grounded members or conduction members in the path of the discharge when the distance between the vent and such insulation or conduction members conforms to manufacturer's recommendations. (NESC/NEC) [86]

**controller (1) (electric pipe heating systems)** A device that regulates the state of a system by comparing a signal from a sensor located in the system with a predetermined value and adjusting its output to achieve the predetermined value. Controllers, as used in electric pipe heating systems, regulate temperatures on the system and can be referred to as temperature controllers or thermostats. Controller sensors can be mechanical (bulb, bimetallic) or electrical (thermocouple, resistance-temperature detector [RTD] thermistor). (PE/EDPG) 622A-1984r, 622B-1988r

**(2)** A device or group of devices that serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected. (NESC/NEC) [86]

**(3) (packaging machinery)** A device or group of devices that serves to control in some predetermined manner the apparatus to which it is connected. (IA/PKG) 333-1980w

**(4)** The component of a system that functions as the system controller. A controller typically sends program messages to and receives response messages from devices. (IM/AIN) 488.2-1992r

**(5) (A)** A functional unit in a computer system that controls one or more units of the peripheral equipment. *Synonym:* peripheral control unit. *See also:* input-output controller; dual-channel controller. **(B)** In robotics, a processor that takes as input desired and measured position, velocity or other pertinent variables and whose output is a drive signal to a controlling motor or activator. **(C)** A device through which one can introduce commands to a control system. (C) 610.10-1994

**(6)** The entity that initiates RamLink transactions. There is exactly one controller on each RamLink ringlet. (C/MM) 1596.4-1996

**(7)** A device or group of devices used to control in a predetermined manner the electric power delivered to the apparatus to which it is connected. (IA/MT) 45-1998

**(8) (CAMAC system)** *See also:* CAMAC crate.

**(9)** *See also:* SBus Controller. (C/BA) 1496-1993w

**Controller** *See:* SBus Controller.

**controller, automatic** *See:* automatic controller.

**controller characteristics (thyristor)** The electrical characteristics of an ac power controller measured or observed at its input or output terminal. (IA/IPC) 428-1981w

**controller current (thyristor)** The current flowing through the terminals of the controller. (IA/IPC) 428-1981w

**controller diagram (electric-power devices)** A diagram that shows the electric connections between the parts comprising the controller and that shows the external connections. (IA/IAC) 270-1966w, [60]

**controller equipment (thyristor)** An operative unit for ac power control comprising one or more thyristor assemblies together with any input or output transformers, filters, other switching devices and auxiliaries required by the thyristor ac power controller to function. (IA/IPC) 428-1981w

**controller faults (thyristor)** A fault condition exists if the conduction cycles of some semiconductors are abnormal. (IA/IPC) 428-1981w

**controller ON-state interval (thyristor)** The time interval in which the controller conducts. *Note:* It is assumed that the starting instant of the controller ON-state interval is coincident with the starting instant of the trigger pulse. (IA/IPC) 428-1981w

**controller power transformer (thyristor)** A transformer within the controller employed to provide isolation or the transformation of voltage or current, or both. (IA/IPC) 428-1981w

**controller section (thyristor)** That part of a controller circuit containing the basic control elements necessary for controlling the load voltage. (IA/IPC) 428-1981w

**controller, self-operated** *See:* self-operated controller.

**controllers for steel-mill accessory machines** Controllers for machines that are not used directly in the processing of steel, such as pumps, machine tools, etc. *See also:* electric controller. (IA/IAC) [60]

**controllers for steel-mill auxiliaries** Controllers for machines that are used directly in the processing of steel, such as screwdowns and manipulators but not cranes and main rolling drives. *See also:* electric controller. (IA/IAC) [60]

**controller, time schedule** *See:* time schedule controller.

**control line** The line, connected to the memory transistor control element, that provides the reference voltage to the memory cell during a read and may provide a high voltage during a write cycle. (ED) 1005-1998

**controlling element, final** *See:* final controlling element.

**controlling elements** The functional components of a controlling system. *See also:* feedback control system. (IM/PE/EDPG) [120], [3]

**controlling elements, forward** *See:* forward controlling elements.

**controlling means** (of an automatic control system) Consists of those elements that are involved in producing a corrective action. (PE/PSE) 94-1970w

**controlling section** A length of track consisting of one or more track circuit sections, by means of which the roadway elements or the device that governs approach to or movement within a block are controlled. (EEC/PE) [119]

**controlling system (1) (automatic control system without feedback)** That portion of the control system that manipulates the controlled system. (IM/PE/EDPG) [120], [3]

**(2) (control system feedback)** The portion that compares functions of a directly controlled variable and a command and adjusts a manipulated variable as a function of the difference. *Note:* It includes the reference input elements; summing point; forward and final controlling elements; and feedback elements. *See also:* feedback control system. (IM/PE/EDPG) [120], [3]

**controlling voltage, composite** *See:* composite controlling voltage.

**control loopback** Loopback of output from one function to be control for another function in the same diagram. *Synonym:* feedback. (C/SE) 1320.1-1998

**control machine (A) (railroad practice)** An assemblage of manually operated levers or other devices for the control of signals, switches, or other units, without mechanical interlocking, usually including a track diagram with indication lights. *See also:* car retarder. **(B) (railroad practice)** A group of levers or equivalent devices used to operate the various mechanisms and signals that constitute the car retarder installation. *See also:* centralized traffic-control system; car retarder. (EEC/PE) [119]

**control, manual** *See:* manual control.

**control mechanism (control systems for steam turbine-generator units)** Includes all systems, devices, and mechanisms between a controller and the controlled valves. (PE/EDPG) 122-1985s

**control metering point (1) (tie line)** The location of the metering equipment that is used to measure power on the tie line for the purpose of control. *See also:* power system; center of distribution. (PE/PSE) [54]

**(2) (electric power system)** The actual or equivalent location of power flow measurement on an area tie line. (PE/PSE) 94-1991w

**control mode (thyristor)** The starting instant of the controller ON-state interval is periodic. The control mode is defined only for steady state operation. *Note:* It is possible to combine several control modes, for example, ON-OFF control and phase control. *See also:* operation modes. (IA/IPC) 428-1981w

**control operator** In the shell command language, a token that performs a control function. A control operator is one of the following symbols:

&
&&
(
)
;
;;
⟨newline⟩
|
||

The end-of-input indicator used internally by the shell is also considered a control operator.On some systems, the symbol (( is a control operator; its use produces unspecified results. (C/PA) 9945-2-1993

**control panel (1) (supervisory control, data acquisition, and automatic control) (station control and data acquisition)** An assembly of man/machine interface devices. (PE/SUB) C37.1-1987s

**(2)** The part of a console that contains switches, pushbuttons and indicators. (C) 610.10-1994w

**control point (project control point)** A project agreed on point in time or times when specified agreements or controls are applied to the software configuration items being developed, e.g., an approved baseline or release of a specified document/code. (C/SE) 828-1998

**control point interfaces** Master station or RTU (or both) element(s) that operate(s) to perform a control function. (SUB/PE) C37.1-1994

**control point selector (test, measurement, and diagnostic equipment)** A device capable of selecting and controlling the proper stimuli, power of loads, and applying it to the unit under test, in accordance with instructions from the programming device. (MIL) [2]

**control position electric indicator** A device that provides an indication of the movement and position of the various control surfaces or structural parts of an aircraft. It may be used for wing flaps, cowl flaps, trim tabs, oil-cooler shutters, landing gears, etc. (EEC/PE) [119]

**control positioning accuracy, precision, or reproducibility (numerically controlled machines)** Accuracy, precision, or reproducibility of position sensor or transducer and interpreting system and including the machine positioning servo. *Note:* May be the same as machine positioning accuracy, precision, or reproducibility in some systems. (IA) [61]

**control power disconnecting device (power system device function numbers)** A disconnecting device, such as a knife switch, circuit breaker, or pull-out fuse block, used for the purpose of respectively connecting and disconnecting the source of control power to and from the control bus or equipment. *Note:* Control power is considered to include auxiliary power which supplies such apparatus as small motors and heaters. (SUB/PE) C37.2-1979s

**control-power winding (power and distribution transformers)** The winding (or transformer) that supplies power to motors, relays, and other devices used for control purposes. *Synonym:* control-power transformer. *See also:* high-voltage and low-voltage windings. (PE/TR) C57.12.80-1978r, [57]

**control-power transformer** *See:* control-power winding.

**control precision** Precision evidenced by either the directly or the indirectly controlled variable, as specified. (CS/PE/EDPG) [3]

**control procedure** The means used to control the orderly communication of information between stations on a data link. (LM/COM) 168-1956w

**controlling process** The session leader that established the connection to the controlling terminal. Should the terminal subsequently cease to be a controlling terminal for this session, the session leader shall cease to be the controlling process. (PA/C) 9945-1-1996, 1003.5-1999

**controlling terminal** A terminal that is associated with a session. Each session may have at most one controlling terminal associated with it, and a controlling terminal is associated with exactly one session. Certain input sequences from the controlling terminal cause signals to be sent to all processes in the process group associated with the controlling terminal. (C/PA) 9945-1-1996, 1003.5-1999

**control program** *See:* supervisory program.

**control punch** *See:* designation hole.

**control range** The total inductive plus capacitive range of reactive current or megavar variation of the static var compensator (SVC), at the point of connection. (PE/SUB) 1031-2000

**control ratio (1) (gas tube)** The ratio of the change in anode voltage to the corresponding change in grid voltage, with all other operating conditions maintained constant. *See also:* gas tube. (ED) 161-1971w

**(2) (power supplies)** The required charge in control resistance to produce a one-volt change in the output voltage. The control ratio is expressed in ohms per volt and is reciprocal of the bridge current. (AES) [41]

**control read-only memory (CROM)** A type of read-only storage in the control block of some processors such that the ROM has been programmed to decode the control logic. (C) 610.10-1994w

**control register** A register in a computer or peripheral device, the contents of which control the operations of the computer or peripheral. *See also:* program counter; device register. (C) 610.10-1994w

**control relay** An auxiliary relay whose function is to initiate or permit the next desired operation in a control sequence. (SWG/PE) C37.100-1992

**control ring** *See:* grading ring.

**control room complex (nuclear power generating station)** The complex that houses and protects plant operating personnel and control and instrumentation equipment. It includes the central control room, adjacent rooms that house supporting control equipment and instrumentation (sometimes known as the auxiliary equipment room), ventilation and life support equipment, and the cable spreading areas serving the equipment therein. (PE/NP) 567-1980w

**control SCADA function** The capability of a supervisory system to selectively perform manual or automatic, or both, operation (singularly or in selected groups) of external devices. Control may be either analog (magnitude or duration) or digital. (SUB/PE) C37.1-1994

**control script** A control_file associated with a software object that is executed by the software administration utilities. (C/PA) 1387.2-1995

**control sequence table (electric-power devices)** A tabulation of the connections that are made for each successive position of the controller. (IA/IAC) [60]

**control signal** Any signal that purposely affects the recording, processing, transmission or interpretation of data by a system element. (C) 610.10-1994w

**control signal one (CS1)** An encoded control signal used on the Control In and Control Out circuits. A CS1 is encoded as a signal at half the bit rate (BR)/2. (C/LM) 802.3-1998

**control signal zero (CS0)** An encoded control signal used on the Control In and Control Out circuits. A CS0 is encoded as a signal at the bit rate (BR). (C/LM) 802.3-1998

**control space** A dedicated area or compartment provided with equipment such as control consoles, gauge boards, control bench boards, switchboards, instrumentation, displays, control switches, communications, and other equipment for the local, remote, or programmed control and monitoring of equipment. The control system equipment may be operated by one or more individuals acting together or independently. (IA/MT) 45-1998

**control span** *See:* sag span.

**control statement (software)** A program statement that selects among alternative sets of program statements or affects the order in which operations are performed. For example, if-then-else, case. *Contrast:* assignment statement; declaration. (C) 610.12-1990

**control station (1) (mobile communication)** A base station, the transmission of which is used to control automatically the emission or operation of another radio station. *See also:* mobile communication system. (VT) [37]

**(2)** A facility that provides the individual responsible for controlling the simulation and that provided the capability to implement simulation control as PDUs on the DIS network. (DIS/C) 1278.3-1996

**control store (software)** In a microprogrammed computer, the computer memory in which microprograms reside. *See also:* microword; nanostore. (C) 610.12-1990, 610.10-1994w

**control structure (software)** A construct that determines the flow of control through a computer program. *See also:* conditional control structure; flow of control; computer program. (C/SE) 729-1983s

**control switch** A manually operated switching device for controlling power-operated devices. *Note:* It may include signaling, interlocking, etc., as dependent functions. (SWG/PE) C37.100-1992

**control switchboard** A type of switchboard including control, instrumentation, metering, protective (relays) or regulating equipment for remotely controlling other equipment. Control switchboards do not include the primary power circuit-switching devices or their connections. (SWG/PE) C37.100-1992, C37.21-1985r

**control-switching point (telephone switching systems)** A switching entity arranged for routing and control in the distance dialing network, at which intertoll trunks are interconnected. (COM) 312-1977w

**control system (1) (broadly)** An assemblage of control apparatus coordinated to execute a planned set of controls. *See also:* control. (IA/IAC) [60]

**(2)** A system in which a desired effect is achieved by operating on the various inputs to the system until the output, which is a measure of the desired effect, falls within an acceptable range of values. *See also:* network analysis; control; open-loop control system; transfer function; closed-loop control system. (MAG/PEL/ET) 264-1977w, 111-1984w

**(3) (automatic control)** A system in which deliberate guidance or manipulation is used to achieve a prescribed value of a variable. *Note:* It is subdivided into a controlling system and a controlled system. (PE/EDPG) [3]

**(4)** A system in which a desired effect is achieved by operating on inputs until the output, which is a measure of the desired effect, falls within an acceptable range of values. *See also:* open-loop control; automatic control; closed-loop control. (C/MAG) 610.2-1987, 264-1977w

**control system, adaptive** *See:* adaptive control system.

**control system, automatic** *See:* automatic control system.

**control system, automatic feedback** *See:* automatic feedback control system.

**control system, cascade** *See:* cascade control system.

**control system, closed-loop** *See:* closed-loop control system.

**control system, coarse-fine** *See:* coarse-fine control system.

**control system, dual-mode** *See:* dual-mode control system.

**control system, duty factor** *See:* duty factor control system.

**control system, feedback** *See:* feedback control system.

**control system, floating** *See:* floating control system.

**control system, multiple-speed floating** *See:* multiple-speed floating control system.

**control system, multi-step** *See:* step control system.

**control system, on-off** *See:* on-off control system.

**control system, positioning** *See:* positioning control system.

**control system, ratio** *See:* ratio control system.

**control system, sampling** *See:* sampling control system.

**control system, single-speed floating** *See:* single-speed floating control system.

**control system, step** *See:* step control system.

**control system, two-step** *See:* two-step control system.

**control system, two-step neutral zone** *See:* two-step control system.

**control system, two-step single-point** *See:* two-step control system.

**control tape** *See:* carriage control tape.

**control terminal (mobile communication) (base station)** Equipment for manually or automatically supervising a multiplicity of mobile and/or radio stations including means for calling or receiving calls from said stations. *See also:* mobile communication system. (VT) [37]

**control total** *See:* hash total.

**control track (electroacoustics)** A supplementary track usually placed on the same medium with the record carrying the program material. *Note:* Its purpose is to control, in some respect, the reproduction of the program, or some related phenomenon. Ordinarily, the control track contains one or more tones, each of which may be modulated either as to amplitude, frequency, or both. *See also:* phonograph pickup. (SP) [32]

**control transfer instruction** *See:* jump instruction.

**control transformers (power and distribution transformers)** Step-down transformers generally used in circuits which are characterized by low power levels and which contribute to a control function, such as in heating and air conditioning, printing, and general industrial controls. (PE/TR) C57.12.80-1978r

**control unit (1) (digital computers)** The parts that effect the retrieval of instructions in proper sequence, the interpretation of each instruction, and the application of the proper signals to the arithmetic unit and other parts in accordance with this interpretation. (C) [20], [85]

**(2) (mobile communication) (mobile station)** Equipment including a microphone and/or handset and loudspeaker together with such other devices as may be necessary for controlling a mobile station. *See also:* mobile communication system. (VT) [37]

**(3)** A functional unit of a computer that interprets and executes the instructions of a program in a prescribed sequence. *See also:* instruction control unit; main control unit. (C) 610.10-1994w

**control valve (control systems for steam turbine-generator units)** Those valves that control the energy input to the turbine and that are actuated by a controller through the control mechanism. (PE/EDPG) 122-1985s

**control variable** *See:* loop-control variable.

**control voltage (1)** The voltage applied to the operating mechanism of a device to actuate it, usually measured at the control power terminals of the mechanism. (SWG/PE) C37.100-1992

**(2)** Voltage that is provided for operating the controlled elements of the vehicle. *Note:* Control voltage may or may not be the same nominal potential as the battery voltage. *See also:* battery voltage. (VT) 1475-1999

**control winding (1) (rotating machinery)** An excitation winding that carries a current controlling the performance of a machine. *See also:* asynchronous machine. (PE) [9]

**(2) (saturable reactor)** A winding by means of which a controlling magnetomotive force is applied to the core. *See also:* magnetic amplifier. (EEC/PE) [119]

**convection current** In an electron stream, the time rate at which charge is transported through a given surface. *See also:* electron emission. (ED) 161-1971w, [45]

**convection-current modulation** The time variation in the magnitude of the convection current passing through a surface, or the process of directly producing such a variation. *See also:* electron emission. (ED) 161-1971w

**convection heater** A heater than dissipates its heat mainly by convection and conduction. (EEC/PE) [119]

**convective discharge (medical electronics) (effluve) (electrical wind) (static breeze)** The movement of a visible or invisible stream of particles carrying away charges from a body that has been charged to a sufficiently high voltage. (EMB) [47]

**convective heat release** The heat contained in the hot gases produced in a fire. (DEI) 1221-1993w

**convenience outlet** *See:* receptacle.

**convention** Any practice that is not formally standardized, but which is adopted by a group in a given situation. For example, programmers usually adopt the convention of indenting subordinate instructions in a routine so that the structure of the program is more easily visualized. *See also:* standard. (C) 610.7-1995, 610.10-1994w

**conventional BIL (basic lightning impulse insulation level)** The crest value of a standard lightning impulse for which the insulation shall not exhibit disruptive discharge when subjected to a specific number of applications of this impulse under specified conditions, applicable specifically to nonself-restoring insulations. (PE/SPD/C) C62.22-1997, 1313.1-1996

**conventional BSL (basic switching impulse insulation level)** The crest value of a standard switching impulse for which the insulation does not exhibit disruptive discharge when subjected to a specific number of impulses under specified conditions, applicable to nonself-restoring insulations. (PE/SPD/C) C62.22-1997, 1313.1-1996

**conventional deviation of the disruptive discharge voltage (*z*)** The difference between the 50% and 16% disruptive discharge voltages. (PE/PSIM) 4-1995

**conventional-electrode coaxial detector (germanium gamma-ray detectors)** Conventional-electrode geometry. A coaxial detector in which the outer contact is an n-type layer. (NPS) 325-1996

**conventionally** (true value of a quantity) The commonly accepted best estimate of the value of that quantity. This and its associated uncertainty will normally be determined by a national or transfer standard, or by a reference instrument that has been calibrated against a national or transfer standard, or by measurement quality assurance (MQA) with a national laboratory or qualified secondary laboratory. (NI) N42.17B-1989r

**conventionally cooled (rotating machinery)** A term referring to windings in which the heat generated within the principal portion of the windings must flow through the major ground insulation before reaching the cooling medium. (PE/REM) [9], [115]

**conventionally true value** The best estimate of the value determined by a primary or secondary standard, or by a reference instrument that has been calibrated against a primary or secondary standard. (NI) N42.20-1995

**conventional withstand voltage (1)** The voltage that an insulation system is capable of withstanding without failure or disruptive discharge under specified test conditions. (PE/C) 1313.1-1996

**(2)** The voltage that an insulation is capable of withstanding with a 0% probability of failure. (SPD/PE) C62.22-1997

**conventions (1) (software)** Requirements employed to prescribe a disciplined uniform approach to providing consistency in a software product, that is, uniform patterns or forms for arranging data. *See also:* practices. (C/SE) 610.12-1990, 983-1986w

**(2)** Accepted guidelines employed to prescribe a disciplined, uniform approach to providing consistency in a software item, for example, uniform patterns or forms for arranging data. (C/SE) 730.1-1995

**convergence (multibeam cathode-ray tubes)** A condition in which the electron beams intersect at a specified point. (ED) 161-1971w

**convergence, dynamic** *See:* dynamic convergence.

**convergence electrode (multibeam cathode-ray tubes)** An electrode whose electric field converges two or more electron beams. (ED) 161-1971w

**convergence function** A function or procedure that provides sufficient additional services to enable a *layer or sublayer* to provide the services expected by a particular higher layer user. (For example, the MAC Convergence Function enables the capabilitites of the *Queued Arbitrated access function* to be enhanced to provide the *Medium Access Control (MAC) Sublayer* service to the *Logical Link Control Sublayer*.). (LM/C) 8802-6-1994

**convergence magnet (multibeam cathode-ray tubes)** A magnet assembly whose magnetic field converges two or more electron beams. (ED) 161-1971w

**convergence plane (multibeam cathode-ray tubes)** A plane containing the points at which the electron beams appear to experience a deflection applied for the purpose of obtaining convergence. (ED) 161-1971w

**convergence protocol (1)** A protocol that provides the convergence service for the provision of enhancements to an underlying service in order to provide for the specific requirements of the convergence service user. (LM/C/COM) 8802-9-1996

**(2)** A protocol that provides the convergence service. (LM/C) 15802-2-1995

**convergence service** A service that provides enhancements to an underlying service in order to provide for the specific requirements of the convergence service user. (LM/C) 15802-2-1995

**convergence surface (multibeam cathode-ray tubes)** The surface generated by the point of intersection of two or more electron beams during the scanning process. (ED) 161-1971w

**convergence time ($T_c$)** The time required to reach within 3 dB of maximum echo return loss, or 25 dB loss, whichever occurs first. (COM/TA) 1329-1999

**Conversation** A set of MAC frames transmitted from one end station to another, where all of the MAC frames form an ordered sequence, and where the communicating end stations require the ordering to be maintained among the set of MAC frames exchanged. (C/LM) 802.3ad-2000

**conversational (software)** Pertaining to an interactive system or mode of operation in which the interaction between the user and the system resembles a human dialog. *Contrast:* batch. *See also:* online; interactive; real time. (C) 610.12-1990

**Conversational Algebraic Language (CAL)** A general-purpose programming language used in time-sharing environments for solving numerical problems. (C) 610.13-1993w

**conversational compiler** *See:* incremental compiler.

**converse inorder traversal** The process of traversing a binary tree in a recursive fashion as follows: the right subtree is traversed, then the root is visited, then the left subtree is traversed. *Contrast:* converse postorder traversal; converse preorder traversal. *See also:* inorder traversal. (C) 610.5-1990w

**converse postorder traversal** The process of traversing a binary tree in a recursive fashion as follows: the right subtree is traversed, then the left subtree is traversed, then the root is visited. *Contrast:* converse inorder traversal; converse preorder traversal. *See also:* postorder traversal. (C) 610.5-1990w

**converse preorder traversal** The process of traversing a binary tree in a recursive fashion as follows: the root is visited, then the right subtree is traversed, then the left subtree is traversed. *Contrast:* converse inorder traversal; converse postorder traversal. *See also:* preorder traversal. (C) 610.5-1990w

**conversion (1) (software)** Modification of existing software to enable it to operate with similar functional capability in a different environment; for example, converting a program from Fortran to Ada, converting a program that runs on one computer to run on another. (C) 610.12-1990

**(2)** A general term covering the process of altering existing power switchgear equipment. (SWG/PE) C37.100-1992

**(3)** The process of altering existing power switchgear equipment from the original manufacturers design. (SWG/PE) C37.59-1996

**conversion efficiency (1) (electrical conversion)** In alternating-current to direct-current conversion equipment, the ratio of the product of output direct-current and voltage to input watts expressed in percent. *Note:* It reflects alternating-current power capacity required for a given voltage and current output and does not necessarily reflect watts lost.

$$= \frac{(E_{dc})(I_{dc})}{P} \text{ (100 percent)}$$

(AES) [41]

**(2) (overall) (photoelectric converter)** The ratio of available power output to total incident radiant power in the active area for photovoltaic operation. *Note:* This depends on the spectral distribution of the source and junction temperature. *See also:* semiconductor. (AES) [41]

**(3) (klystron oscillator)** The ratio of the high-frequency output power to the direct-current power supplied to the beam. *See also:* velocity-modulated tube. (Std100) [84]

**(4) (solar cells)** The ratio of the solar cell's available power output (at a specified voltage) to the total incident radiant power. The cell active area shall be used in this calculation; that is, ohmic contact (but no grid lines) areas on the irradiated side shall be deducted from the total irradiated cell area to determine active area. The spectral distribution of the source and the junction temperature must be specified. (AES/SS) 307-1969w

**conversion factor** *See:* calibration factor.

**conversion loss (nonlinear, active, and nonreciprocal waveguide components)** In a frequency converter (mixer), the ratio of the output power at the converted frequency to the available input power at the signal frequency; often expressed in decibels. (MTT) 457-1982w

**conversion rate (A) (hybrid computer linkage components) (analog-to-digital converter)** The maximum rate at which the start conversion commands can be applied to the converter, to which the converter will respond by providing the desired signal at the output to within a given accuracy. **(B) (analog-to-digital converter with multiplexor with sample and hold)** The maximum rate at which the start sample commands can be applied to the system to which the system will respond by providing the desired signal at the output to within a given accuracy. (Pre-selected channel). (C) 166-1977

**conversion time (A) (hybrid computer linkage components) (analog-to-digital converter)** That time required from the instant at which a conversion command is received and a final digital representation is available for external output to within a given accuracy. **(B) (analog-to-digital converter with multiplexor with sample and hold)** That time required from the time at which a sample command is received and a final digital representation is available for external output to within a given accuracy. (Pre-selected channel). (C) 166-1977

**conversion transconductance (heterodyne conversion transducer)** The quotient of (1) the magnitude of the desired output-frequency component of currents by (2) the magnitude of the input-frequency (signal) component of voltage when the impedance of the output external termination is negligible for all of the frequencies that may affect the result. *Note:* Unless otherwise stated, the term refers to the cases in which the input-frequency voltage is of infinitesimal magnitude. All direct electrode voltages, and the magnitude of the local-oscillator voltage, must remain constant. *See also:* transducer; modulation. (ED) 161-1971w

**conversion transducer (1) (general)** A transducer in which the signal undergoes frequency conversion. *Note:* The gain or loss of a conversion transducer is specified in terms of the useful signal. *See also:* transducer. (PE/EEC) [119]

**(2)** An electric transducer in which the input and the output frequencies are different. *Note:* If the frequency-changing property of a conversion transducer depends upon a generator of frequency different from that of the input or output frequencies, the frequency and voltage or power of this generator are parameters of the conversion transducer. *See also:* heterodyne conversion transducer. (ED) 161-1971w

**conversion voltage gain (conversion transducer)** The ratio of the magnitude of the output-frequency voltage across the output termination, with the transducer inserted between the input-frequency generator and the output termination" to the magnitude of the input-frequency voltage across the input termination of the transducer. (ED) [45]

**convert (data processing)** To change the representation of data from one form to another, for example, to change numerical data from binary to decimal or from cards to tape. (C) [20], [85]

**converter (1) (general)** A machine or device for changing alternating-current power to direct-current power or vice versa. (PE) [9]

**(2) (A) (heterodyne reception) (frequency converter)** The portion of the receiver that converts the incoming signal to the intermediate frequency. **(B) (data transmission)** A device for changing one form of information language to another, so as to render the language acceptable to a different machine (that is, card to tape conversion). (PE) 599-1985

**(3) (facsimile)** A device that changes the type of modulation. *See also:* facsimile. (COM) 168-1956w

**(4)** A network or device for changing the form of information or energy. (IA/ICTL/APP/IAC) [69], [60]

**(5) (test measurement and diagnostic equipment)** A device that changes the manner of representing information from one form to another. (MIL) [2]

**(6)** A device that changes electrical energy from one form to another, as from alternating current to direct current. (NESC/NEC) [86]

**(7)** A device that changes electrical energy from one form to another. A semiconductor converter is a converter that uses semiconductors as the active elements in the conversion process. (IA/SPC) 519-1992

**(8)** A machine or device for changing dc power to ac power, for changing ac power to dc power, or for changing from one frequency to another. This definition covers several different power conversion functions, each of which is known by a separate term. *See also:* dc-dc converter; frequency converter; inverter; rectifier. (PEL/ET) 388-1992r

**(9)** A device capable of converting impulses from one mode to another, such as analog to digital, parallel to serial, or from one code to another. *See also:* code converter; digital-to-analog converter; power supply. (C) 610.10-1994w

**(10) (self-commutated converters) (ac adjustable-speed drives)** An operative unit for electronic power conversion, comprising one or more electronic switching devices and any associated components, such as transformers, filters, commutation aids, controls, and auxiliaries. *Synonym:* converter equipment. (IA/SPC/ID) 936-1987w, 995-1987w

**(11)** A type of repeater that converts the data signal from one media to another. (C/LM) 8802-5-1998

**converter, analog-to-digital** *See:* analog-to-digital converter.

**converter, digital-to-analog** *See:* digital-to-analog converter.

**converter equipment** *See:* converter.

**converter, reversible power** *See:* reversible power converter.

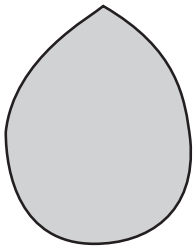
**converter, static solid state** *See:* static, solid-state converter.

**converter switching element (ac adjustable-speed drives)** A part of the converter circuit, bounded by two principal terminals, containing one or more semiconductor devices having the property of controllable or noncontrollable conduction in at least one direction. (IA/ID/SPC) 995-1987w, 936-1987w

**converter tube** An electron tube that combines the mixer and local-oscillator functions of a heterodyne conversion transducer. *See also:* heterodyne conversion transducer. (ED) 161-1971w, [45]

**converting station (power operations)** A station where machinery is used for changing alternating-current (ac) power to direct-current power or vice versa, or from one frequency to another. (PE/PSE) 858-1987s

**convex** Pertaining to a region for which a straight line segment between any two points of the region is entirely contained within the region. *Contrast:* concave.



convex

(C) 610.4-1990w

**convex programming** In operations research, a particular type of nonlinear programming in which the function to be maximized or minimized and the constraints to be applied are appropriately convex or concave functions, respectively. (C) 610.2-1987

**conveyor** A mechanical contrivance, generally electrically driven, that extends from a receiving point to a discharge point and conveys, transports, or transfers material between those points. *See also:* chain-type conveyor; shaker-type conveyor; vibrating-type conveyor; belt-type conveyor. (EEC/PE) [119]

**conveyor, belt-type** *See:* belt-type conveyor.

**conveyor, chain-type** *See:* chain-type conveyor.

**conveyor, shaker-type** *See:* shaker-type conveyor.

**conveyor, vibrating-type** *See:* vibrating-type conveyor.

**convolution efficiency** The ratio of the power density of the desired output at frequency ($\omega_1$ and $\omega_2$) to the product of the power densities of the two inputs at frequencies $\omega_1$ and $\omega_2$, respectively, in the convolution region, expressed in decibels. (UFFC) 1037-1992w

**convolution function (burst measurements)** The integral of the function $x$ ($\tau$) multiplied by another function $y$ ($-\tau$) shifted in time by $t$

$$\int_{-\infty}^{\infty} x(\tau)y(t-\tau)d\tau$$

*See also:* burst. (SP) 265-1966w

**convolution integral (automatic control)** A mathematical integral operation that is used to describe the time response of a linear element to an input function in terms of the weighting function of the element. The integral generally takes the form $\int^t_0 f(x)g(t-x)dx$ where $f(x)$ is an arbitrary input, and $g$ $(t-x)$ is a weighting function that extends backward from instant $t$ through $x$ as far as zero. (PE/EDPG) [3]

**convolver** A three-port device whose output signal is the convolution of two time waveforms applied simultaneously to the input ports; convolution is achieved by physically passing the input signals over one another at the output transducer. (UFFC) 1037-1992w

**cookie** A quantity used to indicate or signal to a recipient of data, significant changes in the state of the entity supplying the data. (IM/ST) 1451.1-1999

**cooking unit, counter-mounted** *See:* counter-mounted cooking unit.

**coolant** A fluid, usually air, hydrogen, or water, used to remove heat from a machine or from certain of its components. *Synonym:* cooling medium. (PE/EM) 67-1990r, [9]

**cooled-input FET preamplifier (germanium gamma-ray detectors)** A preamplifier in which the input field-effect transistor (FET) is cooled to achieve a reduction in noise. (NPS) 325-1986s

**cooler (heat exchanger) (rotating machinery)** A device used to transfer heat between two fluids without direct contact between them. (PE) [9]

**Coolidge tube** An X-ray tube in which the needed electrons are produced by a hot cathode. (ED) [45]

**cooling (power supplies)** The cooling of regulator elements refers to the method used for removing heat generated in the regulating process. *Note:* Methods include radiation, convection, and conduction or combination thereof. (AES) [41]

**cooling coil (rotating machinery)** A tube through whose wall, heat is transferred between two fluids without direct contact between them. (PE) [9]

**cooling, convection** *See:* convection cooling.

**convection cooling (power supplies)** A method of heat transfer that uses the natural upward motion of air warmed by the heat dissipators. (AES/PE) [41], [78]

**cooling duct** *See:* ventilating duct.

**cooling fin** A metallic part of fin extending the cooling area to facilitate the dissipation of the heat generated in the device. *See also:* electron device. (ED) [45]

**cooling, lateral force-air (power supplies)** An efficient method of heat transfer by means of side-to-side circulation that employs blower movement of air through or across the heat dissipators. (AES/PE) [41], [78]

**cooling medium** *See:* coolant.

**cooling system (1) (rectifier)** Equipment, that is, parts and their interconnections, used for cooling a rectifier. *Note:* It includes all or some of the following: rectifier water jacket, cooling oils or fins, heat exchanger, blower, water pump, expansion tank, insulating pipes, etc. *See also:* rectification. (IA) [62]

**(2) (thyristor)** Any equipment, that is, parts and their interconnections, used for cooling a thyristor controller. It includes all or some of the following; thyristor heat sink, cooling coils or fins, heat exchanger, fan or blower, water pump, expansion tank, insulating pipes, equipment enclosure, etc. (IA/IPC) 428-1981w

**(3) (thyristor converter)** Equipment, that is, parts and their interconnections, used for cooling a thyristor converter. *Note:* It includes all or some of the following: thyristor heat sink, cooling coils or fins, heat exchanger, fan or blower, water pump, expansion tank, insulating pipes, etc. (IA/IPC) 444-1973w

**cooling system, direct raw-water (thyristor converter)** A cooling system in which water, received from a constantly available supply, such as a well or water system, is passed directly over the cooling surfaces of the thyristor converter and discharged. (IA/IPC) 444-1973w

**cooling system, direct raw-water, with recirculation (thyristor converter)** A direct raw-water cooling system in which part of the water passing over the cooling surfaces of the thyristor converter is recirculated and raw water is added as needed to maintain the required temperature, the excess being discharged. (IA/IPC) 444-1973w

**cooling system, forced-air (thyristor converter)** An air cooling system in which heat is removed from the cooling surfaces of the thyristor converter by means of a flow of air produced by a fan or blower. (IA/IPC) 444-1973w

**cooling system, heat-exchanger (thyristor converter)** A cooling system in which the coolant, after passing over the cooling

surfaces of the thyristor converter, is cooled in heat exchanger and recirculated. *Note:* Heat may be removed from the thyristor converter cooling surfaces by liquid or air using the following types of heat exchangers: water-to-water, water-to-air, air-to-water, air-to-air, and refrigeration cycle. The liquid in the closed system may be other than water, and the gas in the closed system may be other than air. (IA/IPC) 444-1973w

**cooling system, natural-air (thyristor converter)** An air cooling system in which heat is removed from the cooling surfaces of the thyristor converter only by the natural action of the ambient air. (IA/IPC) 444-1973w

**cooling system regulating equipment (thyristor)** Any equipment used for heating and cooling the thyristor controller, together with the devices for controlling and indicating its temperature. (IA/IPC) 428-1981w

**cooling-water system (rotating machinery)** All parts that are provided for the flow, treatment, or storage of cooling water. (PE) [9]

**coordinate dimension word (numerically controlled machines)** A word defining an absolute dimension. (IA/EEC) [61], [74]

**coordinated operation (1)** Operation of generation and transmission facilities of two or more interconnected systems to achieve greater reliability and economy. (PE/PSE) 858-1993w

**(2) (hydro plants)** Operation of a group of hydro plants and storage reservoirs so as to obtain optimum power benefits with due consideration to all other uses. (PE/PSE) 346-1973w

**(3) (electric power supply)** Operation of generation and transmission facilities of two or more interconnected electrical systems to achieve greater reliability and economy. (PE/PSE) 346-1973w

**coordinated operation of hydroplants (power operations)** Operation of a group of hydroplants and storage reservoirs so as to obtain optimum power benefits with due consideration to all other uses. (PE/PSE) 858-1987s

**coordinated transpositions (electric supply or communication circuits)** Transpositions that are installed for the purpose of reducing inductive coupling, and that are located effectively with respect to the discontinuities in both the electric supply and communication circuits. *See also:* inductive coordination. (PE/EEC) [119]

**COordinate GeOmetry (COGO)** A problem-oriented programming language used to solve coordinate geometry problems in civil engineering applications. (C) 610.13-1993w

**coordinates** A set of data values that specify a location. (C) 610.6-1991w

**coordinate system (pulse terminology)** Throughout the following, a rectangular Cartesian coordinate system is assumed in which, unless otherwise specified:

1) Time ($t$) is the independent variable taking alone the horizontal axis, increasing in the positive sense from left to right.
2) Magnitude ($m$) is the dependent variable taken along the vertical axis, increasing the positive sense or polarity from bottom to top.
3) The following additional symbols are used:
   a) e — The base of natural logarithms.
   b) a, b, c, etc. — Real constants that, unless otherwise specified, may have any value and either sign.
   c) $n$ — A positive integer.

(Std100)

**coordinating entity (1)** That part of an end system or interworking unit (IWU) responsible for the coordination and synchronization of functions belonging to the data and signalling subentities of the layer entity implementing a PSN access protocol. (C/LM) 802.9a-1995w

**(2)** That part of the Network Layer within an end system or interworking unit responsible for the coordination and synchronization of functions belonging to the Data and Signalling subentities of the layer entity implementing a PSN access protocol. (LM/C/COM) 8802-9-1996

**coordination dimension** A reference dimension used to coordinate mechanical interfaces. This is not a manufacturing dimension with a tolerance. (C/BA/MM) 1301.2-1993, 1301.4-1996, 1301.1-1991, 1301.3-1992r

**coordination function** The logical function that determines when a station operating within a basic service set (BSS) is permitted to transmit and may be able to receive protocol data units (PDUs) via the wireless medium (WM). The coordination function within a BSS may have one point coordination function (PCF) and will have one distributed coordination function (DCF). (C/LM) 8802-11-1999

**coordination function pollable** A station able to respond to a coordination function poll with a data frame, if such a frame is queued and able to be generated, and interpret acknowledgments in frames sent to or from the point coordinator. (C/LM) 8802-11-1999

**coordination of protection** The process of choosing settings or time delay characteristics of protective devices, such that operation of the devices will occur in a specified order to minimize customer service interruption and power system isolation due to a power system disturbance. (PE/PSR) C37.113-1999

**coplanar strip transmission line** A planar transmission line consisting of two parallel thin conducting strips of finite width, separated by a finite gap and affixed to the same plane surface of an insulating substrate of arbitrary thickness. (MTT) 1004-1987w

**coplanar waveguide** A planar transmission line consisting of a single thin conducting strip of finite width situated between two semi-infinite ground planes and separated from them by finite gaps, which are all affixed to the same plane surface of an insulating substrate of arbitrary thickness. (MTT) 1004-1987w

**co-polarization** That polarization that the antenna is intended to radiate [receive]. *See also:* polarization pattern. (AP/ANT) 145-1993

**co-polar (radiation) pattern** A radiation pattern corresponding to the co-polarization. *See also:* co-polarization. (AP/ANT) 145-1993

**copper brush (rotating machinery)** A brush composed principally of copper. *See also:* brush. (PE) [9]

**copper-clad aluminum conductors** Conductors drawn from a copper-clad aluminum rod with the copper metallurgically bonded to an aluminum core. The copper forms a minimum of 10 percent of the cross-sectional area of a solid conductor or each strand of a stranded conductor. (NESC/NEC) [86]

**copper-clad steel** Steel with a coating of copper welded to it, as distinguished from copper-plated or copper-sheathed material. (EEC/PE) [119]

**copper-covered steel wire** A wire having a steel core to which is bounded a continuous outer layer of copper. *See also:* conductor. (PE) [4], 64

**copper losses** *See:* load losses.

**coprocessor (CP) (1)** An optional processing unit (impl. dep. #4). (C/MM) 1754-1994

**(2)** A processor used in conjunction with a central processing unit, designed to perform specific functions that may not be executed efficiently by the central processing unit, for example: a floating-point coprocessor. (C) 610.10-1994w

**coprocessor operate (CPop) instructions** Instructions that perform coprocessor calculations, as defined by the CPop1 and CPop2 opcodes. CPop instructions do not include CBccc instructions, nor loads and stores between memory and the coprocessor. (C/MM) 1754-1994

**copy (1) (A) (software)** To read data from a source, leaving the source data unchanged, and to write the same data elsewhere in a physical form that may differ from that of the source. For example, to copy data from a magnetic disk onto a magnetic

tape. *Contrast:* move. **(B) (software)** The result of a copy process as in definition (A). For example, a copy of a data file. *See also:* soft copy; display; hard copy. (C) 610.2-1987, 610.12-1990

**(2) (A) (electronic data processing)** To reproduce data leaving the original data unchanged. *See also:* transfer. **(B) (electronic data processing)** To produce a sequence of character events equivalent, character by character, to another sequence of character events. *See also:* transfer. **(C) (electronic data processing)** The sequence of character events produced in (B). *See also:* transfer. (C) 162-1963

**(3)** To duplicate text or graphic objects from the screen to the clipboard. (C) 1295-1993w

**(4) (A)** A copy of an entry stored in other DSA(s) through bilateral agreement. **(B)** A locally and dynamically stored copy of an entry resulting from a request (a cache copy). (C/PA) 1328.2-1993, 1224.2-1993, 1327.2-1993, 1326.2-1993

**copyback cache** A cache memory scheme with the attribute that data written from the processor is normally written to the cache rather than the main memory. Modified data in the cache is written to the main memory to avoid loss of the data when a cache line flush or replacement occurs. (C/BA) 10857-1994, 896.4-1993w

**copyright** The exclusive right granted to the owner of an original work of authorship, which is fixed in any tangible medium of expression, to reproduce, publish, perform, and/or sell the work. (C/SE) 1420.1b-1999

**cord** One or a group of flexible insulated conductors, enclosed in a flexible insulating covering and equipped with terminals. (EEC/PE) [119]

**cord adjuster** A device for altering the pendant length of the flexible cord of pendant. *Note:* This device may be a rachet reel, a pulley and counterweight, a tent-rope stick, etc. (EEC/PE) [119]

**cord circuit (telephone switching systems)** A connecting circuit, usually terminating in a plug at one or both ends, used at switchboard positions in establishing telephone connections. (COM) 312-1977w

**cord-circuit repeater** A repeater associated with a cord circuit so that it may be inserted in a circuit by an operator. *See also:* repeater. (EEC/PE) [119]

**cord connector** A plug receptacle provided with means for attachment to flexible cord. (EEC/PE) [119]

**cord grip (strain relief)** A device by means of which the flexible cord entering a device or equipment is gripped in order to relieve the terminals from tension in the cord. (EEC/PE) [119]

**cordless switchboard (telephone switching systems)** A telecommunications switchboard in which manually operated keys are used to make connections. (COM) 312-1977w

**core (1) (power and distribution transformers)** An element made of magnetic material, serving as part of a path for magnetic flux. (PE/TR) C57.12.80-1978r

**(2) (electronic information storage)** *See also:* digital computer.

**(3) (mechanical recording)** The central layer or basic support of certain types of laminated media. (SP) [32]

**(4) (electromagnet)** The part of the magnetic structure around which the magnetizing winding is place. (Std100) 270-1966w

**(5) (fiber optics)** The central region of an optical waveguide through which light is transmitted. *See also:* normalized frequency; cladding; optical waveguide. (Std100) 812-1984w

**(6) (composite insulators)** The axially aligned glass fiber reinforced resin rod that forms the mechanically load-bearing component of the insulator. (T&D/PE) 987-1985w

**(7) (A)** The central conductor element of a coaxial cable. *Note:* It is usually constructed of copper. **(B)** Single conductor in a cable (British usage). (C) 610.7-1995

**core area (fiber optics)** The cross sectional area enclosed by the curve that connects all points nearest the axis on the periphery of the core where the refractive index of the core exceeds that of the homogeneous cladding by $k$ times the difference between the maximum refractive index in the core and the refractive index of the homogeneous cladding, where $k$ is a specified positive or negative constant $k1$. *See also:* cladding; homogeneous cladding; core; tolerance field. (Std100) 812-1984w

**core center (fiber optics)** A point on the fiber axis. *See also:* fiber axis; optical axis. (Std100) 812-1984w

**core circuit** The part of the circuitry in an integrated circuit that provides the intended data manipulation function (as distinct from dedicated test circuitry). *Note:* Residual elements, which are permanently connected to the pin (i.e., in test mode as well as in normal function mode), are not regarded as being part of the core circuit. *See also:* residual element. (C/TT) 1149.4-1999

**core diameter (fiber optics)** The diameter of the circle that circumscribes the core area. *See also:* core; tolerance field; core area; cladding. (Std100) 812-1984w

**core disconnect (CD)** A facility provided within an analog boundary module (ABM) (usually mediated by a conceptual switch) that allows a pin to be disconnected from the core circuit so that the signal at the pin can be driven to any value within the pin's normal functional range without affecting the core circuit, and no value generated in the core circuit will affect the pin. *Notes:* 1. The core disconnect facility could be provided as part of the functional driver or receiver attached to the pin, e.g., by implementing a driver with high-Z capability. 2. It is necessary to document all residual elements that remain connected to the pin when it enters the CD state. *See also:* conceptual switch; core circuit; high-Z; residual element; CD state. (C/TT) 1149.4-1999

**core duct (rotating machinery)** The space between or through core laminations provided to permit the radial or axial flow of coolant gas. *See also:* rotor. (PE) [9]

**core dump*** *See:* memory dump.

* Deprecated.

**core end plate (rotating machinery)** A plate or structure at the end of a laminated core to maintain axial pressure on the laminations. (PE) [9]

**core-form transformer (power and distribution transformers)** A transformer in which those parts of the magnetic circuit surrounded by the windings have the form of legs with two common yokes. (PE/TR) C57.12.80-1978r

**core length (rotating machinery)** The dimension of the stator, or rotor, core measured in the axial direction. *See also:* stator; rotor. (PE) [9]

**core loss (1)** The power dissipated in a magnetic core subjected to a time-varying magnetizing force. *Note:* Core loss includes hysteresis and eddy-current losses of the core. (PE/TR) C57.12.80-1978r

**(2) (synchronous machines)** The difference in power required to drive the machine at normal speed, when excited to produce a voltage at the terminals on open circuit corresponding to the calculated internal voltage, and the power required to drive the unexcited machine at the same speed. *Note:* The internal voltage shall be determined by correcting the rated terminal voltage for the resistance drop only. (PE) [9], [84]

**(3) (electronic power transformer)** The measured power loss, expressed in watts, attributable to the material in the core and associated clamping structure, of a transformer that is excited, with no connected load, at a core flux density and frequency equal to that in the core when rated voltage and frequency is applied and rated load current is supplied. (PEL/ET) 295-1969r

**(4) (power and distribution transformers)** The power dissipated in a magnetic core subjected to a time-varying magnetizing force. Core loss includes hysteresis and eddy-current losses of the core. (PE/TR) C57.12.80-1978r

**core-loss current** The in-phase component (with respect to the induced voltage) of the exciting current supplied to a coil. *Note:* It may be regarded as a hypothetical current, assumed to flow through the equivalent core-loss resistance. (CHM) [51]

**core loss, open-circuit (rotating machinery)** The difference in power required to drive a machine at normal speed, when excited to produce a specified voltage at the open-circuited armature terminals, and the power required to drive the unexcited machine at the same speed. (Std100) [84]

**core-loss test (rotating machinery)** A test taken on a built-up (usually unwound) core of a machine to determine its loss characteristic. *See also:* stator. (PE) [9]

**core memory** *See:* magnetic core.

**core package (rotating machinery)** The portion of core lying between two adjacent vent ducts or between an end plate and the nearest vent duct. (PE) [9]

**corequisite** The specification in a software object such that another software object shall be installed, in conjunction with the installation of the first, and configured in conjunction with the configuration of the first. (C/PA) 1387.2-1995

**core, relay** *See:* relay core.

**core specification** Synonym for IEEE Std 1275-1994, i.e., the standard that specifies the system-independent and bus-independent requirements for Open Firmware. (C/BA) 1275.1-1994w, 1275.2-1994w

**core storage** A type of storage in which the data medium consists of magnetic cores. *Contrast:* semiconductor storage. (C) 610.10-1994w

**CORE System** A prototype computer graphics standard that contains common concepts and practices of graphics programming. It was developed by an Association for Computing Machinery (ACM) Special Interest Group on Computer Graphics (SIGGRAPH) committee. (C) 610.6-1991w

**core test (rotating machinery)** FRA test taken on a built-up (usually unwound) core of a machine to determine its loss characteristics or its magnetomotive force characteristics, or to locate short-circuited laminations. *See also:* stator; rotor. (PE) [9]

**Core Test Information Model (CTIM)** The fundamental information entities required to describe tests, test specifications, test requirements, and other test entities within the ABBET™ domain. The CTIM contains the significant types from which the component standards may be derived. (SCC20) 1226-1998

**core-type transformer** A transformer in which those parts of the magnetic-circuit surrounded by the windings have the form of legs with two common yokes. (PE/TR) C57.12.80-1978r

**Coriolis acceleration (inertial sensors)** That increment of acceleration relative to inertial space that arises from the velocity of a particle relative to a rotating coordinate system. Sometimes, the term Coriolis acceleration is also used to describe the apparent acceleration relative to a rotating coordinate system of a force-free moving particle. (AES/GYAC) 528-1994

**coriolis correction (navigation) (navigation aid terms)** An acceleration correction that must be applied to measurements of acceleration with respect to a coordinate system relative to inertial space. (AES/GCS) 172-1983w

**cornea (laser maser)** The transparent outer coat of the human eye that covers the iris and the crystalline lens. It is the main refracting element of the eye. (LEO) 586-1980w

**corner (waveguide technique)** An abrupt change in the direction of the axis of a waveguide. *Synonym:* elbow. *See also:* waveguide. (AP/ANT) [35], [84]

**corner frequency (1)** The frequency at which the skin depth is equal to the thickness of the shield. (PE/IC) 1143-1994r
**(2) (asymptotic form of Bode diagram) (control system feedback)** The frequency indicated by a breakpoint, that is, the junction of two confluent straight lines asymptotic to the log gain curve. *Note:* One breakpoint is associated with each distinct real root of the characteristic equation, one with each set of repeated roots, and one with each pair of complex roots. For a single real root, corner frequency (in radians per second) is the reciprocal of the corresponding time constant (in seconds), and the corresponding phase angle is halfway between the phase angles belonging to the asymptotes extended to infinity. *See also:* feedback control system. (IM/PE/EDPG) [120], [3]

**corner reflector (1)** A reflecting object consisting of two or three mutually intersecting conducting flat surfaces. *Note:* Dihedral forms of corner reflectors are frequently used in antennas; trihedral forms with mutually perpendicular surfaces are more often used as radar targets. (AP/ANT) 145-1993
**(2) (A) (antenna)** A reflecting object consisting of two or three mutually intersecting conducting flat surfaces. *Note:* Dihedral forms of corner reflectors are frequently used in antennas; trihedral forms are more often used as radar targets.
**(B) (radar)** Two (dihedral) or three (trihedral) mutually intersecting conducting surfaces designed to return electromagnetic radiation towards its source. Also used as calibration devices. (AP/PROP) 211-1997
**(3)** Two (dihedral) or three (trihedral) orthogonal conducting surfaces, designed to return an incident electromagnetic wave toward its source. *Note:* A corner reflector is often used to provide a conspicuous radar target as a safety measure for a small sailboat, to enhance the detectability of a radar target on which it is mounted, or to calibrate a radar. (AES) 686-1997

**corner reflector antenna** An antenna consisting of a feed and a corner reflector. (AP/ANT) 145-1993

**corner, waveguide** *See:* waveguide bend.

**cornice lighting (illuminating engineering)** Lighting comprising sources shielded by a panel parallel to the wall and attached to the ceiling, and distributing light over the wall. (EEC/IE) [126]

**corona (1) (air)** A luminous discharge due to ionization of the air surrounding a conductor caused by a voltage gradient exceeding a certain critical value. *See also:* tower. (T&D/PE/TR) [10], C57.19.03-1996
**(2) (gas)** A discharge with slight luminosity produced in the neighborhood of a conductor, without greatly heating it, and limited to the region surrounding the conductor in which the electric field exceeds a certain value. *See also:* partial discharge; discharge. (ED) [45], [84]
**(3) (overhead-power-line corona and radio noise)** A luminous discharge due to ionization of the air surrounding an electrode caused by a voltage gradient exceeding a certain critical value. *Note:* For the purpose of IEEE Std 539-1990, electrodes may be conductors, hardware, accessories, or insulators. (PE/T&D) 539-1990
**(4) (partial discharge) (corona measurement)** A type of localized discharge resulting from transient gaseous ionization in an insulation system when the voltage stress exceeds a critical value. The ionization is usually localized over a portion of the distance between the electrodes of the system. (MAG/ET) 436-1977s
**(5) (dc electric-field strength and ion-related quantities)** A luminous discharge due to ionization of the air surrounding an electrode caused by a voltage gradient exceeding a certain critical value. (T&D/PE) 1227-1990r
**(6) (non-preferred term) (power and distribution transformers)** *See also:* partial discharge. (PE/TR) C57.12.80-1978r
**(7) (dry-type transformers)** *See also:* partial discharge. (PE/TR) C57.124-1991r

**corona charging (electrostatography)** Sensitizing by means of gaseous ions of a corona. *See also:* electrostatography. (ED) [46]

**corona-discharge tube** A low-current gas-filled tube utilizing the corona-discharge properties. (ED) [45]

**corona extinction gradient (overhead-power-line corona and radio noise)** The gradient on that part of an electrode surface at which continuous corona last persists as the applied voltage is gradually decreased. (PE/T&D) 539-1990

**corona extinction voltage (1) (corona measurement)** The highest voltage at which continuous corona of specified pulse amplitude no longer occurs as the applied voltage is gradually decreased from above the corona inception value. Where the applied voltage is sinusoidal, the CEV is expressed as

$1/\sqrt{2}$

of the peak voltage. (MAG/ET) 436-1977s

**(2) (overhead-power-line corona and radio noise)** The voltage applied to the electrode to produce the corona extinction gradient. (T&D/PE) 539-1990

**corona inception gradient (overhead-power-line corona and radio noise)** The gradient on that part of an electrode surface at which continuous corona first occurs as the applied voltage is gradually increased. *See also:* continuous corona. (T&D/PE) 539-1990

**corona inception test** *See:* discharge inception test.

**corona inception voltage (A) (corona measurement)** The lowest voltage at which continuous corona of specified pulse amplitude occurs as the applied voltage is gradually increased. Where the applied voltage is sinusoidal, the CIV is expressed as

$1/\sqrt{2}$

of the peak voltage. **(B)** The voltage applied to the electrode to produce the corona inception gradient. (MAG/T&D/PE/ET) 436-1977, 539-1990

**corona level** *See:* ionization extinction voltage.

**corona loss** Power lost due to corona process. On overhead power lines, this loss is expressed in watts per meter (W/m) or kilowatts per kilometer (kW/km). (T&D/PE) 539-1990

**corona modes (overhead-power-line corona and radio noise)** Two principal modes of corona are the glow mode and the streamer mode. Their characteristics and occurrence depend on the polarity of the electrode, the basic ionization characteristics of the ambient air, and the magnitude, as well as the distribution of the electric field. Thus, the geometry of the electrodes, the ambient weather conditions, and the magnitude, as well as the polarity of the applied voltage, are the main factors determining corona modes. Corona modes that are possible during alternating half-cycles of the alternating-voltage waveform are essentially similar to those of corresponding direct-voltage corona modes when effects of space charges left behind from each preceding half-cycle are taken into account. *See also:* streamer mode; glow mode. (PE/T&D) 539-1990

**corona, overhead power lines** Coronas occurring at the surfaces of power-line conductors and their fittings under the positive or negative polarity of the power-line voltage. *Notes:* 1. Surface irregularities such as stranding, nicks, scratches, and semiconducting or insulating protrusions are usual corona sites. 2. Dry or wet airborne particles in the proximity of power-line conductors and their fittings may cause corona discharges. 3. Weather has a pronounced influence on the occurrence and characteristics of overhead power-line coronas. (T&D/PE) 539-1990

**corona pulse (1) (corona measurement)** A voltage or current pulse which occurs at some location in a transformer as a result of a corona discharge. (MAG/ET) 436-1977s

**(2) (overhead-power-line corona and radio noise)** A voltage or current pulse that occurs at some designated location in a circuit as a result of corona discharge. (T&D/PE) 539-1990

**corona shielding (rotating machinery) (corona grading)** A means adapted to reduce potential gradients along the surface of coils. *See also:* asynchronous machine; direct-current commutating machine. (PE) [9]

**corona voltmeter** A voltmeter in which the crest value of voltage is indicated by the inception of corona. *See also:* instrument. (EEC/PE) [119]

**coroutine (software)** A routine that begins execution at the point at which operation was last suspended, and that is not required to return control to the program or subprogram that called it. *Contrast:* subroutine. (C) 610.12-1990

**coroutines (software)** Two or more modules that can call each other, but are not in a superior to subordinate relationship. *See also:* module. (C/SE) 729-1983s

**corrected-compass course** *See:* magnetic course.

**corrected-compass heading** *See:* magnetic heading.

**correcting signal** *See:* synchronizing signal.

**correction (1) (mathematics of computing) (digital computers)** A quantity (equal in absolute value to the error) added to a calculated or observed value to obtain the true value. *See also:* accuracy rating; error. (C) 162-1963w, 1084-1986w

**(2)** The evaluation of a multinomial function using information from the Calibration Transducer Electronic Data Sheet together with data from one or more channels. (IM/ST) 1451.2-1997

**(3) (analog computer)** *See also:* error. (C) 165-1977w

**correction angle*** **(navigation aid terms)** The angular difference between heading and course of a vehicle. Preferably called drift-correction angle. (AES/GCS) 172-1983w

* Deprecated.

**correction factor (metering) (instrument transformers)** The factor by which the reading of a wattmeter or the registration of a watthour meter must be multiplied to correct for the effects of the error in ratio and the phase angle of the instrument transformer. This factor is the product of the ratio and phase-angle correction factors for the existing conditions of operation. (ELM) C12.1-1982s

**correction rate** The velocity at which the control system functions to correct error in register. (IA/ICTL/IAC) [60]

**corrective action (1) (nuclear power quality assurance)** Measures taken to rectify conditions adverse to quality and, where necessary, to preclude repetition. (PE/NP) [124]

**(2)** Intended to eliminate anomalies. Corrective actions include repair, replacement, calibration, alignment, and other services. *See also:* maintenance. (SCC20) 1226-1998

**corrective maintenance (1) (availability, reliability, and maintainability)** The maintenance carried out after a failure has occurred and intended to restore an item to a state in which it can perform its required function. (R) [29]

**(2) (test, measurement, and diagnostic equipment)** Actions performed to restore a failed or degraded equipment. It includes fault isolation, repair or replacement of defective units, alignment and checkout. (MIL) [2]

**(3) (software)** Maintenance performed to correct faults in hardware or software. *Contrast:* perfective maintenance; adaptive maintenance. (C) 610.12-1990

**(4)** Maintenance that is performed specifically to overcome existing faults. *Contrast:* preventive maintenance. (C) 610.10-1994w

**(5)** Reactive modification of a software product performed after delivery to correct discovered faults. (C/SE) 1219-1998

**corrective network** An electric network designed to be inserted in a circuit to improve its transmission properties, its impedance properties, or both. *See also:* network analysis. (EEC/PE) [119]

**correctness (software)** (A) The degree to which a system or component is free from faults in its specification, design, and implementation. (B) The degree to which software, documentation, or other items meet specified requirements. (C) The degree to which software, documentation, or other items meet user needs and expectations, whether specified or not. (C) 610.12-1990

**correctness proof** *See:* proof of correctness.

**correct relaying-system performance** The satisfactory operation of all equipment associated with the protective-relaying function in a protective-relaying system. It includes the satisfactory presentation of system input quantities to the relaying equipment, the correct operation of the relays in response to these input quantities, and the successful operation of the assigned switching device or devices. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**correct relay operation** An output response by the relay that agrees with the operating characteristic for the input quantities applied to the relay. *See also:* correct relaying-system performance. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**correlation length** The direction-dependent distance over which the mutual coherence function for fields or the covariance function for statistical properties of a medium or surface decreases to $1/e$ of its maximum value. (AP/PROP) 211-1997

**correlated color temperature (illuminating engineering)** (of a light source) The absolute temperature of a blackbody whose chromaticity most nearly resembles that of the light source. (EEC/IE) [126]

**correlated gamma ray summing** The simultaneous detection of two or more gamma rays originating from a single atom disintegration. (NI) N42.12-1994

**correlated jitter** The portion of the total jitter that is related to the data pattern. Since every PHY receives the same pattern, this jitter is correlated among all similarly configured PHYs receiving the same data pattern and therefore may grow in a systematic way along the ring. Also referred to as *pattern jitter* or *systematic jitter*. (C/LM) 8802-5-1998

**correlated photon summing (germanium detectors)** The simultaneous detection of two or more photons originating from a single nuclear disintegration. (PE/NI/EDPG) 485-1983s, N42.12-1980s

**correlation (test, measurement, and diagnostic equipment)** That portion of certification which establishes the mutual relationships between similar or identical support test systems by comparing test data collected on specimen hardware or simulators. (MIL) [2]

**correlation coefficient function** (seismic qualification of Class 1E equipment for nuclear power generating stations) Defines a comparative relationship between two time histories. It provides a statistical estimate of how much two motions are related, as a function of time delay. The numerical range is from zero for unrelated, to +1.0 for related motions. (PE/NP) 344-1987r

**correlation detection (modulation systems)** Detection based on the averaged product of the received signal and a locally generated function possessing some known characteristic of the transmitted wave. *Notes:* 1. The averaged product can be formed, for example, by multiplying and integrating, or by the use of a matched filter whose impulse response, when reversed in time, is the locally generated function. 2. Strictly, the foregoing definition applies to detection based on cross correlation. The term correlation detection may also apply to detection involving autocorrelation, in which case the locally generated function is merely a delayed form of the received signal. (Std100) [123]

**correlator** A filter whose impulse response is the time-reversed complex conjugate of the coded waveform intended to be received. (UFFC) 1037-1992w

**correspondence** *See:* fidelity.

**corrosion (1)** The deterioration of a substance (usually a metal) because of a reaction with its environment. (IA) [59] **(2)** A process of gradual weakening or destruction, usually by a chemical action. (DEI) 1221-1993w

**corrosion fatigue** Reduction in fatigue life in a corrosive environment. (IA) [59]

**corrosion fatigue limit** The maximum repeated stress endured by a metal without failure in a stated number of stress applications under defined conditions of corrosion and stressing. (IA) [59]

**corrosion rate** The rate at which corrosion proceeds. (IA) [59]

**corrosion-resistant (power and distribution transformers)** So constructed, protected, or treated that corrosion will not exceed specified limits under specified test conditions. (PE/TR) C57.12.80-1978r

**corrosion-resistant parts (A) (electric installations on shipboard)** General. Where essential to minimize deterioration due to marine atmospheric corrosion, corrosion-resisting materials, or other materials treated in a satisfactory manner to render them adequately resistant to corrosion should be used. **(B) (electric installations on shipboard)** Corrosion-resisting materials. Silver, corrosion-resisting steel, copper, brass, bronze, copper-nickel, certain nickel-copper alloys, and certain aluminum alloys are considered satisfactory corrosion-resisting materials within the intent of the foregoing. **(C) (electric installations on shipboard)** Corrosion-resistant treatments. The following treatments, when properly done and of a sufficiently heavy coating, are considered satisfactory corrosion-resistant treatments within the intent of the foregoing. Electroplating of: cadmium, chromium, copper, nickel, silver, and zinc, sheradizing, galvanizing dipping and painting. (Phosphate or suitable cleaning, followed by the application of zinc chromate primer or equivalent.) **(D) (electric installations on shipboard)** Application. These provisions should apply to the following components: (1) Parts. Interior small parts which are normally expected to be removed in service, such as bolts, nuts, pins, screws, cap screws, terminals, brushholder studs, springs, etc. (2) Assemblies, subassemblies, and other units. Where necessary due to the unit function, or for interior protection, such as shafts within a motor or generator enclosure, and surface of stator and rotor. (3) Enclosures and their fastenings and fittings. Enclosing cases for control apparatus, outer cases for signal and communication systems (both outside and inside), and similar items together with all their fastenings and fittings which would be seriously damaged or rendered ineffective by corrosion. (IA/MT) 45-1983

**corrugated horn (antenna)** A hybrid-mode horn antenna produced by cutting narrow transverse grooves of specified depth in the interior walls of the horn. *See also:* hybrid-mode horn. (AP/ANT) 145-1993

**corrupt data error (A)** An error condition that results when hardware components fail or an external impulse enters into the system upsetting at least one data bit. **(B)** A condition that results from erratic hardware performance, characterized by introduction of a high degree of random errors in the data. (C) 610.10-1994

**cosecant-squared antenna** A shaped-beam antenna in which the radiation intensity over a part of its pattern in some specified plane (usually the vertical) is proportional to the square of the cosecant of the angle measured from a specified direction in that plane (usually the horizontal). *Note:* Its purpose is to lay down a uniform field along a line that is parallel to the specified direction but that does not pass through the antenna. *See also:* antenna. (AP/ANT) [35]

**cosecant-squared beam antenna** A shaped-beam antenna whose pattern in one principal plane consists of a main beam with well-defined side lobes on one side, but with the absence of nulls over an extended angular region adjacent to the peak of the main beam on the other side, with the radiation intensity in this region designed to vary as the cosecant-squared of the angle variable. *Note:* The most common applications of this antenna are for use in ground-mapping radars and target acquisition radars, since the cosecant-squared coverage provides constant signal return for targets with the same radar

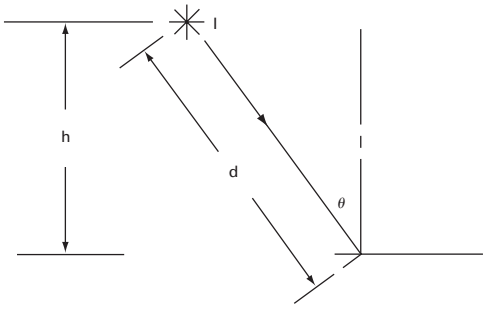
cross section at different ranges but a common height. (AP/ANT) 145-1993

**cosecant-squared pattern** A vertical-plane antenna pattern in which the transmitting and receiving power gains vary as the square of the cosecant of the elevation angle. *Note:* The unique property of this pattern is that it results in the received echo signal being independent of range if

— The target is of constant radar cross section
— The target moves at constant altitude
— The earth's surface can be considered flat

*See also:* modified cosecant-squared antenna pattern. (AES) 686-1997

**cosine-cubed law (illuminating engineering)** An extension of the cosine law in which the distance $d$ between the source and surface is replaced by $h/\cos\theta$, where $h$ is the perpendicular distance of the source from the plane in which the point is located. It is expressed by $E=(I\cos^3\theta)/h^2$. (See figure below.). *See also:* cosine law.




**cosine-cubed law**

(EEC/IE) [126]

**cosine emission law** *See:* Lambert's cosine law.

**cosine law (illuminating engineering)** A law stating that the illuminance on any surface varies as the cosine of the angle of incidence. The angle of incidence θ is the angle between the normal to the surface and the direction of the incident light. The inverse-square law and the cosine law can be combined as $E=(I\cos\theta)/d_2$. *See also:* inverse-square law. (EEC/IE) [126]

**cosmic noise** Noise-like radio waves originating from extragalactic sources. (AP/PROP) 211-1997

**cosmic radio waves** *See:* cosmic noise.

**COSRO** *See:* conical-scan-on-receive-only.

**Costas code** A frequency-hopping pulse compression waveform in which a long pulse is divided into $n$ subpulses with the frequency of each subpulse chosen from $n$ contiguous frequencies in a manner first suggested by John P. Costas. (AES) 686-1997

**costate** The state of the adjoint system. *See also:* control system. (CS/IM) [120]

**cost of incremental fuel (electric power system)** The ultimate replacement cost of the fuel that would be consumed to supply an additional increment of generation (usually expressed in cents per million British thermal units). (PE/PSE) 94-1970w

**costs (power operations)** Monies associated with investment or use of electrical plant. *See also:* fixed investment costs. (PE/PSE) 858-1987s

**COSU** *See:* central office service unit.

**COTS** *See:* commercial-off-the-shelf.

**coulomb** The unit of electric charge in SI units (International System of Units). The coulomb is the quantity of electric charge that passes any cross section of a conductor in one second when the current is maintained constant at one ampere. (Std100) 270-1966w

**Coulomb's law (electrostatic attraction)** The force of repulsion between two like charges of electricity concentrated at two points in an isotropic medium is proportional to the product of their magnitudes and inversely proportional to the square of the distance between them and to the dielectric constant of the medium. *Note:* The force between unlike charges is an attraction. (Std100) 270-1966w

**coulometer (voltameter)** An electrolytic cell arranged for the measurement of a quantity of electricity by the chemical action produced. *See also:* electricity meter. (PE/EEC) [119]

**count** A single response of the counting system. *See also:* tube count. (NI/NPS) 309-1999

**count-down (transponder)** The ratio of the number of interrogation pulses not answered to the total number of interrogation pulses received. (AES/RS) 686-1982s, [42]

**counter (1) (test, measurement, and diagnostic equipment)** **(A)** A device such as a register or storage location used to represent the number of occurrences of an event. **(B)** An instrument for storing integers, permitting these integers to be increased or decreased sequentially by unity or by an arbitrary integer, and capable of being reset to zero or to an arbitrary integer. (MIL) [2]

**(2) (software)** A variable used to record the number of occurrences of a given event during the execution of a computer program; for example, a variable that records the number of times a loop is executed. (C) 610.12-1990

**(3) (A)** A device with a finite number of states each of which represents a number which, upon receipt of an appropriate signal, can be incremented or decremented by a given constant. *Note:* The device may be capable of being set to a particular state such as zero. *See also:* reversible counter; modulo-n counter; keystroke counter; line counter. **(B)** A register or storage location used to accumulate the number of occurrences of some event. *See also:* program counter. (C) 610.10-1994

**counter beam system** Tunnel lighting system or luminaires having a light distribution that is greater in the opposite direction of travel. (RL) C136.27-1996

**counter cells** *See:* counter-electromotive-force cells.

**counterclockwise arc (numerically controlled machines)** An arc generated by the coordinated motion of two axes in which curvature of the path of the tool with respect to the workpiece is counterclockwise, when viewing the plane of motion in the negative direction of the perpendicular axis. (IA) [61]

**counter electromotive force** (any system) The effective electromotive force within the system that opposes the passage of current in a specified direction. (EEC/PE) [119]

**counter-electromotive-force cells (counter cells)** Cells of practically no ampere-hour capability used to oppose the battery voltage. *See also:* battery. (EEC/PE) [119]

**counter-mounted cooking unit (A)** A cooking appliance designed for mounting in or on a counter and consisting of one or more heating elements, internal wiring, and build-in or separately mountable controls. *See also:* wall-mounted oven. **(B)** An assembly of one or more domestic surface heating elements for cooking purposes, designed for flush mounting in, or supported by, a counter, and which assembly is complete with inherent or separately mountable controls and internal wiring. (NESC/NEC/C2) [86]

**counterpoise (1)** A system of conductors, elevated above and insulated from the ground, forming a lower system of conductors of an antenna. *Note:* The purpose of a counterpoise is to provide a relatively high capacitance and thus a relatively low impedance path to earth. The counterpoise is sometimes used in medium- and low-frequency applications where it would be more difficult to provide an effective ground connection. (AP/ANT) 145-1993

**(2)** A conductor or system of conductors arranged beneath the line; located on, above, or most frequently below the surface of the earth; and connected to the grounding systems of the towers or poles supporting the transmission lines. (PE/T&D/SPD/PSIM) 1243-1997, 81-1983, C62.23-1995

**(3)** *See also:* ground grid. (T&D/PE) 524-1992r

**counter, radiation** *See:* radiation counter.

**counter tube (A)** (externally quenched) A radiation-counter tube that requires the use of an external quenching circuit to inhibit reignition. **(B)** (gas-filled) A gas tube used for detection of radiation by means of gas ionization. **(C)** (gas-flow) A radiation-counter tube in which an appropriate gas-fill concentration is maintained by a flow of gas through the tube. **(D)** (Geiger-Mueller) A radiation-counter tube operated in the Geiger-Mueller region. **(E)** (self-quenched) A radiation-counter tube in which reignition of the discharge is inhibited by internal processes. (NI/NPS) 309-1999

**counting channel (liquid-scintillation counting)** A region of the pulse-height spectrum that is defined by upper and lower boundaries set by discriminators. (NI) N42.15-1990

**counting efficiency (1) (radiation counter tubes)** The average fraction of the number of ionizing particles or quanta incident on the sensitive area that produce tube counts. *Note:* The operating conditions of the counter and the condition of irradiation must be specified. (ED) 161-1971w

**(2) (scintillation counters)** The ratio of the average number of photons or particles of ionizing radiation that produce counts to the average number incident on the sensitive area. *Note:* The operating conditions of the counter and the conditions of irradiation must be specified. *See also:* scintillation counter. (NPS) 398-1972r

**(3) (liquid-scintillation counting)** The ratio of the count rate to the disintegration rate, usually expressed as a percentage:

$$E = (R/A) \times 100.$$

$E$ = counting system efficiency
$R$ = net count rate in an individual measurement, counts per minute
$A$ = activity of the radionuclide contained in the check source.

(NI) N42.15-1990

**(4)** The ratio of the number of observed counts to the total number of ionizing particles impinging upon the counter surface when the counting rate is so low that dead-time correction is unnecessary. (NI/NPS) 309-1999

**counting mechanism** (of an automatic line sectionalizer or automatic circuit recloser) A device that counts the number of electrical impulses and, following a predetermined number of successive electrical impulses, actuates a releasing mechanism. It resets if the total predetermined number of successive impulses do not occur in a predetermined time. (SWG/PE) C37.100-1992

**counting operation** (of an automatic line sectionalizer or automatic circuit recloser) Each advance of the counting mechanism towards an opening operation. (SWG/PE) C37.100-1992

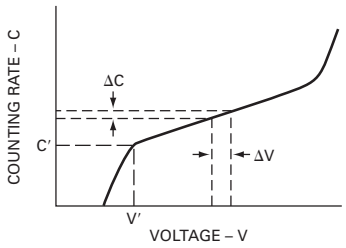
**counting operation time** (of an automatic line sectionalizer) The time between the cessation of a current above the minimum actuating current value and the completion of a counting operation. (SWG/PE) C37.100-1992

**counting rate (1)** Number of counts per unit time. *See also:* anticoincidence. (ED) [45]

**(2) (germanium spectrometers)** The rate at which detector pulses are being registered in a selected voltage interval. The unit is reciprocal seconds (i.e., $s^{-1}$). (NI) N42.14-1991

**counting-rate meter (pulse techniques)** A device that indicates the time rate of occurrence of input pulses averaged over a time interval. *See also:* scintillation counter. (NPS) 398-1972r

**counting rate versus voltage characteristic (gas-filled radiation counter tube)** The counting rate as a function of applied voltage for a given constant average intensity of radiation.




Counting rate-voltage characteristic in which

$$\text{relative plateau slope} = 100\,\frac{\Delta C/C}{\Delta V}$$

$$\text{normalized plateau slope} = \frac{\Delta C/\Delta V}{C'/V'} = \frac{\Delta C/C'}{\Delta V/V'}$$

**counting rate versus voltage characteristic** (ED/NI/NPS) 161-1971w, 309-1999

**counting region** A region that identifies the first and last memory location of a contiguous series to be summed in a multichannel analyzer. (NI) N42.15-1990

**country beam** *See:* upper (driving) beams.

**country code (telephone switching systems)** The one-, two-, or three-digit number that, in the world numbering plan, identifies each country or integrated numbering plan area in the world. The initial digit is always the world-zone number. Any subsequent digits in the code further define the designated geographical area normally identifying a specific country. On an international call, this code is dialed ahead of the national number. (COM) 312-1977w

**counts, tube, multiple** *See:* multiple tube counts.

**counts, tube, spurious** *See:* spurious tube counts.

**couple (1) (storage cell)** An element of a storage cell consisting of two plates, one positive and one negative. *Note:* The term couple is also applied to a positive and a negative plate connected together as one unit for installation in adjacent cells. *See also:* battery. (PE/EEC) [119]

**(2) (thermoelectric)** A thermoelectric device having two arms of dissimilar composition. *Note:* The term thermoelement is ambiguously used to refer to either a thermoelectric arm or to a thermoelectric couple, and its use is therefore not recommended. *See also:* thermoelectric device. (ED) [46]

**coupled fine** A transmission line with multiple guiding members whose propagating waves interact with each other. (MTT) 1004-1987w

**coupled modes (fiber optics)** Modes whose energies are shared. *See also:* mode. (Std100) 812-1984w

**coupler (1) (navigation aid terms)** That portion of a navigational system which receives signals of one type from a sensor and transmits signals of a different type to an actuator. *See also:* autopilot coupler. (AES/GCS) 172-1983w

**(2) (surge testing for equipment connected to low-voltage ac power circuits)** A device, or combination of devices, used to feed a surge from a generator to powered equipment while limiting the flow of current from the power source into the generator. *See also:* coupling network. (SPD/PE) C62.45-1992r

**(3) (fiber optics)** *See also:* optical waveguide coupler. 812-1984w

**coupler interface** That facility of a basic operating unit that is designed to provide convenient connection to, and disconnection from, any other basic operating unit without requiring disassembly of any constituent part of either basic operating unit. This includes standardized mechanical, electrical, electronic, pneumatic, and other interfaces as required. (VT) 1473-1999

**coupler, optical** *See:* optical directional coupler.

**coupling (1) (ground systems)** The association of two or more circuits or systems in such a way that power or signal information may be transferred from one to another. *Note:* Coupling is described as close or loose. A close-coupled process has elements with small phase shift between specified varia-

bles; close-coupled systems have large mutual effect shown mathematically by cross-products in the system matrix. (PE/PSIM) 81-1983

**(2) (rotating machinery)** A part or combination of parts that connects two shafts for the purpose of transmitting torque or maintaining alignment of the two shafts. (PE) [9]

**(3) (software)** The manner and degree of interdependence between software modules. Types include common-environment coupling, content coupling, control coupling, data coupling, hybrid coupling, and pathological coupling. *Contrast:* cohesion. (C) 610.12-1990

**(4) (waveguide)** The power transfer from one transmission path to a particular mode or form in another. *Note:* Small, undesired coupling is sometimes called isolation, decoupling, or cross coupling. (MTT) 146-1980w

**(5) (instrumentation and control equipment grounding in generating stations)** The mechanism by which an interference source produces interference in a signal circuit. (PE/EDPG) 1050-1996

**(6)** The mode of propagation of disturbing energy from a power system to a telecommunications system. There are three forms of coupling between the two systems: magnetic (inductive) coupling, electric (capacitive) coupling, and conductive (resistive) coupling. In addition, coupling by electromagnetic radiation exists and is associated with propagation of radiation fields, e.g., radio frequency interference (RFI), electromagnetic pulse (EMP), and corona. (PE/PSC) 487-1992

**(7)** The association of two or more circuits or systems in such a way that power or signal information may be transferred from one system or circuit to another. (IA/PE/PSE) 1100-1999, 599-1985w

**coupling aperture (coupling hole, coupling slot) (waveguide components)** An aperture in the bounding surface of a cavity resonator, waveguide, transmission line, or waveguide component which permits the flow of energy to or from an external circuit. (MTT) 147-1979w

**coupling capacitance (1) (ground systems)** The association of two or more circuits with one another by means of capacitance mutual to the circuits. (PE/PSIM) 81-1983

**(2) (interference terminology)** The type of coupling in which the mechanism is capacitance between the interference source and the signal system; that is, the interference is induced in the signal system by an electric field produced by the interference source. *See also:* interference. (IE) [43]

**coupling-capacitor voltage transformer (metering)** A voltage transformer comprised of a capacitor divider and an electromagnetic unit so designed and interconnected that the secondary voltage of the electromagnetic units is substantially proportional to, and in phase with, the primary voltage applied to the capacitor divider for all values of secondary burdens within the rating of the coupling-capacitor voltage transformer. (ELM) C12.1-1988

**coupling coefficient (1) (coefficient of coupling)** The ratio of impedance of the coupling to the square root of the product of the total impedances of similar elements in the two meshes. *Notes:* 1. Used only in the case of resistance, capacitance, self-inductance, and inductance coupling. 2. Unless otherwise specified, coefficient of coupling refers to inductance coupling, in which case it is equal to $M/(L_1L_2)^{1/2}$, where $M$ is the mutual inductance, $L_1$ the total inductance of one mesh, and $L_2$ the total inductance of the other. *See also:* network analysis. (IM/HFIM) [40]

**(2) (planar transmission lines)** A number used as a measure of the degree of interaction between the members of a coupled line. One commonly used definition of the coupling coefficient of a symmetrical coupled pair of transmission lines is K, a voltage or field ratio:

$$\frac{\frac{Z_{0e}}{Z_{0o}} - 1}{\frac{Z_{0e}}{Z_{0o}} + 1}$$

where $Z_{0e}$ and $Z_{0o}$ = even- and odd-mode characteristic impedances. (MTT) 1004-1987w

**coupling coefficient, small-signal (electron stream)** The ratio of (A) the maximum change in energy of an electron traversing the interaction space to (B) the product of the peak alternating gap voltage by the electronic charge. *See also:* electron emission; coupling coefficient; coupling. (ED) 161-1971w

**coupling, conductance** *See:* conductance coupling.

**coupling efficiency (fiber optics)** The efficiency of optical power transfer between two optical components. *See also:* coupling loss. (Std100) 812-1984w

**coupling, electric** *See:* electric coupling.

**coupling factor (1) (lightning)** The ratio of the induced voltage to the inducing voltage on parallel conductors. *See also:* direct-stroke protection. (T&D/PE) [10]

**(2) (directional coupler)** The ratio of the incident power fed into the main port, and propagating in the preferred direction, to the power output at an auxiliary port, all ports being terminated by reflectionless terminations. *See also:* waveguide. (IM/HFIM) [40]

**(3)** The ratio of the induced voltage to the inducing voltage on parallel conductors. For example, at the tower, the shield or coupling wires and tower crossarms are at practically the same potential (because of lightning stroke travel time). The stress across the insulator string is one minus the coupling factor multiplied by the tower top potential.

$$\text{Stress} = (1.0 - K_{fc}) \times V_{TT}$$

where
$K_{fc}$ is the coupling factor
$V_{TT}$ is the tower top voltage

(PE/SPD) C62.23-1995

**coupling flange (rotating machinery)** The disc-shaped element of a half coupling that permits attachment to a mating half coupling. *Synonym:* flange. *See also:* rotor. (PE) [9]

**coupling function** A mathematical, graphical, or tabular statement of the influence that one element or subsystem has on another element or subsystem, expressed as the effect/cause ratio of related variables or their transforms. *Note:* For a multi-terminal system described by $m$ differential equations and having $m$ input transforms $R_1 \ldots R_m$ and $m$ output transforms $C_1 \ldots C_m$, the coupling functions consist of all effect/cause ratios which can be formed from transforms bearing unlike-numbered subscripts. (CS/PE/EDPG) [3]

**coupling hole** *See:* coupling aperture.

**coupling, hysteresis** *See:* hysteresis coupling.

**coupling, inductance** *See:* inductance coupling.

**coupling, induction** *See:* induction coupling.

**coupling loop (waveguide components)** A conducting loop that permits the flow of energy between a cavity resonator, waveguide, transmission line, or waveguide component and an an external circuit. (MTT) 147-1979w

**coupling loss (fiber optics)** The power loss suffered when coupling light from one optical device to another. *See also:* lateral offset loss; insertion loss; gap loss; extrinsic joint loss; angular misalignment loss; intrinsic joint loss. (Std100) 812-1984w

**coupling, magnetic friction** *See:* magnetic friction coupling.

**coupling, magnetic-particle** *See:* magnetic-particle coupling.

**coupling network** Electrical circuit for the purpose of transferring energy from one circuit to another. *See also:* coupler. (SPD/PE) C62.45-1992r

**coupling plane** A metal plate to which discharges are applied to simulate electrostatic discharge to objects adjacent (vertically or horizontally) to the EUT. (EMC) C63.16-1993

**coupling probe (waveguide components)** A probe that permits the flow of energy between a cavity resonator, waveguide, transmission line, or waveguide component and an external circuit. (MTT) 147-1979w

**coupling, radiation** *See:* radiation coupling.

**couplings (pothead)** Entrance fittings which may be provided with a rubber gland to provide a hermetic seal at the point where the cable enters the box and may have, in addition, a threaded portion to accommodate the conduit used with the cable or have an armor clamp to clamp and ground the armored sheath on armor-covered cable. (PE/TR) [108]

**coupling slat** *See:* coupling aperture.

**coupling, synchronous** *See:* synchronous coupling.

**coupling wire** A conductor attached to the transmission line structure and below the phase wires, with proper clearance, and connected to the grounding system of the towers or the pole supporting the line. (SPD/PE) C62.23-1995

**course (A) (navigation aids)** The intended direction of travel, expressed as an angle in the horizontal plane between a reference line and the course line, usually measured clockwise from the reference line. **(B) (navigation aids)** The intended direction of travel as defined by a navigational facility. **(C) (navigation aids)** Common usage for "course line." (AES/GCS) 172-1983

**course-deviation indicator** *See:* course-line deviation indicator.

**course line (navigation aids)** The projection in the horizontal plane of a path (proposed path of travel). (AES/GCS) 172-1983w

**course linearity (navigation aids) (instrument landing systems)** A term used to describe the change in DDM (difference in depth of modulation) of the two modulation signals with respect to displacement of the measuring position from the course line but within the course sector. *Synonyms:* flight path; desired track. (AES/GCS) 172-1983w

**course-line computer (navigation aids)** A device, usually carried aboard a vehicle, to convert navigational signals such as VOR/DME (very high-frequency omnidirectional range/distance measuring equipment) into course extending between any desired points regardless of their orientation with respect to the source of the signals. (AES/GCS) 172-1983w

**course-line deviation (navigation aids)** The amount by which the track of a vehicle differs from its course line, expressed in terms of either an angular or linear measurement. (AES/GCS) 172-1983w

**course-line deviation indicator (course deviation indicator) (navigation aids)** A device providing a visual display of the direction and amount of deviation from the intended course. *Synonym:* flight-path-deviation indicator. (AES/GCS) 172-1983w

**course made good (navigation aids)** The direction from the point of departure to the position of the vehicle on the horizontal plane. (AES/GCS) 172-1983w

**course push (pull) (navigation aids)** An erroneous deflection of the indicator of a navigational aid, produced by altering the attitude of the receiving antenna. *Note:* This effect is a manifestation of polarization error and results in an apparent displacement of the course line. (AES/GCS) 172-1983w

**course roughness (navigation aids)** A term used to describe the imperfections in a visually indicated course when such imperfections cause the course indicator to make rapid erratic movements. *See also:* scalloping. (AES/GCS) 172-1983w

**course scalloping** *See:* scalloping.

**course section width (instrument landing systems)** The transverse dimension at a specified distance, or the angle in degrees between the sides of the course sector. *See also:* navigation. (AES/RS) 686-1982s, [42]

**course sector (instrument landing systems) (navigation aid terms)** A wedge-shaped section of airspace containing the course line and spreading with distance from the ground station; it is bounded on both sides by the loci of points at which the DDM (difference in depth of modulation) is a specified amount, usually the DDM giving full-scale deflection of the course-deviation indicator. (AES/GCS) 172-1983w

**course-sector width (navigation aids) (instrument landing systems)** The transverse dimension at a specified distance, or the angle in degrees, between the sides of the course sector. (AES/GCS) 172-1983w

**course sensitivity (navigation systems) (navigation aids)** The relative response of a course-line deviation indicator to the actual or simulated departure of the vehicle from the course line. In VOR (very high-frequency) omnidirectional range), Tacan (tactical air navigation), or similar omnirange systems, course sensitivity is often taken as the number of degrees through which the omnibearing selector must be moved to change the deflection of the course-line deviation indicator from full scale on one side to full scale on the other, while the receiver omnibearing-input signal is held constant. (AES/GCS) 172-1983w

**course softening (navigation aids)** The intentional decrease in course sensitivity upon approaching a navigational aid such than the ratio of indicator deflection to linear displacement from the course line tends to remain constant. (AES/GCS) 172-1983w

**courseware** Instructional materials, such as software and student documentation, designed for use in computer-based instruction. (C) 610.2-1987

**course width (navigation aids)** Twice the displacement (of the vehicle), in degrees, to either side of a course line, which produces a specifed indication on the course deviation indicator (usually the specified indication is full scale). (AES/GCS) 172-1983w

**Coursewriter** A programming language used to write instructional programs for computer-assisted instruction. (C) 610.13-1993w

**cove lighting (illuminating engineering)** Lighting comprising light sources shielded by a ledge or horizontal recess, and distributing light over the ceiling and upper wall. (EEC/IE) [126]

**cover (power system communication equipment)** A protective covering used to enclose or partially enclose equipment that may be mounted in a rack. (PE/PSC) 281-1984w

**coverage** Measure of the representative nature of situations to which a system is submitted during its validation compared to the actual situations it will be confronted with during its operational life. (C/BA) 896.9-1994w

**coverage area (1) (mobile communication)** The area surrounding the base station that is within the signal-strength contour that provides a reliable communication service 90 percent of the time. *See also:* mobile communication system. (VT) [37]

**(2)** The area surrounding the broadcast array that is within the signal strength contour that provides adequate reception. (T&D/PE) 1260-1996

**covered conductor** A conductor covered with a dielectric having no rated insulating strength or having a rated insulating strength less than the voltage of the circuit in which the conductor is used. (NESC/T&D/PE) C2-1997, [10], C2.2-1960

**covered line** An idealized planar transmission line with two conducting ground planes, parallel to the strip conductor. One of the ground planes has only a minor effect on the propagation properties of the line. (MTT) 1004-1987w

**covered plate (storage cell)** A plate bearing a layer of oxide between perforated sheets. *See also:* battery. (PE/EEC) [119]

**cover flange (waveguide components)** A flat flange used in conjunction with a choke flange to provide a choke joint. (MTT) 147-1979w

**cover-up equipment (power line maintenance)** Equipment designed to protect persons from energized parts in a specific work area. Many different types are available to cover conductors, insulators, dead-end assemblies, structures, and apparatus. Cover-up material may be either flexible or rigid. (T&D/PE) 516-1995

**CP** *See:* collision presence; coprocessor.

**CPC** *See:* computer program component.

**CPCI** *See:* computer program configuration item.

**CPE** *See:* circular probable error.

**CPE active state** A state in which the CPE performs a communications functions. (AMR) 1390-1995

**CPE inactive state** A state in which the CPE does not perform a communications function. (AMR) 1390-1995

**CPE address** The LSAP address at which the CPE may be reached. (LM/C) 15802-2-1995

**CPE instance identifier** The tuple of CPE address and CPE instance number that uniquely identifies a CPE instance within the LAN/MAN environment, within the limits of uniqueness of the CPE address and instance values used. (LM/C) 15802-2-1995

**CPE instance number** A number, allocated to the CPE at instantiation time, that distinguishes a CPE instance from all other CPE instances, past and present, associated with a particular CPE address. (LM/C) 15802-2-1995

**CPM** *See:* critical path method.

**CPU** *See:* central processing unit.

**CPU busy time** *See:* CPU time.

**CPU time** In time-sharing computer systems, the time devoted by the central processing unit to the execution of instructions of a particular process, task, or user. *Synonym:* CPU busy time. *See also:* connect time. (C) 610.10-1994w

**CPU timer** A feature of some computer systems that measures elapsed CPU time and that causes an interrupt when a previously specified amount of time has elapsed. (C) 610.10-1994w

**CR** *See:* carriage return character; carriage return; cavity ratio.

**crab angle*** *See:* drift angle; drift correction angle.
* Deprecated.

**cracking (1)** Rupture of the polymeric insulator material to depths equal to or greater than 0.1 mm. (PE/IC) 48-1996
**(2)** Rupture of the weathershed material to depths greater than 0.1 mm. (SPD/PE) C62.11-1999

**cradle base (rotating machinery)** A device that supports the machine at the bearing housings. (PE) [9]

**crane** A machine for lifting or lowering a load and moving it horizontally, in which the hoisting mechanism is an integral part of the machine. *Note:* It may be driven manually or by power and may be fixed or a mobile machine. (EEC/PE) [119]

**crash (1)** The sudden and complete failure of a computer system or component. *See also:* hard failure; disk crash; head crash. (C) 610.12-1990, 610.10-1994w
**(2)** To fail as in definition (A). (C) 610.10-1994w

**crate (1) (CAMAC system)** *See also:* CAMAC crate.
**(2) (FASTBUS crate)** The mechanical housing for FASTBUS modules in a crate segment. (NID) 960-1993

**crate number (c) (subroutines in CAMAC)** The symbol c represents an integer which is the crate number component of a CAMAC address. Crate number in this context can be either the physical crate number or it can be an integer symbol which is interpreted by the computer system software to produce appropriate hardware access information. (NPS) 758-1979r

**crate segment (FASTBUS acquisition and control)** A FASTBUS segment that consists of a backplane mounted on a FASTBUS crate and having connectors to mate with a multiplicity of FASTBUS modules. (NID) 960-1993

**Crawford cell** *See:* transverse-electromagnetic cell.

**crawler** *See:* crawler tractor.

**crawler tractor (conductor stringing equipment)** A tracked unit employed to pull pulling lines, sag conductor, level or clear pull and tension sites, and miscellaneous other work. It is also frequently used as a temporary anchor. Sagging winches on this unit are usually arranged in a vertical configuration. *Synonyms:* tractor; cat; crawler. (T&D/PE) 524-1992r, 524a-1993r

**crawling (rotating machinery)** The stable but abnormal running of a synchronous or asynchronous machine at a speed near to a submultiple of the synchronous speed. *See also:* asynchronous machine. (PE) [9]

**crazing (1) (composite insulators)** Surface microfractures of the weathershed material to depths less than 0. 1 millimeter resulting from ultraviolet exposure. (T&D/PE) 987-1985w
**(2)** The small internal cracking around a point of mechanical stress that sometimes occurs in plastics. (PE/EDPG) 1184-1994
**(3)** Surface microfractures of the insulator material to depths less than 0.1 mm resulting from ultraviolet exposure. (PE/IC) 48-1996

**CRC (1)** violation If the transmitted and received CRC codes are not identical, a CRC violation has occurred, meaning one or more errors has occurred in transmission. (COM/TA) 1007-1991r
**(2)** The cyclic redundancy code used for error detection on each packet. (C/MM) 1596-1992
**(3)** *See also:* cyclic redundancy check. (C) 610.7-1995

**CR differentiator** A high-pass electrical filter section consisting of a capacitor in series with the signal path followed by a resistor across the path. (NPS) 325-1996

**credentials** Information supplied to authenticate a communication. (SCC32) 1455-1999

**credit-card call (telephone switching systems)** A call in which a credit-card identity is used for billing purposes. (COM) 312-1977w

**creep (1)** Continued deformation of material under stress. (IA/PSE) 241-1990r
**(2)** *See also:* watthour meter—creep. (ELM) C12.1-1988

**creepage** The travel of electrolyte up the surface of electrode or other parts of the cell above the level of the main body of electrolyte. *See also:* electrolytic cell. (EEC/PE) [119]

**creepage distance (power and distribution transformers)** The shortest distance between two conducting parts measured along the surface or joints of the insulating material between them. (SWG/PE/TR) C37.100-1992, C57.12.80-1978r

**creepage surface (rotating machinery)** An insulating-material surface extending across the separating space between components at different electric potential, where the physical separation provides the electrical insulation. *See also:* asynchronous machine. (PE) [9]

**creep distance (1) (outdoor apparatus bushings)** The distance measured along the external contour of the weather casing separating the metal parts which have the operating line-to-ground voltage between them. (PE/TR) 21-1976
**(2)** The shortest distance measured along the external contour of the insulating envelope that separates the metal part operating at line voltage and the metal flange at ground potential. (PE/TR) C57.19.03-1996

**creeping stimulus** *See:* accumulating stimulus.

**creeping wave** A wave propagating along a smooth convex surface that has diffracted into the shadow region. (AP/PROP) 211-1997

**crescent** *See:* conductor grip.

**coordination of insulation (1) (lightning insulation strength)** The steps taken to prevent damage to electric equipment due to overvoltages and to localize flashovers to points where they will not cause damage. *Note:* In practice, coordination consists of the process of correlating the insulating strengths of electric equipment with expected overvoltages and with the characteristics of protective devices. (PE/EEC) [8], [74]
**(2)** The selection of insulation strength consistent with expected overvoltages to obtain an acceptable risk of failure. (SPD/PE) C62.22-1997

**crest factor (1) (germanium gamma-ray detectors) (x-ray energy spectrometers) (semiconductor radiation detectors) (charged-particle detectors)** (of an average reading or root-mean-square voltmeter) The ratio of the peak voltage value that an average reading or root-mean-square voltmeter will accept without overloading to the full scale value of the range

being used for measurement. (NPS/NID) 759-1984r, 301-1976s

**(2) (ac voltmeter)** The highest ratio of peak to rms voltage that can be applied to an ac voltmeter before overload sets in. The crest factor may depend upon the full-scale setting of the meter. (NPS) 300-1988r

**(3)** (of a periodic function) The ratio of its crest (peak, maximum) value to its root-mean-square (rms) value. (PE/TR) C57.12.80-1978r

**(4) (electrical measurements in power circuits)** (of a periodic function) The ratio of the peak value to the rms value $cf = y_p/y_{rms}$. (PE/PSIM) 120-1989r

**(5)** (of a periodic function) The ratio of the peak value of a periodic function ($y_{peak}$) to the rms value ($y_{rms}$); $cf = y_{peak}/y_{rms}$. (IA/PSE) 1100-1999

**(6) (pulse carrier)** The ratio of the peak pulse amplitude to the root-mean-square amplitude. *See also:* carrier. (IM/AP/WM&A/ANT) 194-1977w, 145-1983s

**(7)** (of an rms voltmeter) The highest ratio of peak to rms voltage that can be applied to an ac voltmeter before overload sets in. The crest factor may depend on the full-scale setting of the voltmeter. (NPS) 325-1996

**(8)** The ratio of the peak value to the rms value of an ac waveform measured under steady-state conditions. It is unitless, and the ratio for a pure sine wave is equal to $\sqrt{2}$.

$$cf = \frac{V_{in,pk}}{V_{in,rms}}$$

where

$V_{in}$ = the voltage at the user input terminals. (PEL) 1515-2000

**crest value (1) (peak value) (power and distribution transformers)** The maximum absolute value of a function when such a maximum exists. (PE/C/TR) 1313.1-1996, C57.12.80-1978r

**(2)** (of a wave, surge, or impulse) The maximum value that a wave, surge, or impulse attains. (SPD/PE) C62.11-1999, C62.62-2000

**(3) (surge arresters)** The maximum value that an impulse attains. *Synonym:* peak value. (SPD/PE) C62.22-1997, C62.1-1981s, C62.11-1987s, 2-1978w

**crest voltmeter** A voltmeter depending for its indications upon the crest or maximum value of the voltage applied to its terminals. *Note:* Crest voltmeters should have clearly marked on the instrument whether readings are in equivalent root-mean-square values or in true crest volts. It is preferred that the marking should be root-mean-square values of the sinusoidal wave having the same crest value as that of the wave measured. *See also:* instrument. (EEC/PE) [119]

**crest working line voltage (vlwm) (thyristor)** The highest instantaneous value of the line voltage excluding all repetitive and nonrepetitive transient voltages, but including voltage variations. (IA/IPC) 428-1981w

**crest working voltage (semiconductor rectifiers)** (between two points) The maximum instantaneous difference of voltage, excluding oscillatory and transient overvoltages, that exists during normal operation. *See also:* semiconductor rectifier stack; rectification. (IA/EEC/PCON) [62], [110]

**crevice corrosion** Localized corrosion as a result of the formation of a crevice between a metal and a nonmetal, or between two metal surface. (IA) [59], [71]

**criteria** Parameters against which the CASE tool is evaluated, and upon which selection decisions are made. (C/SE) 1209-1992w

**critical angle (fiber optics)** When light propagates in a homogeneous medium of relatively high refractive index ($n_{high}$) onto a planar interface with a homogeneous material of lower index ($n_{low}$), the critical angle is defined by $\arcsin(n_{low}/n_{high})$. *Note:* When the angle of incidence exceeds the critical angle, the light is totally reflected by the interface. This is termed "total internal reflection." *See also:* step index profile; acceptance angle; angle of incidence; reflection; refractive index; total internal reflection. (Std100) 812-1984w

**critical anode voltage** *See:* gas tube; breakdown voltage.

**critical branch (health care facilities)** A subsystem of the Emergency System consisting of feeders and branch circuits supplying energy to task illumination, special power circuits, and selected receptacles serving areas and functions related to patient care, and which can be connected to alternate power sources by one or more transfer switches during interruption of normal power source. (NEC/NESC/EMB) [47], [86]

**critical build-up resistance (rotating machinery)** The highest resistance of the shunt winding circuit supplied from the primary winding for which the machine voltage builds up under specified conditions. (PE) [9]

**critical build-up speed (rotating machinery)** The limiting speed below which the machine voltage will not build up under specified condition of field-circuit resistance. *See also:* direct-current commutating machine. (PE) [9]

**critical characteristics (1) (replacement parts for Class 1E equipment in nuclear power generating stations) (equipment)** Those properties or attributes that are essential for performance of an equipment's safety function. (PE/NP) 934-1987w

**(2) (replacement parts for Class 1E equipment in nuclear power generating stations) (parts)** Those properties or attributes of the part that are essential to the safety function of the equipment in which the part is installed. *Note:* Typical critical characteristics are attributes such as dimensions, materials, electrical and temperature parameters, output tolerances, and fluid viscosity. (PE/NP) 934-1987w

**critical components** Equipment whose failure will result in complete system or functional failure. (PE/NP) 933-1999

**critical component temperature** The temperature of semiconductor components that are most susceptible to malfunction from high temperature. (C/BA) 14536-1995

**critical control command** An MTM-Bus command that has significant effect on the operation of a module to a degree that, for added security, a message conveying such a command should be difficult to send unintentionally. This Standard provides that a message containing a critical control command has to be proceeded by an Enable Module Control (EMC) message. If this procedure is not followed, a Command Sequence Error will occur. (TT/C) 1149.5-1995

**critical controlling current (cryotron)** The current in the control that just causes direct-current resistance to appear in the gate, in the absence of gate current and at a specified temperature. *See also:* superconductivity. (SPD/PE) 32-1972r

**critical coupling** That degree of coupling between two circuits, independently resonant to the same frequency, that results in maximum transfer of energy at the resonance frequency. *See also:* coupling. (EEC/PE) [119]

**critical current (1) (superconductor)** The current in a superconductive material above which the material is normal and below which the material is superconducting, at a specified temperature and in the absence of external magnetic fields. *See also:* superconductivity. (ED) [46]

**(2)** The first-stroke lightning current to a phase conductor which produces a critical impulse flashover voltage wave. (PE/T&D) 1243-1997

**critical damping** The least amount of viscous damping that causes a single-degree-of-freedom system to return to its original position without oscillation after initial disturbance. (PE/SUB) 693-1997

**critical design review (CDR) (A)** A review conducted to verify that the detailed design of one or more configuration items satisfy specified requirements; to establish the compatibility among the configuration items and other items of equipment, facilities, software, and personnel; to assess risk areas for each configuration item; and, as applicable, to assess the results of producibility analyses, review preliminary hardware product specifications, evaluate preliminary test planning, and evaluate the adequacy of preliminary operation and support

documents. *See also:* preliminary design review; system design review. **(B)** A review as in (A) of any hardware or software component. (C) 610.12-1990

**critical dimension (waveguide)** The dimension of the cross-section that determines the cutoff frequency. *See also:* waveguide. (EEC/PE) [119]

**critical event simulation** A simulation that is terminated by the occurrence of a certain event; for example, a model depicting the year-by-year forces leading up to a volcanic eruption, that is terminated when the volcano in the model erupts. *See also:* time-slice simulation. (C) 610.3-1989w

**critical failure** *See:* failure.

**critical field (1) (magnetrons)** The smallest theoretical value of steady magnetic flux density, at a steady anode voltage, that would prevent an electron emitted from the cathode at zero velocity from reaching the anode. *See also:* magnetron. **(2) (nonlinear, active, and nonreciprocal waveguide components)** In a gyromagnetic material that radio-frequency (rf) magnetic field levelabove which transfer of energy occurs from the uniform precession mode to spin waves; that is the field corresponding to nonlineal loss threshold. (MTT) 457-1982w

**critical flashover voltage (CFO)** The amplitude of voltage of a given waveshape that, under specified conditions, causes flashover through the surrounding medium on 50% of the voltage applications. (SPD/PE) C62.22-1997

**critical freeze protection (electric pipe heating systems)** The use of electric pipe heating systems to prevent the temperature of fluids from dropping below the freezing point of the fluid in important or critical outdoor (usually) piping systems at nuclear generating stations. An example of a critical freeze protection system is the heating for the nuclear service water system. (PE/EDPG) 622A-1984r, 622B-1988r

**critical frequency (1) (data transmission)** In radio propagation (by way of the ionosphere) the limiting frequency below which a wave component is reflected by, and above which it penetrates through, an ionospheric layer of vertical incidence. *Note:* The existence of the critical frequency is the result of electron limitation, that is, the inadequacy of the existing number of free electrons to support reflection at higher frequencies. (PE) 599-1985w

**(2) (network or system)** A pole or zero of a transfer or driving-point function. (CAS) [13]

**(3)** (of an ionospheric layer) The limiting frequency below which a normally-incident magneto-ionic wave component is returned by, and above which it penetrates through, an ionospheric layer. (AP/PROP) 211-1997

**critical grid voltage (multielectrode gas tubes)** The grid voltage at which anode breakdown occurs. *Note:* The critical grid voltage is a function of the other electrode voltages or currents and of the environment. *See also:* breakdown voltage. (ED) 161-1971w

**critical head (power operations)** The head at which the full-gate output of the hydroturbine equals the nameplate generator capacity. (PE/PSE) 858-1987s

**critical heat flux** The heat flux below which ignition is not possible. (DEI) 1221-1993w

**critical high-power level (attenuator tubes)** The radio-frequency power level at which ionization is produced in the absence of a control-electrode discharge. (ED) 161-1971w

**critical humidity** The relative humidity above which the atmospheric corrosion rate of a given metal increases sharply. (IA) [59]

**critical hydro period (power operations) (electric power supply)** Period when the limitations of hydroelectric energy supply due to water conditions are most critical with respect to system load requirements. (PE/PSE) 858-1987s, 346-1973w

**critical impulse** (of a relay) The maximum impulse in terms of duration and input magnitude that can be applied suddenly to a relay without causing pickup. (SWG/PE) C37.100-1992

**critical impulse flashover voltage (CFO) (insulators)** The crest value of the impulse wave that, under specified conditions, causes flashover through the surrounding medium on 50% of the applications. *See also:* impulse flashover voltage. (PE/T&D/SPD) 1410-1997, 32-1972r, 1243-1997

**critical impulse time** (of a relay) The duration of a critical impulse under specified conditions. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**critical item (software)** In configuration management, an item within a configuration item that, because of special engineering or logistic considerations, requires an approved specification to establish technical or inventory control at the component level. (C) 610.12-1990

**criticality (1) (power operations)** The state of an assembly of fissionable material in which a stable, self-sustaining chain reaction exists. At this condition a nuclear reactor will produce energy at a constant rate and the effective multiplication factor keff is exactly equal to 1. (PE/PSE) 858-1987s

**(2) (software)** The degree of impact that a requirement, module, error, fault, failure, or other item has on the development or operation of a system. *Synonym:* severity. (C) 610.12-1990

**(3)** A subjective description of the intended use and application of the system. Software criticality properties may include safety, security, complexity, reliability, performance, or other characteristics. (C/SE) 1012-1998

**criticality analysis** A structured evaluation of the software characteristics (e.g., safety, security, complexity, performance) for severity of impact of system failure, system degradation, or failure to meet software requirements or system objectives. (C/SE) 1012-1998

**critical jamming ratio** The ratio of conduit diameter (D) to cable diameter (d) that could result in the cable wedging or jamming in the conduit during the cable pull. (PE/IC) 1185-1994

**critical load (1)** That part of the load that requires continuous quality electric power for its successful operation. (IA/PSE) 241-1990r

**(2)** Devices and equipment whose failure to operate satisfactorily jeopardizes the health or safety of personnel, and/or results in loss of function, financial loss, or damage to property deemed critical by the user. (IA/PSE) 1100-1999

**critical magnetic field (superconductor)** The field below which a superconductor material is superconducting and above which the material is normal, at a specified temperature and in the absence of current. *See also:* superconductivity. (ED) [46]

**critical mating dimension (standard connector)** Those longitudinal and transverse dimensions assuring nondestructive mating with a corresponding standard connector. (IM/HFIM) 474-1973w

**critical overtravel time** (of a relay) The time following a critical impulse until movement of the responsive element ceases just short of pickup. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**critical path** In the critical path method, a path whose sum of activity times is greater than or equal to the sum of activity times for any other path through the network. *Note:* This sum of activity times is the shortest possible completion time of the overall project. (C) 610.2-1987

**critical path method (CPM)** A project management technique in which the activities that constitute a project are identified, dependencies among the activities are determined, a network of parallel and sequential activities is produced, an estimated time is assigned to each activity, and a sequence of activities taking the longest time (a critical path) is identified, determining the shortest possible completion time for the overall project. *See also:* program evaluation and review technique. (C) 610.2-1987

**critical period** That portion of the duty cycle that is the most severe, or the specified time period of the battery duty cycle. (PE/EDPG) 450-1995

**critical piece first (software)** A system development approach in which the most critical aspects of a system are implemented first. The critical piece may be defined in terms of services provided, degree of risk, difficulty, or other criteria. *See also:* top-down; bottom-up. (C) 610.12-1990

**critical point (1) (feedback control system) (Nichols chart)** The bound of stability for the $GH$ ($j\omega$) plot; the intersection of $|GH| = 1$ with ang $GH = -180°$.
**(2) (Nyquist diagram)** The bound of stability for the locus of the loop trasfer function $GH(j\omega)$; the (-1,$j$0) point. (PE/IM/EDPG) [3], [120]

**critical process control (electric pipe heating systems)** The use of electric heat tracing systems to increase or maintain, or both, the temperature of fluids (or processes) in important or critical mechanical piping systems including pipes, pumps, valves, tanks, instrumentation, etc., in nuclear power generating stations. An example of an important or critical mechanical piping system is the safety injection system. (PE/EDPG) 622A-1984r, 622B-1988r

**critical range** Metric values used to classify software into the categories of acceptable, marginal, or unacceptable. (C/SE) 1061-1998

**critical rate-of-rise of OFF-state voltage (thyristor)** The minimum value of the rate of rise of principal voltage which will cause switching from the OFF-state to the ON-state. (IA/IPC) 428-1981w

**critical rate-of-rise of ON-state current (thyristor)** The maximum value of the rate-of-rise of ON-state current that a thyristor can withstand without deleterious effect. *See also:* principal current. (ED) [46]

**critical section (software)** A segment of code to be executed mutually exclusively with some other segment of code which is also called a critical section. Segments of code are required to be executed mutually exclusively if they make competing uses of a computer resource or data item. *See also:* segment; computer; code; data; execute. (C/SE) 729-1983s

**critical service loads** Station auxiliary loads that are sensitive to power supply disturbances and that have an immediate effect upon power transmission or whose outages could cause damage to the equipment. (SUB/PE) 1158-1991r

**critical short-circuit ratio (CSCR)** The SCR corresponding to the operation at maximum available power (MAP); for typical inverter design, CSCR = 2. *Note:* The following operational characteristics are associated with CSCR:

— CSCR represents the borderline between "stable" and "unstable" operating regions. For SCR values lower than CSCR, the operation is in the "unstable" region of the ac voltage/dc power characteristic.
— If the operation is at unity power factor for systems at CSCR (i.e., the operation is at MAP), then the fundamental component of the temporary overvoltage ($TOV_{fc}$) at full load rejection would be near to $\sqrt{2}$.
— A resonance near the second harmonic will occur for systems operating at CSCR.

(PE/T&D) 1204-1997

**critical software (software verification and validation plans) (software)** Software whose failure could have an impact on safety, or could cause large financial or social loss. (C/SE) 1012-1986s, 610.12-1990, 730-1998

**critical speed (rotating machinery)** A speed at which the amplitude of the vibration of a rotor due to shaft transverse vibration reaches a maximum value. *See also:* rotor. (PE) [9]

**critical stroke amplitude** The amplitude of the current of the lightning stroke that, upon terminating on the phase conductor, would raise the voltage of the conductor to a level at which flashover is likely. (SUB/PE) 998-1996

**critical success factor (CSF)** A business system performance measurement that combines with other CSFs to form a key performance indicator (KPI). (C/PA) 1003.23-1998

**critical system (health care facilities)** A system of feeders and branch circuits in nursing homes and residential custodial care facilities arranged for connection to the alternate power source to restore service to certain critical receptacles, task illumination and equipment. (EMB) [47]

**critical temperature (superconductor)** The temperature below which a superconductive material is superconducting and above which the material is normal, in the absence of current and external magnetic fields. *See also:* superconductivity. (ED) [46]

**critical torsional speed (rotating machinery)** A speed at which the amplitude of the vibration of a rotor due to shaft torsional vibration reaches a maximum value. *See also:* rotor. (PE) [9]

**critical travel** (of a relay) The amount of movement of the responsive element of a relay during a critical impulse, but not subsequent to the impulse. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**critical value** Metric value of a validated metric that is used to identify software that has unacceptable quality. (C/SE) 1061-1998

**critical voltage (1) (magnetrons)** The highest theoretical value of steady anode voltage, at a given steady magnetic flux density, at which electrons emitted from the cathode at zero velocity would fail to reach the anode. (ED) 161-1971w
**(2) (relay)** *See also:* relay critical voltage.

**critical-voltage parabola (magnetrons) (cutoff parabola)** The curve representing in Cartesian coordinates the variation of the critical voltage as a function of the magnetic induction. *See also:* magnetron. [84]

**critical withstand current (surge) (impulse)** The highest crest value of a surge of given waveshape and polarity that can be applied without causing disruptive discharge on the test specimen. (PE) [8]

**CROM** *See:* control read-only memory.

**Crookes dark space** *See:* cathode dark space.

**Crosby** *See:* cable clamp.

**Crosby clip** *See:* cable clamp.

**cross acceleration (accelerometer)** The acceleration applied in a plane normal to an accelerometer input reference axis. (AES/GYAC) 528-1994

**crossarm** A horizontal member (usually wood or steel) attached to a pole, post, tower or other structure and equipped with means for supporting the conductors. *Note:* The crossarm is placed at right angles to conductors on straight line poles, but splits the angle on light corners. *See also:* tower. (T&D/PE) [10]

**crossarm guy** A tensional support for a crossarm used to offset unbalanced conductor stress. (T&D/PE) [10]

**cross-assembler (software)** An assembler that executes on one computer but generates machine code for a different computer. (C) 610.12-1990

**cross-axis sensitivity (accelerometer)** The proportionality constant that relates a variation of accelerometer output to cross acceleration. This sensitivity varies with the direction of cross acceleration, and is primarily due to misalignment. (AES/GYAC) 528-1994

**crossband transponder (navigation)** A transponder that replies in a different frequency band from that of the received interrogation. *See also:* navigation. (AES/GCS/RS) 172-1983w, 686-1982s, [42]

**crossbar switch (1)** A switch having a plurality of vertical paths, a plurality of horizontal paths, and electromagnetically-operated mechanical means for interconnecting any one of the vertical paths with any one of the horizontal paths. (PE/EDPG) [3]
**(2)** A switch having vertical and horizontal paths and an electromagnetically operated mechanical means for interconnection of any one vertical path with any one horizontal path. *See also:* step-by-step switch. (C) 610.7-1995

**cross bar switch** A relay-operated device that makes a connection between a line in a set of lines and a line in another set,

where the two sets are arranged along adjacent sides of a matrix of contacts or switch points. (C) 610.10-1994w

**crossbar system** An automatic switching system in which the selecting mechanisms are crossbar switches, common circuits select and test the switching paths and control the operation of the selecting mechanism, and the method of operation is one in which the switching information is received and stored by controlling mechanisms that determine the operations necessary in establishing a telephone connection. *See also:* step-by-step system; electronic switching system. (C/PE/EEC) 610.7-1995, [119]

**cross cable bond** A cable bond used for bonding between the armor or lead sheath of adjacent cables. *See also:* continuity cable bond; cable bond. (T&D/PE) [10]

**cross-category services** A set of tools or features or both that has a direct effect on the operation of one or more components of the OSE, but is not in and of itself a stand-alone component. (C/PA) 14252-1996

**cross check** To test for accuracy by comparing the results of two different methods of computation. (C) 1084-1986w

**cross-compiler (software)** A compiler that executes on one computer but generates machine code for a different computer. (C) 610.12-1990

**cross connect** A group of connection points, often wall- or rack-mounted in a wiring closet, used to mechanically terminate and interconnect twisted-pair building wiring.local area networks. (LM/C) 802.3-1998, 8802-12-1998

**cross connection (telephone switching systems)** Easily changed or removed wire that is run loosely between equipment terminals to establish an electrical association. (COM) 312-1977w

**cross-correlation (excitation systems)** The cross-correlation of two random signals $x_1(t)$ and $x_2(t)$ is $R_{12}(t)$ defined by

$$R_{12}(t) = \int_0^t x_1(t - \tau)x_2(\tau)d\tau$$

If $x_1(t)$ is a random input to a linear stationary system and $x_2(t)$ is the response, then $R_{12}(t)$ is the inverse Laplace transform of the transfer function of the system. (PE/EDPG) 421A-1978s

**cross coupling (transmission medium)** A measure of the undesired power transferred from one channel to another. *See also:* transmission line; coupling. (MTT) 146-1980w

**cross-coupling coefficient (accelerometer)** The proportionality constant that relates a variation of accelerometer output to the product of acceleration applied normal and parallel to an input reference axis. This coefficient can vary, depending on the direction of cross acceleration. (AES/GYAC) 528-1994

**cross-coupling errors (inertial sensors) (gyros)** The errors in the gyro output resulting from gyro sensitivity to inputs about axes normal to an input reference axis. (AES/GYAC) 528-1994

**crossed-field amplifier (microwave tubes)** A crossed-field tube or valve, with a nonreentrant slow-wave structure, used as an amplifier. (ED) [45]

**crossed-field tube (microwave)** A high-vacuum electron tube in which a direct, alternating, or pulsed voltage is applied to produce an electric field perpendicular both to a static magnetic field and to the direction of propagation of a radio-frequency delay line. *Note:* The electron beam interacts synchronously with a slow wave on the delay line. (ED) [45]

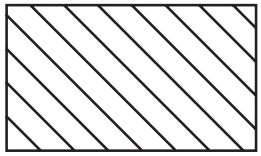
**cross fire (data transmission)** An interfering current in one telegraph or signaling channel resulting from telegraph or signaling current in another channel. (PE) 599-1985w

**crossfooting check** A consistency check in which two totals obtained by adding the same set of numbers in different sequences are compared. (C) 610.5-1990w

**cross-grained** wood Wood in which the fibers deviate from a line parallel to the sides of the piece. Cross-grain may be either diagonal or spiral grain or a combination of the two. (T&D/PE) 751-1990

**crosshairs** A set of two intersecting perpendicular lines whose intersection indicates a position on a graphical display device. *See also:* thumbwheel. (C) 610.6-1991w

**crosshatch (A)** A series of evenly spaced parallel lines within a closed boundary on a display surface. *See also:* hatch. **(B)** To insert a series of evenly spaced parallel lines as in (A).



**crosshatch**

(C) 610.6-1991

**cross-index** A link between two files containing related data. For example, in a library, the subject card catalog is a cross-index for the title and author card catalogs. *See also:* inverted file; cross-indexed file. (C) 610.5-1990w

**cross-indexed file** A file whose contents are linked with another file through a cross-index. *See also:* inverted file. (C) 610.5-1990w

**cross-indexing (A)** The process of linking entities in two files to facilitate searches performed on data contained in those files. **(B)** A method of linking entities as in (A). (C) 610.5-1990

**crossing angle** *See:* angle of cut.

**crossing structure** A structure built of poles and, sometimes, rope nets. It is used whenever conductors are being strung over roads, power lines, communications circuits, highways, or railroads, and is normally constructed in such a way as to prevent the conductor from falling onto or into any of these facilities in the event of equipment failure, broken pulling lines, loss of tension, etc. *Synonyms:* guard structure; temporary structure; H-frame; rider structure. (T&D/PE) 524-1992r

**cross light (illuminating engineering)** Equal illumination in front of the subject from two directions at substantially equal and opposite angles with the optical axis of the camera and a horizontal plane. (EEC/IE) [126]

**cross modulation** A type of intermodulation due to the modulation of the carrier of the desired signal by an undesired signal wave. (AP/PE/ANT) 145-1983s, 599-1985w

**cross-modulation distortion (1) (nonlinear, active, and nonreciprocal waveguide components)** A third-order distortion product that can occur when nonlineal devices are exposed simultaneously to two carriers of different frequency where modulation is present. It is measured by using two separate carriers and providing 100% modulation on one. The cross modulation is defined as the power in one sideband of the unmodulated carrier below the power of the carrier. (MTT) 457-1982w

**(2) (broadband local area networks)** Cross-modulation is the process where the modulation of one carrier is imposed onto another carrier. The exchange of modulation information involves the change of an amplifier's transfer characteristic brought about by a change in amplifier loading. The non-ideal amplifier has an associated compression and expansion characteristic that is dependent on amplifier loading. The change in load caused by the total power of signals and their modulation will create a variation in transfer gain. The change in load due to modulation change is normally the primary cause of cross-modulation. Broadband networks have data devices that have switched carrier transmissions that express cross-modulation as a change in transmission characteristics dependent on channel loading and traffic. (LM/C) 802.7-1989r

**cross neutralization** A method of neutralization used in push-pull amplifiers whereby a portion of the plate-cathode alternating voltage of each tube is applied to the grid-cathode circuit of the other tube. *See also:* feedback; amplifier. (AP/BT/ANT) 145-1983s, 182A-1964w

**cross-office delay** For a tandem call switched cross-office, the interval between starting time point and ending point. *See also:* ending point; starting point. (COM/TA) 973-1990w

**crossover (cathode-ray tubes)** The first focusing of the beam that takes place in the electron gun. *See also:* cathode-ray tube. (ED) [45], [84]

**crossover, automatic voltage-current** *See:* automatic voltage-current crossover.

**crossover characteristic curve (navigation aid terms) (navigation systems such as VOR [very high-frequency omnidirectional range] and ILS [instrument landing system])** The graphical representation of the indicator current variation with change of position in the crossover region. (AES/GCS) 172-1983w

**crossover frequency (1) (frequency-dividing networks)** The frequency at which equal power is delivered to each of two adjacent channels when all channels are properly terminated. *See also:* transition frequency. (SP) [32]

**(2) (automatic control)** *See also:* phase-crossover frequency; gain-crossover frequency.

**crossover loss** For a tracker that uses an offset beam, such as a conical scan tracker, the reduction in signal-to-noise ratio for a target on the tracking axis relative to that for a target on the peak two-way antenna gain of the beam. *Note:* The crossover loss factor is the ratio of the signal-to-noise ratio for a target on the peak two-way antenna gain to that for a target on the tracking axis. *See also:* conical scanning. (AES) 686-1997

**crossover network** *See:* dividing network.

**crossover region (navigation systems)** A loosely defined region in space containing the course line and within which a transverse flight yields information useful in determining course sensitivity and "flyability." (AES/GCS) 172-1983w

**crossover spiral** *See:* lead-over groove.

**crossover time (1) (germanium gamma-ray detectors) (charged-particle detectors)** The instant at which the waveform of a bipolar pulse passes through a designated level. (NID) 301-1976s

**(2) (semiconductor radiation detectors)** The instant at which the transition between the two lobes of a bipolar pulse passes through a designated level (usually the baseline). (NPS) 300-1988r

**(3)** (of a bipolar pulse) The instant at which the transition between the two lobes passes through a designated level (usually the baseline). At this level, the timing with respect to the initiating events is nearly invariant with pulse amplitude. (NPS) 325-1996

**crossover transition (liquid scintillation counting systems)** A gamma ray occurring between two nonadjacent nuclear levels. (NI) N42.14-1991

**crossover voltage, secondary-emission** *See:* secondary-emission crossover voltage.

**crossover walk (1) (germanium gamma-ray detectors) (charged-particle detectors)** (of a pulse) The deviation of the crossover time for some variable, such as (pulse) amplitude. (NPS/NID) 325-1986s, 301-1976s

**(2) (semiconductor radiation detectors)** (of a pulse) A deviation of crossover time of a bipolar pulse due to a change in peak amplitude. *See also:* walk. (NPS) 300-1988r

**crosspoint (telephone switching systems)** A controlled device used in extending a transmission or control path. (COM) 312-1977w

**crosspoint switch (local area networks)** A switching function that provides normal connections, wrap connections, breaks in the transmit, and local loopback for lobe testing in the wrap mode. (LM/C) 802.5c-1991r

**cross polarization (1)** In a specified plane containing the reference polarization ellipse, the polarization orthogonal to a specified reference polarization. *Note:* The reference polarization is usually the copolarization. (AP/ANT) 145-1993

**(2) (waveguide)** The polarization orthogonal to a reference polarization. *Note:* Two fields have orthogonal polarization if their polarization ellipses have the same axial ratio, major axes at right angles, and opposite senses of rotation. *See also:* orthogonal polarization. (MTT/AP/PROP) 146-1980w, 211-1997

**(3) (protective relaying)** The polarization of a relay for directionality using some proportion of the voltage from a healthy (unfaulted) phase(s). One example of this is quadrature polarization. In this case, the polarizing voltage is in quadrature to the faulted phase voltage. (PE/PSR) C37.113-1999

**cross-polarization discrimination** The ratio of the power level at the output of a receiving antenna, nominally co-polarized with the transmitting antenna, to the output of a receiving antenna of the same gain but nominally orthogonally polarized to the transmitting antenna. (AP/PROP) 211-1997

**cross polarization electronic countermeasures** An ECM technique that transmits with a polarization orthogonal to the principal polarization of the victim radar. *Note:* Since cross-polarized antenna patterns are often very different from the normal, copolarized patterns, tracking might be disrupted. *See also:* electronic countermeasures. (AES) 686-1997

**cross-polarization isolation** The ratio of the wanted power to the unwanted power in the same receiver channel when the transmitting antenna is radiating nominally orthogonally polarized signals at the same frequency and power level. (AP/PROP) 211-1997

**cross-polar radiation pattern** A radiation pattern corresponding to the polarization orthogonal to the co-polarization. *See also:* co-polarization. (AP/ANT) 145-1993

**cross-polar side lobe level, relative** The maximum relative partial directivity (corresponding to the **cross polarization**) of a side lobe with respect to the maximum partial directivity (corresponding to the **co-polarization**) of the antenna. *Note:* Unless otherwise specified, the cross-polar side lobe level shall be taken to be that of the highest side lobe of the cross-polar radiation pattern. (AP/ANT) 145-1993

**cross product** *See:* vector product.

**cross protection** An arrangement to prevent the improper operation of devices from the effect of a cross in electric circuits. (EEC/PE) [119]

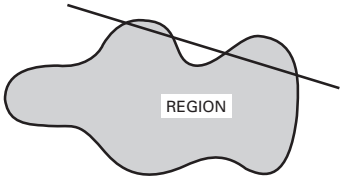
**cross rectifier circuit** A circuit that employs four or more rectifying elements with a conducting period of 90 electrical degrees plus the commutating angle. *See also:* rectification. (EEC/PE) [119]

**cross-reference generator (software)** A software tool that accepts as input the source code of a computer program and produces as output a listing that identifies each of the program's variables, labels, and other identifiers and indicates which statements in the program define, set, or use each one. *Synonym:* cross-referencer. (C) 610.12-1990

**cross-reference list (software)** A list that identifies each of the variables, labels, and other identifiers in a computer program and indicates which statements in the program define, set, or use each one. (C) 610.12-1990

**cross-referencer** *See:* cross-reference generator.

**cross section (1) (image processing and pattern recognition)** The intersection of an $n$-dimensional image or region with an $(n-1)$-dimensional object. For example, the intersection of a two-dimensional image or region with a straight line.




**cross section**

(C) 610.4-1990w

**(2)** Often used as a shortened form of radar cross section. *Note:* This term should be avoided when there is a possibility of confusion with geometric cross section. (AES) 686-1997

**(3)** *See also:* radar cross section; scattering cross section; bistatic cross section; monostatic cross section; backscattering cross section. (ANT)

**cross-sectional area (conductor)** (cross section of a conductor) The sum of the cross-sectional areas of its component wires, that of each wire being measured perpendicular to its individual axis. (PE) 599-1985w

**crosstalk (1) (cable systems in power generating stations)** The noise or extraneous signal caused by ac or pulse-type signals in adjacent circuits. (PE/SUB/EDPG) 422-1977, 525-1992r

**(2) (A) (data transmission)** Undesired energy appearing in one signal path as a result of coupling from other signal paths. *Note:* Path implies wires, waveguides, or other localized or constrained transmission systems. **(B) (data transmission)** (electroacoustics) The unwanted sound reproduced by an electroacoustic receiver associated with a given transmission channel resulting from cross coupling to another transmission channel carrying sound-controlled electric waves or, by extension, the electric waves in the disturbed channel that result in such sound. *Note:* In practice, crosstalk may be measured either by the volume of the overheard sounds or by the magnitude of the coupling between the disturbed and the disturbing channels. In the latter case, to specify the volume of the overheard sounds, the volume in the disturbing channel must also be given. (PE) 599-1985

**(3)** Unwanted electric signals injected into a circuit by stray coupling. (ELM) C12.1-1981

**(4) (instrumentation and control equipment grounding in generating stations)** The noise or extraneous signal caused by ac or dc pulse-type signals in adjacent circuits. (PE/EDPG) 1050-1996

**(5) (telecommunications)** Undesired energy appearing in one path as a result of coupling from another path. Crosstalk is further classified as near-end, far-end, intelligible, or unintelligible. (COM/TA) 1007-1991r

**(6) (telecommunications)** Unwanted coupling between any two paths through the switching system. There are two situations of interest. In the first the crosstalk coupling loss of the system is linear; that is it is independent of applied disturbing signal level and is unaffected by other things, such as circuit noise. The other situation of interest arises with a digital switching system where the crosstalk coupling loss is nonlinear and is a function of applied disturbing signal level circuit noise, and encoder bias. Such systems will, under some conditions of circuit noise and coder bias, display crosstalk coupling loss that tends to decrease with decreasing disturbing signal level. *See also:* equal-level crosstalk coupling loss; crosstalk coupling loss. (COM/TA) 973-1990w

**(7) (multichannel)** The ratio of the signal induced in one channel to a common signal applied to all other channels. (IM/WM&A) 1057-1994w

**(8)** The noise or extraneous signal caused by ac or pulse-type signals in adjacent circuits (measurement of power frequency magnetic fields). (T&D/PE) 644-1994, 1308-1994

**(9)** An electromagnetic field in the space surrounding a cable circuit created by an electrical signal. This field induces currents and electromotive forces in other circuits located close enough to the disturbing cable circuit to be affected. (PE/IC) 1143-1994r

**(10) (A)** A type of noise characterized by unwanted coupling of a signal or the interaction of signals on two adjacent channels. *See also:* near end crosstalk. **(B)** Undesired energy appearing in one signal path as a result of coupling from other signal paths. (C) 610.7-1995

**(11)** Crosstalk is undesired energy appearing in one signal path as a result of coupling from other signal paths. (C/LM) 8802-5-1998

**crosstalk coupling (crosstalk loss)** Cross coupling between speech communication channels or their component parts. *Note:* Crosstalk coupling is measured between specified points of the disturbing and disturbed circuits and is preferably expressed in decibels. *See also:* coupling. (PE/EEC) [119]

**crosstalk coupling loss (telecommunications)** The loss of the crosstalk path. *See also:* crosstalk. (COM/TA) 973-1990w

**crosstalk, electron beam** *See:* electron beam crosstalk.

**crosstalk loss** *See:* crosstalk coupling.

**crosstalk unit** Crosstalk coupling is sometimes expressed in crosstalk units through the relation

$$\text{Crosstalk units} = 10^{[6-(L/20)]}$$

where $L$ = crosstalk coupling in decibels. *Note:* For two circuits of equal impedance, the number of crosstalk units expresses the current in the disturbed circuit as millionths of the current in the disturbing circuit. *See also:* coupling. (EEC/PE) [119]

**crowbar** A protective circuit in a power distribution circuit that rapidly shorts the output voltage to ground when an overvoltage or other error condition occurs. (C) 610.10-1994w

**CR-RC shaping (1) (germanium gamma-ray detectors) (x-ray energy spectrometers) (charged-particle detectors)** The pulse shaping present in an amplifier that has a simple high-pass filter consisting of a capacitor and a resistor together with a simple low-pass filter, separated by impedance isolation. (Pulse shaping in such an amplifier cuts off at 6 dB (decibels) per octave at both ends of the band.). (NPS/NID) 301-1976s, 759-1984r

**(2) (semiconductor charged-particle detectors)** In an amplifier, the pulse shaping produced by a single-section high-pass network followed by a single-section low-pass network, with the two networks separated by an isolating stage and with both networks having the same time constant. (NPS) 300-1988r

**(3)** In an amplifier, the pulse shape produced by m CR high-pass filter sections (differentiators) in conjunction with n RC low-pass filter sections (integrators), all with the same time constant. If the input signal is a step function and no other high-pass sections are in the signal path, the pulse shape is unipolar if m = 1, bipolar if m = 2. For unipolar pulses, the waveform is described by

$$K t_e^n - t/\tau$$

where K is a constant, $\tau$ is time, and t is the time constant of the differentiator. (NPS) 325-1996

**CRS** *See:* configuration report server.

**CRT** *See:* cathode-ray tube.

**CRT display device** A display device that displays data onto a phosphor coated display screen using controlled electron beams within a CRT. *Note:* Raster display devices and random-scan display devices are two major categories of CRT display devices. *See also:* penetration CRT display device; dark trace tube display device; raster display device; storage tube display device. (C) 610.10-1994w

**crude metal** Metal that contains impurities in sufficient quantities to make it unsuitable for specified purposes or that contains more valuable metals in sufficient quantities to justify their recovery. *See also:* electrorefining. (EEC/PE) [119]

**crush loaded weight** The weight of a vehicle when loaded with crew, all seats occupied, and standees to a specified maximum number. (VT) 1475-1999

**crust** A layer of solidified electrolyte. *See also:* fused electrolyte. (EEC/PE) [119]

**CRV** *See:* Code Rule Violation.

**cryogenics (1) (general)** The study and use of devices utilizing properties of materials near absolute-zero temperature. (C) [20], [85]

**(2) (laser maser)** The branch of physics dealing with very low temperatures. (LEO) 586-1980w

**(3)** A branch of technology concerned with devices that make use of the properties assumed by materials at temperatures near absolute zero. (C) 610.2-1987

**cryogenic storage** A type of storage that uses the superconductive and magnetic properties of certain materials at temperatures near absolute zero. (C) 610.10-1994w

**cryotron (1)** A superconductive device in which current in one or more input circuits magnetically controls the superconducting-to-normal transition in one or more output circuits, provided the current in each output circuit is less than its critical value. *See also:* superconductivity. (ED) [46]
**(2)** A device that makes uses of the effects of extremely low temperatures on conductive materials such that small magnetic field changes can control large current changes. (C) 610.10-1994w

**cryptography** The discipline embodying principles, means, and methods for the transformation of data in order to hide its information content, prevent its undetected modification, and/or prevent its unauthorized use. (LM/C) 802.10-1992

**crystal (A) (communication practice)** A piezoelectric crystal.
**(B) (communication practice)** A piezoelectric crystal plate.
**(C) (communication practice)** A crystal rectifier. (PE/EEC) [119]

**crystal-controlled oscillator** *See:* crystal oscillator.

**crystal diode** A rectifying element comprising a semiconducting crystal having two terminals designed for use in circuits in a manner analogous to that of electron-tube diodes. *See also:* rectifier. (EEC/PE) [119]

**crystal loudspeaker (piezoelectric loudspeaker)** A loudspeaker in which the mechanical displacements are produced by piezoelectric action. (EEC/PE) [119]

**crystal microphone (piezoelectric microphone)** A microphone that depends for its operation of the generation of an electric charge by the deformation of a body (usually crystalline) having piezoelectric properties. *See also:* microphone. (EEC/PE) [119]

**crystal mixer (mixer)** A crystal receiver that can be fed simultaneously from a local oscillator and signal source, for the purpose of frequency changing. *See also:* waveguide. (Std100) [84]

**crystal oscillator (crystal-controlled oscillator)** An oscillator in which the principal frequency-determining factor is the mechanical resonance of a piezoelectric crystal. *See also:* oscillatory circuit. (BT) 182A-1964w

**crystal pickup (piezoelectric pickup)** A phonograph pickup that depends for its operation on the generation of an electric charge by the deformation of a body (usually crystalline) having piezoelectric properties. *See also:* phonograph pickup. (EEC/PE) [119]

**crystal pulling** A method of crystal growing in which the developing crystal is gradually withdrawn from a melt. (IA) [12]

**crystal receiver** A waveguide incorporating a crystal detector for the purpose of rectifying received electromagnetic signals. *See also:* waveguide. (AP/ANT) [35], [84]

**crystals hierarchy (primary ferroelectric terms)** Depending on their geometry, crystals are commonly classified into seven systems: triclinic (the least symmetrical), monoclinic, orthorhombic, tetragonal, trigonal, hexagonal, and cubic. The seven systems in turn are divided into point groups (crystal classes) according to their symmetry with respect to a point. There are 32 such crystal classes; 20 are piezoelectric. Piezoelectric crystals have the following property: if stress is applied along certain directions in the crystals, they develop an electric polarization whose magnitude is (within limits) proportional to the applied stress. Conversely, when an electric field is applied along certain directions in a piezoelectric crystal, the crystal is strained by an amount proportional to the applied field. Each crystal system contains at least one piezoelectric class. Ten of the 20 piezoelectric classes possess spontaneous electrical polarization; that is, they have a nonvanishing dipole moment per unit volume and are called polar. The ten polar crystal classes are designated 1, 2, m, 2mm, 4, 4mm, 3, 3m, 6, 6mm in the notation of Hermann and Maugin, $C_1$, $C_2$, $C_{1h}$, $C_{2v}$, $C_4$, $C_{4v}$, $C_3$, $C_{3v}$, $C_6$, $C_{6v}$, respectively in the notation of Schoenflies. (UFFC) 180-1986w

**crystal spots** Spots produced by the growth of metal sulfide crystals upon metal surfaces with a sulfide finish and lacquer coating. The appearance of crystal spots is called spotting in. *See also:* electroplating. (EEC/PE) [119]

**crystal-stabilized transmitter** A transmitter employing automatic frequency control, in which the reference frequency is that of a crystal oscillator. *See also:* radio transmitter. (AP/ANT) 145-1983s

**crystal systems** The term "crystal" is applied to a solid in which the atoms are arranged in a single pattern repeated throughout the body. In a crystal the atoms may be thought of as occurring in small groups, all groups being exactly alike, similarly oriented, and regularly aligned in all three dimensions. Each group can be regarded as bounded by a parallelepiped and each parallelepiped regarded as one of the ultimate building blocks of the crystal. The crystal is formed by stacking together in all three dimensions replicas of the basic parallelepiped without any spaces between them. Such a building block is called a unit cell. Since the choice of a particular set of atoms to form a unit cell is arbitrary, it is evident that there is a wide range of choices in the shapes and dimensions of the unit cell. In practice, that unit cell is selected which is most simply related to the actual crystal faces and X-ray reflections, and which has the symmetry of the crystal itself. Except in a few special cases, the unit cell has the smallest possible size. In crystallography the properties of a crystal are described in terms of the natural coordinate system provided by the crystal itself. The axes of this natural system, indicated by the letters a, b, and, c, are the edges of the unit cell. In a cubic crystal, these axes are of equal length and are mutually perpendicular; in a triclinic crystal they are of unequal lengths and no two are mutually perpendicular. The faces of any crystal are all parallel to planes whose intercepts on the a, b, c axes are small multiples of unit distances or else infinity, in order that their reciprocals, when multiplied by a small common factor, are all small integers or zero. These are the indices of the planes. In this nomenclature we have, for example, faces (100), (010), (001), also called the a, b, c faces, respectively. In the orthorhombic, tetragonal, and cubic systems, these faces are normal to the a, b, c axes, 100, etc. Even in the monoclinic and triclinic systems, these faces contain respectively, the b and c, a and c, and, a and b axes. As referred to the set of rectangular axes X, Y, Z, these indices are in general irrational except for cubic crystals. Depending on their degrees of symmetry, crystals are commonly classified into seven systems: triclinic (the least symmetrical), monoclinic, orthorhombic, tetragonal, trigonal, hexagonal, and cubic. The seven systems, in turn, are divided into point groups (classes) according to their symmetry with respect to a point. There are 32 such classes, eleven of which contain enantiomorphous forms. Twelve classes are of too high a degree of symmetry to show piezoelectric properties. Thus twenty classes can be piezoelectric. Every system contains at least one piezoelectric class. (UFFC) 176-1978s

**crystal-video receiver** A receiver consisting of a crystal detector and a video amplifier. (EEC/PE) [119]

**CSC** *See:* computer software component.

**CSCI** *See:* computer software configuration item.

**C-scope** A cathode-ray oscilloscope arranged to present a C-display. (AES/RS) 686-1990

**CSI** *See:* communication services interface.

**CSMA/CD LAN (1)** Any local area network using the CSMA/CD access protocol. (LM/C) 802.1H-1995
**(2)** An IEEE 802.3 LAN is a CSMA/CD LAN, as is an Ethernet LAN. Most CSMA/CD networks are hybrids, carrying both Ethernet and IEEE 802 style frames. (LM/C) 802.1H-1995

**CSMP III** *See:* Continuous System Modeling Program III.

**CSR** *See:* control and status register.

**CSR Architecture (1)** IEEE Std 1212-1991, IEEE Standard Control and Status Register (CSR) Architecture for Microcomputer Buses. (C/MM) 1596-1992

**(2)** Refers to IEEE Std 1212-1991, the parent document of this series. It specifies the overall architecture of a node on conformant standard buses and specifically the structure and use of its CSRs and standard ROM locations. (C/MM) 1212.1-1993

**(3)** ISO/IEC 13213: 1994 [ANSI/IEEE Std 1212, 1994 Edition], Information technology-Microprocessor systems-Control and Status Registers (CSR) Architecture for microcomputer buses. (C/MM) 1394-1995

**(4)** Refers to IEEE Std 1212-1991. (C/MM) 1596.5-1993, 1212-1991s

**(5)** ISO/IEC 13213: 1994 [ANSI/IEEE Std 1212, 1994 Edition] Information technology—Microprocessor systems—Control and Status Register (CSR) Architecture for microcomputer buses. (C/MM) 1596.4-1996

**CSR space** *See:* control and status register space.

**CSR unit architecture** The logical component of a node that is accessed by I/O driver software. After the node is initialized and configured, the units normally operate independently. Note that one node could have multiple units (for example, processor, memory, and SCSI controller). (C/BA) 896.3-1993w

**CSS/II** *See:* Computer System Simulation II.

**CSSL** *See:* Continuous Systems Simulation Language.

**CSU** *See:* channel service unit.

**CT** *See:* current transformer; computed tomography.

**CTIC** *See:* conformance test interface connector.

**CTRL** *See:* control key.

**CTS** *See:* computer typesetting.

**CTS build system** The hardware and software used to compile and configure a CTS. (C/PA) 2003-1997

**CTS execution system** The hardware and system software on which the CTS is executed. (C/PA) 2003-1997

**cube tap** *See:* multiple plug.

**cubic meters per second ($m^3/s$) (cubic meters per second)** Volume of water or liquid discharged per second under standard conditions. (T&D/PE) 957-1995, 957-1987s

**cubic natural spline (pulse terminology)** A catenated piecewise sequence of cubic polynominal functions p(1, 2), p(2, 3),. . ., p($n-1$, $n$ ) between knots $t_1m_1$ and $t_2m_2$, $t_2$ $m_2$ and $t_3m_3$, . . ., $t_{n-1}$ $m_{n-1}$ and $t_nm_n$, respectively, wherein: (1) At all knots the first and second derivatives of the adjacent polynominal functions are equal, and (2) For all values of t less than $t_1$ and greater than $t_n$ the function is linear. *See also:* waveforms produced by operations on waveforms. (IM/WM&A) 194-1977w

**cue** *See:* call.

**cumulative amplitude probability distribution (control of system electromagnetic compatibility)** A cumulative distribution showing the probability that all amplitudes equal to, or above, a stated value are exceeded as a function of that value. C63.12-1984

**cumulative compound (rotating machinery)** Applied to a compound machine to denote that the magnetomotive forces of the series and the shunt field windings are in the same direction. *See also:* magnetomotive force. (PE) [9]

**cumulative demand** An indicating demand meter in which the accumulated total of maximum demands during the preceding periods is indicated during the period after the meter has been reset and before it is reset again. *Note:* The maximum demand for any one period is equal or proportional to the difference between the accumulated readings before and after reset. (AMR/SCC31) 1377-1997

**cumulative demand meter** (or register) An indicating demand meter in which the accumulated total of maximum demands during the preceding periods is indicated during the period after the meter has been reset and before it is reset again. *Note:* The maximum demand for any one period is equal or proportional to the difference between the accumulated readings before and after reset. *See also:* electricity meter. (ELM) C12.1-1982s

**cumulative demand register (metering)** A register that indicates the sum of the previous maximum demand readings prior to reset. When reset, the present reading is added to the previous accumulated readings. The maximum demand for the present reading period is the difference between the present and previous readings. (ELM) C12.1-1982s

**cumulative detection probability** The probability that a target is detected on at least one of $n$ successive scans or detection opportunities of a surveillance radar. (AES) 686-1997

**cumulative latency** The time it takes for a signal element to travel from the active monitor's transmitter output to its receiver input. (C/LM) 8802-5-1998

**cumulative leakage index (broadband local area networks)** A measurement of cumulative RF signal leakage of a cable system. The measurement is usually specified for a given area. (LM/C) 802.7-1989r

**cumulative probability distribution** *See:* probability distribution function.

**cuprous chloride cell** A primary cell in which depolarization is accomplished by cuprous chloride. *See also:* electrochemistry. (EEC/PE) [119]

**Curie temperature (electrical heating systems)** The temperature at which the magnetic properties of a substance change from ferromagnetic to paramagnetic. (IA/PC) 844-1991

**Curie-Weiss temperature (primary ferroelectric terms)** The intercept $_q$ of the linear portion of the plot of 1/k versus T, in the region above the ferroelectric Curie point, where k is the small-signal relative dielectric permittivity measured at zero bias field along the polar axis, and T is the absolute temperature. *Note:* In many ferroelectrics, k follows the Curie-Weiss relation. (UFFC) 180-1986w

**curl** A vector that has a magnitude equal to the limit of the quotient of the circulation around a surface element on which the point is located by the area of the surface, as the area approaches zero, provided the surface is oriented to give a maximum value of the circulation: the positive direction of this vector is that traveled by a right hand screw turning about an axis normal to the surface element when an integration around the element in the direction of the turning of the screw gives a positive value to the circulation. If the vector $A$ of a vector field is expressed in terms of its three rectangular components $A_x$, $A_y$, and $A_z$, so that the values of $A_x$, $A_y$, and $A_z$ are each given as a function of $x$, $y$, and $z$, the curl of the vector field (abbreviated curl **A** or $\nabla \times \mathbf{A}$) is the vector sum of the partial derivatives of each perpendicular to it, or curl

$$\text{curl } \mathbf{A} = \nabla \times \mathbf{A} = \begin{vmatrix} \mathbf{i} & \mathbf{j} & \mathbf{k} \\ \frac{\delta}{\delta x} & \frac{\delta}{\delta y} & \frac{\delta}{\delta z} \\ \mathbf{A}_x & \mathbf{A}_y & \mathbf{A}_z \end{vmatrix}$$

$$= \mathbf{i}\left\{\frac{\delta A_z}{\delta y} - \frac{\delta A_y}{\delta z}\right\} + \mathbf{j}\left\{\left(\frac{\delta A_x}{\delta z} - \frac{\delta A_z}{\delta x}\right\} + \mathbf{k}\left\{\frac{\delta A_y}{\delta x} - \frac{\delta A_x}{\delta y}\right\}\right.$$

$$= \mathbf{i}(D_yA_z - D_zA_y) + \mathbf{j}(D_zA_x - D_xA_z) + \mathbf{k}(D_xA_y - D_yA_z)$$

where **i**, **j**, and **k** are unit vectors along the $x$, $y$, and $z$ axes, respectively. Example: The curl of the linear velocity of points in a rotating body is equal to twice the angular velocity. The curl of the magnetic field strength at a point within an electric conductor is equal to $k$ times the current density at the point where $k$ is a constant depending on the system of units. (Std100) 270-1966w

**currency symbol character** A character within a picture specification that represents the currency sign. *Note:* $ is commonly used. (C) 610.5-1990w

**current (1)** The flow of electrons within a wire or a circuit; measured in amperes. (C) 610.7-1995

**(2) (general)** A generic term used when there is no danger of ambiguity to refer to any one or more of the currents specifically described. *Note:* (1) For example, in the expression "the current in a simple series circuit, " the word current refers to the conduction current in the wire of the inductor and the displacement current between the plates of the capacitor. (2)

A direct current is a unidirectional current in which the changes in value are either zero or so small that they may be neglected. A given current would be considered a direct current in some applications, but would not necessarily be so considered in other applications. (Std100) 270-1966w

**(3)** The use of certain adjectives before "current" is often convenient, as in convection current, anode current, electrode current, emission current, etc. The definition of conducting current usually applies in such cases and the meaning of adjectives should be defined in connection with the specific applications. (Std100) 270-1966w

**(4)** Sum of the polarization and conductance currents. (PE) 402-1974w

**current amplification (1)** The ratio of the output current to the cathode current due to photoelectric emission at constant electrode voltages. *Notes:* 1. The term output current and photocathode current as here used does not include the dark current. 2. This characteristic is to be measured at levels of operation that will not cause saturation. *See also:* phototube. (ED/NPS) 161-1971w, 398-1972r

**(2) (magnetic amplifier)** The ratio of differential output current to differential control current. (MAG) 107-1964w

**(3)** The ratio of the signal output current to the current applied to the input. *See also:* amplifier. (ED) [45]

**current, anode** *See:* electrode current.

**current attenuation** Either a decrease in signal current magnitude, in transmission from one point to another, or the process thereof, or of a transducer, the scalar ratio of the signal input current to the signal output current. *Note:* By incorrect extension of the term "decibel," this ratio is sometimes expressed in decibels by multiplying its common logarithm by 20. It may be correctly expressed in decilogs. *See also:* decibel; attenuation. (SP) 151-1965w

**current, average discharge** *See:* average discharge current.

**current balance ratio** The ratio of the metallic-circuit current or noise-metallic (arising as a result of the action of the longitudinal-circuit induction from an exposure on unbalances outside the exposure) to the longitudinal circuit current or noise-longitudinal in sigma at the exposure terminals. It is expressed in microamperes per milliampere or the equivalent. *See also:* inductive coordination. (EEC/PE) [119]

**current-balance relay** A balance relay that operates by comparing the magnitudes of two current inputs. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**current-balancing device (thyristor)** Device used to achieve satisfactory division of current among parallel connected semiconductor devices, for example, reactor, resistor, impedance. (IA/IPC) 428-1981w

**current-balancing reactor** A reactor used in semiconductor rectifiers to achieve satisfactory division of current among parallel-connected semicondutor diodes. *See also:* reactor. (PE/TR) [57]

**current balancing transformer** *See:* sharing transformer and current balancing transformer.

**current carrier** In a semiconductor, a mobile conduction electron or hole. (AES/SS) 307-1969w

**current-carrying** *See:* energized.

**current-carrying capacity** The maximum current that a contact is able to carry continuously or for a specified period of time. *See also:* contactor. (IA/IAC) [60], [84]

**current-carrying part** A conducting part intended to be connected in an electric circuit to a source of voltage. *Note:* Non-current-carrying parts are those not intended to be so connected. (SWG/NESC/T&D/PE) C2-1997, 516-1995, C37.100-1992, C37.40-1993, C37.30-1971s

**current circuit (1) (ac high-voltage circuit breakers)** That part of the synthetic test circuit from which the major part of the power frequency current is obtained. (SWG/PE) C37.081-1981r, C37.083-1999

**(2) (relays)** An input circuit to that is applied a voltage or a current which is a measure of primary current. (PE/PSR) C37.90.1-1989r

**current clamp (self-commutated converters) (converter circuit elements)** A clamp that limits the current through a semiconductor device. (IA/SPC) 936-1987w

**current comparator (metering)** A device by which the ratio of two currents and the phase angle between them can be measured precisely. *Note:* A common form of current comparator relies on a balance on ampere-turns produced by currents in two or more windings on one or more magnetic cores. (ELM) C12.1-1988

**current compensator (excitation systems for synchronous machines)** An element of the excitation system that acts to compensate for synchronous machine load current effects. *Notes:* 1. Examples are reactive current compensator and active current compensator. A reactive current compensator is a compensator that acts to modify the regulated voltage in accordance with reactive current. An active current compensator is a compensator that acts to modify the regulated voltage in accordance with active current. 2. Historically, terms such as equalizing reactor and cross current compensator have been used to describe the function of a reactive compensator. These terms are deprecated. 3. Reactive compensators are generally applied with synchronous machine voltage regulators to obtain reactive current sharing among synchronous machines operating in parallel. They function in the following two ways:

a) Reactive droop compensation is the more common mathod. It creates a droop in synchronous machine terminal voltage proportional to reactive current and equivalent to that which would be produced by the insertion of a reactor between the synchronous machine terminals and the paralleling point.

b) Reactive differential compensation is used where droop in synchronous machine voltage is not wanted. It is obtained by a series differential connection of the various synchronous machine, current transformer secondaries, and reactive compensators. The difference current for any synchronous machine from the common series current creates a compensating voltage in the input to the particular synchronous machine voltage regulator which acts to modify the synchronous machine excitation to reduce to minimum (zero) its differential reactive current.

4. Line drop compensators modify synchronous machine terminal voltage by regulator action to compensate for the impedance drop from the machine terminals to a fixed point in the external circuit. Action is accomplished by insertion of a voltage equivalent to the impedance drop within the regulator input circuit. The voltage drops of the resistance and reactance portions of the impedance are obtained, respectively, by an active compensator and a reactive compensator. (PE/EDPG) 421.1-1986r

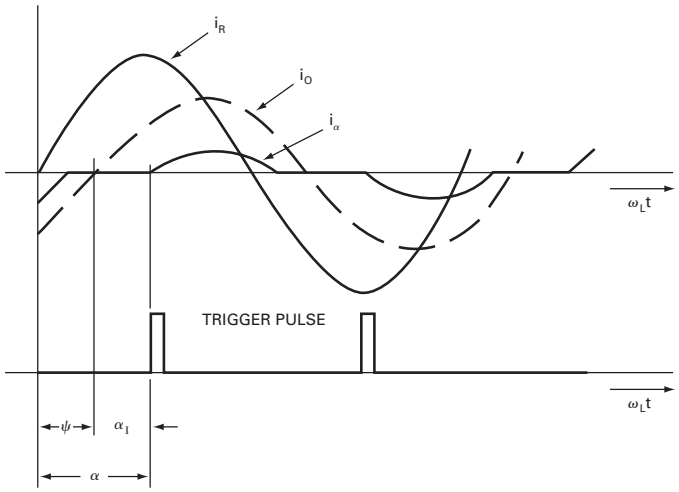
**current, conduction** *See:* conduction current.

**current crest factor** The ratio of the peak value of lamp current to the root-mean-square value of lamp current. (EEC/LB) [97]

**current cutoff (power supplies)** An overload protective mechanism designed into certain regulated power supplies to reduce the load current automatically as the load resistance is reduced. This negative resistance characteristic reduces overload dissipation to negligible proportions and protects sensitive loads. (AP/ANT) [35]

**current cycle loop (substation grounding)** The combination of conductors and connectors that carries the current of the circuit under test. (SUB/PE) 837-1989r

**current delay angle (thyristor)** The interval in electrical angular measure by which the starting instant of conduction is delayed in relation to operation that would occur with contin-




$i_R$ = current in a control element with all control elements continuously gated and a resistive load

NOTE: In the case of a single phase controller $i_R$ is in phase with the line voltage. The latter may be used as a convenient reference voltage to measure $\alpha$

$i_O$ = current in a control element with all control elements continuously gated and at the specified load

$i_\alpha$ = current in a control element with a trigger delay angle of $\alpha$ and at the specified load
$\alpha$ = angle of retard
$\alpha_I$ = current delay angle
$\psi$ = angle between $i_R$ and $i_O$

NOTE: In the case of a single phase controller, $\psi$ is identical with the load power factor angle.

**current delay angle**

uously gated control elements. See $\alpha_I$ of the corresponding figure. (IA/IPC) 428-1981w

**current density (1)** A generic term used where there is no danger of ambiguity to refer either to conduction-current density or to displacement-current density, or to both. (Std100) 270-1966w

**(2)** A vector-point function describing the magnitude and direction of charge flow per unit area. The preferred unit is amperes per square meter ($A/m^2$). (T&D/PE) 1227-1990r

**current derived voltage** A voltage produced by a combination of currents. *Note:* (1) The element used to create this voltage in a pilot system is popularly referred to as a filter. A typical example is a filter that is supplied three-phase currents and produces an output voltage proportional to the symmetrical component content of these currents. (For example, $V_F = K_1 IA_1 + K_2 IA_2 + K_0 IA_0$ where $IA_1$, $IA_2$, and $IA_0$ are the symmetrical components of the $A$ phase current and the $K$ are weighting factors.). (PE/PSR) C37.95-1973s

**current differential relay** A relay designed to detect faults by measuring the current magnitude and phase angle difference between relay terminals of a transmission line. (PE/PSR) C37.113-1999

**current efficiency (specified electrochemical process)** The proportion of the current that is effective in carrying out that process in accordance with Faraday's law. *See also:* electrochemistry. (EEC/PE) [119]

**current extent** *See:* extensional set.

**current generator (signal-transmission system)** A two-terminal circuit element with a terminal current substantially independent of the voltage between its terminals. *Note:* An ideal current generator has zero internal admittance. *See also:* network analysis; signal. (ED) 161-1971w

**current injection method** A synthetic test method in which the voltage circuit is applied to the test circuit breaker before power frequency current zero. (SWG/PE) C37.100-1992, C37.083-1999, C37.081-1981r

**current instance** The package instance whose private data is currently accessible. (C/BA) 1275-1994

**current limit (1)** The maximum output of the battery charger delivered to a discharged battery and load, usually stated as a percentage of output rating and with nominal input voltage supplied to the charger. (IA/PSE) 602-1996

**(2)** A control function that prevents a current from exceeding its prescribed limits. *Note:* Current-limit values are usually expressed as percent of rated-load value. If the current-limit circuit permits the limit value to increase somewhat instead of being a single value, it is desirable to provide either a curve of the limit value of current as a function of some variable such as speed or to give limit values at two or more conditions of operation. (IA/APP/IAC) [69], [60]

**current-limit acceleration (electric drive)** A system of control in which acceleration is so governed that the motor armature current does not exceed an adjustable maximum value. *See also:* electric drive. (IA/ICTL/IAC) [60]

**current-limit control (electric drive)** A system of control in which acceleration, or retardation, or both, are so governed that the armature current during speed changes does not exceed a predetermined value. *See also:* electric drive. (EEC/PE) [119]

**current limiter (protection and coordination of industrial and commercial power systems)** A device intended to function only on fault currents of high magnitude and that may not successfully open on lesser overcurrents regardless of time. Such a device should always be used in series with a fuse, contactor, or circuit breaker to protect against overloads and low-level short circuits. Current limiters are typically added to molded-case circuit breakers, power circuit breakers, or instantaneous circuit protectors. (IA/PSP) 242-1986r

**current limiting, automatic** *See:* automatic current limiting.

**current-limiting characteristic curve** (of a current-limiting fuse) A curve showing the relationship between the maximum peak current passed by a fuse and the correlated root-mean-square available current magnitudes under specified voltage and circuit impedance conditions. *Synonyms:* peak let-

through characteristic curve; cutoff characteristic curve. *See also:* current-limiting fuse.
(SWG/PE) C37.100-1992, C37.40-1993

**current-limiting fuse (protection and coordination of industrial and commercial power systems)** A fuse that will interrupt all available currents above its threshold current and below its maximum interrupting rating, limit the clearing time at rated voltage to an interval equal to or less than the first major or symmetrical loop duration, and limit peak let-through current to a value less than the peak current that would be possible with the fuse replaced by a solid conductor of the same impedance. Note that current-limiting action only becomes effective at a specific value of current. Underwriters Laboratories (UL) only recognizes and permits labeling of Classes G, J, L, R, CC, and T as current limiting, although Class K fuses are, in fact, current limiting. Refer to the National Electrical Code (NEC), Section 240-60b, which prohibits fuse clips for current-limiting fuses accepting noncurrent-limiting fuses. *See also:* threshold current.
(IA/PSP) 242-1986r

**current-limiting fuse unit (1)** A fuse unit that, when its current-responsive element is melted by a current within the fuse's specified current-limiting range, abruptly introduces a high resistance to reduce current magnitude and duration, resulting in subsequent current interruption. *Notes:* 1. The values specified in standards for the threshold ratio, peak let-through current, and $I^2t$ characteristics are used as the measures of current-limiting ability. 2. There are two classes of current-limiting fuse units—power and distribution. They are differentiated from one another by current ratings and minimum melting time-current characteristic.
(SWG/PE) C37.40-1993

**(2)** A fuse unit that, when it is melted by a current within its specified current-limiting range, abruptly introduces a high resistance to reduce the current magnitude and duration. *Note:* There are two classes of current-limiting fuse units—power and distribution. They are differentiated one from the other by current ratings and minimum melting time current characteristics. 2. The values specified in standards for the threshold ratio, peak let-through current, and $I^2t$ characteristics are used as the measures of current-limiting ability.
(SWG/PE) C37.100-1992

**current-limiting overcurrent protective device** A device that, when interrupting currents in its current-limiting range, will reduce the current flowing in the faulted circuit to a magnitude substantially less than that obtainable in the same circuit if the device were replaced with a solid conductor having comparable impedance. (NESC/NEC) [86]

**current-limiting range** (of a current-limiting fuse) That specified range of currents between the threshold current and the rated interrupting current within which current limitation occurs. (SWG/PE) C37.100-1992

**current-limiting reactor (1) (power and distribution transformers)** A reactor intended for limiting the current that can flow in a circuit under short-circuit conditions, or under other operating conditions such as starting, synchronizing, etc. *See also:* reactor. (PE/TR) C57.12.80-1978r, [57]

**(2)** A reactor connected in series with the phase conductors for limiting the current that can flow in a circuit under short-circuit conditions, or under other operating conditions, such as capacitor switching, motor starting, synchronizing, arc stabilization, etc. (PE/TR) C57.16-1996

**current-limiting resistor** A resistor inserted in an electric circuit to limit the flow of current to some predetermined value. *See also:* feedback control system. (EEC/PE/ICTL) [119]

**current loss (electric instruments)** In a voltage-measuring instrument, the value of the current when the applied voltage corresponds to nominal end-scale indication. *Note:* In other instruments it is the current in the voltage circuit at rated voltage. *See also:* accuracy rating. (EEC/AII) [102]

**current margin** The difference between the steady-state currents flowing through a receiving instrument, corresponding, respectively, to the two positions of the telegraph transmitter. *See also:* telegraphy. (EEC/PE) [119]

**current master** *See:* master.

**current of traffic** The movement of trains on a main track in one direction specified by the rules. (EEC/PE) [119]

**current, peak** *See:* peak current.

**current phase-balance protection** A method of protection in which an abnormal condition within the protected equipment is detected by the current unbalance between the phases of a normally balanced polyphase system.
(SWG/PE/PSR) C37.100-1992, C37.90-1978s

**current, polarization** *See:* polarization current.

**current position (A)** The position of the electron beam on a display surface following the most recently executed display command. *Synonym:* beam position. **(B)** A CORE System value that defines the current drawing location in world coordinates. (C) 610.6-1991

**current probe** Used to measure dc, ac, or composite currents. DC current probes should measure dc and composite currents to within ± 1% with a probe calibrator and ± 3% without the calibrator. AC current probes should measure ac currents to within ± 5%. This accuracy should be maintained up to the worst case expected peak current. Proper bandwidth should also be ensured. (PEL) 1515-2000

**current pulsation (rotating machinery)** The difference between maximum and minimum amplitudes of the motor current during a single cycle corresponding to one revolution of the driven load expressed as a percentage of the average value of the current during this cycle. *See also:* asynchronous machine. (PE) [9]

**current, rated** *See:* rated current.

**current rating** (of a relay) The current at specified frequency that may be sustained by the relay for an unlimited period without causing any of the prescribed limitations to be exceeded.
(PE/SWG-OLD/PSR) C37.100-1992, C37.90-1978s

**current rating, 60-hertz (arresters)** A designation of the range of the symmetrical root-mean-square fault currents of the system for which the arrester is designed to operate. *Notes:* 1. An expulsion arrester is given a maximum current rating and may also have a minimum current rating. 2. The designation of the maximum and minimum current ratings of an expulsion arrester not only specifies the useful operating range of the arrester between those extreme values for symmetrical root-mean-square short-circuit current, but indicates that at the point of application of the arrester the root-mean-square short-circuit current for the system should neither be greater than the maximum nor less than the minimum current rating.
(PE/EEC) [119]

**current ratio (series transformer) (mercury lamp)** The ratio of the (root-mean-square) primary current to the root-mean-square secondary current under specified conditions of load.
(EEC/LB) [98]

**current-recovery ratio (arc-welding apparatus)** With a welding power supply delivering current through a short-circuited resistor whose resistance is equivalent to the load setting on the power supply, and with the short-circuit suddenly removed, the ratio of (A) the minimum transient value of current upon the removal of the short-circuit to (B) the final steady-state value is the current-recovery ratio.
(EEC/AWM) [91]

**current regulation (1) (constant-current transformer)** The maximum departure of the secondary current from its rated value, with rated primary voltage at rated frequency applied, and at rated secondary power factor, and with the current variation taken between the limits of a short-circuit and rated load. *Note:* This regulation may be expressed in per unit, or percent, on the basis of the rated secondary current.
(PE/TR) C57.12.80-1978r

**(2) (thyristor)** The method whereby the current is controlled to a specified value. (IA/IPC) 428-1981w

**current relay (1) (general)** A relay that functions at a predetermined value of current. *Note:* It may be an overcurrent, undercurrent, or reverse-current relay. *See also:* relay. (EI) 1-1978s

**(2)** A relay that responds to current. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**current-responsive element** (of a fuse) That part with predetermined characteristics, the melting and severance or severances of which initiate the interrupting function of the fuse. *Note:* The current-response element may consist of one or more fusible elements combined with a strain element or other component(s), or both, that affect(s) the current-responsive characteristic. (SWG/PE) C37.100-1992, C37.40-1993

**current ripple (rotating electric machinery)** Current ripple, for the purposes of this standard, is defined as

$$[(I_{max} - I_{min})/(I_{max} + I_{min})] \times 100$$

expressed in percent where $I_{max}$ and $I_{min}$ are the maximum and minimum values of the current waveform, provided that the current is continuous. (PE/EM) 11-1980r

**current-sensing resistor (power supplies)** A resistor placed in series with the load to develop a voltage proportional to load current. A current-regulated direct-current power supply regulates the current in the load by regulating the voltage across the sensing resistor. (AES/PE) [41], [78]

**current sensitivity (nonlinear, active, and nonreciprocal waveguide components) (diode)** The output current developed by a diode detector for a specified load resistance per unit available radio-frequency (rf) input power. It is expressed in mA/mW. (MTT) 457-1982w

**current, short-circuit** *See:* short-circuit current.

**current tap** *See:* plug adapter lampholder.

**current terminals (direct-current instrument shunts)** Those terminals which are connected into the line whose current is to be measured and that will carry the current of the shunt. (PE/PSIM) 316-1971w

**current terminals of instrument shunts (electric power system)** Those terminals that are connected into the line whose current is to be measured and that will carry the current of the shunt. (PE/PSIM) [55]

**current-transformation ratio** The ratio of the rms value of the primary current to the rms value of the secondary current under specified conditions. (PEL/ET) 389-1990

**current transformer (CT) (1)** An instrument transformer that is intended to have its primary winding connected in series with the conductor carrying the current to be measured or controlled. (In window-type cts, the primary winding is provided by the line conductor and is not an integral part of the transformer.). (PE/TR/PSR) C57.13-1993, C57.12.80-1978r, C37.110-1996

**(2) (metering)** An instrument transformer designed for use in the measurement or control of current. *Note:* Its primary winding, which may be a single turn or bus bar, is connected in series with the load. *See also:* continuous thermal current rating factor; phase angle; instrument transformer. (ELM) C12.1-1982s

**current turn-off time (gas tube surge-protective device)** The time required for the arrester to restore itself to a nonconducting state following a period of conduction. This definition applies only to a condition where the arrester is exposed to a continuous specified dc potential under a specified circuit condition. (SPD/PE) C62.31-1987r, C62.32-1981s, [8]

**current-type telemeter** A telemeter that employs the magnitude of a single current as the translating means. (SWG/PE) C37.100-1992

**current window** The block of 24 *r* registers to which the current window pointer (CWP) points. (C/MM) 1754-1994

**current withstand rating** The maximum allowable current, either instantaneous or for a specified period of time, that a device can withstand without damage, or without exceeding the criteria of an applicable safety or performance standard. (IA/PSE) 446-1995

**current working directory** *See:* working directory.

**curriculum** standard A standard that describes the characteristics of a course of study on a body of knowledge that is offered by an educational institution. (C) 610.12-1990

**cursor (1)** A moveable icon or spot of light on the screen of a display device that indicates the currently selected object or character. (C) 610.2-1987

**(2) (computer graphics)** A cross, flashing underscore, or other symbol that represents a position on a display surface. (C) 610.6-1991w

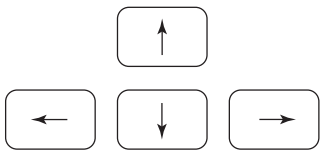
**(3) (A)** In computer graphics, a cross, flashing underscore, or other symbol that represents a position on a graphics display surface. **(B)** A moveable icon or spot of light on the screen of a display device that indicates a particular object or character. **(C)** A moveable mark as in that (A) indicates the position on which the next operation will occur. (C) 610.10-1994

**cursor control** The ability to modify the position of a cursor by explicit commands. (C) 610.2-1987

**cursor control device** An inut device used to control the position of the cursor on a display device. *Synonym:* pointing device. *See also:* paddle; cursor control keypad; mouse; joystick. (C) 610.10-1994w, 610.6-1991w

**cursor control key** Any key on the keyboard that may be used to control a cursor function such as moving the cursor up or down a line. *See also:* home key; carriage return key. (C) 610.10-1994w

**cursor control keypad** A keypad comprising a set of cursor control keys such as in the following diagram of a standard inverted "T" cursor control keypad.



**cursor control keypad**

(C) 610.10-1994w

**cursor position** The line and column position on the screen denoted by the cursor of the terminal. (C/PA) 9945-2-1993

**curvature (coaxial transmission line)** The radial departure from a straight line between any two points on the external surface of a conductor. *See also:* waveguide. (EEC/REWS) [92]

**curvature loss** *See:* macrobend loss.

**curve (A) (computer graphics)** The path traced by a point moving continuously in space. *See also:* arc; closed curve. **(B) (computer graphics)** A finite set of pixels representing a path as in (A). *See also:* closed curve; arc.



**curve**

(C) 610.4-1990

**curve follower** *See:* curve-follower function generator.

**curve-follower function generator (analog computer)** A function generator that operates by automatically following a curve f(x) drawn or constructed on a surface, as the input x varies over its range. (C) 165-1977w

**curve, integrated energy** *See:* integrated energy curve.

**curve, load duration** *See:* load duration curve.

**curve, monthly peak duration** *See:* monthly peak duration curve.

**curve, reservoir operating rule** *See:* reservoir operating rule curve.

**cushion clamp (rotating machinery)** A device for securing the cushion to the supporting member. (PE/EEC) [119]

**cushioning time (speed governing of hydraulic turbines)** The elapsed time during which the (closing) rate of servomotor travel is retarded by the slow closure device. *See also:* slow-closure device. (PE/EDPG/EDPG) 125-1977s, [5]

**customer (1)** The individual or organization that specifies and accepts the project deliverables. The customer may be internal or external to the parent organization of the project, and may or may not be the end user of the software product. A financial transaction between customer and developer is not necessarily implied. (C/SE) 1058.1-1987s

**(2)** The entity or entities for whom the requirements are to be satisfied in the system being defined and developed. This can be an end user of the completed system, an organization within the same company as the developing organization (e.g., System Management), a company or entity external to the developing company, or some combination of all of these. This is the entity to whom the system developer must provide proof that the system developed satisfies the system requirements specified. (C/SE) 1233-1998

**(3)** A person or organization ordering, purchasing, receiving, or affected by a product or process provided by the enterprise. Customers include developers, manufacturers, testers, distributors, operators, supporters, trainers, disposers, and the general public. (C/SE) 1220-1998

**(4) (A)** An individual or organization who specifies the requirements for and formally accepts delivery of a new or modified hardware or software product and its documentation; the customer may or may not be the ultimate user of the system. There are potentially many levels of customers, each with a different level of requirements to satisfy. The customer may be internal or external to the development organization for the project. *See also:* user. **(B)** An individual or organization who acts for the ultimate user of a new or modified hardware or software product to acquire the product and its documentation. *See also:* buyer. (SE/C) 1362-1998

**(5)** The person, or persons, for whom the product is intended, and usually (but not necessarily) who decides the requirements. (C/SE) 1219-1998

**(6)** The purchaser and/or user of a product or service supplied by a service provider or utility. (AMR/SCC31) 1377-1997

**(7)** *See also:* user. (PE/SUB) 1109-1990w

**customer alert (1) (watthour meters)** A switching output used to indicate a time-of-use period. (ELM) C12.13-1985s

**(2) (watthour meters)** A switching output used to indicate events or conditions. (ELM) C12.15-1990

**customer-bank communication terminal (CBCT)** *See:* automated teller machine.

**customer charge (power operations)** The amount paid periodically by a customer without regard to demand or energy consumption. (PE/PSE) 858-1987s, 346-1973w

**customer count** The number of customers or number of meters. The number of customers is the preferred item to count if the counting system is not already in place. (PE/T&D) 1366-1998

**customer generation reserve (power operations)** The operating reserve available through startup of customer generation. (PE/PSE) 858-1987s

**customer load (power operations)** Total of loads including distribution system load and losses but excluding station service, transmission losses, and pumping load. (PE/PSE) 858-1987s

**customer premise equipment (CPE) (1)** Equipment located on the customer's premises that is connected to the telephone line [e.g., telemetry interface units (TIUs), telephones, answering machines, and modems]. (AMR/SCC31) 1390-1995, 1390.2-1999, 1390.3-1999

**(2) (telephone loop performance)** Any equipment connected by customer premises wiring to the customer side of the network interface. (COM/TA) 820-1984r

**(3)** Any equipment connected by customer premises wiring to the customer side of the demarcation point (network interface). (IA/PSE) 1100-1999

**customer premise equipment (CPE) active state** Occurs when the CPE has been alerted and is performing a communication function. (SCC31) 1390.3-1999, 1390.2-1999

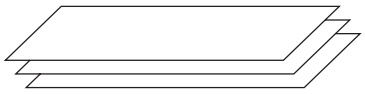
**customer premise equipment (CPE) inactive state** Occurs when the CPE has completed its communication function. (SCC31) 1390.3-1999, 1390.2-1999

**customizing** Modifying, or adding to, the structure of data in the PIN to tailor the general data requirements to an needs of an organization. Customizing can result in an organization-specific data model that should be cross-referenced to the PIN. (PE/EDPG) 1150-1991w

**cut** To duplicate text or graphic objects from the screen to the clipboard and then delete them from the screen. (C) 1295-1993w

**cutback technique (fiber optics)** A technique for measuring fiber attenuation or distortion by performing two transmission measurements. One is at the output end of the full length of the fiber. The other is within 1 to 3 meters of the input end, access being had by "cutting back" the test fiber. *See also:* attenuation. (Std100) 812-1984w

**cut form** A series of individual paper forms that feed into a printing device. *Contrast:* continuous form.



**cut form**

(C) 610.10-1994w

**cut-in loop** A circuit on the roadway energized to automatically cut in the train control or cab signal apparatus on a passing vehicle. (EEC/PE) [119]

**cutoff** *See:* cutoff frequency.

**cutoff angle (illuminating engineering)** (of a luminaire) The angle, measured up from nadir, between the vertical axis and the first line of sight at which the bare source is not visible. (EEC/IE) [126]

**cutoff attenuator** An adjustable length of waveguide used below its cutoff frequency to introduce variable nondissipative attenuation. *See also:* waveguide.

**cutoff calls** Occurs when an established connection is terminated for some reason other than an on-hook by one of the parties. In a switching system, cutoffs can be caused by hardware or software failures, procedural errors, or (in the case of time-division switching systems) digital-signal impairments such as slips, misframes, and errors. The performance measure for cutoff calls is the proportion of cutoff calls to total calls based on a holding time of 3 min. (COM) 973-1990w

**cutoff characteristic** *See:* current-limiting characteristic curve.

**cutoff characteristic curve** *See:* current-limiting characteristic curve.

**cutoff frequency (1) (general)** The frequency that is identified with the transition between a pass band and an adjacent attenuation band of a system or transducer. *Note:* It may be either a theoretical cutoff frequency or an effective cutoff frequency. (SP/PE/MTT/EDPG) 151-1965w, 1050-1996, 146-1980w

**(2) (seismic qualification of Class 1E equipment for nuclear power generating stations)** The frequency in the response spectrum where the zero period acceleration asymptote begins. This is the frequency beyond which the single-degree-of-freedom oscillators exhibit no amplification of motion, and indicate the upper limit of the frequency content of the waveform being analyzed. (PE/NP) 344-1987r

**(3) (planar transmission lines)** For a given mode in a planar transmission line, the frequency below which the mode is not guided by the line. For a shielded transmission line (with a finite cross section), the mode phase constant is very small

compared to the attenuation constant below cutoff, and is zero if the line is nondissipative. For an open transmission line (infinite cross section), the mode is guided above cutoff and radiating below cutoff. (MTT) 1004-1987w

**(4) (nonlinear, active, and nonreciprocal waveguide components)** A figure of merit for a varactor diode. It is the frequency at which Q equals 1. Its relationship to diode series resistance and junction capacitance is given by

$$f_c = \frac{1}{2\pi R_s C_j}$$

where
$f_c$ = cutoff frequency at bias voltage $V_R$
$R_S$ = series resistancce at bias voltage $V_R$
$Cj$ = junction capacitance at bias voltage $V_R$

(MTT) 457-1982w

**(5)** The frequency below which a waveguide fails to transmit a signal in the differential mode. (PE/IC) 1143-1994r

**(6)** The frequency in the response spectrum where the zero period acceleration asymptote begins. This is the frequency beyond which the single-degree-of-freedom oscillators exhibit no amplification of input motion and which indicates the upper limit of the frequency content of the waveform being analyzed. (PE/SUB) 693-1997

**(7)** (of a waveguide) For a given transmission mode in a nondissipative waveguide, the frequency at which the propagation constant is 0.

(PE/MTT/EDPG) 1050-1996, 146-1980w

**cutoff frequency, effective** *See:* effective cutoff frequency.

**cutoff mode (waveguide)** A nonpropagating waveguide mode such that the variation of phase along the direction of the guide is negligible. (MTT) 146-1980w

**cutoff relay (telephony)** A relay associated with a subscriber line, that disconnects the line relay from the line when the line is called or answered. (PE/EEC) [119]

**cutoff voltage (1) (batteries)** The prescribed voltage at which the discharge is considered complete. *Note:* The cutoff or final voltage is usually chosen so that the useful capacity of the battery is realized. The cutoff voltage varies with the type of battery, the rate of discharge, the temperature, and the kind of service. The term cutoff voltage is applied more particularly to primary batteries, and final voltage to storage batteries. (PE/EEC) [119]

**(2) (electron tube)** The electrode voltage that reduces the value of the dependent variable of an electron-tube characteristic to a specified low value. *Note:* A specific cutoff characteristic should be identified as follows: current versus grid cutoff voltage, spot brightness versus grid cutoff voltage, etc. *See also:* electrode voltage. (ED/ED) 161-1971w, [45]

**(3) (magnetrons)** *See also:* critical voltage.

**cutoff waveguide** A waveguide used as a frequency below its cutoff frequency. *See also:* waveguide.

(AP/ANT) [35], [84]

**cutoff wavelength (1)** That wavelength, in free space or in the unbounded guide medium, as specified, above which a traveling wave in that mode cannot be maintained in the guide. *Note:* For $TE_{m,n}$ or $TM_{m,n}$ waves in hollow rectangular cylinders

$$\lambda_c = 2/[(m/a)^2 + (n/b)^2]^{1/2}$$

where $a$ is the width of the waveguide along the $x$ coordinate and $b$ is the height of the waveguide along the $y$ coordinate. *See also:* guided wave; waveguide. (AP/ANT) [35], [84]

**(2) (uniconductor waveguide)** The ratio of the velocity of electromagnetic waves in free space to the cutoff frequency. *See also:* waveguide. (MTT) 146-1980w

**(3) (fiber optics)** That wavelength greater than which a particular waveguide mode ceases to be a bound mode. *Note:* In a single mode waveguide, concern is with the cutoff wavelength of the second order mode. *See also:* mode.

(Std100) 812-1984w

**(4)** (of a waveguide) The free-space wavelength corresponding to the cutoff frequency of the waveguide.

(MTT) 146-1980w

**cut out** The state of being disabled by the conscious use of a cutout device or function. (VT) 1475-1999

**cutout (1) (general)** An electric device used manually or automatically to interrupt the flow of current through any particular apparatus or instrument. (PE/EEC) [119]

**(2)** An assembly of a fuse support with either a fuseholder, fuse carrier, or disconnecting blade. The fuseholder or fuse carrier may include a conducting element (fuse link), or may act as a disconnecting blade by the inclusion of a nonfusible member. *Note:* The term *cutout,* as defined here, is restricted in practice to equipment used on distribution systems. *See also:* distribution; power; distribution cutout; power fuse.

(SWG/PE) C37.100-1992, [56]

**(3)** A device or function whose purpose is deliberately to disable a specified device or function, e.g., "dynamic brake cutout." (VT) 1475-1999

**cutout base** *See:* fuseholder.

**cutout box (interior wiring)** An enclosure designed for surface mounting and having swinging doors or covers secured directly to and telescoping with the walls of the box proper. *See also:* cabinet. (NESC/NEC/EEC/PE) [86], [119]

**cutout loop (railway practice)** A circuit in the roadway that cooperates with vehicle-carried apparatus to cut out the vehicle train control or cab signal apparatus.

(EEC/PE) [119]

**cutout type sectionalizers** A single-phase automatic line sectionalizer that is very similar in outward appearance to a distribution open dropout type fuse cutout and is used in a distribution cutout mounting. (SWG/PE) C37.63-1997

**cut paraboloidal reflector** A reflector that is not symmetrical with respect to its axis. *See also:* antenna.

(AP/ANT) 145-1983s

**cut-section** A location within a block other than a signal location where two adjacent track circuits end.

(EEC/PE) [119]

**cut-set (networks)** A set of branches of a network such that the cutting of all the branches of the set increases the number of separate parts of the network, but the cutting of all the branches except one does not. *See also:* network analysis.

(Std100) 270-1966w

**cut-sheet feed** A mechanism enabling a printer to print on multiple sheets of paper. *See also:* single-sheet feed.

(C) 610.10-1994w

**cutter (audio and electroacoustics)** An electromechanical transducer that transforms an electric input into a mechanical output, that is typified by mechanical motions that may be inscribed into a recording medium by a cutting stylus. *See also:* phonograph pickup. (SP) [32]

**cutter compensation (numerically controlled machines)** Displacement, normal to the cutter path, to adjust for the difference between actual and programmed cutter radii or diameters. (EEC/IA) [74], [61]

**cut-through** A transmission path through the switched telephone network to an end user.

(AMR/SCC31) 1390-1995, 1390.3-1999, 1390.2-1999

**cutting down (electroplating)** Polishing for the purpose of removing roughness or irregularities. *See also:* electroplating.

(PE/EEC) [119]

**cutting stylus (electroacoustics)** A recording stylus with a sharpened tip that, by removing material, cuts a groove into the recording medium. *See also:* phonograph pickup.

(SP) [32]

**CVH** *See:* clocked violation HI.

**CVD** *See:* chemical vapor deposition technique.

**CVL** *See:* clocked violation LO.

**CW** *See:* continuous wave.

**C-weighted sound level** Loudness that is measured with a sound level meter using the C-weighted filter that is built into the sound level meter. The C-weighting has only little depen-

dence on frequency over the greater part of the audible frequency range. (PE/TR) C57.12.90-1999

**cybernetics (1)** A branch of technology concerned with the comparative study of communication and control in living organisms and in machines. (C) 610.2-1987

**(2)** *See also:* system science.

**cycle (1) (A)** An interval of space or time in which one set of events or phenomena is completed. **(B)** Any set of operations that is repeated regularly in the same sequence. The operations may be subject to variations on each repetition. (C) [20], [85]

**(2) (pulse terminology)** The complete range of states or magnitudes through which a periodic waveform or a periodic feature passes before repeating itself identically. (IM/WM&A) 194-1977w

**(3) (A) (data transmission)** An interval of space or time in which one set of events or phenomena is completed; any set of operations that is related regularly in the same sequence. The operations may be subject to variations on each each repetition. **(B) (data transmission)** The complete set of values of a periodic quantity that occurs during a period. *Note:* It is one complete set of positive and negative values of an alternating current. (PE) 599-1985

**(4) (test pattern language)** A complete operation, such as writing or reading, performed by a memory. *Synonym:* period. (TT/C) 660-1986w

**(5) (A) (software)** A period of time during which a set of events is completed. *See also:* software life cycle; software development cycle. **(B) (software)** A set of operations that is repeated regularly in the same sequence, possibly with variations in each repetition; for example, a computer's read cycle. *See also:* pass. (C) 610.12-1990

**(6) (NuBus)** One period of the bus clock, from rising edge to the next rising edge. (C/MM) 1196-1987w

**(7)** A battery discharge followed by a complete recharge. A deep (or full) cycle is described as the removal and replacement of 80% or more of the cell's design capacity. (PE/EDPG) 1184-1994

**(8) (A)** In an ac voltage or current, exactly one complete set of positive and negative values. **(B)** Any set of operations that is repeated regularly in the same sequence. *See also:* machine cycle; instruction cycle; cycle time; read cycle; write cycle. **(C)** To perform, or cause to perform, one set of operations as in definition (B). **(D)** An interval of space or time in which one set of operations as in definition (B) is completed. (C) 610.10-1994

**(9)** The complete series of values of a periodic quantity that occurs during a period. (It is one complete set of positive and negative values of an alternating current.). (IA/MT) 45-1998

®NuBus is a registered trademark of Texas Instruments, Inc.

**cycle counter** *See:* index register.

**cycle life** The number of cycles (discharges and recharges), under specified conditions, that a battery can undergo before failing to meet its specified end-of-life capacity. (PV) 1013-1990, 1144-1996

**cycle master (1)** The node that generates the periodic cycle start. (C/MM) 1394-1995

**(2)** The node that generates the periodic cycle start packet 8000 times a second. (C/MM) 1394a-2000

**cycle of operation (1)** The discharge and subsequent recharge of the cell or battery to restore the initial conditions. *See also:* charge. (EEC/PE) [119]

**(2)** The movement of the LTC from one end of its range to the other and back to its original position. (PE/TR) C57.131-1995

**cycle start** A primary packet sent by the cycle master that indicates the start of an isochronous cycle. (C/MM) 1394-1995

**cycle start packet** A primary packet sent by the cycle master that indicates the start of an isochronous period. (C/MM) 1394a-2000

**cycle stealing** The process of suspending the operation of a central processing unit for one or more cycles to permit the occurrence of other operations, such as transferring data from main storage in response to an output request from an input-output controller. (C) 610.10-1994w, 610.12-1990

**cycle termination** The phase of a cycle during which the master terminates the cycle, and slaves acknowledge this termination by establishing the intercycle state of bus signals. (C/MM) 1096-1988w

**cycle time** The minimum amount of time between the start of successive read or write cycles of a storage device. *See also:* write cycle time; read cycle time. (C) 610.10-1994w

**cyclically magnetized condition** A condition of a magnetic material when, under the influence of a magnetizing force that is a cyclic (but not necessarily periodic) function of time having one maximum and one minimum per cycle, it follows identical hysteresis loops on successive cycles. (Std100) 270-1966w

**cyclic binary code** *See:* Gray code.

**cyclic code** *See:* Gray code.

**cyclic code error detection (power-system communication)** The process of cyclically computing bits to be added at the end of a word such that an identical computation will reveal a large portion of errors that may have been introduced in transmission. *See also:* digital. (PE) 599-1985w

**cyclic decimal code** A binary code in which sequential decimal digits are represented by four-bit BCD expressions, each of which differs from the preceding expression in one place only. *Note:* This is an example of unit-distance code. (C) 1084-1986w

**cyclic duration factor (rotating machinery)** The ratio between the period of loading including starting and electric braking, and the duration of the duty cycle, expressed as a percentage. *See also:* asynchronous machine; direct-current commutating machine. (PE) [9]

**cyclic function** A function that repetitively assumes a given sequence of values at an arbitrarily varying rate. *Note:* That is, if $y$ is a periodic function of $x$ and $x$ in turn is a monotonic nondecreasing function of $t$ , then $y$ is said to be a cyclic function of $t$ . (Std100) 270-1966w

**cyclic irregularity (rotating machinery)** The periodic fluctuation of speed caused by irregularity of the prime-mover torque. *See also:* direct-current commutating machine; asynchronous machine. (PE) [9]

**cyclic permuted code** *See:* unit-distance code.

**cyclic redundancy (check) code** Defined for some digital transmission formats (usually stated with the number of bits in the code; e.g., CRC6, CRC9, etc.). The CRC is the result of a calculation carried out on the set of transmitted bits by the transmitter. The CRC is encoded into the transmitted signal with the data. At the receiver, the calculation creating the CRC may be repeated, and the result compared to that encoded in the signal. The calculations are chosen to optimize the error detection capability. (COM/TA) 1007-1991r

**cyclic redundancy check (CRC) (1)** A form of error check used to ensure the accuracy of transmitting a message. *Note:* The CRC is the result of a calculation carried out on the set of transmitted bits by the transmitter. The CRC is encoded into the transmitted signal with the data. At the receiver, the calculation creating the CRC may be repeated, and the result compared to that encoded in the signal. The calculations are chosen to optimize the error detection capability. *Contrast:* parity check; parity. *See also:* frame check sequence; frame check sequence error. (C) 610.7-1995

**(2)** An error-detection scheme that checks the integrity of a transmitted message for errors introduced during transmission. (PE/SUB) 1379-1997

**(3)** The result of a calculation carried out on the octets within an IrLAP frame; also called a frame check sequence. The CRC is appended to the transmitted frame. At the receiver, the calculation creating the CRC may be repeated, and the

result compared to that encoded in the signal. *Synonym:* frame check sequence. (EMB/MIB) 1073.3.2-2000

**cyclic search** A storage allocation technique in which each search for a suitable block of storage begins with the block following the one last allocated. (C) 610.12-1990

**cyclic shift (1)** An operation that produces a word whose characters are obtained by a cyclic permutation of the characters of a given word. (C) 162-1963w, 270-1966w
**(2)** A shift in which the data moved out of one end of the storing register are reentered into the other end, as in a closed loop. *See also:* circulating register. (C) [20], [85]
**(3)** *See also:* circular shift. (C) 1084-1986w

**cyclic storage** *See:* circulating storage.

**cycling** The repeated charge/discharge cycle of a storage battery. Some batteries are rated by their ability to withstand repeated, deep discharge cycles. (PE/EDPG) 1184-1994

**cyclize** To drive a tester, data must be provided in uniform, consistent, repeatable collections. These collections are termed "cycles" or "tester cycles." The process of constructing these collections, generally from simulation environments, is called "cyclizing." (C/TT) 1450-1999

**cycloconverter/synchroconverter** A converter using controlled rectifier or transistor devices that has the capability of adjusting the frequency and proportional voltage of the output waveform to provide speed control of motors. (IA/MT) 45-1998

**cyclometer register** A set of four or five wheels numbered from zero to nine inclusive on their edges, and so enclosed and connected by gearing that the register reading appears as a series of adjacent digits. *See also:* watthour meter. (EEC/PE) [119]

**cyclotron** A device for accelerating positively charged particles (for example, protons, deuterons, etc.) to high energies. The particles in an evacuated tank are guided in spiral paths by a static magnetic field while they are accelerated many times by an electric field of mixed frequency. (ED) [45]

**cyclotron frequency** *See:* gyro-frequency.

**cyclotron-frequency magnetron oscillations** Those oscillations whose frequency is substantially the cyclotron frequency. (ED) 161-1971w

**cyclotron, frequency-modulated** *See:* frequency-modulated cyclotron.

**cylinder** In an assembly of magnetic disks, the set of all tracks that can be accessed by all the magnetic heads at a given fixed position. (C) 610.10-1994w

**cylindrical antenna*** *See:* cylindrical dipole; cylindrical array.
* Deprecated.

**cylindrical array** A two-dimensional array of elements whose corresponding points lie on a cylindrical surface. (AP/ANT) 145-1993

**cylindrical dipole (antenna)** A dipole, all of whose transverse cross sections are the same, the shape of a cross section of a cylinder being circular. (AP/ANT) 145-1993

**cylindrical reflector** A reflector that is a portion of a cylindrical surface. *Note:* The cylindrical surface is usually parabolic, although other shapes may be employed. (AP/ANT) 145-1993

**cylindrical-rotor generator** An alternating-current generator driven by a high-speed turbine (usually steam) and having an exciting winding embedded in a cylindrical steel rotor. (PE) [9]

**cylindrical wave** A wave whose equiphase surfaces form a family of coaxial cylinders. (AP/PROP) 211-1997

**CYPHERTEXT** A text-formatting language commonly used for typesetting. (C) 610.13-1993w

**cytac (navigation aid terms)** The designation of loran C in an earlier stage of development. (AES/GCS) 172-1983w

# M

**m** *See:* milli.

**M** *See:* mega.

**MA** *See:* module address.

**MAC** *See:* medium access control.

**MAC address** An address that identifies a particular medium access control (MAC) sublayer service access point (SAP). (LM/C) 8802-6-1994

**MAC frame (1)** Except where explicitly stated otherwise, a MAC frame conveying MAC user data across a LAN, or a representation of such a MAC frame within a MAC Bridge or on the non-LAN communications equipment of a Remote Bridge Group. (C/LM) 802.1G-1996

**(2)** A token ring frame containing a MAC PDU exchanged between MAC entities used to convey information that is used by the MAC protocol or management of the MAC sublayer. (C/LM) 8802-5-1998

**(3)** The logical organization of control and data fields (e.g., addresses, data, error check sequences) defined for the MAC sublayer. The MAC frame may be constructed in either ISO/IEC 8802-3 or ISO/IEC 8802-5 format. *See also:* framelocal area networks. (C) 8802-12-1998

**machine (1) (general)** An article of equipment consisting of two or more resistant, relatively constrained parts that, by a certain predetermined intermotion, may serve to transmit and modify force, motion, or electricity so as to produce some given effect or transformation or to do some desired kind of work. *Notes:* 1. If a matrix has as its elements impedances, it is usually referred to as impedance matrix. Frequently the impedance matrix is called impedance for short. 2. Usually such impedances are defined with the mechanical angular velocity of the machine at steady state. *See also:* asynchronous machine. (PE) [9], 270-1966w

**(2) (sound measurements)** Any rotating electrical device of which the acoustical characteristics are to be measured. *Notes:* 1. A small machine has a maximum linear dimension of 250 mm. This dimension is over major surfaces, excluding minor surface protuberances as well as shaft extension, and is measured either parallel to the shaft, or at right angles to it, according to which dimension gives the greater measurement. 2. A medium machine has a maximum linear dimension from 250 mm to 1 m as measured for small machine. 3. A large machine has a maximum linear dimension in excess of 1 m as measured for small machine.

**(3)** A generic term for a device such as a processor or computer. (C) 610.10-1994w

**(4) (computers)** *See also:* universal Turing machine; Turing machine.

**machine address** *See:* absolute address.

**machine-aided** Pertaining to a process or function performed with the assistance of one or more computers. (C) 610.2-1987

**machine-aided translation** Translation from one natural language to another, with the assistance of computer based aids such as automated lexicons and automated thesauri. *Synonym:* machine translation. *See also:* mechanical translation. (C) 610.2-1987

**machine, aircraft electric** *See:* aircraft electric machine.

**machine-centered simulation** *See:* computer simulation.

**machine check (A)** An automatic check. **(B)** A programmed check of machine functions. *See also:* automatic; check. (C) 162-1963

**machine code (1) (computers)** An operation code that a machine is designed to recognize. (MIL/C) [2], [20], [85]

**(2) (software)** Computer instructions and data definitions expressed in a form that can be recognized by the processing unit of a computer. *Contrast:* compiler code; interpretive code; assembly code. *See also:* computer instruction code. (C) 610.12-1990, 610.10-1994w

**machine current** The rms magnitude of the fundamental sinusoidal current at the terminals of the machine. (IA/ID) 995-1987w

**machine cycle** The time required for a processor to perform one internal operation, excluding those which may be accomplished in parallel. *Synonym:* microcycle. (C) 610.10-1994w

**machine-dependent** Pertaining to software that relies on features unique to a particular type of computer and therefore executes only on computers of that type. *Contrast:* machine independent. (C) 610.12-1990

**machine, electric** *See:* electric machine.

**machine equation** *See:* computer equation.

**machine final-terminal stopping device (elevators)** A final-terminal stopping device operated directly by the driving machine. *Synonym:* stop-motion switch. *See also:* control. (EEC/PE) [119]

**machine independent** Pertaining to software that does not rely on features unique to a particular type of computer, and therefore executes on computers of more than one type. *Contrast:* machine-dependent. *See also:* portability. (C) 610.12-1990

**machine instruction (1) (computers)** An instruction that a machine can recognize and execute. (MIL/C) [2], [20], [85]

**(2)** An instruction in the machine language of a particular processing unit of a computer. *See also:* computer instruction; machine code. (C) 610.10-1994w

**machine instruction set** *See:* computer instruction set.

**machine language (1) (A)** A language, occurring within a machine, ordinarily not perceptible or intelligible to persons without special equipment or training. **(B)** A translation or transliteration of definition (A) above into more conventional characters but frequently still not intelligible to persons without special training. (C) 162-1963

**(2) (software)** A language that can be recognized by the processing unit of a computer. Such a language usually consists of patterns of 1's and 0's, with no symbolic naming of operations or addresses. *Synonyms:* machine-oriented language; first-generation language. *Contrast:* symbolic language; assembly language; fifth generation language; fourth generation language; high-order language. (C) 610.12-1990

**(3)** A programming language that is directly executed by the central processing unit (CPU) portion of a computer. *Note:* No further translation, mapping, or decoding is required. *Synonyms:* machine-oriented language; first-generation language. *Contrast:* symbolic language; assembly language; fifth generation language; fourth generation language; high-order language. (C) 610.13-1993w

**(4)** A programming language that is directly executed by the ALU portion of the processor in a computer. *Synonym:* hardware language. (C) 610.10-1994w

**machine operation** *See:* computer operation.

**machine-oriented language (1) (A) (test, measurement, and diagnostic equipment)** A language designed for interpretation and use by a machine without translation. **(B) (test, measurement, and diagnostic equipment)** A system for expressing information which is intelligible to a specific machine; for example, a computer or class of computers. Such a language may include instructions which define and direct machine operations, and information to be recorded by or acted upon by these machine operations. **(C) (test, measurement, and diagnostic equipment)** The set of instructions expressed in the number system basic to a computer, together with symbolic operation codes with absolute addresses, relative addresses, or symbolic addresses. *Synonym:* assembly language; machine language. (MIL) [2]

**(2) (software)** *See also:* machine language. (C) 610.12-1990

**machine or transformer thermal relay (power system device function numbers)** A relay that functions when the temperature of a machine armature or other load-carrying winding or element of a machine or the temperature of a power rectifier or power transformer (including a power rectifier transformer) exceeds a predetermined value. (SUB/PE) C37.2-1979s

**machine positioning accuracy, precision, or reproducibility (numerically controlled machines)** Accuracy, precision, or reproducibility of position sensor or transducer and interpeting system, the machine elements, and the machine positioning servo. *Note:* Cutter, spindle, and work deflection, and cutter wear are not included. (May be the same as control positioning accuracy, precision, or reproducibility in some systems.) (IA/EEC) [61], [74]

**machine readable** Pertaining to data in a form that can be automatically input to a computer; for example, data encoded on a diskette. (C) 610.12-1990

**machine-readable (A)** Pertaining to a medium that can record information and convey it to a machine or sensing device. *Synonym:* machine-sensible. **(B)** Pertaining to information that can be read and processed by a machine. (C) 610.10-1994

**MAchine-Readable Cataloging** In library automation, an internationally-accepted standard for systems used to create catalogs of machine-readable bibliographic records. *Synonyms:* LCMARC; LC-MARC. (C) 610.2-1987

**machine-readable medium (1)** A data medium that is machine-readable. *Synonym:* automated data medium. (C) 610.5-1990w

**(2)** A data medium that can be used to convey data. (C) 610.10-1994w

**machine recognition** *See:* pattern recognition.

**machine ringing (telephone switching systems)** Ringing that once started continues automatically, rhythmically until the call is answered or abandoned. (COM) 312-1977w

**machinery control room** An enclosed or separated space generally located within the machinery spaces that functions as a central control station. (IA/MT) 45-1998

**machinery spaces** Spaces that are primarily used for machinery of any type, or equipment for the control of such machinery, such as boiler, engine, generator, motor, pump and evaporator rooms. (IA/MT) 45-1998

**machine-sensible** *See:* machine-readable.

**machine simulation** A simulation that is executed on a machine. *See also:* computer simulation. (C) 610.3-1989w

**machine time** *See:* time.

**machine-tool control transformers (power and distribution transformers)** Step-down transformers which may be equipped with fuse or other overcurrent protection device, generally used for the operation of solenoids, contactors, relays, portable tools, and localized lighting. (PE/TR) C57.12.80-1978r

**machine translation (MT)** *See:* machine-aided translation.

**machine voltage** The rms value of the fundamental sinusoidal voltage at the terminals of the machine. (IA/ID) 995-1987w

**machine winding (rotating machinery)** A winding placed in slots or around poles directly by a machine. *See also:* rotor; stator. (PE) [9]

**machine word** *See:* word; computer word.

**machining accuracy, precision, or reproducibility** Accuracy, precision, or reproducibility obtainable on completed parts under normal operating conditions. (IA/EEC) [61], [74]

**MACRO** A macro language used in Digital's VAX/VMS environment. (C) 610.13-1993w

**macro (1) (software)** In software engineering, a predefined sequence of computer instructions that is inserted into a program, usually during assembly or compilation, at each place that its corresponding macroinstruction appears in the program. (C) 610.12-1990

**(2)** In word processing, a predefined sequence of text and text formatting commands collected under a single user-defined name. Each time the name is entered, it is automatically replaced by the sequence of text and commands. (C) 610.2-1987

**(3)** A defined procedure or sequence of operations or characters that is inserted in the procedure each time its name is invoked. (SCC20) 771-1998

**macroassembler** An assembler that includes, or performs the functions of, a macrogenerator. (C) 610.12-1990

**macrobending (fiber optics)** In an optical waveguide, all macroscopic deviations of the axis from a straight line; distinguished from microbending. *See also:* microbend loss; macrobend loss; microbending. (Std100) 812-1984w

**macrobend loss (fiber optics)** In an optical waveguide, that loss attributable to macrobending. Macrobending usually causes little or no radiative loss. *Synonym:* curvature loss. *See also:* macrobending; microbend loss. (Std100) 812-1984w

**macro definition** *See:* macro.

**macro generating program** *See:* macrogenerator.

**macrogenerator** A routine, often part of an assembler or compiler, that replaces each macroinstruction in a source program with the predefined sequence of instructions that the macroinstruction represents. *Synonym:* macro generating program. (C) 610.12-1990

**macroinstruction (1) (software)** A source code instruction that is replaced by a predefined sequence of source instructions, usually in the same language as the rest of the program and usually during assembly or compilation. *See also:* macro; macrogenerator. (C) 610.12-1990, 610.10-1994w

**(2) (computers)** An instruction in a source language that is equivalent to a specified sequence of machine instructions. (C) [20], [85]

**macro language** A language used to define macros or macroinstructions. *Note:* IEEE Std 610.12-1990 defines terminology relating to macroinstructions. (C) 610.13-1993w

**macro library** A collection of macros available for use by a macrogenerator. *See also:* system library. (C) 610.12-1990

**macroprocessor (software)** A routine or set of routines provided in some assemblers and compilers to support the definition and use of macros. (C) 610.12-1990

**macroprogramming** Computer programming using macros and macroinstructions. (C) 610.12-1990

**MAC service** The unconfirmed connectionless-mode MAC service defined in ISO/IEC 10039, as an abstraction of the features common to a number of specific MAC services for Local Area Networks. (C/LM) 802.1G-1996

**MAC service data unit (MSDU)** The user data unit received in an MA-UNITDATA request for transfer by the medium access control (MAC) sublayer. (LM/C) 8802-6-1994

**MAC sublayer** *See:* medium access control sublayer.

**MACSYMA** An interactive programming system used to perform formal algebraic manipulation and symbolic mathematics. (C) 610.13-1993w

**MAD** *See:* minimum approach distance; Michigan Algorithmic Decoder.

**MADCAP** An extensible language used to perform numerical computation and set-theoretic operations, using input and output devices that permit two-dimensional input and output. (C) 610.13-1993w

**mag card** A colloquial reference to magnetic card. (C) 610.10-1994w

**magic tee** *See:* hybrid tee.

**magner (polyphase circuit)** At the terminals of entry into a delimited region, the algebraic sum of the reactive power for the individual terminals of entry when the the voltages are all determined with respect to the same arbitrarily selected common reference point in the boundary surface (which may be the neutral terminal of entry). The reference direction for the currents and the reference polarity for the voltages must be the same as for the instantaneous power and the active power.

The reactive power for each terminal entry is determined by considering each conductor and the common reference point as a single-phase two-wire circuit and finding the reactive power for each in accordance with the definition of **magner (single-phase two-wire circuit)**. If the voltages and currents are sinusoidal and of the same period, the reactive power $Q$ for a three-phase circuit is given by

$$Q = E_a I_a \sin(\alpha_a - \beta_a) + E_b I_b \sin(\alpha_b - \beta_b) + E_c I_c \sin(\alpha_c - \beta_c)$$

where the symbols have the same meaning as in **power, instantaneous (polyphase circuit)**. If there is no neutral conductor and the common point for voltage measurement is selected as one of the phase terminals of entry, the expression will be changed in the same way as that for **power, instantaneous (polyphase circuit)**. If both the voltages and currents in the preceeding equations constitute symmetrical polyphase set of the same phase sequence

$$Q = 3E_a I_a \sin(\alpha_a - \beta_a)$$

In general the reactive power $Q$ at the $(m + 1)$ terminals of entry of a polyphase circuit of $m$ phases to a delimited region, when one of the terminals is the neutral terminal of entry, is expressed by the equation

$$Q = \sum_{s=1}^{s=m} \sum_{r=k}^{r=\infty} E_{sr} I_{sr} \sin(\alpha_{sr} - \beta_{sr})$$

where the symbols have the same meaning as in **power, active (polyphase circuit)**. The reactive power can also be stated in terms of the root-mean-square amplitude of the symmetrical components of the voltages and currents as

$$Q = \mathrm{m} \sum_{k=0}^{k=m-1} \sum_{r=k}^{r=\infty} E_{kr} I_{kr} \sin(\alpha_{kr} - \beta_{kr})$$

where the symbols have the same meaning as in **power, active (polyphase circuit)**. When the voltages and currents are quasi- periodic and the amplitudes of the voltages and currents are slowly varying, the reactive power for the circuit of each conductor may be determined for this condition as in **power, reactive (magner) (single-phase two-wire circuit)**. The reactive power for the polyphase circuit is the sum of the reactive power values for the individual conductors. Reactive power is expressed in vars when the voltages are in volts and the currents in amperes. *Note:* The sign of reactive power resulting from the above definition is the opposite of that given by the definition in the 1941 edition of the American Standard Definitions of Electrical Terms. The change has been made in accordance with a recommendation approved by the Standards Committee of the Institute of Electrical and Electronics Engineers, by the American National Standard Institute, and by the International Electrotechnical Commission. (Std100) 270-1966w

**(2) (single-phase two-wire circuit)** At the two terminals of entry of a single-phase two-wire circuit into a delimited region, for the special case of a sinusoidal voltage and a sinusoidal current of the same period, is equal to the product obtained by multiplying the root-mean-square value of the voltage between one terminal of entry and the second terminal of entry, considered as the reference terminal, by the root-mean-square value of the current through the first terminal and by the sine of the angular phase difference by which the voltage leads the current. The reference direction for the current and the reference polarity for the voltage must be the same as for active power at the same two terminals. Mathematically, the reactive power $Q$, for the case of sinusoidal voltage and current, is given by

$$Q = EI \sin(\alpha - \beta)$$

in which the symbols have the same meaning as in **power, instantaneous (two-wire circuit).** For the same conditions, the reactive power $Q$ is also equal to the imaginary part of the product of the phasor voltage and the conjugate of the phasor current, or to the negative of the imaginary part of the product of the conjugate of the phasor voltage and the phasor current. Thus,

$$\begin{aligned} Q &= \mathrm{Im}\mathbf{EI}^* \\ &= -\mathrm{Im}\mathbf{E}^*\mathbf{I} \\ &= \frac{1}{2j}[\mathbf{EI}^* - \mathbf{E}^*\mathbf{I} \end{aligned}$$

in which $\mathbf{E}$ and $\mathbf{I}$ are the phasor voltage and phasor current, respectively, and * denotes the conjugate of the phasor to which it is applied. If the voltage is an alternating voltage and the current is an alternating current, the reactive power for each harmonic component is equal to the product obtained by multiplying the root-mean-square amplitude of that harmonic component of the voltage by the root-mean-square amplitude of the same harmonic component of the current and by the sine of the angular phase difference by which that harmonic component of the voltage leads the same harmonic component of the current. Mathematically, the reactive power of the $r$ th harmonic component of $Q_r$ is given by

$$\begin{aligned} Q_r &= E_r I_r \sin(\alpha_r - \beta_r) \\ &= Im\mathbf{E}_r\mathbf{I}_r^* \\ &= \frac{1}{2j}[\mathbf{E}_r\mathbf{I}_r^* - \mathbf{E}_r^*\mathbf{I}_r] \\ &= -\mathrm{Im}\mathbf{E}_r^*\mathbf{I}_r \end{aligned}$$

in which the symbols have the same meaning as in **power, instantaneous (two-wire circuit)** and **power, active (single-phase two-wire circuit) (average power) (power)**. The reactive power at the two terminals of entry of a single-phase two- wire circuit into a delimited region, for an alternating voltage and current, is equal to the sum of the values of reactive power for every harmonic component. Mathematically, the reactive power $Q$ for an alternating voltage and current, is given by

$$\begin{aligned} Q &= Q_1 + Q_2 + Q_3 + Q_4 + \ldots + Q_r + \ldots \\ &= E_1 I_1 \sin(\alpha_1 - \beta_1) + E_2 I_2 \sin(\alpha_2 - \beta_2) + \ldots \\ &= \sum_{r=1}^{r=\infty} Q_r = \sum_{r=1}^{r=\infty} E_r I_r \sin(\alpha_r - \beta_r) \end{aligned}$$

in which the symbols have the same meaning as in **power, instantaneous (two-wire circuit)**. If the voltage and current are quasi-periodic functions of the form given in **power, instantaneous (two-wire circuit)** and the amplitudes are slowly varying, so that each may be considered to be constant during any one period, but to have slightly different values in successive periods, the reactive power at any time $t$ may be taken as

$$Q = \sum_{r=1}^{r=\infty} E_r(t) I_r(t) \sin(\alpha_r - \beta_r)$$

by analogy with the expression for active power. When the reactive power is positive, the direction of flow of quadergy is in the reference direction of energy flow. Because the reactive power for each harmonic may have either sign, the direction of the reactive power for a harmonic component may be the same as or opposite to the direction of the total reactive power. The value of reactive power is expressed in vars when the voltage is in volts and the current in amperes. *Notes:* 1. The sign of reactive power resulting from the above definition is the opposite of that given by the definition in the 1941 edition of the American Standard Definitions of Electrical Terms. The change has been made in accordance with a recommendation approved by the Standards Committee of the Institute of Electrical and Electronics Engineers, by the American National Standards Institute, and by the Electrotechnical Commission. 2. Any designation of positive reactive power as inductive reactive power is deprecated. If the reference direction is from the generator toward the load, reactive power is positive if the load is predominantly inductive and negative if the load is predominantly capacitive. Thus a

capacitor is a source of quadergy and an inductor is a consumer of quadergy. Designations of two kinds of reactive power are unnecessary and undesirable. (Std100) 270-1966w

**(3)** The product of voltage and the component of alternating current that is 90° out of phase with it. In a passive network reactive power represents the energy that is exchanged alternatively between a capacitive and an inductive storage medium. (CAS) [13]

**magnesium cell** A primary cell with the negative electrode made of magnesium or its alloy. *See also:* electrochemistry. (EEC/PE) [119]

**magnet** A body that produces a magnetic field external to itself. (Std100) 270-1966w

**magnet, focusing** *See:* focusing magnet.

**magnetic (1)** Pertaining to any form of storage medium in which patterns of magnetization are used to store or represent information; for example, magnetic storage, or a magnetic delay line. (C) 610.10-1994w

**(2)** (as applied to a switching device) A term indicating that interruption of the circuit takes place between contacts separable in an intense magnetic field. *Note:* With respect to contactors, this term indicates the means of operation. (SWG/PE) C37.100-1992

**magnetic air circuit breaker** *See:* circuit breaker; magnetic; air circuit breaker.

**magnetically shielded type instrument** An instrument in which the effect of external magnetic fields is limited to a stated value. The protection against this influence may be obtained either through the use of a physical magnetic shield or through the instrument's inherent construction. *See also:* instrument. (EEC/AII) [102]

**magnetic amplifier** A device using one or more saturable reactors, either alone or in combination with other circuit elements, to secure power gain. Frequency conversion may or may not be included. (PE/EM) 43-1974s

**magnetic area moment** *See:* magnetic moment.

**magnetic-armature loudspeaker** A magnetic loudspeaker whose operation involves the vibration of a ferromagnetic armature. (EEC/PE) [119]

**magnetic axis (rotating machinery)** (coil or winding) The line of symmetry of the magnetic-flux density produced by current in a coil or winding, this being the location of approximately maximum flux density, with the air gap assumed to be uniform. *See also:* stator; rotor. (PE) [9]

**magnetic bearing (navigation)** Bearing relative to magnetic north. *See also:* navigation. (AES/RS) 686-1982s, [42]

**magnetic biasing** The simultaneous conditioning of the magnetic recording medium during recording by the superposing of an additional magnetic field upon the signal magnetic field. *Note:* In general, magnetic biasing is used to obtain a substantially linear relationship between the amplitude of the signal and the remanent flux density in the recording medium. *See also:* phonograph pickup; direct-current magnetic biasing; alternating-current magnetic biasing. (SP/MR) [32]

**magnetic bias, relay** *See:* relay magnetic bias.

**magnetic blowout** A magnet, often electrically excited, whose field is used to aid the interruption of an arc drawn between contacts. *See also:* contactor. (IA/ICTL/IAC) [60]

**magnetic brake** A friction brake controlled by electromagnetic means. (IA/ICTL/IAC) [60]

**magnetic-brush development (electrostatography)** Development in which the image-forming material is carried to the field of the electrostatic image by means of ferromagnetic particles acting as carriers under the influence of a magnetic field. *See also:* electrostatography. (ED) [46]

**magnetic bubble memory** *See:* bubble memory.

**magnetic card (1) (computers)** A card with a magnetic surface on which data can be stored by selective magnetization of portions of the flat surface. (C) [20], [85]

**(2)** A card with a magnetic surface that can be used for data storage. (C) 610.10-1994w

**magnetic cell** A storage cell in which patterns of magnetization are used to represent information. *Synonym:* static magnetic cell. (C) 610.10-1994w

**magnetic character** A character that is formed on paper using a special magnetic ink. (C) 610.10-1994w

**magnetic circuit** A region at whose surface the magnetic induction is tangential. *Note:* The term is also applied to the minimal region containing essentially all the flux, such as the core of a transformer. (Std100) 270-1966w

**magnetic compass** A device for indicating the direction of the horizontal component of a magnetic field. *See also:* magnetometer. (EEC/PE) [119]

**magnetic-compass repeater indicator** A device that repeats the reading of a master direction indicator, through a self-synchronous coupling means. (EEC/PE) [119]

**magnetic constant (1) (permeability of free space)** (pertinent to any system of units) The magnetic constant is the scalar dimensional factor that in that system relates the mechanical force between two currents to their magnitudes and geometrical configurations. More specifically, $\mu_0$ is the magnetic constant when the element of force $d\mathbf{F}$ of a current element $I_1 d\mathbf{l}_1$ on another current element $I_2 d\mathbf{l}_2$ at a distance $r$ is given by

$$d\mathbf{F} = \mu_0 I_1 I_2 d\mathbf{l}_1 \times (d\mathbf{l}_2 \times \mathbf{r}_1)/nr^2$$

where $\mathbf{r}_1$ is a unit vector in the direction from $d\mathbf{l}_1$ to $d\mathbf{l}_2$, and $n$ is a dimensionless factor which is unity in unrationalized systems and $4\pi$ in a rationalized system. *Note:* In the centimeter-gram-second (cgs) electromagnetic system, $\mu_0$ is assigned the magnitude unity and the dimension numeric. In the centimeter-gram-second (cgs) electrostatic system, the magnitude of $\mu_0$ is that of $1/c^2$ and the dimension is $[L^{-2}T^2]$. In the International System of Units (SI) $\mu_0$ is assigned the magnitude $4\pi \cdot 10^{-7}$ and has the dimension $[LMT^{-2}I_{-2}]$. (Std100) 270-1966w

**(2) (radio-wave propagation)** *See also:* permeability. (AP/PROP) 211-1990s

**magnetic contactor** A contactor actuated by electromagnetic means. *See also:* contactor. (IA/ICTL/IAC) [60]

**magnetic control relay** A relay that is actuated by electromagnetic means. *Note:* When not otherwise qualified, the term refers to a relay intended to be operated by the opening and closing of its coil circuit and having contacts designed for energizing and/or de-energizing the coils of magnetic contactors or other magnetically operated device. *See also:* relay. (IA/IAC) [60]

**magnetic core (1)** A configuration of magnetic material that is, or is intended to be, placed in a rigid spatial relationship to current-carrying conductors and whose magnetic properties are essential to its use. *Note:* For example, it may be used to concentrate an induced magnetic field as in a transformer, induction coil, or armature; to retain a magnetic polarization for the purpose of storing data; or for its nonlinear properties as in a logic element. It may be made of iron wires, iron oxide, coils of magnetic tape, ferrite, thin film, etc. (C/MIL) 162-1963w, [20], [85], [2]

**(2)** A tiny doughnut-shaped piece of magnetic material used for its non-linear properties to store data in main storage. *Synonym:* memory core. (C) 610.10-1994w

**magnetic coupling** *See:* coupling; electrical coupling.

**magnetic course (navigation)** Course relative to magnetic north. *See also:* navigation. (AES/RS) 686-1982s, [42]

**magnetic deflection (cathode-ray tubes)** Deflecting an electron beam by the action of a magnetic field. *See also:* cathode-ray tube. (ED) [45], [84]

**magnetic delay line** A delay line whose operation is based on the time of propagation of magnetic waves. (C) [20], 610.10-1994w, [85]

**magnetic deviation** Angular difference between compass north and magnetic north caused by magnetic effects in the vehicle. *See also:* navigation. (AES) [42]

**magnetic device (packaging machinery)** A device actuated by electromagnetic means. (IA/PKG) 333-1980w

**magnetic dipole** *See:* Hertzian magnetic dipole.

**magnetic dipole moment (centimeter-gram-second electromagnetic-unit system)** The volume integral of magnetic polarization is often called magnetic dipole moment. *See also:* magnetic polarization. (Std100) 270-1966w

**magnetic direction indicator (MDI)** An instrument providing compass indication obtained electrically from a remote gyrostabilized magnetic compass or equivalent. *See also:* radio navigation. (EEC/PE) [119]

**magnetic disk (1)** A flat circular plate with a magnetic surface on which data can be stored by selective polarization of portions of the flat surface. (C/MIL) 162-1963w, [2], [20], [85]

**(2)** A disk made of plastic or metal that is coated with a magnetizable surface on one or both sides, on which information can be stored. *Contrast:* optical disk. *See also:* magneto-optical disk; diskette; hard disk; platter; floppy disk. (C) 610.10-1994w

**magnetic disk drive** A disk drive that can access a magnetic disk. (C) 610.10-1994w

**magnetic dissipation factor (magnetic material)** The cotangent of its loss angle or the tangent of its hysteretic angle. (Std100) 270-1966w

**magnetic drum (1)** A right circular cylinder with a magnetic surface on which data can be stored by selective polarization of portions of the curved surface. (C/MIL) 162-1963w, [20], [2], [85]

**(2)** A cylinder whose entire surface is coated with a magnetic material on which information can be stored in tracks running the circumference of the cylinder. (C) 610.10-1994w

**magnetic field ($\vec{H}$) (1)** The field surrounding any current-carrying conductor. *See also:* electric field. (PE/IC) 1143-1994r

**(2)** For time harmonic fields in a medium with linear and isotropic magnetic properties, the magnetic flux density divided by the permeability of the medium. (AP/PROP) 211-1997

**magnetic field induction (1) (inductive coupling)** The process of generating voltages and/or currents in a conductive object or electric circuit by means of time-varying magnetic fields. *Notes:* 1. "Magnetic field induction" was formerly called "electromagnetic induction." This usage is now deprecated because electromagnetic induction refers to combined electric and magnetic field effects. 2. "Magnetic field induction" is preferred over "magnetic induction" because the latter is reserved to mean magnetic flux density. (T&D/PE) 1048-1990

**(2) (overhead power lines)** The induction process that results from time-varying quasi-static magnetic fields. *Notes:* 1. "Magnetic field induction" was formerly called "electromagnetic induction". This usage is now deprecated because electromagnetic induction refers to combined electric and magnetic field effects. 2. The term "magnetic field induction" is preferred over "magnetic induction" because the latter may be taken to mean magnetic flux density. *Synonym:* inductive coupling (ground system). *See also:* electromagnetic field induction. (T&D/PE) 539-1990

**(3) (inductive coupling)** The process of generating voltages and/or currents in conductive objects or electric circuits by the induction process that results from time-varying quasi-static magnetic fields. *Notes:* 1. "Magnetic field induction" was formerly called "electromagnetic induction." This usage is now depreciated because electromagnetic induction refers to the combined electric and magnetic field effects. 2. The term "magnetic field induction" is preferred over "magnetic induction" because the latter may be taken to mean magnetic flux density. 3. The fields in the vicinity of a transmission line can be adequately described as an electric field and a magnetic field. Electromagnetic may imply one or both of these fields. There should be no questions as to what is meant when the electric field or the magnetic field is discussed. (T&D/PE) 524a-1993r

**magnetic field integral equation** A Fredholm integral equation of the second kind for the electric current density induced on the surface $S$ of a perfect electric conductor. *Note:* The tangential component of the incident magnetic field acts as the source for the current, hence, the name. The equation is as follows:

$$\vec{J}s = 2\hat{n} \times \vec{H}^i + 2\hat{n} \times \int_{S_0} (\vec{J}_S \times \nabla_0 g) dS_0$$

where

$\hat{n}$ = unit normal to $S$
$\vec{H}^i$ = incident magnetic field
$g = \exp[-jk_0|\vec{r} - \vec{r}_0|]/4\pi|\vec{r} - \vec{r}_0|$
$\vec{J}_s$ = surface current density

(AP/PROP) 211-1997

**magnetic field intensity** *See:* magnetic field strength.

**magnetic field interference** A form of interference induced in the circuits of a device due to the presence of a magnetic field. *Note:* It may appear as common-mode or normal-mode interference in the measuring circuit. *See also:* accuracy rating. (EEC/ERI) [111]

**magnetic field strength ($H$) (1) (magnetizing force)** That vector point function whose curl is the current density and that is proportional to magnetic flux density in regions free of magnetized matter. *Note:* A consequence of this definition is that the familiar formula

$$\mathbf{H} = \frac{1}{4\pi} \int \mathbf{J} \times \nabla(1/r) dv - \frac{1}{4\pi} \nabla \int \mathbf{M} \cdot \nabla (1/r) dv$$

(where $\mathbf{H}$ is the magnetizing force, $\mathbf{J}$ is current density, and $\mathbf{M}$ is magnetization) is a mathematical identity. (Std100) 270-1966w

**(2) (overhead power lines)** A vector quantity, often denoted as $\vec{H}$, related to the magnetic flux density, $\vec{B}$, by:

$$\vec{H} = (\vec{B}/\mu_0) - \vec{M}$$

where $\mu_0$ = the magnetic permeability of free space, $\vec{M}$ = the magnetization of the magnetic medium. In free space, $\vec{M}$ vanishes and the relationship between $\vec{H}$ and $\vec{B}$ becomes

$$\vec{H} = \vec{B}/\mu_0$$

The preferred unit for $\vec{H}$ is amperes per meter (A/m). (T&D/PE) 539-1990

**(3)** The magnitude of a time-varying magnetic field, which, when coupled to a coil, induces a voltage. The unit of magnetic field strength is ampere per meter (A/m). (COM/TA) 1027-1984s

**(4)** The magnitude of the magnetic field vector $\vec{H}$. The units of magnetic field strength are in amperes per meter. *Synonym:* magnetizing force. (AP/PROP) 211-1997

**(5)** A field vector that is equal to the magnetic flux density divided by the permeability of the medium. Magnetic field strength is expressed in units of amperes per meter (A/m). (NIR) C95.1-1999

**magnetic field strength produced by an electric current** (Biot-Savart law and/or Ampere's law) The magnetic field strength, at any point in the neighborhood of a circuit in which there is an electric current $i$, can be computed on the assumption that every infinitesimal length of circuit produces at the point an infinitesimal magnetizing force and the resulting magnetizing force at the point is the vector sum of the contributions of all the elements of the circuit. The contribution, dH, to the magnetizing force at a point $P$ caused by the current $i$ in an element d$s$ of a circuit that is at a distance $r$ from $P$, has a direction $t$ at is perpendicular to both d$s$ and $r$ and a magnitude equal to

$$\frac{i \, \mathrm{ds} \sin \theta}{r^2}$$

where $\theta$ is the angle between the element ds and the line $r$. In vector notation

$$\mathrm{d}H = \frac{i[r \times \mathrm{ds}]}{r^2}$$

This law is sometimes attributed to Biot and Savart, sometimes to Ampere, and sometimes to Laplace, but no one of them gave it in its differential form. (Std100) 270-1966w

**magnetic field vector (A) (radio-wave propagation)** *(any point in a magnetic field).* The magnetic induction divided by the permeability of the medium. **(B) (radio-wave propagation)** In a medium with linear and isotropic magnetic property, the magnetic induction divided by the permeability of the medium. *Synonym:* magnetic vector. *See also:* radio-wave propagation. (AP) 211-1977

**magnetic figure of merit** The ratio of the real part of complex apparent permeability to magnetic dissipation factor. *Note:* The magnetic figure of merit is a useful index of the magnetic efficiency of a material in various electromagnetic devices. (Std100) 270-1966w

**magnetic filling factor** *See:* filling factor.

**magnetic flux ($\phi$) (1)** (through an area) The surface integral of the normal component of the magnetic induction over the area. Thus,

$$\phi_A = \int_A (\mathrm{B} \cdot \mathrm{d}A)$$

where $\phi_A$ is the flux through the area $A$, and **B** is the magnetic induction at the element d$A$ of this area. *Note:* The net magnetic flux through any closed surface is zero. (Std100) 270-1966w

**(2)** A condition in a medium produced by a magnetomotive force such that, when altered in magnitude, a voltage is induced in an electric circuit linked with the flux. (IA/PC) 844-1991

**magnetic flux density ($B$) (1) ($\beta$) (induction motors)** Flux per unit area through an element of area normal to the direction of flux. (IA/PC) 844-1991

**(2) (overhead power lines)** The vector quantity, often denoted as $\vec{B}$, of zero divergence at all points which determines the component of the Coulomb-Lorentz force that is proportional to the velocity of a moving charge. *Notes:* 1. In a zero electric field, the force, $\vec{F}$, is given by

$$\vec{F} = q\vec{v} \times \vec{B}$$

where $\vec{v}$ = the velocity of the electric charge $q$. The vector properties of the field produced by currents in power lines are the same as those given above for the electric field. The preferred unit for the magnitude of the field components is the tesla (T) (1 T = $10^4$ Gauss). 2. For time-varying (ac) fields, values are expressed as their rms values unless stated otherwise. *Synonym:* magnetic field. (T&D/PE) 539-1990

**(3) (magnetic field)** The vector quantity ($B$-field) of divergence zero at all points, which determines the component of the Coulomb-Lorentz force, that is proportional to the velocity of the charge carrier. *Note:* In a zero electric field, the force $F$ is given by $\vec{F} = q\vec{v} \times \vec{B}$, where $\vec{v}$ is the velocity of the electric charge $q$. The vector properties of the field produced by currents in power lines are the same as those given above for the electric field. The magnitudes of the field components are expressed by their rms values in tesla (1T= $10^4$G). (T&D/PE) 644-1994

**(4)** A vector field that acts on moving charges ($q$) such that the force per unit charge ($\vec{F}$) is equal to the vector (cross) product of the velocity ($\vec{v}$) of the particle and $\vec{B}$, the magnetic flux density:

$$\frac{\vec{F}}{q} = \vec{v} \times \vec{B}$$

The units of magnetic flux density are in volt seconds per meter squared. (AP/PROP) 211-1997

**(5)** A field vector quantity that results in a force ($F$) that acts on a moving charge or charges. The vector product of the velocity ($v$) at which an infinitesimal unit test charge, $q$, is moving with $B$, is the force that acts on the test charge divided by $q$.

$$\frac{F}{q} = (v \times B)$$

Magnetic flux density is expressed in units of tesla (T). One tesla is equal to $10^4$ gauss (G). (NIR) C95.1-1999

**magnetic flux density meter (1) (overhead power lines)** A meter designed to measure magnetic flux density. These meters may use any of several types of flux density sensors or probes. *Note:* For measurement of the magnetic flux density from ac power systems, the meter shall conform to IEEE Std 644-1987. (T&D/PE) 539-1990

**(2)** A meter designed to measure the magnetic flux density. *Note:* Several types of meters are in common use, e.g., field meters with air core coil probes, meters with Hall-effect probes, and meters that combine two coils with a ferromagnetic core as in a fluxgate magnetometer. (T&D/PE) 1308-1994

**magnetic flux leakage** That portion of the total magnetic flux in a circuit that does not intercept the material that contains the magnetic flux that is heating. 844-1991

**magnetic focusing (electron beams)** A method of focusing an electron beam by the action of a magnetic field. (BT/ED/AV) [34], [45]

**magnetic friction clutch (coupling) (electric coupling)** A friction clutch (coupling) in which the pressure between the friction surfaces is produced by magnetic attraction. (EM/PE) 290-1980w

**magnetic friction coupling** An electric coupling in which torque is transmitted by means of mechanical friction. Pressure normal to the rubbing surfaces is controlled by means of an electromagnet and a return spring. *Note:* Couplings may be either magnetically engaged or magnetically released depending upon application. (PE) [9]

**magnetic head (1)** A transducer for converting electric variations into magnetic variations for storage on magnetic media, or for reconverting energy so stored into electric energy, or for erasing such stored energy. (SP/MR) [32]

**(2)** A head that can read, write, or erase on a magnetic storage medium. *See also:* erase head; floating head; fixed head; cylinder; access arm. (C) 610.10-1994w

**magnetic heading (navigation)** Heading relative to magnetic north. *See also:* navigation. (AES/RS) 686-1982s, [42]

**magnetic hysteresis (electrical heating systems)** The property of a magnetic material to convert electric energy to heat by virtue of the fact that the magnetic induction for a given magnetizing force depends upon the previous conditions of magnetization. (IA/PC) 844-1991

**magnetic hysteresis loss (A) (magnetic material)** The power expended as a result of magnetic hysteresis when the magnetic induction is periodic. **(B) (magnetic material)** The energy loss per cycle in a magnetic material as a result of magnetic hysteresis when the induction is cyclic (not necessarily periodic). *Note:* Definitions (A) and (B) are not equivalent; both are in common use. (Std100) 270-1966

**magnetic hysteretic angle** The mean angle by which the exciting current leads the magnetizing current. *Note:* Because of hysteresis, the instantaneous value of the hysteretic angle will vary during the cycle; the hysteretic angle is taken to be the mean value. (Std100) 270-1966w

**magnetic induction*** **(1) (signal-transmission system)** The process of generating currents or voltages in a conductor by means of a magnetic field. *See also:* magnetic flux density; signal. (IE) [43]

**(2)** *See also:* magnetic flux density. (AP/PROP) 211-1997

* Deprecated.

**magnetic ink (1)** An ink that contains particles of a magnetic substance whose presence can be detected by magnetic sensors. (C) [85], [20]

**(2)** A special ink containing magnetic particles that can be detected and traced by input devices designed specifically for that purpose. (C) 610.2-1987

**(3)** Special ink that can be read by a magnetic scanner, such as is used on bank checks. *See also:* magnetic character. (C) 610.10-1994w

**magnetic ink character** A character imprinted on a document using magnetic ink. *Synonym:* magnetic character. (C) 610.2-1987

**magnetic ink character reader (MICR)** A character reader that recognizes characters using magnetic ink character recognition. *Contrast:* optical character reader. (C) 610.10-1994w

**magnetic ink character recognition (MICR)** The automatic recognition of magnetic ink characters. *Contrast:* optical character recognition. *See also:* code for magnetic characters. (C) 610.2-1987, 610.10-1994w

**magnetic ink scanner** A scanner that can read magnetic ink characters. (C) 610.10-1994w

**magnetic latching relay (A)** A relay that remains operated from remanent magnetism until reset electrically. **(B)** A bistable polarized (magnetically latched) relay. (PE/EM) 43-1974

**magnetic loading (rotating machinery)** The average flux per unit area of the air-gap surface. *See also:* asynchronous machine. (PE) [9]

**magnetic loss** That contribution to the attenuation constant of a propagating mode on a planar transmission line that represents losses associated with the magnetic properties of the substrates (and overlays) materials involved, which may also include conduction mechanisms. (MTT) 1004-1987w

**magnetic loss angle (1) (core)** The angle by which the fundamental component of the core-loss current leads the fundamental component of the exciting current in an inductor having a ferromagnetic core. *Note:* The loss angle is the complement of the hysteretic angle. (Std100) 270-1966w

**(2)** For a pure sinusoidal wave in a medium with complex permeability $\mu$, the angle defined by the equation

$$f_m = \tan^{-1}\left(\frac{\mu''}{\mu'}\right)$$

where

$\mu''$ = the imaginary part of the complex permeability

$\mu'$ = the real part of the complex permeability

(AP/PROP) 211-1997

**magnetic loss factor, initial (material)** The product of the real component of its complex permeability and the tangent of its magnetic loss angle, both measured when the magnetizing force and the induction are vanishingly small. *Note:* In anisotropic media, magnetic loss factor becomes a matrix. (Std100) 270-1966w

**magnetic loss filling factor** *See:* filling factor.

**magnetic loudspeaker** A loudspeaker in which acoustic waves are produced by mechanical forces resulting from magnetic reactions. (EEC/PE) [119]

**magnetic microphone** *See:* variable-reluctance microphone.

**magnetic microscope** An electron microscope with magnetic lenses. *See also:* electron optics. (ED) [45], [84]

**magnetic mine** A submersible explosive device with a detonator actuated by the distortion of the earth's magnetic field caused by the approach of a mass of magnetic material such as the hull of a ship. (EEC/PE) [119]

**magnetic moment (1) (magnetized body)** The volume integral of the magnetization

$$\mathrm{m} = \int \mathrm{M}dv$$

**(2) (current loop)**

$$\mathrm{m} = I \int \mathrm{n}da = (I/2) \int r \times dr$$

where n is the positive normal to a surface spanning the loop, and r is the radius vector from an arbitrary origin to a point on the loop. *Notes:* 1. The numerical value of the moment of a plane current loop is $IA$, where $A$ is the area of the loop. 2. The reference direction for the current in the loop indicates a clockwise rotation, when the observer is looking through the loop in the direction of the positive normal. 270-1966w

**magnetic north** The direction of the horizontal component of the earth's magnetic field toward the north magnetic pole. *See also:* navigation. (AES/RS) 686-1982s, [42]

**magnetic overload relay** An overcurrent relay the electric contacts of which are actuated by the electromagnetic force produced by the load current or a measure of it. *See also:* relay. (IA/IAC) [60]

**magnetic-particle coupling (1) (electric coupling)** An electric coupling that transmits torque through the medium of magnetic particles in a magnetic field between coupling members. (EM/PE) 290-1980w

**(2)** A type of electric coupling in which torque is transmitted by means of a fluid whose viscosity is adjustable by virtue of suspended magnetic particles. *Note:* The coupling fluid is incorporated in a magnetic circuit in which the flux path includes the two rotating members, the fluid, and a magnetic yoke. Flux density, and hence the fluid viscosity, are controlled through adjustment of current in a magnetic coil linking the flux path. (PE) [9]

**magnetic pickup** *See:* variable-reluctance pickup.

**magnetic-plated wire** A magnetic wire having a core of nonmagnetic material and a plated surface of ferromagnetic material. (SP) [32]

**magnetic-platform influence (electric instruments)** The change in indication caused solely by the presence of a magnetic platform on which the instrument is placed. *See also:* accuracy rating. (EEC/AII) [102]

**magnetic polarization** In the centimeter-gram-second electromagnetic-unit system, the intrinsic induction divided by $4\pi$ is sometimes called magnetic polarization or magnetic dipole moment per unit volume. *See also:* intrinsic induction. (Std100) 270-1966w

**magnetic poles (magnet)** Those portions of the magnet toward which or from which the external magnetic induction appears to converge or diverge, respectively. *Notes:* 1. By convention, the north-seeking pole is marked with N, or plus, or is colored red. 2. The term is also sometimes applied to a fictitious magnetic charge. (Std100) 270-1966w

**magnetic pole strength (magnet)** The magnetic moment divided by the distance between its poles. *Note:* Many authors use the above quantity multiplied by the magnetic constant; the two choices are numerically equal in the centimeter-gram-second electromagnetic-unit system. (Std100) 270-1966w

**magnetic-powder-impregnated tape** A magnetic tape that consists of magnetic particles uniformly dispersed in a nonmagnetic material. *Synonym:* impregnated tape. (SP) [32]

**magnetic power factor** The cosine of the magnetic hysteretic angle (the sine of the magnetic loss angle). (Std100) 270-1966w

**magnetic recorder** Equipment incorporating an electromagnetic transducer and means for moving a magnetic recording medium relative to the transducer for recording electric signals as magnetic variations in the medium. *Note:* The generic term magnetic recorder can also be applied to an instrument that has not only facilities for recording electric signals as magnetic variations, but also for converting such magnetic variations back into electric variations. *See also:* phonograph pickup. (SP) [32]

**magnetic recording (1)** (facsimile) Recording by means of a signal-controlled magnetic field. *See also:* recording. (COM) 168-1956w

**(2)** A method for storing data by selectively magnetizing portions of a magnetizable material. *See also:* nonreturn-to-reference recording; longitudinal magnetic recording; phase-modulation recording; perpendicular magnetic recording; return-to-reference recording. (C) 610.10-1994w

**magnetic recording head** In magnetic recording, a transducer for converting electric currents into magnetic fields, in order to store the electric signal as a magnetic polarization of the magnetic medium. (SP) [32]

**magnetic recording medium** A material usually in the form of a wire, tape, cylinder, disk, etc., on which a magnetic signal may be recorded in the form of a pattern of magnetic polarization. (SP) [32]

**magnetic relay freezing** Sticking of the relay armature to the core as a result of residual magnetism. (EEC/REE) [87]

**magnetic reproducer** Equipment incorporating an electromagnetic transducer and means for moving a magnetic recording medium relative to the transducer, for reproducing magnetic signals as electric signals. (SP) [32]

**magnetic reproducing head** In magnetic recording, a transducer for collecting the flux due to stored magnetic polarization (the recorded signal) and converting it into an electric voltage. (SP) [32]

**magnetic rotation (polarized light)** When a plane polarized beam of light passes through certain transparent substances along the lines of a strong magnetic field, the plane of polarization of the emergent light is different from that of the incident light. *Synonym:* Faraday effect. (Std100) 270-1966w

**magnetic sensitivity (Hall effect devices)** The ratio of the voltage across the Hall terminals to the magnetic flux density for a given magnitude of control current. (MAG) 296-1969w

**magnetic shunt** The section of the core of the ferroresonant transformer that provides the major path for flux generated by the primary winding current that does not link the secondary winding. In addition, the shunts provide a major path for the flux resulting from the output and resonating winding currents that do not link the primary winding. (PEL) 449-1998

**magnetic spectrograph** An electronic device based on the action of a constant magnetic field on the paths of electrons, and used to separate electrons with different velocities. *See also:* electron device. (ED) [84], [46]

**magnetic starter (packaging machinery)** A starter actuated by electromagnetic means. (IA/PKG) 333-1980w

**magnetic storage (1)** A method of storage that uses the magnetic properties of matter to store data by magnetization of materials such as cores, films, or plates, or of material located on the surfaces of tapes, discs, or drums, etc. *See also:* magnetic core; magnetic drum; magnetic tape. (C) 162-1963w
**(2)** Any storage medium that stores data using magnetic properties such as magnetic cores, disks, or tapes. *Contrast:* semiconductor storage. (C) 610.10-1994w

**magnetic storm (1)** A disturbance in the Earth's magnetic field, associated with abnormal solar activity, and capable of seriously affecting both radio and wire transmission. *See also:* radio transmitter. (EEC/PE) [119]
**(2)** A disturbance of the Earth's magnetic field, generally lasting one or more days and characterized by significant changes in the strength of this field. (AP/PROP) 211-1997

**magnetic susceptibility (isotropic medium)** In rationalized systems, the relative permeability minus unity.

$$\kappa = \mu_r - 1 = B_i/\mu_0 H$$

*Notes:* 1. In unrationalized systems, $k = (\mu_r - 1)4\pi$. 2. The susceptibility divided by the density of a body is called the susceptibility per unit mass, or simply the mass susceptibility. The symbol is $\chi$. Thus, $\chi = \kappa/\rho$ where $\rho$ is the density. $\chi$ multiplied by the atomic weight is called the atomic susceptibility. The symbol is $\chi_A$. 3. In anisotropic media, susceptibility becomes a matrix. (Std100) 270-1966w

**magnetic tape (1) (A) (homogeneous or coated)** A tape with a magnetic surface on which data can be stored by selective polarization of portions of the surface. **(B) (homogeneous or coated)** A tape of magnetic material used as the constituent in some forms of magnetic cores. *See also:* coated magnetic tape. (C/MIL) 162-1963, [85], [2]
**(2)** A storage medium made of a flexible plastic ribbon that is coated with magnetic material (such as an iron oxide compound) on which information can be stored. (C) 610.10-1994w

**magnetic tape cartridge** A cartridge holding magnetic tape, on which information can be stored. (C) 610.10-1994w

**magnetic tape cassette** A cassette holding magnetic tape on which information can be stored. *See also:* magnetic tape cartridge. (C) 610.10-1994w

**magnetic tape drive** *See:* tape drive.

**magnetic tape handler (test, measurement, and diagnostic equipment)** A device that handles magnetic tape and usually consists of a tape transport and magnetic tape reader with associated electrical and electronic equipments. Most units provide for tape to be wound and stored on reels; however, some units provide for the tape to be stored loosely in closed bins. (MIL) [2]

**magnetic tape reader (1) (test, measurement, and diagnostic equipment)** A device capable of converting information from magnetic tape where it has been stored as variations in magnetizations into a series of electrical impulses. (MIL) [2]
**(2)** A reader capable of reading information on magnetic tape. (C) 610.10-1994w

**magnetic tape storage** A type of sequential access storage in which information is stored by magnetic recording on the surface of a magnetic tape. (C) 610.10-1994w

**magnetic test coil** A coil that, when connected to a suitable device, can be used to measure a change in the value of magnetic flux linked with it. *Note:* The change in the flux linkage may be produced by a movement of the coil or by a variation in the magnitude of the flux. Test coils used to measure magnetic induction B are often called B coils; those used to determine magnetizing force H may be called H coils. A coil arranged to rotate through an angle of 180 degrees about an axis of symmetry perpendicular to its magnetic axis is sometimes called a flip coil. *See also:* magnetometer. (EEC/PE) [119]

**magnetic thin film (1)** A layer of magnetic material, usually less than 10 000 angstroms thick. *Note:* In electronic computers, magnetic thin films may be used for logic or storage elements. *See also:* coated magnetic tape; magnetic core; magnetic tape. (C) 162-1963w
**(2)** A layer of magnetic material, usually less than one micron thick, applied to a carrier or base for use as storage cells. (C) 610.10-1994w

**magnetic thin film storage** A type of magnetic storage in which information is stored by magnetic recording on a magnetic thin film. (C) 610.10-1994w

**magnetic track braking** A system of braking in which a shoe or slipper is applied to the running rails by magnetic means. *See also:* electric braking. (EEC/PE) [119]

**magnetic variometer** An instrument for measuring differences in a magnetic field with respect to space or time. *Note:* The use of variometer to designate a continuously adjustable inductor is deprecated. *See also:* magnetometer. (EEC/PE) [119]

**magnetic vector (radio-wave propagation)** *See also:* magnetic field vector. (AP) 211-1977s

**magnetic vector potential** An auxiliary solenoidal vector point function characterized by the relation that its curl is equal to the magnetic induction and its divergence vanishes. Curl $\mathbf{A} = \mathbf{B}$, Divergence $\mathbf{A} = \mathbf{0}$. *Note:* These relations are satisfied identically by

$$A = (\mu_0/4\pi)\left[\int \mathbf{M} \times \nabla(1/r)\mathrm{d}v + \int (\mathbf{J}/r)\mathrm{d}v\right]$$

where $v$ is the volume. (Std100) 270-1966w

**magnetization (intensity of magnetization)** (at a point of a body) The intrinsic induction at that point divided by the magnetic constant of the system of units employed:

$$M = B_i/\mu_0 = (B - \mu_0 H)/\mu_0$$

*Note:* The magnetization can be interpreted as the volume density of magnetic moment. (Std100) 270-1966w

**magnetizing current (1)** A hypothetical current assumed to flow through the magnetizing inductance of a transformer. (CHM) [51]

**(2) (rotating machinery)** The quadrature (leading) component (with respect to the induced voltage) of the exciting current supplied to a coil. (PE) [9], 270-1966w

**magnetizing force** *See:* magnetic field strength.

**magnetizing inductance** A hypothetical inductance, assumed to be in parallel with the core-loss resistance, that would store the same amount of energy as that stored in the core for a specified value of excitation. (CHM) [51]

**magnet meter (magnet tester)** An instrument for measuring the magnetic flux produced by a permanent magnet under specified conditions of use. It usually comprises a torque-coil or a moving-magnet magnetometer with a particular arrangement of pole-pieces. *See also:* magnetometer. (PE/EEC) [119]

**magneto** *See:* magnetoelectric generator.

**magneto central office** A telephone central office for serving magneto telephone sets. (COM) [48]

**magnetoelectric generator (electric installations on shipboard)** An electric generator, in which the magnetic flux is provided by one or more permanent magnets. (IA/MT) 45-1983s

**magnetographic printer** A nonimpact printer that creates, by means of magnetic heads operating on a metallic drum, a latent image which is made visible by a toner and transferred and fixed on paper. (C) 610.10-1994w

**magneto-hydrodynamic wave (radio-wave propagation)** A low-frequency wave in an electrically highly conducting fluid (such as a plasma) permeated by a static magnetic field. The restoring forces of the waves are, in general, the combination of a magnetic tensile stress along the magnetic field lines and the compressive stress between the field lines and the fluid pressure (for example, an Alfvén wave). (AP/PROP) 211-1990s

**magneto-ionic medium** An ionized gas that is permeated by a fixed magnetic field. (AP/PROP) 211-1997

**magneto-ionic wave** At a given frequency, either of the two characteristic plane electromagnetic waves that can travel in a homogeneous magneto-ionic medium without change of polarization. *Note:* These characteristic waves are also called the ordinary and extraordinary waves. *See also:* extraordinary wave; ordinary wave. (AP/PROP) 211-1997

**magnetometer** An instrument for measuring the intensity or direction (or both) of a magnetic field or of a component of a magnetic field in a particular direction. *Note:* The term is more usually applied to instruments that measure the intensity of a component of a magnetic field, such as horizontal-intensity magnetometers, vertical-intensity magnetometers, and total-intensity magnetometers. (EEC/PE) [119]

**magnetomotive force** (acting in any closed path in a magnetic field) The line integral of the magnetizing force around the path. (Std100) 270-1966w

**magneto-optic (fiber optics)** Pertaining to a change in a material's refractive index under the influence of a magnetic field. Magneto-optic materials generally are used to rotate the plane of polarization. (Std100) 812-1984w

**magneto-optical disk** A disk that uses optical methods, such as a laser, to record information on a magnetic storage medium. *Synonym:* optically assisted magnetic storage. *See also:* magnetic disk; optical disk. (C) 610.10-1994w

**magnetopause** The transition region between the planetary and the interplanetary magnetic fields. (AP/PROP) 211-1997

**magnetoresistive coefficient (Hall generator)** The ratio at a specified magnetic flux density $B$ of the rate of change of resistance with magnetic flux density to the resistance $R_B$ at the specified magnetic flux density $B$, defined by the equation

$$\alpha_B = \frac{1}{R_B}\frac{dR_B}{dB}$$

(MAG) 296-1969w

**magnetoresistive effect** The change in the resistance of a current-carrying Hall plate when acted upon by a magnetic field. *Notes:* 1. An increase in magnetic field may cause either an increase or a decrease in ferromagnetic and similar Hall plates, whereas there is usually an increase with Hall plates made of other material. 2. There are two factors affecting the changes in resistance: first, a bulk effect due to the characteristics of the Hall plate, and second, a geometric effect due to the shape of the Hall plate and to the presence or absence of shorting bars made of conducting material deliberately, as in the shorting bars plated on some magnetoresistors or the microconductors dispersed in other magnetoresistors or inadvertently, as in the case of the control current electrodes in a Hall generator, added to the current-carrying Hall plate. (MAG) 296-1969w

**magnetoresistive ratio (Hall generator)** The ratio of the resistance $R_B$, at a magnetic flux density $B$, to the resistance $R_0$, at zero magnetic flux density, defined by the equation

$$\alpha_M = \frac{R_B}{R_0}$$

(MAG) 296-1969w

**magnetosphere** The region of a planetary atmosphere where the planetary magnetic field, as modified by the solar wind and the interplanetary magnetic field, controls the motions of charged particles. *Note:* The Earth's magnetosphere includes part of the F region of the terrestrial ionosphere up to the magnetopause. (AP/PROP) 211-1997

**magnetostriction** The phenomenon of elastic deformation that accompanies magnetization. (Std100) 270-1966w

**magnetostriction loudspeaker** A loudspeaker in which the mechanical displacement is derived from the deformation of a material having magnetostrictive properties. (EEC/PE) [119]

**magnetostriction microphone** A microphone that depends for its operation on the generation of an electromotive force by the deformation of a material having magnetostrictive properties. *See also:* microphone. (EEC/PE) [119]

**magnetostriction oscillator** An oscillator with the plate circuit inductively coupled to the grid circuit through a magnetostrictive element, the frequency of oscillation being determined by the magnetomechanical characteristics of the coupling element. *See also:* oscillatory circuit. (AP/ANT) 145-1983s

**magnetostrictive relay** A relay in which operation depends upon dimensional changes of a magnetic material in a magnetic field. *See also:* relay. (EEC/REE) [87]

**magneto switchboard (telephone switching systems)** A telecommunication switchboard for serving magneto telephone sets. (COM) 312-1977w

**magneto telephone set** A local-battery telephone set in which current for signaling by the telephone station is supplied from a local hand generator, usually called a magneto. *See also:* telephone station. (EEC/PE) [119]

**magneto-telluric (M-T)** An adjective denoting natural magnetic and electric fields, and effects produced by them. (COM) 365-1974w

**magneto-telluric current** A current in the Earth associated with time-varying geomagnetic fields. (AP/PROP) 211-1997

**magneto-telluric fields** Electric and magnetic fields induced in the Earth by external time-varying sources that are usually of ionospheric origin. (AP/PROP) 211-1997

**magnetron (induction and dielectric heating)** An electron tube characterized by the interaction of electrons with the electric field of a circuit element in crossed steady electric and magnetic fields to produce alternating-current power output. (IA) 54-1955w

**magnetron injection gun (microwave tubes)** A gun that produces a hollow beam of high total permeance that flows parallel to the axis of a magnetic field. *See also:* magnetron. (ED) [45]

**magnetron oscillator** An electron tube in which electrons are accelerated by a radial electric field between the cathode and one or more anodes and by an axial magnetic field that pro-

vides a high-energy electron stream to excite the tank circuits. *See also:* magnetron. (AP/ANT) 145-1983s

**magnet valve (electric controller)** A valve controlling a fluid, usually air, operated by an electromagnet. *See also:* multiple-unit control. (VT/LT) 16-1955w

**magnet wire (rotating machinery)** Single-strand wire with a thin flexible insulation, suitable for winding coils. *See also:* rotor; stator. (PE) [9]

**magnified sweep (oscilloscopes)** A sweep whose time per division has been decreased by amplification of the sweep waveform rather than by changing the time constants used to generate it. *See also:* oscillograph. (IM/HFIM) [40]

**magnitude (1)** The quantitative attribute of size, intensity, extent, etc., that allows a particular entity to be placed in order with other entities having the same attribute. *Notes:* 1. The magnitude of the length of a given bar is the same whether the length is measured in feet or in centimeters. 2. The word magnitude is used in other senses. The definition given here is the basic one needed for the logical buildup of later definitions. (Std100) 270-1966w

**(2)** The real number indicating the maximum or peak value of a periodically varying quantity. *See also:* amplitude. (AP/PROP) 211-1997

**magnitude characteristic (linear passive networks)** The absolute value of a response function evaluated on the imaginary axis of the complex-frequency plane. (CAS) 156-1960w

**magnitude contours (control system feedback)** Loci of selected constant values of the magnitude of the return transfer function drawn on a plot of the loop transfer function for real frequencies. *Note:* Such loci may be drawn on the Nyquist or inverse Nyquist diagrams, or Nichols chart. *See also:* feedback control system. (PE/EDPG) [3]

**magnitude origin line (pulse terminology)** A line of specified magnitude which, unless otherwise specified, has a magnitude equal to zero and extends through the waveform epoch. (IM/WM&A) 194-1977w

**magnitude parameters and references (pulse terminology)** (Unless otherwise specified, derived from data within the waveform epoch.) *See also:* magnitude reference lines; top magnitude; base magnitude; magnitude reference points. (IM/WM&A) 194-1977w

**magnitude ratio (hydraulic turbines)** The ratio of the peak magnitude of the output signal to the peak magnitude of a constant-frequency constant-amplitude sinusoidal input signal. (PE/EDPG) 125-1977s

**magnitude reference points** *See:* proximal (distal) point; mesial point.

**magnitude reference line (pulse terminology)** A line parallel to the magnitude origin line at a specified magnitude. (IM/WM&A) 194-1977w

**magnitude reference lines (1) (pulse terminology)** The magnitude reference line at the base (top) magnitude. *Synonym:* baseline. *See also:* waveform epoch. (IM/WM&A) 194-1977w

**(2) (percent reference magnitude)** A reference magnitude specified by:

$$(x)\%M_r = M_b + \frac{x}{100}(M_t - M_b)$$

where
$0 < x < 100$
$(x)\%M_r$ = percent reference magnitude
$M_b$ = base magnitude
$M_r$ = top magnitude

$M_b$, $M_t$, and $(x)\%M_r$ are all in the same unit of measurement.

**(3) (proximal line)** (distal) A magnitude reference line at a specified magnitude in the proximal (distal) region of a pulse waveform. Unless otherwise specified, the proximal (distal) line is at the 10 (90) percent reference magnitude. *See also:* waveform epoch.

**(4) (mesial line)** A magnitude reference line at a specified magnitude in the mesial region of a pulse waveform. Unless otherwise specified, the mesial line is at the 50 percent reference magnitude. *See also:* waveform epoch.

**magnitude-referenced point (pulse terminology)** A point at the intersection of a magnitude reference line and a waveform. (IM) 194-1977w

**magnitude-related adjectives (A) (pulse terminology)** Proximal (distal). Of or pertaining to a region near to (remote from) a first state or region of origin. **(B) (pulse terminology)** Mesial. Of or pertaining to region between the proximal and distal regions. (IM/WM&A) 194-1977

**mag tape** A colloquial reference to magnetic tape. (C) 610.10-1994w

**Mahoney map (mathematics of computing)** A diagram used in logic design, simplification, or optimization; invented by Matthew V. Mahoney. *See also:* Karnaugh map; logic map. (C) 1084-1986w

**MAID** *See:* minimum air insulation distance.

**mailbox (1)** A register that maps write data to unit-internal message storage locations. The mapping between registers and message-storage locations is transparent to the one or more producers. A message is sent to a mailbox by performing an atomic block copy of the message bytes to the mailbox register. Following this message write, the mailbox hardware moves the mapping to the next message storage location to prepare for the next message write. (C/MM) 1212.1-1993

**(2)** The mechanism for storing and retrieving intelligent transportation systems (ITS) messages between the back office equipment (BOE) and onboard equipment (OBE). The specific processing mechanisms are defined by the resource manager. (SCC32) 1455-1999

**mailbox service** *See:* electronic mail.

**mail bridge** A bridge that screens mail that is passing between two networks to ensure that the mail items meet administrative constraints. *See also:* learning bridge. (C) 610.7-1995

**mail exploder** The part of an electronic mail delivery system that accepts a piece of mail and a list of addressees as input and sends a copy of the message to each addressee on the list. (C) 610.7-1995

**mail gateway** A device that connects to two or more electronic mail systems, especially dissimilar mail systems on two different networks, and transfers mail messages between them. (C) 610.7-1995

**mail server** On a network, a server that allows users to exchange mail messages. *See also:* file server; disk server; network server; terminal server; database server; print server. (C) 610.7-1995

**mail system gateway** Software that uses the MT interface (the client). (C/PA) 1224.1-1993w

**main (interior wiring)** A feeder extending from the service switch, generator bus, or converter bus to the main distribution center. (EEC/PE) [119]

**main amplifier** (shaping amplifier) The section of amplifier following the preamplifier that contains the pulse-shaping networks (filter networks). These networks optimize the signal-to-noise ratio in the amplifying chain. (NPS) 325-1996

**main anode (pool-cathode tube)** An anode that conducts load current. *Note:* The word main is used only when it is desired to distinguish the anode to which it is applied from an auxiliary electrode such as an excitation anode. It is used only in connection with pool-tube terms. *See also:* electrode. (ED) [45]

**main bang (1) (radar)** A transmitted pulse. (IM/WM&A) 194-1977w

**(2)** The transmitted pulse of a radar, especially its amplitude trace as viewed on an A-display at the start of transmission. (AES) 686-1997

**main bonding jumper** The connection between the grounded circuit conductor and the equipment grounding conductor at the service. (NESC/NEC) [86]

**main capacitance (capacitance potential devices)** The capacitance between the network connection and line. *See also:* outdoor coupling capacitor. 31-1944w

**main circuit** All the conducting parts of the gas-insulated substation assembly included in or connected to the circuits that its switching devices are designed to close or open. (SWG/SUB/PE) C37.122-1983s, C37.122.1-1993, C37.100-1992

**main console** *See:* master console.

**main contacts (1)** For resistance-type LTCs, a set of through current-carrying contacts that have no transition impedance between the transformer winding and the contacts and commutates the current to the main switching contacts without any arc. (PE/TR) C57.131-1995
**(2)** (of a switching device) Contacts that carry all or most of the main current. (SWG/PE/TR) C37.100-1992, C57.12.44-1994

**main control unit** In a processor with more than one instruction control unit, that unit to which, for a given interval of time, the other units are subordinated. (C) 610.10-1994w

**main discharge current wave** The relatively long portion of the ESD current wave that follows the initial current pulse, or that occurs by itself when the initial current pulse does not exist. It may be unidirectional or oscillatory; its initial slope may be fast or slow. (SPD/PE) C62.47-1992r

**main distributing frame (telephone switching systems)** A frame where crossconnections are made between the outside plant and central office equipment. (COM) 312-1977w

**main distribution center** A distribution center supplied directly by mains. *See also:* distribution center. (EEC/PE) [119]

**main distribution frame** *See:* wiring closet.

**main distribution function** *See:* wiring closet.

**main exciter (1) (rotating machinery)** An exciter that supplies all or part of the power required for the excitation of the principal electric machine or machines. *See also:* asynchronous machine. (PE) [9]
**(2) (synchronous machines)** The source of all or part of the field current for the excitation of an electric machine, exclusive of another exciter. (PE/EDPG) 421-1972s

**main exciter response ratio (nominal exciter response)** The numerical value obtained when the response, in volts per second, is divided by the rated-load field voltage, which response, if maintained constant, would develop, in one-half second, the same excitation voltage-time area as attained by the actual exciter. *Note:* The response is determined with no load on the exciter, with the exciter voltage initially equal to the rate-load field voltage, and then suddenly establishing circuit conditions that would be used to obtain nominal exciter ceiling voltage. For a rotating exciter, the response should be determined at the rated speed. This definition does not apply to main exciters having one or more series fields, except a light differential series field, or to electronic exciters. (PE/EEC) [119]

**main file** *See:* master file.

**mainframe (1)** A rigid framework that provides mechanical support for modules inserted into the backplane, ensuring that connectors mate properly and that adjacent modules do not contact each other. It also provides cooling airflow, and ensures that modules do not disengage from the backplane due to vibration or shock. (C/MM) 1155-1992
**(2)** The cabinet that houses the central processor and main storage of a computer system. *Note:* This term is sometimes used as an abbreviation for mainframe computer. (C) 610.10-1994w

**mainframe computer** A computer employing one or more mainframes. *Note:* The distinction between a microcomputer, minicomputer, and mainframe is not yet standardized, however, in 1991 a typical mainframe is IBM's 3090, a typical minicomputer is Digital's VAX, and a typical microcomputer is IBM's PS/2. *See also:* mainframe. (C) 610.10-1994w

**main gap (glow-discharge tubes)** The conduction path between a principal cathode and a principal anode. (ED) 161-1971w

**main ground bus (1)** A conductor or system of conductors that provides for connecting all designated metallic components of the gas-insulated substation to station ground (ground grid). (SWG/PE/SUB) C37.100-1992, C37.122-1983s
**(2)** A conductor or system of conductors provided for connecting all designated metallic components of the gas-insulation substation (GIS) to a substation grounding system. (PE/SUB) 80-2000

**main lead (rotating machinery)** A conductor joining a main terminal to the primary winding. *See also:* asynchronous machine. (PE) [9]

**main lobe** *See:* major lobe.

**main memory** *See:* main storage.

**main model** The top-level unit under test (UUT) model description that includes a list of component packages and a netlist. (SCC20) 1445-1998

**main program** A software component that is called by the operating system of a computer and that usually calls other software components. *See also:* subprogram; routine. (C) 610.12-1990

**main protection** *See:* primary protection.

**main reflector** The largest reflector of a multiple reflector antenna. (AP/ANT) 145-1993

**main ring path** Principal transmission path in the trunk cabling. The main ring path carries the data in the primary direction. *Contrast:* backup path. (C/LM) 8802-5-1998

**mains (1)** The ac power source available at the point of use in a facility. It consists of the set of electrical conductors (referred to by terms including "service entrance," "feeder," or "branch circuit") for delivering power to connected loads at the utilization voltage level. (SPD/PE) C62.48-1995, C62.41-1991r
**(2)** *See also:* primary distribution mains; center of distribution; secondary distribution mains.

**mains coupling coefficient** *See also:* mains decoupling factor.

**mains decoupling factor (mains coupling coefficient)** The ratio of the radio-frequency voltage at the mains terminal to the interfering apparatus to the radio-frequency voltage at the aerial terminals of the receiver. *Note:* Generally expressed in logarithmic units. *See also:* electromagnetic compatibility. (INT) [53], [70]

**main secondary terminals** The main secondary terminals provide the connections to the main secondary winding. *See also:* main secondary winding. 31-1944w

**main secondary winding (capacitance potential devices)** Provides the secondary voltage or voltages on which the potential device ratings are based. *See also:* main secondary terminals. 31-1944w

**mains-interference immunity (mains-interference ratio)** The degree of protection against interference conducted by its supply mains as measured under specified conditions. *Note:* See International Special Committee on Radio Interference recommendation 25.1 and International Electrotechnical Commission publication 69 or subsequent publications where the term "mains-interference ratio" is used. *See also:* electromagnetic compatibility. (INT) [53], [70]

**main station** A telephone station with a distinct call number designation, directly connected to a central office. *See also:* telephone station. (EEC/PE) [119]

**main-station code (telephone switching systems)** The digits designating a main station; these usually follow an office code. (COM) 312-1977w

**main storage** That part of internal storage into which instructions and other data must be loaded for subsequent execution or processing. *Synonyms:* primary storage; main memory. *Contrast:* auxiliary storage. *See also:* real storage; common storage; random-access memory. (C) 610.10-1994w

**main switchgear connections** Those that electrically connect together devices in the main circuit, or connect them to the bus, or both. *Synonym:* primary switchgear connections. (SWG/PE) C37.100-1992

**main switching contacts** For resistance-type LTCs, a set of contacts that has no transition impedance between the transformer winding and the contacts and makes and breaks current. (PE/TR) C57.131-1995

**maintainability (1) (A) (software)** The ease with which a software system or component can be modified to correct faults, improve performance or other attributes, or adapt to a changed environment. *See also:* flexibility; extendability. **(B) (software)** The ease with which a hardware system or component can be retained in, or restored to, a state in which it can perform its required functions. (C) 610.12-1990

**(2)** Ability of an item, under stated conditions of use, to be retained in or restored to a state in which it can perform its required functions, when maintenance is performed under stated conditions and using prescribed procedures and resources. *Note:* Maintainability can, depending on the particular analysis situation, be stated by one or several maintainability characteristics, such as discrete probability distribution, mean active maintenance time, etc. 2. The value of the maintainability characteristic may differ for different maintenance situations. 3. When the term maintainability is used as a maintainability characteristic, it always denotes the probability that the active maintenance is carried out within a given period of time. 4. The required function may be defined as a stated condition. (R) [29]

**(3)** The measure of the ability of an item to be retained in, or restored to, a specified condition when maintenance is performed by personnel having specified skill levels, using prescribed procedures and resources, at each prescribed level of maintenance and repair. (C/BA) 896.3-1993w

**Maintaining, Preparing & Producing Executive Reports (MAPPER)** A nonprocedural programming language for UNIVAC computers, designed for novice users. (C) 610.13-1993w

**maintaining voltage (operating voltage) (glow lamp)** The voltage measured across the lamp electrodes when the lamp is operating. (EEC/EL) [104]

**maintain temperature (1)** Specified temperature of the fluid or process material that the heating system is designed to hold at equilibrium under specified design conditions. (BT/IA/AV/PC) 152-1953s, 844-1991

**(2)** Specified temperature of the fluid or process material that the heat tracing is designed to hold at equilibrium under specified design conditions. (IA) 515-1997

**maintenance (1) (computers)** Any activity intended to keep equipment, programs or a data base in satisfactory working condition, including tests, measurements, replacements, adjustments, and repairs. *See also:* software maintenance; file maintenance. (C) [20], [85]

**(2) (test, measurement, and diagnostic equipment)** Activity intended to keep equipment (hardware) or programs (software) in satisfactory working condition, including tests, measurements, replacements, adjustments, repairs, program copying, and program improvement. Maintenance is either preventive or corrective. (MIL) [2]

**(3)** The combination of all technical and corresponding administrative actions intended to retain an item in, or restore it to, a state in which it can perform its required function. *Note:* The required function may be defined as a stated condition. (R) [29]

**(4) (A) (software)** The process of modifying a software system or component after delivery to correct faults, improve performance or other attributes, or adapt to a changed environment. **(B) (software)** The process of retaining a hardware system or component in, or restoring it to, a state in which it can perform its required functions. *See also:* preventive maintenance. (C) 610.12-1990

**(5)** *See also:* software maintenance. (C/SE) J-STD-016-1995

**(6)** The act of preserving or keeping in existence those conditions that are necessary in order for equipment to operate as it was originally intended. (IA/PSE) 902-1998

**maintenance bypass** Removal of the capability of a channel, component, or piece of equipment to perform a protective action due to a requirement for replacement, repair, test, or calibration. *Note:* A maintenance bypass is not the same as an operating bypass. A maintenance bypass may reduce the degree of redundancy of equipment, but it does not result in the loss of a safety function. (PE/NP) 603-1998

**maintenance concept (test, measurement, and diagnostic equipment)** A description of the general scheme for maintenance and support of an item in the operational environment. (MIL) [2]

**maintenance data/knowledge collection system** One system within the AI-ESTATE architectural concept. This system supports collection of data and knowledge necessary for a maintenance function. It is a special form of the knowledge/data base management system of the AI-ESTATE architectural concept. (ATLAS) 1232-1995

**maintenance, depot** *See:* depot maintenance.

**maintenance derated hours (electric generating unit reliability, availability, and productivity)** The available hours during which a Class 4 unplanned derating was in effect. (PE/PSE) 762-1987w

**maintenance engineering analysis (test, measurement, and diagnostic equipment)** A process performed during the development stage to derive the required maintenance resources such as personnel, technical data, support equipment, repair parts, and facilities. (MIL) [2]

**maintenance factor** *See:* light loss factor.

**maintenance, intermediate** *See:* intermediate maintenance.

**maintenance interval (1) (Class 1E battery chargers and inverters)** The period, defined in terms of real time, operating time, number of operating cycles, or a combination of these, during which satisfactory performance is required without maintenance or adjustments. (PE/NP) 650-1979s

**(2) (switchgear assemblies for Class 1E applications in nuclear power generating stations)** The period, defined in terms of real time, operating time, number of operating cycles, or a combination of these, during which satisfactory performance is expected without maintenance or adjustments. (SWG/PE) C37.100-1992, C37.82-1971s

**maintenance level (test, measurement, and diagnostic equipment)** The level at which maintenance is to be accomplished, that is, organizational, intermediate, and depot. (MIL) [2]

**maintenance manual** *See:* support manual.

**maintenance measurement accuracy** The ratio of good measurements to total measurements. Total measurements include missed measurements or peg counts, as well as errored measurements or peg counts. Maintenance peg counts should register all detected events under all conceivable operating conditions. If, under certain infrequent trouble conditions, registration of detected events requires unreasonable expense or switching system action that interferes with normal call processing, then the events may not be counted. The switching system should tag such defective measurements on the maintenance measurement report. Maintenance usage counts are the ratios of bad measurements to total measurements. (COM/TA) 973-1990w

**maintenance operation device** A removable device for use with power-operated circuit breakers that is used for manual operation of a de-energized circuit breaker during maintenance only. *Note:* This device is not to be used for closing the circuit breaker on an energized circuit. (SWG/PE) C37.100-1992

**maintenance, organizational** *See:* organizational maintenance.

**maintenance outage hours (electric generating unit reliability, availability, and productivity)** The number of hours a unit was in a Class 4 unplanned outage state. (PE/PSE) 762-1987w

**maintenance panel** A part of a unit of equipment used to display information or provide access to test points for maintenance. (C) 610.10-1994w

**maintenance phase** *See:* operation and maintenance phase.

**maintenance plan (software)** A document that identifies the management and technical approach that will be used to maintain software products. Typically included are topics such as tools, resources, facilities, and schedules. *See also:* document. (C/SE) 729-1983s

**maintenance proof test (rotating machinery)** A test applied to an armatue winding after being in service that is suitable for continued service. It is usually made at a lower voltage than the acceptance proof test. (PE/EM) 95-1977r

**maintenance, scheduled** *See:* scheduled maintenance.

**maintenance temperature** *See:* maintain temperature.

**maintenance test (1) (electric submersible pump cable)** Test made after removal of the cable from the well. It is intended to detect deterioration of the cable to determine suitability for reuse. (IA/PC) 1017-1985s

**(2) (power cable systems)** A test made during the operating life of a cable system. It is intended to detect deterioration of the system and to check the entire workmanship so that suitable maintenance procedures can be initiated. (PE/IC) 400-1991

**MA interface** The X.400 Application API. (C/PA) 1224.1-1993w

**main-terminal (1) (A) (bidirectional thyristor)** The main terminal that is named 1 by the device manufacturer. **(B) (bidirectional thyristor)** The main terminal that is named 2 by the device manufacturer. *See also:* anode. (IA/ED) 223-1966, [46], [12]

**(2) (rotating machinery)** A termination for the primary winding. *See also:* asynchronous machine. (PE) [9]

**main terminals (thyristor)** The terminals through which the principal current flows. *See also:* anode. (IA/ED) 223-1966w, [46], [12]

**main transformer (power and distribution transformers)** The term "main transformer" as applied to two single-phase Scott-connected units for three-phase to two-phase or two-phase to three-phase operation, designates the transformer that is connected directly between two of the phase wires of the three-phase lines. *Note:* A tap is provided at the midpoint for connection to the teaser transformer. (PE/TR) C57.12.80-1978r

**main trunk** *See:* trunk line.

**main unit (power and distribution transformers)** The core and coil unit that furnishes excitation to the series unit. (PE/TR) C57.12.80-1978r

**main winding, single-phase induction motor** A system of coils acting together, connected to the supply line, that determines the poles of the primary winding, and that serves as the principal winding for transfer of energy from the primary to the secondary of the motor. *Note:* In some multispeed motors, the same main winding will not be used for both starting operation and running operation. *See also:* asynchronous machine. (PE) [9]

**main window** The primary window for an application. (C) 1295-1993w

**major alarm (telephone switching systems)** An alarm indicating trouble or the presence of hazardous conditions needing immediate attention in order to restore or maintain the system capability. (COM) 312-1977w

**major cycle (electronic computation)** In a storage device that provides serial access to storage positions, the time interval between successive appearances of a given storage position. (C) 162-1963w

**major defect** A unit of product that, when tested, falls below 85% of its specified rated ultimate strength. (PE/T&D) C135.61-1997

**major event** A catastrophic event that exceeds design limits of the electric power system and that is characterized by the following (as defined by the utility):

a) Extensive damage to the electric power system;
b) More than a specified percentage of customers simultaneously out of service;
c) Service restoration times longer than specified.

Some examples are extreme weather, such as a one in five year event, or earthquakes. (PE/T&D) 1366-1998

**major failure** *See:* failure.

**major insulation (1) (outdoor apparatus bushings)** Insulating material internal to the bushing between the line potential conductor and ground. (PE/TR) 21-1976

**(2)** The insulating material providing the dielectric, which is necessary to maintain proper isolation between the energized conductor and ground potential. It consists of internal insulation and the insulating envelope(s). (PE/TR) C57.19.03-1996

**majority (1) (computers)** A logic operator having the property that if P is a statement, Q is a statement, R is a statement..., then the majority of P, Q, R, ..., is true if more than half the statements are true, false if half or less are true. (C) [20], [85]

**(2) (mathematics of computing)** A Boolean operator having the property that if P is a statement, Q is a statement, R is a statement, . . . then the majority of P,Q,R, . . . is true if more than half the statements are true, false if half or less are true. (C) 1084-1986w

**majority carrier (semiconductor)** The type of charge carrier constituting more than one half the total charge-carrier concentration. *See also:* semiconductor; semiconductor device. (ED) 216-1960w

**majority circuit** A circuit with multiple inputs whose output is related to the state of the majority of its inputs. *Note:* Majority circuits are typically used in fault tolerant computers. *See also:* voting computer; majority gate. (C) 610.10-1994w

**majority element** *See:* majority gate.

**majority emitter (transistor)** An electrode from which a flow of majority carriers enters the interelectrode region. *See also:* transistor. (IA) [12]

**majority gate** A gate that performs a majority operation. *Synonym:* majority element. (C) 610.10-1994w

**majority operation** A threshold operation in which each of the operands may take only the values 0 and 1; it takes the value 1 if an only if the number of operands having the value 1 is greater than the number of operands that have the value 0. *See also:* majority gate. (C) 610.10-1994w

**major key** *See:* primary key.

**major lobe** The radiation lobe containing the direction of maximum radiation. *Note:* In certain antennas, such as multilobed or split-beam antennas, there may exist more than one major lobe. *Synonym:* main lobe. *See also:* antenna. (AP/PE/T&D/ANT) [35], 145-1993, 1260-1996

**major loop (control)** A continuous network consisting of all of the forward elements and the primary feedback elements of the feedback control system. *See also:* feedback control system. (IA/IAC) [60]

**major modification** Includes conversion from one type of machine to another type of machine, conversion from one type of enclosure to another type of enclosure, or conversion from one rating to another rating or both. (IA/PC) 1068-1996

**major pulse waveform features** *See:* base; first transition; top; last transition.

**major scheduled generation station shutdown** Periodic shutdowns of the generating station for an extended time scheduled for major reconditioning of the station, for example, fuel reloading. (PE/NP) 380-1975w

**major storm disaster** Designates weather that exceeds design limits of facilities, and that satisfies all of the following: Extensive mechanical damage to facilities; More than a specified percentage of customers out of service; Service restoration longer than a specified time. *Notes:* 1. Typical industry criteria are 10% of customers out of service and 24 hours or more restoration time. Percentage of customers out of service

may be related to a company operating area rather than to an entire company. Examples of major storm disasters are hurricanes and major ice storms. 2. It is suggested that the specified percentage of customers out of service and restoration times be 10% and 24 hours. Percentage of customers out of service may be related to a company operating area rather than to an entire company. Examples of major storm disasters are hurricanes and major ice storms. (PE/PSE) 859-1987w, 346-1973w

**make-break operation (pulse operation) (data transmission)** Used to describe a method of data transmission by means of opening and closing a circuit to produce a series of current pulses. (PE) 599-1985w

**make-break relay contacts** A contact form in which one contact closes connection to another contact and then opens its prior connection to a third contact. (EEC/REE) [87]

**make busy (telephone switching systems)** Conditioning a circuit to be unavailable for service. (COM) 312-1977w

**make-busy signal (telephone switching systems)** A signal transmitted from the terminating end of a trunk to prevent the seizure of the originating end. (COM) 312-1977w

**make, % make (dial-pulse address signaling systems) (telephony)** In dial-pulse signaling, make is that portion of the signal in which the dialing contacts are closed (make). % is the ratio of make time to the total pulse period (make + break) time. (COM/TA) 753-1983w

**makeup time** That part of available time needed for reruns due to faults or mistakes in operations. (C) 610.10-1994w

**making capacity** The maximum current or power that a contact is able to make under specified conditions. *See also:* contactor. (IA/ICTL/IAC) [60], [84]

**making current** (of a switching device) The value of the available current at the time the device closes. *Notes:* 1. Its rms value is measured from the envelope of the current wave at the time of the first major current peak. 2. The making current may also be expressed in terms of instantaneous value of current, in which case it is measured at the first major peak of the current wave. This is designated peak making current. (SWG/PE) C37.100-1992, C37.30-1971s

**making current, rated (switching device)** The maximum root-mean-square current against which the recloser is required to close under specified conditions. *Notes:* 1. The root-mean-square value is measured from the envelope of the current wave at the time of the first major current peak. 2. See ANSI C37.05-1964 (R1969), Methods for Determining the Values of a Sinusoidal Current Wave and Normal-Frequency Recovery Voltage for AC High-Voltage Circuit Breakers. (SWG/PE) C37.60-1981r

**making-current tests (high-voltage switchgear)** Tests that consist of manual or remote control closing of the device against a prescribed current. (SWG/PE) C37.40-1981s

**malfunction (1)** An error that results from failure in the hardware. *See also:* error; fault; mistake. (C/MIL) 162-1963w, 165-1977w, [2]

**(2) (seismic qualification of Class 1E power equipment)** The loss of capability of Class 1E equipment to initiate or sustain a required function, or the initiation of an undesired spurious action that can result in consequences adverse to safety. (SWG/PE/NP) 649-1980s, C37.81-1989r, 650-1979s, 344-1975s

**(3)** The loss of capability to initiate or sustain a required function, often a protective action, or the initiation of undesired spurious action. *Note:* A certain degree of equipment degradation may be acceptable in one system and not in another. In such cases, an evaluation of the equipment or device application should include a determination that the degree of relay contact bounce, changes in device calibration, or degradation of pressure-retaining boundaries are within acceptable limits. (SWG/SUB/PE/PE) C37.122-1983s, C37.100-1992, C37.122.1-1993

**(4) (analog computer)** *See also:* error. (C) 166-1977w

**(5) (test, measurement, and diagnostic equipment)** *See also:* fault. (MIL) [2]

**malicious call (telephone switching systems)** A call of an harassing, abusive, obscene, or threatening nature. (COM) 312-1977w

**managed network** A network or set of networks established and controlled by one or more organizations to meet specific organizational or business needs. (C) 2001-1999

**MAN** *See:* metropolitan area network.

**managed object** The OSI structure of management information (ISO/IEC 10165-2:1992) term used as an abstract representation of a resource. This managed object has a set of attributes. These attributes are equivalent to data objects. (LM/C) 802.10-1992

**management** A process that consists of functions such as planning, organizing, controlling and supervising, and is performed to set and meet the stated objectives. (C) 610.7-1995

**management game** A simulation game in which participants seek to achieve a specified management objective given preestablished resources and constraints; for example, a simulation in which participants make decisions designed to maximize profit in a given business situation and a computer determines the results of those decisions. *See also:* war game. (C) 610.3-1989w

**Management Information Base (MIB)** A repository of information to describe the operation of a specific network device. (C/LM) 802.3-1998

**management information base (MIB) (1)** A conceptual database of information contained in the collection of all the managed object classes and their instances. (LM/C) 802.10-1992

**(2)** A simple network management protocol (SNMP) compatible data structure that defines the functional groups and management objects of a unit or system. (C/MM) 1284.1-1997

**management information format (MIF)** A desktop management interface (DMI) compatible data structure that defines the functional groups and management objects of a unit or system. (C/MM) 1284.1-1997

**management information model** A model that identifies the entities and their relationships that participate in managing an OSI environment. (C) 610.7-1995

**management information octets** DQDB Layer Protocol Data Units (PDUs) used to carry DQDB Layer Management Protocol information between peer DQDB Layer Management Entities (LMEs). (LM/C) 8802-6-1994

**management information system (MIS)** An automated system designed to provide managers with the information required to make basic decisions. *Synonyms:* executive information system; business information system. *See also:* decision support system; computer-aided management. (C) 610.2-1987

**management interface** An interface provided by both the Media Independent Interface (MII) or Gigabit Media Independent Interface (GMII) that provides access to management parameters and services. (C/LM) 802.3-1998

**management review** A systematic evaluation of a software acquisition, supply, development, operation, or maintenance process performed by or on behalf of management that monitors progress, determines the status of plans and schedules, confirms requirements and their system allocation, or evaluates the effectiveness of management approaches used to achieve fitness for purpose. (C/SE) 1028-1997

**manager role** Where each task is initiated. The *manager role* is concerned with taking appropriate action at the completion or failure of a task. (C/PA) 1387.2-1995

**Manchester biphase-L encoding** A signal transmission method defined for the representation of binary data bits. Manchester biphase-L encoding specifies two "half-bits," so that a guaranteed mid-bit transition occurs in the transmitted signal. The

transition is defined to be positive for encoding a logic "0" and negative for encoding a logic "1." (EMB/MIB) 1073.4.1-2000

**Manchester encoding** A method of encoding data in which separate data and clock signals can be combined into a single, self-synchronizable data stream, suitable for transmission on a serial channel. (C) 610.7-1995

**mandatory** A syntax keyword used to specify a total mapping. *Contrast:* optional. *See also:* total. (C/SE) 1320.2-1998

**mandatory category** A category that is essential to establish a common definition and to provide common terminology and concepts for communication among projects, business environments, and personnel. (C/SE) 1044-1993

**mandatory nonidentifying relationship** A kind of nonidentifying relationship in which an instance of the child entity must be related to an instance of the parent entity. *Contrast:* optional nonidentifying relationship. *See also:* nonidentifying relationship. (C/SE) 1320.2-1998

**manhole (1)** (More accurately termed splicing chamber or cable vault) A subsurface chamber, large enough for a man to enter, in the route of one or more conduit runs, and affording facilities for placing and maintaining in the runs, conductors, cables, and any associated apparatus. *See also:* splicing chamber. (T&D/PE) [10]

**(2)** An opening in an underground system that workmen or others may enter for the purpose of installing cables, transformers, junction boxes, and other devices, and for making connections and tests. *See also:* splicing chamber; distribution center. (BT/AV) [34]

**(3)** A subsurface enclosure that personnel may enter used for the purpose of installing, operating, and maintaining submersible equipment and cable. (NESC/T&D) C2-1997, C2.2-1960

**man-centered simulation (man-centred simulation)** *See also:* human-centered simulation. (C) 610.3-1989w

**manhole chimney** A vertical passageway for workmen and equipment between the roof of the manhole and the street level. (T&D/PE) [10]

**manhole cover** A removable lid that closes the opening to a manhole or similar subsurface enclosure. (NESC) C2-1997

**manhole cover frame** The structure that caps the manhole chimney at ground level and supports the cover. (T&D/PE) [10]

**manhole grating** A grid that provides ventilation and a protective cover for a manhole opening. (NESC) C2-1997

**manifold insulation (rotating machinery) (liquid cooling)** The insulation applied between ground and a manifold connecting several parallel liquid-cooling paths in a winding. *See also:* stator. (PE) [9]

**manifold-pressure electric gauge** A device that measures the pressure of fuel vapors entering the cylinders of an aircraft engine. *Note:* The gauge is provided with a scale, usually graduated in inches of mercury, absolute. It provides remote indication by means of a self-synchronous generator and motor. (EEC/PE) [119]

**manipulated variable (control)** A quantity or condition that is varied as a function of the actuating signal so as to change the value of the directly controlled variable. *Note:* In any practical control system, there may be more than one manipulated variable. Accordingly, when using the term it is necessary to state which manipulated variable is being discussed. In process control work, the one immediately preceding the directly controlled system is usually intended. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**manipulation detection** A mechanism used to detect whether a data unit has been modified (either accidentally or intentionally). (LM/C) 802.10-1992

**man-machine interface (1) (man-machine performance in nuclear power generating stations)** The devices through which personnel receive information from the system or process and the devices through which personnel exercise their control of the system or process. (PE/NP) 845-1988s, 1023-1988r

**(2) (station control and data acquisition)** The operator contact with equipments governed by IEEE Std C37.1-1979, Mil-Std-1472 is recommended as a reference for use in the design and evaluation of the man/machine interface to equipments governed by this standard. Alternative human engineering data may be specified by the user. The man/machine interface for operation concerns standards and recommendations for information displays, control capabilities, colors and man/machine interaction of equipments governed by IEEE Std C37.1-1979. (SUB/PE) C37.1-1979s

**(3) (software)** *See also:* user interface. (C) 610.12-1990

**man-machine simulation** *See:* human-machine simulation.

**man-made noise** Noise generated in machines or other technical devices. *See also:* electromagnetic compatibility. (EMC) [53]

**manned space flight network (MSFN) (communication satellite)** A network of ground communication and tracking facilities maintained for the support of manned space flight programs. (COM) [24]

**mantissa (A) (mathematics of computing)** The fractional part of a logarithm. *Contrast:* characteristic. **(B) (mathematics of computing)** For floating-point arithmetic, *See also:* significand. (C) 1084-1986

**manual (1) (electric systems)** Operated by mechanical force, applied directly by personal intervention. *See also:* distribution center. (IA/IAC) [60]

**(2)** Capable of being operated by personal intervention. (NESC) C2-1997

**manual block-signal system** A block or a series of consecutive blocks governed by block signals operated manually upon information by telegraph, telephone, or other means of communication. *See also:* block-signal system. (EEC/PE) [119]

**manual central office** A central office of a manual telephone system. (COM) [48]

**manual checkout (test, measurement, and diagnostic equipment)** A checkout system which relies completely on manual operation, operator decision and evaluation of results. (MIL) [2]

**manual control (1) (excitation systems for synchronous machines)** In excitation control system usage, manual control refers to maintaining synchronous machine terminal voltage by operator action. *Note:* Manual control means may include an exciter field rheostat, controlled rectifiers, or a direct-current (dc) regulator controlling either exciter field current or exciter output voltage, or other means that do not include regulation of synchronous machine terminal voltage. (PE/EDPG) 421.1-1986r

**(2)** Those elements in the excitation control system which provide for manual adjustment of the synchronous machine terminal voltage by open-loop control. (PE/EDPG) 421-1972s

**(3)** Control in which the main devices under control, whether manually or power operated, are controlled by an attendant. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**(4) (programmable instrumentation)** *See also:* local control. (IM/AIN) 488.1-1987r

**manual controller** An electric controller having all of its basic functions performed by devices that are operated by hand. (IA/MT) 45-1998

**manual data input (numerically controlled machines)** A means for the manual insertion of numerical control commands. (IA) [61]

**manual fire-alarm system** A fire-alarm system in which the signal transmission is initiated by manipulation of a device provided for the purpose. *See also:* protective signaling. (EEC/PE) [119]

**manual holdup-alarm system** An alarm system in which the signal transmission is initiated by the direct action of the person attacked or of an observer of the attack. *See also:* protective signaling. (EEC/PE) [119]

**manual hyphenation** In text formatting, hyphenation in which all line-ending and word break decisions are made by the user. *See also:* semi-manual hyphenation; automatic hyphenation. (C) 610.2-1987

**manual input (A) (computers)** The entry of data by hand into a device at the time of processing. **(B) (computers)** The data entered as in definition (A). (C) [20], [85]

**manual load (armature current) division** The effect of a manually operated device to adjust the division of armature currents between two or more motors or two or more generators connected to the same load. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**manual locking carabiner** Has a self-closing gate which remains closed but not locked (unless purposely locked by the user) until intentionally opened by the user for connection or disconnection. (T&D/PE) 1307-1996

**manual lockout device** A device that holds the associated device inoperative unless a predetermined manual function is performed to release the locking feature. (SWG/PE) C37.100-1992

**manually operated door or gate** A door or gate that is opened and closed by hand. *See also:* hoistway. (EEC/PE) [119]

**manually release-free** *See:* mechanically release-free.

**manually trip-free** *See:* mechanically release-free.

**manual mobile telephone system** A mobile communication system manually interconnected with any telephone network, or a mobile communication system manually interconnected with a telephone network. (VT) [37]

**manual operation** Operation by hand without the use of any other source of power. (SWG/PE) C37.100-1992

**manual outage** An outage occurrence that results from intentional or inadvertent operator controlled opening of switching devices. (PE/PSE) 859-1987w

**manual potentiometer (analog computer)** A potentiometer that is set by hand, also known as a "hand-set potentiometer." (C) 165-1977w

**manual release (electromagnetic brake)** A device by which the braking surfaces may be manually disengaged without disturbing the torque adjustment. *See also:* electric drive. (IA/ICTL/IAC/APP) [60], [75]

**manual reset** A function that requires a manual operation to reestablish specific conditions. (SWG/PE) C37.100-1981s

**manual-reset relay** A relay that may be reset manually after an operation. (EEC/REE) [87]

**manual-reset thermal protector (rotating machinery)** A thermal protector designed to perform the function by opening the circuit to or within the protected machine, but requiring manual resetting to close the circuit. *See also:* starting-switch assembly. (PE) [9]

**manual ringing (telephone switching systems)** Ringing that is started by the manual operation of a key and continues only while the key is held operated. (COM) 312-1977w

**manual speed adjustment** A speed adjustment accomplished manually. *See also:* electric drive. (IA/ICTL/IAC) [60]

**manual switchboard (telephone switching systems)** A telecommunication switchboard for making interconnections manually by plugs and jacks or keys. (COM) 312-1977w

**manual telecommunications exchange (telephone switching systems)** A telecommunications exchange in which connections between stations are manually set by means of plugs and jacks or keys. (COM) 312-1977w

**manual telecommunication system (telephone switching systems)** A telecommunications system in which connections between customers are ordinarily established manually by operators in accordance with orders given orally by the calling parties. (COM) 312-1977w

**manual test** A test or collection of tests that requires an operator. The tests may involve power failure testing, on-line replacement testing, media testing, or cable connection tests (when loop-back cables are required). A manual test is invoked by writing to the TEST_START register. (C/MM) 1212-1991s

**manual test equipment (test, measurement, and diagnostic equipment)** Test equipment that requires separate manipulations for each task (for example, connection to signal to be measured, selection of suitable range, and insertion of stimuli). (MIL) [2]

**manual testing** Testing that requires a human to execute some or all of a test procedure. (SCC20) 1226-1998

**manual transfer or selector device (power system device function numbers)** A manually operated device that transfers the control circuits in order to modify the plan of operation of the switching equipment or of some of the devices. (PE/SUB) C37.2-1979s

**manual trip device** A device that is connected to the tripping linkage and that can be operated manually to trip a switching device. (SWG/PE) C37.100-1992

**manufacture (software)** In software engineering, the process of copying software to disks, chips, or other devices for distribution to customers or users. (C) 610.12-1990

**manufactured building** Any building that is of closed construction and that is made or assembled in manufacturing facilities on or off the building site, other than mobile homes or recreational vehicles. (NESC/NEC) [86]

**manufacturer** *See:* builder **(rotating electric machinery)** The organization supplying the electric machinery to the purchaser. (PE/EM) 11-1980r

**manufacturing phase (software)** The period of time in the software life cycle during which the basic version of a software product is adapted to a specified set of operational environments and is distributed to a customer base. (C) 610.12-1990

**manufacturer A** The supplier of the initial GIS. *See also:* gas-insulated substations. (PE) 1416-1998

**manufacturer B** The supplier of the extension GIS. *See also:* gas-insulated substations. (PE) 1416-1998

**manuscript (numerically controlled machines)** An ordered list of numerical control instructions. *See also:* programming. (IA) [61]

**manuscript editor** *See:* document editor.

**many-to-many relationship (1) (data management)** A relationship between two entities A and B such that any instance of A may be more associated with than one instance of B, and vice-versa. *Note:* The use of "m:n relationship" as a synonym for this term is deprecated. *Synonym:* m:n relationship. (C) 610.5-1990w

**(2)** A kind of relationship between two state classes (not necessarily distinct) in which each instance of one class may be associated with any number of instances of a second class (possibly none), and each instance of the second class may be related to any number of instances of the first class (possibly none). (C/SE) 1320.2-1998

**many-to-one decoder** *See:* decoder.

**MAP** *See:* memory allocation and protection.

**map (1) (A) (data management)** To establish a correspondence between the elements of one set and the elements of another set. *Synonym:* map over. **(B) (data management)** To establish a correspondence between the logical structure of a database and the physical structure of that database. (C/IA/APP) [20], 610.5-1990, [75]

**(2)** To create an association between a page-aligned range of the address space of a process and a range of physical memory or some memory object, such that a reference to an address in that range of the address space results in a reference to the associated physical memory or memory object. The mapped memory or memory object is not necessarily memory-resident. (C/PA) 9945-1-1996

**map a range of addresses** To create an association process's address space and a range of physical memory or some memory object, such that a reference to an address in that range of the address space results in a reference to the associated physical memory or memory object. The mapped memory or memory object is not necessarily memory-resident. (C) 1003.5-1999

**map over** *See:* map.

**MAPPER** *See:* Maintaining, Preparing & Producing Executive Reports.

**mapping (1)** Establishing a sequence of the Activities in this standard according to a selected software life cycle model (SLCM). *See also:* Instance; Invocation; Iteration. (C/SE) 1074-1997

**(2)** Process of correspondence between the elements of one set and the elements of another set. (SCC20) 1226-1998

**(3)** An assigned correspondence between two things that is represented as a set of ordered pairs. Specifically, a mapping from a class to a value class is an attribute. A mapping from a state class to a state class is a participant property. A mapping from the (cross product of the) instances of the class and the instances of the input argument types to the (cross product of the) instances of the other (output) argument types is an operation. (C/SE) 1320.2-1998

**mapping completeness** A designation of whether a mapping is complete (totally mapped) or incomplete (partial). *See also:* partial; total. (C/SE) 1320.2-1998

**mapping function (computer graphics)** A transformation that converts display elements from one coordinate system to another. (C) 610.6-1991w

**mapping onto network protocol** The embodiment of hardware and software as it relates to supporting IEEE 1451.1 communications on a specific bus standard. (IM/ST) 1451.1-1999

**map program (software)** A software tool, often part of a compiler or assembler, that generates a load map. (C) 610.12-1990

**map-reader function generator** A variant function generator using a probe to detect the voltage at a point on a conducting surface and having coordinates proportional to the inputs. *See also:* electronic analog computer. (C) 165-1977w

**map vertical** *See:* geographic vertical.

**MAR** *See:* memory address register.

**MARC** *See:* MAchine-Readable Cataloging.

**margin (1) (electric penetration assemblies)** The difference between the most severe design service conditions and the conditions used in the design qualification to account for normal variations in commercial production of equipment and reasonable errors in defining satisfactory performance. (PE/NP) 317-1983r

**(2) (nuclear power generating station) (valve actuators) (safety systems equipment in nuclear power generating stations)** The difference between service conditions and the conditions used for equipment qualification. (PE/NP) 382-1985, 323-1974s, 649-1980s, 627-1980r

**(3) (switchgear assemblies for Class 1E applications in nuclear power generating stations)** The difference between the demonstrated capability of the equipment and that required in service for specific conditions. (SWG/PE) C37.100-1992, C37.82-1971s

**(4) (A) (data transmission)** (Digital) Of a receiving equipment, the maximum degree of distortion of the received signal which is compatible with the correct translation of all of the signals which it may possibly receive. *Note:* This maximum degree of distortion applies without reference to the form of distortion effecting the signals. In other words, it is the maximum degree of the most unfavorable distortion acceptable, beyond which incorrect translation occurs, which determines the value of the margin. The condition of the measurements of the margin are to be specified in accordance with the requirements of the system. **(B) (data transmission)** (Analog) The excess of receive level beyond that needed for proper operation. (PE) 599-1985

**(5) (teletypewriter) (orientation margin) (printing telegraphy)** That fraction of a perfect signal element through which the time of selection may be varied in one direction from the normal time of selection, without causing errors while signals are being received. *Note:* There are two distinct margins, determined by varying the time of selection in either direction from normal. *See also:* telegraphy. (COM) [49]

**(6) (nickel-cadmium storage batteries)** The combination of design margin and aging factor originally used in determining the battery's initial capacity requirements. (PE/EDPG) 1106-1987s

**margin-adjust hyphenation** *See:* hot zone hyphenation.

**margin-adjust zone** *See:* hot zone.

**marginal check (electronic computation)** A preventive maintenance procedure in which certain operating conditions (for example, supply voltage or frequency) are varied about their nominal values in order to detect and locate incipient defective parts. *See also:* check. (C) 162-1963w

**marginal checking (test, measurement, and diagnostic equipment)** A system or method of determining circuit weaknesses and incipient malfunctions by varying the operating conditions of the circuitry. (MIL) [2]

**marginal relay** A relay that functions in response to predetermined changes in the value of the coil current or voltage. *See also:* relay. (EEC/REE) [87]

**marginal testing (test, measurement, and diagnostic equipment)** Testing that presents results on an indicator that has tolerance bands for evaluating the signal or characteristic being tested. (For example: a green band might indicate an acceptable tolerance range; a yellow band, a tolerance range representing marginal operation; and a red band, a tolerance that is unsatisfactory for operation of the item). (MIL) [2]

**margin of commutation $\gamma$ (margin angle)** The time, expressed in degrees (one cycle of the ac waveform, 360°) from the termination of commutation in inverter operation to the next point of intersection between the two halfwaves of the voltage phases which have just commutated. *Note:* At this point of intersection, the converter circuit element which has just terminated conduction changes from reverse blocking state to OFF state. (IA/IPC) 444-1973w

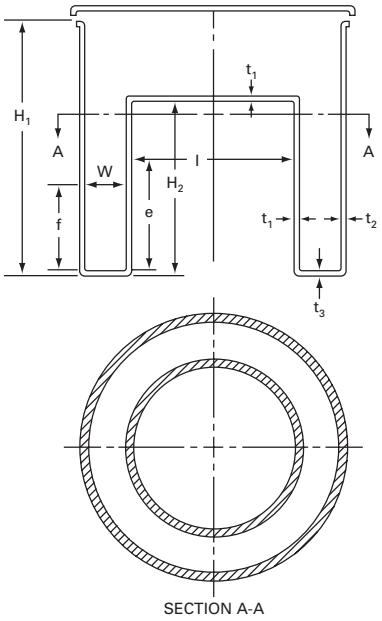
**marine distribution panel** A panel receiving energy from a distribution or subdistribution switchboard and distributing energy to energy-consuming devices or other distribution panels or panelboards of a ship. *See also:* marine electric apparatus. (EEC/PE) [119]

**marine electric apparatus** Electric apparatus designed especially for use on shipboard to withstand the conditions peculiar to such application. (EEC/PE) [119]

**marine generator and distribution switchboard** Receives energy from the generating plant and distributes directly or indirectly to all equipment of a ship supplied by the generating plant. *See also:* marine electric apparatus. (EEC/PE) [119]

**Marinelli beaker (1) (germanium semiconductor detector)** Reentrant (inverted well) beaker. It is available in a variety of sizes for use in large volume, low level, measurements. The beaker specified herein is shown in a corresponding figure. A schematic of a typical sample-detector geometry is also illustrated in a corresponding figure. The specified beaker is considered to be of 450 mL capacity. The actual volume is greater than this, but, for purposes of this standard, the beaker is to be filled to 450 mL $\pm$ 2 mL. The beaker specified was selected because of: high counting efficiency for the sample material used; commercial availability at low cost; common usage in many laboratories; physical convenience. (NPS) 680-1978w

**(2)** A reentrant (inverted well) beaker that can be fitted over a detector endcap for the purpose of holding a radioactive sample in a configuration that surrounds a major portion of the detector. (NPS) 325-1996



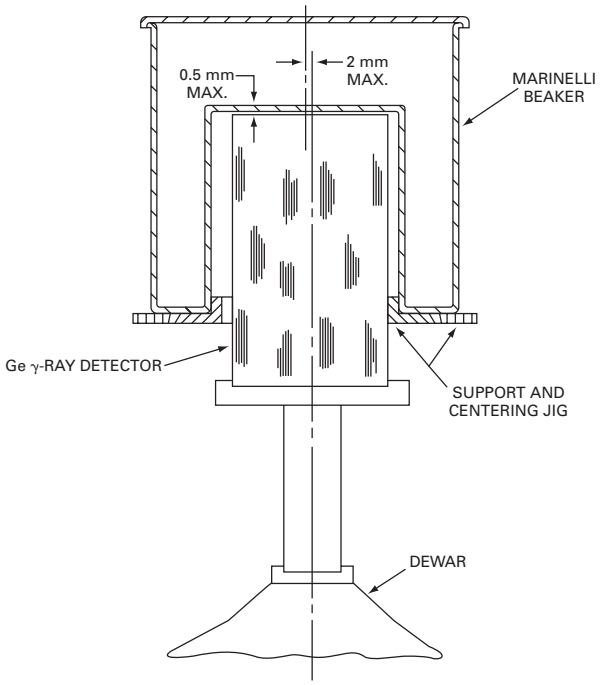

| | mm | inches |
|---|---|---|
| $H_1$ | 104.1 ± 1.3 | 4.10 ± 0.05 |
| $H_2$ | 68.33 ± 0.15 | 2.690 ± 0.006 |
| I | [77.40 − 0.008 e] ± 0.10 avg., ± 0.25 max. | [3.048 − 0.008 e] ± 0.004 avg., ± 0.010 max. |
| W | [14.83 + 0.008 f] ± 0.10 avg., ± 0.25 max. | [0.584 + 0.008 f] ± 0.004 avg., ± 0.010 max. |
| $t_1$ | 1.90 ± 0.1 | 0.075 ± 0.004 |
| $t_2$ | 2.00 ± 0.25 | 0.079 ± 0.010 |
| $t_3$ | 3.60 ± 0.15 | 0.142 ± 0.006 |

MATERIAL : PLASTIC OF DENSITY 1.1 ± 0.1

**standard Marinelli beaker**

**Marinelli beaker standard source (germanium semiconductor detector)** A standard Marinelli beaker containing a carrier with radioactive material. An MBSS may be a certified MBSS, a calibrated MBSS, a certified solution MBSS, or a calibrated solution MBSS. The calibration uncertainty of the photon emission rate for the filled beaker shall be not more than three percent unless otherwise stated. *Note:* The photon emission rate as used in IEEE Std 680-1978w is the number of photons per second resulting from the decay of radionuclides in the source, and is thus higher than the detected rate at the surface. (NPS) 680-1978w

**marine panelboard** A single panel or a group of panel units assembled as a single panel, usually with automatic overcurrent circuit breakers or fused switches, in a cabinet for flush or surface mounting in or on a bulkhead and accessible only from the front, serving lighting branch circuits or small power branch circuits of a ship. *See also:* marine electric apparatus. (EEC/PE) [119]




**Marinelli beaker with solid state detector**

**marine subdistribution switchboard** Essentially a section of the marine generator and distribution switchboard (connected thereto by a bus feeder and remotely located) that distributes energy in a certain section of a vessel. *See also:* marine electric apparatus. (EEC/PE) [119]

**mariner's compass** A magnetic compass used in navigation consisting of two or more parallel polarized needles secured to a circular compass card that is delicately pivoted and enclosed in a glass-covered bowl filled with alcohol to support by flotation the weight of the moving parts. *Note:* The compass bowl is supported in gimbals mounted in the binnacle. The compass card is graduated to show the 32 points of the compass in addition to degrees. (EEC/PE) [119]

**mark (1) (liquid-filled power transformers)** The descriptive name, instructions, cautions, or other information applied to polychlorinated biphenyls (PCBs) and PCB items or other objects subject to these regulations. (LM/C) 802.2-1985s

**(2) (computers)** *See also:* flag.

**(3) (data management)** A symbol or group of symbols that indicates the beginning or end of a field, a word, an item of data, or a set of data such as a file, a record, or a block. (C) 610.5-1990w

**(4)** A symbol or symbols that indicate the beginning or the end of a field, of a word, or of a data item in a file, record, or block. *Synonym:* marker. *See also:* beginning-of-tape marker; field mark; file mark; end mark; address mark; word mark; group mark; end-of-tape marker; index mark. (C) 610.10-1994w

**mark detection** *See:* mark sensing.

**marked (liquid-filled power transformers)** The marking of polychlorinated biphenyl (PCB) items and PCB storage areas and transport vehicles by means of applying a legible mark by painting, fixation of an adhesive label, or by any other method that meets the requirement of these regulations. (LM/C) 802.2-1985s

**marked ratio** The ratio of the rated primary value to the rated secondary value as stated on the nameplate. (PE/TR/PSR) C57.13-1993, C37.110-1996, C57.12.80-1978r

**marker (1) (telephone switching systems)** A wired-logic control circuit that, among other functions, tests, selects, and establishes paths through a switching stage or stages. (COM) 312-1977w

**(2) (navigation aid terms)** A radio beacon to designate a small area. (AES/GCS) 172-1983w

**(3) (computer graphics)** A symbol with a specific appearance that identifies a particular location. *See also:* polymarker. (C) 610.6-1991w

**(4)** *See also:* plumb marker pole. (T&D/PE) 524-1992r

**marker beacon (navigation aid terms)** A radio beacon to designate a small area. (AES/GCS) 172-1983w

**marker-beacon receiver** A receiver used in aircraft to receive marker-beacon signals that identify the position of the aircraft when over the marker-beacon station. (EEC/PE) [119]

**marker lamp (railway practice)** A signal lamp placed at the side of the rear end of a train or vehicle, displaying light of a particular color to indicate the rear end and to serve for identification purposes. (EEC/PE) [119]

**marker light (railway practice)** A light that by its color or position, or both, is used to qualify the signal aspect. (EEC/PE) [119]

**marker radio beacon (navigation aid terms)** A beacon that indicates a specific location. (AES/GCS) 172-1983w

**marker signal (oscilloscopes)** A signal introduced into the presentation for the purpose of identification, calibration, or comparison. (IM/HFIM) [40]

**marker size** An attribute specifying the size of a marker, relative to the standard size of a marker on the display device. (C) 610.6-1991w

**marker type** An attribute specifying the geometric shape of a marker; for example, dot, asterisk, circle. (C) 610.6-1991w

**market** Demand and supply of goods and services. (C/SE) 1430-1996

**marketplace** An infrastructure that supports the exchange of goods and services. (C/SE) 1430-1996

**MARK IV** A procedural language used for report writing and data manipulation. (C) 610.13-1993w

**marking (marking and spacing intervals) (data transmission) (telegraph communication)** Intervals that correspond, according to convention, to one condition or position of the originating transmitting contacts, usually a closed condition; spacing intervals are the intervals that correspond to another condition of the originating transmitting contacts, usually an open condition. *Note:* The terms "mark" and "space" frequently used for the corresponding conditions. The waves corresponding to the marking and spacing intervals are frequently designated as marking and spacing waves, respectively. (PE) 599-1985w

**marking and spacing intervals (telegraph communication)** Intervals that correspond, according to convention, to one condition or position of the originating transmitting contacts, usually a closed condition; spacing intervals are the intervals that correspond to another condition of the originating transmitting contacts, usually an open condition. *Note:* The terms mark and space are frequently used for the corresponding conditions. The waves corresponding to the marking and spacing intervals are frequently designated as marking and spacing waves, respectively. *See also:* telegraphy. (PE/EEC) [119]

**marking engine** A set of electrical and mechanical components that moves the print media and marks that media. In some implementations, a facsimile transmission function is considered to be a marking engine. (C/MM) 1284.1-1997

**marking pulse (teletypewriter)** The signal pulse that, in direct current, neutral, operation, corresponds to a circuit-closed or current-on condition. (COM) [49]

**marking wave (telegraph communication) (keying wave)** The emission that takes place while the active portions of the code characters are being transmitted. *See also:* radio transmitter. (AP/ANT) 145-1983s

**Markov chain** A discrete Markov process. (C) 610.3-1989w

**Markov chain model** A discrete, stochastic model in which the probability that the model is in a given state at a certain time depends only on the value of the immediately preceding state. *Synonym:* Markov model. *See also:* semi-Markov model. (C) 610.3-1989w, 1084-1986w

**Markov model** *See:* Markov chain model.

**Markov process** A stochastic process which assumes that in a series of random events, the probability for occurrence of each event depends only on the immediately preceding outcome. *See also:* semi-Markov process. (C) 610.3-1989w

**mark scanning** Optical sensing of marks recorded manually on a data medium. *Contrast:* mark sensing. (C) 610.2-1987

**mark sensing** Electrical sensing of conductive marks recorded manually on a nonconductive data medium. For example, graphite marks on paper. *Synonym:* mark detection. *Contrast:* mark scanning. (C) 610.2-1987

**mark-sensing card** A card that can be marked with a special electrographic pencil, then read directly into a computer. (C) 610.10-1994w

**mark sensing column** A vertical line of positions on a data medium, capable of being detected by mark sensing. (C) 610.2-1987

**markup language** *See:* page description language.

**M-array glide slope (instrument landing systems)** A modified null-reference glide-slope antenna system in which the modification is primarily an additional antenna used to obtain a high degree of energy cancellation at the low elevation angles. *Note:* Called M because it was 13th in a series of designs. This system is used at locations where higher terrain exists in front of the approach end of the runway, in order to reduce unwanted reflections of energy into the glide-slope sector. *See also:* navigation. (AES/RS) 686-1982s, [42]

**marshaling/demarshaling** The mapping of information typed as given in the signatures of `Perform-`, `Execute-`, and `Publish-`like operations into the network-specific, on-the-wire formats, including any required endian issues. Demarshaling is the reverse process. (IM/ST) 1451.1-1999

**MARshall System for Aerospace Simulation (MARSYAS)** A simulation language used for simulating large physical systems, designed for use by people inexperienced in simulation or programming. Allows equations and FORTRAN subroutines to be written along with the statements describing a block diagram model. (C) 610.13-1993w

**MARSYAS** *See:* MARshall System for Aerospace Simulation.

**maser (1) (data transmission) (microwave amplification by stimulated emission of radiation)** The general class of microwave amplifiers based on molecular interaction with electromagnetic radiation. The nonelectronic nature of the maser principle results in very low noise. (PE) 599-1985w

**(2) (laser maser)** A device for amplifying or generating radiation by induced transitions of electrons, atoms, molecules, or ions between two energy levels having a population inversion; microwave amplification by stimulated emission of radiation. (LEO) 586-1980w

**mask (1) (A) (computers)** A pattern of characters that is used to control the retention or elimination of portions of another pattern of characters. **(B) (computers)** A filter. (C) [20], [85]

**(2) (software)** A pattern of bits or characters designed to be logically combined with an unknown data item to retain or suppress portions of the data item; for example, the bit string "00000011" when logically ANDed with an eight-bit data item, gives a result that retains the last two bits of the data item and has zero in all the other bit positions. *See also:* interrupt mask. (C) 610.12-1990

**mask document** In word processing, a form displayed on a display screen with blank areas for the user to complete. (C) 610.2-1987

**masking (1) (A)** The process by which the threshold of audibility for one sound is raised by the presence of another (masking) sound. **(B)** The amount by which the threshold of audibility of a sound is raised by the presence of another (masking) sound. The unit customarily used is the decibel. (ACO)

**(2) (color television)** A process to alter color rendition in which the appropriate color signals are used to modify each other. *Note:* The modification is usually accomplished by suitable cross coupling between primary color-signal channels. *See also:* television. (BT/SP/AV) [34], [32]

**masking audiogram** A graphic presentation of the masking due to a stated noise. *Note:* This is plotted in decibels as a function of the frequency of the masked tone. (SP) [32]

**masking, fault** *See:* fault masking.

**mask&swap** A data-access operation that stores a *next* value to the *test* specified bits within a specified data type and returns the previous data value. (C/MM) 1596.5-1993

**maskSwap** A bus transaction that stores bits of a *next* argument to a specified data address and returns the previous data value from that address. The affected bits are specified by a *test* argument. In the CSR Architecture this is called a mask_swap transaction. (C/MM) 1596.5-1993

**masquerade** The pretense by an entity to be a different entity. (LM/C) 802.10-1992

**mass (International System of Units (SI))** The SI unit of mass is the kilogram. This unit, or one of the multiples formed by attaching an SI prefix to gram, is preferred for all applications. Among the base and derived units of SI, the unit of mass is the only one whose name, for historical reasons, contains a prefix. Names of decimal multiples and submultiples of the unit of mass are formed by attaching prefixes to the word gram. The megagram (Mg) is the appropriate unit for measuring large masses such as have been expressed in tons. However, the name ton has been given to several large mass units that are widely used in commerce and technology: the long ton of 2240 lb, the short ton of 2000 lb, and metric ton of 1000 kilograms (also called the tonne). None of these terms are SI. The term metric ton should be restricted to commercial usage, and no prefixes should be used with it. Use of the term tonne is deprecated. *See also:* units and letter symbols. (QUL) 268-1982s

**Massachusetts General Hospital Utility Multi-Programming System (MUMPS)** An ANSI standard programming system containing its own operating system, command language, and interactive programming language; designed specifically for medical applications and is particularly adaptable to string handling functions and management of hierarchical data. (C) 610.13-1993w

**mass-attraction vertical** The normal to any surface of constant geopotential; it is the direction that would be indicated by a plumb bob if the earth were not rotating. *See also:* navigation. (AES/RS) 686-1982s, [42]

**mass burning rate** Mass loss per unit time by materials burning under specified conditions. (DEI) 1221-1993w

**mass loading** The change in phase velocity of a surface acoustic wave produced by a thin layer on the substrate of higher density than that of the substrate; perturbations in reflections, velocity, and dispersion that occur due to loading effects of thin films on the substrate surface. (UFFC) 1037-1992w

**mass spectrograph** An electronic device based on the action of a constant magnetic field on the paths of ions, used to separate ions of different masses. *See also:* electron device. (Std100) [84]

**mass storage** An area of storage, or a storage device, having a very large storage capacity. *Note:* Sometimes referred to as secondary storage in order to differentiate from main storage. *Synonym:* bulk storage. (C) 610.10-1994w

**mass unbalance (gyros)** The characteristic of a gyro resulting from lack of coincidence of the center of supporting forces and the center of mass. It gives rise to torques caused by linear accelerations that lead to acceleration-sensitive drift rates. (AES/GYAC) 528-1994

**mast (power transmission and distribution)** A column or narrow-base structure of wood, steel, or other material, supporting overhead conductors, usually by means of arms or brackets, span wires, or bridges. *Note:* Broad-base lattice steel supports are often known as towers; narrow-base steel supports are often known as masts. *See also:* pole; tower. (T&D/PE) [10]

**mast arm** *See:* bracket.

**Master** *See:* SBus Master.

**master (1) (FASTBUS acquisition and control)** A device that is capable of asserting or controlling an operation on a segment according to the FASTBUS protocol. A master may, in addition, contain slave logic. (NID) 960-1993

**(2) (STD bus)** A card controlling a bus transaction. The master that is currently controlling the bus is the current master. The card that is host to all other masters is the permanent master. All masters that are not the permanent master are temporary masters. (C/MM) 961-1987r

**(3) (VMEbus)** A functional module that initiates data transfer bus (DTB) cycles to transfer data between itself and a slave module. (BA/C) 1014-1987

**(4) (VSB)** A functional module that initiates bus cycles in order to transfer data between itself and VSB slaves. The master that is currently in control of the DTB is referred to as the *active* master. (MM/C) 1096-1988w

**(5) (NuBus)** A bus device that initiates a transaction. (C/MM) 1196-1987w

**(6) (NuBus)** A module that has acquired control of the bus through the control acquisition procedure. (C/BA) 1014.1-1994w, 896.3-1993w, 896.4-1993w, 10857-1994

**(7)** A device that initiates communications requests to gather data or perform controls. (PE/SUB) 1379-1997

**master antenna television system (MATV)** A small television antenna distribution system usually restricted to one or two buildings. (LM/C) 802.7-1989r

**master-capable** Said of an MTM-Bus module that is an S-module at a given time, but contains appropriate circuitry so that it may be converted by system control to an M-module if required. (TT/C) 1149.5-1995

**master clock** *See:* clock.

**master clock node** The node managing the overall synchronization process, which initiates clock synchronization cycles. *Synonym:* reference clock node. (C/BA) 896.2-1991w

**master compass** A magnetic or gyro compass arranged to actuate repeaters, course recorders, automatic pilots, or other devices. (EEC/PE) [119]

**master console** In a computer system with more than one console, the primary console that is used to control the computer. *Synonym:* main console. *Contrast:* auxiliary console. *See also:* remote console. (C) 610.10-1994w

**master contactor (power system device function numbers)** A device, generally controlled by [a master element] device function 1 or the equivalent and the required permissive and protective devices, that serves to make and break the necessary control circuits to place an equipment into operation under the desired conditions and to take it out of operation under other abnormal conditions. (SUB/PE) C37.2-1979s

**master control** The train-borne device or system directly providing the control signals to the train. (VT/RT) 1475-1999, 1474.1-1999

**master controller (1) (load-frequency control) (electric power generators)** The central device that develops corrective action for execution at one or more generating units. (PE/PSE) 94-1991w

**(2) (car retarders)** A controller that governs the operation of one or more magnetic or electropneumatic controllers. *Note:* It is designed to coordinate the movement or the pressure of the retarder with the movement of the retarder level. *See also:* car retarder; multiple-unit control. (VT/LT) 16-1955w

**(3) (land transportation vehicles)** A device that generates local and trainlike control signals to the propulsion and/or brake systems. (VT/LT) 16-1955w

**(4)** A physical device utilized by a human operator to provide the master control of a train. (VT) 1475-1999

**master controller state** A state of the finite state machine (fsm) required of M-modules that controls M-module Link Layer behavior with regard to message transmission. (TT/C) 1149.5-1995

**master direction indicator** A device that provides a remote reading of magnetic heading. It receives a signal from a magnetic sensing element. (PE/NP) 344-1975s

**master drive** A drive that sets the reference input for one or more follower drives. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**master elect** A module that has won the most recent arbitration competition. (C/BA) 10857-1994, 896.4-1993w, 896.3-1993w

**master element (power system device function numbers)** The initiating device, such as a control switch, etc. which serves either directly or through such permissive devices as protective and time-delay relays to place an equipment in or out of operation. *Note:* This number is normally used for a hand-operated device, although it may also be used for an electrical or mechanical device for which no other function number is suitable. (SUB/PE) C37.2-1979s

**master file (data management)** An organized collection of records that is relatively permanent; for example, a file containing employee names, addresses, and salary information. *Synonym:* main file. *Contrast:* transaction file. (C) 610.2-1987, 610.5-1990w

**master form** An original form from which, directly or indirectly, other forms may be prepared. (EEC/PE) [119]

**master ground** A portable device designed to short circuit and connect (bond) a de-energized circuit or piece of equipment, or both, to an electrical ground. Normally located remote from, and on both sides of, the immediate work site. Primarily used to provide safety for personnel during construction, reconstruction, or maintenance operations *Synonyms:* ground set; ground stick. (T&D/PE) 524a-1993r, 516-1995, 524-1992r

**master library (software)** A software library containing master copies of software and documentation from which working copies can be made for distribution and use. *Contrast:* system library; software repository; software development library; production library. (C) 610.12-1990

**master oscillator (data transmission)** An oscillator so arranged as to establish the carrier frequency of the output of an amplifier. (PE) 599-1985w

**master physical layer** In a 100BASE-T2 link containing a pair of PHYs, the PHY that uses an external clock for generating its clock signals to determine the timing of transmitter and receiver operations. It also uses the master transmit scrambler generator polynomial for side-stream scrambling. Master and slave PHY status is determined during the Auto-Negotiation process that takes place prior to establishing the transmission link. *See also:* slave Physical Layer. (C/LM) 802.3-1998

**master reference system for telephone transmission** Adopted by the International Advisory Committee for Long Distance Telephony (CCIF), a primary reference telephone system for determining, by comparison, the performance of other telephone systems and components with respect to the loudness, articulation, or other transmission qualities of received speech. *Note:* The determination is made by adjusting the loss of a distortionless trunk in the master reference system for equal performance with respect to the quality under consideration. (EEC/PE) [119]

**master remote unit (MRU)** An intelligent electronic device that acts as a data concentrator or master to other intelligent electronic devices. (That is, an MRU acquires data from and sends data to other intelligent electronic devices). *Synonyms:* submaster; remote master. (PE/SUB) 1379-1997

**master routine** *See:* subroutine.

**master sequence device (power system device function numbers)** A device such as a motor-operated multicontact switch, or the equivalent, or a programming device, such as a computer, that establishes or determines the operating sequence of the major devices in an equipment during starting and stopping or during other sequential switching operations. (SUB/PE) C37.2-1979s

**mastership (FASTBUS acquisition and control)** A master is asserting mastership when it has control of the segment to which it is attached and is asserting grant acknowledge (GK) or address sync (AS). (NID) 960-1993

**master/slave operation (power supplies)** A system of interconnection of two regulated power supplies in which one (the master) operates to control the other (the slave). *Note:* Specialized forms of the master.slave configuration are used in: 1) complementary tracking (plus and minus tracking around a common point); 2) parallel operation to obtain increased current output for voltage regulation; 3) compliance extension to obtain increased voltage output for current regulation. (AES) [41]

**master state** *See:* supervisor state.

**master station (1) (A) (data transmission)** (supervisory system). The station from which remotely located units of switchgear or other equipment are controlled by supervisory control or that receives supervisory indications or selected telemeter readings. **(B) (data transmission)** (electronic navigation). One station of a group of stations, as in LORAN, that is used to control or synchronize the emission of the other stations. (SWG/SWG/PE) C37.100-1992, 599-1985

**(2) (station control and data acquisition)** (of a supervisory system) The entire complement of devices, functional modules, and assemblies that are electrically interconnected to effect the master station supervisory functions. The equipment includes the interface with the communication channel

but does not include the interconnecting channel. During communication with one or more remote stations, the master station is the superior in the communication hierarchy. (PE/SUB) C37.100-1992, C37.1-1994

**(3) (electronic navigation)** One station of a group of stations, as in loran, that is used to control or synchronize the emission of the other stations. *See also:* radio navigation. (AES/RS) 686-1982s, [42]

**(4)** A station that controls other terminals sharing multiple-access transmission medium on a multipoint circuit. (C) 610.7-1995

**master-station supervisory equipment (data transmission)** That part of a (single) supervisory system that includes all necessary supervisory control relays, keys, lamps, and associated devices located at the master station for selection, control, indication, and other functions to be performed. (SWG/PE) C37.100-1992, 599-1985w

**master switch** A switch that dominates the operation of contactors, relays, or other remotely operated devices. (IA/MT) 45-1998

**master terminal (1)** A dedicated terminal that is reserved for the operator of the system or other authorized persons that are privileged to initiate conversations, and to control system-wide processes and operations. *Synonyms:* control terminal; operator console. (C) 610.10-1994w

**(2)** The entire complement of devices, functional modules, and assemblies that are electrically interconnected to effect the master terminal supervisory functions (of a supervisory system). The equipment includes the interface with the communication channel, but does not include the interconnecting channel. (SUB/PE) 999-1992w

**master terminal unit (station control and data acquisition)** The master station of a supervisory control system. *See also:* station; master station. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**mast-type antenna for aircraft** A rigid antenna of streamlined cross section consisting essentially of a formed conductor or conductor and supporting body. (EEC/PE) [119]

**MAT** *See:* machine-aided translation.

**mat (rotating machinery)** A randomly distributed unwoven felt of fibers in a sheetlike configuration having relatively uniform density and thickness. *See also:* stator; rotor. (PE) [9]

**match (A)** A condition in which the values of corresponding components of two or more data items are equal. *See also:* hit. **(B)** To compare two or more data items to determine whether their corresponding components are equal as in definition "A." (C) 610.5-1990

**matched** A state applying to a sequence of zero or more characters when the characters in the sequence correspond to a sequence of characters defined by a BRE or ERE pattern. (C/PA) 9945-2-1993

**matched condition** *See:* matched termination.

**matched filter** A filter that maximizes the output ratio of peak signal power to mean noise power. *Note:* For white noise, a matched filter has a frequency response function that is the complex conjugate of the transmitted spectrum. Its impulse response is the time inverse of the transmitted waveform. (AES) 686-1997

**matched generator insertion gain (waveguide)** A gain resulting from placing two ports of a network between a load having an arbitrary impedance and a matched generator. It is the ratio of the power absorbed in the load when connected to the generator (reference power) to that when the network is inserted. *Contrast:* matched generator insertion loss. (MTT) 146-1980w

**matched generator insertion loss (waveguide)** A loss resulting from placing two ports of a network between a load having an arbitrary impedance and a matched generator. It is the ratio of the power absorbed in the load when connected to the generator (reference power) to that when the network is inserted. *Contrast:* matched generator insertion gain. (MTT) 146-1980w

**matched impedances** Two impedances are matched when they are equal. *Note:* Two impedances associated with an electric network are matched when their resistance components are equal and when their reactance components are equal. *See also:* network analysis. (Std100) 270-1966w

**matched insertion gain (waveguide)** A gain resulting from placing two ports of a network between a matched generator and a matched load. It is the ratio of the power absorbed in the load when connected to the generator (reference power) to that when the network is inserted. *Contrast:* matched insertion loss. (MTT) 146-1980w

**matched insertion loss (waveguide)** A loss resulting from placing two ports of a network between a matched generator and a matched load. It is the ratio of the power absorbed in the load when connected to the generator (reference power) to that when the network is inserted. *Contrast:* matched insertion gain. (MTT) 146-1980w

**matched load insertion gain (waveguide)** A gain resulting from placing two ports of a network between a generator having an arbitrary impedance and a matched load. It is the ratio of the power absorbed in the load when connected to the generator (reference power) to that when the network is inserted. *Contrast:* matched load insertion loss. (MTT) 146-1980w

**matched load insertion loss (waveguide)** A loss resulting from placing two ports of a network between a generator having an arbitrary impedance and a matched load. It is the ratio of the power absorbed in the load when connected to the generator (reference power) to that when the network is inserted. *Contrast:* matched load insertion gain. (MTT) 146-1980w

**matched terminated line (waveguide)** A transmission line having no reflected wave at any transverse section. (MTT) 146-1980w

**matched termination (waveguide components)** A termination matched with regard to the impedance in a prescribed way; for example, a reflectionless termination or a conjugate termination. *See also:* transmission line; reflectionless termination. (MTT) 147-1979w

**matched transmission line (data transmission)** A transmission line is said to be matched at any transverse section if there is no wave reflection at that section. (PE) 599-1985w

**matched waveguide** *See:* matched terminated line.

**matching** *See:* image matching.

**matching error (analog computer)** An error resulting from inaccuracy in matching (two resistors) or mating (a resistor and a capacitor) passive elements. *See also:* electronic analog computer. (EEC/IE) [126]

**matching, impedance** *See:* load matching.

**matching interaction** An instruction method employed by some computer-assisted instruction systems, in which the student is asked to match answers to questions. (C) 610.2-1987

**matching, load** *See:* load matching.

**matching loss (1) (radar)** The loss in S/N (signal-to-noise) output relative to a matched filter, caused by using a filter of other than matched response to the transmitted signal. *Synonym:* mismatch loss. (AES/RS) 686-1982s

**(2) (telecommunications)** The net probability of not being able to establish a network path between an originating line or incoming trunk and a terminating line or trunk when the terminating line or trunk is idle. *Synonym:* overflow loss. (COM/TA) 973-1990w

**matching section (waveguide) (waveguide transformer)** (transforming section) A length of waveguide of modified cross section, or with a metal or dielectric insert, used for impedance transformation. *See also:* waveguide. (AP/ANT) [35]

**matching transformer (induction heater)** A transformer for matching the impedance of the load to the optimum output characteristic of the power source. (IA) 54-1955w

**material (nuclear power generating station)** A substance or combination of substances used as constituents in the manufacture of components, modules, or items. *Note:* This term applies specifically to the subject matter of IEEE Std 467-1980. (PE/NP) 467-1980w

**material absorption** *See:* absorption.

**material dispersion (fiber optics)** That dispersion attributable to the wavelength dependence of the refractive index of material used to form the waveguide. Material dispersion is characterized by the material dispersion parameter M. *See also:* dispersion; material dispersion parameter; distortion; waveguide dispersion; profile dispersion parameter. (Std100) 812-1984w

**material dispersion parameter (M) (fiber optics)**

$$M(\lambda) = -1/c(dN/d\lambda) = \lambda/c(d^2n/d\lambda^2)$$

where $n$ is the refractive index, $N$ is the group index: $N = n - \lambda(dn/d\lambda)$, $\lambda$ is the wavelength, and $c$ is the velocity of light in vacuum. *Notes:* 1. For many optical waveguide materials, M is zero at a specific wavelength $\lambda_0$, usually found in the 1.2 to 1.5 μm range. The sign convention is such that M is positive for wavelengths shorter than $\lambda_0$ and negative for wavelengths longer than $\lambda_0$. 2. Pulse broadening caused by material dispersion in a unit length of optical fiber is given by M times spectral linewidth ($\Delta\lambda$), except at $\lambda = \lambda_0$, where terms proportional to $(\Delta\lambda)^2$ are important. (See Note 1). *See also:* group index; material dispersion. 812-1984w

**material scattering (fiber optics)** In an optical waveguide, that part of the total scattering attributable to the properties of the materials used for waveguide fabrication. *See also:* scattering; waveguide scattering; Rayleigh scattering. (Std100) 812-1984w

**material temperature class (thermal classification of electric equipment and electrical insulation) (evaluation of thermal capability)** The lowest value of a range of temperature indices for insulating materials. (EI) 1-1986r

**Mathematica** A programming language designed to manipulate equations symbolically. (C) 610.13-1993w

**mathematical adjectives** All definitions are stated in terms of time (the independent variable) and magnitude (the dependent variable). Unless otherwise specified, the following terms apply only to waveform data within a waveform epoch. These adjectives may be used to describe the relation(s) between other specified variable pairs (for example, time and power, time and voltage, etc.).

a) *Instantaneous.* Pertaining to the magnitude at a specified time.

b) *Positive (negative) peak.* Pertaining to the maximum (minimum) magnitude.

c) *Peak-to-peak.* Pertaining to the absolute value of the algebraic difference between the positive peak magnitude and the negative peak magnitude.

d) *Root-mean-square (rms).* Pertaining to the square root of the average of the square of the magnitude. If the magnitude takes on $n$ discrete values $m_j$, the root-mean-square magnitude is

$$M_{rss} = \left[\sum_{j=1}^{j=n} m_j^2\right]^{1/2}$$

If the magnitude is a continuous function of time m(t),

$$M_{rss} = \left[\int_{t_1}^{t_2} m^2(t)\mathrm{d}t\right]^{1/2}$$

The summation or the integral extends over the interval of time for which the rms magnitude is desired or, if the function is periodic, over any integral number of periodic repetitions of the function.

e) *Average.* Pertaining to the mean of the magnitude. If the magnitude takes on $n$ discrete values $m_j$, the average magnitude is

$$M_{rms} = \left[\left(\frac{1}{n}\right)\sum_{j=1}^{j=n} m_j^2\right]^{1/2}$$

If the magnitude is a continuous function of time $m(t)$

$$M_{rms} = \left[\left(\frac{1}{t_2 - t_1}\right)\int_{t_1}^{t_2} m^2(t)\mathrm{d}t\right]^{1/2}$$

The summation or the integral extends over the interval of time for which the average magnitude is desired or, if the function is periodic, over any integral number of periodice repetitions of the function.

f) *Average absolute* Pertaining to the mean of the absolute magnitude. If the magnitude takes on $n$ discrete values $m_j$, the average absolute magnitude is

$$\overline{M} = \left(\frac{1}{n}\right)\sum_{j'=1}^{j'=n} m_j$$

If the magnitude is a continuous function of time $m(t)$

$$\overline{M} = \left(\frac{1}{t_2 - t_1}\right)\int_{t_1}^{t_2} m(t)\mathrm{d}t$$

The summation or the integral extends over the interval of time for which the average absolute magnitude is desired or, if the function is periodic, over any integral number of periodic repetitions of the function.

g) *Root sum of squares (rss).*Pertaining to the square root of the arithmetic sum of the squares of the magnitude. If the magnitude takes on $n$ discrete values $m_j$, the root sum of squares magnitude is

$$|\overline{M}| = \left(\frac{1}{n}\right)\sum_{j'=1}^{j'=n} |m_j|$$

If the magnitude is a continuous function of time $m(t)$,

$$|\overline{M}| = \left(\frac{1}{t_2 - t_1}\right)\int_{t_1}^{t_2} |m(t)|\mathrm{d}t$$

The summation or the integral extends over the interval of time for which the root sum of squares magnitude is desired $r$, if the function is periodic, over any integral number of periodic repetitions of the function.

(IM/WM&A) 194-1977w

**mathematical check (1) (graphic symbols for electrical and electronics diagrams)** A programmed check of a sequence of operations that makes use of the mathematical properties of the sequence. Sometimes called a control. *See also:* programmed check. (GSD) 315-1975r

**(2) (mathematics of computing)** A check of the accuracy of a calculation by performing additional calculations. For example, verification of multiplication results by dividing the product by the multiplier to obtain the multiplicand. *Synonym:* arithmetic check. (C) 1084-1986w

**mathematical model (1) (analog computer)** A set of equations used to represent a physical system. (C) 165-1977w

**(2) (modeling and simulation)** A symbolic model whose properties are expressed in mathematical symbols and relationships; for example, a model of a nation's economy expressed as a set of equations. *Contrast:* graphical model; narrative model; software model. (C) 610.3-1989w

**mathematical programming** In operations research, a procedure for locating the maximum or minimum of a function subject to constraints. (C) 610.2-1987

**Mathematical Programming System Extended (MPSX)** A programming language used widely for controlling the solution strategy for mathematical programming problems. (C) 610.13-1993w

**mathematical quantity** *See:* mathematico-physical quantity.

**mathematical simulation (analog computer)** The use of a model of mathematical equations generally solved by computers to represent an actual or proposed system. (C) 165-1977w

**mathematical symbol (abbreviation)** A graphic sign, a letter or letters (which may have letters or numbers, or both, as subscripts or superscripts, or both), used to denote the performance of a specific mathematical operation, or the result of such operation, or to indicate a mathematical relationship.

*See also:* abbreviation; symbol for a unit; symbol for a quantity. (GSD) 267-1966

**mathematico-physical quantity (symbolic quantity) (mathematical quantity) (abstract quantity)** A concept, amenable to the operations of mathematics, that is directly related on one (or more) physical quantity and is represented by a letter symbol in equations that are statements about that quantity. *Note:* Each mathematical quantity used in physics is related to a corresponding physical quantity in a way that depends on its defining equation. It is characterized by both a qualitative and a quantitative attribute (that is, dimensionality and magnitude). (Std100) 270-1966w

**matrix (1) (A) (color television)** An array of coefficients symbolic of a color coordinate transformation. *Note:* This definition is consistent with mathematical usage. **(B) (color television)** To perform a color coordinate transformation by computation or by electrical, optical, or other means. (BT/AV) 201-1979

**(2) (A) (mathematics)** A two-dimensional rectangular array of quantities. Matrices are manipulated in accordance with the rules of matrix algebra. **(B) (mathematics)** By extension, an array of any number of dimensions. (C) [20], [85]

**(3)** A logic network whose configuration is an array of intersections of its input-output leads, with elements connected at some of these intersections. The network usually functions as an encoder or decoder. *Note:* A translating matrix develops several output signals in response to several input signals; a decoder develops a single output signal in response to several input signals (therefore sometimes called an and matrix); an encoder develops several output signals in response to a single input signal and a given output signal may be generated by a number of different input signals (therefore sometimes called an OR matrix). *See also:* encode; translate; decode. (C) 162-1963w

**(4) (general)** Loosely, any encoder, decoder, or translator. (Std100) 270-1966w

**(5) (electrochemistry)** A form used as a cathode in electroforming. (EEC/PE) [119]

**(6) (data management)** A two-dimensional array conceptually arranged in rows and columns. *Note:* A matrix with $m$ rows and $n$ columns is said to be of size $m \times n$ ($m$-by-$n$). *See also:* row-major order; table; column-major order. (C) 610.5-1990w

**matrix-addressed storage display device** A raster display device that does not require refresh. For example, a plasma panel. (C) 610.10-1994w

**matrix character generator** A character generator that creates characters composed of selected dots. *Contrast:* stroke character generator. (C) 610.6-1991w

**matrix circuit** *See:* matrix unit.

**matrix, fundamental** *See:* transition matrix.

**matrix of controls** In networking, a two-dimensional matrix that shows the relationship between all the controls in the communications network and the specific threats they mitigate. (C) 610.7-1995

**matrix printer** *See:* dot matrix printer.

**matrix spike** An aliquot of a sample which is spiked with a known concentration of the analyte of interest. (NI) N42.23-1995

**matrix storage** A type of storage whose elements are arranged in such a manner that access to any location requires the use of two or more coordinates; for example, cathode ray storage. (C) 610.10-1994w

**matrix, system** *See:* system matrix.

**matrix, transition** *See:* transition matrix.

**matrix unit (color television)** A device that performs a color coordinate transformation by electrical, optical, or other means. *Synonym:* matrix circuit. (BT/AV) 201-1979w

**matte dip (electroplating)** A dip used to produce a matte surface on a metal. *See also:* electroplating. (PE/EEC) [119]

**matte surface (illuminating engineering)** A surface from which the reflection is predominantly diffuse, with or without a negligible specular component. *See also:* diffuse reflection. (EEC/IE) [126]

**MATV** *See:* master antenna television system.

**MAU** *See:* medium attachment unit.

**maximum allowable conductor temperature** The maximum temperature limit that is selected in order to minimize loss of strength, sag, line losses, or a combination of the above. (T&D/PE) 738-1993

**maximum arrest force** The peak force measured by the test instrumentation during arrest of the test weight in the dynamic test. (T&D/PE) 1307-1996

**maximum asymmetric short-circuit current (rotating machinery)** The instantaneous peak value reached by the current in the armature winding within a half of a cycle after the winding has been suddenly short-circuited, when conditions are such that the initial value of any aperiodic component of current is the maximum possible. (PE) [9]

**maximum available power (MAP)** The maximum power that can be obtained by increasing dc current while not controlling the ac voltage. (PE/T&D) 1204-1997

**maximum average power (attenuator)** That maximum specified input power applied for a minimum of one hour (unless specified for a longer period) at the maximum operating temperature with output terminated in the characteristic impedance which will not permanently change the specified properties of the attenuator after return to ambient temperature at a power level 20 dB below maximum specified input power. (IM/HFIM) 474-1973w

**maximum average power output (television)** The maximum radio-frequency output power that can occur under any combination of signals transmitted, averaged over the longest repetitive modulation cycle. *See also:* television. (EEC/PE) [119]

**maximum bundle gradient (overhead-power-line corona and radio noise)** For a bundle of two or more subconductors, the highest value among the maximum gradients of the individual subconductors. For example, for a three-conductor bundle with individual maximum subconductor gradients of 16.5, 16.9, and 17.0 kV/cm, the maximum bundle gradient would be 17.0 kV/cm. (T&D/PE) 539-1990

**maximum capability (power operations)** The maximum generation expressed in kilowatt-hours per hour (kWh/h) which a generating unit, station, power source, or system can be expected to supply under optimum operating conditions. (PE/PSE) 858-1987s

**maximum capacity (electric generating unit reliability, availability, and productivity)** The maximum capacity that a unit can sustain over a specified period of time. The maximum capacity can be expressed as gross maximum capacity (GMC) or net maximum capacity (NMC). To establish this capacity, formal demonstration is required.The test is repeated periodically. This demonstrated capacity level is corrected to generating conditions for which there is minimum ambient restriction. When a demonstration test has not been conducted, the estimated maximum capacity of the unit is used. (PE/PSE) 762-1987w

**maximum common-mode signal level** The maximum level of the common-mode signal at which the common mode rejection ratio is still valid. (IM/WM&A) 1057-1994w

**maximum continuous exposure temperature** The highest temperature to which a component of the heat-tracing system may be continuously exposed (heater de-energized). (IA) 515-1997

**maximum continuous operating voltage (MCOV) (1)** The maximum rms value of power-frequency voltage that may be applied continuously between the terminals of the arrester without degradation or deleterious effects. (PE) C62.34-1996

**(2)** The maximum designated root-mean-square (rms) value of power-frequency voltage that may be applied continuously between the terminals of the arrester. (SPD/PE) C62.11-1999

**(3)** The maximum designated root-mean-square value of power frequency voltage that may be applied continuously between the terminals of the overvoltage protective device. (SPD/PE) C62.62-2000

**maximum continuous rating (rotating machinery)** The maximum values of electric and mechanical loads at which a machine will operate successfully and continuously. *Note:* An overload may be implied, along with temperature rises higher than normal standards for the machine. *See also:* asynchronous machine. (PE) [9]

**maximum control current (magnetic amplifier)** The maximum current permissible in each control winding either continuously or for designated operating intervals as specified by the manufacturer and shall be specified as either root-mean-square or average. (MAG) 107-1964w

**maximum credible voltage or current transient** That voltage or current transient that may exist in circuits, as determined by test or analysis, taking into consideration the circuit location, routing, and interconnections combined with failures that the circuits may credibly experience. (PE/NP) 384-1992r

**maximum current (wattmeter or power-factor meter) (instrument)** A stated current that, if applied continuously at maximum stated operating temperature and with any other circuits in the instrument energized at rated values, will not cause electric breakdown or any observable physical degradation. *See also:* instrument. (EEC/AII) [102]

**maximum-deflection angle** The maximum plane angle subtended at the deflection center by the usable screen area. *Note:* In this term, the hyphen is frequently omitted. (ED) 161-1971w

**maximum demand (1) (power operations)** The largest of a particular type of demand occurring within a specified period. (PE/PSE) 858-1987s

**(2) (electric power systems in commercial buildings)** The greatest of all the demands that have occurred during a specified period of time; determined by measurement over a prescribed time interval. (IA/PSE) 241-1990r

**(3)** The greatest of all demands that have occurred during a specified period of time such as one-quarter, one-half, or one hour. *Note:* For utility billing purposes the period of time is generally one month. (IA/PSE) 141-1993r

**(4)** The highest demand measured over a selected period of time, e.g., one month. (AMR/SCC31) 1377-1997

**(5)** *See also:* demand—maximum. (ELM) C12.1-1981

**maximum-demand pointer (friction pointer of a demand meter) (demand meter)** A means used to indicate the maximum demand that has occurred since its previous resetting. The maximum-demand pointer is advanced up the scale of an indicating demand meter by the pointer pusher. When not being advanced, it is held stationary, usually by friction, and it is reset manually when the meter is read for billing purposes. *See also:* demand meter. (EEC/PE) [119]

**maximum design cantilever load-static (MDCL-static)** The maximum cantilever load the surge arrester is designed to continuously carry. (SPD/PE) C62.11-1999

**maximum design rating (composite insulators)** The maximum mechanical load that the insulator is designed to withstand continuously for the life of the insulator. (T&D/PE) 987-1985w

**maximum design voltage (1) (device)** The highest voltage at which the device is designed to operate. *Note:* When expressed as a rating this voltage is termed rated maximum voltage. (PE/PSR) C37.90-1978s

**(2) (outdoor electric apparatus) (to ground)** The maximum voltage at which the bushing is designed to operate continuously. (PE/TR) 21-1976

**(3) (power and distribution transformers)** The highest rms phase-to-phase voltage that equipment components are designed to withstand continuously, and to operate in a satisfactory manner without derating of any kind. (PE/TR) C57.12.80-1978r

**(4) (A)** (of a device) The highest voltage at which the device is designed to operate. **(B)** (of a relay) The highest root-mean-square (rms) or dc voltage at which a relay is designed to be energized continuously. (SWG/SWG/PE) C37.100-1992

**maximum-deviation sensitivity (in frequency-modulation receivers)** Under maximum system deviation, the least signal input for which the output distortion does not exceed a specified limit. *See also:* frequency modulation. 188-1952w

**maximum differential input** The largest value of peak-to-peak differential (ppd) amplitude at which a receiver is expected to operate, under worst-case conditions, without exceeding the objective bit error ratio. (C/LM) 802.3-1998

**maximum discharge current** The maximum surge current that the surge protective device withstands without damage. The maximum discharge current is a peak impulse current, with a wave shape of 8/20. (PE) C62.34-1996

**maximum effort (electric generating unit reliability, availability, and productivity)** Repairs were accomplished in the shortest possible time. *See also:* repair urgency. (PE/PSE) 762-1987w

**maximum excursion (electric conversion)** The maximum positive or negative deviation from the initial or steady value caused by a transient condition. (AES) [41]

**maximum exposure temperature (1) (electrical heating systems)** The highest temperature to which an object may be exposed continuously. (IA/PC) 844-1991

**(2) (electrical heat tracing for industrial applications)** The highest temperature to which a device in the heat-tracing system may be exposed for a given period of time. (BT/AV) 152-1953s

**(3)** The highest temperature to which a component of the heat-tracing system may be exposed either continuously or for a specified period of time. (IA/PC) 515.1-1995

**maximum frequency of interest (A)** For switching power supplies: 10 times the maximum power switch switching frequency. **(B)** For filter products: 10 times the 3dB point. (PEL) 1515-2000

**maximum generation (electric generating unit reliability, availability, and productivity)** The energy that could have been produced by a unit in a given period of time if operated continuously at maximum capacity. Maximum generation can be expressed as gross maximum generation (GMG) or net maximum generation (NMG).

$$MG = \text{period hours} \cdot \text{maximum capacity} = PH \cdot MC$$
$$GMG = PH \cdot GMC$$
$$NMG = PH \cdot NMC$$

(PE/PSE) 762-1987w

**maximum grid current** A design value of the maximum grid current, defined as follows:

$$I_G = D_f \times I_g$$

where

$I_G$ = the maximum grid current in A
$D_f$ = the decrement factor for the entire duration of fault $t_f$, given in s
$I_g$ = the rms symmetrical grid current in A

(PE/SUB) 80-2000

**maximum ground acceleration (seismic design of substations)** The maximum value of acceleration input to the equipment during a given earthquake for a particular site. (PE/SUB) 693-1984s, C37.122.1-1993

**maximum hottest conductor temperature** Used in discussions involving the life testing of materials, in lieu of the phrase winding hottest-spot temperature ($\theta_h$). (PE/TR) 1276-1997

**maximum instantaneous fuel change (gas turbines)** The fuel change allowable for an instantaneous or sudden increased or decreased load or speed demand. *Note:* It is expressed in terms of equivalent load change in percent of rated load. (PE/EDPG) 282-1968w, [5]

**maximum keying frequency (facsimile) (fundamental scanning frequency)** The frequency in hertz numerically equal to

the spot speed divided by twice the scanning spot X dimension. *See also:* scanning. (COM) 168-1956w

**maximum limiting resolution (diode-type camera tube)** The highest value of limiting resolution obtained under optimum irradiance conditions using a stationary bar pattern. Units: LP/RH. (ED) 503-1978w

**maximum maintain temperature (1)** Specified maximum temperature of a surface or process which the heat tracing is capable of maintaining continuously. (IA/PC) 515.1-1995

**(2)** Specified maximum temperature of a surface or process that the heat-tracing cable or surface heating device is capable of maintaining continuously. (IA) 515-1997

**maximum mechanical load** The largest service load allowed on a composite insulator or bushing. The maximum mechanical load (MML) is within the reversible elastic range and is supplied by the manufacturer. (PE/SUB) 693-1997

**maximum modulating frequency (facsimile)** The highest picture frequency required for the facsimile transmission system. *Note:* The maximum modulating frequency and the maximum keying frequency are not necessarily equal. *See also:* facsimile transmission. (COM) 168-1956w

**maximum momentary speed variation (hydraulic turbines)** The maximum momentary change of speed when the load is suddenly changed a specified amount. (PE/EDPG) 125-1977s

**maximum observed frequency (MOF)** In oblique-incidence ionospheric sounding, the MOF is the highest frequency for which the signals transmitted from a sounder are observed on the ionogram, regardless of the propagation path involved. (AP/PROP) 211-1997

**maximum OFF voltage (magnetic amplifier)** The maximum output voltage existing before trip ON control signal is reached as the control signal is varied from trip OFF to trip ON. (MAG) 107-1964w

**maximum operating common-mode signal** The largest common-mode signal for which the waveform recorder will meet its effective bits specifications in recording a simultaneously-applied, normal-mode signal. (IM/WM&A) 1057-1994w

**maximum operating voltage (*Vm*) (1) (household electric ranges)** The maximum voltage to which the electric parts of the range may be subjected in normal operation. *See also:* appliance outlet. (IA/APP) [90]

**(2)** The maximum system operating rms phase-to-phase (or phase-to-ground for single phase, or pole-to-ground for dc) voltage, which is also equal to the 1 per unit (p.u.) base. For clearance calculation, the maximum operating crest phase-to-ground voltage is equal to 1 per unit (p.u.). (T&D/PE) 516-1995

**maximum output (receivers)** The greatest average output power into the rated load regardless of distortion. *See also:* radio receiver. 188-1952w

**maximum output jitter** The peak-to-peak jitter acceptable to enable satisfactory interconnection of digital networks and equipment. (COM/TA) 1007-1991r

**maximum output voltage (magnetic amplifier)** The voltage across the rated load impedance with maximum control current flowing through each winding simultaneously in a direction that increases the output voltage. *Notes:* 1. Maximum output voltage shall be specified either as root-mean-square or average. 2. While specification may be either root-mean-square or average, it remains fixed for a given amplifier. (MAG) 107-1964w

**maximum peak power (attenuator)** That maximum peak power at the maximum specified pulse-length and average power which, when applied for a minimum of one hour (unless specified for a longer period) at the maximum operating temperature, while the output is terminated in the characteristic impedance, will not permanently change the specified properties of the attenuator when returned to ambient temperature at a power level 20 dB below the maximum specified input power or lower. (IM/HFIM) 474-1973w

**maximum permissible exposure (MPE)** The rms and peak electric and magnetic field strengths, their squares, or the plane-wave equivalent power densities associated with these fields and the induced and contact currents to which a person may be exposed without harmful effect and with an acceptable safety factor. (NIR) C95.1-1999

**maximum power output (hydraulic turbines)** The maximum output which the turbine-generator unit is capable of developing at rated speed with maximum head and maximum gate. (PE/EDPG) 125-1977s

**maximum pulse rate (metering)** The number of pulses per second at which a pulse device is nominally rated. (ELM) C12.1-1982s

**maximum pulse repetition rate (digital delay line)** The maximum pulse repetition rate shall be equal to 1/2 $D\tau$, where $D\tau$ is the time spacing between the peaks of the output doublet. (UFFC) [22]

**maximum rated step voltage** The highest value of rated step voltage for which the LTC is designed. (PE/TR) C57.131-1995

**maximum rated through current** The rated through current for which both the temperature rise of the contacts and the service duty test apply. (PE/TR) C57.131-1995

**maximum rate of fuel change (gas turbines)** The rate of fuel change that is allowable after the maximum instantaneous fuel change, when an instantaneous speed or load demand upon the turbine is greater than that corresponding to the maximum instantaneous fuel change. *Note:* It is expressed in percent of equivalent load change per second. (PE/EDPG) 282-1968w, [5]

**maximum relative side lobe level** The maximum relative directivity of the highest side lobe with respect to the maximum directivity of the antenna. (AP/ANT) 145-1993

**maximum retention time (storage tubes)** The maximum time between writing into a storage tube and obtaining an acceptable output by reading. *See also:* storage tube. (ED) 161-1971w

**maximum safe input power (1) (spectrum analyzer)** The power applied at the input which will not cause degradation of the instrument characteristics. *Note:* Input signal conditions, for example, peak or average power, should be specified. (IM) 748-1979w

**(2) (non-real time spectrum analyzer)** The power applied at the input which will not cause degradation of the instrument characteristics. (IM) [14]

**(3) (electrothermic unit)** The maximum peak pulse or cw input power that will cause no permanent change in the calibration or characteristics of the electrothermic unit. Specify in watt-microseconds the maximum (safe) input energy per pulse and the applicable pulse repetition frequency in hertz or in kilohertz. Specify in watts or milliwatts the maximum (safe) input peak pulse power. (IM) 544-1975w

**maximum sensitivity (frequency-modulation systems)** The least signal input that produces a specified output power. 188-1952w

**maximum sine-current differential permeability (toroidal magnetic amplifier cores)** The maximum value of sine-current differential permeability obtained with a specified sine-current magnetizing force. (Std100) 106-1972

**maximum single-conductor gradient (overhead-power-line corona and radio noise)** The maximum value attained by the gradient $E(\theta)$ as $\theta$ varies over the range 0 to $2\pi$, where $E(\theta)$ is the gradient on the surface of the power line conductor expressed as a function of angular position ($\theta$). Unless otherwise stated, the gradient is a nominal gradient. *See also:* nominal conductor gradient; maximum single-subconductor gradient. (T&D/PE) 539-1990

**maximum single-subconductor gradient (overhead-power-line corona and radio noise)** The maximum value attained by the gradient $E(\theta)$ as $\theta$ varies over the range 0 to $2\pi$, where $E(\theta)$ is the gradient on the surface of the power line subconductor expressed as a function of angular position ($\theta$). Unless otherwise stated, the gradient is a nominal gradient.

*See also:* maximum single-conductor gradient; nominal conductor gradient. (T&D/PE) 539-1990

**maximum sound pressure** (for any given cycle of a periodic wave) The maximum absolute value of the instantaneous sound pressure occurring during that cycle. *Note:* In the case of a sinusoidal sound wave this maximum sound pressure is also called the pressure amplitude. (SP) [32]

**maximum speed** The highest speed within the operating speed range of the drive. *See also:* electric drive. (IA/ICTL/IAC) [60]

**maximum static error (MSE)** The maximum difference between any code transition level and its ideal value. (IM/WM&A) 1057-1994w

**maximum surge current rating (semiconductor rectifiers) (rectifier circuits)** (nonrepetitive) The maximum forward current having a specified waveform and short specified time interval permitted by the manufacturer under stated conditions. *See also:* average forward current rating. (IA) [62]

**maximum surge energy absorbed** (for rating purposes only) The maximum allowable surge energy that the photocontrol can absorb without changing its operating characteristics. This is based on a single 10/1000 μs current waveform. (RL) C136.10-1996

**maximum system deviation (frequency-modulation systems)** The greatest frequency deviation specified in the operation of the system. *Note:* Maximum system deviation is expressed in kilohertz. In the case of FCC authorized frequency modulation broadcast systems in the range from 88 to 108 MHz, the maximum system deviation is ±75 kHz. (BT) 185-1975w

**maximum system voltage (1) (electrical systems in commercial buildings)** The highest system voltage that occurs under normal operating conditions, and the highest system voltage for which equipment and other components are designed for satisfactory continuous operation without derating of any kind. (IA/PSE) 241-1990r

**(2)** The highest voltage at which a system is operated. (This voltage excludes voltage transients and temporary overvoltages caused by abnormal system conditions such as faults, load rejection, etc.). *Note:* This is generally considered to be the maximum system voltage. (SPD/PE) C62.22-1991s

**(3)** The highest rms phase-to-phase voltage that occurs on the system under normal operating conditions, and the highest rms phase-to-phase voltage for which equipment and other system components are designed for satisfactory continuous operation without deterioration of any kind. (C/PE/TR) 1313.1-1996, C57.12.80-1978r

**(4)** The highest voltage at which a system is operated. *Note:* This is generally considered to be the maximum system voltage as prescribed in ANSI C84.1-1995. (SPD/PE) C62.11-1999, C62.62-2000

**maximum test output voltage (magnetic amplifier) (nonreversible output)** The output voltage equivalent to the summation of the minimum output voltage plus 66 2/3 percent of the difference between the rated and minimum output voltages. (MAG) 107-1964w

**(2) (A) (reversible output)** Positive maximum test output voltage is the output voltage equivalent to 66 2/3 percent of the rated output voltage in the positive direction. **(B) (reversible output)** Negative maximum test output voltage is the output voltage equivalent to 66 2/3 percent of the rated output voltage in the negative direction. (MAG) 107-1964

**maximum theoretical deviation from a sine wave (self-commutated converters) (converter characteristics)** For a nonsinusoidal wave, the ratio of the arithmetic sum of the amplitudes (rms) of all harmonics in the wave to the amplitude (rms) of the fundamental. (IA/SPC) 936-1987w, 519-1992

**maximum total sag** The total sag at the midpoint of the straight line joining the two points of support of the conductor. *See also:* sag. (NESC/BT/T&D/AV) C2-1997, [34], C2.2-1960

**maximum transfer unit** The largest amount of data that can be transferred across a given physical network. (C) 610.7-1995

**maximum undistorted output (amplitude-modulation broadcast receivers)** The so-called maximum undistorted output is arbitrarily taken as the least power output which contains, under given operating conditions, a total power at harmonic frequencies equal to one percent of the apparent power at the fundamental frequency. This corresponds to a root-sum-square total voltage at harmonic frequencies equal to 10 percent of the root-sum-square voltage at the fundamental frequency, if measured across a pure resistance. (The root-sum-square voltage of a complex wave is the square root of the sum of the squares of the component voltages.) (CE) 186-1948w

**maximum usable frequency (MUF)** The highest frequency by which a radio wave can propagate between given terminals, on a specified occasion, by ionospheric refraction alone. *Notes:* 1. Where the MUF is restricted to a particular ionospheric propagation mode, the values may be quoted together with an indication of that mode (e.g., 1E MUF, 2F2 MUF). 2. If the extraordinary component of the wave is involved, then this is noted [e.g., 1F2 MUF (X)]. Absence of a specific response to the magneto-ionic component implies that the quoted value relates to the ordinary wave. 3. It is sometimes useful to quote the ground range for which the MUF applies. This is indicated in kilometers following the indication of the mode type [e.g., 1F2 (4000) MUF (X)]. (AP/PROP) 211-1997

**maximum usable reading time (storage tubes)** The length of time a storage element, line, or area can be read before a specified degree of decay occurs. *Notes:* 1. This time may be limited by static decay, dynamic decay, or a combination of the two. 2. It is assumed that rewriting is not done. 3. The qualifying adjectives maximum usable are frequently omitted in general usage when it is clear that the maximum usable reading time is implied. *See also:* storage tube. (ED) 158-1962w

**maximum usable read number (storage tubes)** The number of times a storage element, line, or area can be read without rewriting before a specified degree of decay results. *Note:* The qualifying adjectives maximum usable are frequently omitted in general usage when it is clear that the maximum usable read number is implied. *See also:* storage tube. (ED) 158-1962w, [45]

**maximum usable viewing time (storage tubes)** The length of time during which the visible output of a storage tube can be viewed, without rewriting, before a specified decay occurs. *Note:* The qualifying adjectives maximum usable are frequently omitted in general usage when it is clear that maximum usable viewing time implied. *See also:* storage tube. (ED) 158-1962w

**maximum usable writing speed (storage tubes)** The maximum speed at which information can be written under stated conditions of operation. Note the qualifying adjectives maximum usable are frequently omitted in general usage when it is clear that the maximum usable writing speed is implied. *See also:* storage tube. (ED) 158-1962w

**maximum useful output** *See:* maximum undistorted output.

**maximum value of magnetic field** (measurement of power frequency electric and magnetic fields from ac power lines). At a given point, the root-mean-square (rms) value of the semimajor axis of the magnetic field ellipse. (T&D/PE) 1308-1994

**maximum value of the electric field strength** At a given point, the rms value of the semimajor axis magnitude of the electric field ellipse. *See also:* electric field strength. (T&D/PE) 644-1994

**maximum value of the field (overhead power lines)** At a given point, the rms value of the major semi-axis magnitude of the field ellipse; i.e., the largest value of the field that would be measured at that point. (T&D/PE) 539-1990

**maximum value of the magnetic field** At a given point, the rms value of the semimajor axis magnitude of the magnetic field ellipse. (T&D/PE) 644-1994

**maximum voltage (instrument)** (wattmeter, power-factor meter or frequency meter) A stated voltage that, if applied continuously at the maximum stated operating temperature and with any other circuits in the instrument energized at rated values, will not cause electric breakdown or any observable physical degradation. *See also:* accuracy rating; instrument. (EEC/AII) [102]

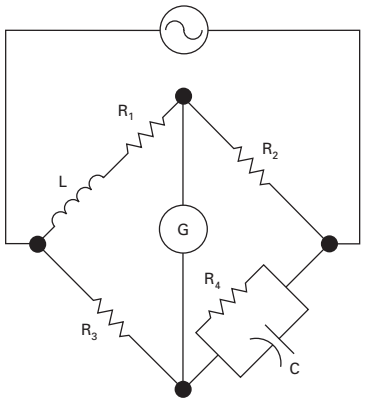
**maximum voltage rating** The highest phase-to-ground or phase-to-ground and phase-to-phase voltage (rms) at which a connector is designed to operate. (T&D/PE) 386-1995

**maximum (hottest-spot) winding temperature** The maximum or hottest temperature of the current carrying components of a transformer winding in contact with insulation or insulating fluid. The hottest spot temperature is a naturally occurring phenomena due to the generation of losses and the heat transfer phenomena. It is the highest temperature inside the transformer winding and is greater than the measured average winding temperature of the coil conductors. All transformers have a maximum (hottest-spot) winding temperature. (PE/TR) C57.134-2000

**maximum (hottest-spot) winding temperature rise** The arithmetic difference between maximum (hottest-spot) winding temperature and the ambient temperature. (PE/TR) C57.134-2000

**maxwell (line)** The unit of magnetic flux in the centimeter-gram-second electromagnetic system. *Note:* The maxwell is $10^{-8}$ weber. (Std100) 270-1966w

**Maxwell bridge (general)** A 4-arm alternating-current bridge characterized by having in one arm an inductor in series with a resistor and in the opposite arm a capacitor in parallel with a resistor, the other two arms being normally nonreactive resistors. *Note:* Normally used for the measurement of inductance (or capacitance) in terms of resistance and capacitance (or inductance). The balance is independent of the frequency, and at balance the ratio of the inductance to the capacitance is equal to the product of the resistances of either pair of opposite arms. It differs from the Hay bridge in that in the arm opposite the inductor, the capacitor is shunted by the resistor. (See the corresponding figure.) *See also:* bridge.




$R_1R_4 = R_2R_3 = L/C$

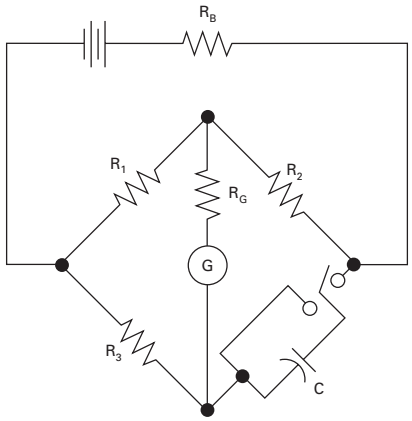
**Maxwell bridge**

(PE/EEC) [119]

**Maxwell direct-current commutator bridge** A 4-arm bridge characterized by the presence in one arm of a commutator, or 2-way contactor, that, with a known periodicity, alternately connects the unknown capacitor in series with the bridge arm and then opens the bridge arm while short-circuiting the capacitor, the other three arms being nonreactive resistors. (See the corresponding figure.) *Note:* Normally used for the measurement of capacitance in terms of resistance and time. The bridge is normally supplied from a battery and the detector is a direct-current galvanometer.

$$C = \frac{R_1}{nR_2R_3} \times \frac{\left[1 - \dfrac{R_1^2}{(R_1 + R_2 + R_B)(R_1 + R_3 + R_G)}\right]}{\left[1 + \dfrac{R_1R_B}{R_3(R_1 + R_2 + R_B)}\right]\left[1 + \dfrac{R_1R_G}{R_2(R_1 + R_3R_G)}\right]}$$

*See also:* bridge.




**Maxwell direct-current commutator bridge**

(EEC/PE) [119]

**Maxwell-Garnett mixing formula** Gives the approximate dielectric constant of a medium containing a few small spherical dielectric inclusions, $\varepsilon_r$, as:

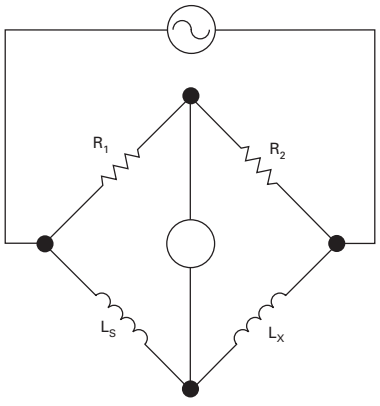
$$\varepsilon_r = \varepsilon_1 \frac{1 + 2fy}{1 - fy} \quad \text{with} \quad y = \frac{\varepsilon_2 - \varepsilon_1}{\varepsilon_2 + 2\varepsilon_1}$$

where

$\varepsilon_1$ = the relative dielectric constant of the background medium
$\varepsilon_2$ = the relative dielectric constant of the inclusions
$f$ = the volume fraction of the inclusions

The Maxwell-Garnett mixing formula is valid when $f$ is less than a few percent and the inclusions are small compared to the wavelength. (AP/PROP) 211-1997

**Maxwell inductance bridge** A 4-arm alternating-current bridge characterized by having inductors in two adjacent arms and usually, nonreactive resistors in the other two arms. (See the corresponding figure.) *Note:* Normally used for the comparison of inductances. The balance is independent of the frequency. *See also:* bridge.

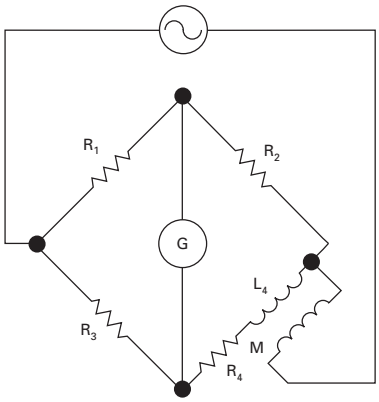



$R_X = R_S\frac{R_2}{R_1}$ $\qquad$ $L_X = L_S\frac{R_2}{R_1}$

**Maxwell inductance bridge**

(EEC/PE) [119]

**Maxwell mutual-inductance bridge** An alternating-current bridge characterized by the presence of mutual inductance between the supply circuit and that arm of the network that includes one coil of the mutual inductor, the other three arms being normally non-reactive resistors. (See the corresponding figure.) *Note:* Normally used for the measurement of mutual inductance in terms of self-inductance. The balance is independent of the frequency. *See also:* bridge.




**Maxwell mutual-inductance bridge**

(EEC/PE) [119]

**Maxwell's equations (Maxwell's laws)** The fundamental equations of macroscopic electrmagnetic field theory. All real (physical) electric and magnetic fields satisfy Maxwell's equations, namely

$$\nabla \times \mathbf{E} = \frac{\partial \mathbf{B}}{\partial t}$$

$$\nabla \times \mathbf{H} = \frac{\partial \mathbf{D}}{\partial t} + \mathbf{J}$$

$$\nabla \cdot \mathbf{B} = 0$$

$$\nabla \cdot \mathbf{D} = q_r$$

where **E** is electric field strength, **D** is electric flux density, **H** is magnetic field strength, **B** is magnetic flux density, **J** is current density, and $q_r$ is volume charge density.

(Std100) 270-1966w

**may (1)** With respect to implementations, the word may is to be interpreted as an optional feature that is not required in this standard but can be provided. With respect to strictly conforming POSIX applications, the word may means that the optional feature shall not be used.

(C/PA) 1003.1-1988s

**(2)** An indication of an optional feature or behavior of the implementation that is not required by this standard, although there is no prohibition against providing it. A Strictly Conforming POSIX.2 Application is permitted to use such features, but shall not rely on the implementation's actions in such cases. To avoid ambiguity, the reverse sense of *may* is not expressed as *may not,* but as *need not*.

(C/PA) 2003.2-1996

**(3)** An indication of an optional feature.

1) With respect to implementations, the word *may* is to be interpreted as an optional feature that is not required in a standard but can be provided.
2) With respect to Strictly Conforming POSIX.5 Applications, the word *may* means that the optional feature shall not be used.

(C) 1003.5-1999

**May Day** *See:* radio distress signal.

**MB** *See:* megabyte.

**MBASIC** A dialect of the BASIC programming language.

(C) 610.13-1993w

**Mbit** Indicates $2^{20}$ bits. (C/MM) 1596.4-1996

**MBWO** *See:* microwave backward-wave oscillator.

**Mbyte** Megabyte. Indicates $2^{20}$ bytes.

(C/MM) 1212-1991s, 1596.4-1996

**MC (metal-cladswitchgear)** *See:* message code.

**MCA** *See:* multichannel analyzer; multichannel pulse-height analyzer.

**MC cable (metal-clad cable)** A factory assembly of one or more conductors, each individually insulated and enclosed in a metallic sheath of interlocking tape, or a smooth or corrugated tube. (NEC/NESC) [86]

**McCulloh circuit** A supervised, metallic loop circuit having manually or automatically operated switching equipment at the receiving end, that, in the event of a break, a ground, or a combination of a break and a ground at any point in the metallic circuit, conditions the circuit, by utilizing a ground return, for the receipt of signals from suitable signal transmitters on both sides of the point of trouble.

(EEC/PE) [119]

**M channel** A 96 kbit/s maintenance channel that is used to convey Physical Layer status and control information to the far end of the link. (C/LM) 802.9a-1995w

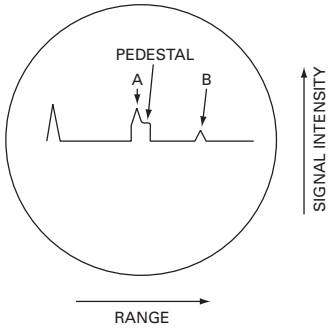
**MCOV** *See:* maximum continuous operating voltage.

**MDA** *See:* minimum detectable amount; mirrored disk array.

**MDC** *See:* minimum detectable concentration.

**MDI (Medium Dependent Interface)** *See:* medium dependent interface; magnetic direction indicator.

**M-display** A type of A-display in which one target range is determined by moving an adjustable pedestal, notch, or step along the baseline until it coincides with the horizontal position of the target-signal deflection; the control that moves the pedestal is calibrated in range. *Note:* This display is usually identified as a variant of an A-display.




**M-display**

(AES) 686-1997

**MDR** *See:* memory data register; memory buffer register.

**MDS** *See:* minimum detectable signal.

**MDV** *See:* minimum detectable velocity.

**ME** *See:* metal-enclosed power switchgear.

**MEA** *See:* minimum en-route altitude.

**mean access time** The average access time identified with the normal operation of a device. (C) 610.10-1994w

**mean charge (nonlinear capacitor)** The arithmetic mean of the transferred charges corresponding to a particular capacitor voltage, as determined from a specified alternating charge characteristic. *See also:* nonlinear capacitor. (ED) [46]

**mean-charge characteristic (nonlinear capacitor)** The function relating mean charge to capacitor voltage. *Note:* Mean-charge characteristic is always single-valued. *See also:* nonlinear capacitor. (ED) [46]

**mean first slip time (communication satellite)** The mean time for a phase-lock loop starting to lock to a slip one or more cycles. (COM) [25]

**mean free path** For sound waves in an enclosure, the average distance sound travels between successive reflections in the enclosure. (ED/SP/ACO) [46], [32]

**mean Hall plate temperature (Hall effect devices)** The value of the temperature averaged over the volume of the Hall plate. (MAG) 296-1969w

**mean horizontal intensity (illuminating engineering) (candlepower)** The average intensity (candelas) of a lamp in a plane perpendicular to the axis of the lamp and which passes through the luminous center of the lamp. (EEC/IE) [126]

**meaning** (of a responsibility) A statement of what the responsibility means. The statement of responsibility is written from the point of view of the requester, not the implementer. The statement of responsibility states what the requester needs to know to make intelligent use of the property or constraint. That statement should be complete enough to let a requester decide whether to make the request, but it should stop short of explaining how a behavior or value is accomplished or derived. Meaning is initially captured using freeform natural language text in a glossary definition. It may be more formally refined into a statement of *pre-conditions* and *post-conditions* using the *specification language*. (C/SE) 1320.2-1998

**mean instrument reading** The arithmetic average of a series of readings. (NI) N42.17B-1989r

**mean life** The arithmetic mean of the times to failure of a group of nominally identical items. *See also:* reliability. (R) [29]

**mean life, assessed** *See:* assessed mean life.

**mean life, extrapolated** *See:* extrapolated mean life.

**mean life, observed** *See:* observed mean life.

**mean life, predicted** *See:* predicted mean life.

**mean logistics time (MLT)** The mean downtime occasioned by the unavailability of spares, replacement parts, test equipment, maintenance facilities, or personnel. (PE/NP) 933-1999

**mean of reversed direct-current values (alternating-current instruments)** The simple average of the indications when direct current is applied in one direction and then reversed and applied in the other direction. *See also:* accuracy rating. (EEC/AII) [102]

**mean outage duration** The mean duration of outage occurrences of a specified type = outage time due to outages of a specified type/number of outage occurrences of a specified type. *Note:* Also referred to as mean time to restoration. (PE/PSE) 859-1987w

**mean pulse time** The arithmetic mean of the leading-edge pulse time and the trailing-edge pulse time. *Note:* For some purposes, the importance of a pulse is that it exists (or is large enough) at a particular instant of time. For such applications the important quantity is the mean pulse time. The leading-edge pulse time and trailing-edge pulse time are significant primarily in that they may allow a certain tolerance in timing. (IM/WM&A) 194-1977w

**mean radiating temperature** For a non-isothermal body or medium:

— The temperature that would give rise to the same total brightness as the actual medium, or

— The temperature that would give rise to the same spectral brightness as the actual medium.

(AP/PROP) 211-1997

**mean side lobe level** The average value of the relative power pattern of an antenna taken over a specified angular region, which excludes the main beam, the power pattern being relative to the peak of the main beam. (AP/ANT) 145-1993

**means of grounding (neutral grounding in electrical utility systems)** The generic agent by which various degrees of grounding are achieved; for example, inductance grounding, resistance grounding, and resonant grounding. (SPD/PE) C62.92-1987r

**mean spherical luminous intensity (illuminating engineering)** Average value of the luminous intensity in all directions for a source. Also, the quotient of the total emitted luminous flux of the source by $4\pi$.

$$I_{ms} = \left(\frac{1}{4\pi}\right)\int_0^{\pi} I\, d\omega = \frac{\Phi_{total}}{4\pi}$$

(EEC/IE) [126]

**mean temperature coefficient of output voltage (Hall effect devices)** The arithmetic average of the percentage changes in output voltage per degree Celsius taken over a given temperature range for a given control current magnitude and a given magnetic flux density. (MAG) 296-1969w

**mean time before failures (MTBF) (power supplies)** A measure of reliability giving the time before first failure. Mean time before failures may be approximated or predicted by summing the reciprocal failure rates of individual components in an assembly. (AES) [41]

**mean time between failures (MTBF) (1) (power supplies)** For repairable equipment, a measure of reliability giving the average time between repairs. Mean time between failures may be approximated or predicted by summing the reciprocal failure rates of individual components in an assembly. (AES) [41]

**(2) (supervisory control, data acquisition, and automatic control) (station control and data acquisition)** The time interval (hours) that may be expected between failures of an operating equipment. (SWG/PE/SPD/SUB) C37.100-1992, C62.1-1981s, C37.1-1994

**(3)** The average time (preferably expressed in hours) between failures of a continuously operating device, circuit, or system. (PE/PSC) 599-1985w

**(4) (nuclear power generating station)** The arithmetic average of operating times between failures of an item. (PE/NP) 352-1975s, 933-1999

**(5) (repairable items)** The product of the number of items and their operating time divided by the total number of failures. (R) [29]

**(6)** The expected or observed time between consecutive failures in a system or component. (C) 610.12-1990

**(7)** For a stated period in the life of a device, the mean value of the lengths of time between consecutive failures under stated conditions. *Note:* Used to measure equipment reliability—the higher the MTBF, the more reliable the equipment. (C) 610.10-1994w

**(8)** The mean exposure time between consecutive failures of a component. It can be estimated by dividing the exposure time by the number of failures in that period, provided that a sufficient number of failures has occurred in that period. (IA/PSE) 493-1997

**mean time between failures, assessed (repaired items)** The mean time between failures of an item determined by a limiting value or values of the confidence interval associated with a stated confidence level, based on the same data as the observed mean time between failures of nominally identical items. *Notes:* 1. The source of the data shall be stated. 2. Results can be accumulated (combined) only when all conditions are similar. 3. The assumed underlying distribution of failures against time shall be stated. 4. It should be stated whether a one-sided or a two-sided interval is being used. 5. Where one limiting value is given, this is usually the lower limit. (R) [29]

**mean time between failures, extrapolated (repaired items)** Extension by a defined extrapolation or interpolation of the observed or assessed mean time between failures for duration and.or conditions different from those applying to the observed or assessed mean time between failures. *Note:* The validity of the extrapolation shall be justified. (R) [29]

**mean time between failures, observed (repaired items)** For a stated period in the life of an item, the mean value of the length of time between consecutive failures, computed as the ratio of the cumulative observed time to the number of failures under stated conditions. *Notes:* 1. The criteria for what constitutes a failure shall be stated. 2. Cumulative time is the sum of the times during which each individual item has been performing its required function under stated conditions.

3. This is the reciprocal of the observed failure rate during the period. (R) [29]

**mean time between failures, predicted (repaired items)** For the stated conditions of use, and taking into account the design of an item, the mean time between failures computed from the observed, assessed, or extrapolated failure rates of its parts. *Note:* Engineering and statistical assumptions shall be stated, as well as the bases used for the computation (observed or assessed). (R) [29]

**mean time between hazardous events (MTBHE)** The average time between occurrences of events, where hazardous events and the equipment that may precipitate them are defined at the system level. The hazardous events included in MTBHE are those whose consequences are of a given severity, as determined by the organization generating the safety goals. (VT/RT) 1483-2000

**mean time to diagnosis (MTTD)** The average length of time taken to isolate and diagnose the failure of a system or system component. (C) 610.10-1994w

**mean time to failure (nonrepaired items)** The total operating time of a number of items divided by the total number of failures. *See also:* reliability. (R) [29]

**mean time to failure, assessed (non-repaired items)** The mean time to failure of an item determined by a limiting value or values of the confidence interval associated with a stated confidence level, based on the same data as the observed mean time to failure of nominally identical items. *Notes:* 1. The source of the data shall be stated. 2. Results can be accumulated (combined) only when all conditions are similar. 3. The assumed underlying distribution of failures against time shall be stated. 4. It should be stated whether a one-sided or a two-sided interval is being used. 5. Where one limiting value is given this is usually the lower limit. (R) [29]

**mean time to failure, extrapolated (non-repaired items)** Extension by a defined extrapolation or interpolation of the observed or assessed mean time to failure for durations and/or conditions different from those applying to the observed or assessed mean time to failure. *Note:* The validity of the extrapolation shall be justified. (R) [29]

**mean time to failure, observed (non-repaired items)** For a stated period in the life of an item, the ratio of the cumulative time for a sample to the total number of failures in the sample during the period, under stated conditions. *Notes:* 1. The criteria for what constitutes a failure shall be stated. 2. Cumulative time is the sum of the times during which each individual item has been performing its required function under stated conditions. 3. This is the reciprocal of the observed failure rate during the period. (R) [29]

**mean time to failure, predicted (non-repaired items)** For the stated conditions of use, and taking into account the design of an item the mean time to failure computed from the observed, assessed or extrapolated mean times to failure of its parts. *Note:* Engineering and statistical assumptions shall be stated, as well as the bases used for the computation (observed or assessed). (R) [29]

**mean time to fix (MTTF)** *See:* mean time to repair.

**mean time to outage** The mean time to outage occurrence of a specified type = service time/number of outage occurrences of the specified type. *Note:* There are other indices such as mean time between failure. (PE/PSE) 859-1987w

**mean time to repair (MTTR) (1) (supervisory control, data acquisition, and automatic control) (station control and data acquisition)** The time interval (hours) that may be expected to return failed equipment to proper operation. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**(2) (nuclear power generating station)** The arithmetic average of time required to complete a repair activity. (PE/NP) 380-1975w, 352-1975s, 933-1999

**(3) (software)** The expected or observed time required to repair a system or component and return it to normal operations. (C) 610.12-1990

**(4)** For a stated period in the life of a device, the average time required for corrective maintenance to be performed. *Note:* Used to measure the complexity and modularity of equipment—the higher the MTTR, the more complex the equipment. (C) 610.10-1994w

**(5)** The mean time to repair or replace a failed component. It can be estimated by dividing the summation of repair times by the number of repairs, and, therefore, it is practically the average repair time. (IA/PSE) 493-1997

**mean zonal candlepower (illuminating engineering)** The average intensity (candelas) of a symmetrical luminaire or lamp at an angle to the luminaire or lamp axis that is in the middle of the zone under consideration. (EEC/IE) [126]

**measurand** A physical or electrical quantity, property, or condition that is to be measured. (SWG/PE) C37.100-1992

**measure (1)** The number (real, complex, vector, etc.) that expresses the ratio of the quantity to the unit used in measuring it. (Std100) 270-1966w

**(2) (software reliability)** A quantitative assessment of the degree to which a software product or process possesses a given attribute. (SE/C) 982.2-1988, 982.1-1988

**(3) (A)** A way to ascertain or appraise value by comparing it to a norm. **(B)** To apply a metric. (C/SE) 1061-1998

**measured current (rotating machinery)** The total direct current resulting from the application of direct voltage to insulation and including the leakage current, the absorption current, and, theoretically, the capacitive current. Measured current is the value read on the microammeter during a direct high voltage test of insulation. (PE/EM) 95-1977r

**measured limiting voltage** The maximum magnitude of voltage that is measured across the terminals of the surge protective device during the application of a series of impulses of specified wave shape and amplitude. (PE) C62.34-1996

**measured service (telephone switching systems)** Service in which charges are assessed in terms of the number of message units during the billing interval. (COM) 312-1977w

**measured signal (automatic null-balancing electric instrument)** The electrical quantity applied to the measuring-circuit terminals of the instrument. *Note:* It is the electrical analog of the measured variable. *See also:* measurement system. (EEC/EMI) [112]

**measured value (power meters)** An estimate of the value of a quantity obtained as a result of a measurement. *Note:* Indicated values may be corrected to give measured values. (IM) 470-1972w, 544-1975w

**measured variable (automatic null-balancing electric instrument) (measurand)** The physical quantity, property, or condition that is to be measured. *Note:* Common measured variables are temperature, pressure, thickness, speed, etc. *See also:* measurement system. (EEC/EMI) [112]

**measure equations** Equations in which the quantity symbols represent pure numbers, the measures of the physical quantities corresponding to the symbols. (Std100) 270-1966w

**measurement (1)** The determination of the magnitude or amount of a quantity by comparison (direct or indirect) with the prototype standards of the system of units employed. (Std100) 270-1966w

**(2)** The act or process of assigning a number or category to an entity to describe an attribute of that entity. A figure, extent, or amount obtained by measuring. (C/SE) 1061-1998

**measurement component** A general term applied to parts or subassemblies that are primarily used for the construction of measurement apparatus. *Note:* It is used to denote those parts made or selected specifically for measurement purposes and does not include standard screws, nuts, insulated wire, or other standard materials. *See also:* measurement system. (EEC/PE) [119]

**measurement device** An assembly of one or more basic elements with other components and necessary parts to form a separate self-contained unit for performing one or more measurement operations. *Note:* It includes the protecting, supporting, and connecting, as well as the functioning, parts, all of

which are necessary to fulfill the application requirements of the device. It should be noted that end devices (which see) are frequently but not always complete measurement devices in themselves, since they often are built-in with all or part of the intermediate means or primary detectors to form separate self-contained units. *See also:* measurement system.
(EEC/PE) [119]

**measurement devices** For an automatic control system, a device that measures physical and electrical quantities.
(PE/PSE) 94-1991w

**measurement energy** The energy required to operate a measurement device or system. *Note:* Measurement energy is normally obtained from the measurand or from the primary detector. *See also:* measurement system. (EEC/PE) [119]

**measurement equipment** A general term applied to any assemblage of measurement components, devices, apparatus, or systems. *See also:* measurement system. (EEC/PE) [119]

**measurement inverter** *See:* measuring modulator.

**measurement mechanism** An assembly of basic elements and intermediate supporting parts for performing a mechanical operation in the sequence of measurement. *Note:* For example, it may be a group of components required to effect the proper motion of an indicating or recording means and does not include such parts as bases, covers, scales, and accessories. It may also be applied to a specific group of elements by substituting a suitable qualifying term, such as time-switch mechanism or chart-drive mechanism. *See also:* measurement system. (EEC/PE) [119]

**measurement range (instrument)** That part of the total range within which the requirements for accuracy are to be met. *See also:* instrument. (EEC/PE) [119]

**Measurements Assurance Program** A program that allows manufacturers to verify the accuracy of their measurements through exchange and measurement of samples with NIST. This involves the analysis of blind test samples sent to the manufacturers by NIST, and NIST measurement of sources certified and provided by the manufacturers.
(NI) N42.22-1995

**measurement space** In pattern recognition, a set of all possible $n$-tuples ($x_1$, $x_2$, . . . , $x_n$) that can be used to represent $n$ measurements of a pattern. *See also:* feature space.
(C) 610.4-1990w

**measurement standard** A standard that describes the characteristics of evaluating a process of product.
(C) 610.12-1990

**measurement system** One or more measurement devices and any other necessary system elements interconnected to perform a complete measurement from the first operation to the end result. *Note:* A measurement system can be divided into general functional groupings, each of which consists of one or more specific functional steps or basic elements.
(EEC/PE) [119]

**measurement uncertainty (1)** (test, measurement, and diagnostic equipment). The limits of error about a measured value between which the true value will lie with the confidence stated. *Note:* Uncertainty of measurement comprises, in general, many components. Some of these components may be estimated on the basis of the statistical distribution of the results of series of measurements and can be characterized by experimental standard deviations. Estimates of other components can be based on experience or other information.
(MIL/T&D/PE) [2], 1308-1994

**(2)** The limits of error for a measured value, between which the true value will lie with the confidence stated. (Measurement uncertainty is associated with measuring the absolute value of the electric and magnetic fields.)
(EMC) 1140-1994r

**measurement voltage divider (voltage ratio box) (volt box)** A combination of two or more resistors, capacitors, or other circuit elements so arranged in series that the voltage across one of them is a definite and known fraction of the voltage applied to the combination, provided the current drain at the tap point is negligible or taken into account. *Note:* The term volt box is usually limited to resistance voltage dividers intended to extend the range of direct-current potentiometers. *See also:* auxiliary device to an instrument.
(PE/EEC) [119]

**measure of effectiveness (MOE) (1)** Measure of how the system/individual performs its functions in a given environment. Used to evaluate alternative approaches' ability to meet functional objectives and mission needs. Examples of such measures include loss exchange results, face effectiveness contributions, and tons delivered per day.
(DIS/C) 1278.3-1996

**(2)** The metrics by which a customer will measure satisfaction with products produced by the technical effort.
(C/SE) 1220-1998

**(3)** Measure of how the system/individual performs its functions in a given environment. Used to evaluate whether alternative approaches meet functional objectives and mission needs. (C/DIS) 1278.4-1997

**measure of performance (MOP) (1)** Measure of how the system/individual performs its functions in a given environment (e.g., number of targets detected, reaction time, number of targets nominated, susceptibility of deception, task completion time). It is closely related to inherent parameters (physical and structural), but measures attributes of system/individual behavior. (DIS/C) 1278.3-1996

**(2)** An engineering performance measure that provides design requirements that are necessary to satisfy a measure of effectiveness. There are generally several measures of performance for each measure of effectiveness. (C/SE) 1220-1998

**(3)** Measure of how the system/individual performs its functions in a given environment. It is closely related to inherent parameters (physical and structural), but measures system/individual behavior. (C/DIS) 1278.4-1997

**measuring accuracy, precision, or reproducibility (numerically controlled machines)** Accuracy, precision, or reproducibility of position sensor or transducer and interpreting system. (IA/EEC) [61], [74]

**measuring and test equipment (1) (nuclear power generating station)** Devices or systems used to calibrate, measure, gage, test, inspect or control to acquire research, development, test or operational data or to determine compliance with design, specifications or other technical requirements.
(PE/NP) 498-1985s

**(2)** *See also:* test, measurement, and diagnostic equipment.
(MIL) [2]

**measuring element (automatic control)** That portion of the feedback elements which converts the signal from the primary detecting element to a form compatible with the reference input. (PE/EDPG) [3]

**measuring mechanism (recording instrument)** The parts that produce and control the motion of the marking device. *See also:* moving element. (EEC/ERI) [111]

**measuring modulator (measurement inverter) (chopper)** An intermediate means in a measurement system by which a direct-current or low-frequency alternating-current input is modulated to give a quantitatively related alternating-current output usually as a preliminary to amplification. *Note:* The modulator may be of any suitable type such as mechanical, magnetic, or varistor. The mechanical types, which are actuated by vibrating or rotating members, may be classified as contacting, microphonic, or generating (capacitive or inductive). *See also:* auxiliary device to an instrument.
(EEC/PE) [119]

**measuring or test equipment (1) (nuclear power quality assurance)** Devices or systems used to calibrate, measure, gage, test, or inspect in order to control or to acquire data to verify conformance to specified requirements. (PE/NP) [124]

**(2)** *See also:* test, measurement, and diagnostic equipment.
(MIL) [2]

**measuring unit** Any analog or digital device that analyzes input currents or voltages or both to produce an output to the relay logic. (PE/PSR) C37.90.1-1989r

**measuring units and relay logic (surge withstand capability tests)** Analog or digital devices which analyze the input currents and voltages to determine the immediate status of that part of the power system that they were installed to protect and to provide the control signal to trip circuit breakers. (PE/PSR) C37.90-1978s

**mechanical back-to-back test (rotating machinery)** A test in which two identical machines are mechanically coupled together and the total losses of both machines are calculated from the difference between the electrical input to one machine and the electrical output of the other machine. *See also:* efficiency. (PE) [9]

**mechanical bias** *See:* relay mechanical bias.

**mechanical braking** The kinetic energy of the drive motor and the driven machinery is dissipated by the friction of a mechanical brake. *See also:* electric drive. (IA/ICTL/IAC) [60]

**mechanical condition monitor (power system device function numbers)** A device that functions upon the occurrence of an abnormal mechanical condition (except that associated with bearings as covered under device function) [bearing protective device], such as excessive vibration, eccentricity, expansion, shock, tilting, or seal failure. (SUB/PE) C37.2-1979s

**mechanical current rating (neutral grounding devices) (electric power)** The symmetrical root-mean-square alternating-current component of the completely offset current wave that the device can withstand without mechanical failure. *Note:* The mechanical forces depend upon the maximum crest value of the current wave. However, for convenience, the mechanical current rating is expressed in terms of the root-mean-square value of the alternating-current component only of a completely displaced current wave. Specifically, the crest value of the completely offset wave will then be 2.82 times the mechanical current rating. *See also:* grounding device. (PE/SPD) 32-1972r

**mechanical cutter (mechanical recorder)** An equipment for transforming electric or acoustic signals into mechanical motion of approximately like form and inscribing such motion in an appropriate medium by cutting or embossing. (SP) [32]

**mechanical data processing** A method of data processing that involves the use of small, simple, mechanical machines. (C) 610.2-1987

**mechanical failure** (of a circuit breaker) Failure other than an electrical failure. (SWG/PE) C37.10-1995

**mechanical fatigue test (rotating machinery)** A test designed to determine the effect of a specific repeated mechanical load on the life of a component. *See also:* asynchronous machine; direct-current commutating machine. (PE) [9]

**mechanical filter** *See:* mechanical wave filter.

**mechanical freedom (accelerometer)** The maximum linear or angular displacement of the accelerometer's proof mass, relative to its case. (AES/GYAC) 528-1994

**mechanical-hydraulic governor (hydraulic turbines)** A governor in which the control signal proportional to speed error and necessary stabilizing signals are developed mechanically, summed by a mechanical system, and are then hydraulically amplified. (PE/EDPG) 125-1988r

**mechanical-impact strength (insulators)** The impact that, under specified conditions, the insulator can withstand without damage. *See also:* insulator. (EEC/IEPL) [89]

**mechanical impedance** The complex quotient of the effective alternating force applied to the system, by the resulting effective velocity. (SP) [32]

**mechanical inertia time (hydraulic turbines)** A characteristic of the machine due to the inertia of the rotating components of the machine defined as:

$$T_M = \frac{(Wk^2)(N^2)(10^{-6})}{(1.61)(\mathrm{HP})}$$

where

$W$ = weight of machine rotating parts, pounds

$k$ = radius of gyration, feet

$N$ = rated speed, rev/min

HP = rated output of turbine, horsepower

*Notes:* 1. $T_M$ is also approximately equal to $2H$ where $H$ is the inertia constant. 2. To calculate $T_M$ using International SI units:

$$T_M = J\omega_0^2 / P_0$$

where $J$ = the polar moment of inertia in kgm$^2$ calculated by dividing $Wk^2$ in newton-meters by acceleration of gravity 9.81 m/second$^2$.

$$= Mk^2 = GD^2$$

$\omega_0 = \pi 2N/60$ rad/second

$P_0$ = rated output of turbine, watts.

(PE/EDPG) 125-1977s

**mechanical inspection** *See:* computer-aided inspection.

**mechanical interchangeability** (of fuse links) The characteristic that permits the designs of various manufacturers to be interchanged physically so they fit into and withstand the tensile stresses imposed by various types of prescribed cutouts made by different manufacturers. (SWG/PE) C37.100-1992, C37.40-1993

**mechanical interlocking machine** An interlocking machine designed to operate the units mechanically. *See also:* interlocking. (EEC/PE) [119]

**mechanical latching relay** A relay in which the armature or contacts may be latched mechanically in the operated or unoperated position until reset manually or electrically. (PE/EM) 43-1974s

**mechanical limit (neutral grounding devices)** The rated maximum instantaneous value of current, in amperes, that the device will withstand without mechanical failure. (PE/SPD) 32-1972r

**mechanically delayed overcurrent trip** *See:* overcurrent release; mechanically delayed release.

**mechanically delayed release (trip)** A release delayed by a mechanical device. (SWG/PE) C37.100-1992

**mechanically de-spun antenna (communication satellite)** A rotating directional antenna, mounted to a rotating object (namely spin stabilized communication satellite); the rotation of the antenna is counter to the rotation of the body it is mounted to, such that the antenna beam points into the same direction of space. (COM) [24]

**mechanically release-free** (trip-free) (as applied to a switching device) A term indicating that the release can open the device even though in a manually operated switching device the operating lever is being moved toward the closed position; or in a power-operated switching device, such as solenoid- or spring-actuated types, the operating mechanism is being moved toward the closed position either by continued application of closing power or by means of a maintenance closing lever. (SWG/PE/TR) C37.100-1992, C57.12.44-1994

**mechanically reset relay** *See:* hand-reset relay.

**mechanically switched capacitor (MSC)** A shunt-connected circuit containing a mechanical power-switching device in series with a capacitor bank and sometimes also a damping reactor. (PE/SUB) 1031-2000

**mechanically switched reactor (MSR)** A shunt-connected circuit containing a mechanical power switching device in series with a reactor. (PE/SUB) 1031-2000

**mechanically timed relays** Relays that are timed mechanically by such features as clockwork, escapement, bellows, or dashpot. *See also:* relay. (EEC/REE) [87]

**mechanical modulator (A) (electronic navigation)** A device that varies some characteristic of a carrier wave so as to transmit information, the variation being accomplished by physically moving or changing a circuit element. **(B) (electronic**

**navigation)** In instrument landing systems, a particular arrangement of radio-frequency transmission lines and bridges with resonant sections coupled to the lines and motor-driven capacitor plates that alter the resonance so as to produce 90- and 150-hertz modulations. *See also:* navigation. (AES/RS) 686-1982, [42]

**mechanical mouse** A mouse whose motion-sensing component is mechanical in nature such as a control ball or a pair of wheels. *Contrast:* optical mouse. (C) 610.10-1994w

**mechanical operation** (of a switch) Operation by means of an operating mechanism connected to the switch by mechanical linkage. *Note:* Mechanically operated switches may be actuated either by manual, electrical, or other suitable means. (SWG/PE) C37.100-1992

**mechanical part** Any part having no electric or magnetic function. (PE/EM) [9]

**mechanical plating** Any plating operation in which the cathodes are moved mechanically during the deposition. *See also:* electroplating. (EEC/PE) [119]

**mechanical recorder** *See:* mechanical cutter.

**mechanical rectifier** A rectifier in which rectification is accomplished by mechanical action. *See also:* rectification. (EEC/PE) [119]

**mechanical reference plane (standard connector)** A transverse plane of the waveguide or transmission line to which all critical, longitudinal dimensions are referenced to assure nondestructive mating; it is the only plane where a mated standard connector pair butt against one another. *Note:* Usually a stable, rugged metal surface. (IM/HFIM) 474-1973w

**mechanical register (pulse techniques)** An electromechanical indicating pulse counter. *See also:* pulse. (NPS) 175-1960w

**mechanical relay damping ring** A loose member mounted on a contact spring to reduce contact chatter. (EEC/REE) [87]

**mechanical reproducer** *See:* phonograph pickup.

**mechanical shock** A significant change in the position of a system in a nonperiodic manner in a relatively short time. *Note:* It is characterized by suddenness and large displacements and develops significant internal forces in the system. *See also:* shock motion. (SP) [32]

**mechanical short-circuit rating** The maximum asymmetrical (peak) fault current that the reactor is capable of withstanding with no loss of electrical or mechanical integrity. (PE/TR) C57.16-1996

**mechanical short-time current rating (current transformer)** The root-mean-square value of the alternating-current component of a completely displaced primary current wave that the transformer is capable of withstanding, with secondary short-circuited. *Note:* Capable of withstanding means that after a test the current transformer shows no visible sign of distortion and is capable of meeting the other specified applicable requirements. *See also:* instrument transformer. (PE/TR) [57]

**mechanical splice (fiber optics)** A fiber splice accomplished by fixtures or materials, rather than by thermal fusion. Index matching material may be applied between the two fiber ends. *See also:* optical waveguide splice; index matching material; fusion splice. (Std100) 812-1984w

**mechanical switching device** A switching device designed to close and open one or more electric circuits by means of guided separate contacts. *Note:* The medium in which the contacts separate may be designated by suitable prefix; that is, air, gas, oil, etc. (SWG/PE) C37.100-1992

**mechanical terminal load (high voltage air switches, insulators, and bus supports)** The external mechanical load at each terminal equivalent to the combined mechanical forces to which the air switch may be subjected. (SWG/PE) C37.30-1992s

**mechanical time constant** (critically damped indicating instrument) The period of free oscillation divided by $2\nu$. *See also:* electromagnetic compatibility. (INT) [53], [70]

**mechanical translation** Translation from one natural language to another by a computer or through some other mechanical means. *See also:* machine-aided translation. (C) 610.2-1987

**mechanical transmission system** An assembly of elements adapted for the transmission of mechanical power. *See also:* phonograph pickup. (SP) [32]

**mechanical trip (railway practice)** (trip arm) A roadway element consisting in part of a movable arm that in operative position engages apparatus on the vehicle to effect an application of the brakes by the train-control system. (EEC/PE) [119]

**mechanical wave filter (mechanical filter)** A filter designed to separate mechanical waves of different frequencies. *Note:* Through electromechanical transducers, such a filter may be associated with electric circuits. *See also:* filter. (PE/EEC) [119]

**mechanical wrap or connection (soldered connections)** The securing of a wire or lead prior to soldering. (EEC/AWM) [105]

**mechanism (1) (indicating instrument)** The arrangement of parts for producing and controlling the motion of the indicating means. *Note:* It includes all the essential parts necessary to produce these results but does not include the base, cover, dial, or any parts, such as series resistors or shunts, whose function is to adapt the instrument to the quantity to be measured. *See also:* moving element; instrument. (EEC/AII) [102]

**(2) (recording instrument)** Includes the arrangement for producing and controlling the motion of the marking device; the marking device; the device (clockwork, constant-speed motor, or equivalent) for driving the chart; the parts necessary to carry the chart. *Note:* It includes all the essential parts necessary to produce these results but does not include the base, cover, indicating scale, chart, or any parts, such as series resistors or shunts, whose function is to make the recorded value of the measured quantity correspond to the actual value. *See also:* moving element. (EEC/PE) [119]

**(3) (overhead power lines)** In the context of biological effects, the process(es) by which an agent (physical or chemical) causes the effect; e.g., causing a change in hormone production or in the function of cell membranes. (T&D/PE) 539-1990

**(4)** (of a switching device) The complete assembly of levers and other parts that actuates the moving contacts of a switching device. (SWG/PE) C37.100-1992

**(5)** In an IDEF0 model, the means used by a function to transform input into output. (C/SE) 1320.1-1998

**mechanism arrow** An arrow or arrow segment that expresses IDEF0 mechanism, i.e., an object type set whose instances are used by a function to transform input into output. The arrowhead of an mechanism arrow is attached to the bottom side of a box. (C/SE) 1320.1-1998

**mechanism loopback** Loopback of output from one function to be mechanism for another function in the same diagram. (C/SE) 1320.1-1998

**mechanism of propagation** *See:* ionospheric mode of propagation.

**media (1) (A)** A means of communication. *See also:* hypermedia. **(B)** Material on which information can be stored or transported. *Note:* Media is the plural form of medium. *See also:* input media; output media. (C) 610.7-1995, 610.10-1994

**(2)** Any readable or writable data storage area. (C/SS) 1244.1-2000

**Media Access Control (MAC)** The data link sublayer that is responsible for transferring data to and from the Physical Layer. (C/LM) 802.3-1998

**media-independent information transfer (information transfer)** Used as a general term to refer to any volume conforming to IEEE Trial-Use Std 949-1985w. (MM/C) 949-1985w

**Media Independent Interface (MII) (1)** A transparent signal interface at the bottom of the Reconciliation sublayer. (C/LM) 802.3-1998

**(2)** A set of signals with electrical, logical, and physical definitions that provide the complete interface between the medium access control (MAC) layer and Physical Layer (PHY) (via the RS). (C/LM) 802.5t-2000

**Medium Dependent Interface** The mechanical and electrical interface between the transmission medium and the Medium Attachment Unit (MAU) (10BASE-T) or PHY (100BASE-T). (C/LM) 802.3-1998

**median** ($L_{50}$) The level exceeded 50% of the time over a specified time period with a specified weather condition. (T&D/PE) 539-1990

**median water conditions (power operations)** Precipitation and runoff conditions which provide water for hydroelectric energy development approximating the median amount and distribution available over a long time period, usually the period of record. (PE/PSE) 858-1987s

**medical devices** Any product that interfaces to the patient directly or operates in the patient environment. (EMB/MIB) 1073.4.1-2000

**medical information bus (MIB)** The informal name for the IEEE 1073 family of standards. (EMB/MIB) 1073.3.1-1994

**medical device system (MDS)** A bedside medical device which is actively connected to a 1073-type communications link. (EMB/MIB) 1073-1996

**medical information system (MIS)** *See:* hospital information system.

**medium (1) (computers)** The material, or configuration thereof, on which data are recorded; for example, paper tape, cards, magnetic tape. (C) [20], [85]

**(2) (information transfer)** A vehicle capable of transferring data. (MM/C) 949-1985w

**(3) (broadband local area networks)** The physical layer utilized to allow transmission of signals to communicate to various devices connected to it. For example, the medium of a CATV system is a broadband coaxial cable. (LM/C) 802.7-1989r

**(4)** The physical material from which the link is constructed.local area networks. (C) 8802-12-1998

**(5)** In data communications, a path over which communication flows, such as coaxial cable; optical fiber. *Note:* Medium is the singular form of media. (C) 610.7-1995

**(6)** The singular form of the term media. (C) 610.10-1994w

**(7)** The material on which the data may be transmitted. STP, UTP, and optical fibers are examples of media. (C/LM) 8802-5-1998

**(8) (data management)** *See also:* empty medium; virgin medium; machine-readable medium; data medium. (C) 610.5-1990w

**medium access control (1)** That part of a data station that supports the medium access control functions that reside just below the LLC sublayer. The MAC procedures include framing/deframing data units, performing error checking, and acquiring the right to use the underlying physical medium. (C/LM/PE/CC/TR) 8802-2-1998, 799-1987w

**(2)** *See also:* medium access control sublayer. (LM/C/CC) 8802-6-1994

**medium access control management protocol data unit (MMPDU)** The unit of data exchanged between two peer MAC entities to implement the MAC management protocol. (C/LM) 8802-11-1999

**medium access control procedure (MAC procedure)** In a local area network (LAN) or metropolitan area network (MAN), the part of the protocol that governs access to the transmission medium independently of the physical characteristics of the medium, but taking into account the topological aspects of the subnetwork, in order to enable the exchange of data between nodes. The MAC procedures include framing, error protection, and acquiring the right to use the underlying transmission medium. (LM/C) 8802-6-1994

**medium access control protocol data unit (MPDU)** The unit of data exchanged between two peer MAC entities using the services of the physical layer (PHY). (C/LM) 8802-11-1999

**medium access control service data unit (MSDU)** Information that is delivered as a unit between MAC service access points (SAPs). (C/LM) 8802-11-1999

**medium access control sublayer (MAC) (1)** The portion of the data station that controls and mediates the access to the ring. (C/LM) 8802-5-1998

**(2)** In a local area network (LAN), the part of the data link layer that supports topology-dependent functions and uses the services of the physical layer to provide service to the logical link control (LLC) sublayer. In ISO/IEC 8802, the combined set of functions in the DQDB Layer that support the MAC Sublayer service to the logical link control (LLC) sublayer. (LM/C) 8802-6-1994

**(3)** The portion of the data link layer that controls access to the medium. The MAC sublayer is required in end nodes.local area networks. (LM/C) 8802-12-1998

**(4)** The lower sublayer of the data link layer of seven-layer OSI model; provides topology-dependent functions between the physical layer and the logical link control sublayer. *See also:* network layer; transport layer; sublayer; application layer; client layer; data link layer; presentation layer; physical layer; entity layer; session layer; logical link control sublayer. (C) 610.7-1995

**medium attachment unit (MAU) (1)** The device that interfaces the communications system to the medium. The MAU incorporates the circuitry from the PLS (physical layer signaling interface) to the medium interface. (LM/C) 802.7-1989r

**(2)** In a local area network (LAN), a device used in a data station to couple the data terminal equipment (DTE) to the transmission medium. (C/LM) 802.9a-1995w

**(3)** In a local area network, a device used in a data station to couple the data terminal equipment (DTE) to the transmission medium. *Note:* This term is contextually specific to IEEE Std 802.3. (C) 610.7-1995

**(4)** A device containing an attachment unit interface (AUI), physical medium attachment (PMA), and medium dependent interface (MDI) that is used to connect a repeater or data terminal equipment (DTE) to a transmission medium. (C/LM) 802.3-1998

**medium dependent interface (MDI) (1) (medium attachment units and repeater units)** The mechanical and electrical interface between the trunk cable medium and the medium attachment unit (MAU). *See also:* coaxial cable interface. (LM/C) 8802-3-1990s

**(2)** The mechanical and electrical interface between the transmission medium and the MAU (10BASE-T) or PHY (100BASE-T). (LM/C) 802.3u-1995s

**(3)** The physically exposed interface between the link segment medium and the PMD of the end node or repeater, for which all mechanical, electrical or optical, and transmitted signal requirements are specified.local area networks. (C) 8802-12-1998

**medium frequency (MF)** 300 kHz to 3 MHz. *See also:* radio spectrum. (AP/PROP) 211-1997

**medium-grain parallel architecture** Parallel architecture that uses between 32 and 1024 processors. *Contrast:* coarse-grain parallel architecture; fine-grain parallel architecture. (C) 610.10-1994w

**medium independent interface (MII)** The logical interface between the Physical Medium Independent (PMI) and PMD in an end node or repeater. Optionally, the MII may be implemented as a physically exposed interface with specified signaling timing and electrical characteristics.local area networks. (C) 8802-12-1998

**medium interface connector (MIC)** A connector interface at which signal transmit and receive characteristics are specified for attaching stations and concentrators. One class of MICs is the connection between the attaching stations and the lobe cabling. A second set is the attachment interface between the concentrator and its lobes. A third set is the interface between the concentrator and the trunk cabling. Two types of connectors are specified: one for connecting to STP media and one for connecting to UTP media. (C/LM) 8802-5-1998

**medium ion (dc electric-field strength and ion-related quantities)** Ion comprised of several molecules or molecular clusters bound together by charge that is larger and less mobile than a small ion due to more mass or a greater number of molecular clusters. Typical radius is in the range of $10^{-9}$ m to $2 \times 10^{-8}$ m. Mobility is in the range of $10^{-7}$ $m^2/Vs$ to $10^{-5}$ $m^2/Vs$. (T&D/PE) 539-1990, 1227-1990r

**medium noise (sound recording and reproducing system)** The noise that can be specifically ascribed to the medium. *See also:* noise. 191-1953w

**medium-pulse-repetition-frequency waveform** A pulsed-radar waveform whose pulse-repetition frequency (PRF) is such that targets of interest are ambiguous with respect to both range and Doppler shift. *See also:* high-pulse-repetition-frequency waveform; low-pulse-repetition-frequency waveform. (AES) 686-1997

**medium scale integration (MSI) (A)** Pertaining to an integrated circuit containing between 100 and 500 transistors in its design. *Contrast:* large scale integration; very large scale integration; small scale integration; ultra-large scale integration. **(B)** Pertaining to an integrated circuit containing between 10 and 100 elements. (C) 610.10-1994

**medium voltage (1) (cable systems in power generating stations)** 601 to 15 000 V. (PE/EDPG) 422-1977
**(2) (system voltage ratings)** A class of nominal system voltages greater than 1000 V and less than 100 000 V. *See also:* low voltage; nominal system voltage; high voltage. (IA/PSE/APP) 241-1990r, [80]

**medium-voltage aluminum-sheathed power cable (aluminum sheaths for power cables)** Cable used in an electric system having a maximum phase-to-phase rms ac voltage above 1 000 V to 72 500 V, the cable having an aluminum sheath as a major component in its construction. (PE/IC) 635-1989r

**medium-voltage power cable (1) (cable systems in power generating stations)** Cables designed to supply power to utilization devices of the plant auxiliary system, operated at 601 to 15 000 V. (PE/EDPG) 422-1977
**(2)** Cable designed to supply power to utilization devices of the plant auxiliary system, operated at 5000–46 000 V in sizes ranging from 8 AWG (8.37 $mm^2$) to 2000 kcmil (1010.0 $mm^2$). (PE/IC) 1185-1994

**medium-voltage system (electric power for industrial and commercial systems only)** An electric system having a maximum root-mean-square alternating-current voltage above 1000 volts to 72 500 volts. *See also:* voltage classes. (IA/PSE) 570-1975w

**meet** *See:* AND.

**meg** Colloquial reference for megabyte. (C) 610.10-1994w

**mega (M) (A) (mathematics of computing)** A prefix indicating one million ($10^6$). **(B) (mathematics of computing)** In statements involving size of computer storage, a prefix indicating $2^{20}$, or 1 048 576. (C) 1084-1986

**megabyte** Either 1 000 000 bytes or $2^{20}$ bytes. *Notes:* 1. The user of these terms shall specify the applicable usage. If the usage is $2^{10}$ or 1024 bytes, or multiples thereof, then note 2 below shall also be included with the definition. 2. As used in IEEE Std 610.10-1994, the terms kilobyte (kB) means $2^{10}$ or 1024 bytes, megabyte (MB) means 1024 kilobytes, and gigabyte (GB) means 1024 megabytes. *See also:* gigabyte. (C) 610.10-1994w

**megacycle** One million cycles. (C) 610.10-1994w

**megahertz (MHz) (1)** A unit of frequency equal to 1 000 000 cycles per second. (LM/C) 802.7-1989r
**(2)** A unit of frequency equal to 1 000 000 Hz, that is, $10^6$ Hz. (C) 610.7-1995

**Meissner oscillator** An oscillator that includes an isolated tank circuit inductively coupled to the input and output circuits of an amplifying device to obtain the proper feedback and frequency. *See also:* oscillatory circuit. (AP/ANT) 145-1983s

**mel** A unit of pitch. By definition, a simple tone of frequency 1000 hertz, 40 decibels above a listener's threshold, produces a pitch of 1000 mels. *Note:* The pitch of any sound that is judged by the listener to be *n* times that of the 1-mel tone is *n* mels. (SP) [32]

**melting channel** The restricted portion of the charge in a submerged resistor or horizontal-ring induction furnace in which the induced currents are concentrated to effect high energy absorption and melting of the charge. *See also:* induction heating. (IA) 54-1955w, 169-1955w

**melting-speed ratio (1)** The ratio between between 0.1 s and 300 s or 600 s minimum melting currents, whichever is specified, which designates the relative speed of the fuse link. (SWG/PE) C37.40-1993
**(2)** (of a fuse) A ratio of the current magnitudes required to melt the current-responsive element at two specified melting times. *Notes:* 1. Specification of the current wave shape is required for time less than one-tenth of a second. 2. The lower melting time in present use is 0.1 s, and the higher minimum melting current times are 100 a for low-voltage fuses and 300 s or 600 s, whichever specified, for high-voltage fuses. (SWG/PE) C37.100-1992

**melting time (1) (protection and coordination of industrial and commercial power systems)** The time required to melt the current-responsive element on a specified overcurrent. Where the fuse is current limiting in less than half-cycle, the melting time may be approximately half or less of the clearing time. (IA/PSP) 242-1986r
**(2)** (of a fuse) The time required for overcurrent to sever the current-responsive element. (SWG/PE/SWG-OLD) C37.100-1992, C37.40-1993, C37.40b-1996

**member** In data management, a subunit contained in a partitioned data set. (C) 610.5-1990w

**membrane keyboard** A type of keyboard in which the keys are not raised, rather it is composed of a semi-flexible plastic sheet with a conductive surface below. *Synonym:* pressure-sensitive keyboard. (C) 610.10-1994w

**membrane potential** The potential difference, of whatever origin, between the two sides of a membrane. *See also:* electrobiology. (EMB) [47]

**memory (1)** All of the addressable storage in a processing unit and other internal storage that is used to execute instructions. *See also:* main storage. (C) 610.10-1994w
**(2)** *See also:* storage medium; storage.

**memory action** (of a relay) A method of retaining an effect of an input after the input ceases or is greatly reduced, so that this input can still be used in producing the typical response of the relay. *Note:* For example, memory action in a high-speed directional relay permits correct response for a brief period after the source of voltage input necessary to such response is short-circuited. (PE) C37.100-1992

**memory address** An address of a particular storage location in memory. (C) 610.10-1994w

**memory address register** A register containing the address of the memory location to be accessed. (C) 610.10-1994w

**memory agent** A module that uses split transactions to assume all the rights and responsibilities of some number of remote memory modules. (C/BA) 896.4-1993w

**memory allocation and protection (A)** To allocate physical sections of memory into logical partitions with read/write protection provided within each partition. **(B)** Pertaining to the hardware components that perform the allocation as in (A). (C) 610.10-1994

**memory array (1)** A matrix of memory locations arranged in a rectangular geometric pattern on an integrated circuit. (C) 610.10-1994w

**(2)** *See also:* array. (ED) 1005-1998

**memory bank** *See:* bank.

**memory board** A circuit board that provides random-access memory to a system. (C) 610.10-1994w

**memory boundary** The last address of an aligned data block. The maximum data block size that can be transferred by an IUT Master is the product of data width and data length. (C/BA) 896.4-1993w

**memory buffer register** A register in which a word is stored as it is read from memory or as it is written to memory. *Synonym:* memory data register. (C) 610.10-1994w

**memory bus** A bus connecting memory to the devices which can access it, including the processor and peripheral devices. (C) 610.10-1994w

**memory capacity (1)** The maximum number of bits that a memory is capable of storing. (ED) 641-1987w

**(2) (software)** The maximum number of items that can be held in a given computer memory; usually measured in words or bytes. (C) 610.12-1990

**(3)** *See also:* capacity. (ED) 1005-1998

**(4) (electronic computation)** *See also:* channel capacity; storage capacity.

**memory cell (1)** The smallest subdivision of a memory into which a unit of data has been or can be entered, in which it is or can be stored, and from which it can be retrieved. (ED) 641-1987w

**(2)** The combination of one or more single or merged transistors formed to provide a means of accessing, changing, and storing data. (ED) 1005-1998

**memory compaction (A)** A storage allocation technique in which the contents of all allocated storage areas are moved to the beginning of the storage space and the remaining storage blocks are combined into a single block. *Synonym:* garbage collection. **(B)** A storage allocation technique in which contiguous blocks of nonallocated storage are combined to form single blocks. (C) 610.12-1990

**memory core** *See:* magnetic core.

**memory cycle (1) (test, measurement, and diagnostic equipment)** The time required to read information from memory and replace it. (MIL) [2]

**(2)** A single complete access (read or write) of memory. (C) 610.10-1994w

**memory data register** *See:* memory buffer register.

**memory device** A device that contains only memory and implements configuration registers. (C/MM) 1155-1992

**memory dump** A display of the contents of all or part of a computer's internal storage, usually in binary, octal, or hexadecimal form. *See also:* static dump; selective dump; snapshot dump; dynamic dump; change dump. (C) 610.12-1990

**memory image** A series of bits that can be stored within a contiguous portion of transponder memory and that may be passed as a parameter within commands initiated by the roadside equipment (RSE). (SCC32) 1455-1999

**memory integrated circuit** An integrated circuit consisting of memory cells and usually including associated circuits such as signal amplification and address selection. (ED) 1005-1998

**memory location** A subdivision of a memory, including one or several memory cells, that is the smallest part of the memory that can be addressed. *Note:* The content of a memory location is usually called a bit, a byte, or a word, as appropriate. (ED) 1005-1998

**memory management unit (MMU)** A device that performs address translation between a CPU's virtual addresses and the physical addresses of some bus; typically, the bus represented by the root node. (C/BA) 1275-1994

**memory map (1)** A diagram that shows where programs and data are stored in a computer's memory. (C) 610.12-1990

**(2)** A list of all the current addresses in a computer. *Note:* This may indicate what is currently allocated, who is using it and where it is located. *Synonym:* memory map list. (C) 610.10-1994w

**memory map list** *See:* memory map.

**memory mapping (A)** The manner in which an address is translated into a physical address of a storage location. *See also:* biasing; segmenting; paging. **(B)** The process of translating addresses as in definition (A). (C) 610.10-1994

**memory-mode agent** An agent that communicates with others by using memory and/or I/O space on the parallel system bus. (C/MM) 1296-1987s

**memory-mode system** A system in which the agents communicate with one another with data structures in memory and/or I/O space. (C/MM) 1296-1987s

**memory object (1)** Either a file or shared memory object. When used in conjunction with *mmap*(), a memory object will appear in the address space of the calling process. (C/PA) 9945-1-1996

**(2)** Either a file or shared memory object. When used in conjunction with `Map_Memory`, `Open_And_Map_Shared_Memory`, or `Open_Or_Create_And_Map_Shared_Memory`, a memory object will appear in the address space of the calling process. (C) 1003.5-1999

**memory organization** The arrangement of memory cells, either by geometrical arrangement in rows and columns or by organization of the data to be stored. (ED) 1005-1998, 641-1987w

**memory page** A segment of transponder memory that is assigned a unique location by which it may be referenced. (SCC32) 1455-1999

**memory relay (A)** A relay having two or more coils, each of which may operate independent sets of contacts, and another set of contacts that remain in a position determined by the coil last energized. **(B)** Sometimes erroneously used for polarized relay. *See also:* relay. (EEC/REE) [87]

**memory-resident** Managed by the implementation in such a way as to provide an upper bound on memory access times. (C/PA) 9945-1-1996, 1003.5-1999

**memory space** The address space used for accessing physical memory devices for storage and retrieval of code and data. (C/MM) 1296-1987s

**memory window** The difference in threshold voltage between the low- and high-conductance logic states of a memory cell. (ED) 641-1987w

**MENTOR** A block-structured language used widely in computer-aided instruction; characterized by its ability to model a student's knowledge. (C) 610.13-1993w

**menu (1)** A list of options available for selection by the user of a computer system. *Synonyms:* display menu; help menu; menu selection. (C) 610.2-1987, 610.6-1991w

**(2)** A rectangular visual user interface control containing a group of controls used to select an action from a group of choices. (C) 1295-1993w

**menu bar** A visual user interface control that is the bounded area near the top of a window, below the title bar, and above the rest of the window that contains cascade buttons that provide access to other menus. (C) 1295-1993w

**menu by-pass** In a menu-driven system, a feature that permits advanced users to perform functions in a command-driven mode without selecting options from the menus. (C) 610.12-1990

**menu-driven** Pertaining to a system or mode of operation in which the user directs the system through menu selections. *Contrast:* command-driven. *See also:* menu by-pass. (C) 610.12-1990

**menu selection (A)** The process of choosing an item from a menu. **(B)** The item chosen from a menu. (C) 610.2-1987

**mercury-arc converter, pool-cathode** *See:* pool-cathode mercury-arc converter; oscillatory circuit.

**mercury-arc rectifier** A gas-filled rectifier tube in which the gas is mercury vapor. *See also:* rectification. (ED) [45], [84]

**mercury cells** Electrolytic cells having mercury cathodes with which deposited metals form amalgams. (EEC/PE) [119]

**mercury-contact relays (A) (mercury plunger relay)** A relay in which the magnetic attraction of a floating plunger by a field surrounding a sealed capsule displaces mercury in a pool to effect contacting between fixed electrodes. **(B) (mercury-wetted-contact relay)** A form of reed relay in which the reeds and contacts are glass enclosed and are wetted by a film of mercury obtained by capillary action from a mercury pool in the base of a glass capsule vertically mounted. **(C) (mercury-contact relay)** A relay mechanism in which mercury establishes contact between electrodes in a sealed capsule as a result of the capsule's being tilted by an electromagnetically actuated armature, either on pick-up or dropout or both. *See also:* mercury relay.

**mercury fluorescent lamp (illuminating engineering)** An electric discharge lamp having a high-pressure mercury arc in an arc tube, and an outer envelope coated with a fluorescing substance (phosphor) which transforms some of the ultraviolet energy generated by the arc into light. (EEC/IE) [126]

**mercury-hydrogen spark-gap converter (dielectric heating)** A spark-gap generator or power source which utilizes the oscillatory discharge of a capacitor through an inductor and a spark gap as a source of radio-frequency power. The spark gap comprises a solid electrode and a pool of mercury in a hydrogen atmosphere. *See also:* induction heating. (IA) 54-1955w, 169-1955w

**mercury lamp (illuminating engineering)** A high intensity discharge (HID) lamp in which the major portion of the light is produced by radiation from mercury operating at a partial pressure in excess of $1.013 \times 10^5$ Pa (one atmosphere). Includes clear, phosphor-coated (mercury-fluorescent), and self-ballasted lamps. (EEC/IE) [126]

**mercury-lamp ballast** *See:* ballast.

**mercury-lamp transformer** *See:* constant-current (series) mercury-lamp transformer.

**mercury motor meter** A motor-type meter in which a portion of the rotor is immersed in mercury, which serves to direct the current through conducting portions of the rotor. *See also:* electricity meter.

**mercury oxide cell** A primary cell in which depolarization is accomplished by oxide of mercury. *See also:* electrochemistry. 341

**mercury-pool cathode (gas tube)** A pool cathode consisting of mercury. (ED) [45], [84]

**mercury relay** A relay in which the movement of mercury opens and closes contacts. (EEC/REE) [87]

**mercury storage** A type of storage that utilizes the acoustic wave propagation properties of mercury to store data. *See also:* acoustic delay line. (C) 610.10-1994w

**mercury vapor lamp transformers (power and distribution transformers)** (multiple-supply type) Transformers, autotransformers, or reactors for operating mercury or metallic iodide vapor lamps for all types of lighting applications, including indoor, outdoor area, roadway, uviarc, and other process and specialized lighting. (PE/TR) C57.12.80-1978r

**mercury-vapor tube** A gas tube in which the active gas is mercury vapor. (ED) 161-1971w

**merge (1) (computers)** To combine two or more sets of items into one, usually in a specified sequence. (C/C) [20], [85]
**(2) (data management)** To combine the items of two or more sets, all in the same order, into one set in that order. *See also:* unbalanced merge; collate; bitonic merge; coalesce; order-by-merging; balanced merge; merge sort. (C) 610.5-1990w

**merge exchange sort** *See:* Batcher's parallel sort.

**merge search** A sequential search in which the set of search arguments is ordered in the same sequence as the set to be searched; the set is searched sequentially, using the first search argument, until an equal or greater search key is found, the former case signifying a successful search, the latter, an unsuccessful search; the search for the next search argument begins where the last search left off. (C) 610.5-1990w

**merge sort** A sort in which the set to be sorted is divided into subsets, the items in each subset are sorted, and the sorted subsets are merged. *Synonym:* merging sort. *See also:* internal merge sort; external merge sort. (C) 610.5-1990w

**merging** Reconfiguration function that involves dual ring stations ceasing to use contra-rotating links in favor of a restored link or station. (LM/C) 802.5c-1991r

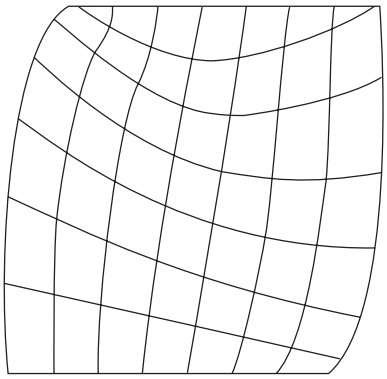
**merging sort** *See:* merge sort.

**meridional ray (fiber optics)** A ray that passes through the optical axis of an optical waveguide (in contrast with a skew ray, which does not). *See also:* optical axis; skew ray; paraxial ray; axial ray; geometric optics; numerical aperture. (Std100) 812-1984w

**Merritt and Miller's Own Block Structured Simulation Language (MOBSSL-UAF)** A simulation language used to model continuous systems using an augmented block structure. (C) 610.13-1993w

**Mesa** An application development language used by Xerox to program Viewpoint applications. (C) 610.13-1993w

**mesh (1)** A set of branches forming a closed path in a network, provided that if any one branch is omitted from the set, the remaining branches of the set do not form a closed path. *Note:* The term loop is sometimes used in the sense of mesh. *See also:* network analysis. (Std100) 270-1966w
**(2) (computer graphics)** A group of polygons that, when placed on the surface of a three-dimensional object, visually describes the shape of the exterior surface. (See the corresponding figure.)



**mesh**

(C) 610.6-1991w

**mesh-connected circuit** A polyphase circuit in which all the current paths of the circuit extend directly from the terminal of entry of one phase conductor to the terminal of entry of another phase conductor, without any intermediate interconnections among such paths and without any connection to the neutral conductor, if one exists. *Note:* In a three-phase system this is called the delta (or D) connection. *See also:* network analysis. (Std100) 270-1966w

**mesh current** A current assumed to exist over all cross sections of a given closed path in a network. *Note:* A mesh current may be the total current in a branch included in the path, or it may be a partial current such that when combined with others the total current is obtained. *See also:* network analysis. (Std100) 270-1966w

**mesh equations** Any set of equations (of minimum number) such that the independent mesh or loop currents of a specified network may be determined from the impressed voltages. *Notes:* 1. For a given network, different sets of equations, equivalent to one another, may be obtained by different choices of mesh or loop currents. 2. The equations may be differential equations, or algebraic equations when impedances and phasor equivalents of steady-state single-frequency sine-wave quantities are used. *Synonym:* loop equations. *See also:* network analysis. (Std100) 270-1966w

**mesh table** A multidimension table that defines every type of delay model in terms of discrete points. Each point represents a delay value in terms of several cell parameters or interconnect parameters. The delay calculation module is expected to interpolate between these points based on a mathematical expression defined by the technology file. (C/DA) 1481-1999

**mesh voltage** The maximum touch voltage within a mesh of a ground grid. (PE/SUB) 80-2000

**mesial point (pulse terminology)** A magnitude referenced point at the intersection of a waveform and a mesial line. *See also:* waveform epoch. (IM/WM&A) 194-1977w

**mesopause** The upper boundary of the mesosphere. (AP/PROP) 211-1997

**mesopic vision (illuminating engineering)** Vision with fully adapted eyes at luminance conditions between those of photopic and scotopic vision, that is, between about 3.4 cd/m$^2$ ($2.2 \times 10^{-3}$ cd/in$^2$) (1.0 fL) and 0.034 cd/m$^2$ ($2.2 \times 10^{-5}$ cd/in$^2$) (0.01 fL). (EEC/IE) [126]

**mesosphere** That part of the Earth's atmosphere, located above the stratosphere, in which the temperature decreases with increasing height. The mesosphere extends to an altitude of around 85 km, where the temperature reaches a minimum value. (AP/PROP) 211-1997

**message (1) (telephone switching systems)** An answered call or the information content thereof. (COM) 312-1977w

**(2) (A)** In telecommunications, a combination of characters and symbols transferred from one point to another. **(B)** For bisync-type devices, the data unit from the beginning of a transmission to the first end-of-text (ETX) characters. **(C)** In information theory, an ordered series of characters or bits intended to convey information. **(D)** A group of characters and control bit sequences transferred as an entity from a data source to a data sink, where the arrangement of characters is determined by the data source. **(E)** An arbitrary amount of information whose beginning and end are defined or implied. (PE/SUB) 999-1992

**(3)** A value or set of values representing an interface event between functions. The term as used here is intended to be very primitive, not implying a particular structure or interface protocol unless modified by an appropriate adjective (like transaction-initiation message). A message can be arbitrarily simple (a signal) or complicated. (C/MM) 1212.1-1993

**(4)** A set of packets starting with a HEADER, consisting of that HEADER and all (ACKNOWLEDGE and DATA) packets transmitted as the immediate consequence of the command in that HEADER, and terminating when the M-module returns to the IDLE Master Controller state. (TT/C) 1149.5-1995

**(5)** An ordered series of characters used to convey information. (C) 610.7-1995

**(6)** Information that can be transferred among processes or threads by being added to and removed from a message queue. A message consists of a fixed-size message buffer. (C/PA) 9945-1-1996

**(7)** A logical grouping of one or more packets sent either from host to printer (a command message) or from printer to host (a response message). (C/MM) 1284.1-1997

**(8)** A package of information meeting a standard format that is sent to or from a transponder's memory. (SCC32) 1455-1999

**(9)** A communication sent from one object to another. *Message* encompasses requests to meet responsibilities as well as simple informative communications. *See also:* request. (C/SE) 1320.2-1998

**(10)** Information that can be transferred among tasks (possibly in different processes) by being added to and removed from a message queue. A message queue consists of a fixed-size buffer. (C) 1003.5-1999

**(11)** A grouping of data elements and/or data frames, as well as associated message metadata, that is used to convey a complete unit of information. For the purposes of this document, a message is an abstract description using a message set template (MST); it is not a specific instance. (SCC32) 1488-2000

**(12)** A set of ordered data (possibly empty) that includes a message boundary indication. Message data may span multiple packets. A packet shall not hold data from more than one message. (C/MM) 1284.4-2000

**message attribute** Information that describes a message and which may specify, at the logical level, relevant associated requirements for data exchange, interpretation, and handling. (SCC32) 1488-2000

**message-based device** An intelligent device that implements the defined VXIbus registers and communication protocols. (C/MM) 1155-1992

**message body** That portion of a message specification that describes the data elements and/or data frames contained within the message. (SCC32) 1488-2000

**message box** A visual user interface control used to display information not requested by the user but displayed in a secondary window by an application in response to an unexpected event or a possibility of something undesirable happening. (C) 1295-1993w

**message code (MC)** The predefined 12-bit code contained in an Auto-Negotiation Message Page. (LM/C) 802.3-1998

**message_extension** An allocated buffer in System Memory containing items that either would not fit in the primary_message or that are only needed for unusually large messages. (C/MM) 1212.1-1993

**message group** A collection of related messages. (SCC32) 1488-2000

**message identifier** An identifier used to identify derived MAC protocol data units (DMPDUs) derived from the same initial MAC protocol data unit (IMPDU). (LM/C) 8802-6-1994

**message instance** An occurrence of a message containing the actual values for the data elements and, in some cases, data about the message. (SCC32) 1488-2000

**message length** Although messages can be of any length up to 65 539 bytes, the packet size should be selected for effective transmissions over the physical link without requiring disassembly and reassembly. For connections through a network, the packet size of that network would generally be the most efficient. (C/MM) 1284.1-1997

**message-mode agent** An agent that exclusively uses message space for communication with other agents. (C/MM) 1296-1987s

**message-mode system** A system in which communication between agents is via blocks of data transmitted in the message space. (C/MM) 1296-1987s

**message page (MP)** An Auto-Negotiation Next Page encoding that contains a predefined 12-bit Message Code. (C/LM) 802.3-1998

**message queue (1)** A data structure and related procedures for passing a sequence of primary_messages from one or more producers to a consumer. (C/MM) 1212.1-1993

**(2)** An object to which messages can be added and removed. Messages may be removed in the order in which they were added or in priority order. (C/PA) 9945-1-1996, 1003.5-1999

**message queue descriptor** A per-process unique value used to identify an open message queue. (C) 1003.5-1999

**message set** A collection of messages based on the ITS class names. (SCC32) 1488-2000

**message set template (MST)** An abstract structure addressing the message attributes and syntax used to specify ITS messages, as well as rules for producing message standards using the MST (e.g., conformance statements). (SCC32) 1488-2000

**message sink** The part of a communications system that is the final destination of a message. *Contrast:* message source. (C) 610.7-1995

**message source (1)** That part of a communication system where messages are assumed to originate. *See also:* information theory. (Std100) 171-1958w

**(2)** The part of a communications system from which a message originates. *Synonym:* information source. *Contrast:* message sink. (C) 610.7-1995

**message space** The address space used for packet based communications ranging from interrupts to negotiated data movement. *See also:* packet. (C/MM) 1296-1987s

**messages, species of** A group of messages having in the Command fields of their respective HEADER packets a common command code. The name, S, of a message species is the same as the name of the command that defines the message species. (TT/C) 1149.5-1995

**message stream modification** Attempts to modify, delete, reorder, duplicate, or insert information while the message stream is being transmitted over a communication channel. Message stream modification attacks may be perpetrated at any point in the communication architecture (e.g., data link, network, transport, application), and could result in unauthorized modification of information or unauthorized receipt of services. (C/BA) 896.3-1993w

**message switch (data transmission)** A technique whereby messages are routed to the appropriate receiver by way of message address codes rather than by switching of the communication channel itself. (PE) 599-1985w

**message switching (1)** A method of handling messages over communications networks. The entire message is transmitted to an intermediate point (that is, a switching computer), stored for a period of time, perhaps very short, and then transmitted again towards its destination. The destination of each message is indicated by an address integral to the message. *See also:* circuit switching. (LM/COM) 168-1956w

**(2)** In data communications, a method of transporting messages by receiving, storing, and forwarding complete messages over communications networks. *See also:* time multiplexed switching; circuit switching; space-division switching. (C) 610.7-1995

**message telecommunication network (telephone switching systems)** An arrangement of switching and transmission facilities to provide telecommunication services to the public. (COM) 312-1977w

**message-timed release (telephone switching systems)** Release effected automatically after a measured interval of communication. (COM) 312-1977w

**message unit (telephone switching systems)** A basic chargeable unit based on the duration and destination of a call. (COM) 312-1977w

**message-unit call (telephone switching systems)** A call for which billing is in terms of accumulated message units. (COM) 312-1977w

**meta (1)** A word denoting a description that is one level of abstraction above the entity being described. (SCC32) 1489-1999

**(2)** A Greek prefix meaning that which pertains to the whole or overall entity or that which is in common or shared with all member entities comprising the whole. (IM/ST) 1451.2-1997

**meta-attribute** A documenting characteristic of a data concept. (SCC32) 1489-1999

**metacomment** A VHDL comment (--) that is used to provide synthesis-specific interpretation by a synthesis tool. (C/DA) 1076.6-1999

**metacompiler** *See:* compiler generator.

**metadata (1)** Data that describes other data; for example, a data dictionary contains a collection of metadata. (C) 610.5-1990w

**(2)** The information kept about software. It consists of the values of the various attributes of each of the objects. (C/PA) 1387.2-1995

**(3)** Information about the way asset description data is stored and organized within a library. (C/SE) 1430-1996

**(4)** Data that defines and describes other data. (SCC32) 1489-1999

**metafile** A file of device-independent commands, typically used to store graphical information to be displayed at a later time or on a different system or device. (C) 610.6-1991w

**META 5 (A)** A programming language used for symbolic data manipulation and for syntax-directed computing. **(B)** An assembly language for CDC computers. (C) 610.13-1993

**metalanguage (1)** A language used to specify some or all aspects of itself or of another language; for example, Backus-Naur form. (C) 610.13-1993w, 610.12-1990

**(2)** A form of notation used to rigorously define the syntax, and sometimes the semantics, of another language. (SCC20) 771-1998

**metal clad** The conducting parts are entirely enclosed in a metal casing. (EEC/PE) [119]

**metal-clad switchgear (1) (electric power distribution for industrial plants)** Metal-enclosed power switchgear characterized by the following necessary features.

a) The main circuit switching and interrupting device is of the removable type arranged with a mechanism for moving it physically between connected and disconnected positions and equipped with self-aligning and self-coupling primary and secondary disconnecting devices.
b) Major parts of the primary circuit, such as the circuit switching or interrupting devices, buses, potential transformers, and control power transformers, are enclosed by grounded metal barriers. Specifically included is an inner barrier in front of or a part of the circuit interrupting device to ensure that no energized primary circuit components are exposed when the unit door is opened.
c) All live parts are enclosed within grounded metal compartments. Automatic shutters prevent exposure of primary circuit elements when the removable element is in the test, disconnected, or fully withdrawn position.
d) Primary bus conductors and connections are covered with insulating material throughout. For special configurations, insulated barriers between phases and between phase and ground may be specified.
e) Mechanical interlocks are provided to ensure a proper and safe operating sequence.
f) Instruments, meters, relays, secondary control devices, and their wiring are isolated by grounded metal barriers from all primary circuit elements with the exception of short lengths of wire, such as at instrument transformer terminals.
g) The door through which the circuit interrupting device is inserted into the housing may serve as an instrument or relay panel and may also provide access to a secondary or control compartment within the housing.

*Notes:* 1. Auxiliary frames may be required for mounting associated auxiliary equipment, such as potential transformers, control power transformers, etc. 2. The term metal-clad switchgear can be properly used only if metal-enclosed switchgear conforms to the foregoing definition. All metal-clad switchgear is metal-enclosed, but not all metal-enclosed switchgear can be correctly designated as metal-clad. The most prevalent type of switching and interrupting device used in metal-clad switchgear is the air-magnetic power circuit breaker over 1000 volts (V). (IA/PSE) 141-1986s

**(2)** Switchgear that is characterized by the following necessary features:

a) The main switching and interrupting device is of the removable (drawout) type arranged with a mechanism for moving it physically between connected and disconnected positions and equipped with self-aligning and self-coupling primary disconnecting devices and disconnectable control wiring connections.
b) Major parts of the primary circuit, that is, the circuit switching or interrupting devices, buses, voltage transformers, and control power transformers, are completely enclosed by grounded metal barriers, that have no intentional openings between compartments. Specifically included is a metal barrier in front of, or a part of, the circuit

interrupting device to ensure that, when in the connected position, no primary circuit components are exposed by the opening of a door.

c) All live parts are enclosed within grounded metal compartments.

d) Automatic shutters that cover primary circuit elements when the removable element is in the disconnected, test, or removed position.

e) Primary bus conductors and connections are covered with insulating material throughout.

f) Mechanical interlocks are provided for proper operating sequence under normal operating conditions.

g) Instruments, meters, relays, secondary control devices and their wiring are isolated by grounded metal barriers from all primary circuit elements with the exception of short lengths of wire such as at instrument transformer terminals.

h) The door through which the circuit-interrupting device is inserted into the housing may serve as an instrument or relay panel, and may also provide access to a secondary or control compartment within the housing.

*Notes:* 1. Auxiliary vertical sections may be required for mounting devices or for use as a bus transition. 2. The term metal- clad (as applied to switchgear assemblies) is correctly used only in connection with switchgear conforming fully to this definition for metal-clad switchgear. Metal-clad switchgear is metal-enclosed, but not all metal-enclosed switchgear can be correctly designated as metal-clad.

(SWG/PE) C37.100-1992, C37.20.2-1993

**metal distribution ratio (electroplating)** The ratio of the thicknesses (weights per unit areas) of metal upon two specified parts of a cathode. *See also:* electroplating.

(PE/EEC) [119]

**metal-enclosed (1) (metal-enclosed bus and calculating losses in isolated-phase bus)** (as applied to metal-enclosed bus) Surrounded by a metal case or housing, with provisions for grounding. (SWG/PE) C37.23-1987r

**(2)** (as applied to a switchgear assembly or components thereof) Surrounded by a metal case or housing, usually grounded. (SWG/PE) C37.100-1992

**metal-enclosed bus (1) (electric power distribution for industrial plants)** An assembly of rigid electrical buses with associated connections, joints, and insulating supports, all housed within a grounded metal enclosure. Three basic types of metal-enclosed bus construction are recognized: nonsegregated phase, segregated phase, and isolated phase. The most prevalent type used in industrial power systems is the nonsegregated phase, which is defined as one in which all phase conductors are in a common metal enclosure without barriers between the phases. When metal-enclosed buses over 100 V are used with metal-clad switchgear, the bus conductors and connections are covered with insulating material throughout. When metal-enclosed buses are associated with metal-enclosed 1000 V and below power circuit breaker switchgear or metal-enclosed interrupter switchgear, the primary bus conductors and connections are usually bare.

(IA/PSE) 141-1986s

**(2) (metal-enclosed bus and calculating losses in isolated-phase bus)** An assembly of conductors with associated connections, joints, and insulating supports within a grounded metal enclosure. The conductors may be either rigid or flexible. (SWG/PE) C37.23-1987r

**(3)** An assembly of conductors with associated connections, joints, and insulating supports within a grounded metal enclosure. (PE/EDPG) 665-1995

**(4)** An assembly of conductors with associated connections, joints, and insulating supports within a grounded metal enclosure. The conductors may be either rigid or flexible. *Note:* In general, three basic types of construction are used: nonsegregated-phase, segregated-phase, and isolated-phase.

- *nonsegregated-phase bus.* A bus in which all phase conductors are in a common metal enclosure without barriers between phases. When associated with metal-clad switchgear, the primary bus and connections shall be covered with insulating material equivalent to the switchgear insulation system.
- *segregated-phase bus.* A bus in which all phase conductors are in a common metal enclosure but are segregated by metal barriers between phases.
- *isolated-phase bus.*A bus in which each phase conductor is enclosed by an individual metal housing separated from adjacent conductor housing by an air space. The bus may be self-cooled or may be forced-cooled by means of circulating a gas or liquid.

(SWG/PE) C37.100-1992

**metal-enclosed equipment** A capacitor equipment assembly enclosed in a metal enclosure or metal house, usually grounded, to prevent accidental contact with live parts *Synonym:* metal-housed equipment. (T&D/PE) 18-1992

**metal-enclosed interrupter switchgear (1) (electric power distribution for industrial plants)** Metal-enclosed power switchgear including the following equipment as required: interrupter switches; power fuses; bare bus and connections; instrument and control power transformers; control wiring and accessory devices. The interrupter switches and power fuses may be of the stationary or removable type. For the removable type, mechanical interlocks are provided to ensure a proper and safe operating sequence.

(PE/SWG/IA/PSE) 141-1986s

**(2)** Metal-enclosed power switchgear including the following equipment as required: Interrupter switches; Power fuses (current limiting or noncurrent limiting); Bare bus and connections; Instrument transformers; Control wiring and accessory devices. The interrupter switches and power fuses may be stationary or removable (drawout) type. When removable type, automatic shutters that cover primary circuit elements when the removable element is in the disconnected, test, or removed position, and mechanical interlocks are to be provided for proper operating sequence.

(SWG/PE) C37.20.3-1996

**(3)** Metal-enclosed power switchgear that includes the following equipment as required: (1) interrupter switches, (2) power fuses, (3) bare bus and connections, (4) instrument transformers, and (5) control wiring and accessory devices. The interrupter switches and power fuses may be of the stationary or removable type. When of the removable type, mechanical interlocks are provided to ensure a proper and safe operating sequence. (SWG/PE) C37.100-1992

**metal-enclosed low-voltage power circuit-breaker switchgear (LV) (A) (metal-enclosed low-voltage power circuit-breaker switchgear)** Low-voltage (LV) switchgear of multiple or individual enclosures, including the following equipment as required: low-voltage power circuit breakers (fused or unfused); bare bus and connections; instrument and control power transformers; instruments, meters, and relays; control wiring and accessory devices. The low-voltage power circuit breakers are contained in individual grounded metal compartments and controlled either remotely or from the front of the enclosure. The circuit breakers may be stationary or removable (drawout) type; when of removable type, mechanical interlocks are provided for proper operating sequence.

**(B)** Metal-enclosed power switchgear, including the following equipment as required: 1000 V and below power circuit breakers (fused or unfused); bare bus and connections; instrument and control power transformers; instruments, meters, relays; control wiring and accessory devices; cable and busway termination facilities. The 1000 V and below power circuit breakers are contained in individual grounded metal compartments and controlled either remotely or from the front of the panels. The circuit breakers are usually of the drawout type, but may be nondrawout. When drawout-type circuit breakers are used, mechanical interlocks must be provided to ensure a proper and safe operating sequence.

(SWG/PE/IA/PSE) C37.20.1-1993, C37.100-1992, 141-1986

**metal-enclosed power switchgear (ME) (metal-clad and station-type cubicle switchgear) (metal-enclosed low-voltage power circuit-breaker switchgear)** A switchgear assembly completely enclosed on all sides and top with sheet metal (except for ventilating openings and inspection windows) containing primary power-circuit switching or interrupting devices or both, with buses and connections. The assembly may include control and auxiliary devices. Access to the interior of the enclosure is provided by doors or removable covers or both. *Note:* Metal-clad switchgear, station-type cubicle switchgear, metal-enclosed interrupter switchgear, and low-voltage power circuit-breaker switchgear are specific types of metal-enclosed power switchgear.
(SWG/PE) C37.20.1-1993r, C37.20.3-1996, C37.100-1992, C37.81-1989r, C37.20.2-1993

**metal fog (electrolysis)** A fine dispersion of metal in a fused electrolyte. *Synonym:* metal mist. *See also:* fused electrolyte.
(PE/EEC) [119]

**metal-graphite brush (rotating machinery)** A brush composed of varying percentages of metal and graphite, copper or silver being the metal generally used. *Note:* This type of brush is soft. Grades of brushes of this type have extremely high current-carrying capacities, but differ greatly in operating speed from low to high. *See also:* brush.
(PE/EEC/LB) [9], [101]

**metal halide lamp (illuminating engineering)** A high intensity discharge (HID) lamp in which the major portion of the light is produced by radiation of metal halides and their products of dissociation possibly in combination with metallic vapors such as mercury. Includes clear and phosphor-coated lamps.
(EEC/IE) [126]

**metal-housed equipment** *See:* metal-enclosed equipment.

**metallic circuit (measuring longitudinal balance of telephone equipment operating in the voice band)** A circuit of which the ground (earth) forms no part.
(COM/PE/TA) 455-1985w, 599-1985w

**metallic covering** A metal sheath or braid used to provide physical protection for heating cable and, in some cases, to provide an electrical ground path. (IA/PC) 515-1997, 515.1-1995

**metallic enclosure** A grounded, leak-tight enclosure that contains the compressed insulating gas and associated electrical equipment.
(SWG/PE/SUB) C37.100-1992, C37.122-1993, C37.122.1-1993

**metallic E-plane line** An E-plane line in which there is no insulating substrate. (MTT) 1004-1987w

**metallic impedance (measuring longitudinal balance of telephone equipment operating in the voice band) (telephone equipment)** Impedance presented by a metallic circuit at any given single frequency, at or across the terminals of one of its transmission ports. (COM/TA) 455-1985w

**metallic longitudinal induction ratio** The ratio of the metallic-circuit current or noise-metallic arising in an exposed section of open wire telephone line, to the longitudinal-circuit current or noise-longitudinal in sigma. It is expressed in microamperes per milliampere or the equivalent. *Synonym:* M-L ratio. *See also:* inductive coordination; metallic noise.
(EEC/PE) [119]

**metallic noise (data transmission)** The weighted noise current in a metallic circuit at a given point when the circuit is terminated at that point in the nominal characteristic impedance of the circuit. (PE) 599-1985w

**metallic outer covering (electrical heat tracing for industrial applications)** A metal sheath or braid used to provide physical protection for heating cable and. in some cases, to provide an electrical ground path. (BT/AV) 152-1953s

**metallic rectifier (electric installations on shipboard)** A metallic rectifier cell is a device consisting of a conductor and semiconductor forming a junction. The junction exhibits a difference in resistance to current flow in the two directions through the junction. This results in effective current flow in one direction only. A metallic rectifier stack is a single columnar structure of one or more metallic rectifier cells.
(IA/MT) 45-1983s

**metallic rectifier cell** A device consisting of a conductor and a semiconductor forming a junction. *Notes:* 1. Synonymous with metallic rectifying cells. 2. Such cells conduct current in each direction but provide a rectifying action because of the large difference in resistance to current flow in the two directions. 3. A metallic rectifier stack is a single columnar structure of one or more metallic rectifier cells. *See also:* rectification. (IA/MT) 45-1983s

**metallic rectifier stack assembly** The combination of one or more stacks consisting of all the rectifying elements used in one rectifying circuit. *See also:* rectification.
(EEC/PE) [119]

**metallic rectifier unit** An operative assembly of a metallic rectifier, or rectifiers, together with the rectifier auxiliaries, the rectifier transformers, and the essential switchgear. *See also:* rectification. (EEC/PE) [119]

**metallic signal (telephone loop performance)** (differential) The metallic voltage is the algebraic difference between the voltages to ground in the two conductors (tip and ring). The metallic current is half the algebraic difference between the current in these conductors. (COM/TA) 820-1984r

**metallic transmission port (measuring longitudinal balance of telephone equipment operating in the voice band) (telephone equipment)** A place of access in the metallic transmission path of a device or network where energy may be supplied or withdrawn, or where the device or network variables may be measured. The terminals of such a port are sometimes referred to as the tip and ring terminals. *Note:* In any particular case, the transmission ports are determined by the way the device is used, and not by its structure alone.
(COM/TA) 455-1985w

**metallic voltage (measuring longitudinal balance of telephone equipment operating in the voice band) (telephone equipment)** The voltage across a metallic circuit.
(COM/TA) 455-1985w

**metallized brush** *See:* metal-graphite brush.

**metallized paper capacitor** A capacitor in which the dielectric is primarily paper and the electrodes are thin metallic coatings deposited thereon. (PE/EM) 43-1974s

**metallized screen (cathode-ray tubes)** A screen covered on its rear side (with respect to the electron gun) with metallic film, usually aluminized, transparent to electrons and with a high optical reflection factor, which passes on to the viewer a large part of the light emitted by the screen on the electron-gun side. *See also:* cathode-ray tube. (ED) [45], [84]

**metal master** *See:* original master.

**metal mist** *See:* metal fog.

**metal negative** *See:* original master.

**metal-nitride-oxide-memory section** The portion of an integrated circuit memory built using a MNOS technology.
(ED) 641-1987w

**metal-nitride-oxide-semiconductor transistor** In analogy with the metal-oxide-semiconductor (MOS) transistor, this acronym derives from the layer sequence in the gate region of the IGFET, namely, Metal-Nitride-Oxide-Semiconductor: MNOS Memory Transistor. Usually it has a variable threshold voltage. Some devices with this layer sequence have fixed threshold voltages. *Synonym:* MNOS transistor.
(ED) 581-1978w, 641-1987w

**metalogical value (1)** One of the enumeration literals 'U', 'X', 'W', or '-' of the type STD_ULOGIC defined by IEEE Std 1164-1993. (C/DA) 1076.3-1997
**(2)** One of the enumeration literals, 'U', 'X', 'W', or '-', of the type STD_ULOGIC (or subtype STD_LOGIC) defined by IEEE Std 1164-1993. (C/DA) 1076.6-1999

**metal-oxide semiconductor (MOS)** A semiconductor technology using field-effect transistors in which the metal gate electrode is isolated from the channel by an oxide film. *Contrast:* bipolar. *See also:* complementary metal-oxide semiconductor
(C) 610.10-1994w

**metal-oxide-semiconductor transistor** A type of IGFET, referring specifically to the layer sequence in the gate region of the IGFET. (ED) 581-1978w, 641-1987w

**metal-oxide surge arrester (MOSA)** A surge arrester utilizing valve elements fabricated from nonlinear resistance metal-oxide materials. (SPD/PE) C62.11-1999

**metal-plastic laminate** A tape made of aluminum, copper, lead, or other metal substrate that is laminated on one or both sides with a tightly adhering plastic film. The film used may consist of either an adhesive polyolefin copolymer that self-bonds to the metal substrate during the laminating process or another polymeric compound that is adhered through the use of a supplemental adhesive. (PE/IC) 1142-1995

**metal-to-metal touch voltage (1)** The voltage between metallic objects or structures within the substation site that may be bridged by direct hand-to-hand or hand-to-feet contact. (SUB/PE) 1268-1997

**(2)** The difference in potential between metallic objects or structures within the substation site that may be bridged by direct hand-to-hand or hand-to-feet contact. *Note:* The metal-to-metal touch voltage between metallic objects or structures bonded to the ground grid is assumed to be negligible in conventional substations. However, the metal-to-metal touch voltage between metallic objects or structures bonded to the ground grid and metallic objects internal to the substation site, such as an isolated fence, but not bonded to the ground grid may be substantial. In the case of gas-insulated substations (GIS), the metal-to-metal touch voltage between metallic objects or structures bonded to the ground grid may be substantial because of internal faults or induced currents in the enclosures. In a conventional substation, the worst touch voltage is usually found to be the potential difference between a hand and the feet at a point of maximum reach distance. However, in the case of a metal-to-metal contact from hand-to-hand or from hand-to-feet, both situations should be investigated for the possible worst reach conditions. (PE/SUB) 80-2000

**metalworking machine tool** A power-driven machine not portable by hand, used to shape or form metal by cutting, impact, pressure, electrical techniques, or a combination of these processes. (NESC/NEC) [86]

**metamers (illuminating engineering)** Lights of the same color but of different spectral energy distribution. *Note:* The term "metamers" is also used to denote objects that, when illuminated by a given source and viewed by a given observer, produce metameric lights. (EEC/IE) [126]

**metamodel** A metamodel Vm for a subset of $IDEF_{object}$ is a view of the constructs in the subset that is expressed using those constructs such that there exists a valid instance of Vm that is a description of Vm itself. (C/SE) 1320.2-1998

**Meta-TEDS** The collection of those Transducer Electronic Data Sheet data fields that pertain to the whole or overall entity or those that are in common or shared with all member entities (channels) comprising the whole transducer product. (IM/ST) 1451.2-1997

**metatype** A collection of defined linguistic entities that share some common features. (C/TT) 1450-1999

**meter (1) (laser maser)** A unit of length in the international systems of units: currently defined as a fixed number of wavelengths, in vacuum, of the orange-red line of the spectrum of krypton 86. Typically, the meter is sub-divided into the following units: centimeter (cm) $10^{-2}$ m, millimeter (mm) $10^{-3}$ m, micrometer ($\mu$m) $10^{-6}$ m, nanometer (nm) $10^{-9}$ m. (LEO/QUL) 586-1980w, 268-1982s

**(2)** A device that measures and records the consumption or usage of the product/service. (AMR/SCC31) 1377-1997

**(3)** *See also:* watthour meter; electricity meter; demand meter. (ELM) C12.1-1981

**meter installation inspection (metering)** Examination of the meter, auxiliary devices, connections, and surrounding conditions, for the purpose of discovering mechanical defects or conditions that are likely to be detrimental to the accuracy of the installation. Such an examination may or may not include an approximate determination of the percentage registration of the meter. (ELM) C12.1-1982s

**meter laboratory** *See:* laboratory.

**meter relay** Sometimes used for instrument relay. *See also:* relay. (EEC/REE) [87]

**meter shop** *See:* shop—meter.

**meter socket** An enclosure that has matching jaws to accommodate the bayonet-type (blade) terminals of a detachable watthour meter and has a means of connections for the termination of the circuit conductors. It may be a single-position socket for one meter or a multiposition trough socket for two or more meters. (ELM) C12.7-1993

**meter support** That part of a ringless-type meter socket that positions and supports a detachable watthour meter. (ELM) C12.7-1993

**method (1)** A software procedure associated with a package. (C/BA) 1275-1994

**(2)** A procedure implementing one of the operations supported by an object class. (C) 1295-1993w

**(3)** A formal, well-documented approach for accomplishing a task, activity, or process step governed by decision rules to provide a description of the form or representation of the outputs. (C/SE) 1220-1994s

**(4)** A property of a class that defines a specific behavior. (SCC20) 1226-1998

**(5)** A statement of how property values are combined to yield a result. (C/SE) 1320.2-1998

**method of pulse measurement** A method of making a pulse measurement comprises: the complete specification of the functional characteristics of the devices, apparatus, instruments, and auxiliary equipment to be used; the essential adjustments required; the procedure to be used in making essential adjustments; the operations to be performed and their sequence; the corrections that will ordinarily need to be made; the procedures for making such corrections; the conditions under which all operations are to be carried out. *See also:* pulse measurement. (IM/WM&A) 181-1977w

**methodology (1)** A comprehensive, integrated series of techniques or methods creating a general systems theory of how a class of thought-intensive work ought to be performed. (C/SE) 730.1-1995

**(2)** A body of methods, rules, and postulates employed by a discipline. (C/SE) 1074-1995s

**methods or types of grounding** (neutral grounding in electrical utility systems) The equipment, procedure, or scheme used for attaining the particular means. (SPD/PE) C62.92-1987r

**method standard** A standard that describes the characteristics of the orderly process or procedure used in the engineering of a product or performing a service. (C) 610.12-1990

**metric (1)** A quantitative measure of the degree to which a system, component, or process possesses a given attribute. (C) 610.12-1990

**(2)** A value calculated from observed attribute values. (LM/C) 802.1F-1993r

**metric algorithm** The behaviour of a metric managed object that models a formalized process to calculate specified results. (LM/C) 802.1F-1993r

**metric attribute** An attribute of a metric managed object whose value is either used as a parameter of one or more metric algorithms or whose value represents the output of such an algorithm. (LM/C) 802.1F-1993r

**metric managed object** A managed object that contains at least one metric attribute whose value is calculated from values of attributes observed in managed objects. (LM/C) 802.1F-1993r

**metrics framework** A decision aid used for organizing, selecting, communicating, and evaluating the required quality attributes for a software system. A hierarchical breakdown of quality factors, quality subfactors, and metrics for a software system. (C/SE) 1061-1998

**metrics sample** A set of metric values that is drawn from the metrics database and used in metrics validation. (C/SE) 1061-1998

**metric validation** The act or process of ensuring that a metric reliably predicts or assesses a quality factor. (C/SE) 1061-1998

**metric value** A metric output or an element that is from the range of a metric. (C/SE) 1061-1998

**metrology (test, measurement, and diagnostic equipment)** The science of measurement for determination of conformance to technical requirements including the development of standards and systems for absolute and relative measurements. (MIL) [2]

**metropolitan area network (MAN) (1)** A network for connecting a group of individual stations and networks [for example, local area networks (LANS)] located in the same urban area. *Note:* A MAN generally operates at a higher speed than the networks interconnected, crosses network administrative boundaries, may be subject to some form of regulation, and supports several access methods. (LM/C) 8802-6-1994

**(2)** A computer network in which the geographic span is generally 5−50 km and operates at speeds greater than 1 Mb/s with physical layer data error ratio comparable to a LAN. *See also:* local area network; wide area network; long haul network. (C) 610.7-1995

**MEW** *See:* microwave early warning.

**mezzanine card** An electronic card assembly mounted parallel to, and with electrical and/or mechanical connections to, its host. (C/BA) 1301.4-1996

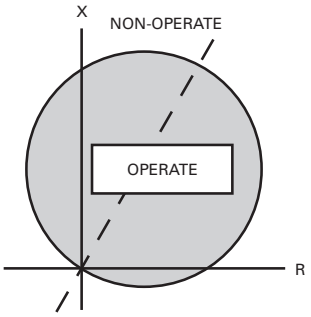
**mezzanine card boundary envelope** A three dimensional set of separation planes within which a mezzanine card and all its components reside. It will be treated as a single unit. (C/BA) 1301.4-1996

**MF** *See:* medium frequency.

**MFLOPS** Millions of floating point operations per second. A measure of computer processing speed. *See also:* MIPS; KOPS. (C) 610.12-1990

**mho (siemens)** The unit of conductance (and of admittance) in the International System of Units (SI). The mho is the conductance of a conductor such that a constant voltage of one volt between its ends produces a current of one ampere in it. (Std100) 270-1966w

**mho characteristic** An inherently directional distance relay characteristic in which the threshold of operation for the basic form plots as a circle on an *R-X* diagram, with the circle passing through the origin. See figure below. *Note:* For a self-polarized relay, the plot of the characteristic passes through the intersection of the *R-X* axes; for a cross-polarized relay it includes this intersection, but the relay retains its full directional characteristic.




**mho characteristic**

(SWG/PE) C37.100-1992

**mho relay** A distance relay for which the inherent operating characteristic on an *R-X* diagram is a circle that passes through the origin. *Note:* The operating characteristic may be described by the equation $Z = K\cos(\theta - \alpha)$ where $K$ and $\alpha$ are constants and $\theta$ is the phase angle by which the input voltage leads the input current. (SWG/PE) C37.100-1992

**mho unit** A distance relaying unit having a circular impedance tripping locus that passes through the origin on an R-X diagram. (PE/PSR) C37.113-1999

**MHz** *See:* megahertz.

**MIB** *See:* Management Information Base; medical information bus; management information base.

**MIC** *See:* medium interface connector.

**mica flake (rotating machinery)** Mica lamina in thickness not over approximately 0.0028 centimeter having a surface area parallel to the cleavage plane under 1.0 centimeter square. *See also:* stator; rotor. (PE) [9]

**mica folium (rotating machinery)** A relatively thin flexible bonded sheet material composed of overlapping mica splittings with or without backing or facing. *See also:* rotor; stator. (PE) [9]

**mica paper (rotating machinery)** (integrated mica) (reconstituted mica) Mica flakes having an area under approximately 0.200 centimeter square combined laminarly into a substantial sheet-like configuration with or without binder, backing, or facing. *See also:* stator; rotor. (PE) [9]

**mica sheet (rotating machinery)** A composite of overlapping mica splittings bonded into a planar structure with or without backing or facing. *See also:* rotor; stator. (PE) [9]

**mica splitting (rotating machinery)** Mica lamina in thickness approximately 0.0015 centimeter to 0.0028 centimeter having a surface area parallel to the basal cleavage plane of at least 1.0 centimeter square. *See also:* rotor; stator. (PE) [9]

**mica tape (rotating machinery)** A composite tape composed of overlapping mica splittings bonded together with or without backing or facing. *See also:* stator; rotor. (PE) [9]

**Michigan Algorithmic Decoder (MAD)** A programming language used widely for doing numerical computations. *Note:* MAD was designed to permit the development of a very fast compiler. *See also:* NOMAD. (C) 610.13-1993w

**MICR** *See:* magnetic ink character reader; magnetic ink character recognition.

**micro (μ) (mathematics of computing)** A prefix indicating one millionth ($10^{-6}$). (C) 1084-1986w

**microarchitecture (1)** The microword definition, data flow, timing constraints, and precedence constraints that characterize a given microprogrammed computer. (C) 610.12-1990

**(2)** The architecture of a microprogrammed computer. (C) 610.10-1994w

**microbar** A unit of pressure formerly in common usage in acoustics. One microbar is equal to one dyne per square centimeter and equals 0.1 newton per square meter. The newton per square meter is now the preferred unit. *Note:* The term bar properly denotes a pressure of $10^6$ dynes per square centimeter. Unfortunately, the bar was once used in acoustics to mean one dyne per square centimeter, but this is no longer correct. (SP) [32]

**microbend loss (fiber optics)** In an optical waveguide, that loss attributable to microbending. (Std100) 812-1984w

**microbending (fiber optics)** In an optical waveguide, sharp curvatures involving local axial displacements of a few micrometers and spatial wavelengths of a few millimeters. Such bends may result from waveguide coating, cabling, packaging, installation, etc. *Note:* Microbending can cause significant radiative losses and mode coupling. *See also:* macrobending. (Std100) 812-1984w

**microchannel plate (electron image tube)** An array of small aligned channel multipliers usually used for intensification. *See also:* camera tube; amplifier. (ED) [45]

**microcircuit** *See:* integrated circuit.

**microcode (1) (software)** A collection of microinstructions, comprising part of, all of, or a set of microprograms. (C) 610.12-1990

**(2)** A collection of microinstructions comprising part of, or all of a microprogram. (C) 610.10-1994w

**microcode assembler** A computer program that translates microprograms from symbolic form to binary form. (C) 610.12-1990

**microcomputer (micro)** A computer that contains at least one microprocessor as its main computing element. *Note:* The distinction between a microcomputer, minicomputer, and mainframe is not yet standardized, however, in 1991 a typical mainframe is IBM's 3090, a typical minicomputer is Digital's VAX, and a typical microcomputer is IBM's PS/2. (C) 610.10-1994w

**microcopy** A copy of an image or document so reduced in size from its original that it cannot be read by the unaided human eye. For example, microform, microfiche, microfilm, microimage. (C) 610.2-1987

**microcycle** *See:* machine cycle.

**microelectronic device (electric and electronics parts and equipment)** An item of inseparable parts and hybrid circuits, usually produced by integrated circuit techniques. Typical examples are microcircuit, integrated circuit package, micromodule. (GSD) 200-1975w

**microfacsimile** Transmission and reception of microimages via facsimile communication. (C) 610.2-1987

**microfiche** A sheet of microfilm capable of containing microimages in a grid pattern. The sheet usually contains a title that can be read without magnification. *Synonym:* fiche. (C) 610.2-1987

**microfilm (A)** A high resolution film for recording microimages. **(B)** To record microimages on film. *See also:* computer output microfilm. (C) 610.2-1987, 610.10-1994

**microfilmer** *See:* computer output microfilmer.

**microfloppy disk** A floppy disk that is 3.5 inches wide. *Contrast:* minifloppy disk. (C) 610.10-1994w

**microfont*** *See:* optical character recognition-B.
* Deprecated.

**microform** A medium that contains micro-images. For example, microfiche, microfilm. (C) 610.2-1987

**micrographics** That branch of science and technology concerned with methods and techniques for converting information to or from microform. *Synonym:* microphotographics. *See also:* office automation. (C) 610.2-1987

**microimage** An image that is too small to be read by the human eye without magnification. (C/C) 610.2-1987, 610.10-1994w

**microinstruction** In microprogramming, an instruction that specifies one or more of the basic operations needed to carry out a machine language instruction. Types include diagonal microinstruction, horizontal microinstruction, and vertical microinstruction. *See also:* nanoinstruction; microcode; microprogram. (C) 610.10-1994w, 610.12-1990

**micrometer (laser maser)** A unit of length equal to $10^{-6}$ m. In common practice a micrometer is a micron. (LEO) 586-1980w

**micron (metric system)** The millionth part of a meter. *Note:* According to the set of submultiple prefixes now established in the International System of Units, the preferred term would be micrometer. However, use of the same word to denote a small length, and also to denote an instrument for measuring a small length, could occasionally invite confusion. Therefore it seems unwise to deprecate, at this time, the continued use of the word micron. (Std100) [123]

**microoperation** In microprogramming, one of the basic operations needed to carry out a machine language instruction. *See also:* microinstruction. (C) 610.12-1990

**microphone** An electroacoustic transducer that responds to sound waves and delivers essentially equivalent electric waves. (T&D/PE/SP) 539-1990, [32]

**microphonics (1) (general)** The noise caused by mechanical shock or vibration of elements in a system. (SP) 151-1965w

**(2) (interference terminology)** Electrical interference caused by mechanical vibration of elements in a signal transmission system. *See also:* signal. (IE) [43]

**(3) (electron tube) (microphonic effect) (microphonism)** The undesired modulation of one or more of the electrode currents resulting from the mechanical vibration of one or more of the valve or tube elements. *See also:* electron tube. (ED) 161-1971w

**microphonics, microphonic noise** Electrical noise caused by mechanical or audio induced vibration of the detector assembly. (NPS) 325-1996

**microphonism** *See:* microphonics.

**microphotographics** *See:* micrographics.

**microprint** A positive microcopy photographically printed onto paper. (C) 610.2-1987

**microprocessor** An integrated circuit that contains the logic elements for manipulating data and for making decisions. *See also:* microcomputer; processor. (C) 610.10-1994w

**microprogram (software)** A sequence of instructions, called microinstructions, specifying the basic operations needed to carry out a machine language instruction. *See also:* control store; microcode. (C) 610.12-1990, 610.10-1994w

**microprogrammable computer** A microprogrammed computer in which microprograms can be created or altered by the user. *Contrast:* fixed-instruction computer. (C) 610.12-1990, 610.10-1994w

**microprogrammed computer** A computer in which machine language instructions are implemented by microprograms rather than by hard-wired logic. *Note:* A microprogrammed computer may or may not be a microcomputer; the concepts are not related despite the similarity of the terms. *See also:* microarchitecture; microprogrammable computer. (C) 610.12-1990, 610.10-1994w

**microprogramming (1)** The process of designing and implementing the control logic of a computer by identifying the basic operations needed to carry out each machine language instruction and representing these operations as sequences of instructions in a special memory called control store. This method is an alternative to hard wiring the control signals necessary to carry out each machine language instruction. Techniques include bit steering, compaction, residual control, single-level encoding, two-level encoding. *See also:* microinstruction; microcode; microprogram. (C) 610.12-1990

**(2)** The process of designing and implementing the control logic of a computer by identifying the basic operations needed to carry out each machine language instruction and then representing these operations in appropriate sequence in a special memory, called a control store. (C) 610.10-1994w

**micropublishing** The production and distribution of information via microform. The information may be original or may have been previously published in another form. (C) 610.2-1987

**micropulsation** Small magnitude fluctuations (usually much less than $10^{-6}$ of the Earth's magnetic field) with periods on the order of seconds or minutes ($f < 1$ Hz). *Note:* Micropulsations usually result from current fluctuations in the E region. (AP/PROP) 211-1997

**microradiometer (radio-micrometer)** A thermosensitive detector of radiant power in which a thermopile is supported on and connected directly to the moving coil of a galvanometer. *Note:* This construction minimizes lead losses and stray electric pickup. *See also:* electric thermometer. (EEC/PE) [119]

**micrositing** Of, or related to, the characteristics of a particular wind-turbine site, as contrasted to those characteristics that prevail over the entire windfarm. (DESG) 1094-1991w

**microspark (overhead-power-line corona and radio noise)** A spark breakdown occurring in the miniature air gap formed by two conducting or insulating surfaces. (This is sometimes called a "gap discharge.") (T&D/PE) 539-1990

**microstrip (1)** A class of planar transmission lines consisting of one or more thin conducting strips of finite width parallel to a single extended conducting ground plane. In its common form, the strips are affixed to an insulating substrate attached

to the ground plane. The semi-infinite space above the strips is filled with a medium of relative permittivity and permeability equal or less than the substrate. (MTT) 1004-1987w

**(2)** *See also:* strip-type transmission line.

**microstrip antenna** An antenna that consists of a thin metallic conductor bonded to a thin grounded dielectric substrate. *Note:* The metallic conductor typically has some regular shape; for example, rectangular, circular, or elliptical. Feeding is often by means of a coaxial probe or a microstrip transmission line. (AP/ANT) 145-1993

**microstrip array** An array of microstrip antennas. (AP/ANT) 145-1993

**microstrip dipole** A microstrip antenna of rectangular shape with its width much smaller than its length. (AP/ANT) 145-1993

**microsyn (accelerometer) (gyros)** An electromagnetic device often used as a pickoff in single-degree-of-freedom gyros and accelerometers. It has a stator, fastened to the sensor case, containing primary and secondary sets of windings, and a rotor, without windings, that is attached to the float. (AES/GYAC) 528-1994

**microwave** Pertaining to the portion of the radio frequency spectrum above 1 GHz. *See also:* microwave link. (C) 610.7-1995

**microwave amplification by stimulated emission of radiation** *See:* maser.

**microwave backward-wave oscillator** *See:* carcinotron.

**microwave early warning (MEW)** A U.S. high-power, long-distance radar of the WWII era with a number of separate displays giving high resolution and large traffic handling capacity in detecting and tracking targets. (AES/RS) 686-1990

**microwave landing system (MLS) (radar)** An airfield approach radar generating a guideline for target landing. (AES/RS) 686-1982s

**microwave link** A communications system in which information is conveyed by microwave transmissions. (C) 610.7-1995

**microwave-pilot protection** A form of pilot protection in which the communication means between relays is a beamed microwave radio channel. (SWG/PE) C37.100-1992

**microwave plumbing** *See:* plumbing.

**microwaves (data transmission)** A term used rather loosely to signify radio waves in the frequency range from about 1000 megahertz (mHz) upwards. (PE) 599-1985w

**microwave therapy** The therapeutic use of electromagnetic energy to generate heat within the body, the frequency being greater than 100 megahertz. *See also:* electrotherapy. (EMB) [47]

**microword** An addressable element in the control store of a microprogrammed computer. (C) 610.12-1990, 610.10-1994w

**midband** The part of the electromagnetic frequency spectrum that is located between television Channels 6 and 7. (LM/C) 802.7-1989r

**middle marker** A marker facility in an ILS (instrument landing system) that is installed approximately 1000 m (3500 ft) from the approach end of the runway on the localizer course line to provide a fix. (AES/RS) 686-1982s

**middle-square function** *See:* mid-square function.

**MID page** A set of one message identifier value. (LM/C) 8802-6-1994

**mid-peak period (watthour meters)** The period of time during which the specified mid-peak rate applies. (ELM) C12.13-1985s

**midrange computer** *See:* minicomputer.

**mid-split** A frequency division scheme that allows two-way traffic on a single cable. Inbound path signals come to the headend from 5 to 108 MHz. Outbound path signals go from the headend from 162 MHz to the upper frequency limit. The guardband is located from 108 to 162 MHz. (LM/C) 802.7-1989r

**mid-square function** In hashing, a hash function that returns the middle digits of the square of the original key. For example, in the function below, the middle three digits are returned.

| Original key | Calculation | Hash Value |
|---|---|---|
| 2964 | $2964 \times 2964 = 8{,}785{,}296$ | 852 |
| 1119 | $1119 \times 1119 = 110{,}781$ | 78 |

*Synonym:* middle-square function. (C) 610.5-1990w

**Mie scattering** Scattering by spherical particles whose diameters are comparable to or greater than a wavelength. *Synonym:* Lorenz-Mie scattering. (AP/PROP) 211-1997

**migrated attribute** A foreign key attribute of a child entity. (C/SE) 1320.2-1998

**migrated key** *See:* foreign key.

**MII** *See:* Media Independent Interface; medium independent interface.

**MIIT** *See:* media-independent information transfer.

**mild environment (nuclear power generating station)** An environment expected as a result of normal service conditions and extremes (abnormal) in service conditions where seismic is the only design basis event (DBE) of consequence. (PE/NP) 323-1974s

**mile of standard cable (MSC)** Two units, both loosely designated as a mile of standard cable, were formerly used as measures of transmission efficiency. One, correctly known as an 800-hertz mile of standard cable, signified an attenuation constant, independent of frequency, of 0.109. The other signified the effect upon speech volume of an actual mile of standard cable, equivalent to an attenuation constant of approximately 0.122. Both units are now obsolete, having been replaced by the decibel. One 800-hertz mile of standard cable is equal to approximately 0.95 decibel. One standard cable mile is equivalent in effect on speech volume to approximately 1.06 decibels. (EEC/PE) [119]

**milestone (1) (software)** A scheduled event for which some project member or manager is held accountable and which is used to measure progress, for example, a formal review, issuance of a specification, product delivery. (C/SE) 729-1983s

**(2)** A scheduled event used to measure progress. Examples of major milestones for software projects may include an acquirer or managerial sign-off, baselining of a specification, completion of system integration, and product delivery. Minor milestones might include baselining of a software module or completion of a chapter of the user's manual. (C/SE) 1058-1998

**milli (m) (mathematics of computing)** A prefix indicating one thousandth ($10^{-3}$). (C) 1084-1986w

**millimeter-wave radar** A radar whose carrier frequency is from 30–300 GHz (wavelength is 1–10 mm). (AES) 686-1997

**milliroentgen (mR)** The amount of X-radiation that produces $2.58 \cdot 10^{-7}$ coulomb per kilogram of air. (SWG/PE) C37.100-1992, 553-1983

**mill scale** The heavy oxide layer formed during hot fabrication or heat treatment of metals. Especially applied to iron and steel. (IA) [59]

**Mills cross antenna system** A multiplicative array antenna system consisting of two linear receiving arrays positioned at right angles to one another and connected together by a phase modulator or switch such that the effective angular response of the output is related to the product of the radiation patterns of the two arrays. (AP/ANT) 145-1993

**MIMD** *See:* multiple instruction, multiple data.

**MIMIC** A problem-oriented programming language for solving engineering problems, particularly those involving differential equations. (C) 610.13-1993w

**mimic bus** A single-line diagram of the main connections of a system constructed on the face of a switchgear or control panel, or assembly. (SWG/PE) C37.100-1992

**MI mineral-insulated, metal sheathed cable** A factory assembly of one or more conductors insulated with a highly compressed refractory mineral insulation and enclosed in a liquidtight and gastight continuous copper sheath. (NESC/NEC) [86]

**mine-fan signal system** A system that indicates by electric light or electric audible signal, or both, the slowing down or stopping of a mine ventilating fan. *See also:* dispatching system. (EEC/PE) [119]

**mine feeder circuit** A conductor or group of conductors, including feeder and sectionalizing switches or circuit breakers, installed in mine entries or gangways and extending to the limits set for permanent mine wiring beyond which limits portable cables are used. (EEC/PE) [119]

**mine hoist** A device for raising or lowering ore, rock, or coal from a mine and for lowering and raising men and supplies.

**mine jeep** A special electrically driven car for underground transportation of officials, inspectors, repair, maintenance, surveying crews, and rescue workers. (EEC/PE) [119]

**mine radio telephone system** A means to provide communication between the dispatcher and the operators on the locomotives where the radio impulses pass along the trolley wire and down the trolley pole to the radio telephone set. *See also:* dispatching system. (EEC/PE) [119]

**miner's electric cap lamp** A lamp for mounting on the miner's cap and receiving electric energy through a cord that connects the lamp with a small battery. (EEC/PE) [119]

**miner's hand lamp** A self-contained mine lamp with handle for convenience in carrying. (EEC/PE) [119]

**mine tractor** A trackless, self-propelled vehicle used to transport equipment and supplies and for general service work. (EEC/PE) [119]

**mine ventilating fan** A motor-driven disk, propeller, or wheel for blowing (or exhausting) air to provide ventilation of a mine. (EEC/PE) [119]

**mini** *See:* minicomputer.

**miniature brush** A brush having a cross-sectional area of less than 1/64 square inch with the thickness and width thereof less than 1/8 inch or, in the case of a cylindrical brush, a diameter less than 1/8 inch. *See also:* brush. (EEC/EM/LB) [101]

**minicartridge** *See:* quarter-inch cartridge.

**minicomputer (mini)** A computer of smaller size relative to a mainframe, but generally larger and more powerful than a microcomputer. *Note:* The distinction between a microcomputer, minicomputer, and mainframe is not yet standardized, however, in 1991 a typical mainframe is IBM's 3090, a typical minicomputer is Digital's VAX, and a typical microcomputer is IBM's PS/2. (C) 610.10-1994w

**minifloppy disk** A floppy disk that is 5.25 inches wide. *Contrast:* microfloppy disk. (C) 610.10-1994w

**minimally conformant network** An IEEE 802.11 network in which two stations in a single basic service area (BSA) are conformant with ISO/IEC 8802-11: 1999. (C/LM) 8802-11-1999

**minimally consistent object** An object that satisfies various conditions set forth in the definition of its class. (C/PA) 1328-1993w, 1224-1993w, 1327-1993w

**minimal perceptible erythema** The erythemal threshold. *See also:* ultraviolet radiation. (EEC/IE) [126]

**minimal ROM format** A format for the node-provided ROM. The minimal ROM format provides a 24-bit company_id value; although additional ROM parameters can be provided, their format and meaning are vendor-dependent. (C/MM) 1212-1991s

**minimum access code (test, measurement, and diagnostic equipment)** A system of coding which minimizes the effect of delays for transfer of data or instructions between storage and other machine units. (MIL) [2]

**minimum air insulation distance (MAID)** The shortest distance in air between electrical apparatus and/or a line worker's body at different potential. This minimum air insulation distance, with a floating electrode in the gap, is equal to or greater than the sum of the individual minimum approach distances. This is the electrical component and does not include any factor for inadvertent movement. (T&D/PE) 516-1995

**minimum approach distance (MAD) (1)** The minimum air insulation distance plus a modifier for inadvertent movement. (T&D/PE) 516-1995

**(2)** The closest distance a qualified employee is permitted to approach either an energized or a grounded object, as applicable for the work method being used. (NESC) C2-1997

**minimum bend radius** The curvature to which a cable can be bent without sustaining damage or significant degradation of performance. (C) 610.7-1995

**minimum clearance between poles (phases)** The shortest distance between any live parts of adjacent poles (phases). *Note:* Cautionary differentiation should be made between clearance and spacing or center-to-center distance. (SWG/PE) C37.40-1993, C37.100-1992

**minimum clearance to ground** The shortest distance between any live part and adjacent grounded parts. (SWG/PE) C37.40-1993, C37.100-1992

**minimum conductance function** *See:* minimum-resistance (conductance) function.

**minimum cut-set** A set of components that, if removed from the system, results in loss of continuity to the load point being investigated and that does not contain as a subset any set of components that is itself a cut-set of the system. (IA/PSE) 493-1997

**minimum delay programming** A programming technique in which storage locations for computer instructions and data are chosen so that access time is minimized. (C) 610.12-1990

**minimum delta (power supplies)** A qualifier, often appended to a percentage specification to describe that specification when the parameter in question is a variable, and particularly when that variable may approach zero. The qualifier is often known as the minimum delta *V*, or minimum delta *I*, as the case may be. (AES) [41]

**minimum demand** The lowest demand measured over a selected period of time, such as one month. (AMR/SCC31) 1377-1997

**minimum detectable activity** That activity giving an indication corresponding to 4.65 times the standard deviation of the indication given by a specific background, divided by the appropriate conversion actor to result in units of activity. (NI) N42.17B-1989r

**minimum detectable amount** The amount of a radionuclide, which if present in a sample, would be detected with a $\beta$ probability of non-detection while accepting a probability $\alpha$ of erroneously detecting that radionuclide in an appropriate blank sample. For IEEE Std N42.23-1995, the $\alpha$ and $\beta$ probabilities are both set at 0.05. (NI) N42.23-1995

**minimum detectable concentration** The minimum detectable amount expressed in concentration units. (NI) N42.23-1995

**minimum detectable signal (MDS)** The minimum signal level that gives reliable detection in the presence of white Gaussian noise. *Note:* MDS must be described in terms of a probability of detection and a probability of false alarm, due to its statistical nature. (AES) 686-1997

**minimum detectable velocity (MDV)** In a Doppler processing radar for detection of moving targets, the minimum target velocity that can be detected. (AES) 686-1997

**minimum differential sensitivity** The smallest value of peak-to-peak differential (ppd) amplitude at which a receiver is expected to operate, under worst-case conditions, without exceeding the objective bit error ratio. (C/LM) 802.3-1998

**minimum discernible signal** The minimum detectable signal for a system using an operator and display or aural device for detection. (AES) 686-1997

**minimum-distance code (1) (computers)** A binary code in which the signal distance does not fall below a specified minimum value. (C) [20], [85]

**(2) (mathematics of computing)** A BCD code in which the Hamming distance between consecutive numerals does not fall below a specified minimum value. (C) 1084-1986w

**minimum-driving-point function (linear passive networks)** A driving-point function that is a minimum-resistance, minimum-conductance, minimum-reactance, and minimum-susceptance function. (CAS) 156-1960w

**minimum en-route altitude (electronic navigation)** The lowest altitude between radio fixes that assures acceptable navigational signal coverage and meets obstruction clearance requirements for instrument flight. *See also:* navigation. (AES/RS) 686-1982s, [42]

**minimum firing power (microwave switching tubes)** The minimum radio-frequency power required to initiate a radio-frequency discharge in the tube at a specified ignitor current. *See also:* gas tube. (ED) 161-1971w

**minimum flashover voltage (impulse)** The crest value of the lowest voltage impulse, of a given wave shape and polarity that causes flashover. (PE) [8]

**minimum fuel limiter (gas turbines)** A device by means of which the speed-governing system can be prevented from reducing the fuel flow below the minimum for which the device is set as required to prevent unstable combustion or blowout of the flame. (PE/EDPG) [5]

**minimum gas density** The minimum operating gas density at which the gas-insulated substation and its components are certified to meet their assigned electrical ratings. (SWG/PE/SUB) C37.100-1992, C37.122.1-1993, C37.122-1993

**minimum illumination (sensitivity)** The minimum level, in footcandles of a photoelectric lighting control, at which it will operate. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

**minimum impulse flashover voltage (neutral grounding devices)** The crest value of the lowest voltage impulse at a given wave shape and polarity that causes flashover. (SPD/PE) 32-1972r

**minimum input shaft torque (electric coupling)** The minimum input torque required to drive an electric coupling with zero output torque load, either with or without rated excitation as specified. (EM/PE) 290-1980w

**minimum melting current** The smallest current at which a current responsive fuse element will melt at any specified time. (SWG/PE) C37.40-1993, C37.100-1992

**minimum ON-state voltage (thyristor)** The minimum positive principal voltage for which the differential resistance is zero with the gate open-circuited. *See also:* principal voltage-current characteristic. (ED) [46]

**minimum ON voltage (magnetic amplifier)** The minimum output voltage existing before the trip OFF control signal is reached as the control signal is varied from trip ON to trip OFF. (MAG) 107-1964w

**minimum output voltage (magnetic amplifier)** The minimum voltage attained across the rated load impedance as the control ampere-turns are varied between the limits established by positive maximum control currents flowing through all the corresponding control windings simultaneously and negative maximum control currents flowing through all the corresponding control windings simultaneously. (MAG) 107-1964w

**minimum perceptible erythema (illuminating engineering)** The erythemal threshold. (EEC/IE) [126]

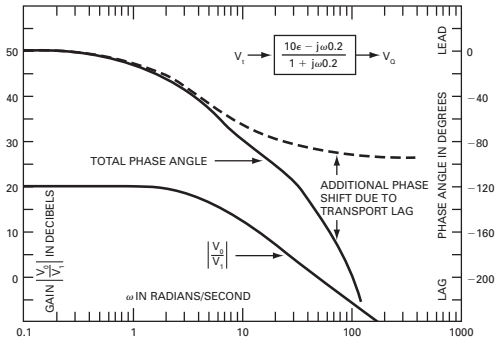
**minimum-phase function (linear passive networks)** A transmittance from which a nontrivial realizable allpass function cannot be factored without leaving a nonrealizable remainder. *Note:* For lumped-parameter networks, this is equivalent to specifying that the function has no zeros in the interior of the right half of the complex-frequency plane. (CAS) 156-1960w

**minimum phase network (1) (data transmission)** A network for which the phase shift at each frequency equals the minimum value which is determined uniquely by the attenuation-frequency characteristic in accordance with the following equation:

$$B_c = \frac{1}{\pi}\int_{-\infty}^{+\infty} \frac{dA}{du} \log \coth \frac{|u|}{2}\, du$$

where $B_c$ is phase shift (radians) at a particular frequency $f_c$, A is attenuation (nepers) as a function of frequency $f$, and $u$ is $\log(f/f_c)$. *Note:* A ladder network employing lumped impedances, with no coupling between the branches, is an example of a minimum phase network. A bridged T or lattice network of the all-pass type is a nonminimum phase network. (PE) 599-1985w

**(2) (excitation systems)** See definition above. *Notes:* 1. A network for which the transfer function expressed as a function of s has neither poles nor zeros in the right-hand s plane. Networks (elements) or systems having either poles or zeros in the right half s-plane do not have minimum phase characteristics, assuming there is no right-hand S-plane pole-zero cancellation. 2. Elements whose response is described by transfer functions having transport lags also exhibit non-minimum phase characteristics. The frequency response characteristics of a typical element with transport lag is given in the corresponding figure.




Element with one time constant and a transport lag.

**minimum phase network**

(PE/EDPG) 421A-1978s

**(3) (two specified terminals or two branches)** A network for which the transfer admittance expressed as a function of p has neither poles nor zeros in the right-hand p plane. *Note:* A simple T section of real lumped constant parameters without coupling between branches is a minimum-phase network, whereas a bridged-T or lattice section of all-pass type may not be. *See also:* network analysis; impedance function. (Std100) 270-1966w

**minimum pulse down time** In order for all devices to detect the zero state of a signal between the occurrence of two successive one states of the signal, the zero state must last for at least a bus dependent minimum pulse down time. (NID) 960-1993

**minimum-reactance function (linear passive networks)** A driving-point impedance from which a reactance function cannot be subtracted without leaving a nonrealizable remainder. *Notes:* 1. For lumped-parameter networks, this is equivalent to specifying that the impedance function has no poles on the imaginary axis of the complex-frequency plane, including the point at infinity. 2. A driving-point impedance (admittance) having neither poles nor zeros on the imaginary axis is both a minimum-reactance and a minimum-susceptance function. (CAS) 156-1960w

**minimum reception altitude (MRA) (electronic navigation)** The lowest en-route altitude at which adequate signals can be received to determine specific radio-navigation fixes. *See also:* navigation. (AES/RS) 686-1982s, [42]

**minimum-resistance (conductance) function (linear passive networks)** A driving-point impedance (admittance) from which a positive constant cannot be subtracted without leaving a nonrealizable remainder. (CAS) 156-1960w

**minimum single-conductor gradient (overhead-power-line corona and radio noise)** The minimum value attained by the gradient $E(\theta)$ as given in the definition of "maximum single-conductor (or subconductor) gradient" as $\theta$ varies over the range 0 to $2\pi$. *See also:* maximum single-conductor gradient; maximum single-subconductor gradient; minimum single-subconductor gradient. (T&D/PE) 539-1990

**minimum single-subconductor gradient (overhead-power-line corona and radio noise)** The minimum value attained by the gradient $E(\theta)$ as given in the definition of "maximum single-subconductor gradient" as $\theta$ varies over the range 0 to $2\pi$. *See also:* minimum single-conductor gradient; maximum single-conductor gradient; maximum single-subconductor gradient. (T&D/PE) 539-1990

**minimum speed (adjustable-speed drive)** The lowest speed within the operating speed range of the drive. *See also:* electric drive. (IA/ICTL/IAC) [60]

**minimum-susceptance function (linear passive networks)** A driving-point admittance from which a susceptance function cannot be subtracted without leaving a nonrealizable remainder. *Notes:* 1. For lumped-parameter networks, this is equivalent to specifying that the admittance function has no poles on the imaginary axis of the complex-frequency plane, including the point at infinity. 2. A driving-point immitance having neither poles nor zeros on the imaginary axis is both a minimum-susceptance and a minimum-reactance function. (CAS) 156-1960w

**minimum tasks** Those V&V tasks required for the software integrity level assigned to the software to be verified and validated. (C/SE) 1012-1998

**minimum test output voltage (magnetic amplifier) (nonreversible output)** The output voltage equivalent to the summation of the minimum output voltage plus 33 1/3 percent of the difference between the rated and minimum output voltages. (MAG) 107-1964w

**minimum tool distance** The minimum distance that must be maintained between tools and energized lines or devices. (T&D/PE) 516-1995

**minimum tool-insulation distance** The shortest permissible distance between energized electrical apparatus and any part of a worker's body or conducting object while performing live work with an insulating tool in the air gap. (T&D/PE) 516-1995

**minimum usable reading speed (storage tubes)** The slowest scanning rate under stated operating conditions before a specified degree of decay occurs. *Note:* The qualifying adjectives minimum usable are frequently omitted in general usage when it is clear that the minimum usable reading speed is implied. *See also:* storage tube. (ED) 158-1962w

**minimum usable writing time (storage tubes)** The time required to write stored information from one specified level to another under stated conditions of operation. *Note:* The qualifying adjectives minimum usable are frequently omitted in general usage when it is clear that the minimum usable writing time is implied. *See also:* storage tube. (ED) 158-1962w, [45]

**minitrack (communication satellite)** A ground based tracking system for satellites using interferometers. It requires a minimum satellite instrumentation, hence the name. (COM) [24]

**minor alarm (telephone switching systems)** An alarm indicating trouble which does not seriously impair the system capability. (COM) 312-1977w

**minor cycle (electronic computation)** In a storage device that provides serial access to storage positions, the time interval between the appearance of corresponding parts of successive words. (C) 162-1963w, 270-1966w

**minor failure** *See:* failure.

**minority carrier (semiconductor)** The type of charge carrier constituting less than one half the total charge-carrier concentration. *See also:* semiconductor. (ED) 216-1960w

**minority emitter (transistor)** An electrode from which a flow of minority carriers enters the interelectrode region. *See also:* transistor; semiconductor. (PE/EEC) [119]

**minor key** *See:* secondary key.

**minor lobe** Any radiation lobe except a major lobe. *See also:* side lobe; back lobe. (AP/T&D/PE/ANT) 145-1993, 1260-1996

**minor loop** A continuous network consisting of both forward elements and feedback elements and is only a portion of the feedback control system. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**minor railway tracks** Railway tracks included in the following list:

a) Spurs less than 2000 feet long and not exceeding two tracks in the same span.
b) Branches on which no regular service is maintained or which are not operated during the winter season.
c) Narrow-gauge tracks or other tracks on which standard rolling stock cannot, for physical reasons, be operated.
d) Tracks used only temporarily for a period not exceeding one year.
e) Tracks not operated as a common carrier, such as industrial railways used in logging, mining, etc.

(T&D) C2.2-1960

**minuend** A number from which another number (the subtrahend) is subtracted to produce a result (the difference). (C) 1084-1986w

**minus** *See:* difference.

**minus input** *See:* inverted input.

**MIPS** A measure of computer processing speed. *See also:* KOPS; MFLOPS. (C) 610.12-1990

**mirrored disk array** A form of RAID storage, known as level 1, in which each block of data is duplicated on a mirror drive. (C) 610.10-1994w

**mirroring** The rotation of one or more display elements one hundred and eighty degrees about an axis in the plane of the display surface. (C) 610.6-1991w

**MIS** *See:* medical information system; management information system.

**misaligned frame** A frame that erroneously includes a fragmentary byte and that contains a frame check sequence error. *Note:* This term is contextually specific to IEEE Std 802.3. (C) 610.7-1995

**misalignment** *See:* input-axis misalignment.

**misalignment drift (gyros)** The part of the total apparent drift component due to uncertainty of orientation of the gyro input axis with respect to the coordinate system in which the gyro is being used. *See also:* navigation. (AES/RS) 686-1982s, [42]

**misalignment loss** *See:* angular misalignment loss; gap loss; lateral offset loss.

**miscellaneous function (numerically controlled machines)** An on-off function of a machine such as spindle stop, coolant on, clamp. (IA/EEC) [61], [74]

**miscellaneous time** The part of up time that is not rerun time, system production time, or system test time, but is time typically used for demonstrations or operator training. *Synonym:* incidental time. (C) 610.10-1994w

**MISD** *See:* multiple instruction, single data.

**misdetection (image processing and pattern recognition)** In pattern recognition, the failure to detect the existence of a pattern. (C) 610.4-1990w

**misfire (1) (gas tube)** A failure to establish an arc between the main anode and cathode during a scheduled conducting period. *See also:* rectification; gas tube. (ED) [45]

**(2)** The failure of a blasting charge to explode when expected. *Note:* In electric firing, this usually is the result of a broken blasting circuit or insufficient current through the electric blasting cap. *See also:* blasting unit. (EEC/PE/MIN) [119]

**mishap** An unplanned event or series of events resulting in death, injury, occupational illness, or damage to or loss of equipment or property, or damage to the environment; an accident. (VT/RT) 1483-2000

**misidentification** In pattern classification, the failure to assign a pattern to its true pattern class. *Synonym:* type I error. *Contrast:* false identification. (C) 610.4-1990w

**mismatch** The condition in which the impedance of a load does not match the impedance of the source to which it is connected. *See also:* self-impedance. (AP/ANT) [35]

**mismatch factors (power meters)** Resulting from a combination of interaction factor and reflection factor resulting from reflective source and load impedances which relate incident, absorbed, and delivered power to a nonreflection load. (IM) 544-1975w

**mismatch loss** *See:* matching loss.

**mismatch uncertainty (power meters)** Uncertainty in an assigned value that is caused by uncorrected or uncertain values for one or both of the mismatch factors. (IM) 470-1972w, 544-1975w

**misordering data** A form of unauthorized data modification in which the reception sequence of data units is altered from the original transmission sequence in an unauthorized manner. This can be attempted by a combination of techniques involving deleting, delaying, and reinserting data; or modifying sequence control information; or both. (C/LM) 802.10-1998

**misrouted calls** A category of call setup irregularities caused by switching system errors. These errors result in a call attempt becoming ineffective after a subscriber has initiated the call correctly (i.e., has gone off-hook, received dial tone, and signaled correctly in the allotted time). This category includes, but is not limited to, calls to the wrong office or wrong number or calls receiving an incorrect tone or announcement or no tone or announcement. Not included in the misrouted calls category are misroutings caused by either erroneous inputs to the switching system, unavailability of service circuits, or failure to establish a network path. (COM/TA) 973-1990w

**missing (thyristor converter)** (misgating) A condition where the onset of conduction of an arm is substantially delayed from its correct instant of time. *Note:* If an arm fails to turn on during inverter service, there is a commutation failure resulting in a conduction-through. (IA/IPC) 444-1973w

**mission (1)** The operating objective for which the system was intended. *See also:* system. (SMC) [63]

**(2) (nuclear power generating station)** The singular objective, task, or purpose of an item or system. (PE/NP) 352-1975s, 933-1999

**mission time (nuclear power generating station)** The time during which the mission should be performed without interruption. (PE/NP) 933-1999, 352-1975s

**mist** *See:* fog.

**mistake (1) (electronic computation)** A human action that produces an unintended result. *Note:* Common mistakes include incorrect programming, coding, manual operation, etc. (C) 162-1963w, [20], [85]

**(2) (analog computer)** *See also:* error. (C) 165-1977w

**(3) (software)** A human action that produces an incorrect result. *Note:* The fault tolerance discipline distinguishes between the human action (a mistake), its manifestation (a hardware or software fault), the result of the fault (a failure), and the amount by which the result is incorrect (the error). (C) 610.12-1990

**mistrigger (thyristor) (misfire)** The failure of a thyristor to conduct at the correct instant of time. (IA/IPC) 428-1981w

**misuse** Use of processing or communication services for other than official or authorized purposes (e.g., personal gain, espionage). Misuse includes the threats of inadvertent or intentional execution of malicious functions (e.g., computer virus, Trojan horse), performance of undesirable functions (e.g., erasing the file system), and general perpetration of errors of commission, omission, and oversight. Misuse could result in unauthorized disclosure or modification of information, unauthorized receipt of services, or denial of service to legitimate users or critical functions. (C/BA) 896.3-1993w

**mixed-base notation** *See:* mixed-radix notation.

**mixed-base numeration system** *See:* mixed-radix notation.

**Mixed-Configuration Group** A Group to which the member Remote Bridges attach by a mixture of Individual Virtual Ports and Multipeer Virtual Ports. *Note:* It is possible for some members of a Mixed-Configuration Group to attach only by Individual Virtual Ports. (C/LM) 802.1G-1996

**mixed frequency fields** The superposition of two or more electromagnetic fields of differing frequency. (NIR) C95.1-1999

**mixed highs (color television)** Those high-frequency components of the picture signal that are intended to be reproduced achromatically in a color picture. (BT/AV) 201-1979w

**mixed logic (logic diagrams)** The defining of the 1-state of the variables as the more positive or less positive of the two possible levels, depending upon the absence or presence of the polarity indicator symbol. *Synonym:* direct polarity indication. (GSD) 91-1973s

**mixed-loop series street-lighting system** A street-lighting system that comprises both open loops and closed loops. *See also:* alternating-current distribution; direct-current distribution. (T&D/PE) [10]

**mixed mode** Pertaining to an expression that contains two or more different data types. For example, $Y := X + N$, where $X$ and $Y$ are floating point variables and $N$ is an integer variable. *Synonym:* mixed type. (C) 610.12-1990

**mixed-mode interference** Interference that consists of components from both common- and differential-mode interference. (EMC) C63.13-1991

**mixed-pressure turbine, condensing or noncondensing (control systems for steam turbine-generator units)** Steam enters the turbine at two or more pressures through separate inlet openings with means for controlling the inlet steam pressures or turbine power output. (PE/EDPG) 122-1985s

**mixed radix** Pertaining to a numeration system that uses more than one radix, such as the biquinary system. (C) [20], [85]

**mixed-radix notation** A radix notation system in which all digit positions do not have the same radix. For example, biquinary notation in which the digit positions have the radix 2 or 5, alternately. *Synonyms:* mixed-radix numeration system; mixed-base numeration system; mixed-base notation. *Contrast:* fixed-radix notation. (C) 1084-1986w

**mixed-radix numeration system** *See:* mixed-radix notation.

**mixed rain and snow** Precipitation consisting of a mixture of rain and wet snow. It usually occurs when the temperature of the air layer near the ground is slightly above freezing. (T&D/PE) 539-1990

**mixed-signal circuit** A circuit in which some variables are represented by analog (continuously variable) quantities, and some variables are represented by digital (discrete) quantities. (C/TT) 1149.4-1999

**mixed sweep (oscilloscopes)** In a system having both a delaying sweep and a delayed sweep, a means of displaying the delaying sweep to the point of delay pickoff and displaying the delayed sweep beyond that point. *See also:* oscillograph. (IM/HFIM) [40]

**mixed transaction** An address beat followed by any number or combination of data write and data read transfers to a single location using the single address transfer mode. This is terminated by the appropriate style of end beat. (C/MM) 896.1-1987s

**mixed type** *See:* mixed mode.

**mixer (A) (data transmission)** In a sound transmission, recording or reproducing system, a device having two or more inputs, usually adjustable, and a common output, which operates to combine linearly in a desired proportion the separate input signals to produce an output signal. **(B) (data transmission)** The stage in a heterodyne receiver in which the incoming signal is modulated with the signal from the local oscillator to produce the intermediate-frequency signal. **(C) (data transmission)** A process of intermingling of data traffic flowing between concentration and expansion stages. (PE) 599-1985

**mixer tube** An electron tube that performs only the frequency-conversion function of a heterodyne conversion transducer when it is supplied with voltage or power from an external oscillator. (ED) 161-1971w

**mixing ratio** (of water vapor) The ratio of the mass of water vapor to the mass of dry air in a given volume of air. This ratio is generally expressed in grams per kilogram. (AP/PROP) 211-1997

**mixing rules** Various theoretical and often empirical models to predict the effective medium constitutive parameters. (AP/PROP) 211-1997

**mixing segment** A medium that may be connected to more than two Medium Dependent Interfaces (MDIs). (C/LM) 802.3-1998

**MKSA system of units** A system in which the basic units are the meter, kilogram, and second, and the ampere is a derived unit defined by assigning the magnitude $4\pi \times 10^{-7}$ to the rationalized magnetic constant (sometimes called the permeability of space). *Notes:* 1. At its meeting in 1950 the International Electrotechnical Commission recommended that the MKSA system be used only in the rationalized form. 2. The electrical units of this system were formerly called the practical electrical units. 3. If the MKSA system is used in the unrationalized form the magnetic constant is $10^{-7}$ henry/meter and the electric constant is $10^7/c^2$ farads/meter. Here $c$, the speed of light, is approximately $3 \times 10^8$ meters/second. 4. In this system, dimensional analysis is customarily used with the four independent (basic) dimensions: mass, length, time, current. (Std100) 270-1966w

**MLHG** *See:* multiline hunt group.

**M-L ratio** *See:* metallic longitudinal induction ratio.

**MLS** *See:* microwave landing system.

**MMI** *See:* man-machine interface; user interface.

**MMU** *See:* memory management unit.

**mnemonic (1) (test, measurement, and diagnostic equipment)** Assisting or intending to assist a human memory and understanding. Thus a mnemonic term is usually an abbreviation, that is easy to remember; for example, mpy for multiply and acc for accumulator. (MIL) [2]
**(2)** An abbreviation or other shortened keyboard notation that is used to substitute for a more complicated action, such as selecting an object or performing an operation on it. (C) 1295-1993w

**mnemonic code (test, measurement, and diagnostic equipment)** A pseudo code in which information, usually instructions, is represented by symbols or characters which are readily identified with the information. (MIL) [2]

**mnemonic symbol (software)** A symbol chosen to assist the human memory, for example, an abbreviation such as "mpy" for "multiply." (C/SE) 729-1983s

**MNOS** Acronym for metal nitride oxide semiconductor. (ED) 641-1987w

**MNOS transistor** *See:* metal-nitride-oxide-semiconductor transistor.

**m:n relationship*** *See:* many-to-many relationship.
* Deprecated.

**mobile (x-ray)** Equipment mounted on a permanent base with wheels and/or casters for moving while completely assembled. (NEC/NESC) [86]

**mobile communication system** Combinations of interrelated devices capable of transmitting intelligence between two or more spatially separated radio stations, one or more of which shall be mobile. (VT) [37]

**mobile home** A factory-assembled structure or structures equipped with the necessary service connections and made so as to be readily movable as a unit or unit(s) without a permanent foundation. The phrase "without a permanent foundation" indicates that the support system is constructed with the intent that the mobile home placed thereon will be moved from time to time at the convenience of the owner. (NESC/NEC) [86]

**mobile home accessory building or structure** Any awning, cabana, ramada, storage cabinet, carport, fence, windbreak or porch established for the use of the occupant of the mobile home upon a mobile home lot. (NESC/NEC) [86]

**mobile home lot** A designated portion of a mobile home park designed for the accommodation of one mobile home and its accessory buildings or structures for the exclusive use of its occupants. (NESC/NEC) [86]

**mobile home park** A contiguous parcel of land which is used for the accommodation of occupied mobile homes. (NESC/NEC) [86]

**mobile home service equipment** The equipment containing the disconnecting means, overcurrent protective devices, and receptacles or other means for connecting a mobile home feeder assembly. (NESC/NEC) [86]

**mobile radio service** Radio service between a radio station at a fixed location and one or more mobile stations, or between mobile stations. *See also:* radio transmission. (EEC/PE) [119]

**mobile station (1)** A radio station designed for installation in a vehicle and normally operated when in motion. *See also:* mobile communication system. (COM/VT) [37]
**(2)** A type of station that uses network communications while in motion. (C/LM) 8802-11-1999

**mobile substation equipment** Substation equipment mounted and readily movable as a system of transportable devices. (PE/SUB) 1268-1997

**mobile telemetering** Electric telemetering between points that may have relative motion, where the use of interconnecting wires is precluded. *Note:* Space radio is usually employed as an intermediate means for mobile telemetering, but radio may also be used for telemetering between fixed points. *See also:* telemetering. (EEC/PE) [119]

**mobile telephone system (automatic channel access)** A mobile telephone system capable of operation on a plurality of frequency channels with automatic selection at either the base station or any mobile station of an idle channel when communication is desired. *See also:* mobile communication system. (VT) [37]

**mobile transformer** Transformers that are usually mounted on trailers for easy transport to temporarily replace stationary transformers taken out of service because of failure or maintenance. (PE/TR) 1276-1997

**mobile transmitter** A radio transmitter designed for installation in a vessel, vehicle, or aircraft, and normally operated while in motion. *See also:* radio transmitter. (AP/ANT) 145-1983s

**mobile unit substation** A unit substation mounted and readily movable as a unit on a transportable device. (SWG/PE) C37.100-1992

**mobility** *See:* drift mobility.

**mobility, Hall** *See:* Hall mobility.

**mobility spectrum** The distribution of ions as a function of mobility. Historically, ions have been classified by mobility

as small ($10^{-5}$ $m^2$/Vs to $2 \times 10^{-4}$ $m^2$/Vs), medium ($10^{-7}$ $m^2$/Vs to $10^{-5}$ $m^2$/Vs), and large ($10^{-9}$ $m^2$/Vs to $10^{-7}$ $m^2$/Vs). (T&D/PE) 539-1990

**MOBSSL-UAF** *See:* Merritt and Miller's Own Block Structured Simulation Language.

**mock-up** A full-sized structural, but not necessarily functional, model built accurately to scale, used chiefly for study, testing, or display; for example, a full-sized model of an airplane displayed in a museum. *See also:* physical model. (C) 610.3-1989w

**mod** *See:* modulo.

**modal** A state in which the user has to complete the request of the mode before continuing. (C) 1295-1993w

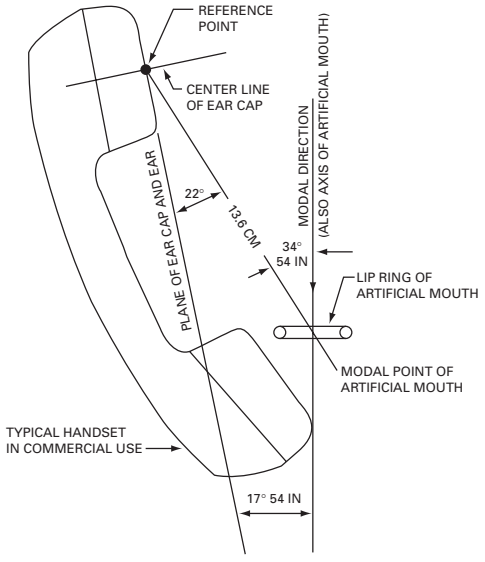
**modal analysis (power-system communication)** A method of computing the propagation of a wave on a multiconductor power line. (PE) 599-1985w

**modal channel (x-ray energy spectrometers)** That channel in the distribution containing the largest number of counts. (NPS/NID) 759-1984r

**modal direction (transmission performance of telephone sets)** The assumed direction of speech transmission on a modal head. Also, the axis of an artificial mouth,. (COM/TA) 269-1983s

**modal distance (telephony)** The distance between the center of the grid of a telephone-handset transmitter cap and the center of the lips of a human talker (or the reference point of an artificial mouth), when the handset is in the modal position. (COM/TA) 269-1971w

**modal head (transmission performance of telephone sets)** Head dimensions that are modal for a human population. The modal head is the same as that adopted by the Comité Consultatif International Télégraphique et Téléphonique (CCITT) for the measurement of Affaiblissement équivalent pour netteté (equivalent articulation loss). The applicable dimensions are shown in the correpsonding figure.




**modal head**

(COM/TA) 269-1983s

**modal noise (fiber optics)** Noise generated in an optical fiber system by the combination of mode dependent optical losses and fluctuation in the distribution of optical energy among the guided modes or in the relative phases of the guided modes. *Synonym:* speckle noise. *See also:* mode. (Std100) 812-1984w

**modal participation factor** The magnitude of each structural mode (natural frequency) that participates to compose the final dynamic response of the system. Each participation factor is a function of the system mass distribution and the generalized mode shape at each natural frequency. (SWG/PE) C37.100-1992, C37.81-1989r

**modal point (transmission performance of telephone sets)** The position of the center of the lips of a modal head. Also, the corresponding reference point of an artificial mouth, the center of the external plane of the lip ring. (COM/TA) 269-1983s

**modal position (transmission performance of telephone sets)** The position a telephone-set handset assumes when the ear-cap of the handset is held in close contact with the ear of a modal head and the modal direction is in the plane defined by the axes of the transmitter cap and ear-cap. (COM/TA) 269-1983s

**mode (1) (radix-independent floating-point arithmetic) (binary floating-point arithmetic)** A variable that a user may set, sense, save, and restore to control the execution of subsequent arithmetic operations. The default mode is the mode that a program can assume to be in effect unless an explicitly contrary statement is included in either the program or its specification. The following mode is implemented: 1) Rounding, to control the direction of rounding errors. 2) In certain implementations, rounding precision, to shorten the precision of results. 3) The implementor may, at his option, implement the following modes: traps disabled or enabled, to handle exceptions. (MM/C) 854-1987r, 754-1985r

**(2) (electron tube)** A state of a vibrating system to which corresponds one of the possible resonance frequencies (or propagation constants). *Note:* Not all dissipative systems have modes. *See also:* oscillatory circuit. (ED) 161-1971w, [45]

**(3) (fiber optics)** In any cavity or transmission line, one of those electromagnetic field distributions that satisfies Maxwell's equations and the boundary conditions. The field pattern of a mode depends on the wavelength, refractive index, and cavity or waveguide geometry. *See also:* bound mode; linearly polarized mode; single mode optical waveguide; differential mode delay; unbound mode; multimode distortion; transverse magnetic mode; multimode optical waveguide; transverse electric mode; hybrid mode; multimode laser; mode volume; equilibrium mode distribution; leaky mode; cladding mode; fundamental mode; equilibrium mode simulator; differential mode attenuation. (Std100) 812-1984w

**(4) (radio-wave propagation)** A characteristic solution to the wave equation for specified boundary conditions. Other uses of the term mode are common. *See also:* mode of propagation, ionospheric. (AP/PROP) 211-1990s

**(5) (mathematics of computing)** A variable that a user may set, sense, save, and restore to control the execution of subsequent arithmetic operations. (C) 1084-1986w

**(6)** An operating condition of a function, subfunction, or physical element of the system. (C/SE) 1220-1994s

**(7)** A collection of attributes that specifies a file's type and its access permissions. *See also:* file access permissions. (C/PA) 9945-1-1996, 9945-2-1993, 1003.5-1999

**(8)** A set of related features or functional capabilities of a product, (e.g., on-line, off-line, and maintenance modes). (C/SE) 1362-1998

**mode conversion (waveguide)** The transformation of an electromagnetic wave from one mode of propagation to one or more other modes. (MTT) 146-1980w

**mode conversion gain (waveguide)** The gain due to the conversion of power from one waveguide mode to another. (MTT) 146-1980w

**mode conversion loss (waveguide)** The loss due to the conversion of power from one waveguide mode to another. (MTT) 146-1980w

**mode coupler (waveguides)** A coupler that provides preferential coupling to a specific wave mode. *See also:* waveguide. (IM/HFIM) [40]

**mode coupling (fiber optics)** In an optical waveguide, the exchange of power among modes. The exchange of power may reach statistical equilibrium after propagation over a finite

distance that is designated the equilibrium length. *See also:* equilibrium length; equilibrium mode distribution; mode; mode scrambler. (Std100) 812-1984w

**mode dispersion** *See:* multimode distortion.

**modal distortion** *See:* multimode distortion.

**mode distortion** *See:* multimode distortion.

**mode filter (1) (fiber optics)** A device used to select, reject, or attenuate a certain mode or modes. (Std100) 812-1984w
**(2) (waveguide components)** A device designed to pass energy along a waveguide in one or more selected modes of propagation, and substantially to reject energy carried in other modes. (MTT) 147-1979w

**mode, higher-order** *See:* higher-order mode.

**MODEL** An application-oriented language used widely for simulating digital circuits. (C) 610.13-1993w

**model (1)** A mathematical or physical representation of the system relationships. (SMC) [63]
**(2) (A) (modeling and simulation)** An approximation, representation, or idealization of selected aspects of the structure, behavior, operation, or other characteristics of a real-world process, concept, or system. *Note:* Models may have other models as components. **(B) (modeling and simulation)** To serve as a model as in definition (A). **(C) (modeling and simulation)** To develop or use a model as in definition (A). (C) 610.3-1989
**(3) (computer graphics)** An accurate and complete graphical representation of an object. *See also:* modeling system. (C) 610.6-1991w
**(4)** A representation of one or more aspects of a system. (C/SE) 1016.1-1993w
**(5)** An analog representation, which may be conceptual, qualitative, or quantitative. (PE/NP) 1082-1997
**(6)** A representation of a real world process, device, or concept. (C/SE) 1233-1998
**(7) (A)** A representation of something that suppresses certain aspects of the modeled subject. This suppression is done in order to make the model easier to deal with and more economical to manipulate and to focus attention on aspects of the modeled subject that are important for the intended purpose of the model. For instance, an accurate model of the solar system could be used to predict when planetary conjunctions will take place and the phases of the moon at a particular time. Such a model would generally not attempt to represent the internal workings of the sun or the surface composition of each planet. **(B)** An interpretation of a theory for which all the axioms of the theory are true. [logic sense]. (C/SE) 1320.2-1998

**model a cell** The creation of a specific elaboration of a model using `modelSearch`. (C/DA) 1481-1999

**model accreditation** (or simulation accreditation) The official certification that a model or simulation is acceptable for use for a specific purpose. (DIS/C) 1278.3-1996

**mode-less** A state that does not interfere with the user performing any other action. (C) 1295-1993w

**model glossary** The collection of the names and definitions of all defined concepts that appear within the views of a model. (C/SE) 1320.2-1998

**model hierarchy** The diagrams that correspond to the nodes of the hierarchical graph structure of an IDEF0 model. (C/SE) 1320.1-1998

**modeling** Technique of system analysis and design using mathematical or physical idealizations of all or a portion of the system. Completeness and reality of the model are dependent on the questions to be answered, the state of knowledge of the system, and its environment. *See also:* system. (SMC) [63]

**modeling procedures** The action of a circuit with respect to timing and power. These actions include creating segments and nodes, determining the propagation properties, and setting the delay and slew equations to use. (C/DA) 1481-1999

**modeling statements** Delay calculation language (DCL) statements that map cell configurations to modeling procedures. (C/DA) 1481-1999

**modeling system** A system in which a computer graphics model can be defined or transformed using world coordinates. (C) 610.6-1991w

**model name** A unique, descriptive name that distinguishes one IDEF0 model from other IDEF0 models with which it may be associated. An IDEF0 model's model name and model name abbreviation are placed in the A-0 context diagram along with the model's purpose statement and viewpoint statement. (C/SE) 1320.1-1998

**model name abbreviation** A unique short form of a model name that is used to construct diagram references. (C/SE) 1320.1-1998

**model note** A textual and/or graphical component of a diagram that records a fact not otherwise depicted by a diagram's boxes and arrows. (C/SE) 1320.1-1998

**model note number** An integer number, placed inside a small square, that unambiguously identifies a model note in a specific diagram. (C/SE) 1320.1-1998

**model page** A logical component of an IDEF0 model that can be presented on a single sheet of paper. Model pages include diagram, text, FEO, and glossary pages. (C/SE) 1320.1-1998

**model space** The coordinate system used by a computer graphics model. (C) 610.6-1991w

**MODEL 204 (M204)** A database manipulation language with English-like syntax. (C) 610.13-1993w

**model validation (1)** The process of determining the degree to which the requirements, design, or implementation of a model are a realization of selected aspects of the system being modeled. *Contrast:* model verification. *See also:* fidelity. (C) 610.3-1989w
**(2)** The process of determining the degree to which a model is an accurate representation of the real world from the perspective of the intended use(s) of the model. (DIS/C) 1278.3-1996

**model verification (1)** The process of determining the degree of similarity between the realization steps of a model; for example, between the requirements and the design, or between the design and its implementation. *Contrast:* model validation. (C) 610.3-1989w
**(2)** The process of determining that a model implementation accurately represents the developer's conceptual description and specifications. (DIS/C) 1278.3-1996

**modem (1) (data transmission)** A contraction of MOdulator-DEModulator, an equipment that connects data terminal equipment to a communication line. (PE) 599-1985w
**(2) (supervisory control, data acquisition, and automatic control)** A modulator/demodulator device that converts serial binary digital data to and from the signal form appropriate for the respective communication channel. (SWG/PE/SUB) C37.100-1992, C37.1-1994
**(3) (broadband local area networks)** A modulator-demodulator device. The modulator encodes digital information onto an analog carrier signal by varying the amplitude, frequency, or phase of that carrier. The demodulator extracts digital information from a similarly modified carrier. A modem transforms digital signals into a form suitable for transmission over an analog medium. (LM/C) 802.7-1989r
**(4)** A device that modulates and demodulates signals transmitted over data communication facilities. One of the functions of a modem is to enable digital data to be transmitted over analog transmission facilities. (SUB/PE) 999-1992w
**(5) (A)** A device that performs modulation and demodulation functions necessary to transmit signals over communication lines. *Note:* This term originated as an abbreviation for modulator-demodulator. *Synonyms:* modulator-demodulator; demodulator-modulator; data set. *See also:* acoustic coupler. **(B)** A device that transforms a digital signal received into an analog signal and vice versa. (C) 610.7-1995

**modem control** The monitoring of modem status lines. (C/PA) 2003.1-1992

**mode mixer** *See:* mode scrambler.

**mode of operation (rectifier circuits)** The characteristic pattern of operation determined by the sequence and duration of commutation and conduction. *Note:* Most thyristor converters and rectifier circuits have several modes of operation, which may be identified by the shape of the current wave. The particular mode obtained at a given load depends upon the circuit constants. *See also:* rectifier circuit element; rectification. (IA/IPC) 444-1973w

**mode of propagation (1) (A) (waveguides)** A form of propagation of guided waves that is characterized by a particular field pattern in a plane transverse to the direction of propagation, which field pattern is independent of position along the axis of the waveguide. *Note:* In the case of uniconductor waveguides the field pattern of a particular mode of propagation is also independent of frequency. *See also:* waveguide. **(B)** A form of electromagnetic wave than can advance and can transport energy along the axis of a transmission line without change in the form of the electromagnetic field pattern in successive transverse sections (except for a monotonic decrease in amplitude along the direction of propagation, due to energy dissipation, which is present to some degree in every transmission line). (MTT) 148-1959, 146-1980, 1004-1987

**(2)** A form of propagation of guided waves where the transverse field pattern is invariant with range (i.e., as in a waveguide). *Note:* Inappropriate uses of the term mode are common. *Synonym:* mechanism of propagation. *See also:* ionospheric mode of propagation. (AP/PROP) 211-1997

**mode of propagation, ionospheric** Representation of a transmission path by the number of hops between the end points of the path, the ionospheric layers producing the ionospheric reflections being indicated for each hop. Example: 1F + 1E represents a hop with an ionospheric reflection in the F region followed by a reflection at the ground, followed, in turn, by a hop with a reflection from the E region. (AP/PROP) 211-1990s

**mode of resonance (waveguide)** A form of natural electromagnetic oscillation in a resonator, characterized by a particular field pattern. (MTT) 146-1980w

**mode of vibration (vibratory body, such as a piezoelectric crystal unit)** A pattern of motion of the individual particles due to stresses applied to the body, its properties, and the boundary conditions. Three common modes of vibration are flexural, extensional, and shear. *See also:* crystal. (EEC/PE) [119]

**mode scrambler (A) (fiber optics)** A device for inducing mode coupling in an optical fiber. *Synonym:* mode mixer. *See also:* mode coupling. **(B) (fiber optics)** A device composed of one or more optical fibers in which strong mode coupling occurs. *Note:* Frequently used to provide a mode distribution that is independent of source characteristics or that meets other specifications. *Synonym:* mode mixer. *See also:* mode coupling. (Std100) 812-1984

**mode shape (mechanical)** A plot that shows displacements of various points in the vibrating structure at a particular instant in time. There is a characteristic mode shape associated with each natural frequency of a vibrating structure. (SWG/SUB/PE) C37.122-1983s, C37.122.1-1993, C37.100-1992

**mode stripper** *See:* cladding mode stripper.

**mode transducer (waveguide components)** A device for transforming an electromagnetic wave from one mode of propagation to another. (MTT) 147-1979w

**mode transformer** *See:* mode transducer.

**mode voltage** *See:* glow voltage.

**mode volume (fiber optics)** The number of bound modes that an optical waveguide is capable of supporting; for $V5$, approximately given by $V^2/2$ and $(V^2/2[g/(g + 2)]$, respectively, for step index and power-law profile waveguides, where g is the profile parameter, and V is normalized frequency. *See also:* step index profile; power-law index profile; normalized frequency; mode; V number; effective mode volume. (Std100) 812-1984w

**modification (A) (software)** A change made to software. *See also:* software. **(B) (software)** The process of changing software. *See also:* software. (C/SE) 729-1983

**modification request (MR)** A generic term that includes the forms associated with the various trouble/problem-reporting documents (e.g., incident report, trouble report) and the configuration change control documents [e.g., software change request (SCR)]. (C/SE) 1219-1998

**modified calling line disconnect** A telephone network feature that, if the end user is off-hook, requires the end user's line to go on-hook before receiving a dial tone from the telephone network. (SCC31) 1390.3-1999, 1390.2-1999

**modified circuit transient recovery voltage** The circuit transient recovery voltage modified in accordance with the normal-frequency recovery voltage and the asymmetry of the current wave obtained on a particular interruption. *Note:* This voltage indicates the severity of the particular interruption with respect to recovery-voltage phenomena. (SWG/PE) C37.100-1992

**modified cosecant-squared antenna pattern** A cosecant-squared antenna pattern modified to obtain increased antenna gain at the higher elevation angles so as to provide larger echo signals from targets at high altitude and short range that would normally be too weak to be detected when sensitivity time control (STC) is used along with the conventional cosecant-squared antenna pattern. *Note:* Sometimes called a thumb pattern. Commonly used in 2-D air-traffic control radars. (AES) 686-1997

**modified impedance relay** An impedance form of distance relay for which the operating characteristic of the distance unit on an *R-X* diagram is a circle having its center displaced from the origin. *Note:* It may be described by the equation

$$Z^2 = 2K_1Z_{\cos}(\theta - \alpha) = K_2{}^2 - K_1{}^2$$

here $K_1$, $K_2$, and $\alpha$ are constants and $\theta$ is the phase angle by which the input voltage leads the input current. (SWG/PE) C37.100-1992

**modified index of refraction** In the troposphere, the sum of the refractive index at a given height $h$ above the mean local surface and the ratio of this height to the geometrical mean radius of the Earth. (AP/PROP) 211-1997

**modified inherent transient recovery voltage (transient recovery voltage)** The TRV (transient recovery voltage) that results from the interaction of a circuit (that produces the inherent transient recovery voltage) and the impedance (capacitors, resistors, etc.) of an interrupting device without the modifying effects of an arc and its voltage. Modifying impedances, such as capacitors and resistors, are sometimes included as part of a switching device to modify the TRV. (SWG/PE) C37.04E-1985w, C37.4D-1985w, C37.100B-1986w, C37.100-1992

**modified-off-the-shelf (MOTS)** A software product that is already developed and available, usable either "as is" or with modification, and provided by the supplier, acquirer, or a third party. (C/SE) 1062-1998

**modified performance test** A test, in the "as found" condition, of a battery's capacity and its ability to provide a high-rate, short-duration load (usually the highest rate of the duty cycle) that will confirm the battery's ability to meet the critical period of the load duty cycle, in addition to determining its percentage of rated capacity. (PE/EDPG) 450-1995

**modified source statements** Original source statements that have been changed. (C/SE) 1045-1992

**modified z transform (data processing)** The modified $z$ transform of $f(t)$, denoted $F(z,m)$, is the delayed $z$ transform of f(t) with the substitution $\Delta = 1 - m$; that is,

$$F(z, m) = \sum_{n=0}^{\infty} f[nT - (1 - m)T]u[nT - (1 - m)T]z^{-n}$$

$$0 < m < 1$$

(IM) [52]

**modify (A)** To change the contents of a database. **(B)** To change the logical structure of a database. *See also:* alter.
(C) 610.5-1990

**Modula 2** *See:* MODUlar LAnguage II.

**MODULA II** *See:* MODUlar LAnguage II.

**modular (software)** Composed of discrete parts. *See also:* modular decomposition; modular programming.
(C) 610.12-1990

**modular assembly** A circuit breaker element consisting of sealed interrupters, mechanism, and connecting terminals.
(SWG/PE) C37.59-1996

**modular constraint** *See:* grid constraint.

**modular decomposition (software)** The process of breaking a system into components to facilitate design and development; an element of modular programming. *Synonym:* modularization. *See also:* factoring; hierarchical decomposition; demodularization; cohesion; coupling; packaging; functional decomposition. (C) 610.12-1990

**modularity (software)** The degree to which a system or computer program is composed of discrete components such that a change to one component has minimal impact on other components. *See also:* cohesion; coupling. (C) 610.12-1990

**modularization** *See:* modular decomposition.

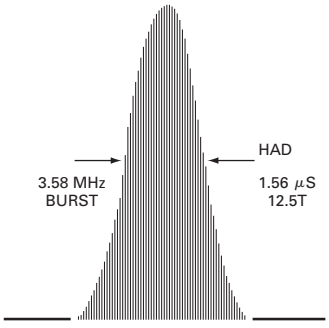
**MODUlar LAnguage II (MODULA II)** A programming language developed, as an expanded version of Pascal, to support modular design, structured programs, and mathematical calculations. *See also:* block-structured language.
(C) 610.13-1993w

**modular programming (software)** A software development technique in which software is developed as a collection of modules. *See also:* stepwise refinement; data structure-centered design; transaction analysis; rapid prototyping; modular decomposition; input-process-output; structured design; transform analysis; object-oriented design.
(C) 610.12-1990

**MODULAR II** *See:* MODUlar LAnguage II.

**modulate (A)** To convert voice or data signal for transmission over a communications network. *Contrast:* demodulate. **(B)** To vary one or more attributes of a carrier (amplitude, frequency, phase) such that the frequency information in the modulating signal can be recovered by its inverse process.
(C) 610.7-1995

**modulated 12.5T pulse (linear waveform distortion)** A burst of color subcarrier frequency of nominally 3.58 MHz. The envelope of the burst is $\sin^2$ shaped with a HAD of nominally 1.56 μs. The MOD 12.5T pulse consists of a luminance and a chrominance component. The envelope of the frequency spectrum consists of two parts, namely signal energy concentrated in the luminance region below 0.6 MHz and in the chrominance region from roughly 3 MHz to 4.2 MHz.




*Envelope of frequency spectrum of modulated 12.5T pulse*

**modulated 12.5T pulse**

(BT) 511-1979w

**modulation (1) (A) (data transmission)** *(Carrier).* (i) The process by which some characteristic of a carrier is varied in accordance with a modulating wave. (ii) The variation of some characteristic of a carrier. *See also:* angle modulation; modulation index. **(B) (data transmission)** *(Signal transmission system).* (i) A process whereby certain characteristics of a wave, often called the carrier, are varied or selected in accordance with a modulating function. (ii) The result of such a process. *See also:* angle modulation; modulation index.
(PE) 599-1985

**(2) (diode-type camera tube)** The ratio of the difference between the maximum and minimum signal currents divided by the sum. To avoid ambiguity, the optical input image intensity shall be assumed to be sinusoidal in the direction of scan.
(ED) 503-1978w

**(3) (fiber optics)** A controlled variation with time of any property of a wave for the purpose of transferring information. (Std100) 812-1984w

**(4) (overhead-power-line corona and radio noise)** The process by which some characteristic of a carrier is varied in accordance with a modulating signal. (T&D/PE) 539-1990

**(5) (broadband local area networks)** The method whereby information is superimposed onto a RF carrier to transport signals through a communications channel.
(LM/C) 802.7-1989r

**(6)** The process of changing or regulating the characteristics of a carrier that is vibrating at a certain amplitude and frequency so that the variations represent meaningful information. *Contrast:* demodulation. (C) 610.7-1995

**modulation contrast (diode-type camera tube)** The ratio of the difference between the peak and the minimum values of irradiance to the sum of the peak and the minimum value of irradiance of an image or specified portion of an image.
(ED) 503-1978w

**modulation index (angle modulation with a sinusoidal modulating function) (data transmission)** The ratio of the frequency deviation of the modulated wave to the frequency of the modulating function. *Note:* The modulation index is numerically equal to the phase deviation expressed in radians.
(PE) 599-1985w

**modulation threshold (illuminating engineering)** In the case of a square wave or sine wave grating, manipulation of luminance differences can be specified in terms of modulation and the threshold may be called the modulation threshold.

$$\text{modulation} = \frac{L_{\max} - L_{\min}}{L_{\max} + L_{\min}}$$

Periodic patterns that are not sine wave can be specified in terms of the modulation of the fundamental sine wave component. The number of periods or cycles per degree of visual angle represents the spatial frequency. (EEC/IE) [126]

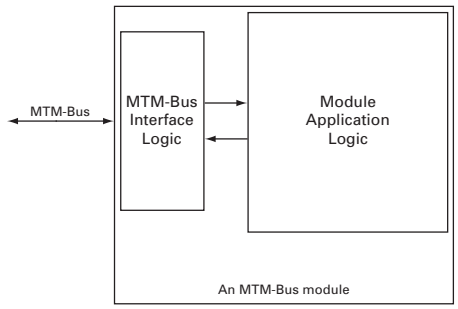
**modulator** A device that converts a signal into a modulated signal that is suitable for transmission. (C) 610.7-1995

**modulation transfer function (diode-type camera tube)** $R_o(N)$, the modulus of the optical transfer function (OTF), is synonymous with the sine amplitude response. That is, the response of the imaging sensor to sinewave images. When the modulation transfer functions or MTFs of a linear sensor's components are known, the overall system MTF can be found by multiplying the individual component MTFs together.
(ED) 503-1978w

**modulator-demodulator** *See:* modem.

**module (1) (cable penetration fire stop qualification test)** An opening in a fire resistive barrier so located and spaced from adjacent modules (openings) that its respective cable penetration fire stop's performance will not affect the performance of cable penetration fire stops in any adjacent module. A module may take on any shape to permit the passage of cables from one or any number of raceways. (ED) 581-1978w

**(2) (A) (software)** A program unit that is discrete and identifiable with respect to compiling, combining with other units, and loading; for example, the input to, or output from, an




NOTE–An MTM-Bus module consists of MTM-Bus interface logic and module application logic.

**MTM-Bus module**

assembler, compiler, linkage editor, or executive routine. **(B) (software)** A logically separable part of a program. *Note:* The terms "module," "component," and "unit" are often used interchangeably or defined to be sub-elements of one another in different ways depending upon the context. The relationship of these terms is not yet standardized. (C) 610.12-1990

**(3) (STEbus)** A plug-in unit consisting of one or more boards that contains at least one bus interface conforming to IEEE Std 1000-1987, which plugs into the backplane. (C/MM) 1000-1987r

**(4) (MULTIBUS)** A basic functional unit within an agent. (C/MM) 1296-1987s

**(5)** Collection of circuitry designed to perform specific functions that includes an interface to Futurebus+. (C/BA) 10857-1994, 896.4-1993w, 896.3-1993w

**(6) (NuBus)** *See also:* board. (C/MM) 1196-1987w

**(7)** A board or board set that comprises a single physical unit. It provides mechanical mounting and protection of electronic components, thermal transfer of heat away from the components to an external heat sink, and electrical and fiber-optic connections. A module is removable and replaceable. (BA/C) 14536-1995

**(8)** A plug-in unit per IEC 50. (C/BA) 1101.4-1993, 1101.3-1993

**(9)** A board, or board set, consisting of one or more nodes, that share a physical interface to SCI. If a module has multiple boards with backplane-mating connectors, it only uses one for the logical connection to the node. The others may provide additional power or I/O for their associated boards, but otherwise merely pass the input link signals through to the output link to provide continuity in case the module is plugged into a ring-connected backplane. (C/MM) 1596-1992

**(10)** Typically a board assembly and its associated mechanical parts, front panel, optional shields, etc., which contains everything required to occupy a slot in a mainframe. A module may occupy one or more slots. (C/MM) 1155-1992

**(11)** A collection of circuitry that is designed to perform a specific operation. This is standard terminology for Futurebus+, while VME64 uses board synonymously. (C/BA) 1014.1-1994w

**(12)** A board, or board set, consisting of one or more nodes that share a physical interface. Although only one board in a module connects to bus signals, each board connector could provide power from the bus. (C/MM) 1212-1991s

**(13)** An electronic circuit assembly that connects to one or more slots on the backplane. It is removable from and replaceable in a backplane assembly via connectors. (C/BA) 896.2-1991w

**(14)** An addressable unit or interconnected set of units attached to the MTM-Bus and fully supporting the MTM-Bus protocols. The boundary of an MTM-Bus module may correspond to the physical partitioning of the system, but is not required to do so. For the purposes of this document, a module is comprised of an MTM-Bus interface and module application logic, as shown in the figure below. (TT/C) 1149.5-1995

**(15) (FASTBUS module)** Any FASTBUS Device that can be housed in a FASTBUS crate, that can connect to a crate segment and that conforms with the mandatory specifications for a FASTBUS module. (NID) 960-1993

**(16)** A packaged functional hardware unit designed for use with other components. (C) 610.10-1994w

**(17)** The smallest component of physical management; i.e., a replaceable device. (C/MM) 1394-1995

**(18)** Multiple cells/units in a single assembly. (SB) 1188-1996

**(19)** A board or board set consisting of one or more nodes that share a physical interface, although only one board in a module connects to bus signals. Each board connection could provide power from the bus. (C/BA) 1156.4-1997

**(20)** Any assembly of interconnected components that constitutes an identifiable device, instrument, or piece of equipment. A module can be disconnected, removed as a unit, and replaced with a spare. It has definable performance characteristics that permit it to be tested as a unit. A module could be a card, a drawout circuit breaker, or other subassembly of a larger device, provided it meets the requirements of this definition. (PE/NP) 603-1998

**module accelerated aging (nuclear power generating station) (advanced life conditioning)** The acceleration process designed to achieve an advanced life condition in a short period of time. It is the process of subjecting a module or component to stress conditions in accordance with known measurable physical or chemical laws of degradation in order to render its physical and electrical properties similar to those it would have at an advanced age operating under expected service conditions. In addition, when operations of a device are cyclical, acceleration is achieved by subjecting the device to the number of cycles anticipated during its qualified life. (PE/NP) 381-1977w

**module accuracy (nuclear power generating station)** Conformity of a measurement value to an accepted standard value or true value. *Note:* For further information, see Process Measurement and Control Terminology SAMA PMC-20.1-1973. (PE/NP) 381-1977w

**module address (MA) (1) (FASTBUS acquisition and control)** The group of bits assigned in the device address field of a FASTBUS address which identifies the module on its segment. The module address may partially overlap the group address. (NID) 960-1993

**(2)** An eight-bit value uniquely identifying an MTM-Bus module. (TT/C) 1149.5-1995

**module aging (nuclear power generating station) (natural)** The change with passage of time of physical chemical, or electrical properties of a component or module under design range operating conditions which may result in degradation of significant performance characteristics. (PE/NP) 381-1977w

**module auxiliary connector (FASTBUS acquisition and control)** The standard connector that mounts above the module segment connector on a module circuit board. (NID) 960-1993

**module calibration (nuclear power generating station)** Adjustment of a device, to bring the module's output to a desired value or series of values, within a specified tolerance, for a particular value or series of values of the input or measurements used to establish the input-output function of the module. (PE/NP) 381-1977w

**module circuit board** The printed board that is the circuit part of a FASTBUS module on which the module segment connector is mounted for mating with the crate segment connector. (NID) 960-1993

**module common-mode rejection (nuclear power generating station)** The ability of a module with a differential input stage to cancel or reject a signal applied equally to both inputs. (PE/NP) 381-1977w

**module components (nuclear power generating station)** Items from which the module is assembled (for example, resistors, capacitors, wires, connectors, transistors, springs, etc.). (PE/NP) 381-1977w

**module conformity (nuclear power generating station)** The closeness with which the curve of a function approximates a specified curve. (PE/NP) 381-1977w

**module contact rating (nuclear power generating station)** The electrical power-handling capability of relay or switch contacts. This should be specified as continuous or interrupting, resistive or inductive, ac or dc. (PE/NP) 381-1977w

**module counter** A counter that reverts to zero in the counting sequence after reaching a value of $n - 1$. (C) 1084-1986w

**module design range operating conditions (nuclear power generating station)** The range of environmental and energy supply operating conditions within which a module is designed to operate. (PE/NP) 381-1977w

**module drift (nuclear power generating station)** A change in output-input relationship over a period of time, normally determined as the change in output over a specified period of time for one or more input values which are held constant under specified reference operating conditions. (PE/NP) 381-1977w

**module electromagnetic interference (nuclear power generating station)** Any unwanted electromagnetically transmitted energy appearing in the circuitry of a module. (PE/NP) 381-1977w

**module energy supply (nuclear power generating station)** Electrical energy, compressed fluid, manual force or other such input to the module that will establish the power for its operation. (PE/NP) 381-1977w

**Module Fail Status (MFS) bit** A bit in the Slave Status register of every S-module that is set by the S-module when the module's built-in test has failed or is currently executing. (TT/C) 1149.5-1995

**module failure trending (nuclear power generating station)** Systematic documentation and analysis of the frequency of a particular failure mode. (PE/NP) 381-1977w

**module frequency response (nuclear power generating station)** The frequency-dependent relation, in both amplitude and phase, between steady-state sinusoidal inputs and the resulting fundamental sinusoidal outputs. (PE/NP) 381-1977w

**module header** A structure attached to or integral to the top of a module's frame that is used for structural performance, marking, and optional component-mounting. (C/BA) 1101.4-1993, 1101.7-1995

**module input overrange constraints (nuclear power generating station)** The upper and/or lower values of the input signal which may be applied to a module without causing damage or otherwise altering permanent characteristics of the module or causing undesired saturation effects. (PE/NP) 381-1977w

**module input signal range (nuclear power generating station)** The region between the limits within which a quantity is measured or received, expressed by stating the lower and upper values of the input signal. (PE/NP) 381-1977w

**module interface** All aspects of the electrical, fiber optic, protocol, mechanical, and thermal interfaces of a module to associated modules, the backplane, I/O connections, module cage and cabinet mounting, conduction and/or convection cooling, and power and ground. (C/BA) 14536-1995

**module interface plane** An assigned plane on the bottom surface of the connector, from which the connector's electrical pins protrude, forming the mating surface. This surface is used as a reference for module dimensions. (C/BA) 1101.4-1993

**module interference plane** An assigned plane on the bottom surface of the connector from which the connector's electrical pins protrude, forming the mating surface. (C/BA) 1101.7-1995

**module isolation characteristics (nuclear power generating station)** provisions for electrical isolation of particular sections of a module from each other; such as input and output circuitry, control and protection circuitry, and redundant protection circuitry. (PE/NP) 381-1977w

**module load capability (nuclear power generating station)** The range of load values within which a module will perform to its specified performance characteristics. (PE/NP) 381-1977w

**module output impedance (nuclear power generating station)** The internal impedance presented by a module at its output terminals to a load. (PE/NP) 381-1977w

**module output ripple (nuclear power generating station)** The ac component of a dc output signal harmonically related in frequency to either the supply voltage or a voltage generated within the module (for example, carrier demodulation). (PE/NP) 381-1977w

**module output signal range (nuclear power generating station)** The region between the limits within which a quantity is transmitted, expressed by stating the lower and upper values of the output signal. (PE/NP) 381-1977w

**module pulse characteristics (nuclear power generating station)** Information such as pulse duration, amplitude, rise time, decay time, separation, and shape. (PE/NP) 381-1977w

**module qualified life (nuclear power generating station)** The life expectancy in years (or cycles of operation, if applicable) over which the module has been demonstrated to be qualified for use, as established by type tests, analysis or other qualification method. (PE/NP) 381-1977w

**module range and characteristics of adjustments (nuclear power generating station)** Such information as upper and lower range-limits of calibration capability and where applicable, their relationship to the calibrated range of the module. (PE/NP) 381-1977w

**module reference operating conditions (nuclear power generating station)** The range of environmental operating conditions of a module within which environmental influences are negligible. (PE/NP) 381-1977w

**module reproducibility (nuclear power generating station)** The closeness of agreement among repeated measurements of the output for the same value of input made under the same operating conditions over a period of time, approaching from both directions. (PE/NP) 381-1977w

**module response time (nuclear power generating station.)** The time required for an output change from an initial value to a specified percentage of the final steady-state value, resulting from the application of a specified input change under specified conditions. For digital equipment (that is, relays, solid state logic, delay networks, etc.). Response time is the time required for a change from an initial state to a specified final state resulting from application of specified input under specified conditions. (PE/NP) 381-1977w

**module retainer** The device used to secure the module in the chassis and to hold module guide ribs against the chassis webs

to attain a good thermal interface. *Synonym:* expansion element. (C/BA) 1101.4-1993, 1101.3-1993, 1101.7-1995

**modules (electric pipe heating systems)** Any assembly of interconnected components that constitutes an identifiable device, instrument, or piece of equipment that can be disconnected, removed as a unit and replaced with a spare, and has definable performance characteristics which permit it to be tested as a unit. A module can be a card or other subassembly. (PE/EDPG) 622A-1984r

**module segment connector (FASTBUS acquisition and control)** The standard connector that mounts on a FASTBUS module and mates with the crate segment connector for connection of the module to the segment. (NID) 960-1993

**module signal to noise rato (nuclear power generating station)** The output signal with input signal applied minus the output signal with no input signal applied divided by the output signal with no input signal applied. (PE/NP) 381-1977w

**Module Status register** A status register that is recommended to be implemented in the MTM-Bus interface circuitry of every S-module. The bits in this register are defined by the manufacturer of the MTM-Bus interface circuitry of an S-bits. The bits of such a register may serve to record error-condition detection or the module's application-related status. (TT/C) 1149.5-1995

**module strength** *See:* cohesion.

**module supplementary board** Any board in a FASTBUS module that does not make direct connection with the crate segment. (NID) 960-1993

**module testing** *See:* component testing.

**module-type tests (nuclear power generating station)** Tests made on one or more production units to demonstrate that the performance characteristics of the module(s) conform to the module's specifications. (PE/NP) 381-1977w

**modulo** An arithmetic operation that yields the remainder of an integer division problem. For example 39-3 modulo 6. (C) 1084-1986w

**modulo *N* check (data transmission)** A form of check digits, such that the number of ones in each number *A* operated upon is compared with a check number *B*, carried along with *A* and equal to the remainder of *A* when divided by *N*; for example, in a modulo 4 check, the check number will be 0, 1, 2, or 3 and the remainder of *A* when divided by 4 must equal the reported check number *B*, or else an error or malfunction has occurred; a method of verification by congruences; for example, casting out nines. *See also:* residue check. (COM) [49]

**modulo-n counter** A counter in which the state represented reverts to zero after reaching a maximum value of n-1. (C) 610.10-1994w

**modulo-*n* residue** The remainder obtained by dividing a number by *n*. (C) 1084-1986w

**modulo-two sum** *See:* exclusive OR.

**modulus (1) (mathematics of computing)** The number of integers that can be represented in a numeration system. For example, in a system with a modulus of five, the only integers that can be represented are 0, 1, 2, 3, and 4. (C) 1084-1986w

**(2) (phasor)** Its absolute value. The modulus of a phasor is sometimes called its amplitude. (Std100) 270-1966w

**MOE** *See:* measure of effectiveness.

**MOF** *See:* maximum observed frequency.

**Moho (mohorovicic discontinuity)** Seismic discontinuity situated about 35 km below the continents and about 10 km below the oceans. Crudely speaking, it separates the earth's crust and mantle. (COM) 365-1974w

**moiré (television)** The spurious pattern in the reproduced picture resulting from interference beats between two sets of periodic structures in the image. *Note:* The most common cause of moiré is the interference between scanning lines and some other periodic structure such as a line pattern in the original scene, a mesh or dot pattern in the camera sensor (for example, the target mesh in an image orthicon), or the phosphor dots or other structure in a shadow-mask picture tube. Moiré may result from the interference between the subcarrier elements of the chrominance signal and another periodic structure. In systems using an fm carrier, such as magnetic or video-disc record-playback systems, moire may also be caused by interference between the upper sidebands of the fm carrier and lower sidebands of harmonics of the fm carrier. In general, moiré may be caused by interference beats between any two periodic structures that are not perfectly aligned and not of the same frequency. (BT/AV) 201-1979w

**moisture barrier** A metal barrier that prevents moisture from permeating radially into the cable core. (PE/IC) 1142-1995

**moisture block** A means for preventing moisture from migrating longitudinally along the cable core, either through the conductor or within the space allowable between the extruded insulation shield and the jacket. (PE/IC) 1142-1995

**moisture content** The amount of water in parts per million by volume (ppmv) that is in the gaseous state and mixed with the insulating gas. *Synonym:* moisture content. (SWG/PE/SUB) C37.100-1992, C37.122.1-1993, C37.122-1993

**moisture-resistant (1) (packaging machinery)** So constructed or treated that exposure to a moist atmosphere will not readily cause damage. (IA/PKG) 333-1980w

**(2)** Not readily injured by exposure to a moist atmosphere. (SWG/PE) C37.100-1992

**molded-case circuit breaker (MCCB) (1)** One that is assembled as an integral unit in a supporting and enclosing housing of molded insulating material. (SWG/PE) C37.100-1992

**(2)** A circuit breaker assembled as an integral unit in a supporting and enclosing housing of insulating material; the overcurrent and tripping means being of the thermal type, the magnetic type, the electronic type, or a combination thereof. (IA/MT) 45-1998

**(3)** A circuit breaker that is assembled as an integral unit in a supporting and enclosing housing of insulating material. (IA/PSP) 1015-1997

**mole (metric practice)** The amount of substance of a system which contains as many elementary entities as there are atoms in 0.012 kilogram of carbon-12 (adopted by 14th General Conference on Weights and Measures). *Note:* When the mole is used, the elementary entities must be specified and may be atoms, molecules, ions, electrons, other particles, or specified groups of such particles. (QUL) 268-1982s

**molecular data element** *See:* composite data element.

**momentary** When used as a modifier to quantify the duration of a short duration variation, refers to a time range at the power frequency from 30 cycles to 3 s. (SCC22) 1346-1998

**momentary current** The current flowing in a device, an assembly, or a bus at the major peak of the maximum cycle as determined from the envelope of the current wave. *Note:* The current is expressed as the rms value, including the dc component, and may be determined by the method shown in IEEE Std C37.09-1979. (SWG/PE) C37.100-1992

**momentary disturbance** A variation in the level of the steady-state supply voltage that results from surges, sags, faults, circuit and equipment switching, or from the operation of circuit breakers or reclosers resulting from their response to abnormal circuit conditions. *See also:* transient. (T&D/PE) 1250-1995

**momentary event interruption** An interruption of duration limited to the period required to restore service by an interrupting device. *Note:* Such switching operations must be completed in a specified time not to exceed 5 min. This definition includes all reclosing operations that occur within 5 min of the first interruption. For example, if a recloser or

breaker operates two, three, or four times and then holds, the event shall be considered one momentary interruption event. (PE/T&D) 1366-1998

**momentary interruption (1) (electric power system)** An interruption of duration limited to the period required to restore service by automatic or supervisory-controlled switching operations or by manual switching at locations where an operator is immediately available. *Note:* Such switching operations must be completed in a specified time not to exceed 5 minutes. (PE/PSE) 346-1973w

**(2)** Single operation of an interrupting device which results in a voltage zero. For example, two breaker or recloser operations equals two momentary interruptions. (PE/T&D) 1366-1998

**(3)** A type of short duration variation. The complete loss of voltage (<0.1 pu) on one or more phase conductors for a time period between 0.5 cycles and 3 s. (SCC22) 1346-1998

**(4) (A) (power quality monitoring)** A type of short duration variation. **(B) (power quality monitoring)** The complete loss of voltage (< 0.1 pu) on one or more phase conductors for a time period between 0.5 cycles and 3 s. (IA/PSE) 1100-1999

**momentary rating (x-ray)** A rating based on an operating interval that does not exceed five seconds. (NESC/NEC) [86]

**monadic (mathematics of computing)** Pertaining to an operation involving a single operand. *Contrast:* dyadic. (C) 1084-1986w

**monadic Boolean operation** A logical operation involving one operand. For example, the NOT operation. *Contrast:* dyadic Boolean operation. (C) 1084-1986w

**monadic operation** An operation involving one operand. For example, the square root operation. *Synonym:* unary operation. *Contrast:* dyadic operation. (C) 1084-1986w

**monadic operator** An operator that specifies an operation on one operand. For example, the square root operator. *Synonym:* unary operator. *Contrast:* dyadic operator. (C) 1084-1986w

**monadic selective construct** An if-then-else construct in which processing is specified for only one outcome of the branch, the other outcome resulting in skipping this processing. *Contrast:* dyadic selective construct. (C) 610.12-1990

**monarch** A processor that has the responsibility for initializing a part of the system, such as a ringlet. If a system has multiple monarchs, they eventually defer to an emperor that coordinates the initialization process. (C/MM) 1596-1992

**monarch processor (1)** The processor selected to manage the configuration and initialization of all modules on one logical bus. *See also:* monarch; emperor processor. (C/BA) 896.3-1993w, 896.4-1993w, 10857-1994

**(2)** The processor that is selected to partially initialize the local-bus resources and fetch the initial boot code. (C/BA/MM) 896.2-1991w, 1212-1991s, 896.10-1997

**monitor (1) (token ring access method)** That function that recovers from various error situations. It is contained in each ring station; however, only the monitor in one of the stations on a ring is the active monitor at any point in time. The monitor function in all other stations on the ring is in standby mode. (LM/C) 802.5-1985s

**(2) (radioactivity monitoring instrumentation)** An instrument that provides a continual measurement of one or more parameters and generates a signal to record or transmit that measurement. (NI) N42.17B-1989r

**(3) (software)** A software tool or hardware device that operates concurrently with a system or component and supervises, records, analyzes, or verifies the operation of the system or component. *Synonym:* execution monitor. *See also:* hardware monitor; software monitor. (C) 610.12-1990, 610.10-1994w

**(4) (A)** A device that observes and records selected activities with a computer system for analysis. **(B)** A generic term refering to any kind of display device. (C) 610.10-1994

**(5)** Continual or periodic testing with comparison to observe or determine trends. (SWG/PE) C37.10-1995

**monitor direction** In T101, refers to transmission from the controlled station (RTU/IED) to the controlling station (master/RTU). (PE/SUB) 1379-1997

**monitor functions** The functions that recover from various error situations and are contained in each ring station. In normal operation only one of the stations on a ring is the active monitor at any point in time. The monitor functions in all other stations on the ring ensures that the active monitor function is being performed. (C/LM) 8802-5-1998

**monitor hazard current (health care facilities)** The hazard current of the line isolation monitor alone. *See also:* hazard current. (EMB) [47]

**monitoring (1) (data transmission)** In communication, an observation of the characteristics of transmitted signals. (PE) 599-1985w

**(2) (electric pipe heating systems)** To check the operation and performance of an equipment or system by sampling the results of the operation. Monitoring with respect to electric pipe heating systems usually consists of checking system temperatures or operation of the heater circuits; voltage, current, etc. (PE/EDPG) 622A-1984r

**(3) (electric heat tracing systems)** To check the operation and performance of an equipment or system by sampling the results of the operation. Monitoring with respect to electric heat tracing systems usually consists of checking system temperatures or operation of the heater circuits; voltage, current, etc. (PE/EDPG) 622B-1988r

**(4)** The process of observing a system to verify that its parameters are within prescribed limits. (PE/EM) 1129-1992r

**(5)** That aspect of performance management concerned with tracking the system activities in order to gather the appropriate data for determining performance. (LM/C) 802.1F-1993r

**monitoring amplifier (electroacoustics)** An amplifier used primarily for evaluation and supervision of a program. *See also:* amplifier. (BT/AV) [34]

**monitoring laboratory** An accredited laboratory that prepares and distributes test materials to a service laboratory for the purpose of monitoring the day-to-day operation of the service laboratory. The service laboratory may also be a monitoring laboratory providing third party testing materials to another service laboratory or a special QA function within the service laboratory not involved in the routine processing of samples. (NI) N42.23-1995

**monitoring relay** A relay that has as its function to verify that system or control-circuit conditions conform to prescribed limits. (SWG/PE) C37.100-1992

**monkey tail** *See:* running board.

**monochromatic (1) (color) (television)** Having spectral emission over an extremely small region of the visible spectrum. (BT/AV) 201-1979w

**(2) (fiber optics)** Consisting of a single wavelength or color. In practice, radiation is never perfectly monochromatic but, at best, displays a narrow band of wavelengths. *See also:* spectral width; line source; coherent. (Std100) 812-1984w

**monochromator (fiber optics)** An instrument for isolating narrow portions of the spectrum. (Std100) 812-1984w

**monochrome (television)** Having only one chromaticity, usually achromatic. (BT/AV) 201-1979w

**monochrome channel (television)** Any path that is intended to carry the monochrome signal. (BT/AV) 201-1979w

**monochrome channel bandwidth (television)** The bandwidth of the path intended to carry the monochrome signal. (BT/AV) 201-1979w

**monochrome display device** A display device that can display only one color, or shades of that color, in addition to the background color. *Contrast:* color display device. *See also:* gray scale display device. (C) 610.10-1994w, 610.6-1991w

**monochrome signal*** **(television)** (monochrome television) A signal wave for controlling the luminance values in the picture. *See also:* luminance signal.

* Deprecated.

**monochrome television** The electric transmission and reception of transient visual images in only one chromaticity, usually achromatic. *Note:* Also termed black-and-white television. (BT/AV) 201-1979w

**monochrome transmission (television)** The transmission of a signal wave for controlling the luminance values in the picture, but not the chromaticity values. *Note:* Also termed black-and-white transmission. (BT/AV) 201-1979w

**monoclinic system (piezoelectricity)** A monoclinic crystal has either a single axis of twofold symmetry or a single plane of reflection symmetry, or both. Either the twofold axis or the normal to the plane of symmetry (they are the same if both exist, and this direction is called the unique axis in any case) is taken as the $b$ or $Y$ axis. Of the two remaining axes, the smaller is the $c$ axis. In class 2, $+Y$ is chosen so that $d_{22}$ is positive; $+Z$ is chosen parallel to c (sense trivial), and $+X$ such that it forms a right-handed system with $+Z$ and $+Y$. In class m, + Z is chosen so that $d_{33}$ is positive, and $+X$ so that $d_{11}$ is positive, and $+Y$ to form a right−handed system. *Note:* "Positive" and "negative" may be checked using a carbon-zinc flashlight battery. The carbon anode connection will have the same effect on meter deflection as the + end of the crystal axis upon release of compression. *See also:* crystal systems. (UFFC) 176-1978s

**monocular visual field (illuminating engineering)** The field for a single eye. (EEC/IE) [126]

**monolithic integrated circuit** An integrated circuit formed in a single piece of the substrate material. *Contrast:* hybrid circuit. (C) 610.10-1994w

**monomode optical waveguide** *See:* single mode optical waveguide.

**monopinch** Single-axis monompulse used in search radars to provide effective beam narrowing by displacing the displayed azimuth by the target angle off axis. Also called "ECS (electrical correction system)" and "EBS (electrical beam sharpening)." (AES/RS) 686-1990

**monopolar ion density (dc electric-field strength and ion-related quantities)** The number of ions of a given polarity per unit volume. The preferred unit is $m^{-3}$; another commonly used unit is $cm^{-3}$. (T&D/PE) 539-1990, 1227-1990r

**monopolar space-charge density (overhead power lines)** The space charge density of one polarity. The preferred unit is $C/m^3$. (T&D/PE) 539-1990, 1227-1990r

**monopole** An antenna, constructed above an imaging plane, that produces a radiation pattern approximating that of an electric dipole in the half-space above the imaging plane. (AP/ANT) 145-1993

**monoprocessor architecture** *See:* single processor architecture.

**monopulse (1)** Simultaneous lobing whereby direction-finding information is obtainable from a single pulse. (AP/ANT) 145-1993

**(2)** A radar technique in which information concerning the angular location of a target is obtained by comparison of signals received in two or more simultaneous antenna beams. *Notes:* 1. The simultaneity of the beams makes it possible to obtain a 2-D angle estimate from a single pulse (hence the term "monopulse"), although multiple pulses are usually employed to improve the accuracy of the estimate or to provide Doppler resolution. 2. The simultaneous lobe technique used in continuous wave (CW) radars is also referred to as monopulse, although pulses are not used. (AES) 686-1997

**monostable** Pertaining to a circuit or device that is capable of assuming one of two states, one of which is stable. *Synonym:* one-shot. *See also:* monostable circuit; bistable. (C) 610.10-1994w

**monostable circuit** A trigger circuit that has one stable and one quasistable state. (C) 610.10-1994w

**monostatic cross section (1)** The scattering cross section in the direction toward the source. *Synonym:* backscattering cross section. *Contrast:* bistatic cross section. (AP/ANT) 145-1993

**(2)** The scattering cross-section of a target in the retro-direction. (AP/PROP) 211-1997

**monostatic radar (1)** A radar where the transmit and receive antennas are collocated. (AP/PROP) 211-1997

**(2)** A radar system that transmits and receives through either a common antenna or through collocated antennas. (AES) 686-1997

**monostatic reflectivity** Reflectivity in which the reflected and incident waves follow the same path but in opposite directions. The transmit and receive antennas are in the same location, and normal incidence occurs at the reflecting surface. (EMC) 1128-1998

**monotonic recorder** A recorder that has output codes that do not decrease (increase) for a uniformly increasing (decreasing) input signal, disregarding random noise. (IM/WM&A) 1057-1994w

**Monte Carlo method (1)** In modeling and simulation, any method that employs Monte Carlo simulation to determine estimates for unknown values in a deterministic problem. (C) 610.3-1989w, 1084-1986w

**(2)** A numerical statistical technique that simulates random propagation and scattering processes by repeatedly calculating outcomes using parameters chosen at random from the processes' parameter space. (AP/PROP) 211-1997

**Monte Carlo simulation** A deterministic simulation in which random statistical sampling techniques are employed such that the result determines estimates for unknown values. (C) 610.3-1989w

**month** A service observing month, which is not generally a calendar month. *See also:* time-consistent traffic measures. (COM/TA) 973-1990w

**month-end processing** The operations required to complete a monthly cycle. For example, monthly ledger processing. (C) 610.2-1987

**monthly cycle** One complete execution of a data processing function that must be performed once a month. *See also:* daily cycle; annual cycle; weekly cycle. (C) 610.2-1987

**monthly peak duration curve (power operations)** A curve showing the total number of days within the month during which the net 60 min clock-hour integrated peak demand equals or exceeds the percent of monthly peak values shown. *See also:* generating station. (PE/PSE) 858-1987s, 346-1973w

**monument** *See:* hub.

**MOP** *See:* measure of performance.

**mortising** *See:* kerning.

**MOS** *See:* metal-oxide semiconductor.

**MOSA** *See:* metal-oxide surge arrester.

**MOS transistor** *See:* metal-oxide-semiconductor transistor.

**most significant** Within a group of data items (e.g., bits or bytes) that, taken as a whole, represents a numerical value, the item within the group with the greatest numerical weighting. (C/BA) 1275-1994

**most significant bit (1) (mathematics of computing)** The bit having the greatest effect on the value of a binary numeral; usually the leftmost bit. (TT/C) 1149.5-1995, 1084-1986w

**(2) (test access port and boundary-scan architecture)** The digit in a binary number representing the greatest numerical value. For shift-registers, the bit furthest from the serial output, or the last bit to be shifted out. Logic values expressed in binary form are shown with their most significant bit on the left. (TT/C) 1149.1-1990

**(3)** In an *n* bit binary word its contribution is (0 or 1 times $2^{n-1}$) toward the maximum word value of $2^{n-1}$. (SWG/PE/SUB) C37.100-1992, C37.1-1987s

**(4)** The bit in the binary notation of a number that is the coefficient of the highest exponent possible. (IM/ST) 1451.2-1997

**most significant character** The character in the leftmost position in a character string. *Contrast:* least significant character. (C) 610.5-1990w

**most significant digit** The digit having the greatest effect on the value of a numeral; usually the leftmost digit; for example, the 7 in 756.4. *Contrast:* least significant digit. (C) 610.5-1990w, 1084-1986w

**most significant word (msw)** In a multiword representation of a binary number, the word containing the msb of that number. (TT/C) 1149.5-1995

**motherboard** The printed circuit board on which an SBus Card is mounted through the connectors specified by this standard. (C/BA) 1496-1993w

**(2) (A)** The main circuit board within a computer, bearing the primary components of a computer system, including the processor, main storage, support circuitry, bus controller and bus connector. *See also:* backplane; daughter board. **(B)** A standard size printed circuit board to which are attached one or more daughterboards that add functionality and provide a selection of interface buffering. (C) 610.10-1994

**motion** To move the pointer while a mouse button is pressed. (C) 1295-1993w

**motion picture display** *See:* cine-oriented image.

**MOTIS** The set of ISO standards for Message-Oriented Text Interchange Systems. (C/PA) 1224.1-1993w

**MOTS** *See:* modified-off-the-shelf.

**motive power (valve actuators)** The electric, fluid, air, nitrogen, or mechanical energy required to operate the actuator. (PE/NP) 382-1985

**motor** A rotating machine that converts electrical energy into mechanical energy. As used in IEEE Std 1068-1996, the term can also be used to mean a generator. (IA/PC) 1068-1996

**motor branch circuit** A branch circuit that supplies energy to one or more motors and associated motor controllers. (IA/MT) 45-1998

**motor-circuit switch (1)** A switch, rated in horsepower, capable of interrupting the maximum operating overload current of a motor of the same horsepower rating as the switch at the rated voltage. (NESC/NEC) [86]

**(2) (packaging machinery)** A switch intended for use in a motor branch circuit. It is rated in horsepower and is capable of interrupting the maximum operating overload current of a motor of the same rating at the rated voltage. (IA/PKG) 333-1980w

**motor conduit box (packaging machinery)** An enclosure on a motor for the purpose of terminating a conduit run and joining motor to power conductors. (IA/PKG) 333-1980w

**motor control center (MCC) (1) (nuclear power generating station)** A floor mounted assembly of one or more enclosed vertical sections having a common horizontal power bus and principally containing combination motor starting units. These units are mounted one above the other in the vertical sections. The sections may incorporate vertical buses connected to the common power bus, thus extending the common power supply to the individual units. Units may also connect directly to the common power bus by suitable connections. (PE/NP) 649-1980s

**(2)** A group of devices assembled for the purpose of switching and protecting a number of load circuits. The control center may contain transformers, contactors, circuit breakers, protective devices, and other devices intended primarily for energizing or de-energizing load circuits. (IA/MT) 45-1998

**motor control circuit** The circuit of a control apparatus or system that carries the electric signals directing the performance of the controller but does not carry the main power current. Motor control circuits tapped from the load side of the motor branch-circuits, short-circuit protective devices shall not be considered to be branch circuits and shall be permitted to be protected by either supplementary or branch-circuit overcurrent protective devices. (NESC/NEC) [86]

**motor-generator set** A machine that consists of one or more motors mechanically coupled to one or more generators to convert electric power from one frequency to another, or to create an isolated power source. (IA/MT) 45-1998

**motor home** A vehicular unit designed to provide temporary living quarters for recreational, camping or travel use built on or permanently attached to a self-propelled vehicle chassis or on a chassis cab or van which is an integral part of the completed vehicle. *See also:* recreational vehicle. (NESC/NEC) [86]

**motoring** An induction or synchronous generator operating as a motor and drawing power from the grid. (PE/EDPG) 1020-1988r

**motor lead extension cable (electric submersible pump cable)** Three-conductor cable running from above the pump to the motor including motor connecting plug. (IA/PC) 1017-1985s

**motor meter** A meter comprising a rotor, one or more stators, and a retarding element by which the resultant speed of the rotor is made proportional to the quantity being integrated (for example, power or current) and a register connected to the rotor by suitable gearing so as to count the revolutions of the rotor in terms of the accumulated integral (for example, energy or charge). *See also:* electricity meter. (ELM) C12.1-1982s

**motor parts (electric)** A term applied to a set of parts of an electric motor. Rotor shaft, conventional stator-frame (or shell), end shields, or bearings may not be included, depending on the requirements of the end product into which the motor parts are to be assembled. (PE) [9]

**motor reduction unit** A motor with an integral mechanical means of obtaining a speed different from the speed of the motor. *Note:* Motor reduction units are usually designed to obtain a speed lower than that of the motor, but may also be built to obtain a speed higher than that of the motor. (IA/MT) 45-1998

**motor starting reactor** A current limiting reactor used to limit the starting current of a machine. (PE/TR) C57.16-1996

**motor supply line (rotating machinery)** The source of electric power to which the windings of a motor are connected. *See also:* direct-current commutating machine; asynchronous machine. (PE) [9]

**motor synchronizing** Synchronizing by means of applying excitation to a machine running at slightly below synchronous speed. *See also:* asynchronous machine. (PE) [9]

**motor-type watthour meter** A motor in which the speed of the rotor is proportional to the power, with a readout device that counts the revolutions of the rotor. (ELM) C12.1-1982s

**mount (1) (switching tubes)** The flange or other means by which the tube, or tube and cavity, are connected to a waveguide. *See also:* gas tube. (ED) 161-1971w, [45]

**(2) (A)** To place a data medium in a position and condition so that it can be accessed; for example, to mount a magnetic tape on a tape drive and connect the tape drive to an application. **(B)** To insert a removable storage medium into place so that it can be accessed. (C) 610.10-1994

**(3)** The action of making a cartridge, side, partition, or volume accessible.

a) Mounting a *volume* is a logical action that implies mounting the one or more partitions that make up the volume.
b) Mounting a *partition* is a logical action that implies mounting the underlying side of a cartridge and engaging a software interface to gain access to that partition.
c) Mounting a *side* is the physical action of mounting a cartridge in a drive in a particular orientation.

d) Mounting a *cartridge* is the physical action of moving a cartridge to a drive and loading it into the drive.

(C/SS) 1244.1-2000

**mounted plow (static or vibratory plows) (cable plowing)** A unit which, to be operable, is semipermanently attached to and dependent upon a prime mover.

**mounting lug, stator** *See:* stator mounting lug.

**mounting pitch (mp) (1)** The interval of distance between repeated features, parts, or assemblies in a given space. (C/BA) 1301.2-1993

**(2)** The interval of distance between parts or assemblies in a given space. (C/MM) 1301.3-1992r

**(3)** The pitch used to arrange parts or assemblies in a given space. (C/MM) 1301.1-1991

**mounting position** (of a switch or fuse support) A position determined by, and corresponding to, the position of the base of the device. *Note:* The usual positions are

a) Vertical
b) Horizontal upright (when the fuse holder or fuse unit is mounted above the supporting insulators)
c) Horizontal underhung (when the fuse holder or fuse unit is mounted below the supporting insulators)
d) Angle (from vertical)

(SWG/PE) C37.40-1993, C37.100-1992

**mounting rabbet (1) (packaging machinery)** Any channel for holding wires, cables, or bus bars; designed expressly for, and used solely for, this purpose. (IA/PKG) 333-1980w

**(2) (rotating machinery)** A male or female pilot on a face or flange type of end shield of a machine, used for mounting the machine with a mating rabbet. The rabbet may be circular, or of other configuration and need not be continuous. (PE) [9]

**mounting ring (rotating machinery)** A ring of resilient or nonresilient material used for mounting an electric machine into a base at the end shield hub. (PE) [9]

**mounting structure** A structure for mounting an insulating support. (PE/SUB) 605-1998

**mount point** Either the root directory or a directory for which the *st_dev* field of the POSIX.1 *struct stat* differs from that of its parent directory. (C/PA) 9945-2-1993

**mouse (1)** A cursor control device, used as a locator, consisting of a hand-held control box within some sort of motion-sensing component such that the position or movement of the mouse on a surface controls the position of a cursor on a display. It is used to provide coordinate input data to a display device. *See also:* puck. (C) 610.6-1991w

**(2)** An electronic or mechanical input device that allows manipulation of the screen pointer. Mice also generally have one or more buttons that allow selection and manipulation of objects. (C) 1295-1993w

**(3)** A cursor control device used as a locator, consisting of a hand-held control box with some sort of motion-sensing component such that the position or movement of the mouse on a surface controls the motion of a cursor on a display device. *Note:* A mouse usually includes one or more buttons which provide additional input information. *See also:* mechanical mouse; shaft recorder; track ball; puck; bus mouse; optical mouse; serial mouse. (C) 610.10-1994w

**mouse port** A port used to interface with a mouse. (C) 610.10-1994w

**mouth reference point (MRP) (1)** A point on the axis of the artificial mouth, 25 mm in front of the center of the external plane of the lip ring. (COM/TA) 269-1992

**(2)** The point on the reference axis, 25 mm in front of the lip plane. (COM/TA) 1206-1994

**(3)** The point on the reference axis of the mouth simulator, 25 mm in front of the lip plane. (COM/TA) 1329-1999

**mouth simulator** A device consisting of a loudspeaker mounted in an enclosure and having a directivity and radiation pattern similar to those of the average human mouth. (COM/TA) 1329-1999

***m*−out−of−*n* code** A binary code in which *m* of the *n* digits that represent a word, character, or digit are in one state, and the other digits are in the opposite state. *See also:* two-out-of-five code. (C) 1084-1986w

**movable bridge coupler (drawbridge coupler)** A device for engaging and disengaging signal or interlocking connections between the shore and a movable bridge span. (EEC/PE) [119]

**movable bridge rail lock** (drawbridge)A mechanical device used to insure that the movable bridge rails are in proper position for the movement of trains. *See also:* interlocking. (EEC/PE) [119]

**movable head** *See:* floating head.

**movable relay contact** The member of a contact pair that is moved directly by the actuating system. (EEC/REE) [87]

**move (1) (A)** To read data from a source, altering the contents of the source location, and to write the same data elsewhere in a physical form that may differ from that of the source. For example, to move data from one file to another. *Contrast:* copy. **(B)** Sometimes, a synonym for **copy.** *See also:* store; load; fetch. (C) 610.12-1990

**(2)** The physical action of moving a cartridge from one location to another, where a location is a slot, a drive, or a port. (C/SS) 1244.1-2000

**movement authority** The authority for a train to enter and travel through a specific section of track, in a given travel direction. Movement authorities are assigned, supervised, and enforced by a communications-based train control system to maintain safe train separation, and to provide protection through interlockings. (VT/RT) 1474.1-1999

**moving average** An average calculated on a selected, changing subset of a time series of data. For example, a four-point moving average would be the average of the last four data points in the time series. (C) 1084-1986w

**moving-base navigation aid** An aid that requires cooperative facilities located upon a moving vehicle other than the one being navigated. *Notes:* 1. The cooperative facilities may move along a predictable path that is referenced to a specified coordinate system such as in the case of a nongeostationary navigation satellite. 2. Such an aid may also be designed solely to permit one moving vehicle to home upon another. *See also:* navigation. (AES/RS) 686-1982s, [42]

**moving-base-derived navigation data** Data obtained from measurements made at moving cooperative facilities located external to the navigated vehicle. *See also:* navigation. (AES/RS) 686-1982s, [42]

**moving-base-referenced navigation data** Data in terms of a coordinate system referenced to a moving vehicle other than the one being navigated. *See also:* navigation. (AES/RS) 686-1982s, [42]

**moving-coil loudspeaker (dynamic loudspeaker)** A moving-conductor loudspeaker in which the moving conductor is in the form of a coil conductively connected to the source of electric energy. (PE/EEC) [119]

**moving-coil microphone (dynamic microphone)** A moving-conductor microphone in which the movable conductor is in the form of a coil. *See also:* microphone. (EEC/PE) [119]

**moving-conductor loudspeaker (moving conductor)** A loudspeaker in which the mechanical forces result from magnetic reactions between the field of the current and a steady magnetic field. (EEC/PE) [119]

**moving-conductor microphone** A microphone the electric output of which results from the motion of a conductor in a magnetic field. *See also:* microphone. (EEC/PE) [119]

**moving contact** A conducting part that bears a contact surface arranged for movement to and from the stationary contact. (SWG/PE) C37.100-1992

**moving-contact assembly (rotating machinery)** That part of the starting switch assembly that is actuated by the centrifugal mechanism. *See also:* centrifugal starting switch. (EEC/PE) [119]

**moving element (instrument)** Those parts that move as a direct result of a variation in the quantity that the instrument is measuring. *Notes:* 1. The weight of the moving element includes one-half the weight of the springs, if any. 2. The use of the term movement is deprecated. (EEC/ERI/AII) [111], [102]

**moving-iron instrument** An instrument that depends for its operation on the reactions resulting from the current in one or more fixed coils acting upon one or more pieces of soft iron or magnetically similar material at least one of which is movable. *Note:* Various forms of this instrument (plunger, vane, repulsion, attraction, repulsion-attraction) are distinguished chiefly by mechanical features of construction. *See also:* instrument. (EEC/PE) [119]

**moving-magnet instrument** An instrument that depends for its operation on the action of a movable permanent magnet in aligning itself in the resultant field produced either by another permanent magnet and by an adjacent coil or coils carrying current, or by two or more current-carrying coils, the axes of which are displaced by a fixed angle. *See also:* instrument. (EEC/PE) [119]

**moving-magnet magnetometer** A magnetometer that depends for its operation on the torques acting on a system of one or more permanent magnets that can turn in the field to be measured. *Note:* Some types involve the use of auxiliary magnets (Gaussian magnetometer), others electric coils (sine or tangent galvanometer). *See also:* magnetometer. (EEC/PE) [119]

**moving target detector (MTD)** A low pulse-repetition frequency (PRF) pulsed Doppler system usually characterized by employing a filter bank, adaptive thresholds, clutter map, and more than one coherent processing interval at different PRFs. (AES) 686-1997

**moving-target indicator improvement factor** *See:* moving-target indication improvement factor.

**moving-target indication (MTI)** A technique that enhances the detection and display of moving radar targets by suppressing fixed targets. *Note:* Doppler processing is one method of implementation. (AES) 686-1997

**moving-target indication improvement factor** The signal-to-clutter power ratio at the output of the clutter filter divided by the signal-to-clutter power ratio at the input of the clutter filter, averaged uniformly over all target radial velocities of interest. *Synonym:* clutter improvement factor. (AES) 686-1997

**MP** A dialect of ALGOL 60 having extensible language features; used largely as a programming language for system software. (C) 610.13-1993w

**mp** *See:* mounting pitch.

**MPE** *See:* minimum perceptible erythema.

**M peak (closed loop) (1) (control system feedback)** The maximum value of the magnitude of the return transfer function for real frequencies, the value at zero frequency being normalized to unity. *See also:* feedback control system. (PE/EDPG) [3]

**(2) (excitation systems)** Mp is the maximum value of the closed-loop amplitude response. *See also:* bandwidth. (PE/EDPG) 421A-1978s

**m-phase circuit** A polyphase circuit consisting of m distinct phase conductors, with or without the addition of a neutral conductor. *Note:* In this definition it is understood that m may be assigned the integral value of three or more. For a two-phase circuit, see: two-phase circuit; two-phase, three-wire circuit; two-phase, four-wire circuit; two-phase, five-wire circuit. *See also:* network analysis. (Std100) 270-1966w

**MPRF** *See:* medium-pulse-repetition-frequency waveform.

**MPSX** *See:* Mathematical Programming System Extended.

**MR** *See:* modification request.

**MRA** *See:* minimum reception altitude.

**MRP** *See:* mouth reference point.

**msb** *See:* most significant bit.

**MSB** *See:* most significant bit.

**MSC** *See:* mile of standard cable; multistrip coupler.

**M scan** *See:* M-display.

**M-scope** A cathode-ray oscilloscope arranged to present an M-display. (AES/RS) 686-1990

**MSDU** *See:* MAC service data unit.

**MSE** *See:* maximum static error.

**MSFN** *See:* manned space flight network.

**MSI** *See:* medium scale integration.

**msw** *See:* most significant word.

**MT** *See:* machine translation.

**M-T** *See:* magneto-telluric.

**MTBF (meantime between failure, mean time between failure)** *See:* mean time before failures; mean time between failures.

**MTE** *See:* manual test equipment.

**MTF** *See:* mean time between failures.

**$m^3/s$ (cubic meters per second)** Volume of water or liquid discharged per second under standard conditions. (T&D/PE) 957-1987s, 957-1995

**MTI** *See:* moving-target indication.

**MTI improvement factor** *See:* moving-target indication improvement factor.

**MT interface** The X.400 Gateway API. (C/PA) 1224.1-1993w

**MTM-Bus** A serial, backplane, test and maintenance bus, consisting of one or more logic boards, that can be used to integrate modules from different design teams or vendors into testable and maintainable subsystems, as specified in this Standard. (TT/C) 1149.5-1995

**MTM-Bus interface logic** The portion of a module that is designed for the purpose of MTM-Bus-compliant communication and through which takes place all the communication between the given module and any other on a given MTM-Bus implementation. MTM-Bus interface logic need not be defined on the basis of physical package boundaries. (TT/C) 1149.5-1995

**MTM-Bus Master** The module in control of the MTM-Bus. This is the module that, at a given time, is sourcing MCTL and MMD. (TT/C) 1149.5-1995

**MTM-Bus mastership** Property of being the current MTM-Bus Master module. (TT/C) 1149.5-1995

**MTM-Bus Slave** An MTM-Bus module that cannot command actions of other modules on the bus, but that may be selected by the MTM-Bus Master module to participate in a message. (TT/C) 1149.5-1995

**MTTD** *See:* mean time to diagnosis.

**MTTF** *See:* mean time to fix; mean time to repair.

**MTTR** *See:* mean time to repair.

**MTU** *See:* maximum transfer unit.

**M204** *See:* MODEL 204.

**M-type backward-wave oscillator** *See:* carcinotron.

**mu circuit (feedback amplifier)** ($\mu$ circuit) That part that amplifies the vector sum of the input signal and the fed-back portion of the output signal in order to generate the output signal. *See also:* feedback. (EEC/PE) [119]

**Mueller matrix** The matrix that relates the Stokes vector of the scattered wave to the Stokes vector of the incident wave. *Synonym:* Stokes matrix. (AP/PROP) 211-1997

**MUF** *See:* maximum usable frequency.

**mu factor ($n$–terminal electron tubes)** ($\mu$ factor) The ratio of the magnitude of infinitesimal change in the voltage at the $j$th

electrode to the magnitude of an infinitesimal change in the voltage at the *l* th electrode under the conditions that the current to the *m* th electrode remain unchanged and the voltages of all other electrodes be maintained constant. *See also:* electron-tube admittances. (ED) 161-1971w, [45]

**muffler** (of a fuse) An attachment for the vent of a fuse, or a vented fuse, that confines the arc and substantially reduces the venting from the fuse. (SWG/PE) C37.100-1992

**multi-access contention protocol** The protocol used on the Aloha network by which a station transmits a message at will and then listens for an acknowledgment. If no ACK is received within a randomly selected timeout interval, the message is re-transmitted. (C) 610.7-1995

**multiaddress** *See:* multiple-address.

**multiaddress format** An address format that contains more than one address field; for example, a three-address instruction. (C) 610.10-1994w

**multiaddress instruction (1)** A computer instruction that contains more than one address field. *Synonym:* multiple-address instruction. *Contrast:* one-address instruction. (C) 610.12-1990

**(2)** A computer instruction that contains more than one address. *Synonym:* multiple instruction. (C) 610.10-1994w

**multianode tank (multianode tube)** An electron tube having two or more main anodes and a single cathode. *Note:* This term is used chiefly for pool-cathode tubes. (ED) [45]

**multiaperture core** A magnetic core, usually used for non-destructive reading, with two or more holes through which wires may be passed in order to create more than one magnetic path. *Synonym:* multiple aperture core. (C) 610.10-1994w

**multiband image** A set of images of the same scene, each formed by radiation from a different segment of the spectrum. (C) 610.4-1990w

**multibeam antenna** An antenna capable of creating a family of major lobes from a single non-moving aperture, through use of a multiport feed, with one-to-one correspondence between input ports and member lobes, the latter characterized by having unique main beam pointing directions. *Note:* Often, the multiple main beam angular positions are arranged to provide complete coverage of a solid angle region of space. (AP/ANT) 145-1993

**multibeam oscilloscope** An oscilloscope in which the cathode-ray tube produces two or more separate electron beams that may be individually or jointly controlled. *See also:* oscillograph; dual-beam oscilloscope. (IM/HFIM) [40], 311-1970w

**multibit point interface** Multibit (e.g., BCD, gray code) point. Master Station or RTU (or both) element(s) that inputs a series of multibit quantities in parallel. (SUB/PE) C37.1-1994

**multicable penetrator** A device consisting of multiple nonmetallic cable seals assembled in a surrounding metal frame, for insertion in openings in decks, bulkheads, or equipment enclosures and through which cables may be passed to penetrate decks or bulkheads or to enter equipment without impairing their original fire or watertight integrity. (IA/MT) 45-1998

**multicast (1)** A transmission mode in which a single message is sent to multiple network destinations, (i.e., one-to-many). (DIS/C) 1278.1-1995, 1278.2-1995

**(2)** A mode of operation in which the M-module transmits data simultaneously (i.e., during a single message) to a predefined subset of the S-modules currently connected to the bus. Also, a message transmitted in this mode. (TT/C) 1149.5-1995

**(3)** A technique that allows copies of a single packet to be passed to a selected subset of all possible destinations. *Contrast:* broadcast. (C) 610.7-1995

**(4)** A medium access control (MAC) address that has the group bit set. A multicast MAC service data unit (MSDU) is one with a multicast destination address. A multicast MAC protocol data unit (MPDU) or control frame is one with a multicast receiver address. (C/LM) 8802-11-1999

**multicast address** A special address indicating a specific group of end nodes.local area networks. (C) 8802-12-1998

**multicast select bit 0; multicast select bit 1** Those bits in the Slave Status register of every S-module by means of which the S-module is programmed to be a member of one of the four possible multicast select groups. (TT/C) 1149.5-1995

**multicast select group** A group of S-modules that may be addressed simultaneously in a multicast. Four such groups are possible. Each has an address defined by IEEE 1149.5-1995. The multicast select group of an S-module is programmable. (TT/C) 1149.5-1995

**multicavity magnetron** A magnetron in which the circuit includes a plurality of cavities. *See also:* magnetron. (ED) 161-1971w

**multicellular horn (electroacoustics)** A cluster of horns with juxtaposed mouths that lie in a common surface. *Note:* The purpose of the cluster is to control the directional pattern of the radiated energy. (SP) [32]

**multichannel analyzer (MCA) (x-ray energy spectrometers)** An instrument which digitizes analog amplitude signal pulses and stores them in a memory as a function of their analog amplitude. (NPS/NID) 759-1984r

**multichannel pulse-height analyzer (MCA)** An electronic device that records and stores pulses according to their height. It consists of three function segments: an ADC to provide a means of measuring pulse amplitude; memory registers (one for each channel of the spectrum) to tally the number of pulses having an amplitude within a given voltage increment; an input/output section that permits transfer of the spectral information to other devices, such as a computer, oscilloscope display, or permanent storage media (disk or magnetic tape storage). *Synonym:* multichannel analyzer. (NI) N42.14-1991

**multichannel radio transmitter** A radio transmitter having two or more complete radio-frequency portions capable of operating on different frequencies, either individually or simultaneously. *See also:* radio transmitter. (AP/ANT) 145-1983s

**multicharacter collating element** A sequence of two or more haracters that collate as an entity. For example, in some coded character sets, an accented character is represented by a (nonspacing) accent, followed by the letter. Another example is the Spanish elements “ch” and “ll.” (C/PA) 9945-2-1993

**multichip integrated circuit** An integrated circuit whose elements are formed on or within two or more semiconductor chips that are separately attached to a substrate. *See also:* integrated circuit. (ED) 274-1966w

**multicomputer** *See:* multiprocessor.

**multiconductor bundle** *See:* bundle.

**multiconstant speed motor (rotating machinery)** A multispeed motor whose two or more definite speeds are constant or substantially constant over its normal range of loads; for example A synchronous or an induction motor with windings capable of various pole groupings. (PE) [9]

**multidimensional system** A system whose state vector has more than one element. *See also:* control system. (PE/EDPG) [3]

**multidrop (1)** Said of the configuration of a bus with a single shared medium segment that allows one or more of its module connectors to be unoccupied without disturbing bus operation. (TT/C) 1149.5-1995

**(2)** Pertaining to a communication arrangement where several devices share a common transmission channel. *Contrast:* multipoint. *See also:* point-to-point. (C) 610.7-1995

**multielectrode tube** An electron tube containing more than three electrodes associated with a single electron stream. (ED) 161-1971w

**multi-element conduction interval (thyristor)** That part of the conduction interval when ON-state current flows in more than one basic control element simultaneously. (IA/IPC) 428-1981w

**multifamily dwelling** A building containing three or more dwelling units. (NESC/NEC) [86]

**multifiber cable (fiber optics)** An optical cable that contains two or more fibers, each of which provides a separate information channel. *See also:* optical cable assembly; fiber bundle. (Std100) 812-1984w

**multifiber joint (fiber optics)** An optical splice or connector designed to mate two multifiber cables, providing simultaneous optical alignment of all individual waveguides. *Note:* Optical coupling between aligned waveguides may be achieved by various techniques including proximity butting (with or without index matching materials), and the use of lenses. (Std100) 812-1984w

**multifield key** *See:* concatenated key.

**multiframe** A cyclic set of consecutive frames in which the relative position of each frame can be identified. (COM/TA) 1007-1991r

**multiframe alignment** *See:* frame alignment.

**multiframe alignment signal** *See:* frame alignment signal.

**multifrequency test** A broad band test motion, simulating a typical seismic motion, that can produce a simultaneous response from all applicable modes of a multidegree-of-freedom system. (SWG/PE) C37.100-1992, C37.81-1989r

**multifrequency transmitter** A radio transmitter capable of operating on two or more selectable frequencies, one at a time, using present adjustments of a single radio-frequency portion. *See also:* radio transmitter. (AP/BT/ANT) 145-1983s, 182-1961w

**multigrounded neutral system (power and distribution transformers)** A distribution system of the four-wire type where all transformer neutrals are grounded, and neutral conductors are directly grounded at frequent points along the circuit. (PE/TR) C57.12.80-1978r

**multilateration** The location of an object by means of two or more range measurements from different reference points. It is a useful technique with radar because of the inherent accuracy of radar range measurement. *Note:* The use of three reference points to obtain target location is known as trilateration. (AES) 686-1997

**multilayer** Pertaining to a printed circuit board with several layers of printed circuit etched or patterned, one over the other and interconnected by electroplated holes which can also receive component leads. (C) 610.10-1994w

**multilayer filter** *See:* interference filter.

**multilevel address** *See:* indirect address.

**multilevel network subject** A network subject that causes information to flow through a network at two or more security levels without risk of compromise by transmitting sensitivity labels along with the data. *Contrast:* single-level network subject. (C) 610.7-1995

**multilevel security (1) (software)** A mode of operation permitting data at various security levels to be concurrently stored and processed in a computer system when at least some users have neither the clearance nor the need-to-know for all data contained in the system. *See also:* data; security; computer system. (C/SE) 729-1983s

**(2)** The capability of simultaneously separating and protecting information of two or more security levels during processing. (C/BA) 896.3-1993w

**multilevel storage** *See:* virtual storage.

**multiline hunt group (MLHG)** A group of lines that have a fixed alternate routing should one or more of the lines in the group be busy. (SCC31/AMR) 1390.3-1999, 1390.2-1999, 1390-1995

**multilist** A technique for organizing records in which records that have equivalent values for a given secondary key form a linked list. *Synonym:* multiple threaded list.

| Student | Name | Homeroom | Link |
|---|---|---|---|
| 1 | MARY | 25 | 4 |
| 2 | JOE | 27 | 15 |
| 3 | JOHN | 10 | 6 |
| 4 | ANNE | 25 | 5 |
| 5 | SUSAN | 25 | – |
| 6 | KIM | 10 | 21 |
| 7 | BOB | 26 | 16 |
| • | • | • | • |

**multilist**

(C) 610.5-1990w

**multimedia** A form of hypermedia consisting of a combination of two or more forms of the following: text, audio, graphics, animation, and full-motion video. (C) 610.10-1994w

**multimode distortion (fiber optics)** In an optical waveguide, that distortion resulting from differential mode delay. *Note:* The term "multimode dispersion" is often used as a synonym; such usage, however, is erroneous since the mechanism is not dispersive in nature. *Synonyms:* mode distortion; intermodal distortion. *See also:* distortion. (Std100) 812-1984w

**multimode fiber (interferometric fiber optic gyro)** An optical fiber waveguide that will allow more than one bound mode to propagate. (AES/GYAC) 528-1994

**multimode group delay** *See:* differential mode delay.

**multimode laser (fiber optics)** A laser that produces emission in two or more transverse or longitudinal modes. *See also:* mode; laser. (Std100) 812-1984w

**multi-mode optical fiber** An optical fiber that has a relatively large core in which the light bounces off the walls of the core. This results in multiple signal paths through the fiber which limits the maximum signaling rate more and more as the fiber length increases. *See also:* single-mode optical fiber. (C) 610.7-1995

**multimode optical waveguide (fiber optics)** An optical waveguide that will allow more than one bound mode to propagate. *Note:* May be either a graded index or step index waveguide. *See also:* mode; bound mode; single mode optical waveguide; power-law index profile; multimode distortion; mode volume; step index optical waveguide; normalized frequency. (Std100) 812-1984w

**multimode SAW oscillator** A surface acoustic wave oscillator in which more than one frequency satisfies the oscillation conditions. (UFFC) 1037-1992w

**multimode waveguide** A waveguide used to propagate power in more than one mode at a frequency of interest. (MTT) 146-1980w

**multinomial** A linear sum of terms involving powers of more than one variable.

$$\sum_{i_1=0}^{N_1}\sum_{i_2=0}^{N_2}\cdots\sum_{i_m=0}^{N_m} A(i_1, i_2, \ldots i_m)X_1^{i_2}X_2^{i_2}\ldots X_m^{i_m}$$

(IM/ST) 1451.2-1997

**multioffice exchange (telephone switching systems)** A telecommunications exchange served by more than one local central office. (COM) 312-1977w

**multiorder lag (automatic control)** In a linear system or element, lag of energy storage in two or more separate elements of the system. *Note:* It is evidenced by a differential equation of order higher than one, or by more than one time-constant. It may sometimes be approximated by a delay followed by a first-order or second-order lag. *See also:* lag. (PE/EDPG) [3]

**multioutlet assembly** A type of surface or flush raceway designed to hold conductors and receptacles, assembled in the field or at the factory. (NESC/NEC) [86]

**multipactor limiter (nonlinear, active, and nonreciprocal waveguide components)** A high-vacuum device that uses the multipacting phenomenon to limit high microwave power levels. (MTT) 457-1982w

**multiparty ringing (telephone switching systems)** By custom, any arrangement that provides for the individual ringing of more than four parties. (COM) 312-1977w

**multipath (1)** The propagation of a wave from one point to another by more than one path. When multipath occurs in radar, it usually consists of a direct path and one or more indirect paths by reflection from the surface of the earth or sea or from large man-made structures. At frequencies below approximately 40 MHz, it may also include more than one path through the ionosphere. (AES) 686-1997

**(2) (facsimile)** *See also:* multipath transmission.

**multipath error** The error in a radar-observed parameter caused by multipath. (AES) 686-1997

**multipath transmission** The propagation phenomenon that results in signals reaching the receiving antenna by two or more paths. When two or more signals arrive simultaneously, wave interference results. The received signal fades if the wave interference is time varying or if one of the terminals is in motion. (AP/PROP) 211-1997

**multiphase transducer** An interdigital transducer having more than two connections and that is driven in different phases; usually used for unidirectional transducers. (UFFC) 1037-1992w

**Multipeer Virtual Port** A Subgroup Port that represents the capability for communication with more than one other Remote Bridge in the Remote Bridge Group to which the Port attaches. *Note:* A Multipeer Virtual Port always has Multipeer Virtual Ports as its peer Ports. (C/LM) 802.1G-1996

**multiple (1)** A group of terminals arranged to make a circuit or group of circuits accessible at a number of points at any one of which connection can be made.

**(2)** To connect in parallel, or to render a circuit accessible at a number of points at any one of which connection can be made. (EEC/PE) [119]

**(3) (analog computer)** A junction into which patch cords may be plugged to form a common connection. (C) 165-1977w

**multiple access (communication satellite)** The capability of having simultaneous access to one communication satellite from a number of ground stations. (COM) [19]

**multiple-address (multiaddress) (computers)** Pertaining to an instruction that has more than one address part. (C) 162-1963w

**multiple-address instruction** *See:* multiaddress instruction.

**multiple aperture core** *See:* multiaperture core.

**multiple arithmetic** A system or method of performing ordinary arithmetic with a digital computer where several parts of one or more numbers are utilized in an arithmetic operation, yielding several results. (C) 1084-1986w

**multiple-beam headlamp (illuminating engineering)** A headlamp so designed as to permit the driver of a vehicle to use any one of two or more distributions of light on the road. (EEC/IE) [126]

**multiple-beam klystron (microwave tubes)** An O-type tube having more than one electron beam, and resonators coupled laterally but not axially. (ED) [45]

**multiple-break relay contacts** Contacts that open a circuit in two or more places. (EEC/REE) [87]

**multiple-choice interaction** An instruction method employed by some computer-assisted instruction systems, in which the student is asked to choose one of a set of multiple choice answers in response to a question. (C) 610.2-1987

**multiple circuit** Two or more circuits connected in parallel. *See also:* center of distribution. (PE/T&D) [10]

**multiple-conductor cable** A combination of two or more conductors cabled together and insulated from one another and from sheath or armor where used. *Note:* Specific cables are referred to as 3-conductor cable, 7-conductor cable, 50-conductor cable, etc. (T&D/PE) [10]

**multiple-conductor concentric cable** A cable composed of an insulated central conductor with one or more tubular stranded conductors laid over it concentrically and insulated from one another. *Note:* This cable usually has only two or three conductors. Specific cables are referred to as 2-conductor concentric cable, 3-conductor concentric cable, etc. (T&D/PE) [10]

**multiple-current generator** A generator capable of producing simultaneously currents or voltages of different values, either alternating-current or direct-current. (PE) [9]

**multiple data stream** *See:* multiple instruction, single data; multiple instruction, multiple data.

**multiple ESD event** An ESD event in which more than one discharge occurs. The time interval between successive discharges may be several microseconds to several tens of milliseconds. Related terms include multiple ESD, multiple discharge, and multiple. (SPD/PE) C62.47-1992r

**multiple exclusive selective construct** *See:* case.

**multiple feeder** A feeder that is connected to a common load in multiple with one or more feeders from independent sources. (SWG/PE) C37.100-1992

**multiple frame transmission** A transmission where more than one frame is transmitted when a token is captured. (C/LM) 8802-5-1998

**multiple-gun cathode-ray tube** A cathode-ray tube containing two or more separate electron-gun systems. (ED) [45]

**multiple hoistway (elevators)** A hoistway for more than one elevator or dumbwaiter. *See also:* hoistway. (PE/EEC) [119]

**multiple inclusive selective construct** A special instance of the case construct in which two or more different values of the control expression result in the same processing. For example, values 1 and 2 cause one branch, 3 and 4 cause another, and so on. (C) 610.12-1990

**multiple independent outages** Outage occurrences, each having distinct and separate initiating incidents, where no outage occurrence is the consequence of any other, but the outage states overlap. (PE/PSE) 859-1987w

**multiple inheritance** The ability of a subclass to inherit responsibilities from more than one superclass. (C/SE) 1320.2-1998

**multiple instruction** *See:* multiaddress instruction.

**multiple instruction, multiple data** Pertaining to a computer architecture in which the processors receive both instructions and data from separate sources. *See also:* multiple instruction, single data; single instruction, multiple data. (C) 610.10-1994w

**multiple instruction, single data** Pertaining to a computer architecture in which all processors receive instructions from separate (multiple) sources but receive data from a single (common) source. *See also:* single instruction, single data; multiple instruction, multiple data. (C) 610.10-1994w

**multiple lampholder (current tap)** A device that by insertion in a lampholder, serves as more than one lampholder. (EEC/PE) [119]

**multiple lightning stroke** A lightning stroke having two or more components. *See also:* direct-stroke protection. (T&D/PE) [10]

**multiple list insertion sort** *See:* address calculation sort.

**multiple metallic rectifying cell** An elementary metallic rectifier having one common electrode and two or more separate electrodes of the opposite polarity. *See also:* rectification. (EEC/PE) [119]

**multiple modulation** A succession of processes of modulation in which the modulated wave from one process becomes the modulating wave for the next. *Note:* In designating multiple-

modulation systems by their letter symbols, the processes are listed in the order in which the modulating function encounters them. For example, PPM-AM means a system in which one or more signals are used to position-modulate their respective pulse subcarriers which are spaced in time and are used to amplitude-modulate a carrier. (AP/ANT) 145-1983s

**multiple outage event** An outage event involving two or more components, or two or more units. (PE/PSE) 859-1987w

**multiple outstanding transactions** A state where more than one transaction has been issued and is pending completion. (C/MM) 1284.4-2000

**multiple-packet error rejection** Error handling and rejection notification occurs on a message-by-message basis. (C/MM) 1284.1-1997

**multiple plug (cube tap) (plural tap)** A device that, by insertion in a receptacle, serves as more than one receptacle. (PE/EEC) [119]

**multiple-pointer form demand register (metering)** An indicating demand register from which the demand is obtained by reading the position of the multiple pointers relative to their scale markings. The multiple pointers are resettable to zero. (ELM) C12.1-1982s

**multiple precision (data management) (mathematics of computing)** Pertaining to the use of two or more computer words to represent a number in order to preserve or gain precision. *Synonyms:* multiprecision; extended precision. *Contrast:* single precision. *See also:* triple precision; double precision. (C) 610.5-1990w, 1084-1986w

**multiple-precision arithmetic** Computer arithmetic performed with operands that are expressed in multiple-precision representation. (C) 1084-1986w

**multiple punching** Punching more than one hole in the same card column by several keystrokes, usually in order to extend the character set of the keypunch. (C) 610.10-1994w

**multiple query error** A word-serial protocol error that occurs when a servant receives a command requiring it to output a response to its data low register, and is unable to respond because of an unread response to a previous command. (C/MM) 1155-1992

**multiple rectifier circuit** A rectifier circuit in which two or more simple rectifier circuits are connected in such a way that their direct currents add, but their commutations do not coincide. *See also:* rectifier circuit element; rectification. (IA) [62]

**multiple rho (electronic navigation)** A generic term referring to navigation systems based on two or more distance measurements for determination of position. *See also:* navigation. (AES/RS) 686-1982s, [42]

**multiple scatter** A calculation of wave scattering from a surface or a collection of particles for which the field exciting each surface element or particle consists of the incident field plus the fields scattered by all the other surface elements or particles in their many interactions. A full multiple scattering solution is an exact solution to the problem. (AP/PROP) 211-1997

**multiple-secondary current transformer (1)** One that has three or more secondary windings, each on a separate magnetic circuit, with all magnetic circuits excited by the same primary winding. (PE/TR) C57.13-1993, C57.12.80-1978r **(2)** One that has two or more secondary coils each on a separate magnetic circuit with all magnetic circuits excited by the same primary winding. (PE/PSR) C37.110-1996

**multiple-shot blasting unit** A unit designed for firing a number of explosive charges simultaneously in mines, quarries, and tunnels. *See also:* blasting unit. (EEC/PE) [119]

**multiple sound track** Consists of a group of sound tracks, printed adjacently on a common base, independent in character but in a common time relationship, for example, two or more have been used for stereophonic sound recording. *See also:* phonograph pickup; multitrack recording system. (SP) [32]

**multiple speed floating** *See:* control system, multiple-speed floating.

**multiple-speed floating control system (automatic control)** A form of floating control system in which the manipulated variable may change at two or more rates each corresponding to a definite range of values of the actuating signal. (PE/EDPG) [3]

**multiple spot scanning (facsimile)** The method in which scanning is carried on simultaneously by two or more scanning spots, each one analyzing its fraction of the total scanned area of the subject copy. *See also:* scanning. (COM) 168-1956w

**multiple street-lighting system** A street-lighting system in which street lights, connected in multiple, are supplied from a low-voltage distribution system. *See also:* direct-current distribution; alternating-current distribution. (T&D/PE) [10]

**multiple-supply-type ballast** A ballast designed specifically to receive its power from an approximately constant-voltage supply circuit and that may be operated in multiple (parallel) with other loads supplied from the same source. *Note:* The deviation in source voltage ordinarily does not exceed plus or minus 5%, but in the case of ballasts designed for a stated input voltage range, the deviation may by greater as long as it is within the stated range. (EEC/LB) [97]

**multiple switchboard (telephone switching systems)** A telecommunications switchboard having each line connected to two or more jacks so that the line is within the reach of several operators. (COM) 312-1977w

**multiple system (electrochemistry)** The arrangement in a multielectrode electrolytic cell whereby in each cell all of the anodes are connected to the positive bus bar and all of the cathodes to the negative bus bar. *See also:* electrorefining. (EEC/PE) [119]

**multiple threaded list** *See:* multilist.

**multiple thyristor converter** A thyristor converter in which two or more simple thyristor converters are connected in such a way that their direct currents add, but their commutations do not coincide. (IA/IPC) 444-1973w

**multiple-time-around echo** *See:* second-time-around echo.

**multiple transit signals** Spurious signals having delay time related to the main signal delay by small odd integers. Specific multiple transit signals may be labeled the third transit (triple transit), fifth transit, etc. There is often a tradeoff available between multiple transit signal levels and bandwidth, delay time, insertion loss, and VSWR (dispersive and nondispersive delay lines). (UFFC) 1037-1992w, [22]

**multiple transmission line** A planar transmission-line configuration employing more than one parallel guiding structure, each of which could form a single planar transmission line. (MTT) 1004-1987w

**multiple tube** A space-charge-controlled tube or valve containing within one envelope two or more units or groups of electrodes associated with independent electron streams, through sometimes with one or more common electrodes. Examples: Double diode, double triode, triode-heptode, etc. *Synonym:* multiple valve. *See also:* multiple-unit tube. (ED) 161-1971w

**multiple tube counts** Spurious counts induced by previous tube counts. (NI/NPS) 309-1999

**multiple-tuned antenna** An antenna designed to operate, without modification, in any of a number of pre-set frequency bands. (AP/ANT) 145-1993

**multiple twin quad (telephony)** A quad in which the four conductors are arranged in two twisted pairs, and the two pairs twisted together. *See also:* cable. (EEC/PE) [119]

**multiple unit** A system of simultaneous control of all vehicles in a consist from one master control through the means of trainlines. (VT) 1475-1999

**multiple-unit control (electric traction)** A control system in which each motive-power unit is provided with its own controlling apparatus and arranged so that all such units operating

together may be controlled from any one of a number of points on the units by means of a master controller. (EEC/PE) [119]

**multiple-unit electric car** An electric car arranged either for independent operation or for simultaneous operation with other similar cars (when connected to form a train of such cars) from a single control station. *Note:* A prefix diesel-electric, gas-electric, etc., may replace the word electric. *See also:* electric motor car. (EEC/PE) [119]

**multiple-unit electric locomotive** A locomotive composed of two or more multiple-unit electric motive-power units connected for simultaneous operation of all such units from a single control station. *Note:* A prefix diesel-electric, turbine-electric, etc., may replace the word electric. *See also:* electric locomotive. (EEC/PE) [119]

**multiple-unit electric motive-power unit** An electric motive-power unit arranged either for independent operation or for simultaneous operation with other similar units (when connected to form a single locomotive) from a single control station. *Note:* A prefix diesel-electric, gas-electric, turbine-electric, etc., may replace the word electric. *See also:* electric locomotive. (EEC/PE) [119]

**multiple-unit electric train** A train composed of multiple-unit electric cars. *See also:* electric motor car. (EEC/PE) [119]

**multiple-unit tube** *See:* multiple tube.

**multiple valve** *See:* multiple tube.

**multiple-valve unit (MVU)** A single structure comprising more than one valve. (SUB/PE) 857-1996

**multiplex** To interleave or simultaneously transmit two or more messages on a signal channel. (C/PE) 610.10-1994w, 599-1985w

**multiplex equipment, asynchronous** A transmission interconnection device that interleaves nonsynchronous low bit-rate digital signals to form a single high bit-rate digital signal. It also performs the reverse function of dividing a high bit-rate digital signal into multiple nonsynchronous low bit-rate signals. The two processes are referred to in this document as multiplexing (combining signals) and demultiplexing (separating signals). Similarly, the mechanisms used to perform these functions are referred to as multiplex equipment. (COM/TA) 1007-1991r

**multiplex equipment, digital** The equipment for combining digital signals from one digital level to a higher digital level. (COM/TA) 1007-1991r

**multiplex equipment, primary** The equipment for combining analog (vf) signals, or digital data signals, to a primary rate digital signal and vice versa. (COM/TA) 1007-1991r

**multiplexer (A) (supervisory control, data acquisition, and automatic control)** A device that allows the interleaving of two or more signals to a single line or terminal. **(B) (supervisory control, data acquisition, and automatic control)** A device for selecting one of a number of inputs and switching its information to the output. (SWG/PE/SUB) C37.1-1987, C37.100-1992

**(2) (A)** A device that allows the transmission of a number of different signals simultaneously over a single channel or transmission facility. *Synonym:* multiplexor. **(B)** A device capable of interleaving the events of two or more activities or of distributing the events of an interleaved sequence to their respective activities. *Contrast:* demultiplexer. (C) 610.7-1995

**multiplexing (1) (modulation systems) (data transmission)** The combining of two or more signals into a single wave (the multiplex wave) from which the signals can be individually recovered. (PE) 599-1985w

**(2)** The division of a transmission facility into two or more channels, either by splitting the frequency band transmitted by the channel into narrower bands, each of which is used to constitute a distinct channel (frequency division multiplexing) or by allotting this common channel to several different information channels one at a time (time-division multiplexing). (SUB/PE) 999-1992w

**(3)** Subdivision of a common channel to make two or more channels by splitting the frequency band transmitted by the common channel into narrower bands, by allotting this common channel to several different information channels, or by other means, one at a time. *Contrast:* demultiplexing. *See also:* time compression multiplexing; frequency-division multiplexing; time-division multiplexing; synchronous time division multiplexing; time multiplexed switching. (C) 610.7-1995

**multiplex lap winding (rotating machinery)** A lap winding in which the number of parallel circuits is equal to a multiple of the number of poles. (PE) [9]

**multiplexor (hybrid computer linkage components)** An electronic multiposition switch under the control of a digital computer, generally used in conjunction with an analog-to-digital converter (ADC), that allows for the selection of any one of a number of analog signals (up to the maximum capacity of the multiplexor), as the input to the ADC. A device that allows the interleaving of two or more signals to a single line or terminus. (C) 166-1977w

**multiplex printing telegraphy** That form of printing telegraphy in which a line circuit is employed to transmit in turn one character (or one or more pulses of a character) for each of two or more independent channels. *See also:* time-division multiplexing; telegraphy; frequency-division multiplexing. (EEC/PE) [119]

**multiplex radio transmission** The simultaneous transmission of two or more signals using a common carrier wave. *See also:* radio transmission. (AP/ANT) 145-1983s

**multiplex wave winding (rotating machinery)** A wave winding in which the number of parallel circuits is equal to a multiple of two, whatever the number of poles. (BT) 204-1961w

**multiplicand** A number to be multiplied by another number (the multiplier) to produce a result (the product). (C) 1084-1986w

**multiplication factor (1) (power operations)** A measure of the change in the neutron population in a reactor core from one generation to the subsequent generation. *See also:* effective multiplication factor; infinite multiplication factor. (PE/PSE) 858-1987s

**(2) (multiplier type of valve or tube) (thermionics)** The ratio of the output current to the primary emission current. *See also:* electron emission. (ED) [45], [84]

**multiplication time** *See:* multiply time.

**multiplication transformation function** In hashing, a hash function that returns the original key multiplied by some value. For example, in the function below, the original key is multiplied by the length of the record in which it is found.

| Original Record | Calculation | Hash Value |
|---|---|---|
| 35 Bob White | $35 \times 13 = 448$ | 448 |
| 41 Richard Doe | $41 \times 17 = 697$ | 697 |

*See also:* mid-square function. (C) 610.5-1990w

**multiplicative array antenna system** A signal-processing antenna system consisting of two or more receiving antennas and circuitry in which the effective angular response of the output of the system is related to the product of the radiation patterns of the separate antennas. (AP/ANT) 145-1993

**multiplier (1) (general)** A device that has two or more inputs and whose output is a representation of the product of the quantities represented by the input signals. (Std100) 270-1966w

**(2) (analog computer)** In an analog computer, a device capable of multiplying one variable by another. (C) 165-1977w

**(3) (mathematics of computing)** A number by which another number (the multiplicand) is multiplied to produce a result (the product). (C) 1084-1986w

**(4)** A device capable of multiplying one variable by another. *Contrast:* divider. *See also:* two-quadrant multiplier; one-quadrant multiplier; analog multiplier; four-quadrant multiplier. (C) 610.10-1994w

**(5)** *See also:* normal linearity; servo multiplier; constant multiplier.

**multiplier, constant** *See:* constant multiplier.

**multiplier, electronic** *See:* electronic multiplier.

**multiplier, four-quadrant** *See:* four-quadrant multiplier.

**multiplier, one-quadrant** *See:* one-quadrant multiplier.

**multiplier phototube** A phototube with one or more dynodes between its photocathode and output electrode. *See also:* amplifier; photocathode. (ED/NPS) 161-1971w, 398-1972r

**multiplier potentiometer (analog computer)** Any of the ganged potentiometers of a servo multiplier that permit the multiplication of one variable by a second variable. (C) 165-1977w, 166-1977w

**multiplier section, electron** *See:* electron multiplier.

**multiplier servo** An electromechanical multiplier in which one variable is used to position one or more ganged potentiometers across which the other variable voltages are applied. *See also:* electronic analog computer; multiplier. (C) 165-1977w, 166-1977w, 610.10-1994w

**multiplier, two-quadrant** *See:* two-quadrant multiplier.

**multiplying-digital-to-analog converter** *See:* digital-to-analog multiplier.

**multiplying punch** *See:* calculating punch.

**multiply time** The elapsed time required to perform one multiplication operation, not including the time required to obtain the operands or to return the result to storage. *Synonym:* multiplication time. *Contrast:* subtract time; add time. (C) 610.10-1994w

**multipoint** Pertaining to a circuit or a communication arrangement where one line connects several stations. *Contrast:* multidrop. *See also:* point-to-point. (C) 610.7-1995

**multipoint circuit (data transmission)** A circuit interconnecting several stations. (PE) 599-1985w

**multipoint connection (1)** A configuration in which more than two stations are connected to a shared communications channel. (LM/COM) 168-1956w

**(2)** A connection between two data stations using one or more intermediate stations. (C) 610.7-1995

**multipole fuse (1) (high-voltage switchgear)** An assembly of two or more single-pole fuses. (SWG/PE) C37.40-1993

**(2)** *See also:* pole. (SWG/PE) C37.100-1981s

**multipole operation** (of a circuit breaker or switching device) A description term indicating that all poles of the device are linked mechanically, electrically, or by other means such that they change state (open or close) substantially simultaneously. Devices may have capability for multipole opening, multipole closing, or both. (SWG/PE) C37.100-1992

**multi-port** *See:* fan-out box.

**multiport bridge** A bridge that interconnects two or more DQDB subnetworks. (LM/C) 8802-6-1994

**multiport memory** A type of memory that can be simultaneously read or written to by two or more devices through the use of separate address and data buses. (C) 610.10-1994w

**multi-port module** A module that has a special pin assignment to connect to multiple other modules. Examples of multi-port modules are switch modules and multi-port memory modules. (C/BA) 14536-1995

**multiposition relay** A relay that has more than one operate or nonoperate position, for example, a stepping relay. *See also:* relay. (EEC/REE) [87]

**multiposition switches (A)** (self-returning switch) A switch that returns to a stated position when it is released from any one of a stated set of other positions. **(B)** (spring return switch) A switch in which the self-returning function is effected by the action of a spring. **(C)** (gravity-return switch) A switch in which the self-returning function is effected by the action of weight. **(D)** (self-positioning switch) A switch that assumes a certain operating position when it is placed in the neighborhood of the position. *See also:* switch. (IA/ICTL/IAC) [60]

**multiprecision** *See:* multiple precision.

**multipressure-zone pothead (electric power distribution)** A pressure-type pothead intended to be operated with two or more separate pressure zones that may be at different pressures. *See also:* pressure-type pothead; single-pressure-zone potheads. (PE) 48-1975s

**multipressure zone termination** *See:* pressure-type termination.

**multiprocessing (1) (computers)** Pertaining to the simultaneous execution of two or more programs or sequences of instructions by a computer network consisting of two or more processors. *See also:* parallel processing; multiprogramming. (C) [20]

**(2) (software)** A mode of operation in which two or more processes are executed concurrently by separate processing units that have access (usually) to a common main storage. *Contrast:* multiprogramming. *See also:* time sharing; multitasking. (C) 610.12-1990

**multiprocessor (computers)** A computer capable of multiprocessing. (C) [20], [85]

**(2) (A)** A computer or network of computers that can execute two or more programs concurrently under integrated control. **(B)** A computer that has more than one processor. *Contrast:* uniprocessor. (C) 610.10-1994

**multiprocessor architecture** An architecture employing two or more stand-alone processors whose activities are coordinated under a central control. *Contrast:* single processor architecture. (C) 610.10-1994w

**multiprogramming (1) (computers)** Pertaining to the interleaved execution of two or more programs by a computer. *See also:* parallel processing. (C) [20], [85]

**(2) (software)** A mode of operation in which two or more computer programs are executed in an interleaved manner by a single processing unit. *Contrast:* multiprocessing. *See also:* multitasking; time sharing. (C) 610.12-1990

**multi-radio-frequency-channel transmitter** *See:* multichannel radio transmitter.

**multirange amplifier** An amplifier that has a switchable, programmable, or automatically set amplification factor in order to adapt different analog signal ranges to a specified output range. (C) 610.10-1994w

**multirate meter** A meter that registers at different rates or on different dials at different hours of the day. *See also:* electricity meter. (EEC/PE) [119]

**multi-ratio current transformer (1) (instrument transformers) (power and distribution transformers)** One from which more than one ratio can be obtained by the use of taps on the secondary winding. (PE/PSR) C37.110-1996, C57.12.80-1978r

**(2)** One with three or more ratios obtained by the use of taps on the secondary winding. (PE/TR) C57.13-1993

**multirestraint relay** A restraint relay so constructed that its operation may be restrained by more than one input quantity. (SWG/PE) C37.100-1992

**multisection coil (rotating machinery)** A coil consisting of two or more coil sections or a group of turns, each section or group being individually insulated. (PE) [9]

**multisegment magnetron** A magnetron with an anode divided into more than two segments, usually by slots parallel to its axis. *See also:* magnetron. (ED) 161-1971w

**multispeed motor** A motor that can be operated at any one of two or more definite speeds, each being practically independent of the load. For example, a dc motor with two armature windings, or an induction motor with windings capable of various pole groupings. (IA/MT) 45-1998

**multistage tube (x-ray tubes)** An x-ray tube in which the cathode rays are accelerated by multiple ring-shaped anodes at progressively higher potential. (ED) [45]

**multistate indication** *See:* supervisory control functions.

**multistatic radar** A radar system having two or more transmitting or receiving antennas with all antennas separated by

large distances when compared to the antenna sizes. *See also:* bistatic radar. (AES) 686-1997

**multistator electromechanical watthour meter** A multistator meter (polyphase electromechanical watthour meter or multielement watthour meter) is a watthour meter containing more than one stator. (ELM) C12.10-1987

**multi-step control** *See:* step control system.

**multi-step control system** *See:* step control system.

**multistream computer** A computer that is capable of executing multiple streams of instructions simultaneously. *See also:* multiple instruction, multiple data; multiple instruction, single data. (C) 610.10-1994w

**multistrip coupler (MSC)** An array of metal strips deposited on a piezoelectric substrate with lengths transverse to the propagation direction, which transfers acoustic power from one acoustic path to an adjacent parallel path. (UFFC) 1037-1992w

**multi-tap (1)** A passive distribution component composed of a directional coupler and a splitter with two or more output connections. *See also:* tap. (LM/C) 802.7-1989r

**(2)** *See also:* fan-out box. (C) 610.7-1995

**multitasking (1)** A mode of operation in which two or more tasks are executed in an interleaved manner. *See also:* time sharing; multiprogramming; multiprocessing. (C) 610.12-1990

**(2)** A mode of operation that provides for concurrent performance or interleaved execution of two or more tasks. (C) 610.10-1994w

**multiterminal** A transmission line with more than two terminals having a source of power. (PE/PSR) C37.113-1999

**multiterminal surge-protective device** A protective device that has three or more terminals, usually containing both series and parallel elements between the terminals. (SPD/PE) C62.62-2000

**multitrace (oscilloscopes)** A mode of operation in which a single beam in a cathode-ray tube is shared by two or more signal channels. *See also:* chopped display; alternate display; oscillograph. (IM/HFIM) [40]

**multitrack recording system** A system that provides two or more recording tracks on a medium, resulting in either related or unrelated recordings in common time relationship. *See also:* multiple sound track; phonograph pickup. (SP) [32]

**multivalent function** If to any value of $u$ there corresponds more than one value of $x$ (or more than one set of values of $x_1, x_2, \ldots, x_n$) then $u$ is a multivalent function. Thus $u = \sin x$, $u = x^2$ are multivalent. (Std100) 270-1966w

**multivalued** A mapping that is not a function. *Contrast:* function; single-valued. (C/SE) 1320.2-1998

**multivalued dependency** A type of dependency among three attributes A, B, and C in relation R, in which B is multivalued dependent on A if, and only if, the set of values of B that match a given pair of values for A and C depends only on the value for A and is independent of the value for C. *See also:* fourth normal form. (C) 610.5-1990w

**multivalued function** If to any value of $x$ (or any set of values of $x_1, x_2, \ldots, x_n$) there corresponds more than one value of $u$, then $u$ is a multivalued function. Thus $u = \cos^{-1} x$ is multivalued. (Std100) 270-1966w

**multivalued property** A property with a multi-valued mapping. *Contrast:* single-valued property. (C/SE) 1320.2-1998

**multivariable function generator (analog computer)** A function generator with more than one input. (C) 165-1977w

**multivariable system** A system whose input vector and.or output vector has more than one element. (CS/PE/EDPG) [3]

**multivibrator** A relaxation oscillator employing two electron tubes to obtain the in-phase feedback voltage by coupling the output of each to the input of the other through, typically, resistance-capacitance elements. *Notes:* 1. The fundamental frequency is determined by the time constants of the coupling elements and may be further controlled by an external voltage. 2. A multivibrator is termed free-running or driven, according to whether its frequency is determined by its own circuit constants or by an external synchronizing voltage. The name multivibrator was originally given to the free-running multivibrator, having been suggested by the large number of harmonics produced. 3. When such circuits are normally in a nonoscillating state and a trigger signal is required to start a single cycle of operation, the circuit is commonly called a one-shot, a flip-flop, or a start-stop multivibrator. *See also:* oscillatory circuit. (AP/ANT) 145-1983s

**multivoltage control (elevators)** A system of control that is accomplished by impressing successively on the armature of the driving-machine motor a number of substantially fixed voltages such as may be obtained from multicommutator generators common to a group of elevators. *See also:* control. (EEC/PE) [119]

**multiway merge sort** A merge sort in which the set to be sorted is divided into two or more ordered subsets that are merged by comparing the smallest items of each subset, outputting the smallest of those, then repeating the process. *See also:* two-way merge sort. (C) 610.5-1990w

**multiway radix trie search** A radix trie search using a trie of order greater than 2, in which more than one digit is considered on each branch. *See also:* binary radix trie search. (C) 610.5-1990w

**multiway tree** A tree of order greater than 2. (C) 610.5-1990w

**multiwire branch circuit** A branch circuit consisting of two or more ungrounded conductors having a potential difference between them, and a grounded conductor having equal potential difference between it and each ungrounded conductor of the circuit and which is connected to the neutral conductor of the system. (NESC/NEC) [86]

**multiwire element** A radiating element composed of several wires connected in parallel, the assemblage being the electrical equivalent of a single conductor larger than any one of the individual wires. (AP/ANT) 145-1993

**MUMPS** *See:* Massachusetts General Hospital Utility Multi-Programming System.

**municipal fire-alarm system** A manual fire-alarm system in which the stations are accessibly located for operation by the public, and the signals of which register at a central station maintained and operated by the municipality. *See also:* protective signaling. (EEC/PE) [119]

**municipal police report system** A system of strategically located stations from any one of which a patrolling policeman may report his presence to a supervisor in a central office maintained and operated by the municipality. *See also:* protective signaling. (EEC/PE) [119]

**M-unit** *See:* refractive modulus.

**Munsell chroma (1) (illuminating engineering)** The index of perceived (Y) and chromaticity coordinates (x,y) for CIE Standard Illuminant C and the CIE 1931 Standard Observer. (EEC/IE) [126]

**(2) (television)** The dimension of the Munsell system of color that corresponds most closely to saturation. *Note:* Chroma is frequently used, particularly in English works, as the equivalent of saturation. (BT/AV) 201-1979w

**Munsell color system (illuminating engineering)** A system of surface-color specification based on perceptually uniform color scales for the three variables: Munsell hue, Munsell value, and Munsell chroma. For an observer of normal color vision, adapted to daylight, and viewing the specimen when illuminated by daylight and surrounded with a middle gray to white background, the Munsell hue, value, and chroma of the color correlate well with the hue, lightness, and perceived chroma. *Note:* A number of other color specification systems have been developed, usually for specific commercial purposes. (IE/EEC/BT/AV) [126], 201-1979w

**Munsell hue (1) (H illuminating engineering)** The index of the hue of the perceived object color defined in terms of the luminance factor (V) and chromaticity coordinates (x,y) for

CIE Standard Illuminant C and the CIE 1931 Standard Observer. (EEC/IE) [126]

**(2) (television)** The index of the hue of the perceived object color defined in terms of the Y value and chromaticity coordinates (x,y) of the color of the light reflected or transmitted by the object. (BT/AV) 201-1979w

**Munsell value (1) (V illuminating engineering)** The index of the lightness of the perceived object color defined in terms of the luminance factor (Y) for CIE Standard Illuminant C and the CIE 1931 Standard Observer. *Note:* The exact definition gives Y as a 5th power function of V so that tabular or iterative methods are needed to find V as a function of Y. However, V can be estimated within ±0.1 by V11.6 (Y/100)1/3-1.6 or within ±0.6 by VY1/2 where Y is the luminance factor expressed in percent. (IE/EEC) [126]

**(2) (television)** The index of the lightness of the perceived object color defined in terms of the Y value. *Note:* Munsell value is approximately equal to the square root of the reflectance expressed in percent. (BT/AV) 201-1979w

**musa antenna** *See:* antenna.

**must operate value** *See:* relay-must-operate value.

**mutable class** A class for which the set of instances is not fixed; its instances come and go over time. *Contrast:* immutable class. *See also:* state class. (C/SE) 1320.2-1998

**mutation** *See:* program mutation.

**mutation testing** A testing methodology in which two or more program mutations are executed using the same test cases to evaluate the ability of the test cases to detect differences in the mutations. (C) 610.12-1990

**mutex (1)** A synchronization object used to allow multiple threads to serialize their access to shared data. This term is derived from the capability it provides, namely, mutual exclusion. The thread that has locked a mutex becomes its owner and remains the owner until that same thread unlocks the mutex. (C/PA) 9945-1-1996

**(2)** A synchronization object used to allow multiple tasks (possibly in different processes) to serialize their access to shared data or other shared resources. The name derives from the capability it provides, namely, mutual exclusion. (C) 1003.5-1999

**(3)** A mechanism for implementing mutual exclusion. (IM/ST) 1451.1-1999

**mutex owner** The task that last locked a mutex, until that same task unlocks the mutex. (C) 1003.5-1999

**Mutex Service** An instance of the class `IEEE1451_MutexService` or of a subclass thereof. (IM/ST) 1451.1-1999

**mutual capacitance** The capacitance between two conductors in a pair when the rate of change of the charges on the two are equal in magnitude but opposite in sign, and the potentials of the remaining conductors in the cable are held constant. (PE/PSC) 789-1988w

**mutual coherence function** The normalized coherence function. *See also:* coherence function. (AP/PROP) 211-1997

**mutual conductance** The control-grid-to-anode transconductance. *See also:* ON period. (ED) [45], [84]

**mutual coupling effect (A)** (on input impedance of an array element) The change in input impedance of an array element from the case when all other elements are present but open circuited to the case when all other elements are present and excited. **(B)** (on the radiation pattern of an array antenna) The change in antenna pattern from the case when a particular feeding structure is attached to the array and mutual impedances among elements are ignored in deducing the excitation, to the case when the same feeding structure is atached to the array and mutual impedances among elements are included in deducing the excitation. (AP/ANT) 145-1993

**mutual impedance (1)** The mutual impedance between any two terminal pairs in a multielement array antenna is equal to the open-circuit voltage produced at the first terminal pair divided by the current supplied to the second when all other terminal pairs are open circuited. *See also:* antenna. (AP/ANT) [35], 149-1979r, 145-1993

**(2)** The ratio of the total induced open-circuit voltage on the disturbed circuit to the disturbing electric supply system phase current, with the effect of all conductors taken into account. (PE/PSC) 367-1996

**mutual inductance** The common property of two electric circuits whereby an electromotive force is induced in one circuit by a change of current in the other circuit. *Notes:* 1. The coefficient of mutual inductance $M$ between two windings is given by the following equation

$$M = \frac{\partial i}{\partial \lambda}$$

where λ is the total flux linkage of one winding and $i$ is the current in the other winding. 2. The voltage $e$ induced in one winding by a current $i$ in the other winding is given by the following equation

$$e = -\left[ M \frac{\mathrm{d}i}{\mathrm{d}t} + i \frac{\mathrm{d}M}{\mathrm{d}t} \right]$$

If $M$ is constant

$$e = -M \frac{\mathrm{d}i}{\mathrm{d}t}$$

(CHM) [51]

**mutual inductor** An inductor for changing the mutual inductance between two circuits. (Std100) 270-1966w

**mutual information** The amount of information about one event, say $x = a$, provided by another event, say $y = b$, for example, $I_{x,y}^{(a;b)} = \log P_{x\,y}^{(a\,b)}$ over $P_x^{(a)}$, where $P_x^{(a)}$ is the probability that $x = a$ and $P_{x\,y}^{(a\,b)}$ is the probability that $x = a$ and $P_{x\,y}^{(a\,b)}$ is the conditional probability that $x = a$ given that $y = b$. *Note:* This quantity is symmetric in its two arguments; that is, $I_{y,x}^{(b;a)} = I_{x,y}^{(a;b)}$. *See also:* information. (IT) [123]

**mutual interference chart** A plot or matrix, with ordinate and abscissa representing the tuned frequencies of a single transmitter-receiver combination, that indicates potential interference to normal receiver operation by reason of interaction of the two equipments under consideration at any combination of tuned transmit/receive frequencies. *Note:* This interaction includes transmitter harmonics and other spurious emissions, and receiver spurious responses and images. *See also:* electromagnetic compatibility. (EMC) [53]

**mutually exclusive events (nuclear power generating station) (reliability analysis of nuclear power generating station safety systems)** Events that cannot exist simultaneously. (PE/NP) 352-1987r

**mutual resistance of grounding electrodes** Equal to the voltage change in one of them produced by a change of one ampere of direct current in the other, and is expressed in ohms. (PE/PSIM) 81-1983

**mutual surge impedance (surge arresters)** The apparent mutual impedance between two lines, both of infinite length. *Note:* It determines the relationship between the surge voltage induced into one line by a surge current of short duration in the other. (PE) [8], [84]

**MUX** *See:* multiplexer.

**MVU** *See:* multiple-valve unit.

# P

**p** *See:* pico.

**PA** Pre-arbitrated. (LM/C) 802.6-1990r

**PA access function** *See:* pre-arbitrated (PA) access function.

**PABX** *See:* private automatic branch exchange.

**pace voltage (surge arresters)** A voltage generated by ground current between two points on the surface of the ground at a distance apart corresponding to the conventional length of an ordinary pace. (PE) [8], [84]

**PACF** *See:* phase angle correction factor.

**pacing (1) (Class 1E connection assemblies)** A method of ongoing qualification by parallel age conditioning. (PE/NP) 572-1985r

**(2)** A method to regulate the flow of bytes read from or written to a Smart Transducer Interface Module. (IM/ST) 1451.2-1997

**pack (1)** To compress several items of data in a storage medium in such a way that the individual items can later be recovered. (C) [20], [85]

**(2) (data management) (software)** To store data in a compact form in a storage medium, using known characteristics of the data and medium in such a way as to permit recovery of the data. *Contrast:* unpack. *See also:* packed data. (C) 610.5-1990w, 610.12-1990

**package (1) (software)** A separately compilable software component consisting of related data types, data objects, and subprograms. *See also:* encapsulation; information hiding; data abstraction. (C) 610.12-1990

**(2)** The combination of a node's properties, methods, and private data. (C/BA) 1275-1994

**(3)** An external container, substrate, or platform used to hold a semiconductor or circuit. *Note:* it may be made of plastic or ceramic with many interfacing pins. (C) 610.10-1994w

**(4)** A group of related OM classes. (C/PA) 1328.2-1993w, 1327.2-1993w, 1224.2-1993w, 1326.2-1993w

**(5)** A group of related classes. (C/PA) 1328-1993w, 1238.1-1994w, 1224-1993w, 1224.1-1993w, 1327-1993w

**package closure** The set of classes that need to be supported in order to be able to create all possible instances of all classes defined in the package. (C/PA) 1328-1993w, 1224-1993w, 1327-1993w

**package, core** *See:* core package.

**package instance** A data structure resulting from the opening of a particular package, consisting of a set of values for the package's private data. (C/BA) 1275-1994

**packaged magnetron** An integral structure comprising a magnetron, its ma gnetic circuit, and its output matching device. *See also:* magnetron. (ED) 161-1971w, [45]

**packager role** Where software that has been developed is organized in a form suitable for distribution. (C/PA) 1387.2-1995

**packaging (1) (software)** In software development, the assignment of modules to segments to be handled as distinct physical units for execution by a computer. (C) 610.12-1990

**(2)** The process of containing, connecting, protecting, and sealing circuits and components into enclosures such as devices, modules, or housings. (C) 610.10-1994w

**packaging machine** Any automatic, semiautomatic, or hand-operated apparatus that performs one or more packaging functions, such as, but not limited to, the fabrication, preparation, filling, closing, labeling, or preparing, or both, for final distribution of any type of package or container used to protect or display, or both, any product. (IA/PKG) 333-1980w

**packed array** An array in which all data elements in the set have non-trivial values. *Synonym:* dense list. (C) 610.5-1990w

**packed binary data** Binary data stored in a compact form in a storage medium, using known characteristics of the data and the medium to permit recovery of the data. (C) 610.5-1990w

**packed data** Data stored in a compact form in a storage medium, using known characteristics of the data and the medium to permit recovery of the data. *See also:* packed decimal data; packed binary data. (C) 610.5-1990w

**packed decimal data** Integer data stored in a compact form in a storage medium, using known characteristics of the data and the medium to permit recovery of the data. In the most common implementation, each decimal digit is represented in binary, occupying four bits, and the right-most decimal digit is followed by a four-bit sign digit (hexadecimal A,C,E, or F for positive; B or D for negative).

| | |
|---|---|
| decimal | $275_{10}$ |
| packed decimal | $0010\ 0111\ 0101\ 1111_2 = 275F_{16}$ |
| decimal | $-91_{10}$ |
| packed decimal | $0000\ 1001\ 0001\ 1011_2 = 091B_{16}$ |

*See also:* unsigned packed decimal data. (C) 610.5-1990w

**packet (1)** A group of binary digits including data and control elements which is switched and transmitted as a composite whole. The data and control elements and possibly error control information are arranged in a specified format. (LM/COM) 168-1956w

**(2) (MULTIBUS II)** A block of information that is transmitted within a single transfer operation in message space. *See also:* message space; transfer operation. (C/MM) 1296-1987s

**(3)** A collection of symbols that contains addressing information and is protected by a CRC. A subaction consists of two packets, a send packet and an echo packet. (C/MM) 1596-1992

**(4)** A 17-bit unit of data consisting of a 16-bit word plus 1 parity bit. (TT/C) 1149.5-1995

**(5)** A sequence of N_chars with a specific order and format. A packet consists of a destination followed by a payload. A packet is delimited by an end_of_packet marker. *See also:* destination; payload. (C/BA) 1355-1995

**(6)** A unit of data of some finite-size that is transmitted as a unit. *Note:* Usually consists of a header containing control information such as a sequence number, the network address of the station that originated the packet, and the network address of the packet's destination. *See also:* long packet; short packet. (C) 610.7-1995, 610.10-1994w

**(7)** A serial stream of clocked data bits. A packet is normally the PDU for the link layer, although the cable physical layer can also generate and receive special short packets for management purposes. (C/MM) 1394-1995

**(8)** A collection of symbols that contains addressing information and is protected by a CRC. A subaction consists of two packets: a send packet and an echo packet. (C/MM) 1596.3-1996

**(9)** A block of information that is transmitted within a single transfer operation. (C/MM) 1596.4-1996

**(10)** A structured field, having a start byte, a two-byte length field (the first two bytes), a flag byte, a command byte, followed by the subcommand and/or data fields. (C/MM) 1284.1-1997

**(11)** Consists of a data frame as defined previously, preceded by the Preamble and the Start Frame Delimiter, encoded, as appropriate, for the Physical Layer (PHY) type. (C/LM) 802.3-1998

**(12) (local area networks)** The total information transmitted over the link medium, including the preamble, the MAC frame, and the start of stream and end of stream delimiters. *See also:* frame. (C) 8802-12-1998

**(13)** A sequence of bits transmitted on Serial Bus and delimited by DATA_PREFIX and DATA_END. (C/MM) 1394a-2000

**(14)** A group of bytes, including address, data, and control elements. (C/MM) 1284.4-2000

**packet assembler/disassembler (PAD) (1)** A device that assembles and disassembles packets. (LM/C/COM) 8802-9-1996

**(2)** A protocol conversion device that performs packet assembly/disassembly. *Note:* Generally refers to a terminal multiplexer device that connects hosts and terminals on a network. (C) 610.7-1995

**packet assembly/disassembly** The process of dividing a message into packets for transmission over a packet switching network and then reassembling the packets in the original message. (C) 610.7-1995

**PACKET COUNT packet** A packet by means of which an M-module conveys to addressed S-modules the number of packets to follow in the current message. S-modules may or may not include the ability to use the data in this packet. (TT/C) 1149.5-1995

**packet data network** *See:* packet switching network.

**packet data transfer** A very fast, but technology-dependent, noncompelled transfer mechanism used to transfer data from a source to a destination. (C/BA) 1014.1-1994w

**packet data transfer protocol** A very fast but technology-dependent noncompelled transfer mechanism that uses a compelled protocol over the entire packet to provide flow control. (C/BA/C/BA) 10857-1994, 896.4-1993w

**packet error** An error that occurs when a packet is lost in the network. *See also:* type error; address error; abnormal preamble; alignment error. (C) 610.7-1995

**packet handler (PH)** A device for processing packets or frames in a manner so as to be able to route individual frames or packets out of one data stream into multiple different data streams. (LM/C/COM) 8802-9-1996

**packetized data transfer** Transfer of data through a network where data is conveyed in packets and/or frames in a statistical manner. Packets or frames are propagated through the network and delivered to destinations based on addressing information contained therein. (LM/C/COM) 8802-9-1996

**packet latency** During a send/receive message, the number of packet transfers by which the first non-NULL DATA packet returned by the addressed S-module lags the first non-null DATA packet transmitted by the M-module. (TT/C) 1149.5-1995

**packet layer** The layer of the protocol concerned with end-to-end transmission of information, possibly through a number of intermediate routers. It is at the packet layer that the routing decisions are taken. (C/BA) 1355-1995

**packet mode protocol** The access protocol based on the use of out-of-band control and Link Layer multiplexing. (LM/C/COM) 8802-9-1996

**packet pair** Two packets, one transmitted by the M-module and one by an S-module, such that the last 14 bits of the M-module-originated packet are transmitted simultaneously with the first 14 bits of the S-module-originated packet. (TT/C) 1149.5-1995

**packet-switched data network (PSDN)** A packet-switched subnetwork that can be a PPSN (private) or a PSPDN (public) packet-switched network. (LM/C/COM) 8802-9-1996

**packet switched network** *See:* packet switching network.

**packet switched public data network (PSPDN)** A public subnetwork that is accessed via the CCITT X.25 protocol and that provides virtual circuit service. (LM/C/COM) 8802-9-1996

**packet switching (1)** A data transmission process, utilizing addressed packets, whereby a channel is occupied only for the duration of transmission of the packet. *See also:* store-and-forward switching; message switching; circuit switching. (LM/COM) 168-1956w

**(2)** A technique used in data communications in which messages are broken into finite-size packets and are forwarded to the other party over the network. Packets may vary in size so long as the size does not exceed the maximum size convention for the local network or protocol in use. *Note:* The packets need not travel the same path. At the end of the circuit, the packets are reassembled into the messages and are then passed on to the receiving terminals. *Contrast:* cell switching. *See also:* fast packet switching; virtual circuit. (C) 610.7-1995

**packet switching network** A network that uses packet switching techniques for transmission of data. *Synonyms:* packet switched network; packet data network. (C) 610.7-1995

**packet symbol** A symbol contained within a packet and protected by the packet's CRC. (Exception: part of the second symbol in a packet contains flow control information that is not covered by the CRC, but the symbol as a whole is still considered to be within the packet.) (C/MM) 1596-1992

**packing density (computers)** The number of useful storage cells per unit of dimension, for example, the number of bits per inch stored on a magnetic tape or drum track. (MIL/C) [2], [85], [20]

**packing fraction (fiber optics)** In a fiber bundle, the ratio of the aggregate fiber cross-sectional core area to the total cross-sectional area (usually within the ferrule) including cladding and interstitial areas. *See also:* ferrule; fiber bundle. (Std100) 812-1984w

**packing gland** An explosion-proof entrance for conductors through the wall of an explosionproof enclosure, to provide compressed packing completely surrounding the wire or cable, for not less than 0.5 in measured along the length of the cable. *See also:* mine feeder circuit. (EEC/PE) [119]

**PAD** *See:* packet assembler/disassembler; packet assembly/disassembly.

**pad (1) (data transmission) (attenuating pad)** A nonadjustable passive network that reduces the power level of a signal without introducing appreciable distortion. *Note:* A pad may also provide impedance matching. (PE) 599-1985w

**(2) (data management)** To fill an item such as a record or block with one or more filler characters in order to satisfy some prescribed condition. For example, in order to right justify a seven-character string in a ten-position field, three blank characters are used to pad the data. *See also:* zero fill; character fill. (C) 610.5-1990w

**(3) (local area networks)** Any combination of octets used to extend the end of the data field of the ISO/IEC 8802-3 MAC frame so that it will meet minimum length requirements. (C) 8802-12-1998

**padding (A)** The technique of filling out a fixed-length block of data with dummy characters, words, or records. **(B)** Dummy characters, words, or records used to fill out a fixed-length block of data. (C) 610.12-1990

**paddle** A cursor control device consisting of a rotatable knob and potentiometer used to control the position of a cursor on a display device. (C) 610.10-1994w

**pad electrode (dielectric heating)** One of a pair of electrode plates between which a load is placed for dielectric heating. (IA) 54-1955w, 169-1955w

**pad-mounted (1)** A method of supporting equipment, generally at ground level. (NESC) C2-1977s

**(2)** A general term describing equipment positioned on a surface-mounted pad located outdoors. The equipment is usually enclosed with all exposed surfaces at ground potential. (SWG/PE) C37.100-1992

**pad-mounted equipment** A general term describing enclosed equipment, the exterior of which enclosure is at ground potential, positioned on a surface-mounted pad. (NESC) C2-1997

**pad-mounted fused switchgear (PMFSG)** Load-interrupter switch and fuse assemblies in which all energized parts are insulated and completely enclosed within an enclosure when the doors and covers are securely closed. The overall enclo-

sure is of suitable environmental and tamper-resistant construction for out-door, above-ground installation. (SWG/PE) C37.73-1998

**pad-mounted transformer (power and distribution transformers)** An outdoor transformer utilized as part of an underground distribution system, with enclosed compartment(s) for high-voltage and low-voltage cables entering from below, and mounted on a foundation pad. (PE/TR) C57.12.80-1978r

**pad-type bearing (rotating machinery)** A journal or thrust-type bearing in which the bearing surface is not continuous but consists of separate pads. *See also:* bearing. (PE) [9]

**PAGE** A text-formatting language that uses two-character instruction codes to control typesetting. (C) 610.13-1993w

**page (1) (A)** A fixed-length segment of data or of a computer program treated as a unit in storage allocation. **(B)** In a virtual storage system, a fixed-length segment of data or of a computer program that has a virtual address and is transferred as a unit between main and auxiliary storage. (C/Std100) 610.12-1990, 610.5-1990

**(2)** A screenful of information on a video display terminal. (C) 610.12-1990

**(3) (or segment)** The smallest portion of memory that can be relocated by memory mappingtechniques. (BA/C) 896.3-1993w

**(4)** A unit of memory with a specific size defined as a power of 2. (C/BA) 1014.1-1994w

**(5) (A)** In virtual storage, a fixed length block of instructions or data that has a virtual address and that is transferred as a unit between real storage and auxiliary storage. **(B)** To transfer data between real and auxiliary storage as in definition (A). (C/Std100) 610.10-1994

**(6)** The granularity of process memory mapping or locking. Physical memory and memory objects can be mapped into the address space of a process on page boundaries and in integral multiples of pages. Process address space can be locked into memory—made memory-resident—on page boundaries and in integral multiples of pages. (C/PA) 9945-1-1996

**(7)** A section of the array that may be written to simultaneously. This usually refers to more than one byte. (ED) 1005-1998

**(8) (A)** A fixed-length block of data, especially that which fits into a single printed sheet. **(B)** To summon a particular page or the next logical page. *See also:* paging. (PE/NP) 1289-1998

**(9)** A logical representation of a single unit of printing media. It is a function of the document formatting rather than the printing process. There are one or more pages per impression. A "four-up" single-color printing will typically have four pages per impression. (C/MM) 1284.1-1997

**(10)** In Auto-Negotiation, the encoding for a Link Code Word. Auto-Negotiation can support an arbitrary number of Link Code Word encodings. Additional pages may have a predefined encoding or may be custom encoded. *See also:* message page; Unformatted Page. (C/LM) 802.3-1998

**(11)** The granularity of memory mapping and locking, *i.e.*, a fixed-length contiguous range of the address space of a process. Physical memory and memory objects can be mapped into the address space of a process on page boundaries and in integral multiples of pages. Process address space can be locked into memory (*i.e.*, made memory-resident) on page boundaries and in integral multiples of pages. *Note:* There is no implied requirement that usage of the term *page* in this interface for memory mapping necessarily be the same as the term might be used in a virtual memory implementation. (C) 1003.5-1999

**page breakage** A portion of main storage that is unused when the last page of data or of a computer program does not fill the entire block of storage allocated to it. *See also:* paging. (C) 610.12-1990

**page description language (PDL) (1)** A computer language in which commands from a text-formatting language are combined into higher-level instructions that can be used in other documents. Examples include GML, HPGL, Postscript, and TEX. *Synonym:* markup language. (C) 610.13-1993w

**(2)** A formal printer machine language, consisting of commands and data (or equivalently, operators and operands) used to specify and control the content and format of printed pages. A data stream encoded in a PDL is rendered into the printed page image by an interpreter. (C/MM) 1284.1-1997

**page eject character** *See:* form feed character.

**page fault** In demand paging, a condition that causes a program interrupt when a page must be read in from disk into main storage. (C) 610.10-1994w

**page frame** A block of main storage having the size of, and used to hold, a page. *See also:* paging. (C) 610.12-1990

**(2) (A)** In real storage, a storage location that has the size of a page. **(B)** An area of main storage used to hold a page. (C) 610.10-1994

**page makeup** *See:* computer-aided page makeup; photocomposition.

**page mode** A method of operation in which more than one memory location is written simultaneously. (ED) 1005-1998

**page orientation** The direction of print on a display device or page of paper; that is, left-to-right or top-to-bottom. *See also:* portrait orientation; landscape orientation. (C) 610.10-1994w

**page printer** A printer that prints one complete page of output at a time. For example, a computer-output microfilm printer or a laser printer. *Contrast:* character-at-a-time printer; line printer. (C) 610.10-1994w

**pager** A routine that initiates and controls the transfer of pages between main and auxiliary storage. *See also:* paging. (C) 610.12-1990

**page reader** A character reader whose input data are in the form of printed text. *See also:* optical character reader. (C) 610.10-1994w

**page reference** An expression that unambiguously identifies a model page. The page reference incorporates a diagram reference to the associated diagram, the type of page, and any sequencing data needed to distinguish different pages of the same type that are associated with the same diagram. (C/SE) 1320.1-1998

**page size (1)** The edge-to-edge dimensions of hard-copy documents, or the average characters per line and the number of lines per screen for electronically displayed documents. (C/SE) 1045-1992

**(2)** The number of storage units in a page. (C) 1003.5-1999

**page swapping** The exchange of pages between main storage and auxiliary storage. *See also:* paging. (C) 610.12-1990, 610.10-1994w

**page table** A table that identifies the location of pages in storage and gives significant attributes of those pages. *See also:* paging. (C) 610.12-1990

**page turning** *See:* paging.

**page type letter** The uppercase letter in a page reference that denotes a specific type of model page. (C/SE) 1320.1-1998

**page zero** In the paging method of storage allocation, the first page in a series of pages. (C) 610.12-1990

**pagination** *See:* automatic pagination.

**paging (1) (A)** A storage allocation technique in which programs or data are divided into fixed-length blocks called pages, main storage is divided into blocks of the same length called page frames, and pages are stored in page frames, not necessarily contiguously or in logical order. *Synonym:* block allocation. *Contrast:* contiguous allocation. **(B)** A storage allocation technique in which programs or data are divided into fixed-length blocks called pages, main storage is divided into

blocks of the same length called page frames, and pages are transferred between main and auxiliary storage as needed. *See also:* virtual storage; demand paging; anticipatory paging. **(C)** The transfer of pages as in definition (B). *Synonym:* page turning. *See also:* working set; page; page swapping; page frame; page zero; page breakage; page table; pager. (C) 610.12-1990

**(2) (A)** A storage allocation technique in which programs or data are divided into fixed-length blocks called pages, main stage is divided into blocks of the same called page frames, and pages are stored in page frames, not necessarily contiguously or in logical order. *See also:* segment. **(B)** The transfer of pages between main and auxiliary memory, as in definition (A). *Synonym:* page turning. (C) 610.10-1994

**(3)** A method of viewing and moving through data in which a user conceives of data as being grouped into pages and moves through it by discrete steps. *See also:* page. (PE/NP) 1289-1998

**paging device** An auxiliary storage device used primarily to hold pages. (C) 610.10-1994w

**paging rate** In a virtual memory system, the rate at which pages are being transferred between real storage and auxiliary storage. (C) 610.10-1994w

**pair** A term applied in electric transmission to two like conductors employed to form an electric circuit. *See also:* cable. (EEC/PE) [119]

**paired brushes (rotating machinery)** (pair of brushes) Two individual brushes that are joined together by a common shunt or terminal. *Note:* They are not to be confused with a split brush. *See also:* brush. (PE) [9]

**paired cable (nonquadded cable)** A cable in which all of the conductors are arranged in the form of twisted pairs, none of which is arranged with others to form quads. *See also:* cable. (EEC/PE) [119]

**pairing (scanning) (television)** The condition in which lines appear in groups of two instead of being equally spaced. (BT/AV) 201-1979w

**pair of brushes** *See:* paired brushes.

**PAL** *See:* programmable array logic.

**PAM** *See:* pulse amplitude modulation.

**PAM5×5** A block coding technique utilizing a 5×5 matrix (representing two 5-level signals) to generate pairs of quinary codes representing data nibbles and control characters. In 100BASE-T2, PAM5×5 code pairs are sent in parallel across two wire pairs. (C/LM) 802.3-1998

**pancake coil** A coil having the shape of a pancake, usually with the turns arranged in the form of a flat spiral. (EEC/PE) [119]

**pancake motor** A motor that is specially designed to have an axial length that is shorter than normal. (PE) [9]

**pane (1)** The rectangular area within a window where an application displays text or graphics. (C) 1295-1993w

**(2)** A component of a window. (C) 610.10-1994w

**paned window** A window that allows a user to view information in different panes of a window, separated by sashes. Panes can be shrunk or enlarged by moving the sash, but the total screen area occupied by the pane window remains constant. (C) 1295-1993w

**panel (1) (Class 1E control boards)** A unit of one or more sections of flat material suitable for mounting electric devices. (SWG/PE/NP) 420-1982, C37.100-1992

**(2) (packaging machinery)** An element of an electric controller consisting of a slab or plate on which various component parts of the controller are mounted and wired. (IA/ICTL/PKG/IAC) 330-1980w, 333-1980w, [60]

**(3) (A) (photovoltaic converter)** Combination of shingles or subpanels as a mechanical and electric unit required to meet performance specifications. *See also:* semiconductor. **(B) (solar cells)** The largest unit combination of solar cells or subpanels that is mechanically designed to facilitate manufacture and handling and that will establish a basis for electrical performance by test. **(C)** A distinct portion of an equipment's surface, usually defined by or contained within a frame or border; for example, a maintenance panel or an operator control panel. *See also:* control panel; plasma panel; display panel. (AES/C/SS) 307-1969, 610.10-1994

**(4) (computers)** *See also:* problem board; control panel. (AES/SS) 307-1969w

**panelboard** A single panel or group of panel units designed for assembly in the form of a single panel; including buses, automatic overcurrent devices, and with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall or partition and accessible only from the front. *See also:* switchboard. (NESC/NEC) [86]

**panel control** An assembly of man-machine interface devices. (SWG/PE) C37.100-1992

**panel efficiency (1) (photoelectric converter)** The ratio of available power output to incident radiant power intercepted by a panel composed of photoelectric converters. *Note:* This is less than the efficiency of the individual photoelectric converters because of area not covered by photoelectric converters, Joule heating, and photoelectric-converter mismatches. *See also:* semiconductor. (AES) [41]

**(2) (solar cells)** The ratio of available electric power output to total incident radiant power intercepted by the area of a panel composed of solar cells. *Note:* This depends on the spectral distribution of the radiant power source and junction temperature(s), requires uniform normal illumination on the intercepting area, and results in an efficiency less than the efficiency of the individual solar cells because of area not covered by solar cells, incident energy heating, solar cell mismatch, optical losses, and wiring losses. (AES/SS) 307-1969w

**panel-frame mounting** (of a switching device) Mounting on a panel frame in the rear of a panel with the operating mechanism on the front of the panel. (SWG/PE) C37.100-1992

**panel interface** A screen-oriented user interface designed to permit interactive processing. (C) 610.10-1994w

**panel system** An automatic telephone switching system that is generally characterized by the following features:

a) The contacts of the multiple banks over which selection occurs are mounted vertically in flat rectangular panels;
b) The brushes of the selecting mechanism are raised and lowered by a motor that is common to a number of these selecting mechanisms;
c) The switching pulses are received and stored by controlling mechanisms that govern the subsequent operations necessary in establishing a telephone connection.

(EEC/PE) [119]

**panic brake** Using any available form of braking, whether or not fail-safe, to obtain the shortest possible stopping distance. (VT) 1475-1999

**panning (1) (computer graphics)** In computer graphics, the process of moving an entire display image in such a manner that new data appears within the viewport as old data disappears, to give a visual impression of horizontal movement of the image. *Note:* The term panning is sometimes used to mean horizontal or vertical movement. *Contrast:* scrolling. (C) 610.6-1991w

**(2)** *See also:* scrolling. (C) 610.2-1987

**paper feed** A mechanism that positions the printing medium as the paper is moved into a printing device. (C) 610.10-1994w

**paperless office** An office that has been automated so that no paper documents are needed. *See also:* office automation; electronic office. (C) 610.2-1987

**paper-lined construction (dry cell) (primary cell)** A type of construction in which a paper liner, wet with electrolyte, forms the principal medium between the negative electrode, usually zinc, and the depolarizing mix. (A layer of paste may lie between the paper liner and the negative electrode.) *See also:* electrolytic cell. (PE/EEC) [119]

**paper tape** *See:* punch tape.

**paper tape reader** A reader that senses hole patterns in punched paper tape and translates them into internal machine data representations. *Synonym:* perforated tape reader. (C) 610.10-1994w

**paper throw character** *See:* form feed character.

**paper traffic** *See:* information traffic.

**PAR** *See:* precision-approach radar.

**parabolic approximation** *See:* parabolic equation.

**parabolic equation** Results when the Helmholtz equation is approximated to emphasize preferred propagation in the axial direction, leading to a differential equation of parabolic form. *Synonym:* parabolic approximation. (AP/PROP) 211-1997

**parabolic profile (fiber optics)** A power-law index profile with the profile parameter, g, equal to 2. *Synonym:* quadratic profile. *See also:* multimode optical waveguide; profile parameter; power-law index profile; graded index profile. (Std100) 812-1984w

**parabolic torus reflector** A toroidal reflector formed by rotating a segment of a parabola about a non-intersecting co-planar line. (AP/ANT) 145-1993

**paraboloidal reflector** An axially symmetric reflector that is a portion of a paraboloid. *Note:* This term may be applied to any reflector that is a portion of a paraboloid, provided the term is appropriately qualified. For example, if the reflector is a portion of a paraboloid but does not include its vertex, then it may be called an off-set paraboloidal reflector. (AP/ANT) 145-1993

**parachute harness** An assembly of webbing, strapping, and attachments, that permits the attachment of a support device (e.g. D-ring), and fits the human such that the entire weight of same can be supported without injury. The lanyard is constructed so that it will support the normal weight of a human, but can be released by pulling on a disconnection means. Upon this action, there will be separation of the body support assembly from the lanyard that has been attached to the harness, thus permitting the movement of the body support means from the human body support assembly. A parachute harness allows separation of the lanyard supporting assembly from an object, commonly an aircraft or helicopter. As released, the force to complete the full separation of the harness is of the order of 1/3 of that required to produce separation resulting from the actuation of the master (main) release (disconnection) means. (T&D/PE) 1307-1996

**paraelastic crystal (primary ferroelectric terms)** By analogy with paraelectric crystals, a crystal in which mechanical strain *S* is a single-valued function of mechanical stress *T*, whose elastic compliance exhibits an obvious Curie-Weiss behavior with temperature over some given temperature range, and that at some critical temperature $T_c$ undergoes a phase transition to a ferroelastic phase. Crystals that clearly have a paraelastic phase include the metallic alloys $Nb_3$ Sn, In-Th, Au-Zn-Sn, and lithium ammonium tartrate. (UFFC) 180-1986w

**paraelastic phase (primary ferroelectric terms)** A phase that encompasses the range of temperature in which the elastic compliance exhibits Curie-Weiss behavior. (UFFC) 180-1986w

**paraelectric Curie temperature** (of a ferroelectric material) The intercept of the linear portion of the plot of $1/\varepsilon$ versus *T*, where $\varepsilon$ is the small signal dielectric permittivity measured at zero bias field and *T* is the absolute temperature in the region above the ferroelectric Curie temperature where $\varepsilon$ generally follows the Curie-Weiss relation. *See also:* ferroelectric domain. (UFFC) 180w

**paraelectric phase (primary ferroelectric terms)** Encompasses the range of temperature or pressure over which the permittivity exhibits Curie-Weiss behavior. (UFFC) 180-1986w

**paraelectric region** The region above the Curie point where the small signal permittivity increases with decreasing temperature. *See also:* small-signal permittivity; ferroelectric Curie point. (UFFC) [21]

**parallax (computer graphics)** The apparent displacement of an object as seen from two different points. It is used to simulate a three-dimensional image on a graphical display device. (C) 610.6-1991w

**parallel (1) (A) (networks) (parallel elements)** Two-terminal elements are connected in parallel when they are connected between the same pair of nodes. **(B) (networks) (parallel elements)** Two-terminal elements are connected in parallel when any cut-set including one must include the others. *See also:* network analysis. (Std100) 270-1966

**(2) (A)** Pertaining to the simultaneity of two or more processes. **(B)** Pertaining to the simultaneity of two or more similar or identical processes. **(C)** Pertaining to simultaneous processing of the individual parts of a whole, such as the bits of a character and the characters of a word using separate facilities for the various parts. *See also:* serial-parallel. (C) 162-1963, [20], [85], 270-1966

**(3) (radio-wave propagation)** Of a propagating wave for which the electric field vector lies parallel to the plane of incidence. *Note:* Sometimes called vertical polarization. (AP) 211-1977s

**(4) (software)** Pertaining to the simultaneous transfer, occurrence, or processing of the individual parts of a whole, such as the bits of a character, using separate facilities for the various parts. *Contrast:* serial. *See also:* concurrent. (C) 610.12-1990

**(5)** Many bits transmitted over a single pathway simultaneously. *Contrast:* serial. *See also:* bit parallel. (C) 610.10-1994w

**(6)** In a propulsion system, the motor circuit in which the final parallel or series-parallel motor connection is achieved and the maximum available per-motor voltage is applied. (VT) 1475-1999

**parallel adder** An adder in which addition is performed concurrently on multiple digits of the operands. *Contrast:* serial adder. (C) 610.10-1994w

**parallel addition** Addition that is performed concurrently on all digit places of the operands. *Note:* This technique uses partial sums and partial carries to obtain its results. *Contrast:* serial addition. (C) 1084-1986w

**parallel architecture** A multiprocessor architecture in which parallel processing can be performed, that is, different parts of a single task can be executed concurrently on different processors. *See also:* fine-grain parallel architecture; medium-grain parallel architecture; coarse-grain parallel architecture. (C) 610.10-1994w

**parallel classes** A pair of classes that are distinct, are not mutually exclusive and have a common generic ancestor class and for which neither is a generic ancestor of the other. (C/SE) 1320.2-1998

**parallel computer (A)** A computer that has multiple arithmetic units or logic units that are used to accomplish parallel operations or parallel processing. *Contrast:* sequential computer; serial computer. **(B)** A computer design in which more than one operation can occur simultaneously. *See also:* simultaneous computer. (C) 610.10-1994

**parallel-connected capacitance** (as applied to interrupter switches) Capacitances are defined to be parallel-connected when the crest value of inrush current to the capacitance being switched exceeds the switch inrush current capability for single capacitance. (SWG/PE) C37.100-1992

**parallel-connected capacitor unit** A capacitor unit with the elements connected in parallel groups, with the parallel groups connected in series between the line terminals. A capacitor unit that has only one string of capacitor elements between the capacitor terminals is considered to be parallel-connected.power systems relaying. (PE) C37.99-2000

**parallel connection** The arrangement of cells in battery made by connecting all positive terminals together and all negative terminals together, the voltage of the group being only that of one cell and the current drain through the battery being divided among the several cells. *See also:* battery. (EEC/PE) [119]

**parallel construct** A program construct consisting of two or more procedures that can occur simultaneously. (C) 610.12-1990

**parallel contention arbitration** A process whereby modules assert their unique arbitration number on a parallel bus and release signals according to an algorithm such that after a period of time the winner's number appears on the bus. (C/BA) 10857-1994, 896.4-1993w

**parallel detection** In Auto-Negotiation, the ability to detect 100BASE-TX and 100BASE-T4 technology specific link signaling while also detecting the Normal Link Pulse (NLP) sequence or Fast Link Pulse (FLP) Burst sequence. (C/LM) 802.3-1998

**parallel digital computer** One in which the digits are handled in parallel. Mixed serial and parallel machines are frequently called serial or parallel according to the way arithmetic processes are performed. An example of a parallel digital computer is one that handles decimal digits in parallel although it might handle the bits that comprise a digit either serially or in parallel. *See also:* serial digital computer. (Std100) 270-1966w

**parallel disk array (PDA)** A form of RAID storage, known as level 3, in which an array of disk drives transfer data in parallel with one redundant drive that functions as a parity check disk. (C) 610.10-1994w

**parallel feeder** A feeder that operates in parallel with one or more feeders of the same type from the same source. *Note:* These feeders may be of the stub-, multiple-, or tie-feeder type. (SWG/PE) C37.100-1992

**parallel heating cable** Heating elements that are electrically connected in parallel, either continuously or in zones, so that watt density per lineal length is maintained irrespective of any change in length for the continuous type or for any number of discrete zones. (BT/IA/AV/PC) 152-1953s, 515.1-1995, 515-1997

**parallel inference machine** A computer containing an inference engine that can perform logic inference processing concurrently on two or more rules or goal clauses. (C) 610.10-1994w

**paralleling (rotating machinery)** The process by which a generator is adjusted and connected to run in parallel with another generator or system. *See also:* direct-current commutating machine; asynchronous machine. (PE) [9]

**paralleling reactor (power and distribution transformers)** A current-limiting reactor for correcting the division of load between parallel-connected transformers which have unequal impedance voltages. *See also:* reactor. (PE/TR) C57.12.80-1978r, [57]

**parallelism (A)** Concurrent operation of several parts of a computer system. *Note:* This could be simultaneous processing of multiple programs, or simultaneous operation of multiple computers. **(B)** Pertaining to specific techniques for implementing parallel operations. *See also:* AND-parallelism; OR-parallelism. (C) 610.10-1994

**parallel-mode interference** *See:* common-mode interference.

**parallel noise** (of a device) Electrical noise that can be attributed to a hypothetical white noise generator connected in parallel with the input of the device. (NPS) 325-1996

**parallel operation (power supplies)** Voltage regulators, connected together so that their individual output currents are added and flow in a common load. Several methods for parallel connection are used: spoiler resistors, master/slave connection, parallel programming, and parallel padding. Current regulators can be paralleled without special precaution. (AES) [41]

**parallel padding (power supplies)** A method of parallel operation for two or more power supplies in which their current limiting or automatic crossover output characteristic is employed so that each supply regulates a portion of the total current, each parallel supply adding to the total and padding the output only when the load current demand exceeds the capability or limit setting-of the first supply. (AES) [41]

**parallel polarization (1) (facsimile)** A linear polarization for which the field vector is parallel to some reference plane. *Note:* These terms are applied mainly to uniform plane waves incident upon a plane of discontinuity (surface of the earth, surface of a dielectric or a conductor). Then the convention is to take as reference the plane of incidence, that is, the plane containing the direction of propagation and the normal to the surface of discontinuity. If these two directions coincide, the reference plane must be specified by some other convention. (COM/AP/ANT) 167-1966w, 145-1993

**(2)** The polarization of a wave for which the electric field vector lies in the plane of incidence. *Note:* This is sometimes called vertical or transverse magnetic (TM) polarization. (EMC) 1128-1998

**(3)** The polarization of a wave for which the electric field vector lies parallel to the plane of incidence. *Note:* Sometimes called vertical or transverse magnetic (TM) polarization. In optics, it is called "p" polarization. In radio propagation, *H* is parallel to the ground. *Synonyms:* transverse-magnetic polarization; vertical polarization. (AP/PROP) 211-1997

**parallel port** A port that transfers data one byte at a time, each bit over its own line. *Contrast:* serial port. (C) 610.10-1994w

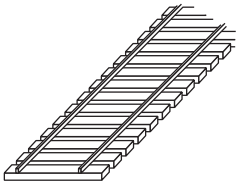
**parallel printer** A printer that receives its input data in the form of a parallel stream of data. *Contrast:* serial printer. (C) 610.10-1994w

**parallel processing (1) (computers)** Pertaining to the simultaneous execution of two or more sequences of instructions or one sequence of instructions operating on two or more sets of data, by a computer having multiple arithmetic and.or logic units. *See also:* multiprocessing; multiprogramming. (C) [20], [85]

**(2)** Pertaining to the concurrent or simultaneous execution of two or more processes in multiple devices, such as processing units or channels. *Contrast:* serial processing. *See also:* pipelining. (C) 610.10-1994w

**parallel programming (power supplies)** A method of parallel operation for two or more power supplies in which their feedback terminals (voltage-control terminals) are also paralleled. These terminals are often connected to a separate programming source. (AES) [41]

**parallel projection (computer graphics)** The projection of a three-dimensional image onto a two-dimensional surface such that objects that are farther from the viewer in three dimensions are rendered the same size as closer ones. *Note:* The resulting image is less realistic than that achieved by a perspective projection. *Contrast:* perspective projection.



**parallel projection**

(C) 610.6-1991w

**parallel rectifier** A rectifier in which two or more similar rectifiers are connected in such a way that their direct currents add and their commutations coincide. *See also:* power rectifier. (IA) [62]

**parallel rectifier circuit** A rectifier circuit in which two or more simple rectifier circuits are connected in such a way that their direct currents add and their commutations coincide. *See also:* rectifier circuit element; rectification. (IA) [12]

**parallel redundant UPS configuration** Consists of two or more UPS modules with static inverter turn-off(s), a system control cabinet, and either individual module batteries or a common battery. (IA/PSE) 241-1990r

**parallel resonance** The sinusoidal steady state condition that exists in a circuit composed of an inductor and a capacitor

connected in parallel when the applied frequency is such that: the driving-point impedance is a maximum; or the susceptance of the two parallel arms are equal in magnitude; or the phase-angle of the driving-point impedance is zero. Sometimes defined as above for more general RLC (resistance-inductance-capacitance) networks. (CAS) [13]

**parallel search storage** A type of storage in which one or more parts of all storage locations are queried simultaneously or concurrently. *See also:* associative storage. (C) 610.10-1994w

**parallel-serial converter** *See:* serializer.

**parallel storage** A storage device in which digits, characters, or words, are dealt with simultaneously or concurrently. (C) [20], [85], 610.10-1994w

**parallel system bus** The signals, media, and protocol used to interconnect agents in the IEEE Std 1296-1987 system). (C/MM) 1296-1987s

**parallel thyristor converter** A thyristor converter in which two or more simple converters are connected in such a way that their direct currents add and their commutations coincide. (IA/IPC) 444-1973w

**parallel-T network** (twin-T network) A network composed of separate T networks with their terminals connected in parallel. *See also:* network analysis. (EEC/PE) [119]

**parallel transmission (1) (data transmission)** Simultaneous transmission of the bits making up a character, either over separate channels or on different carrier frequencies on one channel. (COM) [49]
**(2)** In data communications, the simultaneous transmission of all the bits making up a character or byte where each bit travels on a different path. *Contrast:* serial transmission. (C) 610.7-1995

**parallel two-terminal pair networks** Two-terminal pair networks are connected in parallel at the input or at the output terminals when their respective input or output terminals are in parallel. *See also:* network analysis. (BT) 153-1950w

**parallel vector** A representation specifying a set of waveforms across all primary signals, to be applied to those signals in a parallel fashion (i.e., simultaneously). (C/TT) 1450-1999

**paralyzable system (x-ray energy spectrometers)** Any system or device whose response characteristics contain a region where the ratio of output-to-input count rate decreases with increasing input count rate. (NPS/NID) 759-1984r

**paramagnetic material** Material whose relative permeability is slightly greater than unity and practically independent of the magnetizing force. (Std100) 270-1966w

**Parameter** An instance of the class `IEEE1451_Parameter` or of a subclass thereof. A Parameter is a representation of a variable. Parameters may selectively be manipulated across a network, and can be an externally visible representation for data. (IM/ST) 1451.1-1999

**parameter (1) (mathematical)** A variable that is given a constant value for a specific purpose or process. (C) [20], [85]
**(2) (A) (physical)** One of the constants entering into a functional equation and corresponding to some characteristic property, dimension, or degree of freedom. **(B) (electrical)** One of the resistance, inductance, mutual inductance, capacitance, or other element values included in a circuit or network. Also called network constant. (Std100) 270-1966
**(3)** A quantity of property treated as a constant but which may sometimes vary or be adjusted. (CS/PE/EDPG) [3]
**(4) (A) (test, measurement, and diagnostic equipment)** Any specific quantity or value affecting or describing the theoretical or measurable characteristics of a unit being considered which behaves as an independent variable or which depends upon some functional interaction of other quantities in a theoretically determinable manner. **(B) (test, measurement, and diagnostic equipment)** In programming, a variable that is given a constant value for a specific purpose or process. (MIL) [2]
**(5) (A) (software)** A variable that is given a constant value for a specified application. *See also:* adaptation parameter. **(B) (software)** A constant, variable, or expression that is used to pass values between software modules. *See also:* argument; formal parameter. (C) 610.12-1990
**(6)** In the shell command language, an entity that stores values. There are three types of parameters: variables (named parameters), positional parameters, and special parameters. Parameter expansion is accomplished by introducing a parameter with the $ character. (C/PA) 9945-2-1993
**(7)** A data item required for the calculation of some result. (C/DA) 1481-1999
**(8)** An attribute usually representing some property subject to change, for example, a configuration parameter. (IM/ST) 1451.1-1999

**parameter bunching** One-half the product of the bunching angle in the absence of velocity modulation and the depth of velocity modulation. *Note:* In a reflex klystron the effective bunching angle must be used. *See also:* electron device. (ED) 161-1971w

**parameterized collection class** A kind of collection class restricted to hold only instances of a specified type (class). (C/SE) 1320.2-1998

**parameter potentiometer** A potentiometer employed in analog computers to represent a problem parameter such as a coefficient or a scale factor. *See also:* coefficient potentiometer. (C) 610.10-1994w, 166-1977w, 165-1977w

**Parameter With Update** An instance of the class `IEEE1451_ParameterWithUpdate` or of a subclass thereof. (IM/ST) 1451.1-1999

**parameter word** A word that directly or indirectly provides or designates one or more parameters. (C) 610.10-1994w

**parametric amplifier** An inverting parametric device used to amplify a signal without frequency translation from input to output. *Note:* In common usage, this term is a synonym for reactance amplifer. *See also:* parametric device. (ED) 254-1963w, [46]

**parametric converter** An inverting parametric device or noninverting parametric device used to convert an input signal at one frequency into an output signal at a different frequency. *See also:* parametric device. (ED) [46]

**parametric data** Data representing an internal state variable of an object that is represented by a Parameter. More specifically, physical parametric data generally represents some aspect of the physical world. (IM/ST) 1451.1-1999

**parametric device** A device whose operation depends essentially upon the time variation of a characteristic parameter usually understood to be a reactance. (ED) [46]

**parametric down-converter** A parametric converter in which the output signal is at a lower frequency than the input signal. *See also:* parametric device. (ED) [46]

**parametric test** A test that is performed to verify device behavior such as output drive current, input leakage current, or output voltage. (C/TT) 1450-1999

**parametric test data** The values of the observed or measured electrical or physical properties of a unit under test (UUT) that may be used to determine its characteristics or its conformance to requirements. (SCC20) 1545-1999

**parametric up-converter** A parametric converter in which the output signal is at a higher frequency than the input signal. *See also:* parametric device. (ED) [46]

**parametric variation (automatic control)** A change in those system properties generally regarded as constants which affect the dependent variables describing system operation. (PE/EDPG) [3]

**parasitic element (1) (data transmission)** A radiating element that is not coupled directly to the feed lines of an antenna and that materially affects the radiation pattern or impedance of an antenna, or both. (PE) 599-1985w
**(2)** An unwanted circuit element that is an unavoidable adjunct of a wanted circuit element. (CAS) [13]

**(3)** A radiating element that is not connected to the feed lines of an antenna and that materially affects the radiation pattern or impedance of an antenna, or both. *Contrast:* driven element. (AP/ANT) 145-1993

**parasitic oscillations** Unintended self-sustaining oscillations, or transient impulses. *See also:* oscillatory circuit. (AP/BT/ANT) 145-1983s, 182A-1964w

**parasitics** Electrical properties of a design (resistance, capacitance, and impedance) that arise due to the nature of the materials used to implement the design. (C/DA) 1481-1999

**paraxial approximation** An approximation in which the waves are constrained to travel predominantly in one direction. (AP/PROP) 211-1997

**paraxial ray (fiber optics)** A ray that is close to and nearly parallel with the optical axis. *Note:* For purposes of computation, the angle, θ, between the ray and the optical axis is small enough for sin θ or tan θ to be replaced by θ (radians). *See also:* light ray. (Std100) 812-1984w

**parcel plating** Electroplating upon only a part of the surface of a cathode. *See also:* electroplating. (EEC/PE) [119]

**PARD** *See:* PARD.

**parent** A widget that is the immediate superior of the current widget in the widget instance hierarchy. (C) 1295-1993w

**parent box** An ancestral box related to its child diagram by exactly one parent/child relationship, that is, a box detailed by a child diagram. The existence of this child diagram is indicated by a box detail reference. (C/SE) 1320.1-1998

**parent diagram** A diagram that contains a parent box. (C/SE) 1320.1-1998

**parent directory (A)** When discussing a given directory, the directory that contains a directory entry for the given directory. The parent directory is represented by the pathname dot-dot in the given directory. **(B)** When discussing other types of files, a directory containing a directory entry for the file under discussion. This concept does not apply to dot and dot-dot. (C/PA) 9945-1-1996, 9945-2-1993, 1003.5-1999

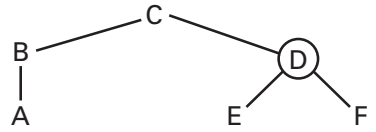
**parent entity (1)** An entity set that has other entities dependent on and related to it called subset entities. The subset entities are linked and related to other entity sets through the parent entity set. (PE/EDPG) 1150-1991w

**(2)** An entity in a specific relationship whose instances can be related to a number of instances of another entity (child entity). (C/SE) 1320.2-1998

**parent function** A function modeled by a parent box. (C/SE) 1320.1-1998

**parenthesis-free notation** *See:* prefix notation.

**parent node** In a tree, a node having a given node as a child node. *Synonym:* father. *Contrast:* dependent node; child node. *See also:* descendant node.




*Node D is the parent node for node E*

**parent node**

(C) 610.5-1990w

**(2)** The node to which a device node is attached. Each device node has exactly one parent node, except the root node, which has none. (A device node descends from its parent node. Traveling "up" the device tree takes one through parent nodes to the root node. Traveling "down" the device tree takes one through child nodes to the leaf nodes.) (C/BA) 1275-1994

**parent process** *See:* POSIX process.

**parent process ID** An attribute of a new process after it is created by a currently active process. The parent process ID of a process is the process ID of its creator, for the lifetime of the creator. After the lifetime of the creator has ended, the parent process ID is the process ID of an implementation-defined system process. (C/PA) 1003.5-1999, 9945-2-1993, 9945-1-1996

**parent segment** In a hierarchical database, a segment that has one or more dependent segments, called child segments, below it in a hierarchy. (C) 610.5-1990w

**parity (1) (A) (mathematics of computing)** An error detection method in which the total number of ones in a binary word, byte, character, or message is set to an odd or even number by appending a redundant bit. This number is subsequently checked to ensure that it remains odd or even. **(B) (mathematics of computing)** The property of oddness or evenness possessed by a word, byte, character, or message. This property is determined by the total number of ones. *See also:* even parity; odd parity. (C) 1084-1986

**(2) (for FASTBUS)** A bit, optionally appended to a FASTBUS word, whose value is chosen to make the total number of one bits (including the parity bit) odd. It is used for error checking since receipt of an even number of one bits implies a transmission error. (NID) 960-1993

**(3)** The value, even or odd, of the sum of a string of binary digits. For example, the parity of the string 0000111101001 is even. *Contrast:* cyclic redundancy check. *See also:* parity bit; parity error; parity check. (C) 610.7-1995

**parity bit (1) (computers)** A binary digit appended to an array of bits to make the sum of all the bits always odd or always even. (MIL/C) [2], [85], [20]

**(2) (mathematics of computing)** A binary digit appended to a binary word, byte, character, or message to make the total number of ones an odd or an even number. *See also:* parity check. (C) 1084-1986w

**(3)** An extra bit attached to a byte, character string, or word, used to enable detection of transmission errors. Based on system convention, the bit is set making the number of ones in a grouping of bits either always even or always odd. *Note:* This permits detection of bit groupings containing single errors. (C) 610.7-1995

**(4)** An extra bit attached to a byte, character string or word, used to detect transmission errors. (C) 610.10-1994w

**parity check (1) (electronic computation)** A summation check in which the bits in a character or block are added (modulo 2) and the sum checked against a single, previously computed parity digit; that is, a check that tests whether the number of ones is odd or even. (MIL/C/COM) [2], [85], [20], [49]

**(2) (mathematics of computing)** A check to determine whether the total number of ones in a binary word, byte, character, or message is odd or even. *Synonyms:* odd-even check; even-odd check. (C) 1084-1986w

**(3)** An error detecting code that uses the parity bit(s). *Contrast:* cyclic redundancy check. *See also:* vertical redundancy check; longitudinal redundancy check. (C) 610.7-1995

**parity error (1)** The failure of a binary word, byte, character, or message to pass a parity check. (C) 1084-1986w

**(2)** An error that occurs when the parity bit of a string is found to be incorrect. (C) 610.7-1995

**Parity Error (PRE) bit** A bit in the Bus Error register of all S-modules. An S-module sets this bit to indicate that the module has detected a Parity Error on a DATA packet received. (TT/C) 1149.5-1995

**parity violation** If the received parity and the parity calculation on the data do not agree, a parity violation has occurred. (COM/TA) 1007-1991r

**park electrical wiring systems** All of the electrical wiring fixtures, equipment and appurtenances related to electrical installations within a mobile home park, including the mobile home service equipment. (NESC/NEC) [86]

**parking (1) (multiprocessor architecture)** The process whereby the current master retains control of the bus when there are no other masters wishing to use it. (C/MM) 896.1-1987s

**(2) (MULTIBUS II)** The state of the bus owner where, after the completion of the current transfer operation, ownership is retained until there is a request by another agent for the use of the bus. (C/MM) 1296-1987s

**parking brake** A means that supplies static braking forces to maintain a vehicle or train in a no motion state. (VT) 1475-1999

**parking lamp (illuminating engineering)** A lighting device placed on a vehicle to indicate its presence when parked. (EEC/IE) [126]

**parking stand** A bracket, designed for installation on an apparatus, suitable for holding accessory devices, such as the insulated parking bushing and the grounding bushing. (T&D/PE) 386-1995

**PARLOG** A logic programming language used widely for parallel computing, supporting declarative programming. (C) 610.13-1993w

**parse (1) (software)** To determine the syntactic structure of a language unit by decomposing it into more elementary subunits and establishing the relationships among the subunits. For example, to decompose blocks into statements, statements into expressions, expressions into operators and operands. (C) 610.12-1990

**(2)** To resolve a request or response into component parts. In the context of messages, a device can break the message into pieces, each of which consists of a header and sometimes some corresponding data. If a device is able to parse a message, it can recognize each piece of a message. It does not necessarily make use of the data found in that message. However, it shall make any confirmation responses or other responses that the message requires. (PE/SUB) 1379-1997

**PARSEC** *See:* PARser and Extensible Compiler.

**parsec (pc)** The distance at which 1 astronomical unit subtends an angle of 1 second of arc; approximately, 1 pc = 206 265 AU = $30857 \times 10^{12}$ m. (QUL) 268-1982s

**parser** A software tool that parses computer programs or other text, often as the first step of assembly, compilation, interpretation, or analysis. (C) 610.12-1990

**PARser and Extensible Compiler (PARSEC)** An extensible language using syntax similar to PL/1; PARSEC is derived from PROTEUS and is yused as the base language for writing PL/PROPHET. (C) 610.13-1993w

**part (1) (unique identification in power plants and related facilities)** An element of a component not amenable to further disassembly for maintenance purposes. (PE/EDPG) 804-1983r, 803-1983r

**(2)** The lowest element of a physical or system architecture, specification tree, or system breakdown structure that can not be partitioned (e.g., bolt, nut, bracket, semiconductor, computer software unit). (C/SE) 1220-1994s

**partial** An incomplete mapping, i.e., some instances map to no related instance. An attribute may be declared partial, meaning it may have no value. A participant property is declared optional as part of the relationship syntax. An operation is declared partial when it may have no meaning for some instances, i.e., it may not give an answer or produce a response. *Contrast:* total. *See also:* mapping completeness; optional. (C/SE) 1320.2-1998

**(2) (A)** A physical component of a complex tone. **(B) (audio and electroacoustics)** A component of a sound sensation that may be distinguished as a simple tone that cannot be further analyzed by the ear and that contributes to the timbre of the complex sound. *Notes:* 1. The frequency of a partial may be either higher or lower than the basic frequency and may or may not be an integral multiple or submultiple of the basic frequency. If the frequency is not a multiple or submultiple, the partial is inharmonic. 2. When a system is maintained in steady forced vibration at a basic frequency equal to one of the frequencies of the normal modes of vibration of the system, the partials in the resulting complex tone are not necessarily identical in frequency with those of the other normal modes of vibration. (SP) [32]

**partial automatic control** Control that is a combination of manual and automatic control. For example, to cause a voltage reduction, the local automatic load tap changing closed-loop control may be biased by way of a supervisory control command. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**partial-automatic station** A station that includes protection against the usual operating emergencies, but in which some or all of the steps in the normal starting or stopping sequence, or in the maintenance of the required character of service, must be performed by a station attendant or by supervisory control. (SWG/PE) C37.100-1992

**partial-automatic transfer equipment** (or throwover) Equipment that automatically transfers load to another (emergency) source of power when the original (preferred) source to which it has been connected fails, but that will not automatically retransfer the load to the original source under any conditions. *Note:* The restoration of the load to the preferred source from the emergency source upon the reenergization of the preferred source after an outage may be of the continuous-circuit restoration type or the interrupted-circuit restoration type. (SWG/PE) C37.100-1992

**partial-body exposure** Exposure that results when RF fields are substantially nonuniform over the body. Fields that are nonuniform over volumes comparable to the human body may occur due to highly directional sources, standing-waves, reradiating sources, or in the near field region of a radiating structure. *See also:* radio-frequency hot spot. (NIR) C95.1-1999

**partial-body irradiation (electrobiology)** Pertains to the case in which part of the body is exposed to the incident electromagnetic energy. *See also:* electrobiology. (NIR) C95.1-1982s

**partial carry (parallel addition)** A technique in which some or all of the carries are stored temporarily instead of being allowed to propagate immediately. *See also:* carry. (C) [85], [20]

**(2) (A) (mathematics of computing)** A carry process in which the carry digits are stored temporarily, instead of being processed as they occur. *Contrast:* complete carry. *See also:* cascaded carry; partial sum. **(B) (mathematics of computing)** The numeral that represents the carry digits generated in definition "A". (C) 1084-1986

**partial checkback message** Message from the initiating end is mirrored by the receiving end back to the initiating end to verify error-free transmission of the message. (SWG/PE/SUB) C37.100-1992, C37.1-1987s

**partial cluster** A subclass cluster in which an instance of the superclass may exist without also being an instance of any of the subclasses. *Contrast:* total cluster. *See also:* superclass. (C/SE) 1320.2-1998

**partial correctness (software)** In proof of correctness, a designation indicating that a program's output assertions follow logically from its input assertions and processing steps. *Contrast:* total correctness. (C) 610.12-1990

**partial dial abandon or a partial dial timeout** Occurs if the call is abandoned or times out without sufficient digits dialed. (COM/TA) 973-1990w

**partial-dialing timing** The time interval following each dialed digit except the last that determines if the call shall be treated as if dialing had stopped prematurely. For nonimmediate start trunk types, the partial-dial timing interval may be shorter. Instead of timing each digit, an alternative for multifrequency trunks is an overall time limit from the beginning of the start signal until end of pulsing. (COM/TA) 973-1990w

**Partial Differential Equation Language (PDEL)** An application-oriented language used for solving partial differential equations in which the user does not have to program the numerical analysis algorithms. *Note:* Used as a preprocessor to PL/1. (C) 610.13-1993w

**partial directivity** (of an antenna for a given polarization) In a given direction, that part of the radiation intensity corresponding to a given polarization divided by the total radiation intensity averaged over all directions. *Note:* The (total) directivity of an antenna, in a specified direction, is the sum of the

partial directivities for any two orthogonal polarizations. (AP/ANT) 145-1993

**partial discharge (PD) (1) (power and distribution transformers)** An electric discharge which only partially bridges the insulation between conductors, and which may or may not occur adjacent to a conductor. *Notes:* 1. Partial discharges occur when the local electric-field intensity exceeds the dielectric strength of the dielectric involved, resulting in local ionization and breakdown. Depending on intensity, partial discharges are often accompanied by emission of light, heat, sound, and radio influence voltage (with a wide frequency range). 2. The relative intensity of partial discharge can be observed at the transformer terminals by measurement of the apparent charge (coulombs). However, the apparent charge (terminal charge) should not be confused with the actual charge transferred across the discharging element in the dielectric which in most cases cannot be ascertained. Partial discharges tests using the radio influence voltage techniques which are responsive to the apparent terminal charges are generally used for measurement of relative discharge intensity. 3. Partial discharges can also be detected and located using sonic techniques. 4. "Corona" has also been used to describe partial discharges. This is a non-preferred term since it has other unrelated meanings. (PE/TR) C57.12.80-1978r **(2) (dry-type transformers)** An electric discharge that only partially bridges the insulation between conductors. The term "corona" has also been used frequently with this connotation. Such usage is imprecise and is gradually being discontinued in favor of the term "partial discharge." (PE/PSIM/TR) 454-1973w, C57.124-1991r **(3)** A localized electric discharge resulting from ionization in an insulation system when the voltage stress exceeds the critical value. This discharge partially bridges the insulation between electrodes. (SWG/PE) 1291-1993r, C37.100-1992 **(4) (liquid-filled power transformers)** An electric discharge that only partially bridges the insulation between conductors. (PE/TR/PSIM) C57.113-1988s, 62-1995 **(5)** A discharge that does not completely bridge the insulation between electrodes. (PE/PSIM) 4-1995 **(6)** An electric discharge that only partially bridges the insulation between conductors, and that may or may not occur adjacent to the conductor. (PE/TR) C57.104-1991 **(7)** A discharge that does not completely bridge the insulation between electrodes. *Note:* The term "corona" is preferably reserved for partial discharges in air around a conductor, but not within the bushing assembly. (PE/TR) C57.19.03-1996

**partial discharge energy (dielectric tests)** The energy dissipated by an individual discharge. The partial discharge energy is expressed in joules. (PE/PSIM) 454-1973w

**partial discharge extinction voltage (1) (dry-type transformers)** The voltage at which partial discharges exceeding a specified level cease under specified conditions when the voltage is gradually decreased from a value exceeding the inception voltage. This voltage is expressed as the peak value divided by the square root of two. (PE/TR) C57.124-1991r **(2)** The voltage at which partial discharge (corona) is no longer detectable on instrumentation adjusted to a specified sensitivity, following application of a specified higher voltage. (SWG/PE/IC) 1291-1993r, 48-1996

**partial discharge-free test voltage (dry-type transformers)** A specified voltage, applied in accordance with a specified test procedure, at which the test object should not exhibit partial discharges above the acceptable energized background noise level. (PE/TR) C57.124-1991r, C57.113-1991

**partial discharge inception voltage (1) (dry-type transformers)** The lowest voltage at which partial discharges exceeding a specified level are observed under specified conditions when the voltage applied to the test object is gradually increased from a lower value. This voltage is expressed as the peak value divided by the square root of two. (PE/TR) C57.124-1991r **(2)** The voltage that should be recorded on the device or system under test when raised to a point where the PD signal rises above the energized background noise level. (SWG/PE) 1291-1993r

**partial discharge power (dielectric tests)** The power fed into the terminals of the test object due to partial discharges. The average discharge power is expressed in watts. (PE/PSIM) 454-1973w

**partial duplex** An operating condition that allows simultaneous communication in both send and receive directions with 3-20 dB switched loss in either direction. (COM/TA) 1329-1999

**partial effective area** (of an antenna for a given polarization and direction) In a given direction, the ratio of the available power at the terminals of a receiving antenna to the power flux density of a plane wave incident on the antenna from that direction and with a specified polarization differing from the receiving polarization of the antenna. (AP/ANT) 145-1993

**partial failure** *See:* failure.

**partial-fraction expansion** A sum of fractions that is used to represent a function that is a ratio of polynomials. The denominators of the fractions are the poles of the function. (CAS) [13]

**partial gain** (of an antenna for a given polarization) In a given direction, that part of the radiation intensity corresponding to a given polarization divided by the radiation intensity that would be obtained if the power accepted by the antenna were radiated isotropically. *Note:* The (total) gain of an antenna, in a specified direction, is the sum of the partial gains for any two orthogonal polarizations. (AP/ANT) 145-1993

**partially dead region or layer (x-ray energy spectrometers)** (of a semiconductor detector) Any region or layer on or in the detector which contributes an output pulse which is less than the full energy peak for that incident radiation. (NPS/NID) 759-1984r

**partially inverted file** A file that has been inverted on some of its secondary keys. *Contrast:* fully inverted file. (C) 610.5-1990w

**partially polarized wave** A wave with some randomly polarized content. (AP/PROP) 211-1997

**partially shielded insulated splice (power cable joints)** An insulated splice in which a conducting material is employed over a portion of the insulation for electric stress control. (PE/IC) 404-1986s

**partial outage state** The component or unit is at least partially energized, or is not fully connected to all of its terminals, or both, so that it is not serving some of its functions within the power system. *Note:* A unit composed of a three-terminal line would be in the partial outage state if it were disconnected from one terminal with two line sections still carrying power. (PE/PSE) 859-1987w

**partial product** The result obtained by multiplying the multiplicand by one of the digits of the multiplier. *Synonym:* intermediate product. (C) 1084-1986w

**partial-read pulse** Any one of the currents applied that cause selection of a cell for reading. *See also:* coincident-current selection. (Std100) 163-1959w

**partial realized gain** (of an antenna for a given polarization) The partial gain of an antenna for a given polarization reduced by the loss due to the mismatch of the antenna input impedance to a specified impedance. (AP/ANT) 145-1993

**partial reference designation (electric and electronics parts and equipment)** A reference designation that consists of a basic reference designation and which may include, as prefixes, some but not all of the reference designations that apply to the subassemblies or assemblies within which the item is located. (GSD) 200-1975w

**partial-select output (A)** The voltage response of an unselected magnetic cell produced by the application of partial-read pulses or partial-write pulses. **(B)** The integrated voltage response of an unselected magnetic cell produced by the appli-

cation of partial-read pulses or partial-write pulses. *See also:* coincident-current selection. (Std100) 163-1959

**partial sum** The result obtained from the addition of two or more numbers without regard to carries. *Note:* In the binary numeration system, the partial sum is the same result as is obtained from the exclusive-OR operation. *See also:* cascaded carry. (C) 1084-1986w

**partial system downtime** A weighted time out of service for switching system failures that put a number of lines out of service simultaneously. This measure is the expected probability that two randomly chosen lines will be out of service simultaneously due to the same fault cause. It may be expressed in minutes per year. It protects customers under circumstances that are not fully covered by individual line downtime or total system downtime. *Synonym:* simultaneous line downtime. (COM/TA) 973-1990w

**partial-write pulse** Any one of the currents applied that cause selection of a cell for writing. *See also:* coincident-current selection. (Std100) 163-1959w

**participant property** A kind of property of a state class that reflects that class' knowledge of a relationship in which instances of the class participate. When a relationship exists between two state classes, each class contains a participant property for that relationship. A participant property is a mapping from a state class to a related (not necessarily distinct) state class. The name of each participant property is the name of the role that the other class plays in the relationship, or it may simply be the name of the class at the other end of the relationship (as long as using the class name does not cause ambiguity). A value of a participant property is the identity of a related instance. (C/SE) 1320.2-1998

**participate** With regard to the action of an S-module during message transmission, to execute the command contained in the HEADER packet of the current message and return packets as required by that command and by the state of the Acknowledge bit in the HEADER packet. The handling of some errors may cause an S-module to cease to participate in a message (e.g., by ceasing to execute the current command, by returning NULL packets when data is expected, by driving a constant value on the MSD signal without regard to packet transmission timing, etc). (TT/C) 1149.5-1995

**participating slave** A slave involved in a transaction as either a selected slave, an intervening slave, a broadcast slave, or a slave involved in multiple packet mode. (C/BA) 10857-1994, 896.3-1993w, 896.4-1993w

**particle accelerator** Any device for accelerating charged particles to high energies, for example, cyclotron, betatron, Van der Graaff generator, linear accelerator, etc. (ED) [45]

**particle size distribution** The probability density function describing the size distribution of particles in a medium. (AP/PROP) 211-1997

**particle velocity (sound field)** The velocity of a given infinitesimal part of the medium, with reference to the medium as a whole, due to the sound wave. *Note:* The terms instantaneous particle velocity, effective particle velocity, maximum particle velocity, and peak particle velocity have meanings that correspond with those of the related terms used for sound pressure. (SP) [32]

**particulate** A small particle that is created by thermal decomposition of organic materials present inside the generator. (PE/EM) 1129-1992r

**parting** The selective corrosion of one or more components of a solid solution alloy. (IA) [59]

**parting limit** The maximum concentration of a more-noble component in an alloy, above which parting does not occur within a specific environment. (IA) [59]

**Partition** An addressable portion of a Partitioned File. (IM/ST) 1451.1-1999

**partition (1) (A)** A portion of a computer's main storage that is set aside to hold a single program. **(B)** A portion of a storage medium that is set aside for some special purpose; for example, the boot partition of a magnetic disk contains operating system files from which the computer can be booted. **(C)** A portion of a storage medium that is treated as if it were an individual medium; as in a partition of a hard disk. (C) 610.10-1994

**(2)** A partition is a program or part of a program that can be invoked from outside the Ada implementation. Each partition may run in a separate address space, possibly on a separate computer. An *active partition* is a partition that contains at least one task. Every active partition has an *environment task*, on which all the other tasks of that partition depend. An active partition corresponds to a POSIX process. (C) 1003.5-1999

**(3)** A subdivision of a file. (IM/ST) 1451.1-1999

**(4)** A portion of a side of a cartridge that is accessible as a unit. (C/SS) 1244.1-2000

**partitioned access** The process of storing and retrieving data from storage in such a way that the data is divided into subunits, called members, and the data may be processed as a whole or member by member. *Note:* The directory used to retrieve each member is stored along with the data. *See also:* partitioned data set; basic partitioned access method. (C) 610.5-1990w

**partitioned data set** A file that is divided into subunits, called members, each of which may be processed individually. *Contrast:* indexed file; sequential file. (C) 610.5-1990w

**Partitioned File** An instance of the class `IEEE1451_PartitionedFile` or of a subclass Thereof. (IM/ST) 1451.1-1999

**partitioning (software) (software requirements specifications)** Decomposition; the separation of the whole into its parts. (C/SE) 830-1984s, 610.12-1990

**partition noise** Noise caused by random fluctuations in the distribution of current between the various electrodes. (ED) [45]

**partly cloudy sky (illuminating engineering)** A sky that has 30% to 70% cloud cover. (EEC/IE) [126]

**Partner** The remote entity in a Link Aggregation Control Protocol exchange. (C/LM) 802.3ad-2000

**part programming, computer (numerically controlled machines)** The preparation of a manuscript in computer language and format required to accomplish a given task. The necessary calculations are to be performed by the computer. (IA/EEC) [61], [74]

**part programming, manual (numerically controlled machines)** The preparation of a manuscript in machine control language and format required to accomplish a given task. The necessary calculations are to be performed manually. (IA/EEC) [61], [74]

**parts (replacement parts for Class 1E equipment in nuclear power generating stations)** Items from which the equipment is assembled (for example, resistors, capacitors, wires, connectors, transistors, tubes, lubricants, O-rings, and springs). (PE/NP) 934-1987w

**parts per million** $x/10^6$ is $x$ parts per million. (CAS) [13]

**parts per million by volume (PPMV) (1)** The volume of water vapor in the total SF6 system at the pressure the system is operated. (SUB/PE) C37.122-1983s

**(2)** One million times the ratio of the volume of water vapor present in the gas to the total volume of the gas (including water vapor). (PE/IC) 1125-1993

**parts per million by weight (PPMW) (1)** The weight of water vapor in the total SF6 system at the pressure the system is operated. (SUB/PE) C37.122-1983s

**(2)** One million times the ratio of the weight of water vapor present in the gas to the total weight of the gas (including water vapor). (PE/IC) 1125-1993

**parts program** A set of computer instructions used to control the action of a numerical control machine in producing a particular manufactured part. (C) 610.2-1987

**part-winding starter** A starter that applies voltage successively to the partial sections of the primary winding of an alternating-current motor. *See also:* starter. (IA/ICTL/IAC) [60]

**part-winding starting (rotating machinery)** A method of starting a polyphase induction or synchronous motor, by which certain specially designed circuits of each phase of the primary winding are initially connected to the supply line. The remaining circuit or circuits of each phase are connected to the supply in parallel with initially connected circuits, at a predetermined point in the starting operation. (PE) [9]

**party line (1) (data transmission)** A subscriber line arranged to serve more than one main station, with discriminatory ringing for each station. (PE) 599-1985w

**(2) (telephone switching systems)** A line arranged to serve more than one main station, with distinctive ringing for each station. (COM) 312-1977w

**(3)** A communication channel that services multiple terminals. (SUB/PE) 999-1992w

**Pascal** A general-purpose programming language standardized by IEEE & ASC X3 adapted for use on a variety of computers; characterized by its ability to handle algorithms, various data types, and block-structured. *Note:* Often used in teaching programming concepts, Pascal was named after Blaise Pascal, a French mathematician, and was developed by Niklaus Wirth. *See also:* block-structured language; MODULA II; JOSEF; Rascal; high-order language. (C) 610.13-1993w

**Paschen's law (gas)** The law stating that, at a constant temperature, the breakdown voltage is a function only of the product of the gas pressure by the distance between parallel plane electrodes. *See also:* discharge. (ED) [45], [84]

**pass (1)** A single cycle in the processing of a set of data, usually performing part of an overall process. For example, a pass of an assembler through a source program; a pass of a sort program through a set of data. (C) 610.12-1990

**(2)** The lack of any deviation from the expected post condition of a test case signifies a pass for that specific test case. Adherence to specification or documentation, or functional baseline indicates a pass. (C/PA) 2000.2-1999

**pass band (1) (data transmission)** A range of frequency spectrum that can pass at low attenuation. *See also:* band-pass filter. (T&D/PE) 1308-1994, 599-1985w

**(2)** A range of frequencies transmitted to a terminal at low attenuation. *See also:* bandwidth. (C/CAS) 610.7-1995, [13]

**(3)** A band of frequencies that pass through a filter with little attenuation (relative to other frequency bands such as a stop band). (CAS/T&D/PE) 1308-1994

**pass-band ripple** The difference between maxima and minima of loss in a filter passband. If the differences are of constant amplitude then the filter is said to be equiripple. (CAS) [13]

**pass element (power supplies)** A controlled variable-resistance device, either a vacuum tube or power transistor, in series with the source of direct-current power. The pass element is driven by the amplified error signal to increase its resistance when the output needs to be lowered or to decrease its resistance when the output must be raised. *See also:* series regulator. (AES) [41]

**passenger elevator** An elevator used primarily to carry persons other than the operator and persons necessary for loading and unloading. *See also:* elevator. (EEC/PE) [119]

**passenger information sign** A device that displays or annunciates transit trip information to passengers. (VT) 1477-1998

**passenger vessel** A vessel that carries more than 12 persons in addition to the crew. (IA/MT) 45-1998

**pass/fail criteria** Decision rules used to determine whether a software item or a software feature passes or fails a test. (C/SE) 829-1998

**pass gate** The transistor(s), controlled by the word-line, to enable the programming of bits along the selected word-line and the isolating of bits on unselected word-lines from the array source. (ED) 1005-1998

**passivation** The process or processes (physical or chemical) by means of which a metal becomes passive. (IA) [59]

**passivator** An inhibitor that changes the potential of a metal appreciably to a more cathodic or noble value. (IA) [59]

**passive-active cell** A cell composed of passive and active areas. *See also:* electrolytic cell. (IA) [59]

**passive angle tracking (PAT)** A tracking technique that uses a received signal other than the backscattered radar emissions with which to track an object, jammer, or other signal source. Passive homing, home-on-jam (HOJ), and track-on-jam (TOJ) are examples of PAT using a radar receiving system. (AES) 686-1997

**passive concentrator** A type of token ring concentrator that contains no active elements in the signal path of any lobe port. Embedded repeater functions may be provided by the ring in and ring out port. (C/LM) 8802-5-1998

**passive data dictionary** A data dictionary that is only a repository for data definitions. *Note:* No active measures are taken to ensure that the data dictionary is consistent with the data items actually used in the system. *Synonym:* stand-alone data dictionary. *Contrast:* active data dictionary. (C) 610.5-1990w

**passive device** A device that does not require power and contains no active components. The term encompasses taps, directional couplers, splitters, power inserters, and in-line equalizers. (LM/C) 802.7-1989r

**passive electric network** An electric network containing no source of energy. *See also:* network analysis. (EEC/PE) [119]

**passive filter** A filter network containing only passive elements, such as inductors, capacitors, resistors and transformers. (CAS) [13]

**passive fire protection** The selection of materials that resist ignition and fire propagation, and produce low levels of fire products. (DEI) 1221-1993w

**passive graphics** A method of operation of a computer graphics system in which the graphics system does not accept input from a user and does not allow the user to influence its processing while it is in progress. *Contrast:* interactive graphics. (C) 610.6-1991w

**passive homing guidance (navigation aid terms)** Guidance in which a craft or missile is directed toward a destination by means of natural radiation from the destination. (AES/GCS) 172-1983w

**passive limiter (nonlinear, active, and nonreciprocal waveguide components)** A nonlinear device that suppresses input radio-frequency (rf) power without the aid of an external bias. (MTT) 457-1982w

**passive satellite (communication satellite)** A communication satellite that is a reflector and performs no active signal processing. (COM) [24]

**passive sensor (test, measurement, and diagnostic equipment)** A sensor requiring no source of power other than the signal being measured. (MIL) [2]

**Passive-Star Coupler** A component of a 10BASE-FP fiber optic mixing segment that divides optical power received at any of N input ports among all N output ports. The division of optical power is approximately uniform. (C/LM) 802.3-1998

**passive station (data transmission)** All stations on a multipoint network, other than the master and slave(s), that, during the information message transfer state, monitor the line for supervisory sequences, ending characters, etc. (PE) 599-1985w

**passive test (test, measurement, and diagnostic equipment)** A test conducted upon an equipment or any part thereof when the equipment is not energized. *Synonym:* cold test. (MIL) [2]

**passive transducer** A transducer that has no source of power other than the input signal(s), and whose output signal-power

cannot exceed that of the input. *Note:* The definition of a passive transducer is a restriction of the more general passive network, that is, one containing no impressed driving forces. *See also:* transducer. (Std100) 270-1966w

**passivity (A) (chemical)** The condition of a surface that retards a specified chemical reaction at that surface. *See also:* electrochemistry. **(B) (electrolytic or anodic)** Such a condition of an anode that the normal anodic reaction is retarded. *See also:* electrochemistry. (EEC/PE) [119]

**paste (dry cell) (primary cell)** A gelatinized layer containing electrolyte that lies adjacent to the negative electrode. *See also:* electrolytic cell. (EEC/PE) [119]

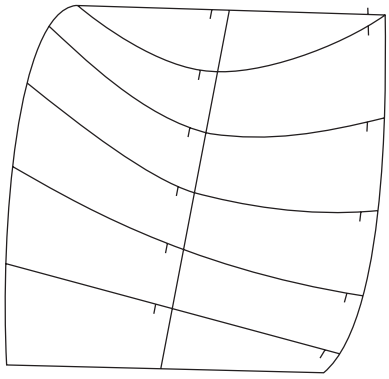
**pasted sintered plate (alkaline storage battery)** A plate consisting of fritted metal powder in which the active material is impregnated. *See also:* battery. (EEC/PE) [119]

**patch (1)** To connect circuits together temporarily by means of a cord, known as a patch cord. (EEC/PE) [119]

**(2) (computers)** To modify a routine in a rough or expedient way. (C) [20], [85]

**(3) (A) (software)** A modification made directly to an object program without reassembling or recompiling from the source program. **(B) (software)** A modification made to a source program as a last-minute fix or afterthought. **(C) (software)** Any modification to a source or object program. **(D) (software)** To perform a modification as in definitions (A), (B), or (C). (C) 610.12-1990

**(4) (computer graphics)** A portion of the surface of a three-dimensional object, as displayed on a graphical display device. (See the corresponding figure.)



**patch**

(C) 610.6-1991w

**patch bay (1) (analog computer)** In an analog computer, a concentrated assembly of the inputs and outputs of computing elements, control elements, tie points, reference voltages, and ground points that offers a means of electrical connection. (C) 165-1977w

**(2)** A specially designed rewireable panel that allows its user to dynamically rewire or perform analog programming. *Synonym:* wiring panel. (C) 610.10-1994w

**patch board** A specially designed reconfigurable connection board used to prototype or test integrated circuits. *Synonym:* patch panel. *See also:* problem board. (C) 610.10-1994w

**patchcord (test, measurement, and diagnostic equipment)** An interconnecting cable for plugging or patching between terminals; commonly employed on patchboard, plugboard, and in maintenance operations. (MIL) [2]

**patch cord** Flexible cable unit or element with connectors(s) used to establish connections on a patch panel. (C/LM) 802.3-1998

**patch panel** *See:* electronic analog computer; problem board.

**patent** A document protecting an invention that grants an inventor the right to prevent others from making, using, or selling the invention for 20 years from the date of application for patent. (C/SE) 1420.1b-1999

**path (1) (navigation) (navigation aid terms)** A line connecting a series of points in space and constituting a proposed or traveled route. *See also:* course line; flight track; flight path. (AES/GCS) 172-1983w

**(2) (network analysis)** Any continuous succession of branches, traversed in the indicated branch directions. (CAS) 155-1960w

**(3) (telephone switching systems)** The set of links and junctors joined in series to establish a connection. (COM) 312-1977w

**(4) (A) (telecommunications switching systems)** A continuous physical connection. **(B) (telecommunications switching systems)** A time slot in a shared facility. (COM/TA) 973-1990

**(5) (A) (software)** In software engineering, a sequence of instructions that may be performed in the execution of a computer program. **(B) (software)** In file access, a hierarchical sequence of directory and subdirectory names specifying the storage location of a file. (C) 610.12-1990

**(6)** In the critical path method, any sequence of activities that goes from the beginning to the end of a project. (C) 610.2-1987

**(7) (A) (data management)** In a hierarchical database, a sequence of segments encountered in traversing from the root segment to an individual dependent segment. **(B) (data management)** With respect to a network or graph, some sequence of nodes such that each successive node is connected to its predecessor by an edge. *See also:* simple path. (C) 610.5-1990

**(8)** A bridged route between a source and a destination. (LM/C/CC) 8802-2-1998

**(9)** The concatenation of all the physical links between the link layers of two nodes. (C/MM) 1394-1995

**(10)** The sequence of segments and repeaters providing the connectivity between two DTEs in a single collision domain. In CSMA/CD networks there is one and only one path between any two DTEs. (LM/C/LM) 802.3-1998

**(11) (data transmission)** *See also:* channel. 599-1985w

**path analysis (software)** Analysis of a computer program to identify all possible paths through the program, to detect incomplete paths, or to discover portions of the program that are not on any path. (C) 610.12-1990

**path assertion** *See:* common ancestor constraint.

**path cofactor** *See:* path factor.

**path condition (software)** A set of conditions that must be met in order for a particular program path to be executed. (C) 610.12-1990

**path delay value (PDV)** The sum of all segment delay values for all segments along a given path. (C/LM) 802.3-1998, 802.9a-1995w

**path expression** A logical expression indicating the input conditions that must be met in order for a particular program path to be executed. (C) 610.12-1990

**path factor (network analysis)** The graph determinant of that part of the graph not touching the specified path (loop). *Notes:* 1. A path (loop) factor is obtainable from the graph determinant by striking out all terms containing transmittance products of loops that touch that path (loop). 2. For loop Lk, the loop factor is $-\partial\Delta/\partial \boldsymbol{L_k}$. (CAS) 155-1960w

**path length (1)** The length of a magnetic flux line in a core. *Note:* In a toroidal core with nearly equal inside and outside diameters, the value

$$l_m = \frac{\pi}{2}\,(\text{O.D.} + \text{I.D.})$$

where O.D. and I.D. are the outside and inside diameters of the core, is commonly used. (Std100) 163-1959w

**(2) (interferometer fiber optic gyro) (laser gyro)** The geometrical length of the path traversed in a single pass by an optical beam. *See also:* optical path length. (AES/GYAC) 528-1994

**path loss** The amount of attenuation between a headend port and a user outlet port. (LM/C) 802.7-1989r

**pathname (1)** A string that is used to identify a file. A pathname consists of, at most, {PATH_MAX} bytes, including the terminating null character. It has an optional beginning slash, followed by zero or more filenames separated by slashes. If the pathname refers to a directory, it may also have one or more trailing slashes. Multiple successive slashes are considered to be the same as one slash. A pathname that begins with two successive slashes may be interpreted in an implementation-defined manner, although more than two leading slashes shall be treated as a single slash. (C/PA) 9945-1-1996, 9945-2-1993

**(2)** A POSIX.1 pathname with characters drawn from the POSIX.1 portable character set. (C/PA) 1387.2-1995

**(3)** A nonempty string that is used to identify a file. A pathname consists of, at most, `POSIX_Limits.Pathname_Maxima'Last` components of type `POSIX.POSIX_Character`. It has an optional beginning slash followed by zero or more filenames separated by slashes. If the pathname refers to a directory, it may also have one or more trailing slashes. Multiple successive slashes are considered the same as one slash. A pathname that begins with two successive slashes may be interpreted in an implementation-defined manner, although more than two leading slashes shall be treated exactly the same as a single slash. (C) 1003.5-1999

**pathname character string** A sequence of characters from the portable filename character, including the / (slash) character. Within software definition files of exported catalogs, all such strings shall be encoded using IRV. (C/PA) 1387.2-1995

**pathname component** *See:* filename.

**pathname resolution** Pathname resolution is performed for a process to resolve a pathname to a particular file in a file hierarchy. There may be multiple pathnames that resolve to the same file. Each filename in the pathname is located in the directory specified by its predecessor (for example, in the pathname fragment "a/b", file "b" is located in directory "a"). Pathname resolution fails if this cannot be accomplished. If the pathname begins with a slash, the predecessor of the first filename in the pathname is taken to be the root directory of the process (such pathnames are referred to as absolute pathnames). If the pathname does not begin with a slash, the predecessor of the first filename of the pathname is taken to be the current working directory of the process (such pathnames are referred to as "relative pathnames"). The interpretation of a pathname component is dependent on the values of {NAME_MAX} and {_POSIX_NO_TRUNC} associated with the path prefix of that component. If any pathname component is longer than {NAME_MAX}, and {_POSIX_NO_TRUNC} is in effect for the path prefix of that component, the implementation shall consider this an error condition. Otherwise, the implementation shall use the first {NAME_MAX} bytes of the pathname component. The special filename, dot, refers to the directory specified by its predecessor. The special filename, dot-dot, refers to the parent directory of its predecessor directory. As a special case, in the root directory, dot-dot may refer to the root directory itself. A pathname consisting of a single slash resolves to the root directory of the process. A null pathname is invalid. (C/PA) 9945-1-1996, 9945-2-1993

**pathocathode radiant sensitivity** *See:* cathode radiant sensitivity.

**pathological coupling** A type of coupling in which one software module affects or depends upon the internal implementation of another. *Contrast:* control coupling; data coupling; content coupling; common-environment coupling; hybrid coupling. (C) 610.12-1990

**path prefix** A pathname, with an optional ending slash, that refers to a directory. (PA/C) 9945-1-1996, 9945-2-1993, 1003.5-1999

**path testing** Testing designed to execute all or selected paths through a computer program. *Contrast:* branch testing; statement testing. (C) 610.12-1990

**path transmittance (network analysis)** The product of the branch transmittances in that path. (CAS) 155-1960w

**path variability value (PVV) (1)** A value that is bounded by the sum of the segment variability values (SVVs) for all the segments along a given path. (C/LM) 802.9a-1995w

**(2)** The sum of all segment variability values for all the segments along a given path. (C/LM) 802.3-1998

**pathway** A facility for the placement of telecommunications. (IA/PSE) 1100-1999

**patient care information system** A broad classification of computational-based systems used for clinical support of patient care. For the purposes of this standard the scope of patient care information systems is further limited to medical device data exchange. (EMB/MIB) 1073-1996

**patient care-related electrical appliance (health care facilities)** An electrical appliance that is intended to be used for diagnostic, therapeutic or monitoring purposes in a patient care area. (EMB) [47]

**patient care system (PCS)** A patient care information system which is actively connected to a 1073-type communications link. (EMB/MIB) 1073-1996

**patient data management system** *See:* patient care information system.

**patient equipment grounding point (health care facilities)** A jack or terminal which serves as the collection point for redundant grounding of electric appliances serving a patient vicinity or for grounding other items in order to eliminate electromagnetic interference problems. (EMB) [47]

**patient grounding point (health care facilities)** A jack or terminal bus which serves as the collection point for redundant grounding of electric appliances serving a patient vicinity. (NESC/NEC) [86]

**patient lead (health care facilities)** Any deliberate electrical connection which may carry current between an appliance and a patient. This may be a surface contact (for example, an electrocardiogram (ECG) electrode); an invasive connection (for example, implanted wire or catheter); or an incidental long-term connection (for example, conductive tubing). It is not intended to include adventitious or casual contacts such as pushbutton, bed surface, lamp, hand-held appliance, etc. (EMB) [47]

**patient vicinity (health care facilities)** In an area which patients are normally cared for the patient vicinity is the space with surfaces likely to be contacted by the patient or an attendant who can touch the patient. This encloses a space within the room 6 ft beyond the perimeter of the bed in its nominal location, and extending vertically 7.5 ft above the floor. (NESC/NEC) [86]

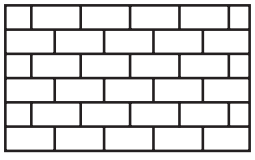
**patina** A green coating consisting principally of basic sulfate and occasionally containing small amounts of carbonate or chloride, that forms on the surface of copper or copper alloys exposed to the atmosphere a long time. (IA) [59]

**patrol tour** An inspection by a member of the security organization along a predetermined route to observe the route area's security conditions. (PE/NP) 692-1997

**patrol tour stations (nuclear security systems)** Points along patrol tour routes where security force member progress is acknowledged. (PE/NP) 692-1986s

**pattern (1) (image processing and pattern recognition)** A meaningful regularity that can be used to classify objects or other items of interest. (C) 610.4-1990w

**(2) (computer graphics)** A series of repeated entities or a repetitious design within a closed boundary on a display surface. (See the corresponding figure.)



**pattern**

(C) 610.6-1991w

**(3) (test pattern language)** The sequence of addresses and data used to test a semiconductor memory. (TT/C) 660-1986w

**(4)** A sequence of characters used either with RE notation or for pathname expansion as a means of selecting various character strings or pathnames, respectively. The syntaxes of the two patterns are similar, but not identical; this standard always indicates the type of pattern being referred to in the immediate context of the use of the term. (C/PA) 9945-2-1993

**(5)** One or more vectors comprising a functionality test for a specific portion of a device under test (DUT). (C/TT) 1450-1999

**(6)** *See also:* radiation pattern.

**pattern class** One of a set of mutually exclusive categories into which a pattern can be classified. *Synonyms:* class; category. (C) 610.4-1990w

**pattern classification** The process of assigning patterns to pattern classes. *Synonym:* pattern identification. (C) 610.4-1990w

**pattern distortion (oscilloscopes)** Any deformation of the pattern from its intended form. (IEC 151-14.). *Notes:* 1. In an oscilloscope the intended form is rectilinear and rectangular. 2. An oscilloscope control that affects pattern distortion may be labeled "pattern" or "geometry." (IM) 311-1970w

**pattern, heating** *See:* heating pattern.

**pattern identification** *See:* pattern classification.

**pattern insensitivity** The ability to write, store, and read streams of data without regard to the sequence of the data and the pattern of distribution of ones and zeros across the memory locations. (ED) 641-1987w

**pattern jitter** *See:* correlated jitter.

**pattern-propagation factor** Ratio of the field strength that is actually present at a point in space to that which would have been present if free-space propagation had occurred with the antenna beam directed toward the point in question. This factor is used in the radar equation to modify the strength of the transmitted or received signal to account for the effect of multipath propagation, diffraction, refraction, and pattern of an antenna. (AES) 686-1997

**pattern recognition (1)** The identification of shapes, forms, or configurations by automatic means. (C) [20], [85]

**(2) (image processing and pattern recognition)** The analysis, description, identification, and classification of objects or other meaningful regularities by automatic or semiautomatic means. *Synonym:* machine recognition. (C) 610.4-1990w

**patterns** A set of unit under test (UUT) stimulus and expected response states. A pattern contains one unit of logic state (0, 1, X, Z) data for each UUT input and each UUT output pin. (SCC20) 1445-1998

**pattern segmentation** The process of determining which regions or areas of in-terest in an image or other set of data constitute patterns of interest for pattern recognition. (C) 610.4-1990w

**pattern select** A broadcast address specifying that all devices seeing the broadcast remain attached to the master only if their T pins are asserted during the immediately ensuing write data cycle. (NID) 960-1993

**pattern-sensitive fault** A fault that appears in response to some particular pattern of data. *See also:* data-sensitive fault. (C) [20], [85]

**pause (1)** To suspend the execution of a computer program. *Synonym:* halt. *Contrast:* stop. (C) 610.12-1990

**(2)** A mechanism for full duplex flow control. (C/LM) 802.3-1998

**pause instruction** A computer instruction that specifies suspension of the execution of a computer program. *Note:* A pause instruction does not cause an exit from the program. *Synonym:* halt instruction. *See also:* stop instruction; optional-pause instruction. (C) 610.10-1994w

**Pause Interrupt Enabled (PIE) bit** A bit in the Slave Status register of every S-module that is set to indicate that the S-module may generate an interrupt during the PAUSE Slave Controller state when the S-module is addressed. (TT/C) 1149.5-1995

**PAX** *See:* private automatic exchange.

**payback** A financial analysis technique where the cost to implement a project is compared to the annual savings due from the project. (SCC22) 1346-1998

**payload (1)** The information bits (within a frame). (COM/TA) 1007-1991r

**(2)** The data (a message, a memory access request, an acknowledgment, etc.) that is to be transferred from the source node to the destination node. It has a specific format, defined in the transaction layer. Note that a payload may be null. *See also:* packet. (C/BA) 1355-1995

**(3)** The portion of a primary packet that contains data defined by an application layer. (C/MM) 1394-1995

**(4)** The portion of a primary packet that contains data defined by an application. (C/MM) 1394a-2000

**payout site** *See:* tension site.

**pay station** *See:* public telephone station.

**P-band** A letter-band designation no longer applicable and which should not be used. Originally it denoted frequencies in the vicinity of 230 MHz, which are no longer allowed for radar usage. Later it was sometimes applied to denote the 420–450 MHz International Telecommunication Union (ITU) allocated radiolocation band that is now called UHF by IEEE Std 521-1984, IEEE Standard Letter Designations for Radar-Frequency Bands. (AES) 686-1997

**PBX** *See:* private branch exchange.

**PBX trunk** *See:* private-branch-exchange trunk.

**PC** *See:* personal computer; printed circuit.

**PCA** *See:* physical configuration audit.

**PCB** *See:* polychlorinated biphenyl; askarel.

**PCC** *See:* point of common coupling.

**PCD** *See:* POSIX Conformance Document.

**P channel (1) (for the ISLAN16-T)** A 10 Mbit/s packet channel, that provides a Physical Layer service to an ISO/IEC 8802-3 MAC. (C/LM) 802.9a-1995w

**(2)** A full duplex packet channel that provides IEEE 802 MAC Layer services. The P channel may optionally carry CCITT Q.93x (where x refers to the family of CCITT Q.930 protocols) call control in a logically out-of-band fashion, which may be highlighted by referring to it as $P_D$. Presently there is only one P channel defined per ISLAN interface. The minimum size of the P channel shall be limited by the application requirements of the topology that represents the connection of the AU to the backbone LAN application. The support of station management communication will be an important factor in the characterization of P channel bandwidth size. (LM/C/COM) 8802-9-1996

**p-channel device (metal-nitride-oxide field-effect transistor)** Insulated-gate field-effect transformer (IGFET) where source and drain are regions of p-type conductivity. (ED) 581-1978w

**p-channel metal-oxide semiconductor (PMOS)** A type of semiconductor technology which employs metal oxide field effect transistors, using holes to conduct current in the semiconductor channel. *Note:* The channel has a predominantly positive charge. *Contrast:* n-channel metal-oxide semiconductor. *See also:* complementary metal-oxide semiconductor. (C) 610.10-1994w

**PCM** *See:* punched card machine; pulse code modulation.

**PC parallel port** The parallel printer port used as the parallel interface for most printers and supported by most PCs. This interface has been variously defined by different PC and peripheral manufacturers. This standard describes the more prevalent variations of the interface and defines a family of signaling methods that are backward compatible with the typical PC parallel port. (C/MM) 1284-1994

**PCS** *See:* print contrast signal; power conditioning subsystem; physical coding sublayer; patient care system.

**PCSN** *See:* private circuit switching network.

**PCTP** *See:* POSIX Conformance Test Procedure.

**PCTS** *See:* POSIX Conformance Test Suite.

**P.D** *See:* control action, proportional plus derivative.

**PD** *See:* partial discharge.

**PDA** *See:* parallel disk array.

**PDEL** *See:* Partial Differential Equation Language.

**PDES** *See:* Product Data Exchange Specification.

**P-display** A name for the type of display commonly known as plan-position indicator (PPI). (AES) 686-1997

**PDL** *See:* program design language.

**PDM** *See:* pulse-duration modulation.

**PDN** *See:* public data network.

**PDR** *See:* preliminary design review.

**PDS** *See:* partitioned data set.

**PDS/MaGen** *See:* Problem Descriptor System.

**PDU** *See:* protocol data unit; command protocol data unit.

**PDV** *See:* path delay value.

**PE** Conduit fabricated from polyethylene. (SUB/PE) 525-1992r

**PEAK** Channel number corresponding to the peak of a distribution. (NPS) 398-1972r

**peak** *See:* line.

**peak alternating gap voltage (electron tube) (traveling-wave tubes)** The negative of the line integral of the peak alternating electric field taken along a specified path across the gap. *Note:* The path of integration must be stated. (ED) 161-1971w

**peak anode current** The maximum instantaneous value of the anode current. *See also:* electronic controller. (IA/IAC) [60]

**peak burst magnitude (audio and electroacoustics)** The maximum absolute peak value of voltage, current, or power for a burstlike excursion. *See also:* burst duration; burst. (SP) [32]

**peak cathode current (steady-state)** The maximum instantaneous value of a periodically recurring cathode current. (ED) 161-1971w

**peak-charge characteristic (nonlinear capacitor)** The function relating one-half the peak-to-peak value of transferred charge in the steady state to one-half the peak-to-peak value of a specified applied symmetrical alternating capacitor voltage. *Note:* Peak-charge characteristic is always single-valued. *See also:* nonlinear capacitor. (ED) [46]

**peak code** The codes that will produce the maximum decoder output level. (COM/TA) 1007-1991r

**peak current (low-voltage dc power circuit breakers used in enclosures)** The instantaneous value of current at the time of its maximum value. (SWG/PE) C37.14-1979s, C37.100-1992

**peak demand** *See:* maximum demand.

**peak detector (overhead-power-line corona and radio noise)** A detector, the output voltage of which is the true peak value of an applied signal or noise. (T&D/PE) 539-1990

**peak discharge current** The peak current occurring during a transient discharge. *Note:* Due to the very short discharge time, substantial peak currents (up to a few amperes) can be encountered in typical induction circumstances. (T&D/PE) 539-1990

**peak distortion (data transmission)** The largest total distortion of telegraph signals noted during a period of observation. (PE) 599-1985w

**peak electrode current (electron tube)** The maximum instantaneous current that flows through an electrode. *See also:* electrode current. (ED) [45]

**peak error** The residual with the largest absolute value. (IM/WM&A) 1057-1994w

**peak flux density** The maximum flux density in a magnetic material in a specified cyclically magnetized condition. (Std100) 163-1959w

**peak forward anode voltage (electron tube)** The maximum instantaneous anode voltage in the direction in which the tube is designed to pass current. *See also:* electronic controller; electrode voltage. (ED) [45]

**peak forward current rating (rectifier circuit element) (repetitive)** The maximum repetitive instantaneous forward current permitted by the manufacturer under stated conditions. *See also:* average forward current rating. (IA) [62]

**peak forward voltage** (of a rectifying element) The maximum instantaneous voltage between the anode and cathode during the positive nonconducting period. *See also:* rectification. (EEC/PE) [119]

**peak full-width-half-maximum calibration coefficients** The full-width-half-maximum (also called shape) ($F$) versus channel number ($Ch$) coefficients as

$$F = P + Q \cdot Ch^{1} + R \cdot Ch^{2I} + W \cdot Ch^{3I}$$

with the coefficients, $P$, $Q$, $R$, and $W$ stored as four successive 14-character numbers including the decimal point, and $I$ as a four-character number including the decimal point. Leading spaces are interpreted as zeros. Any values not used or calculated should be set to all spaces. The $P$ term is usually called the offset or zero intercept. The $I$ is the lowest exponent of the channel number. In most cases I will be 0.5 for a quadratic dependance of the FWHM with channel and I will be 1.0 for linear dependance of the FWHM with channel. The $Q$ term is the multiplier for the lowest power dependance of the FWHM-channel curve. The $R$ term is the multiplier of the second exponent term of the FWHM-channel curve. The W term is the multiplier of the third exponent term of the FWHM-channel curve. (NPS/NID) 1214-1992r

**peak induction** (of toroidal magnetic amplifier cores) The magnetic induction corresponding to the peak applied magnetizing force specified. *Note:* It will usually be slightly less than the true saturation induction. *Synonym:* peak flux density. (Std100) 106-1972

**peaking circuit** A circuit capable of converting an input wave into a peaked waveform. (EEC/PE) [119]

**peaking network** A type of interstage coupling network in which an inductance is effectively in series (series peaking network) or in shunt (shunt peaking network) with the parasitic capacitance to increase the amplification at the upper end of the frequency range. *See also:* network analysis. (EEC/PE) [119]

**peaking station (power operations)** A generating station that is normally operated to provide power only during maximum load periods. (PE/PSE) 858-1987s, 346-1973Tw

**peaking time (1) (semiconductor radiation detectors)** The time elapsed from the first zero crossing of the defined zero level to the departure from peak amplitude of a pulse equal to the maximum rated amplifier output. (NID) 301-1976s **(2) (germanium gamma-ray detectors) (charged-particle detectors)** (of an amplifier output pulse) The time between the 1% amplitude point on the leading edge and the 100% amplitude point of a pulse (provided that the pulse does not have a flat top). For flat-top pulses, the peaking time is defined as the time between the 1% amplitude point and the midpoint of the flat top. (NPS) 325-1986s **(3)** The time interval between the 1% point on the first transition and the top centerline. (NPS) 300-1988r

**peaking time tp** (of a pulse) The interval between the 1% point on the first transition, with respect to the peak height, and the top center line. *See also:* transition; top centerline. (NPS) 325-1996

**peak inrush current (electronic power transformer)** The peak instantaneous current value resulting from the excitation of the transformer with no connected load, and with essentially zero source impedance, and using the minimum turns primary tap and rated voltage. (PEL/ET) 295-1969r

**peak instantaneous sound pressure level** (measurement of sound pressure levels of ac power circuit breakers) Maximum unweighted positive or negative pressure peak value reached by an impulsive sound wave at any time during the period of observation. Unit: decibel (dB). Readings can be considered as peak instantaneous sound pressure level if the C-weighting is used and the response time of the instrument is 50 μs or less. Peak instantaneous sound pressure level is sometimes referred to as impact noise. (SWG/PE) C37.100-1992, C37.082-1982r

**peak inverse anode voltage (electron tube)** The maximum instantaneous anode voltage in the direction opposite to that in which the tube is designed to pass current. *See also:* electrode voltage; electronic controller. (ED) [45]

**peak inverse voltage (PIV) (semiconductor diode)** The maximum instantaneous anode-to-cathode voltage in the reverse direction that is actually applied to the diode in an operating circuit. *Notes:* 1. This is an applications term not to be confused with breakdown voltage, which is a property of the device. 2. In semiconductor work the preferred term is peak reverse voltage. *See also:* semiconductor; peak reverse voltage. (ED) 216-1960w

**peak inverse voltage, maximum rated (semiconductor diode)** The recommended maximum instantaneous anode-to-cathode voltage that may be applied in the reverse direction. *See also:* semiconductor. (ED) 216-1960w

**peak jitter** *See:* jitter.

**peak let-through characteristic curve** *See:* current-limiting characteristic curve.

**peak let-through current (1) (protection and coordination of industrial and commercial power systems)** The maximum instantaneous current through a current-limiting fuse during the total clearing time. Since this is an instantaneous value, it may well exceed the root-mean-square (rms) available current, but will be less than the peak current available without a fuse in the circuit if the fault level is high enough for it to operate in its current-limiting mode. (IA/PSP) 242-1986r **(2)** The highest current flowing in the circuit following the inception of the fault that the circuit breaker and the protected system must withstand, expressed as an instantaneous rather than an rms value. (IA/PSP) 1015-1997

**peak let-through cutoff current** (of a current-limiting fuse) The highest instantaneous current passed by the fuse during the interruption of the circuit. (SWG/PE) C37.100-1992, C37.40-1993

**peak limiter** A device that automatically limits the magnitude of a signal to a predetermined maximum value by changing its amplification. *Notes:* 1. The term is frequently applied to a device whose gain is quickly reduced and slowly restored when the instantaneous magnitude of the input exceeds a predetermined value. 2. In this context, the terms instantaneous magnitude and instantaneous peak power are used interchangeably. (BT/AV) [34]

**peak load (1) (A)** The maximum load consumed or produced by a unit or group of units in a stated period of time. It may be the maximum instantaneous load or the maximum average load over a designated interval of time. *Note:* Maximum average load is ordinarily used. In commercial transactions involving peak load (peak power) it is taken as the average load (power) during a time interval of specified duration occurring within a given period of time, that time interval being selected during which the average power is greatest. *See also:* generating station. **(B)** The maximum load of a specified unit or group of units in a stated period of time. (T&D/PE/IA/PSE) [10], 241-1990, 141-1993 **(2) (rotating machinery) (motors)** The largest momentary or short-time load expected to be delivered by a motor. It is expressed in percent of normal power or normal torque. *See also:* asynchronous machine. (PE) [9]

**peak load duty (thyristor converter)** A type of duty where the rating of the converter is specified in terms of the magnitude and duration of the peak load together with the time of no-load between peaks. (IA/IPC) 444-1973w

**peak load station (electric power supply)** A generating station that is normally operated to provide power during maximum load periods. *See also:* generating station. (PE/PSE) [54]

**peak magnetizing force (1) (toroidal magnetic amplifier cores)** The maximum value of applied magnetomotive force per mean length of path of the core. (MAG) 393-1977s **(2) (peak field strength)** The upper or lower limiting value of magnetizing force associated with a cyclically magnetized condition. (Std100) 163-1959w

**peak nominal varistor voltage (low voltage varistor surge arresters)** Voltage across the varistor measured at a specified pulsed direct-current (dc) current of specific duration coincident with a specified alternating-current (ac) current crest. (PE) [8]

**peak overvoltages** (for current-limiting fuses) The peak value of the voltage that can exist across a current-limiting fuse during its arcing interval. (SWG/PE) C37.100-1992, C37.40-1993

**peak percent curve** *See:* integrated energy curve.

**peak point (tunnel-diode characteristic)** The point on the forward current-voltage characteristic corresponding to the lowest positive (forward) voltage at which $d/dV = 0$.

**peak-point current (tunnel-diode characteristic)** The current at the peak point. *See also:* peak point. (ED) 253-1963w, [46]

**peak-point voltage (tunnel-diode characteristic)** The voltage at which the peak point occurs. *See also:* peak point. (ED) 253-1963w, [46]

**peak power density** The maximum instantaneous power density occurring when power is transmitted. (NIR) C95.1-1999

**peak power, instantaneous** *See:* instantaneous peak power.

**peak power output (modulated carrier system)** The output power, averaged over a carrier cycle, at the maximum amplitude that can occur with any combination of signals to be transmitted. *See also:* television; radio transmitter. (AP/ANT) 145-1983s

**peak power pulse (waveguide)** The root-mean-square (rms) value of rectangular pulse of radio frequency (RF) power passing through the transverse section of a waveguide. (MTT) 146-1980w

**peak pulse amplitude (television)** The maximum absolute peak value of the pulse excluding those portions considered to be unwanted, such as spikes. *Note:* Where such exclusions are made, it is desirable that the amplitude chosen be illustrated pictorially. *See also:* pulse. (PE) 599-1985w

**peak pulse power, carrier-frequency** The power averaged over that carrier-frequency cycle that occurs at the maximum of the pulse of power (usually one half the maximum instantaneous power). (IM/WM&A) 194-1977w

**peak radiant responsivity (diode-type camera tube)** The peak value of the spectral response of the tube usually specified together with the wavelength at which it occurs. Units: amperes watt$^{-1}$ (AW$^{-1}$). (ED) 503-1978w

**peak repetitive ON-state current (thyristor)** The peak value of the on-state current including all repetitive transient currents. *See also:* principal current. (ED/IA) [46], [123], [12], [62]

**peak responsibility** The load of a customer, a group of customers, or a part of the system at the time of occurrence of the system peak load. *See also:* generating station. (T&D/PE) [10]

**peak restriking voltage (surge arresters)** The maximum instantaneous voltage that is attained by the re-striking voltage. (PE) [8], [84]

**peak reverse voltage (semiconductor rectifiers)** The maximum instantaneous value of the reverse voltage that occurs across a semiconductor rectifier device, or rectifier stack. *See also:* rectification. (IA) [12]

**peak sound pressure** (for any specified time interval) The maximum absolute value of the instantaneous sound pressure in that interval. *Note:* In the case of a periodic wave, if the time interval considered is a complete period, the peak sound pressure becomes identical with the maximum sound pressure. (SP) [32]

**peak switching current (rotating machinery)** The maximum peak transient current attained following a switching operation on a machine. *See also:* asynchronous machine. (PE) [9]

**peak-to-Compton ratio for the 1332 keV $^{60}$Co peak** The ratio of the full-energy peak height, for $^{60}$Co measured at 1332 keV, to the average height of the corresponding Compton plateau between 1040 keV and 1096 keV. (NI) N42.14-1991

**peak torque (electric coupling)** The maximum torque an electric coupling will transmit or develop for any speed relation on input and output members, with rated excitation and at specified operating conditions. (EM/PE) 290-1980w

**peak value (1) (A)** (of alternating voltage) The maximum value, disregarding small high-frequency oscillations (greater than 10 kHz) such as those arising from partial discharges. **(B)** (of impulse voltages) The maximum value of impulses that are smooth double exponential waves without overshoot. (PE/PSIM) 4-1995

**(2) (surge arresters) (voltage or current)** The maximum value of an impulse. If there are small oscillations superimposed at the peak, the peak value is defined by the maximum value and not the mean curve drawn through the oscillations. (PE) [8], [84]

**(3) (electrical measurements in power circuits)** The largest absolute value ($y_p$) of $y$. (PE/PSIM) 120-1989r

**(4)** *See also:* crest value. (SPD/PE) C62.22-1997

**peak wavelength (1) (fiber optics)** The wavelength at which the radiant intensity of a source is maximum. *See also:* spectral width; spectral line. (Std100) 812-1984w

**(2) (light-emitting diodes)** The wavelength at which the spectral radiant intensity is a maximum. (ED) [127]

**peak withstand current (1) (of an air switch)** The crest value of the total current during the maximum cycle that a switch is required to carry at rated frequency. (SWG/PE) C37.34-1994

**(2)** The maximum instantaneous current at the major peak of an offset power-frequency sinusoidal current that a switch is required to carry. (SWG/PE) 1247-1998

**peak working voltage (1) (pulse transformers)** The maximum instantaneous voltage stress that may appear under operation across the insulation being considered, including abnormal and transient conditions. (PEL/ET) 390-1987r

**(2) (charging inductors)** The algebraic sum of the maximum alternating crest voltage and the direct voltage of the same polarity appearing between the terminals of the inductor winding or between the inductor winding and the grounded elements. (MAG) 306-1969w

**(3) (corona measurement)** The maximum instantaneous voltage that may appear under normal rated conditions across the insulation being considered. This insulation may be within a winding, between windings, or between winding and grounds. (MAG/ET) 436-1977s

**peanut** *See:* rope connector.

**PEARL** *See:* Process and Experiment Automation Realtime Language.

**PEC** *See:* protocol error counter.

**Pederson ray** The upper ionospheric ray in oblique-incidence propagation. *See also:* junction frequency. (AP/PROP) 211-1997

**pedestal** A substantially flat-topped pulse that elevates the base level for another wave. *See also:* pulse. (EEC/PE) [119]

**pedestal bearing (rotating machinery)** A complete assembly of a bearing with its supporting pedestal. (PE) [9]

**pedestal bearing insulation (rotating machinery)** The insulation applied either below the bearing liner shell and the adjacent pedestal support or between the base of the pedestal and the machine bed plate, to break the current path that may be formed through the shaft to the outboard bearing to the frame to the drive-end bearing and thence back to the shaft. *Note:* The voltage is usually very low. However, very destructive bearing currents can flow in this path if some insulating break is not provided. High-pressure moulded laminates are usually employed for this type of insulation. (PE) [9]

**pedestal delay time (amplitude, frequency, and pulse modulation)** The time elapsed between the application of an electronic command signal to the electronic driver and the time the diffracted light reaches the 10% intensity point. (UFFC) [17]

**peeling** The unwanted detachment of a plated metal coating from the base metal. *See also:* electroplating. (EEC/PE) [119]

**peer (1)** Elements of a distributed system that communicate with each other using a common protocol. (DIS/C) 1278.2-1995

**(2)** Service layer on a remote node at the same level. For instance a "peer link layer" is the link layer on a different node. (C/MM) 1394-1995

**peer-entity authentication** The corroboration that a peer entity in an association is the one claimed. This service, when provided by the (N)-layer, provides corroboration to the (N+1)-entity that the peer entity is the claimed (N+1)-entity. This is primarily intended for, although not limited to, connection-oriented service and may be either unilateral or mutual. (LM/C) 802.10-1992

**peer graphics** *See:* information graphics.

**peer Port (of a Virtual Port)** A Virtual Port is a peer (Virtual) Port of a given Virtual Port when both Virtual Ports attach to the same Group and both represent the capability for communication between the Remote Bridges to which they belong. (C/LM) 802.1G-1996

**peer protocol** The sequence of message exchanges between two entities in the same layer that utilize the services of the underlying layers to effect the successful transfer of data and/or control information from one location to another location. (C/LM/CC) 8802-2-1998

**peer-to-peer communication (A)** Communication between two or more processes or programs by which both computers can exchange data freely. *Note:* Any physical differences between the computers are rendered transparent to the application. **(B)** Communication between two or more network nodes in which either node can initiate sessions, and is able to poll or answer to polls. (C) 610.7-1995

**peg count (1) (telephone switching systems)** The notation of the number of occurrences of an event. (COM) 312-1977w

**(2)** *See also:* traffic peg count. (COM/TA) 973-1990w

**pel** *See:* pixel.

**Peltier coefficient, absolute** The product of the absolute temperature and the absolute Seebeck coefficient of the material; the sign of the Peltier coefficient is the same as that of the Seebeck coefficient. *Note:* The opposite sign convention has also been used in the technical literature. *See also:* thermoelectric device. (ED) [46]

**Peltier coefficient, quotient** The quotient of: "A," the rate of Peltier heat absorption by the junction of the two conductors by "B," the electric current through the junction; the Peltier coefficient is positive if Peltier heat is absorbed by the junction when the electric current flows from the second-named conductor to the first conductor. *Notes:* 1. The opposite sign convention has also been used in the technical literature. 2. The Peltier coefficient of a couple is the algebraic difference of either the relative or absolute Peltier coefficients of the two conductors. *See also:* thermoelectric device. (ED) [46]

**Peltier coefficient, relative** The Peltier coefficient of a couple composed of the given material as the first-named conductor and a specified standard conductor. *Note:* Common standard conductors are platinum, lead, and copper. *See also:* thermoelectric device. (ED) [46]

**Peltier effect** The absorption or evolution of thermal energy, in addition to the Joule heat, at a junction through which an electric current flows; and in a nonhomogeneous, isothermal conductor, the absorption or evolution of thermal energy, in addition to the Joule heat, produced by an electric current. *Notes:* 1. For the case of a nonhomogeneous, nonisothermal conductor, the Peltier effect cannot be separated from the Thomson effect. 2. A current through the junction of two dissimilar materials causes either an absorption or liberation of heat, depending on the sense of the current, and at a rate directly proportional to it to a first approximation. *See also:* thermoelectric device. (ED) [46], 270-1966w

**Peltier heat** The thermal energy absorbed or evolved as a result of the Peltier effect. *See also:* thermoelectric device. (ED) [46]

**penalty brake** A function of the automatic train protection portion of the master control system, accomplished by a safety critical, full-service, or emergency brake application. *Note:* Although most commonly associated with an overspeed operating condition, penalty braking may be initiated for a variety of reasons, depending on the vehicle design and the requirements of the authority having jurisdiction. (VT) 1475-1999

**penalty factor** A factor that produces the incremental cost of delivered power from a source when multiplied by the incremental cost of power at the source. Mathematically, it is:

$$\frac{1}{(1 - \text{Incremental Transmission Loss})^*}$$

* Expressed as a decimal. (PE/PSE) 94-1991w

**pencil-beam antenna (1)** An antenna whose radiation pattern consists of a single main lobe with narrow principal half-power beamwidths and side lobes having relatively low levels. *Note:* The main lobe usually has approximately elliptical contours of equal radiation intensity in the angular region around the peak of the main lobe. This type of pattern is diffraction-limited in practice. It is often called a sum pattern in radar applications. (AP/ANT) 145-1993
**(2)** Antenna beam with a narrow radiation lobe with approximately equal azimuth and elevation beamwidths (i.e., one with circular or almost circular shape in the plane perpendicular to the direction of propagation). (AES) 686-1997

**pendant** A device or equipment that is suspended from overhead either by means of the flexible cord carrying the current or otherwise. (EEC/PE) [119]

**pending master** The master that participated in and won the most recent arbitration cycle. As a result it will assume bus mastership when the current master releases the bus. (NID) 960-1993

**pendulosity (accelerometer) (gyros)** The product of the inertial-sensing mass and the distance from the center of mass to the center of support measured along the pendulous axis. (AES/GYAC) 528-1994

**pendulous accelerometer** An accelerometer that employs a proof mass that is suspended to permit a rotation about an axis perpendicular to an input axis. (AES/GYAC) 528-1994

**pendulous axis (accelerometer)** In pendulous devices, an axis through the mass center of the proof mass, perpendicular to and intersecting the output axis. The positive direction is defined from the output axis to the proof mass. (AES/GYAC) 528-1994

**pendulous integrating gyro accelerometer (PIGA)** A device using a single-degree-of-freedom gyro having an intentional pendulosity along the spin axis that is servo-driven about the input axis at a rate that balances the torque induced by acceleration along the input axis. The angle through which the servoed axis rotates is proportional to the integral of applied acceleration. (AES/GYAC) 528-1994

**pendulous reference axis (PRA) (accelerometer)** The direction of an axis, as defined by the case mounting surfaces or external case markings or both. It is nominally parallel to the pendulous axis. (AES/GYAC) 528-1994

**penetration** Attacks by unauthorized persons in attempts to gain system access by defeating the system security perimeter (e.g., log-in controls, access controls, bypass controls). Penetration often is in conjunction with browsing or misuse, and could result in unauthorized disclosure or modification of information, unauthorized receipt of services, or denial of service to legitimate users or critical functions. (C/BA) 896.3-1993w

**penetration CRT display device** A CRT display device characterized by a display screen covered with several layers of phosphor that are selectively energized by varying the voltage of the electron beam, allowing the display of multiple colors. *Note:* Often used to add color to a random-scan display device. (C) 610.10-1994w

**penetration depth (1)** For a given frequency, the depth at which the electric field strength of an incident plane wave, penetrating into a lossy medium, is reduced to $1/e$ of its value just beneath the surface of the lossy medium. *Note:* The penetration depth, also called the skin depth, is equal to the reciprocal of the attenuation constant in the lossy medium. *Synonym:* skin depth. (AP/PROP) 211-1997
**(2)** For a plane electromagnetic wave incident on the boundary of a medium, the distance from the boundary into the medium along the direction of propagation in the medium, at which the field strengths of the wave have been reduced to $1/e$ ($\sim$36.8%) of the boundary values. (NIR) C95.1-1999

**penetration, depth of** *See:* depth of current penetration.

**penetration frequency (A)** For a given angle of incidence, the lowest frequency that just penetrates the ionosphere. **(B)** *See also:* critical frequency. (AP/PROP) 211-1997

**penetration frequency, oblique incidence propagation (radio-wave propagation)** For a given angle of incidence, the lowest frequency that just penetrates the ionosphere. (AP/PROP) 211-1990s

**penetration frequency, vertical incidence propagation** *See:* critical frequency.

**pentode** A five-electrode electron tube containing an anode, a cathode, a control electrode, and two additional electrodes that are ordinarily grids. (ED) 161-1971w

**pen travel** The length of the path described by the pen in moving from one end of the chart scale to the other. The path may be an arc or a straight line. *See also:* moving element. (EEC/EMI) [112]

**perceived chroma of an area of surface color (illuminating engineering)** The attribute according to which it appears to exhibit more or less chromatic color judged in proportion to the brightness of a similarly illuminated area that appears to be white or highly transmitting. In a given set of viewing conditions, and at luminance levels that result in photopic vision, a stimulus of a given chromaticity and luminance factor exhibits approximately constant perceived chroma for all levels of illumination; but for a stimulus of a given chromaticity viewed at a given level of illumination, the perceived chroma generally increases if the luminance factor is increased. (EEC/IE) [126]

**perceived color (illuminating engineering)** The proximal stimulus applied to the retina initiates color which is perceived as a substance occupying the space in front of the observer's eyes. Color may be perceived as self-luminous or as being reflected or transmitted light. It may be perceived as being confined to a point or line or arrayed as a surface or film or distributed in three dimensions as in the case of the perceived image of a patch of fog. A perceived image may be perceived as composed of volume color as in the case of fog or as covered by surface color as in the case of a piece of chalk. In the case of the sky or a patch of color seen through an

aperture where it cannot be identified as belonging to a specific object, it is called aperture color and judgement is suspended as to whether the color is self-luminous or perceived by reflected or transmitted light. The color of a point source of light may be perceived and described as such. This is a special case of a self-luminous color. (EEC/IE) [126]

**perceived light-source color (illuminating engineering)** The color perceived to belong to a light source. (EEC/IE) [126]

**perceived object color** The color perceived to belong to an object, resulting from characteristics of the object, of the incident light, and of the surround, the viewing direction, and observer adaptation. *See also:* color. (EEC/IE) [126]

**percentage differential relay** A differential relay in which the designed response to the phasor difference between incoming and outgoing electrical quantities is modified by a restraining action of one or more of the input quantities. *Note:* The relay operates when the magnitude of the phasor difference exceeds the specified percentage of one or more of the input quantities. (SWG/PE) C37.100-1992

**percentage error (watthour meter)** The difference between a meter's percentage registration and 100%. A meter whose percentage registration is 95% is said to be 5% slow, or its error is −5%. A meter whose percentage registration is 105% is 5% fast, or its error is +5%. (ELM) C12.1-1982s

**percentage immediate appreciation (telephone transmission system)** The percentage of the total number of spoken sentences that are immediately understood without conscious deductive effort when each sentence conveys a simple and easily understandable idea. *See also:* volume equivalent. (PE/EEC) [119]

**percentage modulation (A)** In angle modulation, the fraction of a specified reference modulation, expressed in percent. **(B)** In amplitude modulation, the modulation factor expressed in percent. *Note:* It is sometimes convenient to express percentage modulation in decibels below 100% modulation. *See also:* radio transmission. (BT) 182A-1964

**percentage modulation, effective (single, sinusoidal input component)** The ratio of the peak value of the fundamental component of the envelope to the direct-current component in the modulated conditions, expressed in percent. *Note:* It is sometimes convenient to express percentage modulation in decibels below 100% modulation. (AP/ANT) 145-1983s

**percentage registration (accuracy) (percentage accuracy) (watthour meter)** The ratio of the actual registration of the meter to the true value of the quantity measured in a given time, expressed as a percentage. *See also:* electricity meter. (ELM) C12.1-1982s

**percent energy resolution** *See:* energy resolution.

**percent flutter (reproduced tone) (sound recording and reproducing)** The root-mean-square deviation from the average frequency, expressed as a percentage of average frequency. (SP) 193-1971w

**percent harmonic distortion (electroacoustics)** A measure of the harmonic distortion in a system or transducer, numerically equal to 100 times the ratio of the square root of the sum of the squares of the root-mean-square voltages (or currents) of each of the individual harmonic frequencies, to the root-mean-square voltage (or current) of the fundamental. *Note:* It is practical to measure the ratio of the root-mean-square amplitude of the residual harmonic voltages (or currents), after the elimination of the fundamental, to the root-mean-square amplitude of the fundamental and harmonic voltages (or currents) combined. This measurement will indicate percent harmonic distortion with an error of less than 5% if the magnitude of the distortion does not exceed 30%. *See also:* distortion. (SP) 151-1965w

**percent impairment of hearing** (percent hearing loss) An estimate of a person's ability to hear correctly. It is usually based, by means of an arbitrary rule, on the pure-tone audiogram. The specific rule for calculating this quantity from the audiogram now varies from state to state according to a rule or law. *Note:* The term disability of hearing is sometimes used for impairment of hearing. Impairment refers specifically to a person's illness or injury that affects his personal efficiency in the activities of daily living. Disability has the additional medicolegal connotation that an impairment reduces a person's ability to engage in gainful activity. Impairment is only a contributing factor to the disability. (SP) [32]

**percent impedance (1) (rectifier transformer)** The percent of rated alternating-current winding voltage required to circulate current equivalent to rated line kilovolt-amperes in the alternating-current winding with all direct-current winding terminals short-circuited. *See also:* rectifier transformer. (Std100) C57.18-1964w

**(2) (rectifier transformer)** The percent of rated primary winding voltage required to circulate current equivalent to rated kilovoltamperes in the primary winding with all secondary winding terminals short-circuited. (PE/TR) C57.18.10-1998

**percent loss of life** The equivalent aging in hours at the reference hottest-spot temperature over a time period (usually 24 h) times 100 divided by the total normal insulation life in hours at the reference hottest-spot temperature. The equivalent aging in hours at different hot-spot temperatures is obtained by multiplying the aging acceleration factors for the hottest-spot temperatures times the time periods of the various hottest-spot temperatures. (PE/TR) C57.91-1995

**percent-make-and-break (telephone switching systems)** The proportions of a dial pulse cycle during which the circuit is closed (make) and opened (break) respectively. (COM) 312-1977w

**percent polarized** The degree of polarization expressed in percent. *See also:* degree of polarization. (AP/PROP) 211-1997

**percent pulse waveform distortion (pulse terminology)** Pulse waveform distortion expressed as a percentage of, unless otherwise specified, the pulse amplitude of the reference pulse waveform. (IM/WM&A) 194-1977w

**percent pulse waveform feature distortion (pulse terminology)** Pulse waveform feature distortion expressed as a percentage of, unless otherwise specified, the pulse amplitude of the reference pulse waveform. (IM/WM&A) 194-1977w

**percent ratio (instrument transformers)** The true ratio expressed in percent of the marked ratio. (PE/TR) C57.13-1978s, C57.12.80-1978er

**percent ratio correction** The difference between the ratio correction factor and unity, expressed in percent [(RCF − 1) × 100]. *See also:* ratio correction factor. (PE/TR) C57.13-1993, [57]

**percent ripple (1) (power system communication equipment)** The ratio of the effective (root-mean-square) value of the ripple voltage or current to the average value of the total (direct current) voltage or current, expressed in percent. (PE/PSC) 281-1984w

**(2) (electrical conversion)** The ratio of the root-mean-square (RMS) value of the voltage pulsations ($E_{max}$ to $E_{min}$) to the average value of the total voltage.

$$\text{percent ripple} = \frac{\text{RMS ripple}}{E_{\text{nominal}}}(100\%)$$

*Note:* In most applications, the definition has been revised to simplify the calculations by defining percent ripple as the ratio of the root-mean-square (RMS) value of the voltage pulsations to the nominal no-load output voltage of the converter $E_{\text{nominal}}$.

$$\text{percent ripple} = \frac{\text{RMS ripple}}{E_{\text{av}}}(100\%)$$

(AES) [41]

**(3)** The ratio of the value of the ripple voltage to the value of the total voltage multiplied by 100. (PEL/ET) 388-1992r

**percent ripple voltage or current** *See:* percent ripple.

**percent steady-state deviation (control)** The difference between the ideal value and the final value, expressed as a per-

centage of the maximum rated value of the directly controlled variable (or another variable if specified). *See also:* feedback control system. (IA/IAC) [60]

**percent syllable articulation** *See:* syllable articulation.

**percent system deviation (control)** At any given point on the time response, the difference between the ideal value and the instantaneous value, expressed as a percentage of the maximum rated value of the directly controlled variable (or another variable if specified). *See also:* deviation; feedback control system. (IA/IAC) [60]

**percent total flutter (sound recording and reproducing)** The value of flutter indicated by an instrument that responds uniformly to flutter of all rates from 0.5 up to 200 Hz. *Note:* Except for the most critical tests, instruments that respond uniformly to flutter of all rates up to 120 Hz are adequate, and their indications may be accepted as showing percent total flutter. (SP) 193-1971w

**percent transformer correction-factor error** Difference between the transformer correction factor and unity expressed in percent. *Note:* The percent transformer correction-factor error is positive if the transformer correction factor is greater than unity. If the percent transformer correction-factor error is positive, the measured watts or watthours will be less than the true value. (PE/TR) [57], C57.13-1978s

**percent transient deviation (control)** The difference between the instantaneous value and the final value, expressed as a percentage of the maximum rated value of the directly controlled variable (or another variable if specified). *See also:* feedback control system. (IA/IAC) [60]

**percent unbalance of phase voltages (electrical conversion)** The ratio of the maximum deviation of a phase voltage from the average of the total phases to the average of the phase voltages, expressed in percent.

$$\text{percent unbalance} = \frac{\text{RMS phase voltage} - \text{RMS average phase voltages}}{\text{RMS average phase voltage}} \times 100\%$$

(AES) [41]

**perfect conductor** A medium for which the conductivity is infinite. In a perfect conductor, the total electric and magnetic fields are identically zero regardless of the exciting source. *Synonyms:* ideal conductor; perfectly conducting medium. (AP/PROP) 211-1997

**perfect dielectric (1) (ideal dielectric)** A dielectric in which all of the energy required to establish an electric field in the dielectric is recoverable when the field or impressed voltage is removed. Therefore, a perfect dielectric has zero conductivity and all absorption phenomena are absent. A complete vacuum is the only known perfect dielectric. (Std100) 270-1966w
**(2)** A dielectric medium in which the conductive and dielectric losses are identically zero. *See also:* ideal dielectric. (AP/PROP) 211-1997

**perfect diffusion (illuminating engineering)** That in which flux is uniformly scattered in accordance with Lambert's cosine law. *See also:* Lambert's cosine law. (EEC/IE) [126]

**perfective maintenance (1) (software)** Software maintenance performed to improve the performance, maintainability, or other attributes of a computer program. *Contrast:* adaptive maintenance; corrective maintenance. (C) 610.12-1990
**(2)** Modification of a software product after delivery to improve performance or maintainability. (C/SE) 1219-1998

**perfectly conducting medium** *See:* perfect conductor.

**perforated punch tape** *See:* perforated tape.

**perforated tape (1)** Tape in which a code hole(s) and a tape-feed hole have been punched in a row. (IA) [61]
**(2)** A tape on which a pattern of holes is used to represent information. *Synonyms:* perforated punch tape; punched tape. *See also:* paper tape reader; chadless tape. (C) 610.10-1994w

**perforated tape reader** *See:* paper tape reader.

**perforator (1) (telegraph practice)** A device for punching code signals in paper tape for application to a tape transmitter. *Note:* A perforating device that is automatically controlled by incoming signals is called a reperforator. *See also:* telegraphy. (C/COM) [20], [49], [85]
**(2) (test, measurement, and diagnostic equipment)** A device for punching digital information into tape for application to a tape transmitter or tape reader. *Synonym:* tape punch. (MIL) [2]

**performance (1) (software)** The degree to which a system or component accomplishes its designated functions within given constraints, such as speed, accuracy, or memory usage. (C) 610.12-1990
**(2)** A measure of a computer system or subsystem to perform its functions; for example, response time, throughput, or number of transactions per second. The efficiency of a system in accomplishing pieces of work is an attribute of performance. (C/PA) 14252-1996

**performance characteristic(s) (1)** Those characteristics (such as impedance, losses, dielectric test levels, temperature rise, sound level, etc.) that describe the performance of the equipment under specified conditions of operation. (PE/TR) C57.12.80-1978r
**(2)** (of a device) An operating characteristic, the limit or limits of which are given in the design test specifications. (SWG/PE) C37.100-1992, [56], C37.40-1993
**(3)** The parameters that are essential to describe the behavior or applicability of the device under specified conditions of operation. (SPD/PE) C62.62-2000

**performance chart (magnetron oscillators)** A plot on coordinates of applied anode voltage and current showing contours of constant magnetic field, power output, and over-all efficiency. *See also:* magnetron. (ED) 161-1971w

**performance criteria** The established level of quality (bias, precision, detection sensitivity, etc.) and operational commitments (turnaround times, reporting protocol, etc.) that are:

1) Agreed upon between the Service Laboratory and the customer (or inter-governmental agencies or intra-company entities) within a formal contract.
2) Established by the Service Laboratory and documented within the Laboratory's Operational or Quality Assurance Program Manual or
3) Both 1 and 2 above.

(NI) N42.23-1995

**performance criterion** The criterion upon which the insulation strength or withstand voltages and clearances are selected. The performance criterion is based on an acceptable probability of insulation failure and is determined by the consequence of failure, required level of reliability, expected life of equipment, economics, and operational requirements. The criterion is usually expressed in terms of an acceptable failure rate (number of failures per year, years between failures, risk of failure, etc.) of the insulation configuration. (PE/C) 1313.1-1996

**performance evaluation (1) (software)** The technical assessment of a system or system component to determine how effectively operating objectives have been achieved. *See also:* component; system. (C/SE) 729-1983s
**(2)** The analysis, in terms of initial objectives and estimates, usually made on site to provide information on operating experience and to identify required corrective actions. (PE/NP) 933-1999

**performance factor** The ratio PL/RRS where PL, the performance level, is the level of ground shaking and RRS, the required response spectrum, is the test or analysis level. (PE/SUB) 693-1997

**performance index (excitation systems)** A scalar measure of the quality of system behavior. It is frequently a function of system output and control input over some specified time interval and/or frequency range. A quadratic performance index is a quadratic function of system states and this form finds

wide applications to linear systems. (PE/EDPG) 421A-1978s

**performance level (PL)** A specified level of earthquake ground shaking that is used to define standardized seismic qualification levels (high, moderate, and low) for substation equipment. (PE/SUB) 693-1997

**Performance Level 1** Environment primarily intended for aircraft applications subject to extreme vibration, shock, and temperature variations. (C/MM) 1156.1-1993

**Performance Level 2** Environment primarily intended for shipboard, subsurface ship, and shore applications subject to substantial vibration, extreme shock, and temperature variations. (C/MM) 1156.1-1993

**Performance Level 3** Environment primarily intended for shipboard, vehicular, and shore applications subject to vibration, shock, and temperature variations. (C/MM) 1156.1-1993

**Performance Level 4** Environment primarily intended for sheltered applications subject to vibration, corrosion, shock, and temperature variations. (C/MM) 1156.1-1993

**Performance Level 5** Environment primarily intended for sheltered applications subject to minimal vibration, shock, or temperature variations. (C/MM) 1156.1-1993

**performance management** In networking, a management function defined for controlling and analyzing the throughput and error rate of the network. (C) 610.7-1995

**performance monitor (test, measurement, and diagnostic equipment)** A device that continuously or periodically scans a selected number of test points to determine if the unit is operating within specified limits. The device may include provisions for insertion of stimuli. (MIL) [2]

**performance monitoring** Determining whether equipment is operating or capable of operating within specific limits. (PE/NP) 933-1999

**performance requirement (1) (software)** A requirement that imposes conditions on a functional requirement; for example a requirement that specifies the speed, accuracy, or memory usage with which a given function must be performed. (C) 610.12-1990

**(2)** A requirement that specifies a performance characteristic that a system or system component must possess; for example, speed, accuracy, frequency. (C/PA) 14252-1996

**(3)** The measurable criteria that identifies a quality attribute of a function, or how well a functional requirement must be accomplished. (C/SE) 1220-1998

**performance specification (software)** A document that specifies the performance characteristics that a system or component must possess. These characteristics typically include speed, accuracy, and memory usage. Often part of a requirements specification. (C) 610.12-1990

**performance test** A constant current or constant power capacity test, made on a battery after it has been in service, to detect any change in the capacity. (PE/SB/EDPG) 1106-1995, 450-1995, 1188-1996

**performance testing** Testing conducted to evaluate the compliance of a system or component with specified performance requirements. *See also:* functional testing. (C/PE/EDPG) 610.12-1990, 1248-1998

**performance tests (rotating machinery)** The tests required to determine the characteristics of a machine and to determine whether the machine complies with its specified performance. *See also:* direct-current commutating machine; asynchronous machine. (PE) [9]

**performance verification (test, measurement, and diagnostic equipment)** A short, precise check to verify that the unit under test is operational and performing its intended function. (MIL) [2]

**performing activity** The person(s) or organization that performs the tasks specified in this standard. (C/SE) 1220-1994s

**periapsis (communication satellite)** The least distant point from the center of a primary body (or planet) to an orbit around it. (COM) [19]

**perigee (navigation aid terms)** That orbital point nearest the earth when the earth is the center of attraction. (AES/GCS) 172-1983w

**perimeter** In image processing, the number of pixels in the border of a region. (C) 610.4-1990w

**perimeter lights (illuminating engineering)** Aeronautical ground lights provided to indicate the perimeter of a landing pad for helicopters. (EEC/IE) [126]

**period (1) (pulse terminology)** The absolute value of the minimum interval after which the same characteristics of a periodic waveform or a periodic feature recur. (IM/WM&A) 194-1977w

**(2) (modeling and simulation)** The time interval between successive events in a discrete simulation. (C) 610.3-1989w

**(3) (NuBus)** Time between two driving edges. (C/MM) 1196-1987w

**(4)** An interval of time in the battery duty cycle during which the load is assumed to be constant for purposes of cell sizing calculations. (PE/EDPG) 1115-1992

**(5)** The character ".". The term *period* is contrasted against *dot* which is used to describe a specific directory entry. (C/PA) 9945-2-1993

**(6)** An interval of time in the battery duty cycle during which the load is assumed to be constant for purposes of cell sizing calculations. (SCC29) 485-1997

**period, critical hydro** *See:* critical hydro period.

**period hours (electric generating unit reliability, availability, and productivity)** The number of hours a unit was in the active state. (PE/PSE) 762-1987w

**periodically sampled equivalent time format (pulse measurement)** A format that is identical to the periodically sampled real time format, below, except that the time coordinate is equivalent to and convertible to real time. Typically, each datum point is derived from a different measurement on a different wave in a sequence of waves. *See also:* sampled format. (IM/WM&A) 181-1977w

**periodically sampled real time format (pulse measurement)** A finite sequence of magnitudes $m_0, m_1, m_2, \ldots m_n$ each of which represents the magnitude of the wave at times $t_0, t_0 + \Delta t, t_0 + 2\Delta t, \ldots t_0 + n\Delta t$, respectively, wherein . . . the data may exist in a pictorial format or as a list of numbers. *See also:* sampled format. (IM/WM&A) 181-1977w

**periodic and random deviation** The sum of all ripple and noise components measured over a specified bandwidth and state, unless otherwise specified, in peak-to-peak values. (PEL) 1515-2000

**periodic-automatic-reclosing equipment** A piece of equipment that provides for automatically reclosing a circuit-switching device a specified number of times at specified intervals between reclosures. *Note:* This type of automatic reclosing equipment is generally used for ac circuits. (SWG/PE) C37.100-1992

**periodic check (test, measurement, and diagnostic equipment)** A test or series of tests performed at designated intervals to determine if all elements of the unit under test are operating within their designated limits. (MIL) [2]

**periodic damping** *See:* underdamping.

**periodic duty (packaging machinery) (power and distribution transformers)** Intermittent operation in which the load conditions are regularly recurrent. (NEC/NESC/IA/PE/PKG/TR) 333-1980w, C57.16-1996, C57.12.80-1978r, [86]

**periodic electromagnetic wave (radio-wave propagation)** A wave in which the electric field vector is repeated in detail in either of two ways: at a fixed point, after the lapse of a time known as the period, or at a fixed time, after the addition of a distance known as the wavelength. (AP) 211-1977s

**periodic frequency modulation (converters having ac output) (self-commutated converters)** The periodic variation of the output frequency from its rated value. (IA/SPC) 936-1987w

**periodic function** A function that satisfies $f(x) = f(x + nk)$ for all $x$ and for all integers $n$, $k$ being a constant. For example, $\sin(x + a) = \sin(x + a + 2n\pi)$. (Std100) 270-1966w

**periodic line (transmission lines)** A line consisting of successive identically similar sections, similarly oriented, the electrical properties of each section not being uniform throughout. *Note:* The periodicity is in space and not in time. An example of a periodic line is the loaded line with loading coils uniformly spaced. *See also:* transmission line. (Std100) 270-1966w

**periodic monitoring** The process of sampling the state of some phenomenon at a sample interval greater than 1 s. (SWG/SUB/PE) C37.122-1983s, C37.122.1-1993, C37.100-1992

**periodic output voltage modulation (self-commutated converters) (converters having ac output)** The periodic variation of output voltage amplitude at frequencies less than the fundamental output frequency. (IA/SPC) 936-1987w

**periodic permanent-magnet focusing (PPM) (microwave tubes)** Magnetic focusing derived from a periodic array of permanent magnets. *See also:* magnetron. (ED) [45]

**periodic pulse train (automatic control)** A pulse train made up of identical groups of pulses, the groups repeating at regular intervals. (PE/EDPG) [3]

**periodic rating (1) (electric power sources)** The load that can be carried for the alternate periods of load and rest specified in the rating, the apparatus starting at approximately room temperature, and for the total time specified in the rating, without causing any of the specified limitations to be exceeded. *See also:* asynchronous machine. (IA/IAC) [60]

**(2) (relay)** A rating that defines the current or voltage that may be sustained by the relay during intermittent periods of energization as specified, starting cold and operating for the total time specified without causing any of the prescribed limitations to be exceeded. (SWG/PE) C37.100-1981s

**periodic slow-wave circuit (microwave tubes)** A circuit whose structure is periodically recurring in the direction of propagation. *See also:* microwaves. (ED) [45]

**periodic tasks** Tasks that have to be processed at regular intervals, and each instance shall be normally completed before the next instance of the same task arrives. (C/BA) 896.3-1993w

**periodic test** Test performed at scheduled intervals to detect failures and verify operability. (PE/NP) 379-1994, 308-1980Gs, 381-1977w, 338-1987r

**periodic wave** A wave in which the displacement at each point of the medium is a periodic function of the time. Periodic waves are classified in the same manner as periodic quantities. (Std100) 270-1966w

**periodic waveguide** A waveguide in which propagation is obtained by periodically arranged discontinuities or periodic modulations of the material boundaries. (MTT) 146-1980w

**period timing check** A timing check that specifies the allowable time between successive periods of a signal. (C/DA) 1481-1999

**peripheral (1)** A device, attached to a host via a communication link. (C/MM) 1284-1994

**(2)** Pertaining to a device that operates in combination or conjunction with the computer but is not physically part of the computer and is not essential to the basic operation of the system; for example, printers, keyboards, graphic digital converters, disks, and tape drives. *Note:* Such devices are often referred to as "peripherals" or "peripheral equipment." *See also:* input-output device. (C) 610.10-1994w

**peripheral air-gap leakage flux (rotating machinery)** The component of air-gap magnetic flux emanating from the rotor or stator, that flows from pole to pole without entering the radially opposite surface of the air gap. *See also:* rotor; stator. (PE) [9]

**peripheral controller** *See:* input-output controller.

**peripheral control unit** *See:* controller.

**peripheral device** A device connected to another device (host) that, in turn, controls its operation. (EMC) C63.4-1991

**peripheral equipment (test, measurement, and diagnostic equipment)** Equipment external to a basic unit. A tape unit, for example, is peripheral equipment to a computer. (MIL) [2]

**peripheral personality** The characteristics of a language processor or operating environment that a peripheral runs to interpret commands and data being sent. (C/MM) 1284-1994

**peripheral stimulation** Action by a chemical or physical agent at or near the surface of an organism. (T&D/PE) 539-1990

**peripheral storage** *See:* auxiliary storage.

**peripheral transfer** The process of transmitting data between two peripheral units. *See also:* radial transfer. (C) 610.10-1994w

**peripheral unit** With respect to a particular processing unit, any equipment that can communicate directly with that unit. (C) 610.10-1994w

**peripheral vision (illuminating engineering)** The seeing of objects displaced from the primary line of sight and outside the central visual field. (EEC/IE) [126]

**peripheral visual field (illuminating engineering)** That portion of the visual field which falls outside the region corresponding to the foveal portion of the retina. (EEC/IE) [126]

**periphery** The outer part of an integrated circuit where instances of cell types designed specifically to interface the internal circuitry to the "outside world" are placed. This part includes "pad" cells (which are input and output buffers) and power and ground pads; it may also include test circuitry, such as boundary scan cells. (C/DA) 1481-1999

**periscope (navigation aid terms)** An optical instrument which displaces the line of sight parallel to permit a view which otherwise may be obstructed itself. (AES/GCS) 172-1983w

**periscope antenna** An antenna consisting of a very directive feed located close to ground level and oriented so that its beam illuminates an elevated reflector that is oriented so as to produce a horizontal beam. (AP/ANT) 145-1993

**periscopic sextant (navigation aid terms)** A sextant designed to be mounted inside a vehicle, with a tube extending vertically upward through the skin of the vehicle. (AES/GCS) 172-1983w

**permanent connection (substation grounding)** A grounding connector that will retain its electrical and mechanical integrity for the design life of the conductor within limits established in IEEE Std 837-1984. (SUB/PE) 837-1989r

**permanent echo** A signal reflected from an object fixed with respect to the radar site. (AES) 686-1997

**permanent fault (1) (surge arresters)** A fault that can be cleared only by action taken at the point of fault. (PE) [8], [84]

**(2)** A continuous and stable failure or error. (C/BA) 896.3-1993w

**(3)** One that will persist regardless of how fast the system is de-energized or the number of times that the system is de-energized and re-energized. (T&D/PE) 1250-1995

**permanent-field synchronous motor** A synchronous motor similar in construction to an induction motor in which the member carrying the secondary laminations and windings carries also permanent-magnet field poles that are shielded from the alternating flux by the laminations. It starts as an induction motor but operates normally at synchronous speed. *See also:* permanent-magnet synchronous motor. (PE) [9]

**permanent font** *See:* internal font.

**permanent forced outage (1)** A forced outage where the component or unit is damaged and cannot be restored to service

until repair or replacement is completed. *Note:* Repairs can be further classified by urgency as high, normal, and low urgency repairs. (PE/PSE) 859-1987w

**(2) (electric power system)** An outage whose cause is not immediately self-clearing, but must be corrected by eliminating the hazard or by repairing or replacing the component before it can be returned to service. An example of a permanent forced outage is a lightning flashover which shatters an insulator thereby disabling the component until repair or replacement can be made. *Note:* This definition derives from transmission and distribution applications and does not necessarily apply to generation outages. (PE/PSE) 346-1973w

**permanent forced outage duration (electric power system)** The period from the initiation of the outage until the component is replaced or repaired. (PE/PSE) 346-1973w

**permanently grounded device** A grounding device designed to be permanently connected to ground, either solidly or through current transformers and/or another grounding device. (SPD/PE) 32-1972r

**permanently installed decorative fountains and reflection pools** Those that are constructed in the ground, on the ground, or in a building in such a manner that the pool cannot be readily disassembled for storage and are served by electrical circuits of any nature. These units are primarily constructed for their aesthetic value and not intended for swimming or wading. (NESC/NEC) [86]

**permanently installed swimming, wading and therapeutic pools** Those that are constructed in the ground, on the ground, or in a building in such a manner that the pool cannot be readily disassembled for storage, whether or not served by electrical circuits of any nature. (NESC/NEC) [86]

**permanent magnet (PM)** A ferromagnetic body that maintains a magnetic field without the aid of external electric current. (Std100) [84]

**permanent-magnet erasing head (electroacoustics)** A head that uses the fields of one or more permanent magnets for erasing. *See also:* phonograph pickup. (SP) [32]

**permanent-magnet focusing (microwave tubes)** Magnetic focusing derived from the use of a permanent magnet. *See also:* magnetron. (ED) [45]

**permanent-magnet generator (1) (magneto)** A generator in which the open-circuit magnetic flux field is provided by one or more permanent magnets. (PE) [9]

**(2)** An electric generator in which the magnetic flux is provided by one or more pairs of permanent magnets. (IA/MT) 45-1998

**permanent-magnet loudspeaker** A moving-conductor loudspeaker in which the steady field is produced by means of a permanent magnet. (EEC/PE) [119]

**permanent-magnet moving-coil instrument (d'arsonval instrument)** An instrument that depends for its operation on the reaction between the current in a movable coil or coils and the field of a fixed permanent magnet. *See also:* instrument. (PE/EEC) [119]

**permanent-magnet moving-iron instrument (polarized-vane instrument)** An instrument that depends for its operation on the action of an iron vane in aligning itself in the resultant magnetic field produced by a permanent magnet and the current in an adjacent coil of the instrument. *See also:* instrument. (EEC/PE) [119]

**permanent-magnet, second-harmonic, self-synchronous system** A remote-indicating arrangement consisting of a transmitter unit and one or more receiver units. All units have permanent-magnet rotors and toroidal stators using saturable ferromagnetic cores and excited with alternating current from a common external source. The coils are tapped at three or more equally spaced intervals, and the corresponding taps are connected together to transmit voltages that consist principally of the second harmonic of the excitation voltage. The rotors of the receiver units will assume the same angular position as that of the transmitter rotor. *See also:* synchro system. (EEC/PE) [119]

**permanent-magnet synchronous motor (rotating machinery)** A synchronous motor in which the field system consists of one or more permanent magnets. *See also:* permanent-field synchronous motor. (PE) [9]

**permanent master** *See:* master.

**permanent record** Records that shall be maintained for the lifetime of the project or as long as required by contract. These records may be forwarded to the customer for retention by the customer's record keeping system upon request or at the end of the contract period. (NI) N42.23-1995

**permanent signal (A) (telephone switching systems)** A sustained off-hook supervisory signal originating outside a switching system. **(B)** Occurs if no dialed (or outpulsed) digits are received and the system times out. (COM/TA) 312-1977, 973-1990

**permanent-signal alarm (telephone switching systems)** An alarm resulting from the simultaneous accumulation of a predetermined number of permanent signals. (COM) 312-1977w

**permanent signal timing or no dial timing** The time from the beginning of line or trunk seizure until the first character dialed is detected. This applies for individual lines and immediate start trunks. (COM/TA) 973-1990w

**permanent-signal tone (telephone switching systems)** A tone that indicates to an operator or other employee that a line is in a permanent-signal state. (COM) 312-1977w

**permanent-split capacitor motor** A capacitor motor with the same value of effective capacitance for both starting and running operations. *See also:* asynchronous machine. (PE) [9]

**permanent storage** A type of storage whose contents cannot be modified. *Synonym:* nonerasable storage. *Contrast:* erasable storage. *See also:* read-only storage. (C) 610.10-1994w

**permanent virtual circuit** A virtual circuit that is established at service subscription time and always connects the same two user end points. *Note:* Bandwidth on a PVC is always available but lacks the flexibility of dynamically connecting to different end users. *See also:* switched virtual circuit. (C) 610.7-1995

**permeability ($\mu$) (1) (A) (general)** A general term used to express various relationships between magnetic induction and magnetizing force. These relationships are either:

a) absolute permeability, that in general is the quotient of a change in magnetic induction divided by the corresponding change in magnetizing force; or
b) specific (relative) permeability, which is the ratio of the absolute permeability to the magnetic constant.

*Note:* Relative permeability is a pure number that is the same in all unit systems; the value and dimension of absolute permeability depend upon the system of units employed. **(B) (general)** In anisotropic media, permeability becomes a matrix. (Std100) 270-1966

**(2) (electrical heating systems)** Ratio of the magnetic flux density to the corresponding magnetizing force. (IA/PC) 844-1991

**(3)** The drainage characteristic of soil that denotes its capacity to conduct or discharge fluids under a given hydraulic gradient. (SUB/PE) 980-1994

**(4)** A macroscopic material property of a medium that relates the magnetic flux density, $\vec{B}$, to the magnetic field, $\vec{H}$, in the medium. For a monochromatic wave in a linear medium, that relationship is described by the (phasor) equation:

$$\vec{B} = \pi = \cdot \vec{H}$$

where

$\pi = =$ a tensor that is generally frequency dependent

For an isotropic medium, the tensor reduces to a complex scalar:

$$\mu = \mu' - j\mu''$$

where
$\mu'$ = the real part of the permeability
$\mu''$ accounts for losses

(AP/PROP) 211-1997

**permeability, complex** *See:* complex permeability.

**permeability, relative complex** *See:* relative complex permeability.

**permeameter** An apparatus for determining corresponding values of magnetizing force and flux density in a test specimen. From such values of magnetizing force and flux density, normal induction curves or hysteresis loops can be plotted and magnetic permeability can be computed. *See also:* magnetometer. (EEC/PE) [119]

**permeance** The reciprocal of reluctance. (Std100) 270-1966w

**permissible mine equipment** Equipment that complies with the requirements of and is formally approved by the United States Bureau of Mines after having passed the inspections and the explosion and.or other tests specified by that Bureau. *Note:* All equipment so approved must carry the official approval plate required as identification for permissible equipment. (EEC/PE) [119]

**permissible response rate (A) (steam generating unit)** The maximum assigned rate of change in generation for load-control purposes based on estimated and known limitations in the turbine, boiler, combustion control, or auxiliary equipment. The permissible response rate for a hydro-generating unit is the maximum assigned rate of change in generation for load-control purposes based on estimated and known limitations of the water column, associated piping, turbine, or auxiliary equipment. *See also:* speed-governing system. **(B)** steam-generating unit. The maximum allowable rate of change of generation under load control, which is based on the limitations of the turbine, boiler, combustion control, and/or auxiliary equipment. **(C)** hydro-generating unit. The maximum allowable rate of change of generation under load-control, which is based on the limitations of the water column, piping, turbine, and/or auxiliary equipment. (PE/PSE) 94-1970, 94-1991

**permission** *See:* file permission.

**permissions** *See:* file access permissions.

**permissive (1)** (as applied to a relay system) A general term indicating that functional cooperation of two or more relays is required before control action can become effective. (SWG/PE/PSR) C37.90-1978s, C37.100-1992

**(2)** A term that describes the constraints placed on accesses of a data format; the read, write, and lock accesses can be performed divisibly (i.e., using multiple transations) using a multiphase fetch and/or update process. (C/MM) 1596.5-1993

**(3)** Pertaining to a scheme requiring permission to trip from a remote terminal, usually in the form of a pilot signal. (PE/PSR) C37.113-1999

**permissive block** A block in manual or controlled manual territory, governed by the principle that a train other than a passenger train may be permitted to follow a train other than a passenger train in the block. *See also:* block-signal system; controlled manual block signal system. (EEC/PE) [119]

**permissive connection** A connection in which non-voice information can be sent over the voice communications network. *See also:* programmable connection; RJ-45. (C) 610.7-1995

**permissive control (electric power system)** An automatic generation control methodology that reduces generating unit control error only when unit change will reduce area control error. (PE/PSE) 94-1991w

**permissive control device (power system device function numbers)** Generally a two-position device that in one position permits the closing of a circuit breaker, or the placing of an equipment into operation, and in the other position prevents the circuit breaker or the equipment from being operated. (SUB/PE) C37.2-1979s

**permissive [security] attribute** A security attribute that identifies an active entity or a resource as member of a group. An entity is granted access to all resources in the groups of which it is a member. Permissive attributes could be used alone or in combination with restrictive attributes. Commonly, when used in combination with restrictive attributes, they are secondary in the determination of access privilege. (C/LM) 802.10-1998, 802.10g-1995

**permit** *See:* clearance.

**permittivity (ε) (1) (primary ferroelectric terms) (small-signal, ferroelectric material)** The incremental change in electric displacement per unit electric field when the magnitude of the measuring field is very small compared to the coercive electric field. The small signal relative permittivity, $\kappa$, is equal to the ratio of the absolute permittivity $\varepsilon$ to the permittivity of free space $\varepsilon_0$, that is $\kappa = \varepsilon/\varepsilon_0$. Macroscopically, $\varepsilon$ is found by measuring the capacitance. The units of permittivity are coulombs/volt-meter or farads/meter. In a ferroelectric, the measuring field or voltage must be sufficiently small in order to prevent ferroelectric domain reorientation from contributing to the permittivity. *Note:* The value of the small-signal permittivity may depend on the remanent polarization, electric field, mechanical stress, sample history, or frequency of the measuring field. (Measurements are usually made at a frequency of 1 kHz or higher.) (UFFC) 180-1986w

**(2)** A macroscopic material property of the medium that relates the electric flux density, $D$, to the electric field, $\vec{E}$, in the medium. For a monochromatic wave in a linear medium, that relationship is described by the (phasor) equation:

$$\vec{D} = \varepsilon = \cdot \vec{E}$$

where $\varepsilon =$, the complex permittivity, is a tensor that is generally frequency dependent. For an isotropic medium, the tensor reduces to a complex scalar:

$$\varepsilon = \varepsilon' - j\varepsilon''$$

where
$\varepsilon'$ = the real part of the permittivity
$\varepsilon''$ accounts for losses

(AP/PROP) 211-1997

**permittivity, complex** *See:* complex permittivity.

**permittivity, free space** *See:* free space permittivity.

**permittivity in physical media** The real part of the complex permittivity. *See also:* complex dielectric constant. (AP/ANT) 145-1983s

**permittivity, relative complex** *See:* relative complex permittivity.

**permutation** An ordered sequence of a given number of items chosen from a set. *Contrast:* combination. (C) 610.5-1990w

**permutation index** An automatic index in which each item appears repeatedly, each time with a different word of the item as the first word, followed by the subsequent words in the item, then by that part of the item that came before the word. *See also:* permutation on subject headings index; keyword and context index. (C) 610.2-1987

**permutation on subject headings (POSH)** *See:* permutation on subject headings index.

**permutation on subject headings index** A permutation index in which the item entries are subject headings. (C) 610.2-1987

**perpendicular magnetic recording** A type of magnetic recording in which magnetic polarities representing data are aligned perpendicularly to the plane of the recording surface. *Synonym:* vertical magnetic recording. *Contrast:* longitudinal magnetic recording. (C) 610.10-1994w

**perpendicular magnetization** Magnetization of the recording medium in a direction perpendicular to the line of travel and parallel to the smallest cross-sectional dimension of the medium. *Note:* In this type of magnetization, either single pole-piece or double pole-piece magnetic heads may be used. *See also:* phonograph pickup. (SP/MR) [32]

**perpendicular polarization (1) (facsimile)** A linear polarization for which the field vector is parallel to some reference plane. *Note:* These terms are applied mainly to uniform plane waves incident upon a plane of discontinuity (surface of the earth, surface of a dielectric or a conductor). Then the convention is to take as reference the plane of incidence, that is, the plane containing the direction of propagation and the normal to the surface of discontinuity. If these two directions coincide, the reference plane must be specified by some other convention. (COM/AP/ANT) 167-1966w, 145-1993

**(2)** The polarization of a wave for which the electric field is perpendicular to the plane of incidence. Sometimes called horizontal or transverse electric (TE) polarization. (EMC) 1128-1998

**(3)** The polarization of a wave for which the electric field vector is perpendicular to the plane of incidence. *Note:* Sometimes called horizontal or transverse electric (TE) polarization; in optics, such a wave is said to be "s" polarized. (AP/PROP) 211-1997

**persistence (1) (oscilloscopes)** The decaying luminosity of the luminescent screen (phosphor screen) after the stimulus has been reduced or removed. *See also:* phosphor decay. (IM) 311-1970w

**(2) (A) (computer graphics)** The length of time that a display image remains on a display surface without being refreshed. **(B) (computer graphics)** The tendency of a phosphor to continue to emit light when no longer energized by an electron beam. (C) 610.6-1991

**(3)** A mode for semaphores, shared memory, and message queues requiring that the object and its state (including data, if any) are preserved after the object is no longer referenced by any process. Persistence of an object does not imply that the state of the object is maintained across a system crash or a system reboot. (C/PA) 9945-1-1996

**(4)** A characteristic of semaphores, shared memory, and message queues requiring that the object and its state (including data, if any) are preserved after last close (the object is no longer referenced by any process). Persistence of an object does not necessarily imply that the state of the object is maintained across a system crash or a system reboot. (C) 1003.5-1999

**persistence characteristic (1) (camera tubes)** The temporal step response of a camera tube to illumination. (ED) 161-1971w

**(2) (decay characteristic) (luminescent screen)** A relation, usually shown by a graph, between luminance (or emitted radiant power) and time after excitation is removed. (ED) 161-1971w

**persistent-cause forced outage (electric power system)** A component outage whose cause is not immediately self-clearing but must be corrected by eliminating the hazard or by repairing or replacing the affected component before it can be returned to service. *Note:* An example of a persistent-cause forced outage is a lightning flashover that shatters an insulator thereby disabling the component until repair or replacement can be made. *See also:* outage. (PE/PSE) [54]

**persistent-cause forced-outage duration (electric power system)** The period from the initiation of a persistent-cause forced outage until the affected component is replaced or repaired and made available to perform its intended function. *See also:* outage. (PE/PSE) [54]

**persistent current (superconducting material)** A magnetically induced current that flows undiminished in a superconducting material or circuit. *See also:* superconductivity. (ED) [46]

**persistent-image device** An optoelectronic amplifier capable of retaining a radiation image for a length of time determined by the characteristics of the device. *See also:* optoelectronic device. (ED) [46]

**persistent-image panel (optoelectronic device)** A thin, usually flat, multicell persistent-image device. *See also:* optoelectronic device. (ED) [46]

**persistent menu** A menu that popped up and stayed visible for one round of use. Menus stay on the screen until the user chooses an item or dismisses the menu. (C) 1295-1993w

**persistent URI** A Uniform Resource Identifier (URI) is persistent if it is a reference that does not need to change at the link in a document, and can still reach the desired object even though that object may have changed locations. (C) 2001-1999

**personal computer (1) (measurement of radio-noise emissions)** A system, containing a host and a limited number of peripherals designed to be used in the home or in small offices, that enables individuals to perform a variety of computing or word-processing functions or both, and that typically is of a size permitting it and its peripherals to be located on a table surface. *Note:* Other definitions given in product standards or applicable regulations may take precedence. (EMC) C63.4-1991

**(2)** A single-user microcomputer designed for personally controllable applications. *See also:* workstation; laptop computer; desktop computer; home computer. (C) 610.2-1987, 610.10-1994w

**personal computing (A)** Computing performed using a personal computer. **(B)** Computing performed in an environment in which the user has complete control over the data and access to software with which the data may be manipulated. *Synonym:* personal processing. (C) 610.2-1987

**personal ground (conductor stringing equipment)** A portable device designed to connect (bond) a deenergized conductor or piece of equipment, or both, to an electrical ground. It is distinguished from a master ground in that it is utilized at the immediate site when work is to be performed on a conductor or piece of equipment that could accidentally become energized. *Synonyms:* ground stick; working ground; red head. (T&D/PE) 524a-1993r, 524-1992r, 1048-1990

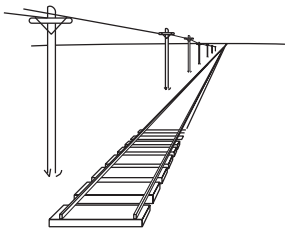
**personal name attributes** The Organizational-Unit-Name-1, Organizational-Unit-Name-2, Organizational-Unit-Name-3, and Organizational-Unit-Name-4 attributes specific to the class. (C/PA) 1224.1-1993w

**personal processing** *See:* personal computing.

**personnel security** Procedures to ensure that personnel with access to sensitive information and critical services have the appropriate authorizations and training. (C/BA) 896.3-1993w

**person-to-person call (telephone switching systems)** A call intended for a designated person. (COM) 312-1977w

**perspective projection (computer graphics)** The projection of a three-dimensional image onto a two-dimensional surface such that objects that are farther from the viewer in three dimensions are rendered smaller than closer ones. *Contrast:* parallel projection.



**perspective projection**

(C) 610.6-1991w

**PERT** *See:* program evaluation and review technique.

**perturbation technique** An approximate analytical method, the accuracy of which is based on the smallness of one or more characteristics of the medium or interface. (AP/PROP) 211-1997

**perturbed electric or magnetic field (A) (electric and magnetic fields from ac power lines)** (weakly perturbed field) The field at a point will be regarded as weakly perturbed if the magnitude does not change by more than 5% or the di-

rection does not vary by more than 5 degrees, or both, when an object is introduced into the vicinity. The electric field at the surface of the object is in general strongly perturbed [see definition (C) below] by the presence of the object. At power frequencies the magnetic field is not in general perturbed by the presence of objects which are free of magnetic materials. Exceptions to this are regions near the surface of nonmagnetic electric conductors which develop eddy currents because of the B-field time variation. **(B) (electric and magnetic fields from ac power lines)** (moderately perturbed field) The field at a point will be regarded as moderately perturbed if the magnitude varies between 5% and 30% or the direction varies between 5 degrees and 30 degrees, or both, when an object is introduced into the vicinity. **(C) (electric and magnetic fields from ac power lines)** (strongly perturbed field) The field at a point will be regarded as strongly perturbed if the magnitude varies in excess of 30% or the direction varies in excess of 30 degrees, or both, when an object is introduced into the vicinity. (T&D/PE) 644-1979

**perturbed field (1) (measurement of power frequency electric and magnetic fields from ac power lines)** A field that is changed in magnitude or direction, or both, by the introduction of an object. *Note:* The electric field at the surface of the object is, in general, strongly perturbed by the presence of the object. At power frequencies the magnetic field is not, in general, greatly perturbed by the presence of objects that are free of magnetic materials. Exceptions to this are regions near the surface of thick electric conductors where eddy currents alter time-varying magnetic fields. (T&D/PE) 644-1994

**(2) (overhead power lines)** A field that is changed in magnitude and/or direction by the introduction of an object or by an electric charge in the region. *Note:* The electric field close to the object is, in general, strongly perturbed by the presence of the object. At power frequencies the magnetic field is not, in general, greatly perturbed by the presence of objects that are free of magnetic materials. Exceptions to this are regions near the surface of thick electric conductors where eddy currents alter time-varying magnetic fields. (T&D/PE) 539-1990

**per-unit quantity (rotating machinery)** The ratio of the actual value of a quantity to the base value of the same quantity. The base value is always a magnitude, or in mathematical terms, a positive, real number. The actual value of the quantity in question (current, voltage, power, torque, frequency, etc.) can be of any kind: root-mean-square, instantaneous, phasor, complex, vector, envelope, etc. *Note:* The base values, though arbitrary, are usually related to characteristic values, for example, in case of a machine, the base power is usually chosen to be the rated power (active or apparent), the base voltage to be the rated root-mean-square voltage, the base frequency, the rated frequency. Despite the fact that the choice of base values is rather arbitrary, it is of advantage to choose base values in a consistent manner. The use of a consistent per-unit system becomes a practical necessity when a complicated system is analyzed. *See also:* asynchronous machine. (PE) [9]

**per unit reactance** On a rated current base, a dimensionless quantity obtained by referencing the magnitude of the reactance to the rated system line-to-neutral voltage divided by the rated current of the reactor. *Note:* Per unit reactance can also be defined on an arbitrary MVA base. (PE/TR) C57.16-1996

**per-unit resistance** The measured watts expressed in per-unit on the base of the rated kilovolt-amperes of the teaser winding. *See also:* efficiency. (EEC/PE) [119]

**per-unit system (1) (rotating machinery)** The system of base values chosen in a consistent manner to facilitate analysis of a device or system, when per-unit quantities are used. Its importance becomes paramount when analog facilities (network analyzer, analog and hybrid computers) are utilized. *Note:* In electric network analysis and electromechanical system studies, usually four independent fundamental base values are chosen. The rest of the base values are derived from the fundamental ones. In most cases power, voltage, frequency, and time are chosen as fundamental base values. The base power must be the same for all types: apparent, active, reactive, instantaneous. The base time is usually one second. From the above, all other base values can be found, for example, base power times base time equals base energy, etc. The per-unit system can cover extensive networks because the base voltages of network sections connected by transformers can differ, in which case an ideal per-unit transformer is usually introduced having a turns ratio equal to the quotient of the effective turns ratio of the actual transformer and the ratio of base voltage values. By keeping the power, frequency, and time bases the same, only those base quantities will differ for different network sections that are directly or indirectly related to voltage (for example, current, impedance, reactance, inductance, capacitance, etc.) but those related to power, frequency, and time only (for example, energy, torque, etc.) will remain unchanged. *See also:* asynchronous machine. (PE) [9]

**(2)** The reference unit, established as a calculating convenience, for expressing all power system electrical parameters on a common reference base. One per unit (pu) is 100% of the base chosen. The pu system in power system engineering is used to obtain a better comparison of the performance of the power system elements of different ratings, similar to the decibel system used for equating the losses and levels of different telecommunications systems. (PE/PSC) 367-1996

**per-unit value (ac rotating machinery)** (basic per-unit quantities for ac rotating machines) The actual value divided by the base quantity when both actual and base values are expressed in the same units. (EM/PE) 86-1987w

**perveance** The quotient of the space-charge-limited cathode current by the three-halves power of the anode voltage in a diode. *Note:* Perveance is the constant G appearing in the Child-Langmuir-Schottky equation

$$i_k = \mathrm{G}e_b^{3/2}$$

When the term perveance is applied to triode or multigrid tube, the anode voltage $e_b$ is replaced by the composite controlling voltage $e$ of the equivalent diode. (ED) [45]

**Petri net (software)** An abstract, formal model of information flow, showing static and dynamic properties of a system. A Petri net is usually represented as a graph having two types of nodes (called places and transitions) connected by arcs, and markings (called tokens) indicating dynamic properties. (C) 610.3-1989w, 610.12-1990

**PFM telemetry** *See:* pulse frequency modulation telemetry.

**p gate thyristor** (cathode date SCR) A thyristor in which the gate terminal is connected to the p region adjacent to the region to which the cathode terminal is connected and that is normally switched to the ON state by applying a positive signal between gate and cathode terminals. (IA/IPC) 428-1981w

**pH** (of a solution A) The pH is obtained from the measurements of the potentials $E$ of a galvanic cell of the form $\mathrm{H_2}$: solution A: saturated potassium chloride (KCl); reference electrode with the aid of the equation

$$\mathrm{pH} = \frac{E - E_0}{(\mathrm{R}T/\mathrm{F})\ln 10} = \frac{E - E_0}{2.303\mathrm{R}T/\mathrm{F}}$$

in which $E_0$ is a constant depending upon the nature of the reference electrode, R is the gas constant in joules per mole per degree, $T$ is the absolute temperature in kelvins, and F is the Faraday constant in coulombs per gram equivalent. Historically, pH was defined by

$$\mathrm{pH} = \log \frac{1}{[H+]}$$

in which $[H+]$ is the hydrogen ion concentration. According to present knowledge there is no simple relation between hydrogen ion concentration or activity and pH. Values of pH

may be regarded as a convenient scale of acidities. *See also:* ion; ion activity. (EEC/PE) [119]

**PH** *See:* packet handler.

**phandle** A cell-sized datum identifying a particular package. (C/BA) 1275-1994

**phanotron** A hot-cathode gas diode. *Note:* This term is used primarily in the industrial field. (ED) [45]

**phantom circuit (data transmission)** A third circuit derived from two physical circuits by means of repeating coils installed at the terminals of the physical (side) circuits. A phantom circuit is a superimposed circuit derived from two suitably arranged pairs of wires, called side circuits, the two wires of each pair being effectively in parallel. (PE) 599-1985w

**phantom-circuit loading coil** A loading coil for introducing a desired amount of inductance in a phantom circuit and a minimum amount of inductance in the constituent side circuits. *See also:* loading. (EEC/PE) [119]

**phantom-circuit repeating coil (phantom-circuit repeat coil)** A repeating coil used at a terminal of a phantom circuit, in the terminal circuit extending from the midpoints of the associated side-circuit repeating coils. (EEC/PE) [119]

**phantom group** A group of four open wire conductors suitable for the derivation of a phantom circuit. (EEC/PE) [119]

**phantom signaling** A technique where a dc power source is superimposed on the transmit and receive signal pairs in a transparent or "phantom" fashion such that its application does not affect the data bearing signals on either pair. This dc power source is normally applied to request a concentrator to insert a lobe into the ring. (C/LM) 8802-5-1998

**phantom target (A) (radar)** An echo box, or other reflection device, that produces a particular blip on the radar indicator. **(B) (radar)** A condition, maladjustment, or phenomenon (such as a temperature inversion) that produces a blip on the radar indicator resembling blips of targets for which the system is being operated. *See also:* echo box; navigation. (AES/RS) 686-1982

**phase (1)** (of a periodic phenomenon $f(t)$, for a particular value of $t$) The fractional part $t/P$ of the period $P$ through which $t$ has advanced relative to an arbitrary origin. *Note:* The origin is usually taken at the last previous passage through zero from the negative to the positive direction. (IM) [120]
**(2) (A)** A distinct part of a process in which related operations are performed, as in the shift phase of a shift-and-carry operation. **(B)** A relative measurement that describes the temporal relationship between two signals that have the same frequency. (C) 610.10-1994
**(3)** A major stage within the generating-plant life cycle. *See also:* plant life cycle. (PE/EDPG) 1150-1991w
**(4)** The time within a timing cycle when a primary input is in transition between logic states. (SCC20) 1445-1998

**phase advancer** A phase modifier that supplies leading reactive volt-amperes to the system to which it is connected. Phase advancers may be either synchronous or asynchronous. *See also:* converter. (EEC/PE) [119]

**phase angle (1) (general)** The measure of the progression of a periodic wave in time or space from a chosen instant or position. *Notes:* 1. The phase angle of a field quantity, or of voltage or current, at a given instant of time at any given plane in a waveguide is $(wt - \beta z + \theta)$, when the wave has a sinusoidal time variation. The term waveguide is used here in its most general sense and includes all transmission lines; for example, rectangular waveguide, coaxial line, strip line, etc. The symbol $\beta$ is the imaginary part of the propagation constant for that waveguide, propagation is in the $+z$ direction, and $\theta$ is the phase angle when $z = t = 0$. At a reference time $t = 0$ and at the plane $z$, the phase angle $(-\beta z + \Theta)$ will be represented by $\Phi$. 2. Phase angle is obtained by multiplying the phase by 360 degrees or by $2\pi$ radians. (IM) [38]
**(2) (speed governing of hydraulic turbines)** Referring to a simultaneous phasor diagram of the input and output, the angle by which the output signal lags or leads the input signal. (PE/EDPG) 125-1977s
**(3) (electronics)** The phase angle of a current transformer is the phase displacement between the primary and secondary currents. The phase angle is positive when the secondary current leads the primary current. (PEL/ET) 389-1990

**phase angle correction factor (PACF)** The ratio of the true power factor to the measured power factor. It is a function of both the phase angles of the instrument transformers and the power factor of the primary circuit being measured. *Note:* The phase angle correction factor corrects for the phase displacement of the secondary current or voltage, or both, due to the instrument transformer phase angle(s). For a current transformer, the phase angle correction factor:

$$\text{PACF} = \cos(\theta_2 + \beta)/\cos(\theta_2)$$

For a voltage transformer, the phase angle correction factor:

$$\text{PACF} = \cos(\theta_2 - \beta)/\cos(\theta_2)$$

When both voltage and current transformers are used, the combined phase angle correction:

$$\text{PACF} = \cos(\theta_2 + \beta - \gamma)/\cos(\theta_2)$$

$\theta_2$ is the apparent power factor angle of the circuit being measured. (PE/TR) C57.13-1993

**phase angle, dielectric** *See:* dielectric phase angle.

**phase angle, loop** *See:* loop phase angle.

**phase-angle measuring (power system device function numbers)** A relay that functions at a predetermined phase angle between two voltages or between two currents or between voltage and current. (PE/SUB) C37.2-1979s

**phase angle of an instrument transformer** The phase displacement, in minutes or radians, between the primary and secondary values. The phase angle of a current transformer is designated by the Greek letter beta ($\beta$) and is positive when the current leaving the identified secondary terminal leads the current entering the identified primary terminal. The phase angle of a voltage transformer is designated by the Greek letter gamma ($\gamma$) and is positive when the secondary voltage from the identified to the unidentified terminal leads the corresponding primary voltage. (PE/TR) C57.13-1993, C57.12.80-1978r

**phase back (electrical heating systems)** The amount of retardation (expressed in percent or as an angle) during which the controlling element is prevented from conducting. (IA/PC) 844-1985s

**phase-balance relay** A relay that responds to differences between quantities of the same nature associated with different phases of a normally balanced polyphase circuit. (SWG/PE) C37.100-1992

**phase belt (coil group)** A group of adjacent coils in a distributed polyphase winding of an alternating-current machine that are ordinarily connected in series to form one section of a phase winding of the machine. Usually, there are as many such phase belts per phase as there are poles in the machine. *Note:* The adjacent coils of a phase belt do not necessarily occupy adjacent slots; the intervening slots may be occupied by coils of another winding on the same core. Such may be the case in a two-speed machine. *See also:* rotor; stator. (PE) [9]

**phase center** The location of a point associated with an antenna such that, if it is taken as the center of a sphere whose radius extends into the far-field, the phase of a given field component over the surface of the radiation sphere is essentially constant, at least over that portion of the surface where the radiation is significant. *Note:* Some antennas do not have a unique phase center. (AP/ANT) 145-1993

**phase-change recording** A method of recording information on optical storage in which the laser strikes the optical medium, causing it to crystallize in a controlled manner such that the change can be interpreted as a binary 0 or 1. (C) 610.10-1994w

**phase characteristic (1)** The variation with frequency of the phase angle of a phasor quantity. (Std100) 270-1966w

**(2) (linear passive networks)** The angle of a response function evaluated on the imaginary axis of the complex-frequency plane. (CAS) 156-1960w

**phase characteristic, loop (automatic control) (closed loop)** The phase angle of the loop transfer function for real frequencies. *See also:* feedback control system. (PE/EDPG) [3]

**phase-coded transducer** An interdigital transducer in which the electrodes do not strictly alternate in polarity, thus creating a coded time-phase relationship; the phase of the signal is determined by the polarity of the connections to the interdigital transducer bus bars. (UFFC) 1037-1992w

**phase coherence** *See:* coherent.

**phase-coil insulation (rotating machinery)** Additional insulation between adjacent coils that are in different phases. *See also:* asynchronous machine. (PE) [9]

**phase-comparison monopulse** A form of monopulse employing receiving beams with different phase centers as obtained, for example, from side-by-side antennas or separate portions of an array. *Note:* The information on target displacement from the antenna axis appears as a relative phase between signals received at the two phase centers. *See also:* amplitude-comparison monopulse; monopulse. (AES) 686-1997

**phase-comparison protection** A form of pilot protection that compares the relative phase-angle position of specified currents at the terminals of a circuit. (SWG/PE/PSR) C37.100-1992, C37.113-1999

**phase conductor (alternating-current circuit)** The conductors other than the neutral conductor. *Note:* If an alternating-current circuit does not have a neutral conductor, all the conductors are phase conductors. (Std100) 270-1966w

**phase connections (rotating machinery)** The insulated conductors (usually arranged in peripheral rings) that make the necessary connections between appropriate phase belts in an alternating-current winding. *See also:* stator; rotor. (PE) [9]

**phase constant (β) (1) (A) (fiber optics)** The imaginary part of the axial propagation constant for a particular mode, usually expressed in radians per unit length. *See also:* axial propagation constant. **(B)** The imaginary component of the propagation constant. This is the spatial rate of decrease of phase of a field component in the direction of propagation in radians per unit length. (Std100/MTT) 812-1984, 1004-1987

**(2) (waveguide)** Of a traveling wave, the space rate of change of phase of a field component (or of the voltage or current) in the direction of propagation, in radians per unit length. (MTT) 146-1980w

**(3)** The magnitude of the phase vector. *See also:* propagation vector. (AP/PROP) 211-1997

**phase contours** Loci of the return transfer function at constant values of the phase angle. *Note:* Such loci may be drawn on the Nyquist, inverse Nyquist, or Nichols diagrams for estimating performance of the closed loop with unity feedback. In the complex plane plot of $KG(j\omega)$, these loci are circles with centers at $-1/2, j/2N$ and radiuses such that each circle passes through the origin and the point $-1, j0$. In the inverse Nyquist diagram they are straight lines $\gamma = -N(x + 1)$ radiating from the point $-1,0$. *See also:* Nyquist diagram; Nichols chart; inverse Nyquist diagram. (IM) [120]

**phase control (1) (rectifier circuits)** The process of varying the point within the cycle at which forward conduction is permitted to begin through the rectifier circuit element. *Note:* The amount of phase control may be expressed in two ways: the reduction in direct-current voltage obtained by phase control or the angle of retard or advance. (IA) [62]

**(2) (thyristor)** The starting instant is synchronous with respect to the line voltage. The controller ON-state interval is equal to or less than half the line period. (IA/IPC) 428-1981w

**phase control power (thyristor converter)** The power used to synchronize the phase control of the thyristor converter to the ac supply input phases. (IA/IPC) 444-1973w

**phase control range (thyristor)** The range over which it is possible to adjust the angle of retard expressed in electrical degrees. (IA/IPC) 428-1981w

**phase converter (rotating machinery)** A converter that changes alternating-current power of one or more phases to alternating-current power of a different number of phases but of the same frequency. *See also:* converter. (PE) [9]

**phase-corrected horn** A horn designed to make the emergent electromagnetic wave front substantially plane at the mouth. *Note:* Usually this is achieved by means of a lens at the mouth. *See also:* waveguide; circular scanning. (AP/ANT) [35], [84]

**phase correction (telegraph transmission)** The process of keeping synchronous telegraph mechanisms in substantially correct phase relationship. *See also:* telegraphy. (EEC/PE) [119]

**phase correction pattern** A metallized area of varying width applied to the device substrate such that the resulting piezoelectric "shorting" effect adjusts the relative phase of the passing acoustic wavefront along its entire length. (UFFC) 1037-1992w

**phase corrector** A network that is designed to correct for phase distortion. *See also:* network analysis. (Std100) 270-1966w

**phase-crossover frequency (hydraulic turbines)** The frequency at which the phase angle reaches 180 degrees. (PE/EDPG) 125-1977s

**phased-array antenna** An array attenna whose beam directon or radiation pattern is controlled primarily by the relative phases of the excitation coefficients of the radiating elements. *See also:* antenna. (AP/ANT) 145-1983s

**phase delay (1) (facsimile)** (in the transfer of a single-frequency wave from one point to another in a system) The time delay of a part of the wave identifying its phase. *Note:* The phase delay is measured by the ratio of the total phase shift in cycles to the frequency in hertz. *See also:* facsimile transmission. (COM) 168-1956w

**(2) (dispersive and nondispersive delay lines)** The ratio of total radian phase shift, to the specified radian frequency, w. Phase delay is nominally constant over the frequency band of operation for nondispersive delay devices. *See also:* phase lag. (UFFC) [22]

**(3)** The ratio of total radian insertion phase shift ϕ to the specified radian frequency ω. Phase delay is nominally constant over the frequency band of operation for nondispersive delay devices (dispersive and nondispersive delay line). (UFFC) 1037-1992w

**(4)** (as applied to relaying) An equal delay of both the leading and trailing edges of a locally generated block. (SWG/PE) C37.100-1992

**(5)** The ratio of the total phase shift (radians) experienced by a sinusoidal signal in transmission through a system or transducer, to the frequency (radians/second) of the signal. *Note:* The unit of phase delay is the second. (SP) 151-1965w

**phase delay distortion (system or transducer)** The difference between the phase delay at one frequency and the phase delay at a reference frequency. (SP) 151-1965w

**phase delay time** In the transfer of a single-frequency wave from one point to another in a system, the time delay of a part of the wave identifying its phase. *Note:* The phase delay time is measured by the ratio of the total phase delay through the network, in cycles, to the frequency, in hertz. *See also:* measurement system. (IM) 285-1968w, [38]

**phase deviation ($\phi(t)$) (1) (angle modulation) (phase modulation)** The peak difference between the instantaneous angle of the modulated wave and the angle of the carrier. *Note:* In the case of a sinusoidal modulating function, the value of the phase deviation, expressed in radians, is equal to the modulation index. *See also:* angle or phase; phase modulation. (Std100) [123]

**(2) (data transmission)** The lack of direct proportionality of phase shift to frequency over the frequency range required

for transmission, or the effect of such departure on a transmitted signal. (PE) 599-1985w

**(3)** Instantaneous phase departure from a nominal phase. (SCC27) 1139-1999

**phase difference (general)** The difference in phase between two sinusoidal functions having the same periods. (Std100) 270-1966w

**(2) (A) (automatic control)** Between sinusoidal input and output of the same frequency, phase angle of the output minus phase angle of the input: it is called "phase lead" if the input angle is the smaller, "phase lag" if the larger. **(B) (automatic control)** Of two periodic phenomena (for example, in nonlinear systems) the difference between the phase angles of their two fundamental waveforms. *Note:* Regarded as part of the transfer function which relates output to input at a specified frequency, phase difference is simply the phase angle $\theta(j\omega)$ in $A(j\omega) \exp j\theta(j\omega)$. Measurement of phase difference in the complex case is sometimes made in terms of the angular interval between respective crossings of a mean reference line, but values so measured will generally differ from those made in terms of the fundamental waveforms. *See also:* phase shift. (PE/EDPG) [3]

**phase distance relay** A distance relay designed to detect phase-to-phase and three-phase faults. (PE/PSR) C37.113-1999

**phase distortion (1) (data transmission)** Either the lack of direct proportionality of phase shift to frequency over the frequency range required for transmission, or the effect of such departure on a transmitted signal. (PE) 599-1985w

**(2) (facsimile)** *See also:* delay distortion; phase-frequency distortion. (C) 610.7-1995

**phased satellite (communication satellite)** A satellite, the center of mass of which is maintained in a desired relation relative to other satellites, to a point on earth or to some other point of reference such as the sub-solar point. *Note:* If it is necessary to identify those satellites that are not phased satellites, the term "unphased satellites" may be used. (COM) [19]

**phase-failure protection** *See:* open-phase protection; phase-undervoltage protection.

**phase-frequency distortion (facsimile)** Distortion due to lack of direct proportionality of phase shift to frequency over the frequency range required for transmission. *Notes:* 1. Delay distortion is a special case. 2. This definition includes the case of a linear phase-frequency relation with the zero frequency intercept differing from an integral multiple of p. *See also:* phase delay distortion; phase distortion; facsimile transmission; distortion. (COM) 168-1956w

**phase function matrix** The matrix that results when the elements of the Mueller matrix are averaged over all scatterer orientations. The phase function matrix relates the average scattered Stokes vector to the incident Stokes vector. (AP/PROP) 211-1997

**phase grouping** The same phase of a number of circuit breaker' poles is grouped in an adjacent configuration along the line of the same row. (SWG/SUB/PE) C37.122-1983s, C37.100-1992

**phase hit or change** A sudden change in the received signal phase (or frequency) lasting longer than 4 ms. Since two common modulation techniques for high-speed data transmission are phase and frequency modulation, phase hits cause errors by looking like data. *See also:* gain hit or change; dropouts. (PE/IC) 1143-1994r

**phase instability ($S_\phi(f)$)** One-sided spectral density of the phase deviation. (SCC27) 1139-1999

**phase-insulated terminal box (rotating machinery)** A terminal box so designed that the protection of phase conductors against electric failure within the terminal box is by insulation only. (PE) [9]

**phase jitter** An instability in the phase of a transmission signal. *See also:* amplitude jitter. (C) 610.7-1995

**phase lag (phase delay) (2-port network)** The phase angle of the input wave relative to the output wave ($\phi_{in} - \phi_{out}$), or the initial phase angle of the output wave relative to the final phase angle of the output wave ($\phi_i - \phi_f$). *Note:* Under matched conditions, phase lag is the negative of the angle of the transmission coefficient of the scattering matrix for a 2-port network. *See also:* phase difference. (IM) 285-1968w, [38]

**phase localizer (navigation aid terms)** A localizer in which the on-course line is defined by the phase reversal of energy radiated by the sideband antenna system, a reference carrier signal being radiated and used for the detection of phase. (AES/GCS) 172-1983w

**phase lock** The state of synchronization between two ac signals in which they remain at the same frequency and with constant phase difference. This term is typically applied to a circuit that synchronizes a variable oscillator with an independent signal. (PE/PSR) 1344-1995

**phase-locked** Pertaining to two signals whose phases relative to each other are kept constant by a controlling device. (C) 610.10-1994w

**phase lock loop (communication satellite)** A circuit for synchronizing a variable local oscillator with the phase of a transmitted signal. Widely used in space communication for coherent carrier tracking, and threshold extension, bit synchronization and symbol synchronization. (COM) [24]

**phase locus** (for a loop transfer function, say G(s) H(s) A plot in the *s* plane of those points for which the phase angle, ang *GH*, has some specified constant value. *Note:* The phase loci for 180 degrees plus or minus *n* 360 degrees are also root loci. *See also:* feedback control system. (PE/EDPG) [3]

**phase margin (1) (loop transfer function for a stable feedback control system) (excitation systems)** 180 degrees minus the absolute value of the loop phase angle at a frequency where the loop gain is unity. *Note:* Phase margin is a convenient way of expressing relative stability of a linear system under parameter changes, in Nyquist, Bode, or Nichols diagrams. In a conditionally stable feedback control system where the loop gain becomes unity at several frequencies, the term is understood to apply to the value of phase margin at the highest of these frequencies. *See also:* feedback control system. (PE/EDPG) 421A-1978s

**(2) (speed governing of hydraulic turbines)** 180 degrees minus the absolute value of the open-loop phase angle at a frequency where the open-loop gain is unity. (PE/EDPG) 125-1977s

**(3)** The absolute value of loop phase angle subtracted from 180 degrees found in a feedback system at the frequency for which its gain reaches unity. The margin from 180 degrees represents a measure of dynamic stability. (PEL) 1515-2000

**phase meter (phase-angle meter)** An instrument for measuring the difference in phase between two alternating quantities of the same frequency. *See also:* instrument. (EEC/PE) [119]

**phase modifier (rotating machinery)** An electric machine, the chief purpose of which is to supply leading or lagging reactive power to the system to which it is connected. Phase modifiers may be either synchronous or asynchronous. *See also:* converter. (IA/PE/MT) 45-1983s, [9]

**phase-modulated transmitter** A transmitter that transmits a phase-modulated wave. (AP/BT/ANT) 145-1983s, 182-1961w

**phase modulation (1) (data transmission)** Angle modulation in which the angle of a carrier is caused to depart from its reference value by an amount proportional to the instantaneous value of the modulating function. *Notes:* 1. A wave phase modulated by a given function can be regarded as a wave frequency modulated by the time derivative of that function. 2. Combinations of phase and frequency modulation are commonly referred to as frequency modulation. *See also:* reactance modulator; angle or phase; pulse duration; phase deviation. (IT/AP/PE/ANT) 145-1983s, 599-1985w, [123]

**(2) (overhead-power-line corona and radio noise)** Modulation in which the angle of a carrier is caused to depart from

its reference value by an amount proportional to the instantaneous value of the modulating signal. (T&D/PE) 539-1990

**(3)** A modulation technique in which a data signal is sent onto a fixed carrier frequency by modifying the phase of the carrier. (C) 610.7-1995

**phase-modulation recording** A type of magnetic recording in which each storage cell is divided into two regions that are each magnetized in opposite senses; the sequence of these senses indicates whether the binary character represented is zero or one. *See also:* double-pulse recording. (C) 610.10-1994w

**phase-modulation telemetering (electric power system)** A type of telemetering in which the phase difference between the transmitted voltage and a reference voltage varies as a function of the magnitude of the measured quantity. *See also:* telemetering. (PE/PSE) 94-1970w

**phase modulator, optical** *See:* optical phase modulator.

**phase nonlinearity** The deviation in phase from a perfectly phase-linear response as a function of frequency. The phase response of a perfectly phase-linear system is directly proportional to frequency. (IM/WM&A) 1057-1989w

**phase of a circularly polarized field vector** In the plane of polarization, the angle that the field vector makes, at a time taken as the origin, with a reference direction and with the angle counted as positive if it is in the same direction as the sense of polarization and negative if it is in the opposite direction to the sense of polarization. (AP/ANT) 145-1993

**phase overcurrent** The current flowing in a phase conductor which exceeds a predetermined value. (SWG/PE) C37.100-1981s

**phase path (radio-wave propagation)** For a monochromatic electromagnetic wave, the product of the phase constant and the physical path length. *Note:* In a slowly varying spatially inhomogeneous medium, the phase path length equals the line integral of the real part of the phase vector along the ray path. (AP/PROP) 211-1990s

**phase path length** For a monochromatic electromagnetic wave, the product of the phase constant and the physical path length. *Note:* In a slowly varying spatially inhomogeneous medium, the path length equals the line integral of the real part of the phase constant along the ray path. *See also:* electrical length. (AP/PROP) 211-1997

**phase pattern** (of an antenna) The spatial distribution of the relative phase of a field vector excited by an antenna. *Notes:* 1. The phase may be referred to any arbitrary reference. 2. The distribution of phase over any path, surface, or radiation pattern cut is also called a phase pattern. (AP/ANT) 145-1993

**phase recovery time (microwave gas tubes)** The time required for a fired tube to deionize to such a level that a specified phase shift is produced in the low-level radio-frequency signal transmitted through the tube. *See also:* gas tube. (ED) 161-1971w

**phase, relative** *See:* relative phase.

**phase relay** A relay that by its design or application is intended to respond primarily to phase conditions of the power system. (SWG/PE) C37.100-1992

**phase resolution** The minimum change of phase that can be distinguished by a system. *See also:* measurement system. (IM) [38]

**phase-reversal protection** *See:* phase-sequence reversal protection.

**phase-reversals relay** *See:* negative-phase-sequence relay.

**phase-segregated terminal box** A terminal box so designed that the protection of phase conductors against electric failure within the terminal box is by insulation, and additionally by grounded metallic barriers forming completely isolated individual phase compartments so as to restrict any electric breakdown to a ground fault. (PE) [9]

**phase-selector relay** A programming relay whose function is to select the faulted phase or phases, thereby controlling the operation of other relays or control devices. (SWG/PE) C37.100-1992

**phase-separated terminal box** *See:* phase-segregated terminal box.

**phase separator (rotating machinery)** Additional insulation between adjacent coils that are in different phases. *See also:* stator; rotor. (PE) [9]

**phase sequence (1)** (set of polyphase voltages or currents) The order in which the successive members of the set reach their positive maximum values. *Note:* The phase sequence may be designated in several ways. If the set of polyphase voltages or currents is a symmetrical set, one method is to designate the phase sequence by specifying the integer that denotes the number of times that the angular phase lag between successive members of the set contains the characteristic angular phase difference for the number of phases m. If the integer is zero, the set is of zero phase sequence; if the integer is one, the set is of first phase sequence; and so on. Since angles of lag greater than $2p$ produce the same phase position for alternating quantities as the same angle decreased by the largest integral multiple of 2p contained in the angle of lag, it may be shown that there are only m distinct symmetrical sets normally designated from 0 to $m - 1$ phase sequence. It can be shown that only for the first phase sequence do all the members of the set reach their positive maximum in the order of identification at uniform intervals of time. (PE) [9], 270-1966w

**(2) (power and distribution transformers)** The order in which the voltages successively reach their positive maximum values. *See also:* direction of rotation of phasors. (PE/TR) C57.12.80-1978r

**phase-sequence indicator** A device designed to indicate the sequence in which the fundamental components of a polyphase set of potential differences, or currents, successively reach some particular value, such as their maximum positive value. *See also:* instrument. (EEC/PE) [119]

**phase-sequence relay** A relay that responds to the order in which the phase voltages or currents successively reach their maximum positive values. (SWG/PE) C37.100-1992

**phase-sequence reversal** A reversal of the normal phase sequence of the power supply. For example, the interchange of two lines on a three-phase system will give a phase reversal. (IA/ICTL/IAC) [60]

**phase-sequence reversal protection** A form of protection that prevents energization of the protected equipment on the reversal of the phase sequence in a polyphase circuit. (SWG/PE) C37.100-1992

**phase-sequence test (rotating machinery)** A test to determine the phase sequence of the generated voltage of a three-phase generator when rotating in its normal direction. *See also:* asynchronous machine. (PE) [9]

**phase-sequence voltage relay (power system device function numbers)** A relay that functions upon a predetermined value of polyphase voltage in the desired phase sequence. (PE/SUB) C37.2-1979s

**phase shift (1)** The absolute magnitude of the difference between two phase angles. *Notes:* 1. The phase shift between two planes of a 2-port network is the absolute magnitude of the difference between the phase angles at those planes. The total phase shift, or absolute phase shift, is expressed as the total number of cycles, including any fractional number, between the two planes, where one complete cycle is $2\pi$ radians or 360 degrees. Relative phase shift is the total or absolute phase shift less the largest integral number of $2\pi$ radians or 360 degrees. The unit of phase shift is, therefore, the radian or the electrical degree. The term 2-port network is used in its most general sense to include structures of passive or active elements. This includes the case of a given length of waveguide but may also refer to any two ports of a multiport device, where it is understood that a signal is incident only at

one port. 2. A phase shift can be either a phase lead (advance) or a phase lag (delay). *See also:* measurement system. (IM) 285-1968w, [38]

**(2) (A) (transfer function)** A change of phase angle with frequency, as between points on a loop phase characteristic. *See also:* feedback control system. **(B) (signal)** A change of phase angle with transmission. (IM) [120]

**(3)** The total number of degrees or radians that a continuous-wave signal experiences as it is transmitted through the delay device at a given frequency within the band of operation. The phase shift is nominally linearly proportional to frequency within the frequency band of operation for a nondispersive delay device (dispersive and nondispersive delay lines). (UFFC) 1037-1992w, [22]

**(4)** The displacement in time of one waveform relative to another of the same frequency and harmonic content. (SCC22) 1346-1998

**(5)** The displacement between corresponding points on similar wave shapes, and is expressed in degrees leading or lagging. (IA/AES/PSE) 1100-1999, [41]

**phase-shift circuit** Anetwork that provides a voltage component shifted in phase with respect to a reference voltage. *See also:* electronic controller. (IA/ICTL/IAC) [60]

**phase shifter (data transmission)** A device in which the output voltage (or current) may be adjusted, in use or in its design, to have some desired phase relation with the input voltage (or current). (PE) 599-1985w

**phase shifter, waveguide** *See:* waveguide phase shifter.

**phase-shifting transformer (1) (metering)** An assembly of one or more transformers intended to be connected across the phases of a polyphase circuit so as to provide voltages in the proper phase relations for energizing varmeters, varhour meters, or other measurement equipment. This type of transformer is sometimes referred to as a phasing transformer. (ELM) C12.1-1988

**(2)** A transformer that advances or retards the phase-angle relationship of one circuit with rspect to another. *Notes:* 1. The terms "advance" and "retard" describe the electrical angular position of the load voltage with respect to the source voltage. 2. If the load voltage reaches its positive maximum sooner than the source voltage, this is an "advance" position. 3. Conversely, if the load voltage reaches its positive maximum later than the source voltage, this is a "retard" position. *See also:* regulating winding; excitation-regulating winding; main unit; load-tap-changing transformer; excited winding; series winding; regulated circuit; excitation winding; voltage-regulating relay; series unit; phase-shifting transformer; regulating transformer; line-drop compensator; voltage winding for regulating equipment. (PE/TR) C57.12.80-1978r

**phase-shift keying (PSK) (modulation systems)** The form of phase modulation in which the modulating function shifts the instantaneous phase of the modulated wave among predetermined discrete values. (Std100) 270-1964w

**phase-shift oscillator** An oscillator produced by connecting any network having a phase shift of an odd multiple of 180 degrees (per stage) at the frequency of oscillation, between the output and the input of an amplifier. When the phase shift is obtained by resistance-capacitance elements, the circuit is an R-C phase-shift oscillator. *See also:* oscillatory circuit. (AP/ANT) 145-1983s

**phase space (A)** The state space augmented by the independent time variable. **(B)** One used synonymously with the state space, usually with the state variables being successive time derivatives of each other. *See also:* control system. (CS/IM) [120]

**phase spacing (1)** The distance between center-lines of adjacent devices of differing phases. (SWG/PE) C37.40-1993

**(2)** (of a fuse or switching device) The distance between center-lines of the current-carrying parts of the adjacent poles of the switching device. (SWG/PE) C37.100-1992

**phase splitter (data transmission) (phase splitting circuit)** A device which produces, from a single input wave, two or more output waves that differ in phase from one another. (PE) 599-1985w

**phase-splitting circuit** *See:* phase splitter.

**phase swinging (rotating machinery)** Periodic variations in the speed of a synchronous machine above or below the normal speed due to power pulsations in the prime mover or driven load, possibly recurring every revolution. (PE) [9]

**phase-to-ground insulation configuration** An insulation configuration between a terminal and the neutral or ground. (PE/C) 1313.1-1996

**phase-to-ground per unit overvoltage (power and distribution transformers)** The ratio of a phase-to-ground overvoltage to the phase-to-ground voltage corresponding to the maximum system voltage. (PE/TR) C57.12.80-1978r

**phase-to-phase insulation configuration** An insulation configuration between two-phase terminals. (PE/C) 1313.1-1996

**phase-to-phase per unit overvoltage (power and distribution transformers)** The ratio of a phase-to-phase overvoltage to the phase-to-phase voltage corresponding to the maximum system voltage. (PE/TR) C57.12.80-1978r

**phase-to-phase voltage on an alternating-current electric system** *See:* nominal system voltage; maximum system voltage; medium voltage; high voltage; low voltage; service voltage; utilization voltage.

**phase transfer function** The argument $\Phi(N)$ of the modulation transfer function is designated as the phase transfer function. (ED) 503-1978w

**phase transition (primary ferroelectric terms)** A change in the crystal structure, usually occurring at a well-defined temperature, which alters the orientation or magnitude, or both, of the electric polarization. (UFFC) 180-1986w

**phase-tuned tube (microwave gas tubes)** A fixed-tuned broadband transmit-receive tube, wherein the phase angle through and the reflection introduced by the tube are controlled within limits. *See also:* gas tube. (ED) 161-1971w

**phase-undervoltage protection** A form of protection that disconnects or inhibits connection of the protected equipment on deficient voltage in one or more phases of a polyphase circuit. (SWG/PE) C37.100-1992

**phase-undervoltage relay** A relay that operates when one or more phase voltages in a normally balanced polyphase circuit is less than a predetermined value. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**phase vector ($\vec{\beta}$)** The real part of the propagation vector, $\vec{k}$. *Note:* The phase vector points in the direction of maximum rate of change of the phase. *See also:* propagation vector. (AP/PROP) 211-1997

**phase vector in physical media** The imaginary part of the propagation vector. (AP/ANT) 145-1983s

**phase velocity (1) (fiber optics)** For a particular mode, the ratio of the angular frequency to the phase constant. *See also:* coherence time; axial propagation constant; group velocity. (Std100) 812-1984w

**(2) (of a traveling plane wave at a single frequency)** The velocity of an equiphase surface along the wave normal. *See also:* radio-wave propagation; waveguide. (AP/ANT/PROP) [35], [36]

**(3) (waveguide)** Of a traveling wave at a given frequency, and for a given mode, the velocity of an equiphase surface in the direction of propagation. (MTT) 146-1980w

**(4)** The velocity at which the equiphase planes of a propagating wave travel. *Note:* The minimum phase velocity is in the direction of the wave normal. (AP/PROP) 211-1997

**phase-versus-frequency response characteristic** A graph or tabulation of the phase shifts occurring in an electric transducer at several frequencies within a band. *See also:* transducer. (AP/ANT) 145-1983s

**phase voltage (machine or apparatus)** (of a winding) The potential difference across one phase of the machine or apparatus. *See also:* asynchronous machine. (PE) [9], [84]

**phase weighting** Response weighting by change in period of finger arrangement inside the interdigital transducer. (UFFC) 1037-1992w

**phasing** The adjustment of picture position along the scanning line. *See also:* scanning. (COM) 168-1956w

**phasing signal** A signal used for adjustment of the picture position along the scanning line. *See also:* facsimile signal. (COM) 168-1956w

**phasing time (facsimile)** The time interval during which the start positions of the scanning and recording strokes are aligned so as to ensure against a split image at the recorder. (COM) 167-1966w

**phasing voltage** (of a network protector) The voltage across the open contacts of a selected phase. *Note:* This voltage is equal to the phasor difference between the transformer voltage and the corresponding network voltage. (SWG/PE/TR) C37.100-1992, C57.12.44-1994

**phasor (1) (metering)** A complex number, associated with sinusoidally varying electrical quantities, such that the absolute value (modulus) of the complex number corresponds to either the peak amplitude or rms value of the quantity, and the phase (argument) to the phase angle at zero time. By extension, the term "phasor" can also be applied to impedance and related complex quantities that are not time-dependent. (ELM) C12.1-1988

**(2)** A complex number expressing the magnitude and phase of a time-varying quantity. Unless otherwise specified, it is used only within the context of steady-state alternating linear systems. In polar coordinates, it can be written as $Ae^{j\phi}$, where $A$ is the amplitude or magnitude (usually rms, but sometimes indicated as peak value) and $\phi$ is the phase angle. The phase angle $\phi$ should not be confused with the space angle of a vector. *See also:* electric field strength. (T&D/PE) 644-1994

**(3)** A complex equivalent of a simple sine wave quantity such that the complex modulus is the sine wave amplitude and the complex angle (in polar form) is the sine wave phase angle. *See also:* vector. (PE/PSR) 1344-1995

**phasor diagram (synchronous machines)** A diagram showing the relationships of as many of the following phasor quantities as are necessary: armature current, armature voltages, the direct and quadrature axes, armature flux linkages due to armature and field winding currents, magnetomotive forces due to armature and field-winding currents, and the various components of air-gap flux. (PE) [9]

**phasor difference** *See:* phasor sum.

**phasor function** A functional relationship that results in a phasor. (Std100) 270-1966w

**phasor notation** For monochromatic fields, the complex notation used in the expressions for field quantities with the exponential time factor $\exp\{j\omega t\}$. For example, for plane waves

$$\vec{\boldsymbol{\epsilon}}(\vec{r}, t) = \mathrm{Re}\{\vec{\mathrm{E}}(\vec{r}, \omega)\exp(j\omega t)\}$$

where
$\vec{\boldsymbol{\epsilon}}(\vec{r}, t)$ = the instantaneous electric field
Re indicates the real part
$\vec{\mathrm{E}}(\vec{r}, \omega)$ = the phasor notation for the electric field

(AP/PROP) 211-1997

**phasor power (rotating machinery)** The phasor representing the complex power. *See also:* asynchronous machine. (PE) [9]

**(2) (A) (polyphase circuit)** At the terminals of entry of a polyphase circuit into a delimited region, a phasor (or plane vector) that is equal to the (phasor) sum of the phasor powers for the individual terminals of entry when the voltages are all determined with respect to the same arbitrarily selected common reference point in the boundary surface (which may be the neutral terminal of entry). The reference direction for the currents and the reference polarity for the voltages must be the same as for instantaneous power, active power, and reactive power. The phasor power for each terminal of entry is determined by considering each conductor and the common reference point as a single-phase, two-wire circuit and finding the phasor power for each in accordance with the definition of (B) below. The phasor power $\mathbf{S}$ is given by $\mathbf{S} = \mathbf{P} + \mathbf{jQ}$ where $\mathbf{P}$ is the active power for the polyphase circuit and $\mathbf{Q}$ is the reactive power for the same terminals of entry. If the voltages and currents are sinusoidal and of the same period, the phasor power $\mathbf{S}$ for a three-phase circuit is given by

$$\mathbf{S} = \mathbf{E}_a\mathbf{I}_a^* + \mathbf{E}_b\mathbf{I}_b^* + \mathbf{E}_c\mathbf{I}_c^*$$

where $\mathbf{E}_a$, $\mathbf{E}_b$, and $\mathbf{E}_c$ are the phasor voltages from the phase conductors $a$, $b$, and $c$, respectively, to the neutral conductor at the terminals of entry; $\mathbf{I}_a$, $\mathbf{I}_b$, and $\mathbf{I}_c$ are the conjugate of the phasor currents in the phase conductor, so that there are only three terminals of entry; the point of entry of one of the phase conductors may be chosen as the common voltage point; and the phasor from that conductor to the common voltage point becomes zero. If the terminal of entry of phase conductor $b$ is chosen as the common point, the phasor power of a three- phase, three-wire circuit becomes

$$\mathbf{S} = \mathbf{E}_{ab}\mathbf{I}_a^* + \mathbf{E}_{cb}\mathbf{I}_c^*$$

where $\mathbf{E}_{ab}$, $\mathbf{E}_{cb}$ are the phasor voltages from phase conductor $a$ to $b$ and from $c$ to $b$, respectively. If both the voltages and currents in the preceding equations constitute symmetrical sets of the same phase sequence $\mathbf{S} = 3\mathbf{E}_a\mathbf{I}_a^*$. In general, the phasor power at the $(m + 1)$ terminals of entry of a polyphase circuit of $m$ phases to a delimited region, when one of the terminals is the neutral terminal of entry, and is expressed by the equation

$$\mathbf{S} = \sum_{s=1}^{s=m}\sum_{r=1}^{r=\infty}\mathbf{E}_{sr}\mathbf{I}_{sr}^*$$

where $\mathbf{E}_{sr}$ is the phasor representing the $r$th harmonic of the voltage from phase conductor $s$ to neutral at the terminals of entry. $\mathbf{I}_{sr}^*$ is the conjugate of the phasor representing the $r$th harmonic of the current through the $s$th terminal of entry. The phasor power can also be stated in terms of the symmetrical components of the voltages and currents as

$$\mathbf{S} = m\sum_{k=0}^{k=m-1}\sum_{r=1}^{r=\infty}\mathbf{E}_{kr}\mathbf{I}_{kr}^*$$

where $\mathbf{E}_{kr}$ is the phasor representing the symmetrical component of $k$th sequence of the $r$th harmonic of the line-to-neutral set of polyphase voltages at the terminals of entry. $\mathrm{I}_{kr}^*$ is the conjugate of the phasor representing the symmetrical component of the $k$th sequence of the $r$th harmonic of the polyphase set of currents through the terminals of entry. Phasor power is expressed in voltamperes when the voltages are in volts and the currents in amperes. *Note:* This term was once defined as "vector power." With the introduction of the term "phasor quantity," the name of this term has been altered to correspond. The definition has also been altered to agree with the change in the sign of reactive power. *See also:* reactive power. **(B) (single-phase two-wire circuit)** At the two terminals of entry of a single-phase two-wire circuit into a delimited region, a phasor (or plane vector) of which the real component is the active power and the imaginary component is the reactive power at the same two terminals of entry. When either component of phasor power is positive, the direction of that component is in the reference direction. The phasor power $\mathbf{S}$ is given by $\mathbf{S} = P + jQ$ where $P$ and $Q$ are the active and reactive power, respectively. If both the voltage and current are sinusoidal, the phasor power is equal to the product of the phasor voltage and the conjugate of the phasor current.

$\mathbf{E} = Ee^{j\alpha}$; $\mathbf{I} = \mathbf{I}e^{j\beta}$;

the phasor power is

$$S = P + jQ = \mathbf{EI}^* = EIe^{j(\alpha-\beta)}$$
$$= EI[\cos(\alpha - \beta) + j\sin(\alpha - \beta)]$$

If the voltage is an alternating voltage and the current is an alternating current, the phasor power for each harmonic component is defined in the same way as for the sinusoidal voltage

and sinusoidal current. Mathematically, the phasor power of the $r$th harmonic component $\mathbf{S}_r$ is given by

$$\mathbf{S}_r = P_r + jQ_r = \mathbf{E}_r\mathbf{I}_r^* = E_rI_re^{j(\alpha r - \beta r)}$$
$$= E_rI_r[\cos(\alpha_r - \beta_r) + j\sin(\alpha_r - \beta_r)]$$

The phasor power at the two terminals of entry of a single-phase two-wire circuit into a delimited region, for an alternating voltage and current, is equal to the (phasor) sum of the values of the phasor power for every harmonic. Mathematically, this relation may be expressed

$$\mathbf{S} = \mathbf{S}_1 + \mathbf{S}_2 + \mathbf{S}_3 + \ \ldots\ = \Sigma\mathbf{S}_r$$
$$= \mathbf{E}_1\mathbf{I}_1^* + \mathbf{E}_2\mathbf{I}_2^* + \mathbf{E}_3\mathbf{I}_3^* \ \ldots\ = \Sigma\ \mathbf{E}_r\mathbf{I}_r^*$$
$$= (\mathbf{P}_1 + \mathbf{P}_2 + \mathbf{P}_3 + \ \ldots\ ) + j(Q_1 + Q_2 + Q_3 + \ \ldots\ )$$
$$= \Sigma\ (P_r + jQ_r)$$

The amplitude of the phasor power is equal to the square root of the sum of the squares of the active power and the reactive power. Mathematically, if $S$ is the amplitude of the phasor power and $\theta$ is the angle between the phasor power and the real-power axis,

$$\mathbf{S} + Se^{j\theta}$$
$$S = (P^2 + Q^2)^{1/2}$$
$$= [(P_1 + P_2 + P_3 + \ \ldots\ )^2 + (Q_1 + Q_2 + Q_3 + \ \ldots\ )^2]^{1/2}$$
$$\theta = \tan^{-1}\frac{\mathrm{Q}}{\mathrm{P}} = \tan^{-1}\frac{\mathrm{Q}_1 + Q_2 + Q_3}{P_1 + P_2 + P_3 + \ \ldots}$$

If the voltage and current are quasi-periodic and the amplitude of the voltage and current components are slowly varying, the phasor power may still be taken as the phasor having $P$ and $Q$ as its components, the values of $P$ and $Q$ being determined for these conditions, as specified in "power, active (single-phase two-wire circuit) (average power) (power)" and "power, reactive (magner) (single-phase two-wire circuit)," respectively. For this condition the phasor power will be a function of time. If the voltage and current have the same waveform, the amplitude of the phasor power is equal to the apparent power, but they are not the same for all other cases. The phasor power is expressed in voltamperes when the voltage is in volts and the current in amperes. *Note:* This term was once defined as "vector power." With the introduction of the term "phasor quantity," the name of this term has been altered to agree with the change in the sign of reactive power. *See also:* alternating current; reactive power.

(Std100) 270-1966

**phasor power factor (A)** The power factor of the synchronous machine defined by the cosine of the phasor angle between the fundamental sinusoidal phase voltage and the fundamental sinusoidal phase current. *Note:* This is not the angle between the load converter commutating voltage and the machine current. **(B)** The ratio of the active power to the amplitude of the phasor power. The phasor power factor is expressed by the equation

$$F_{pp} = \frac{P}{S}$$

where $F_{\mathrm{pp}}$ is the phasor power factor, $P$ is the active power, and $S$ is the amplitude of phasor power. If the voltages and currents are sinusoidal and, for polyphase circuits, form symmetrical sets,

$$\mathrm{A} = |A|e^{j\theta A}$$
$$\mathrm{B} = |B|e^{j\theta B}$$

*See also:* power factor, displacement.

(Std100/IA/ID) 995-1987, 270-1966

**phasor product (quotient)** A phasor whose amplitude is the product (quotient) of the amplitudes of the two phasors and whose phase angle is the sum (difference) of the phase angles of the two phasors. If two phasors are

$$F_{pp} = \cos(\alpha - \beta)$$

the phasor product is

$$AB = |AB|e^{j(\theta A + \theta B)}$$

and the quotient is

$$\frac{A}{B} = \left|\frac{A}{B}\right| e^{j(\theta A - \theta B)}$$

(Std100) 270-1966w

**phasor quantity (A)** A complex equivalent of a simple sine-wave quantity such that the modulus of the former is the amplitude $A$ of the latter, and the phase angle (in polar form) of the former is the phase angle of the latter. **(B)** Any quantity (such as impedance) that is expressed in complex form. *Note:* In definition "A," sinusoidal variation with $t$ enters; in definition "B," no time variation (in constant-parameter circuits) enters. The term "phasor quantity" covers both cases.

(Std100) 270-1966

**phasor quotient** *See:* phasor product.

**phasor reactive factor (A)** The ratio of the reactive power to the amplitude of the phasor power. The phasor reactive factor is expressed by the equation

$$F_{qp} = \frac{Q}{S}$$

where $F_{\mathrm{qp}}$ is the phasor reactive factor, $Q$ is the reactive power, and $S$ is the amplitude of the phasor power. If the voltages and currents are sinusoidal and, for polyphase circuits, form symmetrical sets. **(B)** $F_{\mathrm{pp}} = \sin(\alpha - \beta)$.

(Std100) 270-1966

**phasor sum (difference)** A phasor of which the real component is the sum (difference) of the real components of two phasors and the imaginary component is the sum (difference) of the imaginary components of two phasors. If two phasors are

$$A = a_1 + ja_2$$
$$B = b_1 + jb_2$$

phasor sum (difference) is

$$A \pm B = (a_1 \pm b_1) + j(a_2 \pm b_2)$$

(Std100) 270-1966w

**PH_CHARACTERISTICS** Physical layer characteristics indication primitive. A set of attributes used to delineate the optional capabilities of a BCC or DCC Physical layer. This set of capabilities is required to be labeled on a BCC or DCC. In addition, there is required to be a mechanism for providing this information to the BCC's or DCC's MIB upper layers. The list of attributes includes the following capabilities: low-speed (2400 Bd or 9600 Bd) operation, high-speed (1 Mb/s) operation, +12 V used from MIB connector, BCC capability, capability for DCC interrupt function, and capability for DCC sync function. (EMB/MIB) 1073.3.1-1994

**PHIGS** *See:* Programmer's Hierarchical Interactive Graphics System.

**Philips gauge** A vacuum gauge in which the gas pressure is determined by measuring the current in a glow discharge. *See also:* instrument. (EEC/PE) [119]

**phi polarization** ($\Phi$ polarization) The state of the wave in which the $E$ vector is tangential to the lines of latitude of a given spherical frame of reference. *Note:* The usual frame of reference has the polar axis vertical and the origin at or near the antenna. Under these conditions, a vertical dipole will radiate only theta ($\theta$) polarization, and a horizontal loop will radiate only phi ($\Phi$) polarization. *See also:* antenna.

(AP/ANT) 149-1979r, 145-1983s

**phon** The unit of loudness level as specified in the definition of loudness level. (SP) [32]

**Phong shading (computer graphics)** A technique for shading a three-dimensional solid object by interpolating the normal vectors at the vertices of each polygon face, resulting in realistic highlights. *See also:* Gouraud shading.

(C) 610.6-1991w

**phonograph pickup (mechanical reproducer)** A mechanoelectrical transducer that is actuated by modulations present in the groove of the recording medium and that transforms this mechanical input into an electric output. *Notes:* 1. Where no confusion is likely the term phonograph pickup may be shortened to pickup. 2. A phonograph pickup generally includes a pivoted mounting arm and the transducer itself (the pickup cartridge). (SP) [32]

**phosphene (A) (electrotherapy) (electrical)** A visual sensation experienced by a human subject during the passage of current through the eye. *See also:* electrotherapy. **(B) (overhead power lines)** Visual sensations due to nonoptical stimulation of the visual system. (EMB/T&D/PE) [47], 539-1990

**phosphor (1)** A substance capable of luminescence. *See also:* television; radio navigation; fluorescent lamp; cathode-ray tube. (EEC/PE) [119]
**(2) (computer graphics)** A chemical coating, used on the inside face of a display surface, that emits light when energized by an electron beam. (C) 610.6-1991w

**phosphor decay** A phosphorescence curve describing energy emitted versus time. *See also:* oscillograph. (IM/HFIM) [40]

**phosphorescence (illuminating engineering)** The emission of light as the result of the absorption of radiation, and continuing for a noticeable length of time after excitation. (EEC/IE) [126]

**phosphor screen** All the visible area of the phosphor on the cathode-ray tube faceplate. *See also:* oscillograph. (IM/HFIM) [40]

**phot* (illuminating engineering)** A unit of illuminance equal to one lumen per square centimeter. (EEC/IE) [126]
* Deprecated.

**photocathode** An electrode used for obtaining a photoelectric emission when irradiated. *See also:* electrode; phototube. (NPS) 398-1972r

**photocathode blue response** The photoemission current produced by a specified luminous flux from a tungsten filament lamp at 2854 K color temperature when the flux is filtered by a CS 5-58 blue filter of half stock thickness (1.75–2.25 mm). This parameter is useful in characterizing response to scintillation counting sources. (NPS) 398-1972r

**photocathode luminous sensitivity** *See:* cathode luminous sensitivity.

**photocathode response (diode-type camera tube)** The response of a photocathode is the current emitted into vacuum per incident radiant power of specified spectral distribution. It is expressed in amperes watt$^{-1}$ (AW$^{-1}$). (ED) 503-1978w

**photocathode, semitransparent** *See:* semitransparent photocathode.

**photocathode spectral quantum efficiency (diode-type camera tube)** The ratio of the average number of electrons emitted to the number of photons in the input signal irradiance on the photocathode face as a function of the photon energy, frequency, or wavelength. (ED) 503-1978w

**photocathode transit time** That portion of the photomultiplier transit time corresponding to the time for photoelectrons to travel from the photocathode to the first dynode. (NPS) 398-1972r

**photocathode transit-time difference** The difference in transit time between electrons leaving the center of the photocathode and electrons leaving the photocathode at some specified point on a designated diameter. (NPS) 398-1972r

**photocell (1) (photoelectric cell)** A solid-state photosensitive electron device in which use is made of the variation of the current-voltage characteristic as a function of incident radiation. *See also:* phototube. (NPS) 398-1972r
**(2) (photoelectric cell)** A device exhibiting photovoltaic or photoconductive effects. *See also:* phototube. (ED) [45], [84]
**(3)** A semiconductor device, the electrical properties of which are affected by illumination. *Note:* One common type of photocell is the photoelectric cell which generates electricity when exposed to light, and is used to power many portable devices. (C) 610.10-1994w

**photochemical radiation (illuminating engineering)** Energy in the ultraviolet, visible and infrared regions to produce chemical changes in materials. *Note:* Examples of photochemical processes are accelerated fading tests, photography, photoreproduction and chemical manufacturing. In many such applications a specific spectral region is of importance. (EEC/IE) [126]

**photocomposer** *See:* phototypesetter.

**photocomposition** The formation of text and graphics into discrete camera-ready pages. *Synonym:* page makeup. *See also:* computer-aided page makeup. (C) 610.2-1987

**photoconductive cell** A photocell in which the photoconductive effect is utilized. *See also:* phototube. (ED) [45], [84]

**photoconductive effect (photoconductivity)** A photoelectric effect manifested as a change in the electric conductivity of a solid or a liquid and in which the charge carriers are not in thermal equilibrium with the lattice. *Note:* Many semiconducting metals and their compounds (notably selenium, selenides, and tellurides) show a marked increase in electric conductance when electromagnetic radiation is incident on them. *See also:* photoemissive effect; phototube; photoelectric effect; photovoltaic effect. 270-1966w

**photoconductivity (fiber optics)** The conductivity increase exhibited by some nonmetallic materials, resulting from the free carriers generated when photon energy is absorbed in electronic transitions. The rate at which free carriers are generated, the mobility of the carriers, and the length of time they persist in conducting states (their lifetime) are some of the factors that determine the amount of conductivity change. *See also:* photoelectric effect. (Std100) 812-1984w

**photocurrent (fiber optics)** The current that flows through a photosensitive device (such as a photodiode) as the result of exposure to radiant power. Internal gain, such as that in an avalanche photodiode, may enhance or increase the current flow but is a distinct mechanism. *See also:* dark current; photodiode. (Std100) 812-1984w

**photodetector** A device that senses incident illumination. (C) 610.10-1994w

**photodiode (fiber optics)** A diode designed to produce photocurrent by absorbing light. Photodiodes are used for the detection of optical power and for the conversion of optical power to electrical power. *See also:* avalanche photodiode; photocurrent. (Std100) 812-1984w

**photoelectric beam-type smoke detector (fire protection devices)** A device which consists of a light source which is projected across the area to be protected into a photosensing cell. smoke between the light source and the receiving photosensing cell reduces the light reaching the cell, causing actuation. (NFPA) [16]

**photoelectric cathode** *See:* photocathode.

**photoelectric color-register controller** A photoelectric control system used as a longitudinal position regulator for a moving material or web to maintain a preset register relationship between repetitive register marks in the first color and reference positions of the printing cylinders of successive colors. *See also:* photoelectric control. (IA/IAC) [60]

**photoelectric control** Control by means of which a change in incident light effects a control function. (IA/ICTL/IAC) [60]

**photoelectric counter** A photoelectrically actuated device used to record the number of times a given light path is intercepted by an object. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

**photoelectric current** The current due to a photoelectric effect. *See also:* photoelectric effect. (IA/IAC) [60], [84]

**photoelectric cutoff register controller** A photoelectric control system used as a longitudinal position regulator that maintains

the position of the point of cutoff with respect to a repetitively referenced pattern on a moving material. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

**photoelectric directional counter** A photoelectrically actuated device used to record the number of times a given light path is intercepted by an object moving in a given direction. *See also:* photoelectric control. (IA/CEM) [58]

**photoelectric door opener** A photoelectric control system used to effect the opening and closing of a power-operated door. *See also:* photoelectric control. (IA/CEM) [58]

**photoelectric effect (A) (fiber optics)** *External photoelectric effect.* The emission of electrons from the irradiated surface of a material. **(B) (fiber optics)** *Internal photoelectric effect.* Photoconductivity. (Std100) 812-1984

**photoelectric emission (electron tube)** The ejection of electrons from a solid or liquid by electromagnetic radiation. *See also:* field-enhanced photoelectric emission. (ED) 161-1971w

**photoelectric flame detector (fire protection devices)** A device whose sensing element is a photocell which either changes its electrical conductivity or produces an electrical potential when exposed to radiant energy. (NFPA) [16]

**photoelectric lighting controller** A photoelectric relay actuated by a change in illumination to control the illumination in a given area or at a given point. *See also:* photoelectric control. (IA/IAC) [60]

**photoelectric loop control** A photoelectric control system used as a position regulator for a strip processing line that matches the average linear speed in one section to the speed in an adjacent section to maintain the position of the loop located between the two sections. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

**photoelectric pinhole detector** A photoelectric control system that detects the presence of minute holes in an opaque material. *See also:* photoelectric control. (IA/CEM) [58]

**photoelectric power system** *See:* photovoltaic power system.

**photoelectric pyrometer** An instrument that measures the temperature of a hot object by means of the intensity of radiant energy exciting a phototube. (IA/ICTL/IAC) [60]

**photoelectric relay** A relay that functions at predetermined values of incident light. *See also:* photoelectric control. (IA/IAC) [60]

**photoelectric scanner** A single-unit combination of a light source and one or more phototubes with a suitable optical system. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

**photoelectric side-register controller** A photoelectric control system used as a lateral position regulator that maintains the edge of, or a line on, a moving material or web at a fixed position. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

**photoelectric smoke detector** A photoelectric relay and light source arranged to detect the presence of more than a predetermined amount of smoke in air. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

**photoelectric smoke-density control** A photoelectric control system used to measure, indicate, and control the density of smoke in a flue or stack. *See also:* photoelectric control. (IA/IAC) [60]

**photoelectric spot-type smoke detector (fire protection devices)** A device which contains a chamber with either overlapping or porous covers which prevent the entrance of outside sources of light but which allow the entry of smoke. The unit contains a light source and a special photosensitive cell in the darkened chamber. The cell is either placed in the darkened area of the chamber at an angle different from the light path or has the light blocked from it by a light stop or shield placed between the light source and the cell. With the admission of smoke particles, light strikes the particles and is scattered and reflected into the photosensitive cell. This causes the photosensing circuit to respond to the presence of smoke particles in the smoke chamber. (NFPA) [16]

**photoelectric system (protective signaling)** An assemblage of apparatus designed to project a beam of invisible light onto a photoelectric cell and to produce an alarm condition in the protection circuit when the beam is interrupted. *See also:* protective signaling. (EEC/PE) [119]

**photoelectric tube** An electron tube, the functioning of which is determined by the photoelectric effect. *See also:* phototube. (ED) [45]

**photo-electron** An electron liberated by the photoemissive effect. *See also:* photoelectric effect. (ED) [45]

**photo-electron irradiation dark current increase (diode-type camera tube)** That irreversible dark current increase which is caused by bombardment of the charge storage target by photo-electrons. (ED) 503-1978w

**photo-electron irradiation deterioration (diode-type camera tube)** That irreversible dark current increase which is associated with bombardment of the charge storage target by photo-electrons. (ED) 503-1978w

**photoemissive effect** *See:* photoelectric effect.

**photoemission spectrum (scintillator material)** The relative numbers of optical photons emitted per unit wavelength as a function of wavelength interval. The emission spectrum may also be given in alternative units such as wave number, photon energies, frequency, etc. *Note:* Optical photons are photons with energies corresponding to wavelengths between 2000 and 15 000 angstroms. (NPS) 175-1960w

**photoflash lamp (illuminating engineering)** A lamp in which combustible metal or other solid material is burned in an oxidizing atmosphere to produce light of high intensity and short duration for photographic purposes. (EEC/IE) [126]

**photoformer** A function generator that operates by means of a cathode-ray beam optically tracking the edge of a mask placed on a screen. *See also:* electronic analog computer. (C) 165-1977w

**photographic emulsion** The light-sensitive coating on photographic film consisting usually of a gelatin containing silver halide. (SP) [32]

**photographic sound recorder (optical sound recorder)** Equipment incorporating means for producing a modulated light beam and means for moving a light-sensitive medium relative to the beam for recording signals derived from sound signals. (SP) [32]

**photographic sound reproducer (optical sound reproducer)** A combination of light source, optical system, photoelectric cell, or other light-sensitive device such as a photoconductive cell, and a mechanism for moving a medium carrying an optical sound record (usually film), by means of which the recorded variations may be converted into electric signals of approximately like form. (SP) [32]

**photographic transmission density (optical density)** The common logarithm of opacity. Hence, film transmitting 100 percent of the light has a density of zero, transmitting 10 percent a density of 1, and so forth. Density may be diffuse, specular, or intermediate. Conditions must be specified. (SP) [32]

**photo-ionization** Ionization of atoms or molecules caused by infrared, visible, or ultraviolet photons. (AP/PROP) 211-1997

**photometer (illuminating engineering)** An instrument for measuring photometric quantities such as luminance, luminous intensity, luminous flux or illuminance. (EEC/IE) [126]

**photometric brightness** *See:* luminance.

**photometry (illuminating engineering)** The measurement of quantities associated with light. *Note:* Photometry may be visual in which the eye is used to make a comparison, or physical in which measurements are made by means of physical receptors. (EEC/IE) [126]

**(2) (A) (television)** (general) The measurement of quantities referring to radiation evaluated in accordance with the visual effect it produces, as based on certain conventions.

**(B) (television)** (visual) That branch of photometry in which the eye is used to make comparison. **(C) (television)** (physical) That branch of photometry in which the measurement is made by means of physical receptors. (BT/AV) 201-1979

**photomultiplier** *See:* multiplier phototube.

**photomultiplier transit time (scintillation counting)** The time difference between the incidence of a delta-function light pulse on the photocathode of the photomultiplier and the occurrence of the half-amplitude point on the output-pulse leading edge. (NPS) 398-1972r

**photomultiplier tube** *See:* multiplier phototube.

**photomultiplier tube gain** The ratio of the signal output current to the photoelectric signal current from the photocathode. (NI) N42.15-1990

**photon (1) (A) (fiber optics)** A quantum of electromagnetic energy. The energy of a photon is $h\nu$ where h is Planck's constant and $\nu$ is the optical frequency. *See also:* nonlinear scattering; Planck's constant. **(B)** Ionizing electromagnetic radiation, irrespective of origin. (Std100/NI) 812-1984, N42.17B-1989

**(2) (range protection)** A quantum of electromagnetic radiation irrespective of origin. (NI) N323-1978r

**photon emission spectrum, scintillator material (scintillation counting)** The relative numbers of optical photons emitted per unit wavelength as a function of wavelength interval. The emission spectrum may also be given in alternative units such as wavenumber, photon energies, frequency, and so on. (NPS) 398-1972r

**photon emitting diode (light-emitting diodes)** A semiconductor device containing a semiconductor junction in which radiant flux is nonthermally produced when a current flows as a result of an applied voltage. (ED) [127]

**photon noise** *See:* quantum noise.

**photo-optic storage** *See:* optical storage.

**photopic spectral luminous efficiency function ($V\lambda$) (photometric standard observer for photopic vision)** The photopic spectral luminous efficiency function gives the ratio of the radiant flux at wavelength $\lambda_m$ to that at wavelength $\lambda$, when the two fluxes produce the same photopic luminous sensations under specified photometric conditions, $\lambda_m$ being chosen so that the maximum value of this ratio is unity. Unless otherwise indicated, the values used for the spectral luminous efficiency function relate to photopic vision by the photometric standard observer having the characteristics laid down by the International Commission on Illumination (CIE). (ED) [127]

**photopic vision (illuminating engineering)** Vision mediated essentially or exclusively by the cones. It is generally associated with adaptation to a luminance of at least 3.4 $cd/m^2$ ($2.2 \times 10^{-3}$ $cd/in^2$) (1.0fL). (EEC/IE) [126]

**photosensitive recording (facsimile)** Recording by the exposure of a photosensitive surface to a signal-controlled light beam or spot. *See also:* recording. (COM) 168-1956w

**photosensitive tube** *See:* photoelectric tube.

**photosensitizers (laser maser)** Substances that increase the sensitivity of a material to irradiation by electromagnetic radiation. (LEO) 586-1980w

**phototube (photoelectric tube)** An electron tube that contains a photocathode and has an output depending at every instant on the total photoelectric emission from the irradiated area of the photocathode. *See also:* field-enhanced photoelectric emission. (NPS) 398-1972r

**phototube gain (liquid-scintillation counting)** The ratio of the signal output current to the photoelectric signal current from the photocathode. (NI) N42.15-1980s

**phototube housing** An enclosure containing a phototube and an optical system. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

**phototube, multiplier** *See:* multiplier phototube.

**phototypesetter** A nonimpact printer that creates characters using photographic techniques. *Synonym:* photocomposer. (C) 610.10-1994w

**phototypesetting** The preparation of textual material for printing using an optical system with a light source, a type store, a lens system, and a light-sensitive recording medium. *See also:* computer-aided typesetting. (C) 610.2-1987

**photovaristor** A varistor in which the current-voltage relation may be modified by illumination, for example, cadmium sulphide or lead telluride. *See also:* semiconductor device. (Std100) 102-1957w

**photovoltaic array (terrestrial photovoltaic power systems)** The smallest installed assembly of photovoltaic (PV) panels, support structure, foundation, and other components as required, such as a tracker. *Synonym:* PV array. *See also:* array control. (PV) 928-1986r

**photovoltaic array subfield (terrestrial photovoltaic power systems)** One or more arrays associated by a distinguishing feature, such as field geometry or electrical interconnection. *Synonym:* PV array subfield. *See also:* array control. (PV) 928-1986r

**photovoltaic cell (terrestrial photovoltaic power systems)** The basic device that converts sunlight directly into dc electricity. *Synonym:* PV cell. *See also:* array control. (PV) 928-1986r

**photovoltaic effect (fiber optics)** The production of a voltage difference across a pn junction resulting from the absorption of photon energy. The voltage difference is caused by the internal drift of holes and electrons. *Synonym:* PV effect. *See also:* photon. (Std100) 812-1984w

**photovoltaic module (terrestrial photovoltaic power systems)** The smallest, complete, environmentally protected assembly of photovoltaic (PV) cells (flat plte-type), or receiver(s) and optics (concentrator-type), and related components, such as interconnects and mounting, that accepts unconcentrated sunlight. *Synonym:* PV module. *See also:* array control. (PV) 928-1986r

**photovoltaic panel (terrestrial photovoltaic power systems)** One or more photovoltaic (PV) modules assembled and wired and designed to provide a field-installable unit. *Synonym:* PV panel. *See also:* array control. (PV) 928-1986r

**photovoltaic power system (terrestrial photovoltaic power systems)** A system that converts sunlight directly into electric energy and processes it into a form suitable for use by the intended load. The system will include an array subsystem and may also include the following major subsystems: power conditioning, storage, thermal, and system monitor and control. A photovoltaic (PV) system-utility interface may also be included. *Synonym:* PV power system. *See also:* array control. (PV) 928-1986r

**photovoltaic receiver (terrestrial photovoltaic power systems)** An assembly of one or more photovoltaic (PV) cells that accepts concentrated sunlight and incorporates means for thermal and electric energy removal. *Synonym:* PV receiver. *See also:* array control. (PV) 928-1986r

**photovoltaic system-utility interface (terrestrial photovoltaic power systems)** The interconnection between the power conditioning subsystem, the on-site ac loads, and the utility. *Synonym:* PV system-utility interface. *See also:* array control. (PV) 928-1986r

**PhPDU** *See:* physical protocol data unit.

**PHR** *See:* physical record.

**PhsDU** *See:* physical interface data unit.

**PhSDU** *See:* physical protocol service unit; physical service data unit.

**PhS_User** *See:* physical service user.

**PHY** Abbreviation for physical. *See also:* physical layer. (LM/C) 802.5-1989s

**PHY layer** *See:* physical layer.

**PHY packet (1)** A packet either generated or received by the cable physical layer. These packets are always exactly 64 bits long where the last 32 bits are the bit complement of the first 32 bits. (C/MM) 1394-1995

**(2)** A 64-bit packet where the most significant 32 bits are the one's complement of the least significant 32 bits. (C/MM) 1394a-2000

**physical (data management)** Pertaining to the representation and storage of data on a data medium such as magnetic disk, or to characteristics of the data such as the length of data elements or records. *Contrast:* logical. (C) 610.5-1990w

**physical address (1)** A unique identifier that selects a particular device from the set of all devices connected to a particular bus. (C/BA) 1275-1994

**(2)** The address of a data item in physical memory. *See also:* virtual address. (C) 610.10-1994w

**physical address space** The set of possible physical addresses for a particular bus. (C/BA) 1275-1994

**physical architecture** An arrangement of physical elements that provides the design solution for a consumer product or life-cycle process intended to satisfy the requirements of the functional architecture and the requirements baseline. (C/SE) 1220-1994s

**physical characteristics** The physical *design* attributes or distinguishing features that pertain to a measurable description of a product or process. (C/SE) 1220-1994s

**physical child segment** In a hierarchical database, a child segment in a physical database. *See also:* logical child segment. (C) 610.5-1990w

**physical circuit (data transmission)** A two-wire metallic circuit that is not arranged for phantom use. (PE) 599-1985w

**physical coding sublayer (PCS)** A sublayer used in 100BASE-T and 1000BASE-X to couple the Media Independent Interface (MII) and the Physical Medium Attachment (PMA). The PCS contains the functions to encode data bits into code-groups that can be transmitted over the physical medium. Four PCS structures are defined—one for 100BASE-X, one for 100BASE-T4, one for 100BASE-T2, and one for 1000BASE-X. (C/LM) 802.3-1998

**physical concept** Anything that has existence or being in the ideas of man pertaining to the physical world. Examples are magnetic fields, electric currents, electrons. (Std100) 270-1966w

**physical configuration audit (software)** An audit conducted to verify that a configuration item, as built, conforms to the technical documentation that defines it. *See also:* functional configuration audit. (C) 610.12-1990

**physical connection** The full-duplex physical layer association between directly connected nodes. In the case of the cable physical layer, this is a pair of physical links running in opposite directions. (C/MM) 1394-1995

**physical damage (rotating machinery)** This contributes to electrical insulation failure by opening leakage paths through the insulation. Included here are: physical shock, vibration, overspeed, short-circuit forces, erosion by foreign matter, damage by foreign objects, and thermal cycling. (PE/EM) 432-1976s

**physical database (A) (data management)** A database as it is actually stored. **(B) (data management)** A database containing a collection of related segments or records that are physically stored together. *Note:* Segments within a physical database are known as physical segments. *Contrast:* logical database. (C) 610.5-1990

**physical data model (data management)** A data model that represents the implementation of the data contained in a data structure. *Contrast:* logical data model. (C) 610.5-1990w

**physical defect** *See:* fault.

**physical element** A product, subsystem, assembly, component, subcomponent, subassembly, or part of the physical architecture defined by its designs, interfaces (internal and external), and requirements (functional, performance, constraints, and physical characteristics). (C/SE) 1220-1994s

**physical entity** *See:* physical quantity.

**physical format** *See:* low-level format.

**physical ID (1)** The six least significant bits of the node ID. On a particular bus, each node's physical ID is unique. (C/MM) 1394a-2000

**(2)** The least-significant 6 bits of the node_ID. This number is unique on a particular bus and is chosen by the physical layer during initialization. (C/MM) 1394-1995

**physical interface (1)** The circuitry that interfaces the module, board(s), and node(s) to the bus signals. (C/MM) 1212-1991s

**(2)** The circuitry that interfaces a module's nodes to the input link, output link, and miscellaneous signals. (C/MM) 1596.3-1996, 1596-1992

**physical interface data unit (PhsDU)** An octet (8 data bits) that is communicated across the interface between a BCC or a DCC Physical layer and Data Link layer. (EMB/MIB) 1073.3.1-1994

**physical layer (PHY) (1) (Layer 1)** The layer of the ISO Reference Model that provides the mechanical, electrical, functional, and procedural characteristics access to the transmission medium. (DIS/C) 1278.2-1995

**(2)** In this part of ISO/IEC 8802, the subdivision that provides the protocol to allow transfer of *slot octets, management information octets,* and *DQDB Layer* timing information over the *transmission link* between *DQDB Layer subsystems* at adjacent *nodes.* The Physical Layer provides the service to the *DQDB Layer.* (LM/C) 8802-6-1994

**(3)** The first layer of the seven-layer OSI model; responsible for transporting bits between adjacent systems. *Note:* This layer accepts a bit stream, called a frame, from the data link layer and places it on the media. It also performs the inverse operation of extracting a bit stream from the physical media and passes it to the data link layer. This layer describes mechanical and electrical characteristics of the connection, as well as the required interchange circuits. *See also:* medium access control sublayer; session layer; logical link control sublayer; entity layer; client layer; application layer; presentation layer; data link layer; sublayer; transport layer; network layer. (C) 610.7-1995

**(4)** The layer, in a stack of three protocol layers defined for the Serial Bus, that translates the logical symbols used by the link layer into electrical signals on the different Serial Bus media. The physical layer guarantees that only one node at a time is sending data and defines the mechanical interfaces for the Serial Bus. There are different physical layers for the backplane and for the cable environment. See figure 34 for the relation of the physical layer to the Serial Bus protocol stack. (C/MM) 1394-1995

**(5)** The layer responsible for interfacing with the transmission medium. This includes conditioning signals received from the MAC for transmitting to the medium and processing signals received from the medium for sending to the MAC. (C/LM) 8802-5-1998

**(6)** The Serial Bus protocol layer that translates the logical symbols used by the link layer into electrical signals on Serial Bus media. The physical layer is self-initializing. Physical layer arbitration guarantees that only one node at a time is sending data. The mechanical interface is defined as part of the physical layer. There are different physical layers for the backplane and for the cable environment. (C/MM) 1394a-2000

**physical layer convergence procedure (PLCP)** The part of the *Physical Layer* that supports the transfer of *slot octets, management information octets,* and *DQDB Layer* timing information in a manner that adapts the capabilities of the *transmission system* to the service expected by the DQDB Layer. (LM/C) 8802-6-1994

**physical layer entity (PHY)** That portion of the physical layer between the medium dependent interface (MDI) and media independent interface (MII), or between the MDI and gigabit media independent interface (GMII), consisting of the physical coding sublayer (PCS), physical medium attachment (PMA), and, if present, physical medium dependent (PMD) sublayers. The PHY contains the functions that transmit, re-

ceive, and manage the encoded signals that are impressed on and recovered from the physical medium. (C/LM) 802.3-1998

**physical layer protocol data unit (PhPDU)** A frame, consisting of both nondata symbols (delimiters or start and stop bits) and data symbols (data bits), that is transmitted from a bedside communications controller (BCC) to a device communications controller (DCC) or from a DCC to a BCC. A PhPDU includes mechanisms indicating the start and end of transmission. PhPDUs may be preceded and followed by idle periods on the serial transmission medium. Conditions exist in which two consecutive PhPDUs may be transmitted contiguously by the same station. (EMB/MIB) 1073.4.1-2000

**physical layer service access point (PhSAP)** The interface between the Physical layer entity and the Physical layer user entity. It consists of the set of services performed by the Physical layer entity. (EMB/MIB) 1073.4.1-2000

**physical layer service data unit (PhSDU)** A set of octets, constituting a frame, that is transferred between the PhS_user layer entity and the Physical layer entity. A PhSDU transferred from the PhS_user layer entity is transmitted on the physical medium. Alternatively, a PhSDU is a frame of octets that is received from the physical medium and is transferred to the PhS_user layer entity. (EMB/MIB) 1073.4.1-2000

**physical layer signaling sublayer** The portion of the physical layer, contained within the DTE, that provides the logical and functional coupling between the MAU and the data link layer. (C) 610.7-1995

**physical link** In the cable physical layer, the simplex path from the transmit function of the port of one node to the receive function of a port of a directly connected node. (C/MM) 1394-1995

**physically connected** The state when an IEEE 1073 connector is connected at both ends of the cable. This is indicated to both the DCC and the BCC by voltage levels. (EMB/MIB) 1073.3.1-1994

**physical media components (PMC) (1)** The sublayer of the PHY responsible for interfacing with the transmission medium. The functions of the PMC include receive, transmit, clock recovery, and ring access control. (C/LM) 8802-5-1998

**(2)** The sublayer of the PHY responsible for interfacing with the transmission medium. The functions of the PMC include receive, transmit, clock recovery, and ring access control. The PMCs for different medium rates and types are different. (C/LM) 802.5t-2000

**physical medium** *See:* transmission medium.

**physical medium attachment (PMA) (medium attachment units and repeater units)** The portion of the medium attachment interface (MAU) that contains the functional circuitry. (LM/C) 802.3-1985s

**physical medium attachment sublayer (1)** The portion of the MAU that contains the functional circuitry. *Synonym:* PMA sublayer. (LM/C) 610.7-1995

**(2)** That portion of the physical layer that contains the functions for transmission, reception, and (depending on the PHY) collision detection, clock recovery, and skew alignment. (C/LM) 802.3-1998

**physical medium dependent sublayer (1)** In 100BASE-X, that portion of the physical layer responsible for interfacing to the transmission medium. The PMD is located just above the medium dependent interface (MDI). (C/LM) 802.3-1998

**(2) (local area networks)** The medium dependent portion of the physical layer. (C) 8802-12-1998

**physical medium independent sublayer (local area networks)** The medium independent portion of the Physical Layer. (C) 8802-12-1998

**physical memory** The main storage actually provided in a computer. *See also:* virtual storage. (C) 610.10-1994w

**physical model** A model whose physical characteristics resemble the physical characteristics of the system being modeled; for example, a plastic or wooden replica of an airplane. *Contrast:* symbolic model. *See also:* scale model; mock-up; iconic model. (C) 610.3-1989w

**physical optics (fiber optics)** The branch of optics that treats light propagation as a wave phenomenon rather than a ray phenomenon, as in geometric optics. (Std100) 812-1984w

**physical optics approximation** Estimates the field scattered by a body by considering only the interaction of the incident wave with the local geometry of the body at every point illuminated by the incident wave. The physical optics approximation is the Kirchhoff approximation in the illuminated part of the body and zero in its shadow. (AP/PROP) 211-1997

**Physical Parameter** An instance of a subclass of `IEEE1451_PhysicalParameter`. (IM/ST) 1451.1-1999

**Physical Parameter Type** The syntax and interpretation of the Physical Parameter's data and metadata. (IM/ST) 1451.1-1999

**physical parent segment (data management)** In a hierarchical database, a parent segment in a physical database. *See also:* logical parent segment. (C) 610.5-1990w

**physical photometer (illuminating engineering)** An instrument containing a physical receptor and associated filters, which is calibrated so as to read photometric quantities directly. *See also:* physical receptor. (EEC/IE) [126]

**physical property** Any one of the generally recognized characteristics of a physical system by which it can be described. (Std100) 270-1966w

**physical protocol data unit (PhPDU)** A frame, consisting of both nondata symbols (delimiters or start and stop bits) and data symbols (data bits), that is transmitted from a BCC to a DCC or from a DCC to a BCC. A PhPDU includes mechanisms indicating the start and end of transmission. PhPDUs may be preceded and followed by idle periods on the serial transmission medium. There are conditions in which two consecutive PhPDUs may be transmitted contiguously by the same station. (EMB/MIB) 1073.3.1-1994, 1073.4.1-1994s

**physical protocol service unit (PhSDU)** A symbol for a single data bit transmitted on the physical medium between a BCC and a DCC. (EMB/MIB) 1073.3.1-1994

**physical quantity (concrete quantity) (physical entity)** A particular example of a measurable physical property of a physical system. It is characterized by both a qualitative and a quantitative attribute (that is, kind and magnitude). It is independent of the system of units and equations by which it and its relation to other physical quantities are described quantitatively. (Std100) 270-1966w

**physical receptor (illuminating engineering)** A device which generates electric current or voltage or undergoes a change of resistance or generates a charge when radiation is incident on it. (EEC/IE) [126]

**physical record (PHR) (A) (data management)** A record whose characteristics depend on the manner or form in which it is stored, retained, or moved. *Note:* A physical record may consist of all or part of a logical record or several physical records. **(B) (data management)** That which is accessed by a single read or write operation. (C) 610.5-1990

**physical requirement (software)** A requirement that specifies a physical characteristic that a system or system component must possess; for example, material, shape, size, weight. *Contrast:* functional requirement; implementation requirement; design requirement; interface requirement; performance requirement. (C) 610.12-1990

**physical security (1)** Protection of system resources from physical access, tampering, and destruction, such as through the use of barriers, locks, seals, and intrusion detection systems. (C/BA) 896.3-1993w

**(2)** The application of methods for preventing malevolent acts against safeguards and security interests, detecting such acts as they occur, and responding to such acts. (PE/NP) 692-1997

**physical segment (data management)** In a hierarchical database, the smallest unit of accessible data. *See also:* physical

child segment; physical twin segment; physical parent segment. (C) 610.5-1990w

**physical sequential access** *See:* sequential access.

**physical service (PhS)** The service performed by the Physical layer entity for the Physical layer user entity. (EMB/MIB) 1073.4.1-2000

**physical service data unit (PhSDU)** A set of octets, comprising a frame, that is transferred between the Ph_user layer entity and the Physical layer entity. A PhSDU transferred from the Ph_user layer entity is transmitted on the physical medium. Alternatively, a PhSDU is a frame of octets that is received from the physical medium and is transferred to the Ph_user layer entity. (EMB/MIB) 1073.4.1-1994s

**physical service user (PhS_User)** Refers to the Data Link layer entity, which is the user of a bedside communications controller (BCC) or a device communications controller (DCC) Physical layer entity. (EMB/MIB) 1073.4.1-2000

**physical signaling components (PSC) (1)** The sublayer of the PHY responsible for processing the signal elements received from the ring by the PMC for sending symbols to the MAC and for conditioning the symbols received from the MAC for inclusion as signal elements in the repeated data stream to the PMC. (C/LM) 8802-5-1998

**(2)** The sublayer of the PHY responsible for changing the signal elements received from the ring by the PMC into indicators and sending these indicators to the MAC. It is also responsible for conditioning the indicators received from the MAC for inclusion as signal elements by the PMC in the repeated data stream. At a particular medium rate, the PSC may be the same for different medium types. (C/LM) 802.5t-2000

**physical signaling sublayer (PLS)** In 10BASE-T, that portion of the physical layer contained within the data terminal equipment (DTE) that provides the logical and functional coupling between the medium attachment unit (MAU) and the data link layer. (C/LM) 802.3-1998

**physical stimuli (illuminating engineering)** May be either distal or proximal. (EEC/IE) [126]

**physical structure (data management)** The representation and storage of a database on a data medium. *See also:* reorganization; conceptual schema. (C) 610.5-1990w

**physical source statements (PSS)** Source statements that measure the quantity of software in lines of code. (C/SE) 1045-1992

**physical system** A part of the real physical world that is directly or indirectly observed or employed by mankind. (C) 270-1966w, 610.10-1994w

**physical twin segment (data management)** In a hierarchical database, a twin segment in a physical database. *Contrast:* logical twin segment. (C) 610.5-1990w

**physical unit** *See:* unit.

**physical verification** The process of evaluating whether or not the requirements of the physical architecture are traceable to the verified functional architecture and satisfy the validated requirements baseline. (C/SE) 1220-1994s

**physical volume** *See:* volume.

**PI** *See:* processor interface.

**P.I** *See:* proportional plus integral control action.

**pick device (1)** A logical input device used to select a display element on a display surface. A typical physical device is a light pen. *See also:* sonic pen. (C) 610.6-1991w

**(2)** An input device that is used to specify or detect a particular display element or segment. *Contrast:* pointing device. *See also:* electronic pen; light pen. (C) 610.10-1994w

**pickle (electroplating)** A solution or process used to loosen or remove corrosion products such as oxides, scale, and tarnish from a metal. *See also:* electroplating. (IA) [59]

**pickling (A) (electroplating) (chemical)** The removal of oxides or other compounds from a metal surface by means of a solution that acts chemically upon the compounds.

**(B) (electrolytic)** Pickling during which a current is passed through the pickling solution to the metal (cathodic pickling) or from the metal (anodic pickling). *See also:* electroplating. (PE/EEC) [119]

**pickoff (1) (test, measurement, and diagnostic equipment)** A sensing device that responds to movement to create a signal or to effect some type of control. (MIL) [2]

**(2) (accelerometer) (gyros)** A device that produces an output signal as a function of the relative linear or angular displacement between two elements. (AES/GYAC) 528-1994

**pickoff axis (inertial sensors) (dynamically tuned gyro)** The axis of angular displacement between the rotor and the case that results in the maximum signal per unit of rotation from the pickoff. (AES/GYAC) 528-1994

**pickoff offset (dynamically tuned gyro)** The difference in angular rotor position between operation at pickoff electrical null and at gyro operating null. (AES/GYAC) 528-1994

**pickup (1) (electronics)** A device that converts a sound, scene, or other form of intelligence into corresponding electric signals (for example, a microphone, a television camera, or a phonograph pickup). *See also:* television; phonograph pickup; microphone. (MIL/BT/AV) [2], [34]

**(2)** (of a relay) The action of a relay as it makes designated response to progressive increase of input. As a qualifying term, the state of a relay when all response to progressive increase of input has been completed. Also used to identify the minimum value of an input quantity reached by progressive increases that will cause the relay to reach the pickup state from reset. *Note:* In describing the performance of relays having multiple inputs, pickup has been used to denote contact operation, in which case pickup value of any input is meaningful only when related to all other inputs. (SWG/PE) C37.100-1992

**pickup and seal voltage (magnetically operated device)** The minimum voltage at which the device moves from its deenergized into its fully energized position. (IA/ICTL) 74-1958w

**pickup current** *See:* pickup value.

**pickup factor, direction-finder antenna system** An index of merit expressed as the voltage across the receiver input impedance divided by the signal field strength to which the antenna system is exposed, the direction of arrival and polarization of the wave being such as to give maximum response. *See also:* navigation. (AES/GCS/RS) 173-1959w, 686-1982s, [42], 172-1983w

**pickup spectral characteristic (color television)** The set of spectral responses of the device, including the optical parts, that converts radiation to electric signals, as measured at the output terminals of the pickup tubes. *Note:* Because of nonlinearity, the spectral characteristics of some kinds of pickup tubes depend upon the magnitude of radiance used in the measurement. (BT/AV) 201-1979w

**pickup tube** *See:* camera tube.

**pickup value** The minimum input that will cause a device to complete contact operation or similar designated action. *Note:* In describing the performance of devices having multiple inputs, the pickup value of an input is meaningful only when related to all other inputs. (SWG/PE) C37.100-1981s

**pickup voltage (magnetically operated device)** (or current) The voltage (or current) at which the device starts to operate when its operating coil is energized under conditions of normal operating temperature. *See also:* contactor. (VT/IA/LT/IAC) 16-1955w, [60]

**pico (mathematics of computing)** A prefix indicating $10^{-12}$. (C) 1084-1986w

**PICS** *See:* protocol implementation conformance statement.

**PICT** A standard electronic format for exchanging graphical information. (ATLAS) 1232-1995

**pictorial format (pulse measurement)** A graph, plot, or display in which a waveform is presented for observation or analysis. Any of the waveform formats defined in the follow-

ing subsections may be presented in the pictorial format. (IM/WM&A) 181-1977w

**pictorial pattern recognition** The recognition of patterns in visual or pictorial data. (C) 610.4-1990w

**picture** *See:* image.

**picture data (data management)** Data that are associated with a picture specification. *Synonym:* pictured data. *See also:* decimal picture data; binary picture data. (C) 610.5-1990w

**pictured data** *See:* picture data.

**picture element (1) (pixel)** The smallest area of a television picture capable of being delineated by an electric signal passed through the system or part thereof. *Note:* It has three important properties, namely: $P_v$, the vertical height of the picture element; $P_h$, the horizontal length of the picture element; and $P_a$, the aspect ratio of the picture element. In addition, $N_p$, the total number of picture elements in a complete picture, is of interest since this number provides a convenient way of comparing systems. For convenience, $P_v$ and $P_h$ are normalized for $V$, the vertical height of the picture; that is, $P_v$ or $P_h$ must be multiplied by $V$ to obtain the actual dimension in a particular picture. $P_v$ is defined as $P_v = 1/N$, where $N$ is the number of active scanning lines in the raster. $P_h$ is defined as $P_h = t_r A/t_e$, where $t_r$ is the average value of the rise and delay times (10 percent to 90 percent) of the most rapid transition that can pass through the system or part thereof, $t_e$ is the duration of the part of a scanning line that carries picture information, and $A$ is the aspect ratio of the picture. (At present all broadcast television systems have a horizontal to vertical aspect ratio of 4/3.) $P_a$ is defined as $P_a = P_h/P_v = t_r AN/te$ and $N_p$ is defined as $N_p = (1/P_v) \times (A/P_h) = Nt_e/T_r$. *See also:* television. (BT) [33]

**(2) (image processing and pattern recognition) (computer graphics)** *See also:* pixel. (C) 610.4-1990w, 610.6-1991w

**picture frequencies (facsimile)** The frequencies which result solely from scanning subject copy. *Note:* This does not include frequencies that are part of a modulated carrier signal. *See also:* scanning. (COM) 168-1956w

**picture inversion (facsimile)** A process that causes reversal of the black and white shades of the recorded copy. *See also:* facsimile transmission. (COM) 168-1956w

**picture processing** *See:* image processing.

**picture signal (television or facsimile)** The signal resulting from the scanning process. *See also:* television. (BT/AV) [34]

**picture specification** A character-by-character description of the composition and characteristics of the representation of some data item; for example, the picture S99V999 (S = sign character; 9 = decimal digit character; V = radix point character) may be used to describe the following items, resulting in the picture data as indicated:

| value | picture data |
|---|---|
| .06 | +00.060 |
| −10.342 | −10.342 |
| 3 | +03.000 |

(C) 610.5-1990w

**picture transmission (telephotography)** The electric transmission of a picture having a gradation of shade values. (EEC/PE) [119]

**picture tube (kinescope) (television)** A cathode-ray tube used to produce an image by variation of the beam current as the beam scans a raster. *See also:* television. (BT/AV) 201-1979w

**P.I.D** *See:* proportional plus integral plus derivative control action.

**PIE** *See:* Pause Interrupt Enabled (PIE) bit.

**Pierce gun (microwave tubes)** A gun that delivers an initially convergent electron beam. If a magnetic focusing scheme is used, the beam is made to enter the field at the minimum beam diameter or else, if the magnetic field threads through the cathode, the magnetic field must have a shape that is consistent with the desired beam that imparts certain flow characteristics to the electron beam. In Brillouin flow, angular electron velocity about the axis is imparted to the beam on entry into the magnetic field and the resulting inwardly directed force balances both the space charge and centrifugal forces. In practice, values of field up to twice the theoretical equilibrium value may be found necessary. In confined flow there is no overall angular velocity of the beam about the beam axis. Individual electron trajectories are tight helices (of radius small compared to beam radius) whose axis is along a magnetic-field line. The required magnetic field is several times greater than the Brillouin value and the flux must intersect the cathode surface. (ED) [45]

**Pierce oscillator** An oscillator that includes a piezoelectric crystal connected between the input and the output of a three-terminal amplifying element, the feedback being determined by the internal capacitances of the amplifying elements. *Note:* This is basically a Colpitts oscillator. *See also:* oscillatory circuit; Colpitts oscillator. (AP/BT/ANT) 145-1983s, 182A-1964w

**piezoelectric accelerometer** A device that employs a piezoelectric material as the principal restraint and pickoff. It is generally used as a vibration or shock sensor. (AES/GYAC) 528-1994

**piezoelectric crystal cut, type** *See:* type of piezoelectric crystal cut.

**piezoelectric-crystal element** A piece of piezoelectric material cut and finished to a specified geometrical shape and orientation with respect to the crystallographic axes of the material. *See also:* crystal. (PE/EM) 43-1974s

**piezoelectric-crystal plate** A piece of piezoelectric material cut and finished to specified dimensions and orientation with respect to the crystallographic axes of the material, and having two major surfaces that are essentially parallel. *See also:* crystal. (PE/EM) 43-1974s

**piezoelectric-crystal unit** A complete assembly, comprising a piezoelectric-crystal element mounted, housed, and adjusted to the desired frequency, with means provided for connecting it in an electric circuit. Such a device is commonly employed for purposes of frequency control, frequency measurement, electric wave filtering, or interconversion of electric waves and elastic waves. *Note:* Sometimes a piezoelectric-crystal unit may be an assembly having in it more than one piezoelectric-crystal plate. Such an assembly is called a mutliple-crystal unit. *See also:* crystal. (PE/EM) 43-1974s

**piezoelectric effect** Some materials become electrically polarized when they are mechanically strained. The direction and magnitude of the polarization depend upon the nature and amount of the strain, and upon the direction of the strain. In such materials the converse effect is observed, namely, that a strain results from the application of an electric field. (Std100) 270-1966w

**piezoelectric loudspeaker** *See:* crystal loudspeaker.

**piezoelectric microphone** *See:* crystal microphone.

**piezoelectric pickup** *See:* crystal pickup.

**piezoelectric transducer** A transducer that depends for its operation on the interaction between electric charge and the deformation of certain materials having piezoelectric properties. *Note:* Some crystals and specially processed ceramics have piezoelectric properties. (SP) [32]

**PIGA** *See:* pendulous integrating gyro accelerometer.

**piggyback board** *See:* daughter board.

**piggybacking** A technique in which an acknowledgment of a previously received protocol data unit is carried within an outgoing protocol data unit. (C) 610.7-1995

**pigtail (fiber optics)** A short length of optical fiber, permanently fixed to a component, used to couple power between it and the transmission fiber. *See also:* launching fiber. (Std100) 812-1984w

**pileup** *See:* relay pileup.

**pile-up (x-ray energy spectrometers)** (of signal pulses) Two pulses (signals) are said to be piled-up when a second pulse

occurs before the transient response of the preceding pulse has decayed to a negligible value. (NPS/NID) 759-1984r

**pile-up rejection (x-ray energy spectrometers)** A technique used to identify and reject pulses (signals) that are piled up. (NPS/NID) 759-1984r

**pillbox antenna** A reflector antenna having a cylindrical reflector enclosed by two parallel conducting plates perpendicular to the cylinder, spaced less than one wavelength apart. *Contrast:* cheese antenna. (AP/ANT) 145-1993

**PILOT** *See:* Programmed Inquiry, Learning Or Teaching.

**pilot (1)** A signal transmitted either inbound or outbound through the system in order to provide a reference for automatic gain or automatic slope control (AGC or ASC circuits within the amplifier). (LM/C) 802.7-1989r

**(2)** A selected cell whose condition is assumed to indicate the condition of the entire battery. *See also:* battery. (EEC/PE) [119]

**pilotage (navigation aid terms)** The process of directing a vehicle by reference to recognizable landmarks or soundings, or to electronic or other aids to navigation. Observations may be by any means including optical, aural, mechanical, or electronic. (AES/GCS) 172-1983w

**pilot cell (1) (storage battery)** A selected cell whose condition is assumed to indicate the condition of the entire battery. *See also:* battery. (EEC/PE) [119]

**(2)** One or more cells chosen for monitoring the operating parameters, e.g., cell voltage, specific gravity and temperature, of the entire battery. (SCC21) 937-2000

**pilot channel** A channel over which a pilot is transmitted. (EEC/PE) [119]

**pilot circuit** The portion of a control apparatus or system that carries the controlling signal from the master switch to the controller. *See also:* control. (IA/ICTL/IAC) [60]

**pilot communication scheme** A protection scheme involving relays at two or more substations that share data or logic status via a communication channel to improve tripping speed and/or coordination. (PE/PSR) C37.113-1999

**pilot director indicator** A device that indicates to the pilot information as to whether or not the aircraft has departed from the target track during a bombing run. (EEC/PE) [119]

**piloted ignition** Initiation of combustion as a result of contact of a material or its vapors with an energy source such as a flame, spark, electrical arc, or glowing wire. (DEI) 1221-1993w

**pilot exciter (1) (excitation systems for synchronous machines)** The equipment providing the field current for the excitation of another exciter. (PE/EDPG) 421.1-1986r

**(2)** The source of all or part of the field current for the excitation of another exciter. (IA/MT) 45-1998

**pilot fit (rotating machinery) (spigot fit)** A clearance hole and mating projection used to guide parts during assembly. (PE) [9]

**pilot house control (illuminating engineering)** A mechanical means for controlling the elevation and train of a searchlight from a position on the other side of the bulkhead or deck on which it is mounted. (EEC/IE) [126]

**pilot lamp** A lamp that indicates the condition of an associated circuit. In telephone switching, a pilot lamp is a switchboard lamp that indicates a group of line lamps, one of which is or should be lit. (EEC/PE) [119]

**pilot light** A light, associated with a control, that by means of position or color indicates the functioning of the control. (EEC/PE) [119]

**pilot line (conductor stringing equipment)** A lightweight line, normally synthetic fiber rope, used to pull heavier pulling lines that, in turn, are used to pull the conductor. Pilot lines may be installed with the aid of finger lines or by helicopter when the insulators and travelers are hung. *Synonyms:* P-line; leader; lead line; P-line; pilot rope; leader; straw line. (T&D/PE) 524a-1993r, 524-1980s, 524-1992r

**pilot line winder (1) (conductor stringing equipment)** A device designed to payout and rewind pilot lines during stringing operations. It is normally equipped with its own engine which drives a drum or a supporting shaft for a reel mechanically, hydraulically or through a combination of both. These units are usually equipped with multiple drums or reels, depending upon the number of pilot lines required. The pilot line is payed out from the drum or reel, pulled through the travelers in the sag section, and attached to the pulling line on the reel stand or drum puller. It is then rewound to pull the pulling line through the travelers. (T&D/PE) 524-1980s

**(2) (conductor stringing equipment)** A device designed to payout and rewind pilot lines during stringing operations. It is normally equipped with its own engine, which drives a drum or a supporting shaft for a reel mechanically, hydraulically, or through a combination of both. These units are usually equipped with multiple drums or reels, depending upon the number of reels, pulled through the travelers in the sag section, and attached to the pulling line on the reel stand or drum puller. It is then rewound to pull the pulling line through the travelers. (T&D/PE) 524a-1993r

**pilot protection** A form of line protection that uses a communication channel as a means to compare electrical conditions at the terminals of a line. (SWG/PE) C37.100-1992

**pilot rope** *See:* pilot line.

**pilot streamer (lightning)** The initial low-current discharge that begins when the voltage gradient exceeds the breakdown voltage of air. *See also:* direct-stroke protection. (T&D/PE) [10]

**pilot wire** An auxiliary conductor used in connection with remote measuring devices or for operating apparatus at a distant point. *See also:* center of distribution. (T&D/PE) [10]

**pilot-wire-controlled network** A network whose switching devices are controlled by means of pilot wires. *See also:* alternating-current distribution. (T&D/PE) [10]

**pilot wire protection** Pilot protection in which a metallic circuit is used for the communicating means between relays at the circuit terminals. (SWG/PE) C37.100-1992

**pilot-wire regulator** An automatic device for controlling adjustable gains or losses associated with transmission circuits to compensate for transmission changes caused by temperature variations, the control usually depending upon the resistance of a conductor or pilot wire having substantially the same temperature conditions as the conductors of the circuits being regulated. *See also:* transmission regulator. (EEC/PE) [119]

**pi mode (magnetrons)** ($\pi$ mode) The mode of operation for which the phases of the fields of successive anode openings facing the interaction space differ by p radians. *See also:* magnetron. (ED) 161-1971w

**$\pi$-model** A simplification of a general resistor/inductor/capacitor (RLC) network that represents the driving point admittance for an interconnect. (C/DA) 1481-1999

**PIN** *See:* plant information network.

**pin (1)** The point at which connection is made between the integrated circuit and the substrate on which it is mounted (e.g., the printed circuit board). For packaged components, this would be the package pin; for components mounted directly on the substrate, this would be the bonding pad. (TT/C) 1149.1-1990

**(2)** Any of the leads on a device that connect it to the system, each of which provides some function such as input, output, control, power, or ground. (C) 610.10-1994w

**(3)** A terminal point where an interconnect structure makes electrical contact with the fixed structures of a cell instance, or the conceptual point where a net connects to a lower level in the design hierarchy. (C/DA) 1481-1999

**pinboard (1)** A perforated board that accepts manually inserted pins to control the operation of equipment. (MIL/C) [2], [20], [85]

**(2)** *See also:* plugboard. (C) 610.7-1995

**pinch (electron tube)** The part of the envelope of an electron tube or valve carrying the electrodes and through which pass the connections to the electrodes. *See also:* electron tube. (ED) [45], [84]

**pinch effect (1) (rheostriction)** The phenomenon of transverse contraction and sometimes momentary rupture of a fluid conductor due to the mutual attraction of the different parts carrying currents. *See also:* induction heating; electrothermics. (Std100) 270-1966w

**(2) (disk recording)** A pinching of the reproducing stylus tip twice each cycle in the reproduction of lateral recordings due to a decrease of the groove angle cut by the recording stylus when it is moving across the record as it swings from a negative to a positive peak. (SP) [32]

**(3) (induction heating)** The result of an electromechanical force that constricts, and sometimes momentarily ruptures, a molten conductor carrying current at high density. *See also:* skin effect. (IA) 54-1955w

**pin count** The number of cell instance pins that an interconnect structure visits, including all input, output, and bidirectional pins. Pin count is the number of "places" the interconnect goes to on the chip. (C/DA) 1481-1999

**pin-cushion distortion (1)** A defect in a display surface that causes parallel lines to bow towards each other, causing a distorted image. *See also:* barrel distortion. (C) 610.6-1991w

**(2) (camera tubes or image tubes)** A distortion that results in a progressive increase in radial magnification in the reproduced image away from the axis of symmetry of the electron optical system. *Note:* For a camera tube, the reproducer is assumed to have no geometric distortion. *See also:* distortion, amplitude-frequency; hiss; distortion factor; percent harmonic distortion. (ED/BT) 161-1971w, 185-1975w

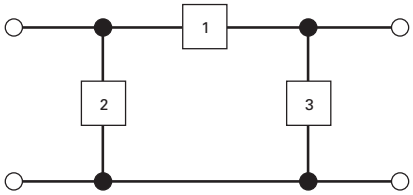
**p-i-n detector (germanium gamma-ray detectors) (charged-particle detectors) (x-ray energy spectrometers) (semiconductor radiation detectors)** A detector consisting of an intrinsic or nearly intrinsic region between a p- and n-region. (NPS/NID) 300-1988r, 301-1976s, 759-1984r, 325-1996

**PIN diode (fiber optics)** A diode with a large intrinsic region sandwiched between p- and n-doped semiconducting regions. Photons absorbed in this region create electron-hole pairs that are then separated by an electric field, thus generating an electric current in a load circuit. (Std100) 812-1984w

**p-i-n diode attenuator (nonlinear, active, and nonreciprocal waveguide components)** A device that provides a predetermined value of attenuation in a transmission line in response to a precise value of bias. (MTT) 457-1982w

**p-i-n diode limiter (nonlinear, active, and nonreciprocal waveguide components)** A passive microwave power limiter that utilizes the nonlinear conductivity of p-i-n diodes. (MTT) 457-1982w

**pi network** ($\pi$ network) A network composed of three branches connected in series with each other to form a mesh, the three junction points forming an input terminal, an output terminal, and a common input and output terminal, respectively. *See also:* network analysis.




*The junction point between branches 1 and 2 forms an input terminal, that between branches 1 and 3 forms an output terminal, and that between branches 2 and 3 forms a common input and output terminal.*

**pi ($\pi$) network**

(Std100) 270-1966w

**pin feed** *See:* tractor feed.

**ping** Describes the transmission of a physical layer (PHY) packet to a particular node in order to time the response packet(s) provoked. (C/MM) 1394a-2000

**ping-pong transmission technique** *See:* time compression multiplexing.

**pin insulator** A complete insulator, consisting of one insulating member or an assembly of such members without tie wires, clamps, thimbles, or other accessories, the whole being of such construction that when mounted on an insulator pin it will afford insulation and mechanical support to a conductor that has been properly attached with suitable accessories. *See also:* insulator; tower. (T&D/PE) [10]

**pin jack** A single-conductor jack having an opening for the insertion of a plug of very small diameter. (PE/EM) 43-1974s

**pink noise (speech quality measurements)** A random noise whose spectrum level has a negative slope of 10 decibels per decade. 297-1969w

**pin-on platform** A platform attached by a pin to a boom to support a worker at an elevated worksite. A platform is a device used to support the worker in a standing position (generally without sides). (T&D/PE) 1307-1996

**pins (electron tube or valve)** Metal pins connected to the electrodes that plug into the holder. They ensure the electric connection between the electrodes and the external circuit and also mechanically fix the tube in its holder. *See also:* electron tube. (ED) [45], [84]

**PIO** *See:* programmed input-output.

**pip** A popular term for a sharp deflection in a visible trace. *See also:* radar. (EEC/PE) [119]

**pipe (1)** An object accessed by one of the pair of file descriptors created by the *pipe*() function. Once created, the file descriptors can be used to manipulate it, and it behaves identically to a FIFO special file when accessed in this way. It has no name in the file hierarchy. (C/PA) 9945-1-1996, 9945-2-1993

**(2)** The circuitry in a pipelined processor that implements the overlapping parallel functions. (C) 610.10-1994w

**(3)** An object accessed by one of the pair of file descriptors created by the `POSIX_IO.Create_Pipe` procedure. Once created, the file descriptors can be used to manipulate a pipe, and it behaves identically to a FIFO special file when accessed in this way. It has no name in the file hierarchy. (C) 1003.5-1999

**pipe cable** A pressure cable in which the container for the pressure medium is a loose-fitting rigid metal pipe. *See also:* oil-filled pipe cable; pressure cable. (T&D/PE) [10]

**pipe guide** A component of a switch-operating mechanism designed to maintain alignment of a vertical rod or shaft. (SWG/PE) C37.30-1992s

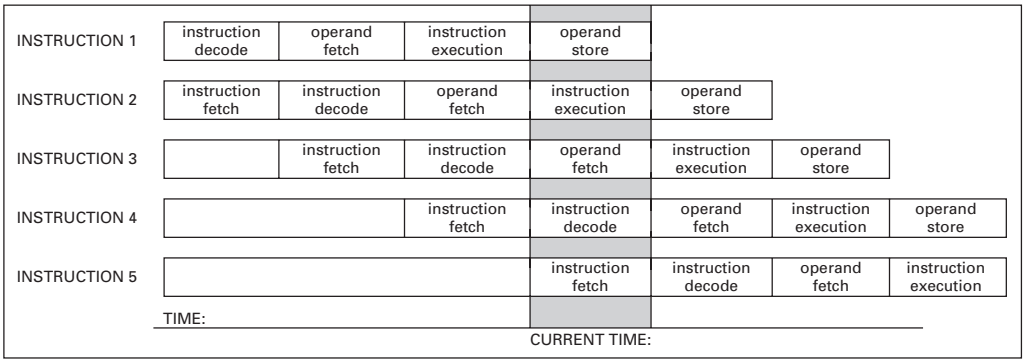
**pipeline (1) (heating of pipelines and vessels)** A length of pipe, including pumps, valves, flanges, control devices, strainers, or similar equipment for conveying fluids. (NESC/IA/PC) 844-1991, [86]

**(2) (software)** A software or hardware design technique in which the output of one process serves as input to a second, the output of the second process serves as input to a third, and so on, often with simultaneity within a single cycle time. (C) 610.12-1990

**(3)** In the shell command language, a sequence of one or more commands separated by the control operator "|". (C/PA) 9945-2-1993

**pipelined transfer (FASTBUS acquisition and control)** The portion of a FASTBUS operation in which a master either sends data to or causes data to be sent by an attached slave on every transition of data sync. The slave acknowledges receipt of or sends data with every transition of data acknowledge. The master does not wait for an acknowledge signal from the slave before causing another data sync transition. (NID) 960-1993

**pipeline processing** *See:* pipelining.




**pipelining**

**pipeline processor** A processor in which execution of instructions takes place as a series of units, arranged so that several units can be simultaneously processing appropriate parts of several instructions. (C) 610.10-1994w

**pipelining** The function of forwarding in sequence some or all of the Beginning of Message (BOM) and Continuation of Message (COM) *Derived MAC Protocol Data Units* (*DMPDU*s) before receipt of the End of Message (EOM) DMPDU. (LM/C) 8802-6-1994

**(2) (A)** Parallel processing in which instructions are executed in an assembly-line fashion: consecutive instructions are operated upon in sequence, but with several being initiated before the first is complete. *Synonym:* pipeline processing. **(B)** A technique for operation in which each instruction is broken into multiple steps, which are performed by different portions of the computer. A typical instruction stream allows a different instruction to be at each step in the pipeline at any point in time, allowing multiple instructions to overlap execution. See the corresponding figure. *Note:* In microprocessors, pipelining can make multiple cycle instructions appear to execute in a single clock cycle once the pipeline is full. (C) 610.10-1994

**pipe-ventilated** *See:* duct ventilated.

**pip-matching display (navigation) (navigation aid terms)** A display in which the received signal appears as a pair of blips, the comparison of the characteristics of which provides a measure of the desired quantity. (AES/GCS) 172-1983w

**pi point** ($\pi$ point) A frequency at which the insertion phase shift of an electric structure is 180 degrees or an integral multiple thereof. (EEC/PE) [119]

**Pirani gauge** A bolometric vacuum gauge that depends for its operation on the thermal conduction of the gas present, pressure being measured as a function of the resistance of a heated filament ordinarily over a pressure range of $10^{-1}$ to $10^{-4}$ conventional millimeter of mercury. *See also:* instrument. (EEC/PE) [119]

**piston (high-frequency communication practice) (plunger)** A conducting plate movable along the inside of an enclosed transmission path and acting as a short-circuit for high-frequency currents. *See also:* waveguide. (PE/EEC) [119]

**piston attenuator (waveguide)** A variable cutoff attenuator in which one of the coupling devices is carried on a sliding member like a piston. *See also:* waveguide. (AP/ANT) [35], [84]

**pistonphone** A small chamber equipped witha reciprocating piston of measurable displacement that permits the establishment of a known sound pressure in the chamber. (SP) [32]

**pit (rotating machinery)** A depressed area in a foundation under a machine. (PE) [9]

**pitch (1) (audio and electroacoustics)** The attribute of auditory sensation in terms of which sounds may be ordered on a scale extending from low to high, such as a musical scale. *Notes:* 1. Pitch depends primarily upon the frequency of the sound stimulus, but it also depends upon the sound pressure and wave form of the stimulus. 2. The pitch of a sound may be described by the frequency of that simple tone, having a specified sound pressure or loudness level, that seems to the average normal ear to produce the same pitch. 3. The unit of pitch is the "mel." (SP/ACO) [32]

**(2) (cable)** *See also:* lay. 30-1937w

**(3)** The centerline to centerline spacing of modules or boards in a card cage or on a backplane. (C/BA) 14536-1995

**(4)** The center-to-center spacing between adjacent chassis module slots. (C/BA) 1101.3-1993

**(5)** The spacing from the side A surface of the guide rib on a module to the side A surface of the guide rib on an adjacent module. (C/BA) 1101.4-1993

**(6)** The nominal spacing from the centerline of a module to the centerline of an adjacent module. (C/BA) 1101.7-1995

**pitch angle** *See:* pitch attitude.

**pitch attitude (navigation aid terms)** The angle between the longitudinal axis of the vehicle and the horizontal. *Synonym:* pitch angle. (AES/GCS) 172-1983w

**pitch factor (rotating machinery)** The ratio of the resultant voltage induced in a coil to the arithmetic sum of the magnitudes of the voltages induced in the two coil sides. *See also:* armature. (PE) [9]

**pits** Depressions produced in metal surfaces by nonuniform electrodeposition or from electrodissolution; for example, corrosion. (EEC/PE) [119]

**pitting** Localized corrosion taking the form of cavities at the surface. (IA) [59]

**pitting factor** The depth of the deepest pit resulting from corrosion divided by the average penetration as calculated from weight loss. (IA) [59]

**PIV** *See:* peak inverse voltage; peak reverse voltage.

**pivot-friction error** Error caused by friction between the pivots and the jewels: it is greatest when the instrument is mounted with the pivot axis horizontal. *Note:* This error is included with other errors into a combined error defined in repeatability. *See also:* moving element. (EEC/AII) [102]

**pivot year** A year used to specify the beginning of a 100-year window and to interpret 2-digit year dates within that window. *Note:* In a window that spans the Year 2000 boundary, any two-digit year value greater than or equal to the last 2 digits of the pivot year is interpreted as having a prefix of "19," while any two-digit year value less than the last two digits of the pivot year is interpreted as having a prefix of "20." Thus, for example, in a system supporting a 1950 to 2049 window, a pivot year of 1950 causes two-digit year values between 50 and 99 to be interpreted as 1950 to 1999, and two-digit year values between 00 and 49 to be interpreted as 2000 to 2049. (C/PA) 2000.1-1999

**pixel (1) (image processing and pattern recognition)** In image processing, the smallest element of a digital image that can be assigned a gray level. *Note:* This term originated as a con-

traction for "picture element." *Synonyms:* pel; picture element; resolution cell. *See also:* edge pixel; line pixel. (C) 610.4-1990w

**(2) (computer graphics)** The smallest element of a display surface that can be assigned independent characteristics. *Note:* This term is derived from the term "picture element." *Synonyms:* pel; picture element. *See also:* voxel. (C) 610.6-1991w

**(3)** An abbreviation for picture element—the smallest unit of display on a video screen. (C) 1295-1993w

**(4)** The smallest element of a display surface whose characteristics are independent assigned. *Note:* This term is derived from the term "picture element." *Synonym:* pel; picture element. (C) 610.10-1994w

**PL/1** *See:* Programming Language/1.

**PL/I** Deprecated for PL/1. (C) 610.13-1993w

**PLA** *See:* programmable logic array.

**place (1) (elecronic digital computers)** In positional notation, a position corresponding to a given power of the base, a given cumulated product, or a digit cycle of a given length. It can usually be specified as the nth character from one end of the numerical expression. (C) 162-1963w

**(2)** *See also:* digit place. (C) 1084-1986w

**placeholder** *See:* dummy.

**place value** In a positional notation system, the power of the radix that corresponds to a given place. For example, in a decimal integer the place values from right to left are 1, 100, etc. (C) 1084-1986w

**plain conductor** A conductor consisting of one metal only. *See also:* conductor. (T&D/PE) [10]

**plain flange (waveguide) (plane flange) (plain connector)** A coupling flange with a flat face. *See also:* waveguide. (AP/ANT) [35]

**planar array** A two-dimensional array of elements whose corresponding points lie in a plane. (AP/ANT) 145-1993

**planar dielectric waveguide** A planar transmission line consisting of one or more dielectric layers or dielectric strips of finite width, or both, located above a single or between a pair of extended conducting ground planes. (MTT) 1004-1987w

**planar network** A network that can be drawn on a plane without crossing of branches. *See also:* network analysis. (Std100) 270-1966w

**planar transmission line** A transmission line composed of one or more parallel plates, slabs, or sheets of conducting or insulating materials, including free space, and in which one or more layers are composed of materials of differing electromagnetic properties, arranged in strips of finite cross section and aligned with the axis of propagation to form the guiding structures. The line may be enclosed laterally by conducting walls aligned parallel to the axis of propagation. (MTT) 1004-1987w

**Planckian locus (television)** The locus of chromaticities of Planckian (blackbody or full) radiators having various temperatures. *See also:* chromaticity diagram. (BT/AV) 201-1979w

**Planck radiation law (illuminating engineering)** An expression representing the spectral radiance of a blackbody as a function of the wavelength and temperature. This law commonly is expressed by the formula

$$L_\lambda = I_\lambda/A' = c_{1L}\lambda^{-5}[e^{(c2/\lambda T} - 1]^{-1}$$

in which $L_\lambda$ is the spectral radiance, $I_\lambda$ is the spectral radiant intensity, $A'$ is the projected area (A cos θ) of the aperture of the blackbody, $e$ is the base of natural logarithms (2.71828), $T$ is the absolute temperature, and $c_{1L}$ and $_2$ are constants designated as the first and second radiation constraints. *Notes:* 1. The designation $c_{1L}$ is used to indicate that the equation in the form given here refers to the radiance $L$, or to the intensity $I$ per unit projected area $A'$, of the source. Numerical values are commonly given not for $c_{1L}$ but for $c_1$, which applies to the total flux radiated from a blackbody aperture, that is, in a hemisphere (2π steradians), so that, with the Lambert cosine law taken into account, $c_1 = \pi c_{1L}$. The currently recommended value of $c_1$ is $3.7415 \times 10^{-16}$ W · m$^2$ or $3.7415 \times 10^{-12}$ W · cm$^2$. Then $c_{1L}$ is $1.1910 \times 10^{-16}$ W · m$^2$ · sr$^{-1}$ or $1.1910 \times 10^{-12}$ W · cm$^2$ · sr$^{-1}$. If, as is more convenient, wavelengths are expressed in micrometers and area in square centimeters, $c_{1L} = 1.1910 \times 101$W · μm$^4$ × cm$^{-2}$ · sr − 1, $L_\lambda$ being given in W · cm$^{-2}$ · sr$^{-1}$ · μ$^{-1}$. The presently recommended value of $c^2$ is 1.43879 cm kelvin. The Planck law in the following form gives the energy radiated from the blackbody in a given wavelength interval ($\lambda_1 - \lambda_2$):

$$(Q = \int_{\lambda_1}^{\lambda_2} Q_\lambda d\lambda) = Atc_1 \int_{\lambda_1}^{\lambda_2} \lambda^{-5} (e^{(c2/\lambda T)-1} d\lambda$$

If $A$ is the area of the radiation aperture or surface in square centimeters, $t$ is the time in seconds, λ is the wavelength in micrometers, $c_1 = 3.7415 \times 10^4$ W · μm$^4$ · cm$^{-2}$, then Q is the total energy in watt seconds (joules) emitted from this area (that is, in the solid angle 2π) in time $t$, within the wavelength interval ($\lambda_1 - \lambda_2$). 2. It often is convenient, as is done here, to use different units of length in specifying wavelengths and areas, respectively. If both quantities are expressed in centimeters and the corresponding value for $c_1$(3.7415 × $10^{-5}$ erg · cm · sec$^{-1}$) is used, this equation gives the total emission of energy in ergs from area $A$ (that is in the solid angle 2π), for time $t$, and for the interval $\lambda_1 - \lambda_2$ in centimeters. (EEC/IE) [126]

**Planck's constant (fiber optics)** The number $h$ that relates the energy E of a photon with the frequency $\nu$ of the associated wave through the relation $E = h\nu/h = 6.626 \times 10^{-34}$ joule second. *See also:* photon. (Std100) 812-1984w

**Planck's radiation law** Defines the emission spectrum of a blackbody in terms of its physical temperature. (AP/PROP) 211-1997

**plane angle (SI) (International System of Units (SI))** The SI unit for plane angle is the radian. Use of the degree and its decimal submultiples is permissible when the radian is not a convenient unit. Use of the minute and second is discouraged except for special fields such as cartography. *See also:* units and letter symbols. (QUL) 268-1982s

**plane bend (waveguide components)** (corner) A waveguide bend (corner) in which the longitudinal axis of the guide remains in a plane parallel to the plane of the magnetic field vectors throughout the bend (corner). (MTT) 147-1979w

**plane-earth factor (radio-wave propagation)** The ratio of the electric field strength that would result from propagation over an imperfectly conducting plane earth to that which would result from propagation over a perfectly conducting plane. (AP) 211-1977s

**plane flange** *See:* cover flange.

**plane of contraflexure** In an H-frame structure, locates the inflection points for each pole. An inflection point is a point in the pole that separates an outward pole curvature from an inward pole curvature. This is also a location of zero moment. (T&D/PE) 751-1990

**plane of incidence** The plane containing the normal to the surface of a boundary and the phase vector, $\tilde{\boldsymbol{\beta}}$, of the incident wave. (AP/PROP) 211-1997

**plane of polarization (1) (data transmission)** For a plane polarized wave, the plane containing the electric intensity and the direction of propagation. (PE) 599-1985w

**(2) (radio-wave propagation)** For a plane-polarized wave, the plane containing the electric and magnetic field vectors. (AP) 211-1977s

**(3)** A plane containing the polarization ellipse. *Notes:* 1. When the ellipse degenerates into a line segment, the plane of polarization is not uniquely defined. In general, any plane containing the segment is acceptable; however, for a plane wave in an isotropic medium, the plane of polarization is taken to be normal to the direction of propagation. 2. In optics, the expression *plane of polarization* is associated with a linearly polarized plane wave (sometimes called a *plane po-*

*larized wave*) and is defined as a plane containing the field vector of interest and the direction of propagation. This usage would contradict the above one and is deprecated. (AP/ANT) 145-1993

**plane of propagation (radio-wave propagation)** Of an electromagnetic wave, the plane containing the attenuation vector and the wave normal; in the common degenerate case where these vectors have the same direction, the plane containing the electric vector and the wave normal. (AP) 211-1977s

**plane-parallel resonator (laser maser)** A beam resonator comprising a pair of plane mirrors oriented perpendicular to the axis of the beam. (LEO) 586-1980w

**plane-polarized wave (1) (radio-wave propagation)** At a point in a homogeneous medium, an electromagnetic wave whose electric and magnetic field vectors at all times lie in a fixed plane. (AP) 211-1977s

**(2)** *See also:* plane of polarization. (AP/ANT) 145-1993

**plane wave (1) (fiber optics)** A wave whose surfaces of constant phase are infinite parallel planes normal to the direction of propagation. (Std100) 812-1984w

**(2)** A wave in which the only spatial dependence of the field vectors is through a common exponential factor whose exponent is a linear function of position. *Notes:* 1. In a linear, homogeneous, and isotropic space the electric field vector, magnetic field vector and the propagation vector are mutually perpendicular. The ratio of the magnitude of the electric field vector to the magnitude of the magnetic field vector is equal to the intrinsic impedance of the medium; for free space the intrinsic impedance is equal to 376.730Ω or approximately 120πΩ. 2. A plane wave can be resolved into two component waves corresponding to two orthogonal polarizations. The total power flux density of the plane wave at a given point in space is equal to the sum of the power flux densities in the orthogonal component waves. (AP/ANT) 145-1993

**(3)** A wave whose equiphase surfaces form a family of parallel planes. (AP/PROP) 211-1997

**plane-wave equivalent power density** A commonly used term associated with any electromagnetic wave, equal in magnitude to the power density of a plane wave having the same electric (*E*) or magnetic (*H*) field strength. (NIR) C95.1-1999

**plane wave exponential factor (radio-wave propagation)** The factor $\exp(-j\vec{k}\cdot\vec{r})$ in the phasor expression for plane wave fields, where $\vec{k}$ is the wave vector and $\vec{r}$ is the position vector. (AP/PROP) 211-1990s

**plane wave propagation factor** The factor $\exp(-j\vec{k}\cdot\vec{r})$ in the phasor expression for plane wave fields, where $\vec{k}$ is the propagation vector (a constant) and $\vec{r}$ is the position vector. (AP/PROP) 211-1997

**plane wave, uniform** *See:* uniform plane wave.

**PLANIT** *See:* Programming LANguage for Interactive Teaching.

**planned derated hours (electric generating unit reliability, availability, and productivity)** The available hours during which a basic or extended planned derating was in effect. (PE/PSE) 762-1987w

**planned derating (electric generating unit reliability, availability, and productivity)** That portion of the unit derating that is scheduled well in advance. *See also:* extended planned derating; basic planned derating. (PE/PSE) 762-1987w

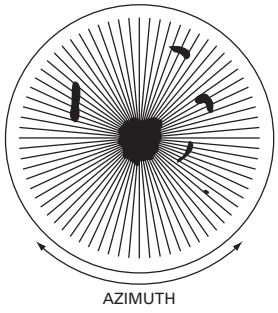
**planned outage (electric generating unit reliability, availability, and productivity)** The state in which a unit is unavailable due to inspection, testing, nuclear refueling, or overhaul. A planned outage is scheduled well in advance. (PE/PSE) 762-1987w

**planned outage hours (electric generating unit reliability, availability, and productivity)** The number of hours a unit was in the basic or extended planned outage state. (PE/PSE) 762-1987w

**planned stop** *See:* optional stop.

**PLANNER** A computer language and reasoning model used commonly in artificial intelligence for proving theorems and for manipulating models in a robot. (C) 610.13-1993w

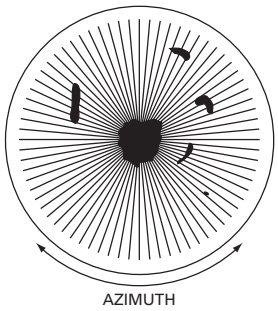
**plan-position indication (PPI) (A)** A type of radar display format. *See also:* display. **(B)** A display in which target blips are shown in plan position, thus forming a map-like display, with radial distance from the center representing range and with the angle of the radius vector representing azimuth angle.




**PPI display**

(AES/RS) 686-1990

**Plan-position indicator (PPI)** A display in which target echoes (blips) are shown in plan position, thus forming a map-like display, with radial distance from the center representing range and with the angle of the radius vector representing azimuth angle.




**Plan-position indicator**

(AES) 686-1997

**plan-position indicator (PPI) (navigation aid terms)** A type of radar display format. *See also:* display; display; display. (AES/GCS) 172-1983w, 686-1997

**plan-position-indicator scope** A cathode-ray oscilloscope arranged to present a plan-position-indicator display. (AES/RS) 686-1990

**plan standard** A standard that describes the characteristics of a scheme for accomplishing defined objectives or work within specified resources. (C) 610.12-1990

**plant** For a given system, that part which is to be controlled and whose parameters are unalterable. *See also:* process equipment. (CS/PE/EDPG) [3]

**plant-capacity factor** *See:* plant factor.

**plant dynamics** Equations which describe the behavior of the plant. *See also:* control system. (CS/IM) [120]

**plant factor (plant-capacity factor)** The ratio of the average load on the plant for the period of time considered to the aggregate rating of all the generating equipment installed in the plant. *See also:* generating station. (T&D/PE) [10]

**plant information network (PIN)** A representation of both the flow and the structure of the information that supports the discrete activities occurring during the life cycle of the plant. (PE/EDPG) 1150-1991w

**plant life cycle** The life of a power plant from conception to decommissioning. In this model, the cycle consists of five phases: site selection and plant concepts, design, construction, operation, and decommissioning. (PE/EDPG) 1150-1991w

**plasma** A macroscopically neutral assembly of charged and possibly also uncharged particles. *Note:* A plasma is said to be cold if the thermal effects of charged particles on dynamic

processes in the plasma can be neglected for the particular problem involved. A plasma is said to be hot (or warm) if the thermal effects are not negligible. (AP/PROP) 211-1997

**plasma display device** A display device employing a plasma panel to display data on the display screen. *Note:* An image can persist for relatively long periods of time on such a device. *Synonyms:* gas-discharge display device; gas plasma display device. (C) 610.10-1994w

**plasma frequency ($f_N$)** A natural frequency of oscillation of charged particles in a plasma given by:

$$(f_N)^2 = (2\pi)^{-2}\frac{Nq^2}{m\varepsilon_0}$$

where

$q$ = the charge per particle
$m$ = the particle mass
$N$ = the particle number density
$\varepsilon_0$ = the permittivity of free space

*Note:* For electrons, with $f_N$ in Hertz and $N$ in electrons per cubic meter:

$$(f_N)^2 = 80.6N$$

(AP/PROP) 211-1997

**plasma panel** A grid of electrodes encased within two flat glass plates separated by an ionizing gas in which the energizing of selected electrodes causes the gas to be ionized and light to be emitted at that point. *Note:* Also called a matrix-addressed storage display device. *Synonym:* gas panel. *See also:* plasma display device. (C) 610.10-1994w

**plasmapause** The outer boundary of the plasmasphere, characterized by a steep decrease of the plasma density. (AP/PROP) 211-1997

**plasma sheath** A layer of charged particles, of substantially one sign, that accumulates around a body in a plasma. (AP/PROP) 211-1997

**plasmasphere** That ionized region of the topside ionosphere that encircles the Earth around the equator and follows the rotation of the Earth. *Note:* In the equatorial plane, the plasmasphere extends to a distance of 3–7 Earth radii, depending on local time and geomagnetic activity. (AP/PROP) 211-1997

**plasma waves** Electrostatic waves associated with a "warm" plasma, giving rise to density and velocity fluctuations. (AP/PROP) 211-1997

**plastic (rotating machinery)** A material that contains as an essential ingredient an organic substance of large molecular weight, is solid in its finished state, and, at some stage in its manufacture or in its processing into finished articles, can be shaped by flow. (PE) [9]

**plastic-clad silica fiber (fiber optics)** An optical waveguide having silica core and plastic cladding. (Std100) 812-1984w

**plate (electron tube)** A common name for an anode in an electron tube. *See also:* electrode. (ED) 161-1971w

**plateau** The portion of the counting-rate-versus-voltage characteristic in which the counting rate is substantially independent of the applied voltage. (NI/NPS) 309-1999

**plateau length** The range of applied voltage over which the plateau of a radiation-counter tube extends. (NI/NPS) 309-1999

**plateau slope** The slope of the plateau of a gas-filled counter tube expressed as the percentage change in counting rate per 100 V change in applied voltage. Alternatively, the slope can be expressed in percent counting rate per volt change in applied voltage. (NI/NPS) 309-1999

**plateau slope, normalized** *See:* normalized plateau slope.

**plateau slope, relative** *See:* relative plateau slope.

**plate-circuit detector** A detector functioning by virtue of a nonlinearity in its plate-circuit characteristic. (EEC/PE) [119]

**plated-through hole (electronics)** Deposition of metal on the side of a hole and on both sides of a base to provide electric connection, and an enlarged portion of conductor material surrounding the hole on both sides of the base. (EEC/AWM) [105]

**plated wire storage** A type of magnetic storage in which information is stored by magnetically recording it on a plated wire surface. (C) 610.10-1994w

**plate (anode) efficiency** The ratio of load circuit power (alternating current) to the plate power input (direct current). *See also:* network analysis. (AP/ANT) 145-1983s

**plate keying** Keying effected by interrupting the plate-supply circuit. *See also:* telegraphy. (AP/ANT) 145-1983s

**plate (anode) load impedance** The total impedance between anode and cathode exclusive of the electron stream. *See also:* network analysis. (AP/ANT) 145-1983s

**plate (anode) modulation** Modulation produced by introducing the modulating signal into the plate circuit of any tube in which the carrier is present. (AP/BT/ANT) 145-1983s, 182A-1964w

**platen** In impact printers, the surface against which a print element strikes in order to make character imprints. (C) 610.10-1994w

**plate (anode) neutralization** A method of neutralizing an amplifier in which a portion of the plate-to-cathode alternating voltage is shifted 180 degrees and applied to the grid-cathode circuit through a neutralizing capacitor. (AP/BT/ANT) 145-1983s, 182A-1964w

**plate out (monitoring radioactivity in effluents)** A thermal, electrical, chemical, or mechanical action that results in a loss of material by deposition on surfaces between sampling point and detector. (NI/PE/NP) N42.18-1980r, 380-1975w

**plate (anode) power input** The power delivered to the plate (anode) of an electron tube by the source of supply. *Note:* The direct-current power delivered to the plate of an electron tube is the product of the mean plate voltage and the mean plate current. (AP/ANT) 145-1983s

**plate (anode) pulse modulation** Modulation produced in an amplifier or oscillator by application of externally generated pulses to the plate circuit. (AP/ANT) 145-1983s

**platform** *See:* aerial platform.

**platform, aerial** *See:* aerial platform.

**platform control power** Energy source(s) available at platform potential for performing protection and control functions. (T&D/PE) 824-1994

**platform erection (navigation aid terms)** In the alignment of inertial systems, the process of bringing the vertical axis of a stable platform system into agreement with the local vertical. (AES/GCS) 172-1983w

**platform fault-detection** A means used to detect insulation failure on the platform that results in current flowing from normal current-carrying circuit elements to the platform. (T&D/PE) 824-1994

**platform fault-detection device (series capacitor)** A device to detect insulation failure on the platform that results in current flowing from normal current carrying circuit elements to the platform. (T&D/PE) 824-1985s

**platform internal interface (PII)** The interface between application platform service components within that platform. (C/PA) 14252-1996

**platform, lineperson's** *See:* lineperson's platform.

**platform profile** A profile whose focus is on functionality and interfaces for a particular type of platform, which may be a single processor shared by a group of applications or a large distributed system with each application dedicated to a single processor. (C/PA) 14252-1996

**platform-to-ground signaling devices** Devices to transmit protection, control, and alarm functions to and from the platform. (T&D/PE) 824-1994

**plating rack (electroplating)** Any frame used for suspending one or more electrodes and conducting current to them during electrodeposition. *See also:* electroplating. (EEC/PE) [119]

**platter** One disk within a stack of disks, such that the disks are attached to a common spindle. *See also:* disk. (C) 610.10-1994w

**playback (1)** A term used to denote reproduction of a recording. (EEC/PE) [119]

**(2)** *See also:* reversible execution. (C) 610.12-1990

**(3)** To output data or text for review purposes. *Synonyms:* playout; printout. (C) 610.10-1994w

**playback head** *See:* read head.

**playback loss** *See:* translation loss.

**playout** *See:* playback.

**PL/C** A subset of PL/1 characterized by its enhanced debugging, quick compilation, code optimization and error checking facilities. *Note:* The C stands for Cornell University, where the language was developed. (C) 610.13-1993w

**PLCP** *See:* physical layer convergence procedure.

**PL/DB** *See:* Programming Language/Data Base.

**plenary capacitance** (between two conductors) The capacitance between two conductors when the changes in the charges on the two are equal in magnitude but opposite in sign and the other n − 2 conductors are isolated conductors. (Std100) 270-1966w

**plenum** An air compartment or chamber to which one or more ducts are connected and which forms part of an air-distribution system. (NESC/NEC) [86]

**PLI** Deprecated for PL/1. (C) 610.13-1993w

**plier clamp** *See:* strand restraining clamp.

**P-line** *See:* pilot line.

**pliotron** A hot-cathode vacuum tube having one or more grids. *Note:* This term is used primarily in the industrial field. (ED) [45]

**PII** *See:* platform internal interface.

**PL/M** A procedure-oriented programming language derived from PL/1, designed specifically for microcomputers. (C) 610.13-1993w

**plotter** An output device that presents data on paper in the form of a two-dimensional graphic representation. *See also:* drum plotter; analog plotter; digital plotter; flatbed plotter; electrostatic plotter; raster plotter. (C) 610.10-1994w

**plotter step size (1)** The minimum distance between two points or parallel lines on a plotter. *See also:* increment size. (C) 610.6-1991w, 610.10-1994w

**(2)** The distance between adjacent addressable points of a plotter. (C) 610.10-1994w

**plotting board** The flat surface of a flatbed plotter on which the output is displayed. *Synonym:* plotting table. (C) 610.10-1994w

**plotting chart (navigation aid terms)** A chart designed primarily for plotting dead reckoning lines of position. (AES/GCS) 172-1983w

**plotting head** A head within a plotter that is used to create marks on the display surface. (C) 610.10-1994w

**plotting table** *See:* plotting board.

**plow (cable plowing)** Equipment capable of laying cable, flexible conduit, etc., underground. (T&D/PE) 590-1977w

**plow blade (cable plowing)** A soil-cutting tool. (T&D/PE) 590-1977w

**plow blade amplitude (cable plowing)** Maximum displacement of plow blade tip from mean position induced by the vibrator (half the stroke). (T&D/PE) 590-1977w

**plow blade frequency (cable plowing)** Rate of blade tip vibration in hertz. (T&D/PE) 590-1977w

**plowing (cable plowing)** A process for installing cable, flexible conduit, etc., by cutting or separating the earth, permitting the cable or flexible conduit to be placed or pulled in behind the blade. (T&D/PE) 590-1977w

**PLPC** *See:* physical layer convergence procedure.

**PL/PROPHET** A language similar in style to PL/1, used in conjunction with the PROPHET system in pharmacology research. *See also:* PARSEC. (C) 610.13-1993w

**plug (1)** A device, usually associated with a cord, that by insertion in a jack or receptacle establishes connection between a conductor or conductors associated with the plug and a conductor or conductors connected to the jack or receptacle. (PE/EM) 43-1974s

**(2)** A cluster of blades fixed to a photocontrol, shorting cap, or nonshorting cap to establish an electrical and mechanical connection when inserted into a mating receptacle. (RL) C136.10-1996

**plug adapter (plug body)** A device that by insertion in a lampholder serves as a receptacle. (EEC/PE) [119]

**plug adapter lampholder (current tap)** A device that by insertion in a lampholder serves as one or more receptacles and a lampholder. (EEC/PE) [119]

**plugboard (1) (general)** A perforated board that accepts manually inserted plugs to control the operation of equipment. *See also:* control panel. (C) [20], [85]

**(2) (test, measurement, and diagnostic equipment)** Patchboard the use of which is restricted to punched card machines. *See also:* patch board. (MIL) [2]

**(3)** A printed circuit board into which plugs or pins may be placed to control the operation of equipment. *Synonym:* pinboard. *See also:* jack. (C) 610.7-1995, 610.10-1994w

**plugboard chart** A chart that shows, for a given job, where plugs may be inserted into a plugboard. *Synonym:* plugging chart. (C) 610.10-1994w

**plug braking (rotating machinery)** A form of electric braking of an induction motor obtained by reversing the phase sequence of its supply. *See also:* asynchronous machine. (PE) [9]

**plug fuses (protection and coordination of industrial and commercial power systems)** Plug fuses are rated 125 volts (V) and are available with current artings up to 30 amperes (A). Their use is limited to circuits rated 125 V or less. However, they may also be used in circuits supplied from a system having a grounded neutral, and in which no conductor operates at more than 150 V to ground. The National Electrical Code (NEC) requires type S fuses in all new installations of plug fuses because they are tamper resistant and size limiting, thus making it difficult to overfuse. (IA/PSP) 242-1986r

**plugging** A control function that provides braking by reversing the motor line voltage polarity or phase sequence so that the motor develops a counter-torque that exerts a retarding force. *See also:* electric drive. (IA/ICTL/IAC) [60]

**plugging chart** *See:* plugboard chart.

**plug-in** A communication device when it is so designed that connections to the device may be completed through pins, plugs, jacks, sockets, receptacles, or other forms of ready connectors. (EEC/PE) [119]

**plug-in device** A device that may be installed and removed at will, especially a device that is attached to a bus intended for system expansion. (C/BA) 1275-1994

**plug-in driver** A package, usually associated with a plug-in device and serving as the interface to that device, that is created by evaluating an FCode program resident on that device. (C/BA) 1275-1994

**plug-in-type bearing (rotating machinery)** A complete journal bearing assembly, consisting of a bearing liner and bearing housing and any supporting structure that is intended to be inserted into a machine end-shield. *See also:* bearing. (PE) [9]

**plug-in unit** *See:* CAMAC plug-in unit.

**plug-receptacle interface temperature** The temperature either at the top of the receptacle or at the bottom of the control base with the control mounted in the receptacle in an ambient temperature of 25°C. (RL) C136.10-1996

**plumb-bob gravity** At a site on the earth, the force per unit mass acting on a mass at rest relative to the earth, not including any reaction force from the suspension. The plumb bob gravity includes the gravitational attraction of the earth, the effect of the centripetal acceleration due to the earth rotation,

and tidal effects. The time average of the plumb-bob-gravity acceleration in the earth-fixed frame is the vector difference of the earth-Newtonian-gravitational acceleration and the earth-rotation-centripetal acceleration. The earth-Newtonian-gravitational-acceleration vector points generally toward the center of mass of the earth, as modified by the effects of gravity anomalies and the earth's flattening due to the earth rotation. The earth-rotation-centripetal-acceleration vector points toward and is perpendicular to the earth-rotation axis. The magnitude and direction of the instantaneous plumb-bob-gravity acceleration vary about their averages by approximately $\pm 0.15$ μg and $\pm 0.15$ μrad, respectively, with an approximate 12.4 h period due to the effect of lunar-solar earth and ocean tides. The tidal acceleration is due to the difference between the lunar and solar attractions at the site and at the center of the earth, the variation in earth attraction caused by the variation in the distance of the site from the center of the earth due to tidal deformation and ocean tide loading, and the gravitational attraction of the solid earth and ocean tide deformations. The direction of the plumb-bob-gravity acceleration defines the local vertical down direction, and its magnitude defines the unit of acceleration *g* used in accelerometer scale factor calibration at a test site (with compensation for tidal effects if accuracy warrants).
(AES/GYAC) 1293-1998

**plumb-bob vertical (navigation aid terms)** The direction indicated by a simple, ideal, frictionless pendulum that is motionless with respect to the earth; it indicates the direction of the vector sum of the gravitational and centrifugal accelerations of the earth at the location of the observer.
(AES/GCS) 172-1983w

**plumbing (1) (data transmission)** A term employed in communication practice to designate coaxial lines or wave guides and accessory equipment for radio-frequency transmission.
(COM/PE) 599-1985w

**(2)** A colloquial expression for pipe-like waveguide circuit elements and transmission lines. *Synonym:* microwave plumbing. (AES) 686-1997

**plumb mark (conductor stringing equipment)** A mark placed on the conductor located vertically below the insulator point of support for steel structures and vertically above the pole center line at ground level for wood pole structures used as a reference to locate the center of the suspension clamp.
(T&D/PE) 524-1992r

**plumb marker pole** A small diameter, lightweight pole with a marking device attached to one end, having sufficient length to enable a worker to mark the conductor directly below him/her from a position on the bridge or arm of the structure. This device is utilized to mark the conductor immediately after completion of sagging. *Synonym:* marker.
(T&D/PE) 524-1992r

**plume** *See:* positive prebreakdown streamers.

**plunger relay** A relay operated by a movable core or plunger through solenoid action. *See also:* relay. (EEC/REE) [87]

**plural service** *See:* dual service.

**plural tap** *See:* multiple plug.

**plus input (oscilloscopes)** An input such that the applied polarity causes a deflection polarity in agreement with conventional deflection polarity. (IM) 311-1970w

**plus/minus operation** A winding arrangement in which one or the other end of the tap winding is connected by a reversing change-over selector to the main winding, and allows use of the taps in a buck or boost mode when travelling through the tapping range. (PE/TR) C57.131-1995

**PM** *See:* permanent magnet; phase modulation; protective margin; permanent-magnet focusing.

**PMA** *See:* physical medium attachment.

**PMA sublayer** *See:* physical medium attachment sublayer.

**PMOS** *See:* p-channel metal-oxide semiconductor.

**PMSG** *See:* dead-front pad-mounted switchgear.

**pnet** A physical net that has no correspondence to the logical function of the design, such as a route segment, which is reserved for future routes across a hard macro, or a power net not described in the design netlist. (C/DA) 1481-1999

**pneumatically release-free (trip-free)** (as applied to a pneumatically operated switching device) A term indicating that by pneumatic control the switching device is free to open at any position in the closing stroke if the release is energized. *Note:* This release-free feature is operative even though the closing control switch is held closed.
(SWG/PE) C37.100-1992

**pneumatic bellows, relay** *See:* relay pneumatic bellows.

**pneumatic brake pipe** A pressurized air line, continuous over the length of the train, used variously to indicate train integrity, provide indication of a emergency condition, equalize reservoir pressures, or propagate a brake application signal.
(VT) 1475-1999

**pneumatic controller** A pneumatically supervised device or group of devices operating electric contacts in a predetermined sequence. *See also:* multiple-unit control.
(VT/LT) 16-1955w

**pneumatic loudspeaker** A loudspeaker in which the acoustic output results from controlled variation of an air stream.
(EEC/PE) [119]

**pneumatic operation** Power operation by means of compressed gas. (SWG/PE) C37.100-1992

**pneumatic switch** A pneumatically supervised device opening or closing electric contacts, and differs from a pneumatic controller in being purely an ON and OFF type device. *See also:* control switch. (VT/LT) 16-1955w

**pneumatic transducer** A unilateral transducer in which the sound output results from a controlled variation of an air stream. (SP) [32]

**pneumatic tubing system (protective signaling)** An automatic fire-alarm system in which the rise in pressure of air in a continuous closed tube, upon the application of heat, effects signal transmission. *Note:* Most pneumatic tubing systems contain means for venting slow pressure changes resulting from temperature fluctuations and therefore operate on the so-called rate-of-rise principle. *See also:* protective signaling.
(EEC/PE) [119]

***p-n* junction (semiconductor)** A region of transition between *p*- and *n*-type semiconducting material. *See also:* semiconductor device. (PE/EEC) [119]

**PN sequence** *See:* pseudonoise sequence.

**pocket** A card stacker in a card sorter. *Synonym:* bin.
(C) 610.10-1994w

**pocketbook** *See:* insulator cover; conductor grip.

**pocket sort** *See:* distribution sort.

**pocket-type plate** (of a storage cell) A plate of an alkaline storage battery consisting of an assembly of perforated oblong metal pockets containing active material. *See also:* battery.
(EEC/PE) [119]

**poid** The curve traced by the center of a sphere when it rolls or slides over a surface having a sinusoidal profile. (SP) [32]

**Poincaré sphere (1)** A sphere whose points are associated in a one-to-one fashion with all possible polarization states of a plane wave [field vector] according to the following rules: The longitude equals twice the tilt angle and the latitude is twice the angle whose cotangent is the negative of the axial ratio of the polarization ellipse. *Notes:* 1. For this definition, the axial ratio carries a sign. 2. The points of the northern hemisphere of the Poincaré sphere represent polarizations with a left-hand sense and those of the southern hemisphere represent polarization with a right-hand sense. The north pole represents left-hand circular polarization and the south pole right-hand circular polarization. The points of the equator represent all possible linear polarizations. *See also:* axial ratio.
(AP/ANT) 145-1993

**(2)** A tool for graphically displaying the polarization state of a monochromatic wave. For a fully polarized wave, each point on the sphere's surface defines a unique polarization state, with axial ratio and tilt angle mapping into latitude and longitude, respectively. (AP/PROP) 211-1997

**point (1) (A) (positional notation)** The character, or the location of an implied symbol, that separates the integral part of a numerical expression from its fractional part. For example, it is called the binary point in binary notation and the decimal point in decimal notation. If the location of the point is assumed to remain fixed with respect to one end of the numerical expressions, a fixed-point system is being used. If the location of the point does not remain fixed with respect to one end of the numerical expression, but is regularly recalculated, then a floating-point system is being used. *Note:* A fixed-point system usually locates the point by some convention, while a floating-point system usually locates the point by expressing a power of the base. *See also:* variable point; checkpoint; breakpoint; rerun point; floating point; fixed point; branch point. **(B) (positional notation)** The character, or implied location of such a character, that separates the integral part of a numerical expression from the fractional part. Since the place to the left of the point has unit weight in the most commonly used systems, the point is sometimes called the units point, although it is frequently called the binary point in binary notation and the decimal point in decimal notation. *See also:* floating point; breakpoint; fixed point. (C) [20], 270-1966, [85], 162-1963

**(2) (lightning protection)** The pointed piece of metal used at the upper end of the elevation rod to receive a lightning discharge. (EEC/PE) [119]

**(3)** The standard typographical unit of measurement, approximately equal to 1/72 in. (C) 1295-1993w

**(4)** (for supervisory control or indication or telemeter selection) All of the supervisory control or indication devices in a system, exclusive of the common devices, in the master station and in the remote station that are necessary for

1) Energizing the closing, opening, or other circuits of a unit, or set of units of switchgear or other equipment being controlled, or
2) Automatic indication of the closed or open or other positions of the unit, or set of units of switchgear or other equipment for which indications are being obtained, or
3) Connecting a telemeter transmitting equipment into the circuit to be measured and to transmit the telemeter reading over a channel to a telemeter receiving equipment.

*Note:* A point may serve for any two or all three of the purposes described above; for example, when a supervisory system is used for the combined control and indication of remotely operated equipment, point (for supervisory control) and point (for supervisory indication) are combined into a single control and indication point. (SWG/PE) C37.100-1992

**(5) (lightning protection)** *See also:* radix point. (C) 1084-1986w

**point contact (semiconductors)** A pressure contact between a semiconductor body and a metallic point. *See also:* semiconductor device; semiconductor. (ED) 216-1960w

**point-contact transistor** A transistor having a base electrode and two or more point-contact electrodes. *See also:* transistor; semiconductor. (ED) 216-1960w

**point coordination function (PCF)** A class of possible coordination functions in which the coordination function logic is active in only one station in a basic service set (BSS) at any given time that the network is in operation. (C/LM) 8802-11-1999

**point detector** A device that is a part of a switch-operating mechanism and is operated by a rod connected to a switch, derail, or movable-point frog to indicate that the point is within a specified distance of the stock rail. (EEC/PE) [119]

**point equipment (point)** Elements of a supervisory system, exclusive of the basic common equipment, that are peculiar to and required for the performance of a discrete supervisory function.

1) **alarm point.** Station (remote or master, or both) equipment that inputs a signal to the alarm function.
2) **accumulator point.** Station (remote or master, or both) equipment that accepts a pulsing digital input signal to accumulate a total of pulse counts.
3) **analog point.** Station (remote or master, or both) equipment that inputs an analog quantity to the analog function.
4) **control point.** Station (remote or master, or both) equipment that operates to perform the control function.
5) **indication (status) point.** Station (remote or master, or both) equipment that accepts a digital input signal for the function of indication.
6) **sequence of events point.** Station (remote or master, or both) equipment that accepts a digital input signal to perform the function of registering sequence of events.
7) **telemetering selection point.** Station (remote or master, or both) equipment for the selective connection of telemetering transmitting equipment to appropriate telemetering receiving equipment over an interconnecting communication channel. This type of point is more commonly used in electromechanical or stand-alone type of supervisory control.
8) **spare point.** Point equipment that is not being utilized, but is fully wired and equipped.
9) **wired point.** Point for which all common equipment, wiring, and space are provided. To activate the point requires only the addition of plug-in hardware.
10) **space-only point.** Point for which cabinet space only is provided for future addition or wiring and other necessary plug-in equipment.

*Note:* A point may serve for one or more of the purposes described above, for example, when a supervisory system is used for combined control and supervision of remotely operated equipment, a point for supervisory control and point for supervisory indication may be combined into a single control and indication point. *See also:* supervisory control functions. (SWG/PE/SUB) C37.100-1992, C37.1-1987s

**pointer (1) (software)** A data item that specifies the location of another data item; for example, a data item that specifies the address of the next employee record to be processed. *Synonym:* link. *See also:* pointer segment; stack pointer. (C) 610.5-1990w, 610.12-1990

**(2)** An identifier that indicates the address or storage location of an data item. (C) 610.10-1994w

**pointer data** Data used to represent the addresses of other data items. (C) 610.5-1990w

**pointer optimization** A database reorganization technique in which database access is made more efficient by reestablishing the pointers within the database so that fewer pointers are needed to represent the database structure. (C) 610.5-1990w

**pointer pusher (demand meter)** The element that advances the maximum demand pointer in accordance with the demand and in integrated-demand meters is reset automatically at the end of each demand interval. *See also:* demand meter. (EEC/PE) [119]

**pointer segment (data management)** A segment in a database that establishes a parent/child relationship between segments. *Note:* The segment contains only a pointer to the physical child segment for its parent segment. (C) 610.5-1990w

**pointer shift due to tapping** The displacement in the position of a moving element of an instrument that occurs when the instrument is tapped lightly. The displacement is observed by a change in the indication of the instrument. *See also:* moving element. (EEC/AII) [102]

**point ID printout (sequential events recording systems)** A brief coded method of identifying inputs using alphanumeric characters, usually used in computer based systems. (PE/EDPG) [1]

**pointing accuracy (communication satellite)** The angular difference between the direction in which the main beam of an antenna points and the required pointing direction. (COM) [25]

**pointing device (1)** A device, such as a mouse, trackball, or joystick, used to move a pointer on the screen. (C) 1295-1993w

**(2)** An input deice that is used to specify a particular addressable location. *Contrast:* pick device. *See also:* stylus; cursor control device. (C) 610.10-1994w, 610.6-1991w

**point-junction transistor** A transistor having a base electrode and both point-contact and junction electrodes. *See also:* transistor. (EEC/PE) [119]

**point method (illuminating engineering)** (formerly called "point-by-point method") A lighting design procedure for predetermining the illuminance at various locations in lighting installations, by use of luminaire photometric data. The direct component of illuminance due to the luminaires and the interreflected component of illuminance due to the room surfaces are calculated separately. The sum is the total illumination at a point. (EEC/IE) [126]

**point object** A synthetic environment object that is geometrically anchored to the terrain with a single point. (C/DIS) 1278.1a-1998

**point of common coupling (PCC) (1)** The connection point between the SVC and the power system at which performance requirements are defined. (SUB/PE) 1303-1994

**(2)** The busbar from which other loads sensitive to voltage may be connected as well as the static var compensator (SVC) and any disturbing load it is required to compensate. (PE/SUB) 1031-2000

**(3)** The point at which the electric utility and the customer interface occurs. Typically, this point is the customer side of the utility revenue meter. *Note:* In practice, for building-mounted photovoltaic (PV) systems (such as residential PV systems) the customer distribution panel may be considered the PCC for convenience in making measurements and performing testing. (SCC21) 929-2000

**point of connection** For a static var compensator (SVC) with a dedicated transformer, the high voltage (HV) bus to which the whole is connected. For an SVC connected to an existing transformer, or direct connected at low voltage, the busbar to which it is connected. (PE/SUB) 1031-2000

**point of fixation (illuminating engineering)** A point or object in the visual field at which the eyes look, and upon which they are focused. (EEC/IE) [126]

**point of measurement** Place at which the conventionally true values are determined and at which the reference point of the monitor is placed for test purposes. (NI) N42.20-1995

**point of observation (illuminating engineering)** For most purposes it may be assumed that the distribution of luminance in the field of view can be described as if there were a single point of observation located at the midpoint of the baseline connecting the centers of the entrance pupils of the two eyes. For many problems it is necessary, however, to regard the centers of the entrance pupils as separate points of observation for the two eyes. (EEC/IE) [126]

**point of presence** The point at which the local telephone company terminates subscribers' circuits for long distance dial-up or leased line communications. (C) 610.7-1995

**point of regulation (POR)** The location in the subsystem (unit under test) where voltage is sensed for voltage regulation. The point of regulation can be remote or local to the voltage regulation equipment. (PEL) 1515-2000

**point-of-sale terminal (1)** A device for recording sales data in machine readable form at the time each sale is made. (C) 610.2-1987

**(2)** A job-oriented terminal for recording sales data in machine-readable form at the time and place at which each sale is made. (C) 610.10-1994w

**point on tangent (POT)** *See:* hub.

**point operator** An image operator that assigns a gray level to each output pixel based on the gray level of the corresponding input pixel. *Contrast:* neighborhood operator. (C) 610.4-1990w

**point source (laser maser)** A source of radiation whose dimensions are small enough compared with the distance between source and receptor for them to be neglected in calculations. (LEO) 586-1980w

**point test** A predefined location within equipment or routines at which a known result should be present if the equipment or routine is operating properly. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**point-to-multipoint connection** A connection with multiple endpoints, wherein one endpoint that is designated as the root (originator) is connected by a point-to-point connection with all other endpoints. (C/LM) 802.9a-1995w

**point-to-point (1)** Descriptive of a communication channel that services just two terminals. (SUB/PE) 999-1992w

**(2)** Pertaining to a channel, line, or a circuit that has only two end points. *See also:* multipoint; multidrop. (C) 610.7-1995

**point-to-point communications** Communications that take place between exactly two devices. (C/MM) 1284.4-2000

**point-to-point configuration** A network configuration in which two communicating stations are connected by a point-to-point channel. (C) 610.7-1995

**point-to-point connection** A connection with only two endpoints. (C/LM) 802.9a-1995w

**point-to-point control system** *See:* positioning control system.

**point-to-point radio communication** Radio communication between two fixed stations. *See also:* radio transmission. (EEC/PE) [119]

**point transposition** A transposition, usually in an open wire line, that is executed within a distance comparable to the wire separation, without material distortion of the normal wire configuration outside this distance. (EEC/PE) [119]

**Poisson's equation** In rationalized form:

$$\nabla^2 V = -\frac{\rho}{\varepsilon_0 \varepsilon}$$

where $\varepsilon_0\varepsilon$ is the absolute capacitivity of the medium, $V$ the potential, and $\rho$ the charge density at any point. (Std100) 270-1966w

**polar axis (primary ferroelectric terms)** A direction that is parallel to the spontaneous polarization vector. When a polar crystal is heated or cooled, the internal or external electrical conduction generally cannot provide enough current to compensate for the change in polarization with temperature, and the crystal develops an electric charge on its surface. For this reason, polar crystals are called pyroelectric. *Note:* For crystal class m, the polar axis is in an arbitrary direction in a plane (the mirror plane). The polar axis for crystal class 1 can be in any arbitrary direction. (UFFC) 180-1986w

**polar cap** Polar region bounded by the auroral zone. (AP/PROP) 211-1997

**polar cap absorption (PCA)** The intense absorption of radio waves in the polar regions caused by the arrival of high-energy solar protons concentrated in this region by the lines of force of the Earth's magnetic field. (AP/PROP) 211-1997

**polar contact** A part of a relay against which the current-carrying portion of the movable polar member is held so as to form a continuous path for current. (EEC/PE) [119]

**polar direct-current telegraph system** A system that employs positive and negative currents for transmission of signals over the line. *See also:* telegraphy. (EEC/PE) [119]

**polar-duplex signaling (telephone switching systems)** Any method of bidirectional signaling over a line using ground potential compensation and polarity sensing. (COM) 312-1977w

**polarential telegraph system** A direct-current telegraph system employing polar transmission in one direction and a form of differential duplex transmission in the other direction. *Note:* Two kinds of polarential systems, known as types A and B, are in use. In half-duplex operation of a type-A polarential system the direct-current balance is independent of line re-

sistance. In half-duplex operation of a type-B polarential system the direct-current balance is substantially independent of the line leakage. *See also:* telegraphy. (COM) [49]

**polarimetry** The study of electromagnetic propagation, scattering, and emission that considers the complete polarization state of any arbitrarily polarized wave. (AP/PROP) 211-1997

**Polaris correction (navigation aids)** A correction to be applied to the corrected sextant altitude of Polaris to obtain latitude. (AES/GCS) 172-1983w

**polarity (1) (instrument transformers) (power and distribution transformers)** The designation of the relative instantaneous directions of the currents entering the primary terminals and leaving the secondary terminals during most of each half cycle. *Note:* Primary and secondary terminals are said to have the same polarity, when, at a given instant during most of each half cycle, the current enters the identified, similarity marked primary lead and leaves the identified, similarly marked secondary terminal in the same direction as though the two terminals formed a continuous circuit. (PE/PSR/TR) C37.110-1996, C57.12.80-1978r

**(2) (batteries)** An electrical condition determining the direction in which current tends to flow on discharge. By common usage the discharge current is said to flow from the positive electrode through the external circuit. *See also:* battery. (PE/EEC) [119]

**(3) (television) (picture signal)** The sense of the potential of a portion of the signal representing a dark area of a scene relative to the potential of a portion of the signal representing a light area. Polarity is stated as black negative or black positive. *See also:* television. (BT/AV) [34]

**(4)** The relative instantaneous directions of the currents entering the primary terminals and leaving the secondary terminals during most of each half cycle. *Note:* Primary and secondary terminals are said to have the same polarity when, at a given instant during most of each half cycle, current enters the primary terminal and leaves the secondary terminal in the same direction as though there was a continuous circuit between the two terminals. (PE/TR) C57.13-1993

**(5)** The orientation of any device that has poles or signed electrodes. (C) 610.10-1994w

**(6)** Polarity of the dc voltage with respect to ground, e.g., positive or negative. (PE/TR) C57.19.03-1996

**(7)** The polarity of a regulator is intrinsic in its design. Polarity is correct if the regulator boosts the voltage in the "raise" range and bucks the voltage in the "lower" range. The relative polarity of the shunt winding and the series windings of a step-voltage regulator will differ in the boost and buck modes between Type A and Type B regulators. (PE/TR) C57.15-1999

**polarity and angular displacement (regulator)** Relative lead polarity of a regulator or a transformer is a designation of the relative instantaneous direction of current in its leads. In addition to its main transformer windings, a regulator commonly has auxiliary transformers or auxiliary windings as an integral part of the regulator. The same principles apply to the polarity of all transformer windings. *Notes:* 1. Primary and secondary leads are said to have the same polarity when at a given instant the current enters an identified secondary lead in the same direction as though the two leads formed a continuous circuit. 2. The relative lead polarity of a single-phase transformer may be either additive or subtractive. If one pair of adjacent leads from the two windings is connected together and voltage applied to one of the windings, then:

a) The relative lead polarity is additive if the voltage across the other two leads of the windings is greater than that of the higher-voltage winding alone.
b) The relative lead polarity is subtractive if the voltage across the other two leads of the winding is less than that of the higher-voltage winding alone.

3. The polarity of a polyphase transformer is fixed by the internal connections between phases as well as by the relative locations of leads: it is usually designated by means of a vector line diagram showing the angular displacement of windings and a sketch showing the marking of leads. The vector lines of the diagram represent induced voltages and the recognized counterclockwise direction of rotation is used. The vector line representing any phase voltage of a given winding is drawn parallel to that representing the corresponding phase voltage of any other winding under consideration. *See also:* voltage regulator. (PE/TR) C57.15-1968s

**polarity guard** A device that guarantees proper tip and ring polarity. (SCC31) 1390.2-1999, 1390.3-1999

**polarity marks (instrument transformers)** The identifications used to indicate the relative instantaneous polarities of the primary and secondary current and voltages. *Notes:* 1. On voltage transformers during most of each half cycle in which the identified primary terminal is positive with respect to the unidentified primary terminal, the identified secondary terminal is also positive with respect to the unidentified secondary terminal. 2. The polarity marks are so placed on current transformers that during most of each half-cycle, when the direction of the instantaneous current is into the identified primary terminal, the direction of the instantaneous secondary current is out of the correspondingly identified secondary terminal. 3. This convention is in accord with that by which standard terminal markings $H_1$, $X_1$, etc., are correlated. *See also:* instrument transformer. (PE/TR) [57]

**polarity or polarizing voltage device (power system device function numbers)** A device that operates, or permits the operation of, another device on a predetermined polarity only, or verifies the presence of a polarizing voltage in the equipment. (PE/SUB) C37.2-1979s

**polarity-related adjectives (A) (pulse terminology)** Of, having, or pertaining to a single polarity. **(B) (bipolar)** Of, having, or pertaining to both polarities. (IM/WM&A) 194-1977

**polarity reversal** Change of voltage polarity from positive to negative or from negative to positive polarity. (PE/TR) C57.19.03-1996

**polarity test (rotating machinery)** A test taken on a machine to demonstrate that the relative polarities of the windings are correct. *See also:* asynchronous machine. (PE) [9]

**polarizability** The average electric dipole moment produced per molecule per unit of electric field strength. (Std100) 270-1966w

**polarization (1) (primary ferroelectric terms)** The electric dipole moment per unit volume. Polarization is related to electric displacement D through the linear expression

$$D_i = P_i + \varepsilon_0 E_i$$

where the derived constant $\varepsilon_0$ (usually called the permittivity of free space) equals $8.854 \cdot 10^{12}$ coulomb/volt-meter. In ferroelectric materials both $D$ and $P$ are nonlinear functions of $E$ and may depend on previous history of the material. When the electric field is applied along a polar axis that is also a special axis of the prototype phase of the crystal, this expression may then be regarded as a scalar equation, since $D$, $E$, and $P$ all point along the same direction. When the term $\varepsilon_0 E$ in the above expression is negligible compared to $P$ (as in the case for most ferroelectric materials), $D$ is nearly equal to $P$; therefore, the $D$ versus $E$ and $P$ versus $E$ plots of the hysteresis loop become, in practice, equivalent. *Note:* The polarization $P$ may be expressed as the bound surface charge per unit area of a free surface normal to the direction of $P$. *See also:* desired polarization; polarization error. (UFFC) 180-1986w

**(2) (primary ferroelectric terms)** (of a waveguide mode) In some cases, the polarization of the electric field vector on the axis of symmetry of a waveguide. In general, however, the polarization of the mode is not identical to the polarization of the electric field vector in the mode, since the latter varies from point to point in the guide cross-section. *Notes:* 1. Polarization is that property of a degenerate waveguide mode which characterizes a particular mode within a set of degenerate modes. The main application of this concept is to

waveguides of square or circular cross-section. 2. When two orthogonal modes can be identified in a square or circular waveguide, a polarization ellipse can be associated with the field vectors and considered in terms of axial ratio, etc. (MTT) 146-1980w

**(3) (radiated wave)** That property of a radiated electromagnetic wave describing the time-varying direction and amplitude of the electric field vector; specifically, the figure traced as a function of time by the extremity of the vector at a fixed location in space, as observed along the direction of propagation. *Note:* In general the figure is elliptical and it is traced in a clockwise or counterclockwise sense. The commonly referenced circular and linear polarizations are obtained when the ellipse becomes a circle or a straight line, respectively. Clockwise sense rotation of the electric vector is designated right-hand polarization and counterclockwise sense rotation is designated left-hand polarization. *See also:* radiation. (AP/ANT) [35]

**(4) (electronic navigation)** (desired) The polarization of the radio wave for which an antenna system is designed. *See also:* navigation. (AES/RS/GCS) 686-1982s, 173-1959w, [42]

**(5) (batteries)** The change in voltage at the terminals of the cell or battery when a specified current is flowing, and is equal to the difference between the actual and the equilibrium (constant open-circuit condition) potentials of the plates, exclusive of the IR drop. *See also:* polarization. (EEC/PE) [119]

**(6) (waveguide)** (of a field vector) For a field vector at a single frequency at a fixed point in space, the polarization is that property which describes the shape and orientation of the locus of the extremity of the field vector and the sense in which this locus is traversed. *Notes:* 1. For a time harmonic (or single frequency) vector, the locus is an ellipse with center at the origin. In some cases, this ellipse becomes a circle or a segment of a straight line. The polarization is then called "circular" and "linear, " respectively. 2. The orientation of the ellipse is defined by its plane, called the plane of polarization, and by the direction of its axes. (For a linearly polarized field, any plane containing the segment locus of the field vector is a plane of polarization.) (MTT) 146-1980w

**(7) (A)** (of an antenna) In a given direction from the antenna, the polarization of the wave transmitted by the antenna. *Note:* When the direction is not stated, the polarization is taken to be the polarization in the direction of maximum gain. **(B)** [of a wave (radiated by an antenna in a specified direction)] In a specified direction from an antenna and at a point in its far field, the polarization of the (locally) plane wave that is used to represent the radiated wave at that point. *Note:* At any point in the far field of an antenna, the radiated wave can be represented by a plane wave whose electric field strength is the same as that of the wave and whose direction of propagation is in the radial direction from the antenna. As the radial distance approaches infinity, the radius of curvature of the radiated wave's phase front also approaches infinity, and thus, in any specified direction, the wave appears locally as a plane wave. (AP/ANT) 145-1993

**(8)** (as applied to a relay) The input that provides a reference for establishing the direction of system phenomena such as direction of power or reactive flow, or direction to a fault or other disturbance on a power system. (SWG/PE) C37.100-1992

**(9)** (of an electromagnetic wave) The locus of the tip of the electric field vector observed in a plane orthogonal to the wave normal. *Notes:* 1. Elliptical polarization is the most general case. 2. The polarization of an electromagnetic wave is defined by the tilt angle, the axial ratio and the sign of the axial ratio, which expresses the sense of rotation of the polarization ellipse. *See also:* circularly polarized wave; elliptically polarized wave; linearly polarized wave; parallel polarization; perpendicular polarization. (AP/PROP) 211-1997

**polarization capacitance (biological)** The reciprocal of the product of electrode capacitive reactance and $2\pi$ times the frequency.

$$C_p = \frac{1}{2\pi f X_p}$$

*See also:* electrode impedance. (EMB) [47]

**polarization controller, optical** *See:* optical polarization controller.

**polarization coupling loss** That part of the transmission loss due to the mismatch between the polarization of the incoming wave and the polarization of the receiving antenna. (AP/PROP) 211-1997

**polarization current** Time-dependent, decaying current in the specimen, following the instant that a constant voltage is applied until steady-state conditions have been obtained. *Notes:* 1. Polarization current does not include the conductance current. The sum of the polarization and conductance currents in the specimen is that which is normally observed during measurements. 2. Polarization current includes both polarization absorption and capacitive-charge currents. (PE) 402-1974w

**polarization, desired** *See:* desired polarization.

**polarization diversity reception (data transmission)** That form of diversity reception that utilizes separate vertically and horizontally polarized receiving antennas. (PE) 599-1985w

**polarization efficiency** The ratio of the power received by an antenna from a given plane wave of arbitrary polarization to the power that would be received by the same antenna from a plane wave of the same power flux density and direction of propagation, whose state of polarization has been adjusted for a maximum received power. *Notes:* 1. The polarization efficiency is equal to the square of the magnitude of the inner product of the polarization vector describing the receiving polarization of the antenna and the polarization vector of the plane wave incident at the antenna. 2. If the receiving polarization of an antenna and the polarization of an incident plane wave are properly located as points on the Poincaré sphere, then the polarization efficiency is given by the square of the cosine of one-half the angular separation of the two points. *Synonym:* polarization mismatch factor. *See also:* polarization vector. (AP/ANT) 145-1993

**polarization ellipse (waveguide)** The locus of the extremity of a field vector at a fixed point in space. *See also:* polarization. (MTT) 146-1980w

**polarization error (navigation aid terms) (navigation)** The error arising from the transmission or reception of an electromagnetic wave having a polarization other than that intended for the system. (AES/GCS) 172-1983w

**polarization index ($P.I._{t2/t1}$) (1) (rotating machinery)** The ratio of the the insulation resistance of a machine winding measured at 1 min after voltage has been applied divided into the measurement at 10 min. (PE/EM) 95-1977r

**(2)** Variation in the value of insulation resistance with time. The quotient of the insulation resistance at time ($t_2$) divided by the insulation resistance at time ($t_1$). If times $t_2$ and $t_1$ are not specified, they are assumed to be 10 min and 1 min, respectively. Unit conventions: values of 1 through 10 are assumed to be in minutes, values of 15 and greater are assumed to be in seconds (e.g., $P.I._{60/15}$ refers to $IR_{60s}/IR_{15s}$). (PE/EM) 43-2000

**polarization index test (rotating machinery)** A test for measuring the ohmic resistance of insulation at specified time intervals for the purpose of determining the polarization index. *See also:* asynchronous machine; direct-current commutating machine. (PE) [9]

**polarization maintaining fiber (interferometric fiber optic gyro)** A single-mode fiber that preserves the plane of polarization of light coupled into it as the beam propagates through its length. (AES/GYAC) 528-1994

**polarization match** The condition that exists when a plane wave, incident upon an antenna from a given direction, has a polarization that is the same as the receiving polarization of the antenna in that direction. *See also:* receiving polarization. (AP/ANT) 145-1993

**polarization mismatch factor** *See:* polarization efficiency.

**polarization mismatch loss** The magnitude, expressed in decibels, of the polarization efficiency. (AP/ANT) 145-1993

**polarization pattern** (of an antenna) (A) The spatial distribution of the polarizations of a field vector excited by an antenna taken over its radiation sphere. (B) The response of a given antenna to a linearly polarized plane wave incident from a given direction and whose direction of polarization is rotating about an axis parallel to its propagation vector; the response being plotted as a function of the angle that the direction of polarization makes with a given reference direction. *Notes:* 1. When describing the polarizations over the radiation sphere [definition (A)], or a portion of it, reference lines shall be specified over the sphere, in order to measure the tilt angles of the polarization ellipses and the direction of polarization for linear polarizations. An obvious choice, though by no means the only one, is a family of lines tangent at each point on the sphere to either the $\theta$ or $\phi$ coordinate line associated with a spherical coordinate system of the radiation sphere. 2. At each point on the radiation sphere, the polarization is usually resolved into a pair of orthogonal polarizations, the co-polarization and the cross polarization. To accomplish this, the co-polarization must be specified at each point on the radiation sphere. For certain linearly polarized antennas, it is common practice to define the co-polarization in the following manner: First specify the orientation of the co-polar electric field vector at a pole of the radiation sphere. Then, for all other directions of interest (points on the radiation sphere), require that the angle that the co-polar electric field vector makes with each great circle line through the pole remain constant over that circle, the angle being that at the pole. In practice, the axis of the antenna's main beam should be directed along the polar axis of the radiation sphere. The antenna is then appropriately oriented about this axis to align the direction of its polarization with that of the defined co-polarization at the pole. This manner of defining co-polarization can be extended to the case of elliptical polarization by defining the constant angles using the major axes of the polarization ellipses rather than the co-polar electric field vector. The sense of polarization must also be specified. 3. The polarization pattern [definition (B)] generally has the shape of a dumbbell. The polarization ellipse of the antenna in the given direction is similar to one that can be inscribed in the dumbbell shape with points of tangency at the maxima and minima points; thus, the axial ratio and tilt angle can be obtained from the polarization pattern. *See also:* cross polarization; tilt angle; co-polarization. (AP/ANT) 145-1993

**polarization-phase vector** (for a field vector) The polarization vector, among all of those that define the same polarization, that carries the phase information of the field vector whose polarization it represents. *Note:* The polarization-phase vector of the field vector $\vec{E}$ is given by $\vec{E} == \vec{E}/E$ where $E$ is magnitude of $\vec{E}$ that is, the positive square root of $\vec{E} * \vec{E}$. *See also:* polarization vector. (AP/ANT) 145-1993

**polarization potential (biological)** The boundary potential over an interface. *See also:* electrobiology. (EMB) [47]

**polarization ratio** The magnitude of a complex polarization ratio. (AP/ANT) 145-1993

**polarization reactance (biological)** The impedance multiplied by the sine of the angle between the potential vector and the current vector.

$$X_p = Z_p \sin \theta$$

*See also:* electrode impedance. (EMB) [47]

**polarization, receiving** *See:* receiving polarization.

**polarization receiving factor** The ratio of the power received by an antenna from a given plane wave of arbitrary polarization to the power received by the same antenna from a plane wave of the same power density and direction of propagation, whose state of polarization has been adjusted for the maximum received power. *Note:* It is equal to the square of the absolute value of the scalar product of the polarization unit vector of the given plane wave with that of the radiation field of the antenna along the direction opposite to the direction of propagation of the plane wave. *See also:* waveguide. (MTT) 146-1980w

**polarization resistance (biological)** The impedance multiplied by the cosine of the phase angle between the potential vector and the current vector. $R_p = Z_p \cos \theta$. *See also:* electrode impedance. (EMB) [47]

**polarization state** *See:* state of polarization.

**polarization unit vector (field vector)** (at a point) A complex field vector divided by its magnitude. *Notes:* 1. For a field vector of one frequency at a point, the polarization unit vector completely describes the state of polarization, that is, the axial ratio and orientation of the polarization ellipse and the sense of rotation on the ellipse. 2. A complex vector is one each of whose components is a complex number. The magnitude is the positive square root of the scalar product of the vector and its complex conjugate. *See also:* waveguide. (MTT) 146-1980w

**polarization vector** (for a field vector) A unitary vector which describes the state of polarization of a field vector at a given point in space. *Notes:* 1. Polarization vectors differing only by a unitary factor ($e^{j\alpha}$ where $\alpha$ is real) correspond to the same polarization state. 2. The appropriate inner product, $\langle \hat{e}_1, \hat{e}_2 \rangle$, for two polarization vectors in the same plane of polarization is given by $\langle \hat{e}_1, \hat{e}_2 \rangle = \hat{e}_1^* \cdot \hat{e}_2$ where $\hat{e}_1$ and $\hat{e}_2$ represent the polarization vectors corresponding to polarizations 1 and 2. 3. The inner product of polarization vectors representing the same polarization is equal to unity. The inner product of two polarization vectors representing two orthogonal polarizations is zero. 4. The inner product of a polarization vector corresponding to a specified polarization, $\hat{e}_1$, and a complex electric field vector $\vec{E}$, at a point in space will yield the component of the electric field vector corresponding to the specified polarization, $\vec{E}_1$; that is $\vec{E}_1 = (\hat{e}_1^* \cdot \vec{E})\hat{e}_1$. 5. The basis vectors for the components of the polarization vector may correspond to any two orthogonal polarizations, the most common being two orthogonal linear polarizations or right-hand and left-hand circular polarizations. (AP/ANT) 145-1993

**polarized dipole magnetization** *See:* polarized return-to-zero recording.

**polarized electrolytic capacitor** An electrolytic capacitor in which the dielectric film is formed adjacent to only one metal electrode and in which the impedance to the flow of current in one direction is greater than in the other direction. (EEC/PE) [119]

**polarized plug (packaging machinery)** A plug so arranged that it may be inserted in its counterpart only in a predetermined position. (IA/PKG) 333-1980w

**polarized relay** A relay that consists of two elements, one of which operates as a neutral relay and the other of which operates as a polar relay. *See also:* polar relay; neutral relay. (EEC/PE) [119]

**polarized return-to-zero recording (RZ(P))** Return-to-zero recording in which zeros are represented by magnetization in one sense, ones are represented by magnetization in the opposite sense, and the reference condition is the absence of magnetization. *Synonym:* polarized dipole magnetization. *Contrast:* non-polarized return-to-zero recording. (C) 610.10-1994w

**polarized snubber (converter circuit elements) (self-commutated converters)** A snubber, including a diode, in which the limiting action depends on the direction of voltage or current. (IA/SPC) 936-1987w

**polarizer** A substance that when added to an electrolyte increases the polarization. *See also:* electrochemistry. (EEC/PE) [119]

**polarizer, optical** *See:* optical polarizer.

**polarizing fiber (interferometric fiber optic gyro)** A single-mode fiber that maintains one and only one polarization state as the beam propagates through its length by suppressing its orthogonal state. (AES/GYAC) 528-1994

**polar mode** *See:* resolver.

**polar navigation (navigation aids)** Navigation in polar regions where unique considerations and techniques are applied. (AES/GCS) 172-1983w

**polar operation (data transmission)** Circuit operation in which mark and space transitions are represented by a current reversal. (PE) 599-1985w

**polar orbit (communication satellite)** An inclined orbit with an inclination of 90°. The plane of a polar orbit contains the polar axis of the primary body. (COM) [19]

**polar regions (navigation aid terms)** The regions near the geographic poles. Definite limits for these regions are not recognized. (AES/GCS) 172-1983w

**polar relay** A relay in which the direction of movement of the armature depends upon the direction of the current in the circuit controlling the armature. *See also:* neutral relay; electromagnetic relay; polarized relay. (EEC/PE) [119]

**pole (1) (illuminating engineering)** A standard support generally used where overhead lighting distribution circuits are employed. (EEC/IE) [126]

**(2) (electric power or communication)** A column of wood or steel, or some other material, supporting overhead conductors, usually by means of arms or brackets. *See also:* pole shoe; field pole; tower. (T&D/PE) [10]

**(3) (pole unit)** (of a switching device or fuse) That portion of the device associated exclusively with one electrically separated conducting path of the main circuit of the device. *Notes:* 1. Those portions that provide a means for mounting and operating all poles together are excluded from the definition of a pole. 2. A switching device or fuse is called single-pole if it has only one pole. If it has more than one pole, it may be called multipole (two-pole, three-pole, etc.) and provided, in the case of a switching device, that the poles are or can be coupled in such a manner as to operate together. (SWG/PE) C37.100-1992

**(4)** The complex frequency where a Laplace transform is infinite. Combined with residues, this is a convenient mathematical notation for the impedance or transfer function of a passive circuit, such as a resistor/inductor/capacitor (RLC) circuit, since poles above this frequency can be ignored in calculations without significant loss of accuracy. (C/DA) 1481-1999

**(5)** *See also:* stick. (PE/T&D) 516-1995

**pole body (rotating machinery)** The part of a field pole around which the field winding is fitted. *See also:* asynchronous machine. (PE) [9]

**pole-body insulation (rotating machinery)** Insulation between the pole body and the field coil. *See also:* asynchronous machine. (PE) [9]

**pole bolt (rotating machinery)** A bolt used to fasten a pole to the spider. (PE) [9]

**pole-cell insulation (rotating machinery) (salient pole)** Insulation that constitutes the liner between the field pole coil and the salient pole body. *See also:* rotor. (PE) [9]

**pole-changing winding (rotating machinery)** A winding so designed that the number of poles can be changed by simple changes in the coil connections at the winding terminals. *See also:* rotor; stator. (PE) [9]

**pole disagreement relay** A protective relay designed to monitor currents in the three poles of a device, such as a circuit breaker, to verify the integrity of the electrical continuity of all its phases. (SWG/PE) C37.100-1992

**pole end plate (rotating machinery)** A plate or structure at each end of a laminated pole to maintain axial pressure on the laminations. *See also:* asynchronous machine. (PE) [9]

**pole face (rotating machinery)** The surface of the pole shoe or nonsalient pole forming one boundary of the air gap. *See also:* asynchronous machine; direct-current commutating machine. (PE) [9]

**pole-face bevel (rotating machinery)** The portion of the pole shoe that is beveled so as to increase the length of the radial air gap. *See also:* asynchronous machine. (PE) [9]

**pole face, relay** *See:* relay pole face.

**pole-face shaping (rotating machinery)** The contour of the pole shoe that is shaped other than by being beveled, so as to produce nonuniform radial length of the air gap. *See also:* rotor; stator. (PE) [9]

**pole fixture** A structure installed in lieu of a single pole to increase the strength of a pole line or to provide better support for attachments than would be provided by a single pole. Examples are A fixtures, H fixtures, etc. *See also:* open-wire pole line. (EEC/PE) [119]

**pole guy** A tension member having one end securely anchored and the other end attached to a pole or other structure that it supports against overturning. *See also:* tower. (T&D/PE) [10]

**pole line** A series of poles arranged to support conductors above the surface of the ground, and the structures and conductors supported thereon. *See also:* open-wire pole line. (EEC/PE) [119]

**pole, offset marker** *See:* offset marker pole.

**pole piece** A piece or an assembly of pieces of ferromagnetic material forming one end of a magnet and so shaped as to appreciably control the distribution of the magnetic flux in the adjacent medium. (Std100) 270-1966w

**pole pitch (rotating machinery)** The peripheral distance between corresponding points on two consecutive poles; also expressed as a number of slot positions. *See also:* stator; armature; rotor. (PE) [9]

**pole, plumb marker** *See:* plumb marker pole.

**pole shoe** The portion of a field pole facing the armature that serves to shape the air gap and control its reluctance. *Note:* For round-rotor fields, the effective pole shoe includes the teeth that hold the field coils and wedges in place. *See also:* stator; rotor; field pole. (PE) [9]

**pole slipping (rotating machinery)** The process of the secondary member of a synchronous machine slipping one pole pitch with respect to the primary magnetic flux. (PE) [9]

**pole steps** Devices attached to the side of a pole, conveniently spaced to provide a means for climbing the pole. *See also:* tower. (T&D/PE) [10]

**pole strap** *See:* positioning strap.

**pole tip (rotating machinery)** The leading or trailing extremity of the pole shoe. *See also:* stator; rotor. (PE) [9]

**pole-top cover** *See:* insulator cover.

**pole-type regulator** A regulator that is designed for mounting on a pole or similar structure. (PE/TR) C57.15-1999

**pole-type transformer (power and distribution transformers)** A transformer which is suitable for mounting on a pole or similar structure. (PE/TR) C57.12.80-1978r

**pole-unit mechanism** (of a switching device) That part of the mechanism that actuates the moving contacts of one pole. (SWG/PE) C37.100-1992

**pole-zero cancellation (1)** The pole-zero adjustment on the shaping amplifier adjusts the zero location of the pole-zero network to cancel exactly the preamplifier output pole and thus provide single-pole (i.e., no under or overshoot) response of the signal pulse at the amplifier output. This operation converts the long-tailed preamplifier pulse to a short-tailed pulse suitable for signal optimization and subsequent pulse-height analysis. Proper pole-zero cancellation is an absolute necessity to prevent spectral degradation at moderate (2000 $s^{-1}$) rates. (NI) N42.14-1991

**(2)** A technique used to cancel out the effects of a singularity in an amplifier's transfer function in order to effect a mono-

tonic return of signal pulses to the baseline. (NPS/NID) 759-1984r

**policies (safety systems equipment in nuclear power generating stations)** Management directives that describe the organization, principles, plans, or courses of action. (PE/NP) 600-1983w

**poling (1)** The process by which a direct-current electric field exceeding the coercive field is applied to a multidomain ferroelectric to produce a net remanent polarization. *See also:* remanent polarization; ferroelectric domain; polarization. (UFFC) [21], 180-1986w

**(2) (general)** The adjustment of polarity. Specifically, in wire line practice, it signifies the use of transpositions between transposition sections of open wire or between lengths of cable to cause the residual crosstalk couplings in individual sections or lengths to oppose one another. *See also:* open-wire pole line. (EEC/PE) [119]

**polishing (electroplating)** The smoothing of a metal surface by means of abrasive particles attached by adhesive to the surface of wheels or belts. *See also:* electroplating. (EEC/PE) [119]

**Polish notation** *See:* prefix notation.

**poll (data transmission)** A flexible, systematic method, centrally controlled for permitting stations on a multipoint circuit to transmit without contending for the line. (PE) 599-1985w

**poll/final bit** A bit set by the BCC to "1" to solicit a response from a DCC. The P/F bit is set to "1" by the DCC to indicate that the final frame of the message has been transmitted. (EMB/MIB) 1073.3.1-1994

**poll function check** Accomplished when analog function is performed with all remotes. A check of master and remote station equipment by exercising a predefined component or capability. *See also:* analog function check. (SUB/PE) C37.1-1994

**polling (1) (supervisory control, data acquisition, and automatic control) (data request)** The process by which a data acquisition system selectively requests data from one or more of its remote terminals. A remote terminal may be requested to respond with all, or a selected portion of, the data available. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**(2)** A technique for sharing a multiple-access transmission medium, where devices cannot transmit until they have received implicit or explicit permission. *See also:* centralized polling; distributed polling. (C) 610.7-1995

**(3)** A scheduling scheme whereby the local process periodically checks until the prespecified events (*e.g.*, read, write) have occurred. (C) 1003.5-1999

**(4) (supervisory control, data acquisition, and automatic control) (data request)** *See also:* supervisory control.

**polling supervisory system (station control and data acquisition)** A system in which the master interrogates each remote to ascertain if there has been a change since the last interrogation. Upon detection of a change the master may request data immediately. (PE/SUB) C37.100-1992, C37.1-1994

**polychlorinated biphenyl (liquid-filled power transformers)** Any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances that contains such substance ≥50 parts per million (ppm) dry weight basis. Examples: PCB liquids and nonliquids. (LM/C) 802.2-1985s

**polychlorinated biphenyl article (liquid-filled power transformers)** Any manufactured article, other than a PCB container that contains PCBs and whose surface(s) has been in direct contact with PCBs. Examples: PCB large high- and low-voltage capacitors; PCB transformer; PCB cooler motor. (LM/C) 802.2-1985s

**polychlorinated biphenyl article container (liquid-filled power transformers)** Any package, can bottle, bag, barrel, drum, tank, or other device used to contain PCB articles or PCB equipment, and whose surface(s) has not been in direct contact with PCBs. Examples: Shipping or storage cartons for capacitors. (LM/C) 802.2-1985s

**polychlorinated biphenyl container (liquid-filled power transformers)** Any package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs or PCB articles and whose surface(s) has been in direct contact with PCBs. Examples: Bottle, barrel, drum, or box. (LM/C) 802.2-1985s

**polychlorinated biphenyl contaminated electrical equipment (liquid-filled power transformers)** Any electrical equipment, including but not limited to transformers (including those used in railway locomotives and self-propelled cars), capacitors, circuit breakers, reclosers, voltage regulators, switches (including sectionalizers and motor starters), bushings, electromagnets, and cable, that contain 50 parts per million (ppm) or greater PCBs but less than 500 ppm PCB. Oil-filled electrical equipment other than circuit breakers, reclosers, and cable whose PCB concentration is unknown must be assumed to be PCB-contaminated electrical equipment. Examples: Some oil-filled units; some retrofilled units. (LM/C) 802.2-1985s

**polychlorinated biphenyl equipment (liquid-filled power transformers)** Any manufactured item, other than a PCB container, that contains a PCB article or other PCB equipment. Examples: Microwave oven, power-factor-corrected lighting ballast. (LM/C) 802.2-1985s

**polychlorinated biphenyl item (liquid-filled power transformers)** Any PCB article, PCB article container, PCB container, or PCB equipment that deliberately or unintentionally contains or has a part of it any PCB or PCBs at a concentration of 50 parts per million (ppm) or greater. Examples: PCB askarel contaminated transformer (mineral) oil, or coolants retrofilled to transformer formerly cooled with askarel. (LM/C) 802.2-1985s

**polychlorinated biphenyl storage for disposal (liquid-filled power transformers)** The facilities meet the following criteria:

a) Adequate roof and walls to prevent rain water from reaching the stored PCBs and PCB items.
b) An adequate floor that has continuous curbing with a minimum 6 inches high curb. The floor and curbing provide a containment volume equal to at least two times the internal volume of the largest PCB article or PCB container stored therein or 25% of the total internal volume of all PCB articles or PCB containers stored therein, whichever is greater.
c) No drain valves, floor drains, expansion joints, sewer lines, or other openings that would permit liquids to flow from the curbed area.
d) Floors and curbing constructed of continuous smooth and impervious materials, such as Portland cement, concrete, or steel, to prevent or minimize penetration of PCBs.
e) Not located at a site that is below the 100-year flood water elevation.

(LM/C) 802.2-1985s

**polychlorinated biphenyl transformer** Any transformer that contains 500 parts per million (ppm) PCB or greater. Examples: PCB askarel-insulated units; some oil-filled units; some retrofilled units. (LM/C) 802.2-1985s

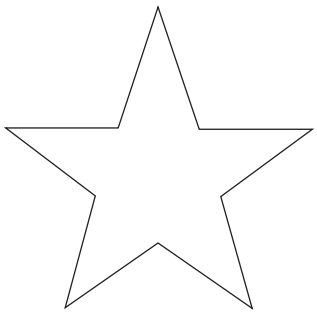
**polycrystalline silicon** A silicon layer that contains a multiplicity of crystals. This is the common form of silicon that is employed for transistor gates and interconnections on the surface of dielectric layers in MOS circuits. (ED) 1005-1998

**Polyforth** A dialect of FORTH. (C) 610.13-1993w

**polygon** A display element that consists of an area enclosed by a sequence of straight lines. (C) 610.6-1991w

**polygon fill** *See:* fill.

**polyline** A display element that consists of a set of connected lines.



**polyline**

(C) 610.6-1991w

**polyline attribute** A characteristic of the line segments that make up a polyline. For example, color index, line type, line width. (C) 610.6-1991w

**polymarker** A display element that consists of a set of locations, each of which is indicated by a marker.



**polymarker**

(C) 610.6-1991w

**polymarker attribute** A characteristic of the markers that make up a polymarker. For example, color index, marker size, marker type. (C) 610.6-1991w

**Polymorphic Programming Language** An interactive, extensible language containing facilities for defining new data types and operators. (C) 610.13-1993w

**polyphase** (as applied to a relay) A descriptive term indicating that the relay is responsive to polyphase alternating electrical input quantities. *Note:* A multiple-unit relay with individual units responsive to single-phase electrical inputs is not a polyphase relay even though the several single-phase units constitute a polyphase set. (SWG/PE) C37.100-1992

**polyphase ac fields (1)** Fields whose space components may not be in phase. These fields will be produced by polyphase power lines. The field at any point can be described by the field ellipse—that is, by the magnitude and direction of the semimajor axis and the magnitude and direction of its semiminor axis. *Note:* Such fields are sometimes referred to as being elliptically polarized. Certain power line geometries can produce circularly polarized fields. For polyphase power lines, the electric field at large distances ($\geq$15 m) away from the outer phases (conductors) can frequently be considered a single-phase field because the minor axis of the electric field ellipse is only a fraction ($<$10%) of the major axis when measured at a height of 1 m above ground level. *See also:* electric field strength. (T&D/PE) 644-1994

**(2)** Fields whose space components may not be in time phase with each other. These fields will be the transversal fields produced by polyphase power lines. The field at any point can be described by the field ellipse; i.e., the magnitude and direction of the major semi-axis and the magnitude and direction of the minor semi-axis. The magnitude of the field strength is the magnitude of the major semi-axis. *Note:* For polyphase power lines, the electric field at a distance of 15 m or more away from the outer phases (conductors) can frequently be considered a single-phase field because the minor axis of the electric-field ellipse is only a fraction (less than 10%) of the major axis when measured at a height of 1 m. Similar remarks apply for the magnetic field. *See also:* ac electric field strength. (T&D/PE) 539-1990

**polyphase circuit** An alternating-current circuit consisting of more than two intentionally interrelated conductors that enter (or leave) a delimited region at more than two terminals of entry and that are intended to be so energized that in the steady state the alternating voltages between successive pairs of terminals of entry of the phase conductors, selected in a systematic chosen sequence, have:

a) the same period,
b) definitely related and usually equal amplitudes, and
c) definite and usually equal phase differences. If a neutral conductor exists, it is intended also that the voltages from the successive phase conductors to the neutral conductor be equal in amplitude and equally displaced in phase.

*Note:* For all polyphase circuits in common use except the two-phase three-wire circuit, it is intended that the voltage amplitudes and the phase differences of the systematically chosen voltages between phase conductors be equal. For a two-phase three-wire circuit it is intended that voltages between two successive pairs of terminals be equal and have a phase difference of p.2 radians, but that the voltage between the third pair of terminals have an amplitude $(2)^{1.2}$ times as great as the other two, and a phase difference from each of the other two of 3 p.4 radians. *See also:* zig-zag connection of polyphase circuits. (Std100) 270-1966w

**polyphase code** A pulse compression waveform in which a long pulse is subdivided into many subpulses and the phase of each subpulse is chosen with a quantization less than $\pi$ radians. The Frank polyphase code is an example in which the phases are selected so as to obtain a discrete version of the continuous analog linear frequency-modulation waveform. (AES) 686-1997

**polyphase machine (rotating machinery)** A machine that generates or utilizes polyphase alternating-current power. These are usually three-phase machines with three voltages displaced 120 electrical degrees with respect to each other. *See also:* asynchronous machine. (PE) [9]

**polyphase merge sort** An unbalanced merge sort in which the distribution of the sorted subsets is based on a polynomial series such as the Fibonacci series. *See also:* cascade merge sort. (C) 610.5-1990w

**polyphase symmetrical set (1) (polyphase voltages)** A symmetrical set of polyphase voltages in which the angular phase difference between successive members of the set is not zero, $\pi$ radians, or a multiple thereof. The equations of symmetrical set of polyphase voltages represent a polyphase symmetrical set of polyphase voltages if $k/m$ is not zero, 1/2, or a multiple thereof. (The symmetrical set of voltages represented by the equations of symmetrical set of polyphase voltages may be said to have polyphase symmetry if $k/m$ is not zero, 1/2, or a multiple of 1/2). *Note:* This definition may be applied to a two-phase four-wire or five-wire circuit if $m$ is considered to be 4 instead of 2. It is not applicable to a two-phase three-wire circuit. (Std100) 270-1966w

**(2) (polyphase currents)** This definition is obtained from the corresponding definitions for voltage by substituting the word current for voltage, the symbol I for $E$, and $\beta$ for $\alpha$ wherever they appear. The subscripts are unaltered. (Std100) 270-1966w

**polyphase synchronous generator** A generator whose field circuits are arranged so that two or more symmetrical alternating electromotive forces with definite phase relationships are produced at the terminals. Polyphase synchronous generators are usually two-phase, producing two electromotive forces displaced 90 electrical degrees apart, or three-phase, producing three electromotive forces displaced 120 electrical degrees apart. (Polyphase generators used for marine services are generally three phase.) (IA/MT) 45-1998

**polyplastic** A synonym for polyethylene-coated, nylon-reinforced hose, usually considered to be nonconductive. (In

terms of this guide, the hose is used to carry water.) (T&D/PE) 957-1995

**polyplexer** Equipment combining the functions of duplexing and lobe switching. (AES/RS) 686-1990

**poly-sol** Plastic additive used in some washing applications to break down surface adhesion. (T&D/PE) 957-1987s

**polyvinyl chloride** An insulator in cable coatings and coaxial cable foam compositions. (C) 610.7-1995

**pondage (power operations)** Hydroreserve and limited storage capacity that provides only daily or weekly regulation of streamflow. (PE/PSE) 858-1987s

**pondage station** A hydroelectric generating station with storage sufficient only for daily or weekend regulation of flow. *See also:* generating station. (T&D/PE) [10]

**p-on-n solar cells (photovoltaic power system)** Photovoltaic energy-conversion cells in which a base of n-type silicon (having fixed positive holes in a silicon lattice and electrons that are free to move) is overlaid with a surface layer of p-type silicon (having fixed electrons in a silicon lattice and positive holes that are free to move). (AES) [41]

**pool cathode** A cathode at which the principal source of electron emission is a cathode spot on a metallic pool electrode. (ED) [45]

**pool-cathode mercury-arc converter** A frequency converter using a mercury-arc pool-type discharge device. (IA) 54-1955w, 169-1955w

**pool rectifier** A gas-filled rectifier with a pool cathode, usually mercury. (ED) [45], [84]

**pool tube** A gas tube with a pool cathode. *See also:* electronic controller. (ED) [45]

**POP** *See:* point of presence.

**pop** *See:* pull.

**populate** *See:* load.

**population (1) (data management)** The number of records in a file or database. (C) 610.5-1990w
**(2) (utility power systems)** Transformers that have given common specific characteristics. (PE/TR) C57.117-1986r

**population, conceptual** *See:* conceptual population.

**population inversion (laser maser)** A nonequilibrium condition of a system of weakly interacting particles (electronics, atoms, molecules, or ions) which exists when more than one-half of the particles occupy the higher of two energy states. (LEO) 586-1980w

**pop-up menu (1)** A menu that is brought into view as a result of a selection action other than choosing a menu-bar label. *Contrast:* pull-down menu. (PE/NP) 1289-1998
**(2)** A menu that appears outside of menu bar when requested, usually as the result of pressing BMenu or KMenu. (C) 1295-1993w

**pores (electroplating)** Micro discontinuities in a metal coating that extend through to the base metal or underlying coating. *See also:* electroplating. (LEO) 586-1980w

**Port** A Port Object. Context may indicate that the Port Object is of a specific class. (IM/ST) 1451.1-1999

**port (1) (electronic devices or networks)** A place of access to a device or network where energy may be supplied or withdrawn or where the device or network variables may be observed or measured. *Notes:* 1. In any particular case, the ports are determined by the way the device is used and not by its structure alone. 2. The terminal pair is a special case of a port. 3. In the case of a waveguide or transmission line, a port is characterized by a specified mode of propagation and a specified reference plane. 4. At each place of access, a separate port is assigned to each significant independent mode of propagation. 5. In frequency changing systems, a separate port is also assigned to each significant independent frequency response. *See also:* network analysis; optoelectronic device; waveguide. (ED/IM/HFIM) [46], [45], [40]
**(2) (rotating machinery)** An opening for the intake or discharge of ventilating air. (PE) [9]
**(3) (rotating machinery)** (for a waveguide component) A means of access characterized by a specified reference plane and a specified propagating mode in a waveguide which permits power to be coupled into or out of a waveguide component. *Note:* At low frequencies the port is synonymous with a terminal pair. 2. To each propagating mode at a specified reference plane there corresponds a distinct port. (MTT) 146-1980w
**(4) (broadband local area networks)** An electrical interface that has defined operating boundaries. The specific references within IEEE Std 802.7-1989 assume ports to be 75 Ω transmission line interfaces that have an associated connector to which the signals pass. (LM/C) 802.7-1989r
**(5)** A source or destination of data transferred by a Data Transfer class command into and/or out of an S-module. A port may be an on-module memory, on-module interface, a peripheral attached to a module, or some other mechanism to/from which data is passed.Within IEEE Std 1149.5-1995, a port is defined by a module address, a port ID meaningful to the MTM-Bus interface logic of that module, and the semantics and structure of packets by which data can be conveyed to and/or from that port. This latter often entails some description of the application to/from which data are passed. A port is selected/accessed/addressed via a Data Transfer class command. (TT/C) 1149.5-1995
**(6)** The physical interconnection point or an access point for a communication link. (C) 610.7-1995
**(7)** An input or output connection between a peripheral device and a computer. *See also:* parallel port; serial port; mouse port; input-output port. (C) 610.10-1994w
**(8)** A physical layer entity in a node that connects to either a cable or backplane and provides one end of a physical connection with another node. (C/MM) 1394-1995
**(9)** A signal interface provided by token ring stations, passive concentrator lobes, active concentrator lobes, or concentrator trunks that is generally terminated at a media interface connector (MIC). Ports may or may not provide physical containment of channels. *See also:* Bridge Port. (C/LM/C/LM) 802.1G-1996, 8802-5-1998
**(10)** An interface point connecting a communications channel and a device. (PE/SUB) 1379-1997
**(11)** A segment or Inter-Repeater Link (IRL) interface of a repeater unit. (C/LM) 802.3-1998
**(12)** A conceptual point at which a cell or a hierarchical design unit makes its interface available to higher levels in the design hierarchy. (C/DA) 1481-1999
**(13)** An abstraction of an access point to network communications. (IM/ST) 1451.1-1999
**(14)** The part of the physical layer (PHY) that allows connection to one other node. (C/MM) 1394a-2000
**(15)** A physical entity that allows import or export of one or more cartridges from a library. (C/SS) 1244.1-2000
**(16)** *See also:* link interface. (C/BA) 1355-1995
**(17)** *See also:* Bridge Port. (C/LM) 802.1G-1996

**portability (1) (software)** The ease with which a system or component can be transferred from one hardware or software environment to another. *Synonym:* transportability. *See also:* machine independent. (C) 610.12-1990
**(2) (application software)** The ease with which application software and data can be transferred from one application platform to another. (C/PA) 14252-1996
**(3)** The capability of being moved between differing environments without losing the ability to be applied or processed. (ATLAS) 1232-1995
**(4)** The capability of being read and/or interpreted by multiple systems. (SCC20) 1232.1-1997
**(5)** The ease with which software can be transferred from one system or environment to another. A relative measure of effort, inversely proportional to the level of modification required for software to be transferred from one system or environment to another. (SCC20) 1226-1998

**portable (x-ray)** X-ray equipment designed to be hand-carried. (NEC/NESC) [86]

**portable appliance** An appliance which is actually moved or can easily be moved from one place to another in normal use. For the purpose of this article, the following major appliances other than built-in are considered portable if cord-connected; refrigerators, gas range equipment, clothes washers, dishwashers without booster heaters, or other similar appliances. *See also:* appliance. (NESC/NEC) [86]

**portable battery** A storage battery designed for convenient transportation. *See also:* battery. (EEC/PE) [119]

**portable character set** The set of characters described in 2.4 that is supported on all conforming systems. This term is contrasted against the smaller *portable filename character set*. (C/PA) 9945-2-1993

**portable character string** A sequence of characters from the portable character set. Within software definition files of exported catalogs, all such strings shall be encoded using IRV. (C/PA) 1387.2-1995

**portable computer** A personal computer that is designed and configured to permit transportation as a piece of handheld luggage. *Note:* U.S. Federal regulations limit use of the term "portable" to objects weighing no more than 21 pounds. *See also:* notebook computer; transportable computer; hand-held computer; laptop computer. (C) 610.2-1987, 610.10-1994w

**portable concentric mine cable** A double-conductor cable with one conductor located at the center and with the other conductor strands located concentric to the center conductor with rubber or synthetic insulation between conductors and over the outer conductor. *See also:* mine feeder circuit. (EEC/PE) [119]

**portable filename character set** The set of characters from which portable filenames are constructed. For a filename to be portable across conforming implementations it shall consist only of the following characters:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

0 1 2 3 4 5 6 7 8 9 . _ -

The last three characters are the period, underscore, and hyphen characters, respectively. The hyphen shall not be used as the first character of a portable filename. Upper- and lowercase letters shall retain their unique identities between conforming implementations. In the case of a portable pathname, the slash character may also be used. (C/PA) 9945-1-1996, 9945-2-1993, 1003.5-1999

**portable identifier character set** The set of characters from which portable identifiers are constructed. This set shall consist only of the following characters:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

0 1 2 3 4 5 6 7 8 9 . _ ( ) -

(C/PA) 2003-1997

**portable lighting (illuminating engineering)** Lighting involving equipment designed for manual portability. (EEC/IE) [126]

**portable luminaire (illuminating engineering)** A lighting unit which is not permanently fixed in place. (EEC/IE) [126]

**portable mine blower** A motor-driven blower to provide secondary ventilation into spaces inadequately ventilated by the main ventilating system and with the air directed to such spaces through a duct. (EEC/PE) [119]

**portable mine cable** An extra-flexible cable, used for connecting mobile or stationary equipment in mines to a source of electric energy when permanent wiring is prohibited or impracticable. *See also:* mine feeder circuit. (EEC/PE) [119]

**portable mining-type rectifier transformer** A rectifier transformer that is suitable for transporting on skids or wheels in the restrictive areas of mines. *See also:* rectifier transformer. (Std100) C57.18-1964w

**portable parallel duplex mine cable** A double or triple-conductor cable with conductors laid side by side without twisting, with rubber or synthetic insulation between conductors and around the whole. The third conductor, when present, is a safety ground wire. *See also:* mine feeder circuit. (EEC/PE) [119]

**portable pathname character set** The set of characters from which portable pathnames are constructed. The set contains all the characters of the portable filename set, plus the character slash (/). (C) 1003.5-1999

**portable platforms** A platform temporarily installed on a pole or tower. The platforms are available in various lengths and materials. They may be fixed or may pivot. The platform may have an anchorage point for a positioning strap. (T&D/PE) 1307-1996

**portable shunt (direct-current instrument shunts)** An instrument shunt with insulating base which may be laid on, or fastened to, any flat surface. It may be used also for switchboard applications where the current is relatively low and connection bars are not used. (PE/PSIM) 316-1971w

**portable standard watthour meter** A portable meter, principally used as a standard for testing other meters. It is usually provided with several current and voltage ranges and with a readout indicating revolutions and fractions of a revolution of the rotor. *Note:* Electronic portable standards not using a rotor may have a readout indicating equivalent revolutions and fractions of revolutions, or other units such as percentage registration. (ELM) C12.1-1982s

**portable station (1) (mobile communication)** A mobile station designed to be carried by or on a person. Personal or pocket stations are special classes of portable stations. *See also:* mobile communication system. (VT) [37]

**(2)** A type of station that may be moved from location to location, but that only uses network communications while at a fixed location. (C/LM) 8802-11-1999

**portable traffic control light (illuminating engineering)** A signalling light designed for manual portability that produces a controllable distinctive signal for purposes of directing aircraft operations in the vicinity of an aerodrome. (EEC/IE) [126]

**portable transmitter** A transmitter that can be carried on a person and may or may not be operated while in motion. *Notes:* 1. This has been called a transportable transmitter, but the designation portable is preferred. 2. This includes the class of so-called walkie-talkies, handy-talkies, and personal transmitters. *See also:* radio transmission; transportable transmitter; radio transmitter. (AP/BT/ANT) 145-1983s, 182A-1964w

**portable X- or gamma-radiation survey instrument (radiation survey instruments)** An instrument with a self-contained energy source (for example, batteries) designed to measure exposure rate while being carried. Such instruments may also have the capability to measure integral exposure, but instruments with the capability of measuring integral exposure only are specifically are specifically excluded from this definition. (NI) N13.4-1971w

**portal** The logical point at which medium access control (MAC) service data units (MSDUs) from a non-IEEE 802.11 local area network (LAN) enter the distribution system (DS) of an extended service set (ESS). (C/LM) 8802-11-1999

**port difference (hybrid)** A port that yields an output proportional to the difference of the electric field quantities existing at two other ports of the hybrid. *See also:* waveguide. (IM/HFIM) [40]

**PORT ID packet** The first DATA packet transferred in a Data Transfer class message. This packet contains the identifier (Port Identifier) by which means a port is selected for the remainder of the message. (TT/C) 1149.5-1995

**Port Object** Any Object whose class is `IEEE1451_SubscriberPort` or a subclass thereof or a subclass of `IEEE1451_BasePort`. (IM/ST) 1451.1-1999

**port protection system** A computer security mechanism used to protect dial-up communication lines from unauthorized use, often requiring special passwords or using call-back procedures. *Synonym:* secure modem. (C) 610.7-1995

**portrait image** *See:* cine-oriented image.

**portrait orientation** A page orientation of a display surface having greater height than width. *Note:* Derived from portraits of people, which are usually vertical in format. *Contrast:* landscape orientation. (C) 610.10-1994w

**port signal (data transmission)** The signal used to telemeter the real time occurrence of polarity reversals of a power voltage or current. The signal may be a pulse train, a square voltage wave, a frequency shift keying (FSK) tone or an FSK carrier wave. Use is generally for frequency or phase-angle telemetering. (PE) 599-1985w

**port sum (hybrid)** A port that yields an output proportional to the sum of the electric-field quantities existing at two other ports of the hybrid. *See also:* waveguide. (IM/HFIM) [40]

**port-to-port time** The elapsed time between the application of a stimulus to an input interface and the appearance of the response at an output interface. *See also:* think time; response time; turnaround time. (C) 610.12-1990

**Port Transfer Error** A port-specific error indicating some failure with relation to transmission of command or data to/from a currently selected port. (TT/C) 1149.5-1995

**Port Transfer Error (PTE) bit** A bit in the Bus Error register of all S-modules. An S-module sets this bit to indicate that the port selected by the command in the current message has reported a Data Transfer Port Error. Such errors will be found defined in the port documentation of specific S-modules. The acronym stands for "Port Transfer Error". (TT/C) 1149.5-1995

**POSH** *See:* permutation on subject headings; permutation on subject headings index.

**position (1) (FASTBUS acquisition and control)** The location of a module in a crate. The position number corresponds to the geographical address. (NID) 960-1993

**(2) (navigation) (navigation aids)** The location of a point with respect to a specified or implied coordinate system. (AES/GCS) 172-1983w

**(3) (A) (within a string)** The ordinal position of one element of a string relative to another. **(B) (within an attribute)** The ordinal position of one value relative to another. (C/PA) 1328-1993, 1224-1993, 1327-1993

**(4) (navigation aids) (navigation)** *See also:* digit place. (C) 1084-1986w

**(5) (navigation aids) (navigation)** *See also:* punch position; sign position.

**positional crosstalk (multibeam cathode-ray tubes)** The variation in the path followed by an one electron beam as the result of a change impressed on any other beam in the tube. (ED) 161-1971w

**positional notation (A)** A number representation that makes use of an ordered set of digits, such that the value contributed by each digit depends on its position as well as on the digit value. *Note:* The Roman numeral system for example, does not use positional notation. *Synonym:* positional representation. *See also:* binary system; binary numeration system; decimal system; decimal numeration system; biquinary numeration system; Gray code. **(B)** One of the schemes for representing numbers, characterized by the arrangement of digits in sequence, with the understanding that successive digits are to be interpreted as coefficients of successive powers of an integer called the base (or radix) of the number system. *Notes:* 1. In the binary number system the successive digits are interpreted as coefficients of the successive powers of the base two, just as in the decimal number system they relate to successive powers of the base ten. 2. In the ordinary number systems each digit is a character that stands for zero or for a positive integer smaller than the base. 3. The names of the number systems with bases from 2 to 20 are: binary, ternary, quaternary, quinary, senary, septenary, octonary (also octal), novenary, decimal, unidecimal, duodecimal, terdenary, quaterdenary, quindenary, sexadecimal (also hexadecimal), septendecimal, octodenary, novendenary, and vicenary. The sexagenary number system has the base 60. The commonly used alternative of saying base-3, base-4, etc., in place of ternary, quaternary, etc., has the advantage of uniformity and clarity. 4. In the most common form of positional notation, the expression $\pm a_n a_{n-1} \ldots a_2 a_1 a_0 \cdot a_{-1} a_{-2} \ldots a_{-m}$ is an abbreviation for the sum

$$\pm \sum_{i=-m}^{n} a_i r^i$$

where the point separates the positive powers from the negative powers, the $a_i$ are integers ($0 \leq a_i < r$) called digits, and $r$ is an integer, greater than one, called the base (or radix). *See also:* radix; base. **(C)** A number-representation system having the property that each number is represented by a sequence of characters such that successive characters of the sequence represent integral coefficients of accumulated products of a sequence of integers (or reciprocals of integers) and such that the sum of these products, each multiplied by its coefficient, equals the number. Each occurrence of a given character represents the same coefficient value. *Note:* The biquinary system is an example of (C). **(D)** A number-representation system such that if the representations are arranged vertically in order of magnitude with digits of like significance in the same column, then each column of digits consists of recurring identical cycles (for numbers sufficiently large in absolute value) whose length is an integral multiple of the cycle length in the column containing the next-less-significant digits. *Note:* (B), (C), and (D) are not mutually exclusive. The biquinary system is an example of (C) and (D); whereas the Gray code system is an example of (D) only. The binary and decimal systems are examples of (B), (C), and (D). (C) 162-1963, [20], 270-1966

**positional parameter** In the shell command language, a parameter denoted by a single digit or one or more digits in curly braces. (C/PA) 9945-2-1993

**positional representation** *See:* positional notation.

**positional response (close-talking pressure-type microphone)** The response-frequency measurements conducted with the principal axis of a microphone collinear with the axis of the artificial voice and the combination of microphone and artificial voice placed at various angles to the horizontal plane. *Note:* Variations in positional response of carbon microphones may be due to gravitational forces. (SP) 258-1965w

**positional servomechanism (1)** In an analog computer, a servomechanism in which a mechanical shaft is positioned, usually in the angle of rotation, in accordance with one or more input signals. *Note:* Frequently, the shaft is positioned (excluding transient motion) in a manner linearly related to the value of the input signal. *See also:* repeater servomechanism; servomechanism. (C) 610.10-1994w

**(2)** A servomechanism in which a mechanical shaft is positioned, usually in the angle of rotation, in accordance with one or more input signals. *Note:* Frequently, the shaft is positioned (excluding transient motion) in a manner linearly related to the value of the input signal. However, the term also applies to any servomechanism in which a loop input signal generated by a transmitting transducer can be compared to a loop feedback signal generated by a compatible or identical receiving transducer to produce a loop error signal that, when reduced to zero by movement of the receiving transducer, results in a shaft position related in a prescribed and repeatable manner to the position of the transmitting transducer. *See also:* repeater servomechanism; electronic analog computer. (C) 165-1977w

**position changing mechanism (power system device function numbers)** A mechanism that is used for moving a main device from one position to another in an equipment; as, for example, shifting a removable circuit breaker unit to and from

the connected, disconnected, and test positions. (SUB/PE) C37.2-1979s

**position-control system** A control system that attempts to establish and.or maintain an exact correspondence between the reference input and the directly controlled variable, namely physical position. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**position index, P (illuminating engineering)** A factor which represents the relative average luminance for a sensation at the borderline between comfort and discomfort (BCD), for a source located anywhere within the visual field. (EEC/IE) [126]

**position indicating device (designator)** A mechanical device that indicates, at the location the switch-operating mechanism, whether the contacts of the switch are in the open or closed position. (SWG/PE) C37.30-1992s

**position indicator (elevators)** A device that indicates the position of the elevator car in the hoistway. It is called a hall position indicator when placed at a landing or a car position indicator when placed in the car. *See also:* control. (PE/EEC) [119]

**position influence (electric instruments)** The change in the indication of an instrument that is caused solely by a position departure from the normal operating position. *Note:* Unless otherwise specified, the maximum change in the recorded value caused solely by an inclination in the most unfavorable direction from the normal operating position. *See also:* accuracy rating. (EEC/ERI/EMI/AII) [111], [112], [102]

**positioning control system (1) (automatic control)** A control system in which there is a predetermined relation between the actuating signal and the position of a final controlling element. *Note:* In a "proportional-position control system" there is a continuous linear relation between the value of the actuating signal and the position of a final controlling element. (PE/EDPG) [3]

**(2) (numerically controlled machines)** A system in which the controlled motion is required only to reach a given end point, with no path control during the transition from one end point to the next. (IA) [61]

**positioning device system** A system of equipment or hardware that, when used with its line-worker's body belt or full body harness, allows a worker to be supported on an elevated vertical surface, such as a pole or tower, and work with both hands free. (NESC) C2-1997

**positioning strap** A strap with snaphook(s) to connect to the D-rings of a line-worker's body belt or full body harness. Used as a positioning device (also known as pole strap or safety strap). (NESC/T&D/PE) C2-1997, 1307-1996

**positioning time** *See:* seek time.

**position lights (illuminating engineering)** The aircraft aeronautical lights which form the basic or internationally recognized navigation light system. *Note:* The system is composed of a red light showing from dead ahead to 110 degrees to the left, a green light showing from dead ahead to 110 degrees to the right, and a white light showing to the rear through 140 degrees. (EEC/IE) [126]

**position light signal** A fixed signal in which the indications are given by the position of two or more lights. (EEC/PE) [119]

**position of the effective short (microwave switching tubes)** The distance between a specified reference plane and the apparent short-circuit of the fired tube in its mount. *See also:* gas tube. (ED) 161-1971w

**position readout (numerically controlled machines)** Display of absolute position as derived from a position transducer. (IA) [61]

**position seating** A control scheme that uses the limit switch as the primary control for operation of a VAM. The limit switch controls the VAM by interrupting power to the motor contactor when the valve actuator has completed a predetermined number of revolutions. (PE/NP) 1290-1996

**position-sensitive detector (1)** A detector in which the centroid of the area of impact of ionizing radiation (at the surface of the detector) can be measured in one or two dimensions. (NPS) 300-1988r

**(2)** A detector in which the centroid of the area of impact of ionizing radiation can be determined from the signals issuing from its terminals. Depending on the design, position sensing can be in one or more dimensions. (NPS) 325-1996

**position sensor or position transducer (numerically controlled machines)** A device for measuring a position and converting this measurement into a form convenient for transmission. (IA) [61]

**position stopping** A control function that provides for stopping the driven equipment at a preselected position. *See also:* electric controller. (IA/ICTL/IAC) [60]

**position switch (power system device function numbers)** A switch that makes or breaks contact when the main device or piece of apparatus which has no device function number reaches a given position. (SUB/PE) C37.2-1979s

**position-type telemeter** *See:* ratio-type telemeter.

**positive** Pertaining to a voltage or charge that is associated with a deficiency of electrons. *Contrast:* negative. (C) 610.10-1994w

**positive after-potential (electrobiology)** Relatively prolonged positivity that follows the negative after-potential. *See also:* contact potential. (EMB) [47]

**positive column (gas tube)** The luminous glow, often striated, in a glow-discharge cold-cathode tube between the Faraday dark space and the anode. *See also:* gas tube. (ED) [45]

**positive conductor** A conductor connected to the positive terminal of a source of supply. *See also:* center of distribution. (T&D/PE) [10]

**positive creep effect (semiconductor rectifiers)** The gradual increase in reverse current with time, that may occur when a direct-current reverse voltage is applied to a semiconductor rectifier cell. *See also:* rectification. (IA) [12]

**positive electrode (A) (primary cell)** The cathode when the cell is discharging. The positive terminal is connected to the positive electrode. *See also:* electrolytic cell. **(B) (metallic rectifier)** The electrode to which the forward current flows within the metallic rectifying cell. *See also:* rectification. (PE/EEC) [119]

**positive feedback (regeneration) (data transmission)** The process by which a part of the power in the output circuit of an amplifying device reacts upon the input circuit in such a manner as to reinforce the initial power, thereby increasing the amplification. (PE) 599-1985w

**positive glow** A bright blue discharge appearing as a luminous sheet adhering closely and uniformly to the electrode. Positive glow appears at electric field strengths above those required for burst corona and onset streamers. The corona current of positive glow is essentially pulseless. *See also:* burst corona. (T&D/PE) 539-1990

**positive grid** *See:* retarding-field (positive-grid) oscillator.

**positive-grid oscillator tube (Barkhausen tube)** A triode operating under oscillating conditions such that the quiescent voltage of the grid is more positive than that of either of the other electrodes. (ED) [45]

**positive logic** An electronic logic system where the voltage representing one, active, or true has a more positive value than the voltage representing zero, inactive, or false. It is normally used in industrial and commercial control switching systems for safety reasons. (IM/ST) 1451.2-1997

**positive logic convention** The representation of the 1-state and the 0-state by the high (H) and low (L) levels, respectively. (GSD) 91-1984r

**positive matrix (positive)** A matrix with a surface like that which is to be ultimately produced by electroforming. (PE/EEC) [119]

**positive modulation** (in an amplitude-modulation television system) That form of modulation in which an increase in

brightness corresponds to an increase in transmitted power. *See also:* television. (EEC/PE) [119]

**positive nonconducting period (rectifier element)** The nonconducting part of an alternating-voltage cycle during which the anode has a positive potential with respect to the cathode. *See also:* power rectifier; rectification. (IA) [62]

**positive noninterfering and successive fire-alarm system** A manual fire-alarm system employing stations and circuits such that, in the event of simultaneous operation of several stations, one of the operated stations will take control of the circuit, transmit its full signal, and then release the circuit for successive transmission by other stations that are held inoperative until they gain circuit control. *See also:* protective signaling. (EEC/PE) [119]

**positive onset streamers** Streamers occurring at electric field strengths at and slightly above the corona inception voltage gradient. These appear as bright blue "brushes" increasing in length to several inches as the voltage gradient is increased. The associated current pulses are of appreciable magnitude, short duration (in the range of hundreds of nanoseconds), and low repetition rate (less than 1 kHz). *Note:* Occurrence of burst corona and positive onset streamers requires the same range of electric field strength. (T&D/PE) 539-1990

**positive-phase-sequence reactance (rotating machinery)** The quotient of the reactive fundamental component of the positive-sequence primary voltage due to the sinusoidal positive-sequence primary current of rated frequency, and the value of this current, the machine running at rated speed. *See also:* asynchronous machine. (PE) [9]

**positive-phase-sequence relay** A relay that responds to the positive-phase-sequence component of a polyphase input quantity. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**positive-phase-sequence resistance (rotating machinery)** The quotient of the in-phase component of positive-sequence primary voltage corresponding to direct load losses in the primary winding and stray load losses due to sinusoidal positive-sequence primary current, and the value of this current, the machine running at rated speed. (PE) [9]

**positive-phase-sequence symmetrical components** (of an unsymmetrical set of polyphase voltages or currents of $m$ phases) The set of symmetrical components that have the first phase sequence. That is, the angular phase lag from the first member of the set to the second, from every other member of the set to the succeeding one, and from the last member to the first, is equal to the characteristic angular phase difference, or $2\pi/m$ radians. The members of this set will reach their positive maxima uniformly in their designated order. The positive-phase-sequence symmetrical components for a three-phase set of unbalanced sinusoidal voltages ($m = 3$), having the primitive period, are represented by the equations

$$e_{a1} = (2)^{1/2}E_{a1}\cos(\omega t + \alpha_{a1})$$

$$e_{b1} = (2)^{1/2}E_{a1}\cos\left(\omega t + \alpha_{a1} - \frac{2\pi}{3}\right)$$

$$e_{c1} = (2)^{1/2}E_{a1}\cos\left(\omega t + \alpha_{a1} - \frac{4\pi}{3}\right)$$

derived from the equation of symmetrical components of a set of polyphase (alternating) voltages. Since in this case $r = 1$ for every component (of 1st harmonic) the third subscript is omitted. Then $k$ is 1 for 1st sequence and $s$ takes on the algebraic values 1, 2, and 3 corresponding to phases $a$, $b$, and $c$. The sequence of maxima occurs in the order $a$, $b$, $c$. *See also:* network analysis. (Std100) 270-1966w

**positive plate (storage cell)** The grid and active material from which current flows to the external circuit when the battery is discharging. *See also:* battery. (EEC/PE) [119]

**positive-polarity lightning stroke** A stroke resulting from a positively charged cloud that lowers positive charge to the earth. *See also:* direct-stroke protection. (T&D/PE) [10]

**positive prebreakdown streamers** Streamers occurring at electric field strengths above those required for onset streamers and positive glow. The discharge appears as a light blue filament with branching extending far into the gap. The associated current pulses have high magnitude, short duration (in the range of hundreds of nanoseconds), and low repetition rate (in the range of a few kilohertz). *Note:* When appearing as multiple discharges, these streamers are usually referred to as a "plume." When the plume occurs between an electrode and an airborne particle (snow, rain, aerosols, etc.) coming into near proximity or impacting on the electrode, it is referred to as an "impingement plume." When the plume occurs due to the disintegration of water drops resting on the electrode surface, it is referred to as a "spray plume." (T&D/PE) 539-1990

**positive-sequence impedance** The quotient of that component of positive-sequence rated-frequency voltage, assumed to be sinusoidal, that is due to the positive-sequence component of current, divided by the positive-sequence component of current. *See also:* asynchronous machine. (PE) [9]

**positive-sequence resistance** That value of resistance that, when multiplied by the square of the fundamental positive-sequence rated-frequency component of armature current and by the number of phases, is equal to the sum of the copper loss in the armature and the load loss resulting from that current, when the machine is operating at rated speed. Positive-sequence resistance is normally that corresponding to rated armature current. *Note:* Inasmuch as the load loss may not vary as the square of the current, the positive-sequence resistance applies accurately only near the current for which it was determined. (EEC/PE) [119]

**positive shielding angle** The shielding angle formed when the shield wire is located above and inside of the area occupied by the outermost conductors. *See also:* shielding angle; negative shielding angle. (SUB/PE) 998-1996

**positive terminal (batteries)** The terminal from which the positive electric charge flows through the external circuit to the negative terminal when the cell discharges. *Note:* The flow of electrons in the external circuit is to the positive terminal and from the negative terminal. *See also:* battery. (EEC/PE) [119]

**POSIX** Portable Operating Systems Interface. A family of standards, which define a standard operating system interface, plus the environment to support application portability at the source code level. (C/PA) 1003.23-1998

**POSIX character** A value of the type `POSIX_Character`. An array of POSIX characters, of type `POSIX_String` is called a ***POSIX** string*. (C) 1003.5-1999

**POSIX Conformance Document (PCD)** The conformance document required by a POSIX standard. (C/PA) 13210-1994, 2003.1-1992

**POSIX Conformance Test Procedure (PCTP)** The non-software procedures possibly used in conjunction with other test methods to measure conformance. (C/PA) 13210-1994, 2003.1-1992

**POSIX Conformance Test Suite (PCTS)** The collection of software possibly used in conjunction with other test methods to measure conformance. (C/PA) 13210-1994, 2003.1-1992

**POSIX I/O** The input/output operations defined by IEEE Std 1003.5-1992 and IEEE Std 1003.5b-1995. (C/PA) 1003.5-1992r, 1003.5b-1995

**POSIX process** A conceptual object, having an associated address space, one or more threads of control executing within that address space, a collection of system resources required for execution, and certain other attributes. A POSIX process is said to perform an action if any of the conceptual threads of control within it performs the action. A process is created by another process with procedures `POSIX_Process_Primitives.Start_Process`, `POSIX_Process_Primitives.Start_Process_Search`, or the function `POSIX_Unsafe_Process_Primitives.Fork`. The process that issues `Start_Process`, `Start_Process_Search`, or `Fork` is known as the parent process. The newly created process is the child process. (C) 1003.5-1999

**POSIX SP** *See:* POSIX Standardized Profile.

**POSIX Standardized Profile (POSIX SP)** A standardized profile that specifies the application of certain POSIX base standards in support of a class of applications and does not require any departure from the structure defined by the reference model for POSIX systems in this guide. (C/PA) 14252-1996

**post (waveguide)** A cylindrical rod placed in a transverse plane of the waveguide and behaving substantially as a shunt susceptance. *See also:* waveguide. (AP/ANT) [35]

**post-accelerating (deflection) electrode (intensifier electrode)** An electrode to which a potential is applied to produce post-acceleration. *See also:* electrode. (PE/PSR) C37.90-1978s

**post acceleration (electron-beam tubes)** Acceleration of the beam electrons after deflection. (ED) 161-1971w

**postal telephone and telegraph** Common carriers that are owned by the government and in which the government is the sole monopoly supplier of communication facilities. (C) 610.7-1995

**postamble (1)** In networking, a sequence of bits appended after the last bit of the frame check sequence. *See also:* preamble; abnormal preamble. (C) 610.7-1995
**(2)** A sequence of bits recorded at the end of each block on a magnetic medium for the purpose of synchronization when reading backward. *Contrast:* preamble. (C) 610.10-1994w
**(3)** In 10BROAD36, the bit pattern appended after the last bit of the Frame Check Sequence by the Medium Attachment Unit (MAU); the Broadband End-of-Frame Delimiter (BEOFD). (C/LM) 802.3-1998

**postamble breakpoint** *See:* epilog breakpoint.

**post-arc current** The current that flows through the arc gap of a circuit breaker immediately after current zero, and that has a substantially lower magnitude than the test current. (SWG/PE) C37.100-1992

**post-condition** A condition that is guaranteed to be true after a successful property request. (C/SE) 1320.2-1998

**post-deflection acceleration** *See:* post acceleration.

**postdialing delay (1)** The time interval between the end of dialing and a physical connection that ensures completion or correct call cisposition, insofar as these are under switch control. For example, the time from seizure of a ringing circuit until the actual start of ringing (or audible ringing) is not included in postdialing delay. This interval excludes the timing period sometimes required to detect the end of dialing. The originating system delay objective excludes the outpulsing interval. The terminating system delay objective excludes the interval between seizure of a ringing circuit and the start of called-party alerting and excludes the interval between the start of called-party alerting and the initiation of the audible ring signal to the caller. (COM/TA) 973-1990w
**(2)** In an automatic telecommunications system that time interval between the receipt of the last called address digit from the calling station and the application of ringing to the called station. (COM) 312-1977w

**post disconnect timing** A timing interval (normally about 12 s in length), initiated when the called party goes on-hook, in which the established connection remains in place as long as the calling party continues to remain off-hook. (AMR/SCC31) 1390-1995, 1390.3-1999, 1390.2-1999

**posted transaction** A transaction in which the request and response are performed within different transactions. (C/BA) 1014.1-1994w

**post emphasis** *See:* de-emphasis.

**post equalization** *See:* de-emphasis.

**post-fault (event)** A qualifying term that refers to an interval beginning with the clearing of a fault. (SWG/PE) C37.100-1992

**postfix notation (mathematics of computing)** A method of forming mathematical expressions in which each operator is preceded by its operands. For example, A added to B and the result multiplied by C is expressed as AB + CX. *Synonyms:* suffix notation; reverse Polish notation. *Contrast:* infix notation; prefix notation. (C) 1084-1986w

**post insulator (composite insulators)** Intended to be loaded in tension, bending, or compression. The most common types are a horizontal line post where the post projects nearly horizontally from a pole and is loaded in flexure by the conductor, and a station post insulator used as a bus support in an outdoor substation. (T&D/PE) 987-1985w

**postmortem dump (1)** A dump that is produced upon abnormal termination of a computer program. *See also:* static dump; selective dump; memory dump; dynamic dump; snapshot dump; change dump. (C) 610.12-1990
**(2)** A static dump used for debugging purposes that is performed at the end of a machine run. (C) [85]

**postorder traversal** The process of traversing a binary tree in a recursive fashion as follows: the left subtree is traversed, then the right tree is traversed, then the root is visited. *Synonym:* endorder traversal. *Contrast:* preorder traversal; inorder traversal. *See also:* converse postorder traversal. (C) 610.5-1990w

**postprocessor (1) (software)** A computer program or routine that carries out some final processing step after the completion of the primary process; for example, a routine that reformats data for output. *Contrast:* preprocessor. (C) 610.12-1990
**(2) (numerically controlled machines)** A set of computer instructions that transform tool centerline data into machine motion commands using the proper tape code and format required by a specific machine control system. Instructions such as feedrate calculations, spindle-speed calculations, and auxiliary-function commands may be included. (IA) [61]

**post puller** An electric vehicle having a powered drum handling wire rope used to pull mine props, after coal has been removed, for the recovery of the timber. (EEC/PE) [119]

**Postscript** A page description language used in many laser printers. (C) 610.13-1993w

**post, waveguide** *See:* waveguide post.

**POT** *See:* point on tangent.

**potential diagram (electrode-optical system)** A diagram showing the equipotential curves in a plane of symmetry of an electron-optical system. *See also:* electron optics. (ED) [45], [84]

**potential energy** The work required to bring the system from an arbitrarily chosen reference configuration to the given configuration without change in other energy of the system. (Std100) 270-1966w

**potential false-proceed operation** The existence of a condition of vehicle or roadway apparatus in an automatic train control or cab-signal installation under which a false-proceed operation would have occurred had a vehicle approached or entered a section where normally a restrictive operation would occur. (EEC/PE) [119]

**potential gradient (1)** A vector of which the direction is normal to the equipotential surface, in the direction of decreasing potential, and of which the magnitude gives the rate of variation of the potential. (Std100) [84]
**(2)** *See also:* voltage gradient. (T&D/PE) 539-1990

**potential hydro energy (power operations) (electric power supply)** The possible aggregate energy obtainable over a specified period by practical use of the available stream flow and river gradient. (PE/PSE) 858-1987s, 346-1973w

**potentially blocking operation** An operation that is not allowed within a protected action, because it may be required to block the calling task. Certain operations are defined by the Ada language to be potentially blocking. (C) 1003.5-1999

**potential master (1)** A potential master is a module that is capable of participating in the control acquisition process and taking full control of the bus. A potential master may be in any of these states:

a) entrant;
b) free bystander;

c) inhibited bystander;
d) competitor;
e) withholder;
f) master elect;
g) master;
h) recompeting master.

(C/MM) 896.1-1987s

**(2)** A module capable of acquiring control of the bus through the control acquisition process. (C/BA) 896.4-1993w

**potential profile** A plot of potential as a function of distance along a specified path. (PE/PSIM) 81-1983

**potential slave** A module that is capable of being addressed by and is able to carry out transactions with the master. (C/MM) 896.1-1987s

**potential source-rectifier exciter (1) (excitation systems for synchronous machines)** An exciter whose energy is derived from a stationary alternating-current (ac) potential source and converted to direct current by rectifiers. The exciter includes the power potential transformers and power rectifiers which may be either noncontrolled or controlled, including gate circuitry. It is exclusive of input control elements. The source of ac power may come from the machine terminals or from a station auxiliary bus or a separate winding within the synchronous machine. (PE/EDPG) 421.1-1986r

**(2) (synchronous machines)** An exciter whose energy is derived from a stationary alternating current potential source and converted to direct current by rectifiers. *Note:* (1) The exciter includes the power potential transformers, where used, and power rectifiers which may be either noncontrolled or controlled, including gate circuitry. (2) It is exclusive of input control elements. (PE/EDPG) 421-1972s

**potential transformer (1) (voltage transformer)** An instrument transformer that is intended to have its primary winding connected in shunt with a power-supply circuit, the voltage of which is to be measured or controlled. *See also:* instrument transformer. (ELM) C12.1-1982s

**(2) (power and distribution transformers)** *See also:* fused-type voltage transformer; cascade-type voltage transformer; double-secondary voltage transformer; insulated-neutral terminal type voltage transformer; voltage transformer; rated secondary voltage; thermal burden rating of a voltage transformer; rated voltage. (PE/TR) C57.12.80-1978r

**potential transformer, cascade-type** A single high-voltage line-terminal potential transformer with the primary winding distributed on several cores with the cores electromagnetically coupled by coupling windings and the secondary winding on the core at the neutral end of the high-voltage winding. Each core is insulated from the other cores and is maintained at a fixed potential with respect to ground and the line-to-ground voltage. *See also:* instrument transformer. (PE/TR) C57.13-1978s

**potential transformer, double-secondary** One that has two secondary windings on the same magnetic circuit insulated from each other and the primary. Either or both of the secondary windings may be used for measurement or control. *See also:* instrument transformer. (PE/TR) C57.13-1978s

**potential transformer, fused-type** One that is provided with the means for mounting a fuse, or fuses, as an integral part of the transformer in series with the primary winding. *See also:* instrument transformer. (PE/TR) C57.13-1978s

**potential transformer, grounded-neutral terminal type** One that has the neutral end of the high-voltage winding connected to the case or mounting base. *See also:* instrument transformer. (PE/TR) C57.13-1978s

**potential transformer, insulated-neutral terminal type** One that has the neutral end of the high-voltage winding insulated from the case or base and connected to a terminal that provides insulation for a lower-voltage insulation class than required for the rated insulation class of the transformer. *See also:* instrument transformer. (PE/TR) C57.13-1978s

**potential transformer, single-high-voltage line terminal** One that has the line end of the primary winding connected to a terminal insulated from ground for the rated insulation class. The neutral end of the winding may be (1) insulated from ground but for a lower insulation class than the line end (insulated neutral) or (2) connected to the case or base (grounded neutral). *See also:* instrument transformer. (PE/TR) C57.13-1978s

**potential transformer, two-high-voltage line terminals** One that has both ends of the high-voltage winding connected to separate terminals that are insulated from each other, and from other parts of the transformer, for the rated insulation class of the transformer. *See also:* instrument transformer. (PE/TR) C57.13-1978s

**potentiometer (1) (measurement techniques)** An instrument for measuring an unknown electromotive force or potential difference by balancing it, wholly or in part, by a known potential difference produced by the flow of known currents in a network of circuits of known electrical constants. *See also:* instrument. (EEC/PE) [119]

**(2) (analog computer)** A resistive element with two end terminals and a movable contact. *See also:* attenuator. (C) 165-1977w

**(3)** A resistor with an adjustable sliding contact that functions as an adjustable voltage divider. *See also:* function potentiometer; servo potentiometer; parameter potentiometer. (C) 610.10-1994w, 165-1977w

**potentiometer, follow-up** *See:* follow-up potentiometer.

**potentiometer, function** *See:* function potentiometer.

**potentiometer granularity (analog computer)** The physical inability of a potentiometer to produce an output voltage that varies in other than discrete steps, due either to contacting individual turns of wire in a wire-would potentiometer or to discrete irregularities of the resistance element of composition or film potentiometers. (C) 165-1977w, 166-1977w

**potentiometer, grounded** *See:* grounded potentiometer.

**potentiometer, linear** *See:* linear potentiometer.

**potentiometer, manual** *See:* manual potentiometer.

**potentiometer, multiplier** *See:* multiplier potentiometer.

**potentiometer, parameter** *See:* parameter potentiometer.

**potentiometer, servo** *See:* servo potentiometer.

**potentiometer set** In an analog computer, a computer-control state that supplies the same operating potentiometer loading as under computing conditions and thus allows correct potentiometer adjustment. (C) 610.10-1994w, 165-1977w, 166-1977w

**potentiometer, sine-cosine** *See:* sine-cosine potentiometer.

**potentiometer, tapered** *See:* tapered potentiometer.

**potentiometer, tapped** *See:* tapped potentiometer.

**potentiometer, ungrounded** *See:* ungrounded potentiometer.

**pothead** A device that seals the end of a cable and provides insulated egress for the conductor or conductors. (PE/TR) [107], [108], 48-1975s

**pothead body** The part of a pothead that joins the entrance fitting to the insulator or to the insulator lid. *See also:* transformer; pothead. (PE/TR) [107], 48-1975s, [108]

**pothead bracket or mounting plate** The part of the pothead used to attach the pothead to the supporting structure. *See also:* transformer; pothead. (PE) 48-1975s

**pothead bracket or mounting-plate insulator** An insulator used to insulate the pothead from the supporting structure for the purpose of controlling cable sheath currents. *See also:* pothead; transformer. (PE) 48-1975s

**pothead entrance fitting** A fitting used to seal or attach the cable sheath, armor, or other coverings to the pothead. *See also:* pothead; transformer. (PE) 48-1975s

**pothead insulator** An insulator used to insulate and protect each conductor passing through the pothead. *See also:* pothead; transformer. (PE/TR) [107], [108], 48-1975s

**pothead insulator lid** The part of a multi-conductor pothead used to join two or more insulators to the body. *See also:* transformer; pothead. (PE/TR) [107], [108], 48-1975s

**pothead mounting plate** The part of the pothead used to attach the pothead to the supporting structure. *See also:* transformer. (PE/TR) [107], [108]

**pothead mounting-plate insulator** An insulator used to insulate the pothead from the supporting structure for the purpose of controlling cable sheath currents. *See also:* transformer. (PE/TR) [107], [108]

**pothead sheath insulator** An insulator used to insulate an electrically conductive cable sheath or armor from the metallic parts of the pothead in contact with the supporting structure for the purpose of controlling cable sheath currents. *See also:* pothead. (PE) 48-1975s

**Potier reactance (rotating machinery)** An equivalent reactance used in place of the primary leakage reactance to calculate the excitation on load by means of the Potier method. *Note:* It takes into account the additional leakage of the excitation winding on load and in the overexcited region; it is greater than the real value of the primary leakage reactance. It is useful for the calculation of excitation of the machine at other loads and power factors. The height of a Potier reactance triangle determines the reactance drop, and the reactance $X_P$ is equal to the reactance drop divided by the current. The value of Potier reactance is that obtained from the no-load normal-frequency saturation curve: and normally with the excitation for rated voltage and current at zero power factor (overexcited), and at rated frequency. Approximate values of Potier reactance may be obtained from test load excitations at loads differing from rated load, and at power factors other than zero.The excitation results in the range from zero power factor overexcited to unity power factor are close enough to the test values for most practical applications. (PE) [9]

**Potter horn** A circular horn with one or more abrupt changes in diameter that excites two or more waveguide modes in order to produce a specified aperture illumination. (AP/ANT) 145-1993

**potting (encapsulation)** The sealing of components and associated conductors in a filter assembly with an insulating, thermally conductive material to exclude contaminants. (EMC) C63.13-1991

**potty seat** *See:* insulator lifter.

**Poulsen arc** (also Poulsen singing arc or signing arc) A type of arc-gap transmitting circuit that uses a resistance-capacitance (rc) circuit to tune the arc. This technique substantially reduces the bandwidth used by the arc-gap transmitter. (EMC) 140-1990r

**poured joint (power cable joints)** A joint insulated by the means of a hot or cold poured insulating medium which solidifies. (PE/IC) 404-1986s

**powder** *See:* explosives.

**power (Φ) (1) (laser maser)** The time rate at which energy is emitted, transferred, or received; usually expressed in watts (or in joules per second). (LEO) 586-1980w

**(2)** (used as an adjective) A general term used by reason of specific physical or electrical characteristics to denote application or restriction, or both, to generating stations, switching stations, or substations. (PE/SWG-OLD) C37.100-1992, C37.40-1993

**(3)** The rate of generating, transferring, or using energy. (PE/PSE) 858-1993w

**(4) (fiber optics)** *See also:* irradiance; radiant intensity; radiant power. 812-1984w

**power—active** The time average of the instantaneous power over one period of the wave. *Note:* For sinusoidal quantities in a two-wire circuit, it is the product of the voltage, the current, and the cosine of the phase angle between them. For nonsinusoidal quantities, it is the sum of all the harmonic components, each determined as above. In a polyphase circuit, it is the sum of the active powers of the individual phases. (ELM) C12.1-1988

**power, active** *See:* active power.

**power amplification (1)** The ratio of the power level at the output terminals of an amplifier to that at the input terminals. Also called power gain. *See also:* power gain; amplifier. (AP/ANT) 145-1983s

**(2) (magnetic amplifier)** The product of the voltage amplification and the current amplification. (MAG) 107-1964w

**power—apparent** For sinusoidal quantities in either single-phase or polyphase circuits, apparent power is the square root of the sum of the squares of the active and reactive powers. *Note:* This is, in general, not true for nonsinusoidal quantities. (ELM) C12.1-1988

**power, apparent** *See:* apparent power.

**power, auxiliary** *See:* auxiliary power.

**power, available** *See:* available power.

**power, average phasor** *See:* average phasor power.

**power budget** The minimum optical power available to overcome the sum of attenuation plus power penalties of the optical path between the transmitter and receiver calculated as the difference between the transmitter launch power (min) and the receive power (min). (C/LM) 802.3-1998

**power cable** Cable used to supply power to plant auxiliary system devices. The classifications for power cable are: low voltage and medium voltage. (PE/IC) 1185-1994

**power capacitor** An assembly of dielectric and electrodes in a container (case), with terminals brought out, that is intended to introduce capacitance into an electric power circuit. (T&D/PE) 18-1992

**power capacity (waveguide)** The maximum power which can be carried by the waveguide under a specified set of environmental and circuit conditions with a desired safety factor. (MTT) 146-1980w

**power, carrier-frequency, peak pulse** *See:* peak pulse power, carrier-frequency.

**power-circuit limit switch** A limit switch the contacts of which are connected into the power circuit. *See also:* switch. (IA/ICTL/IAC) [60]

**power circuit protector (low-voltage ac power circuit protectors)** An assembly consisting of a modified low-voltage power circuit breaker, which has no direct-acting tripping devices, with a current-limiting fuse in series with the load terminals of each pole. (SWG/PE) C37.100-1992, C37.29-1981r

**power-closed car door or gate (elevators)** A door or gate that is closed by a car-door or gate power closer or by a door or gate power operator. *See also:* elevator. (PE/EEC) [119]

**power coefficient (attenuator) (characteristic insertion loss)** Temporary and reversible variation in decibels when input power is varied from 20 dB below full rated power or lower to full rated power after steady-state condition has been reached. (IM/HFIM) 474-1973w

**power, commercial** *See:* commercial power.

**power conditioning subsystem (PCS) (terrestrial photovoltaic power systems)** The subsystem that converts the dc power from the array subsystem to dc or ac power that is compatible with system requirements. *See also:* array control. (PV) 928-1986r

**power connection** The connection between the heating cable and incoming power. (IA/PC) 515.1-1995

**power control center (power operations)** The location where power system operators monitor, analyze, or control power systems using digital or analog teleprocessing systems. (PE/PSE) 858-1987s

**power correction capacitor** Device that provides a capacitive load to offset the demand for lagging reactive power. (PE/EDPG) 1020-1988r

**power dBm level** Decibels relative to one milliwatt. This is the customary unit worldwide for measurement of telecommunications signal power. Zero dBm equals one milliwatt. (COM/TA) 1007-1991r

**power density (*S*) (1) (control of system electromagnetic compatibility)** (of an electromagnetic wave) Emitted power per unit cross-sectional area normal to the direction of propagation. (EMC) C63.12-1987

**(2)** (of a traveling wave) The time average of the Poynting vector. *Synonym:* power flux density. *See also:* spectral power density; spectral power flux density. (AP/PROP) 211-1997

**(3)** Power per unit area normal to the direction of propagation, usually expressed in units of watts per square meter ($W/m^2$) or, for convenience, units such as milliwatts per square centimeter ($mW/cm^2$) or microwatts per square centimeter ($\mu W/cm^2$). For plane waves, power density, electric field strength ($E$), and magnetic field strength ($H$) are related by the impedance of free space, i.e., 377 Ω. In particular,

$$S = \frac{E^2}{377} = 377\,H^2$$

where $E$ and $H$ are expressed in units of V/m and A/m, respectively, and $S$ in units of $W/m^2$. Although many survey instruments indicate power density units, the actual quantities measured are $E$ or $E^2$ or $H$ or $H^2$. (NIR) C95.1-1999

**(4) (fiber optics)** *See also:* irradiance. 812-1984w

**power-density spectrum** A plot of power density per unit frequency as a function of frequency. (EMC) [53]

**power detection** That form of detection in which the power output of the detecting device is used to supply a substantial amount of power directly to a device such as a loudspeaker or recorder. *See also:* detection. (EEC/PE) [119]

**power dissipation (light-emitting diodes)** The time average product of current times voltage of the device. (ED) [127]

**power distribution, underground cables** *See:* cable bedding; aluminum-covered steel wire; cable separator; base ambient temperature.

**power disturbance** Any deviation from the nominal value (or from some selected thresholds based on load tolerance) of the input ac power characteristics. (IA/PSE) 1100-1999

**power disturbance monitor** Instrumentation developed specifically to capture power disturbances for the analysis of voltage and current measurements. (IA/PSE) 1100-1999

**power divider (waveguide)** A device for producing a desired distribution of power at a branch point. *See also:* waveguide. (AP/ANT) [35], [84]

**power, effective radiated** *See:* effective radiated power.

**power elevator** An elevator utilizing energy other than gravitational or manual to move the car. *See also:* elevator. (EEC/PE) [119]

**power, emergency** *See:* emergency power.

**power factor (1) (electrical heating systems)** The ratio of the circuit power (watts) to the circuit voltamperes. (IA/PC) 844-1991

**(2) (converter characteristics) (self-commutated converters)** (total) The ratio of the total active power in watts to the total apparent power in voltamperes (the product of root-mean-square [rms] voltage and rms current) on the ac (alternating current) side of the converter. *Note:* This definition includes the effect of harmonic components of current and voltage, as well as the effect of phase displacement between current and voltage. (IA/SPC) 936-1987w

**(3) (harmonic control and reactive compensation of static power converters)** (total) The ratio of the total power input in watts to the total voltampere input to the converter. *Notes:* 1. This definition includes the effect of harmonic components of current and voltage, the effect of phase displacement between current and voltage, and the exciting current of the transformer. Voltamperes are the product of root-mean-square (rms) voltage and rms current. 2. The power factor is determined at the ac line terminals of the converter. (IA/SPC) 519-1981s

**(4)** The ratio of total watts to the total root-mean-square (RMS) voltamperes.

$$F_P = \frac{\Sigma \text{ Watts per Phase}}{\Sigma \text{ RMS Voltamperes per Phase}} = \frac{\text{Active Power}}{\text{Apparent Power}}$$

*Note:* If the voltages have the same waveform as the corresponding currents, power factor becomes the same as phasor power factor. If the voltages and currents are sinusoidal and, for polyphase circuits, form symmetrical sets, $F_P = \cos(\alpha - \beta)$. *See also:* asynchronous machine. (PE/AES) [9], 270-1966w, [84], [41]

**(5) (rectifier or rectifier unit) (thyristor converter)** The ratio of the total watts input (total power input in watts) to the total voltampere input to the rectifier, rectifier unit or converter. *Notes:* 1. This definition includes the effect of harmonic components of current and voltage, the effect of phase displacement between the current and voltage, and the exciting current of the transformer. Voltampere is the product of root- mean square volts and root-mean-square amperes. 2. It is determined at the alternating-current line terminals of the thyristor converter or rectifier unit. *See also:* power rectifier; rectification. (IA/IPC) 444-1973w

**(6) (rotating machinery) (dielectric)** The cosine of the dielectric phase angle or the sine of the dielectric loss angle. (PE) [9]

**(7) (insulation) (outdoor apparatus bushings)** The ratio of the power dissipated in the insulation, in watts, to the product of the effective voltage and current in voltamperes, when tested under a sinusoidal voltage and prescribed conditions. *Note:* The insulation power factor is equal to the cosine of the phase angle between the voltage and the resulting current when both the voltage and current are sinusoidal. (PE/TR) 21-1976, C57.19.03-1996, C57.12.80-1978r

**(8) (metering)** The ratio of the active power to the apparent power. (ELM) C12.1-1988

**(9) (thyristor)** The ratio of the total watts to the total voltamperes. *Note:* This definition includes the effect of harmonic components of current and voltage, and the effect of phase displacement between current and voltage. (IA/IPC) 428-1981w

**(10) (hydroelectric power plants)** Ratio of real to total apparent power (kW/kVA) expressed as a decimal or percent. (PE/EDPG) 1020-1988r

**(11) (dielectric)** The cosine of the phase angle between a sinusoidal voltage applied across a dielectric (or combinations of dielectrics) and the resulting current through the dielectric system. (PE/PSIM) 62-1995

**power factor adjustment clause (power operations)** A clause in a rate schedule that provides for an adjustment in the billing if the customer's power factor varies from a specified reference. (PE/PSE) 858-1987s

**power-factor angle** The angle whose cosine is the power factor. *See also:* asynchronous machine. (PE) [9]

**power factor, arithmetic** *See:* arithmetic power factor.

**power factor, coil Q** *See:* coil *Q*.

**power-factor-corrected mercury-lamp ballast** A ballast of the multiple-supply type that has a power-factor-correcting device, such as a capacitor, so that the input current is at a power factor in excess of that of an otherwise comparable low-power-factor ballast design, but less than 90%, when the ballast is operated with center rated voltage impressed upon its input terminals and with a connected load, consisting of the appropriate reference lamp(s), operated in the position for which the ballast is designed. The minimum input power factor of such a ballast should be specifically stated. (EEC/LB) [97]

**power factor, dielectric** *See:* dielectric power factor.

**power factor, displacement (1) (thyristor)** The ratio of the active power of the fundamental wave, in watts, to the apparent power of the fundamental wave in voltamperes. This is the cosine of the phase angle by which the fundamental current lags the fundamental voltage. This is the power factor

as seen in utility metering by watthour and varhour meters assuming that the ac voltages are sinusoidal. (IA/IPC) 428-1981w

**(2) (converter characteristics) (self-commutated converters)** The displacement component of power factor; the ratio of the active power of the fundamental wave, in watts, to the apparent power of the fundamental wave, in volt-amperes. It is also equal to cosf1, the cosine of the phase displacement angle between the fundamental component of the voltage and current on the ac (alternating current) side of a converter. (IA/SPC) 936-1987w

**(3) (A)** The displacement component of power factor. **(B)** The ratio of the active power of the fundamental wave, in watts, to the apparent power of the fundamental wave, in volt-amperes. (IA/PSE) 1100-1999

**power-factor influence (electric instruments)** The change in the recorded value that is caused solely by a power-factor departure from a specified reference power factor maintaining constant power (or vars) at rated voltage, and not exceeding 120% of rated current. It is to be expressed as a percentage of the full-scale value. (EEC/ERI/AII) [111], [102]

**power-factor meter** A direct-reading instrument for measuring power factor. It is provided with a scale graduated in power factor. *See also:* instrument. (EEC/PE) [119]

**power factor relay (power system device function numbers)** A relay that operates when the power factor in an alternating-current (ac) circuit rises above or falls below a predetermined value. (SUB/PE) C37.2-1979s

**power-factor tip-up (rotating-machinery stator-coil insulation)** The difference between the power-factors measured at two different designated voltages applied to an insulation system, other conditions being constant. *Notes:* 1. Used mainly as a measure of discharges, and hence of voids, within the system at the higher voltage. 2. The incremental change in power factor divided by incremental change in voltage applied to an insulation system. 3. Tip-up tests may be made using dissipation factor (tan δ) instead of power factor. In this case the tip-up is often identified as Δ tan δ or delta tan delta. *See also:* asynchronous machine. (EM/PE) 286-1975w

**power-factor tip-up test (rotating machinery)** A test applied to insulation to determine the power-factor tip-up. *See also:* asynchronous machine. (PE) [9]

**power factor, total** *See:* total power factor.

**power-factor-voltage characteristic (rotating machinery stator-coil insulation)** The relation between the magnitude of the applied test voltage and the measured power factor of the insulation. *Note:* The characteristic is usually shown as a curve of power factor plotted against test voltage. *See also:* asynchronous machine. (EM/PE) 286-1975w

**power-fail circuit** A logic circuit that protects an operating program if primary power fails by informing the computer when power failure is imminent, initiating a routine that saves all volatile data. After power has been restored, the circuit initiates a routine that restores the data and restarts computer operations. (C) 610.10-1994w

**power failure (emergency and standby power)** Any variation in electric power supply that causes unacceptable performance of the user's equipment. (IA/PSE) 446-1995

**power failure recovery** A sequence of events that provides orderly control of system shutdown during a temporary power failure and start-up after power is restored. (C/MM) 1296-1987s

**power feeder** A feeder supplying principally a power or heating load. *See also:* feeder.

**power-flow angle** The angle (ϕ) between the direction of the power-flow vector and the direction of the propagation vector. (UFFC) 1037-1992w

**power-flow vector** Vector-characterizing energy propagation caused by a wave and giving magnitude and direction of power per unit-area propagating in the wave (i.e., analogous to Poynting vector). (UFFC) 1037-1992w

**power flux density** *See:* power density.

**power frequency (1)** The value of frequency used in the electrical power system, such as 50 Hz or 60 Hz. (EMC) C63.13-1991

**(2)** The frequency at which a device or system is designed to operate. (SWG/PE) C37.34-1994, C37.100-1992

**power-frequency current-interrupting rating (surge arresters)** (of an expulsion arrester) A designation of the range of the symmetrical root-mean-square fault currents of the system for which the arrester is designed to operate. An expulsion arrester is given a maximum current-interrupting rating and may also have a minimum current-interrupting rating. (PE/SPD) C62.1-1981s

**power-frequency dew withstand voltage** The rms voltage that can be applied to an insulator or a device, completely covered with condensed moisture, under specified conditions for a specified time without causing flashover or puncture. (SWG/PE) C37.40-1993

**power-frequency dry withstand voltage** The rms voltage that can be applied to a dry device under specified conditions for a specified time without causing flashover or puncture. (SWG/PE) C37.40-1993

**power-frequency overvoltage** A root-mean-square voltage in excess of the maximum (highest) system voltage that lasts longer than one cycle. (SPD/PE) C62.62-2000

**power-frequency recovery voltage** The power-frequency rms voltage that occurs across the terminals of an ac circuit-interrupting device after the interruption of the current and after the high-frequency transients have subsided. (SWG/PE) C37.40-1993

**power-frequency sparkover voltage (1)** The rms value of the lowest power-frequency sinusoidal voltage that will cause sparkover when applied across the terminals of an arrester. (SPD/PE) C62.11-1999

**(2)** The root-mean-square value of the lowest power-frequency sinusoidal voltage that will cause sparkover when applied across the terminals of a surge-protective device. (SPD/PE) C62.62-2000

**power-frequency wet withstand voltage** The rms voltage that can be applied to a wetted device under specified conditions for a specified time without causing flashover or puncture. (SWG/PE) C37.40-1993

**power-frequency withstand voltage** A specified root-mean-square test voltage, at a power frequency that will not cause a disruptive discharge. (SPD/PE) C62.62-2000, C62.11-1999

**power fuse** A fuse consisting of an assembly of a fuse support and a fuse unit or fuseholder that may or may not include the refill unit or fuse link. *Note:* The power fuse is identified by the following characteristics:

a) Dielectric withstand basic impulse insulation level (BIL) strengths at power levels
b) Application primarily in stations and substations
c) Mechanical construction basically adapted to station and substation mountings

(SWG/PE) C37.40-1993, C37.100-1992

**power fuse unit (installations and equipment operating at over 600 volts, nominal)** A vented, nonvented or controlled vented fuse unit in which the arc is extinguished by being drawn through solid material, granular material, or liquid, either alone or aided by a spring. (NEC/NESC) [86]

**power gain (1) (data transmission)** The ratio of the signal power that a transducer delivers to its load to the signal power absorbed by its input circuit. *Notes:* 1. Power gain is usually expressed in decibels. 2. If more than one component is involved in the input or output, the particular components used are specified. 3. If the output signal power is at a frequency other than the input signal power, the gain is a conversion gain. (PE) 599-1985w

**(2) (two-port linear transducer)** At a specified frequency, the ratio of:

a) the signal power that the transducer delivers to a specified load; to
b) the signal power delivered to its input port.

*Note:* The power gain is not defined unless the input impedance of the transducer has a positive real part.
(ED) 161-1971w

**(3)** *See also:* partial gain. (AP/ANT) 145-1993

**power gap** The part of the bypass gap that carries the fault current after sparkover of the bypass gap.
(T&D/PE) 824-1994

**power influence (telephone loop performance)** The power of a longitudinal signal induced in a telephone circuit by an electromagnetic field emanating from a conductor or conductors of a power system. In common usage, power influence is synonymous with longitudinal noise. (COM/TA) 820-1984r

**power, instantaneous** *See:* instantaneous power.

**power inverter** A component for converting dc power into ac power. (IA/MT) 45-1998

**power klystron (microwave tubes)** A klystron, usually an amplifier, with two or more cavities uncoupled except by the beam, designed primarily for power amplification or generation. (ED) [45]

**power knock out** A function, derived from friction brakes being applied above a low preset level on any truck, that removes propulsion power on every vehicle in the train.
(VT) 1475-1999

**power-law index profile (fiber optics)** A class of graded index profiles characterized by the following equations:

$$n(r) = n_1(1 - 2\Delta(r/a)^g)^{1/2} \quad r = a$$

$$n(r) = n_2 = n_1(1 - 2\Delta)^{1/2} \quad r = a$$

where

$$\Delta = \frac{n_1^2 - n_2^2}{2n_1^2}$$

where $n(r)$ is the refractive index as a function of radius, $n_1$ is the refractive index on axis, $n_2$ is the refractive index of the homogeneous cladding, $a$ is the core radius, and $g$ is a parameter that defines the shape of the profile. *Notes:* 1. $\alpha$ is often used in place of $g$. Hence, this is sometimes called an alpha profile. 2. For this class of profiles, multimode distortion is smallest when $g$ takes a particular value depending on the material used. For most materials, this optimum value is around 2. When $g$ increases without limit, the profile tends to a step index profile. *See also:* graded index profile; step index profile; profile parameter; mode volume.
(Std100) 812-1984w

**power level (data transmission)** The magnitude of power averaged over a specified interval of time. *Note:* Power level may be expressed in units in which the power itself is measured or in decibels indicating the ratio to a reference power. This ratio is usually expressed either in decibels, referred to one mW (milliwatt), abbreviated dBm, or in decibels referred to one W (watt), abbreviated dBW. (PE) 599-1985w

**power level at DSX** Power in dBm of an all-ones signal measured at a digital signal crossconnect (DSX). *See also:* dBDSX. (COM/TA) 1007-1991r

**power-line carrier (1) (overhead-power-line corona and radio noise)** The use of RF energy, generally below 600 kHz, to transmit information, using power lines to guide the information transmission. (T&D/PE) 539-1990

**(2) (protective relaying of utility-consumer interconnections)** A high-frequency signal superimposed on the normal voltage on a power circuit. It is customarily coupled to the power line by means of a coupling capacitor. A tuning device provides series resonance at the carrier frequency. Prevention of shorting of the carrier signal by a fault external to the protected line is ordinarily provided by a line trap.
(PE/PSR) C37.95-1973s

**(3)** The use of radio frequency energy to transmit information over transmission lines whose primary purpose is the transmission of power. (SUB/PE) 999-1992w

**power-line-conducted radio noise** Radio noise produced by equipment operation, which exists on the power line of the equipment and is measurable under specified conditions. *Note:* It may enter a receptor, such as ITE, by direct coupling or by subsequent radiation from some circuit element.
(EMC) C63.4-1991

**power loss (A) (data transmission)** From a circuit, in the sense that it is converted to another form of power not useful for the purpose at hand (for example $I^2R$ loss). A physical quantity measured in watts in the International System of Units (SI) and having the dimensions of power. For a given $R$, it will vary with the current in $R$. **(B) (data transmission)** Defined as the ratio of two powers. If $P_o$ is the output power and $P_i$ is the input power of a transducer or network under specified conditions, $P_o/P_i$ is a dimensionless quantity that would be unity if $P_o = P_i$. **(C) (data transmission)** (Logarithmic). Loss may also be defined as the logarithm, or a quantity directly proportional to the logarithm of a power ratio, such as $P_o/P_i$. Thus if loss $= 10\log_{10}(P_o/P_i)$, the loss is zero when $P_o = P_i$. This is the standard for measuring loss in decibels. *Notes:* 1. In cases (B) and (C), the loss for a given linear system is the same whatever may be the power levels. Thus (B) and (C) give characteristics of the system, and do not depend, as (A) does, on the value of the current or other dependent quantity. 2. If more than one component is involved in the input or output, the particular components used must be specified. This ratio is usually expressed in decibels. 3. If the output signal power is at a frequency other than the input signal power, the loss is a conversion loss. **(D) (data transmission)** (Electric instrument) (watt loss). In the circuit of a current-or-voltage- measuring instrument, the active power at its terminals for end-scale indication. *Note:* For other than current or voltage- measuring instruments, for example, wattmeters, the power loss of any circuit is expressed at a stated value of current or of voltage. (PE) 599-1985

**power monitor** A functional module that monitors the status of the primary power source to the system, and signals when that power has strayed outside the limits required for reliable system operation. Since most systems are powered by an ac source, the power monitor is typically designed to detect drop-out or brown-out conditions on ac lines.
(C/BA) 1014-1987

**power, nonfirm** *See:* nonfirm power.

**power, nonreactive** *See:* nonreactive power.

**power of ten** *See:* decade.

**power-on retention time** The retention time with the memory biased in the on condition in a nonoperating (that is, unclocked, deselected) mode. (ED) 641-1987w

**power-operated door or gate (elevators)** A hoistway door and/or a car door or gate that is opened and closed by a door or gate power operator. *See also:* hoistway. (EEC/PE) [119]

**power operation** Operation by other than hand power.
(SWG/PE) C37.100-1992

**power outage** Complete absence of power at the point of use.
(IA/PSE) 446-1995

**power outlet** An enclosed assembly which may include receptacles, circuit breakers, fuseholders, fused switches, buses and watt-hour meter mounting means; intended to supply and control power to mobile homes, recreational vehicles or boats, or to serve as a means for distributing power required to operate mobile or temporarily installed equipment.
(NESC/NEC) [86]

**power output (hydraulic turbines)** The electrical output of the turbine generator unit as measured at the generator terminals.
(PE/EDPG) 125-1977s

**power output, instantaneous** *See:* instantaneous power output.

**power pack** A unit for converting power from an alternating-current or direct-current supply into alternating-current or direct-current power at voltages suitable for supplying an electronic device. (EEC/PE) [119]

**power, partial discharge** *See:* partial discharge power.

**power pattern** *See:* radiation pattern.

**power, phase control** *See:* phase control power.

**power, phasor** *See:* phasor power.

**power pool (power operations)** Term referring to a group of power systems operating as an interconnected system and pooling their resources. (PE/PSE) 858-1987s

**power primary detector (electric power system)** A power-measuring device for producing an output proportional to power input. *See also:* speed-governing system. (PE/PSE) 94-1970w

**power quality** The concept of powering and grounding electronic equipment in a manner that is suitable to the operation of that equipment and compatible with the premise wiring system and other connected equipment. (IA/PSE) 1100-1999

**power quantities (two-phase circuit) (single-phase three-wire circuit)** The definitions of the power quantities for a single-phase circuit of more than two wires and of a two-phase circuit are essentially the same as those expressions involve m, the number of phases or phase conductors, the numeral 2 should be used for single-phase, three-wire systems, and the numeral 4 for two-phase, four-wire and five-wire systems. *See also:* polyphase symmetrical set. (Std100) 270-1966w

**power rating (waveguide attenuator)** The maximum power that, if applied under specified conditions of environment and duration, will not produce a permanent change that causes any performance characteristics to be outside of specifications. This includes characteristic insertion loss and standing-wave ratio. *See also:* waveguide. (IM/HFIM) [40]

**power rating or voltage rating (coaxial transmission line) (line and connectors)** That value of transmitted power or voltage that permits satisfactory operation of the line assembly and provides an adequate safety factor below the point where injury or appreciably shortened life will occur. *See also:* transmission line. (EEC/REWS) [92]

**power—reactive** For sinusoidal quantities in a two-wire circuit, reactive power is the product of the voltage, the current, and the sine of the phase angle between them. For nonsinusoidal quantities, it is the sum of all the harmonic components, each determined as above. In a polyphase circuit, it is the sum of the reactive powers of the individual phases. (ELM) C12.1-1988

**power, reactive** *See:* reactive power.

**power rectifier** A rectifier unit in which the direction of average energy flow is from the alternating-current circuit to the direct-current circuit. (IA) [62]

**power rectifier transformer (power and distribution transformers)** A rectifier transformer connected to mercury-arc or semiconductor rectifiers for electrochemical service, steel processing applications, electric furnace applications, mining applications, transportation applications, and direct-current transmissions. (PE/TR) C57.12.80-1978r

**power reflectance*** **(1)** (of a radome) At a given point on a radome, the ratio of the power flux density that is internally reflected from the radome to that incident on the radome from an internal radiating source. (AP/ANT) 145-1993
**(2)** *See also:* power reflection coefficient. (AP/PROP) 211-1997

* Deprecated.

**power reflection coefficient** The squared magnitude of the Fresnel reflection coefficient. *Synonym:* power reflection factor. (AP/PROP) 211-1997

**power reflection factor** *See:* power reflection coefficient.

**power relay** A relay that responds to a suitable product of voltage and current in an electric circuit. *See also:* active-power relay; reactive power relay. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**power_reset** An initialization event triggered by the restoration of primary power. On a backplane bus, a power_reset event is generally triggered by one or several specialized signals driven by the shared power supply. (C/MM) 1212-1991s

**power response (close-talking pressure-type microphone)** The ratio of the power delivered by a microphone to its load, to the applied sound pressure as measured by a Laboratory Standard Microphone placed at a stated distance from the plane of the opening of the artificial voice. *Note:* The power response is usually measured as a function of frequency in decibels (dB) above 1 milliwatt per newton per square centimeter [mW/(N/m$^2$ )] or 1 milliwatt per 10 microbars [mW/10$\mu$bar]. *See also:* close-talking pressure-type microphones. (SP) 258-1965w

**power selsyn** (synchros or selsyns) An inductive type of positioning system having two or more similar mechanically independent slip-ring machines with corresponding slip rings of all machines connected together and the stators fed from a common power source. *See also:* synchro system. (PE) [9]

**power sensitivity error** The maximum deviation from linearity over each power range of either the electrothermic unit or the electrothermic power meter. Expressed in percent. (IM) 544-1975w

**power service protector** An assembly consisting of a modified low-voltage power circuit breaker, which has no direct-acting tripping devices, with a current-limiting fuse connected in series with the load terminals of each pole. (SWG/PE) C37.100-1992

**power, signal electronics** *See:* signal electronics power.

**powers of units (International System of Units (SI))** An exponent attached to a symbol containing a prefix indicates that the multiple or submultiple of the unit (the unit with its prefix) is raised to the power expressed by the exponent. For example:

$1\ \mathrm{cm}^3 = (10^{-2}\ \mathrm{m})^3 = 10^{-6}\ \mathrm{m}^3$

$1\ \mathrm{ns}^{-1} = (10^{-9}\ \mathrm{s})^{-1} = 10^{9}\ \mathrm{s}^{-1}$

$1\ \mathrm{mm}^2/\mathrm{s} = (10^{-3}\ \mathrm{m})^2/\mathrm{s} = 10^{-6}\ \mathrm{m}^2/\mathrm{s}$

*See also:* prefixes and symbols; units and letter symbols. (QUL) 268-1982s

**power source isolation** Absence of a direct-current circuit (path) between the power source and the system power supply outputs. (PE/EDPG) [1]

**power sources** The electrical and mechanical equipment and their interconnections necessary to generate or convert power. (PE/NP) 603-1998

**power spectral density (PSD) (1) (seismic qualification of Class 1E equipment for nuclear power generating stations)** The mean squared amplitude per unit frequency of a waveform. PSD is expressed in $g^1$2/Hz versus frequency for acceleration waveforms. (PE/NP) 344-1987r
**(2)** The Fourier transform of the autocorrelation function of a time series of data. For a stationary ergodic time series, the PSD is equal to the expected value of the magnitude squared of the Fourier transform of the data. The PSD expresses the noise variance in an accelerometer's output as a function of positive and negative frequencies, usually in $g^2$/Hz, and is calculated as the ensemble or frequency average of the magnitude squared of the fast Fourier transform (FFT) of the data. The one-sided PSD plots twice the PSD value versus positive frequency $f$, since for a real time series the two-sided PSD values are equal for $f$ and $-f$. The velocity random walk coefficient is calculated from the two-sided PSD acceleration white noise level (half the one-sided PSD level). (AES/GYAC) 1293-1998

**power station battery (1)** A battery that is a separate source of energy for communication equipment in power stations. (COM)
**(2) (control)** A battery that is a separate source of energy for the control of power apparatus in a power station. *See also:* battery. (PE) 599-1985w

**power storage** That portion of the water stored in a reservoir available for generating electric power. *See also:* generating station. (T&D/PE) [10]

**power supply** A unit that converts voltage from one level to another, usually regulating the output. *Note:* Typically used to convert an AC voltage to a DC voltage. *See also:* converter. (C) 610.10-1994w

**power-supply assembly** The conductors, including the grounding conductors, insulated from one another, the connectors, attachment plug caps, and all other fittings, grommets, or devices installed for the purpose of delivering energy from the source of electrical supply to the distribution panel within the recreational vehicle. (NESC/NEC) [86]

**power supply circuit (relay system)** An input circuit to a relay system that supplies power for the functioning of the relay system. (PE/PSR) C37.90.1-1989r

**power supply, direct-current** *See:* direct-current power supply.

**power supply, direct-current regulated** *See:* direct-current regulated power supply.

**power supply, uninterruptible** *See:* uninterruptible power supply.

**power-supply voltage range (transmitter performance)** The range of voltages over which there is not significant degradation in the transmitter or receiver performance. *See also:* audio-frequency distortion. (VT) [37]

**power switchboard (1)** A type of switchboard including primary power-circuit switching and interrupting devices together with their interconnections. *Note:* Knife switches, fuses, and air circuit breakers are the commonly used switching and interrupting devices. (SWG/PE) C37.100-1992
**(2)** A switchgear and control assembly that receives energy from the main generating plant and distributes directly or indirectly to all equipment supplied by the generating plant. (IA/MT) 45-1998

**power system (1) (generating stations electric power system)** The electric power sources, conductors, and equipment required to supply electric power. (PE/EDPG) 505-1977r
**(2) (electric)** The generation resources and/or transmission facilities operated as an entity to meet load and/or interchange commitments. (PE/PSE) 94-1991w
**(3)** The generation resources and/or transmission facilities operated under common management or supervision to meet load and interchange commitments. (PE/PSE) 858-1993w

**power system, emergency** *See:* emergency power system.

**power system stabilizer (1) (excitation systems for synchronous machines)** An element or group of elements that provide an additional input to the regulator to improve power system performance. *Note:* A number of different quantities may be used as input to the power system stabilizer, such as, shaft speed, frequency, synchronous machine electrical power, etc. (PE/EDPG) 421.1-1986r
**(2) (excitation systems)** Used to provide damping at power system frequencies associated with local and intertie modes of oscillation. (PE/EDPG) 421.4-1990
**(3) (excitation systems) (synchronous machines)** An element or group of elements that provide an additional input to the regulator to improve the dynamic performance of the power system. *Note:* A number of different quantities may be used as input to the power system stabilizer, such as shaft speed, frequency, synchronous machine electrical power, and others. (PE/EDPG) 421.2-1990, 421-1972s

**power system, standby** *See:* standby power system.

**power-temperature coefficient** The change in power required to hold the bolometer element at the desired operating resistance per unit change in ambient temperature. *Note:* This quantity is expressed in microwatts per degree Celsius. (IM) 470-1972w

**power termination connection** The termination applied to the end of a heating cable where the power is supplied. (IA) 515-1997

**power test method** A test that determines the power dissipation characteristics of a damper by the measurement of the force and velocity imparted to the test span at the point of attachment to the shaker. (T&D/PE) 664-1993

**power transfer relay** A relay so connected to the normal power supply that the failure of such power supply causes the load to be transferred to another power supply. (EEC/PE) [119]

**power transformer (power and distribution transformers)** A transformer that transfers electric energy in any part of the circuit between the generator and the distribution primary circuits. (PE/TR) C57.12.80-1978r

**power transmittance of a radome** In a given direction, the ratio of the power flux density emerging from a radome with an internal source to the power flux density that would be obtained if the radome were removed. (AP/ANT) 145-1993

**power type relay** A term for a relay designed to have heavy-duty contacts usually rated 15 A or higher. Sometimes called a contactor. (PE/EM) 43-1974s

**power up/down protection** *See:* inadvertent write protection.

**power, utility** *See:* commercial power.

**power vector (A) (single-phase two-wire circuit)** At the two terminals of entry of a single-phase two-wire circuit into a delimited region, a vector whose magnitude is equal to the apparent power, and the three rectangular components of which are, respectively, the active power, the reactive power, and the distortion power at the same two terminals of entry. Mathematically, the vector power U is given by

$$\mathrm{U} = \mathrm{i}P + \mathrm{j}Q + \mathrm{k}D$$

where i, j, and k are unit vectors along the three perpendicular axes, respectively. $P$, $Q$, and $D$ are the active power, reactive power, and distortion power, respectively. The direction cosines of the angles between the vector power U and the three rectangular axes are

$$\cos\phi = \frac{P}{\mathrm{U}}$$

$$\cos\Psi = \frac{Q}{\mathrm{U}}$$

$$\cos\theta = \frac{D}{\mathrm{U}}$$

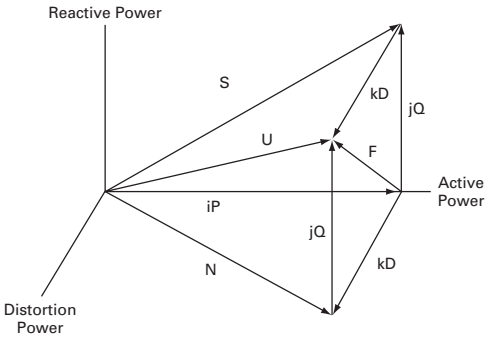
The magnitude of the vector power is the apparent power, or

$$\mathrm{U} = (P^2 + Q^2 + D^2)^{\frac{1}{2}}$$

$$= \left(\sum_{r=1}^{r=\infty}\sum_{q=1}^{q=\infty} E_r{}^2 I_q{}^2\right)^{\frac{1}{2}}$$

where the symbols are those of the preceding definitions. The geometric power diagram shows the relationships among the different types of power. Active power, reactive power, and distortion power are represented in the directions of the three rectangular axes. The diagram corresponds to a case in which all three are positive. Since the sign of $D$ is not definitely determined, $D$ may be drawn in either direction along the axis. The position of U is thus also ambiguous, as it may occupy either of two positions, for $D$ positive or negative. When the sign of $D$ has been assumed, the vector positions of the fictitious power F and the nonreactive power N are determined. They have been shown in the corresponding figure, with the assumption that $D$ has the same sign as P. Vector power is expressed in voltamperes when the voltage is in volts and the current in amperes. *Notes:* 1. The vector power becomes a plane vector having the same magnitude as the phasor power if the voltage and the current have the same wave form. This condition is fulfilled as a special case when the voltage and current are sinusoidal and of the same period. 2. The term vector power as defined in the 1941 edition of the American Standard Definitions of Electrical Terms has now been called phasor power and the present definition of vector power is new. *See also:* network analysis. **(B) (polyphase circuit)** At the terminals of entry of a polyphase circuit, a vector of which the three rectangular components are, respectively, the active power, the reactive power, and the distortion power at the

same terminals of entry. In determining the components, the reference terminals for voltage measurement are taken as the neutral terminal of entry, if one exists, otherwise as the true neutral point. The vector power is also the (vector) sum of the vector powers for the individual terminals of entry. The vector power for each terminal of entry is determined by considering each phase conductor and the common reference point as a single-phase circuit, as described for distortion power. The sign given to the distortion power in determining the vector power for each single-phase circuit is the same as that of the total active power. The magnitude of the vector power is the apparent power. If the voltages have the same waveform as the corresponding currents, the magnitude of the vector power is equal to the amplitude of the phasor power. Vector power is expressed in voltamperes when the voltages are in volts and the currents in amperes. *See also:* network analysis.




**power vector**

(Std100) 270-1966

**power winding (saturable reactor)** A winding to which is supplied the power to be controlled. Commonly the functions of the output and power windings are accomplished by the same winding, which is then termed the output winding. *See also:* magnetic amplifier. (PE/EEC) [119]

**Poynting vector (1)** If there is a flow of electromagnetic energy into or out of a closed region, the rate of flow of this energy is, at any instant, proportional to the surface integral of the vector product of the electric field strength and the magnetizing force. This vector product is called Poynting's vector. If the electric field strength is E and the magnetizing force is H, then Poynting's vector is given by

$$U = E \times H \text{ and } U = E \times H/4\pi$$

in rationalized and unrationalized systems, respectively. Poynting's vector is often assumed to be the local surface density of energy flow per unit time. (Std100) 270-1966w

**(2)** *See also:* time-averaged Poynting vector; instantaneous Poynting vector. (AP/PROP) 211-1997

**Poynting vector, instantaneous [$\vec{P}(t,\vec{r})$]** *See:* instantaneous Poynting vector.

**Poynting vector, time-averaged** *See:* time-averaged Poynting vector.

**PPCSN** *See:* private packet/frame and circuit switching network.

***p*-percent disruptive discharge voltage ($V_p$)** The prospective value of the test voltage that has a *p*-percent probability of producing a disruptive discharge. (PE/PSIM) 4-1995

**PPI** *See:* plan-position indicator.

***p-p* junction (semiconductor)** A region of transition between two regions having different properties in *p*-type semiconducting material. *See also:* semiconductor device. (PE/EEC) [119]

**ppm** *See:* parts per million.

**PPM** *See:* periodic permanent-magnet focusing; pulse position modulation.

**PPMV** *See:* parts per million by volume.

**PPMW** *See:* parts per million by weight.

**PPS** *See:* preferred power supply.

**PPSN** *See:* private packet/frame switching network.

**PR** *See:* physical record.

**PRA** *See:* pendulous reference axis.

**practical reference pulse waveform (pulse measurement)** A reference pulse waveform which is derived from a pulse which is produced by a device or apparatus. (IM/WM&A) 181-1977w

**practical stability** *See:* finite-time stability.

**practice** Recommended approach, employed to prescribe a disciplined, uniform approach to the software life cycle. (C/SE) 730.1-1995

**practices (software quality assurance)** Requirements employed to prescribe a disciplined uniform approach to the software development process. *See also:* conventions; standards. (C) 610.12-1990

**pragma** A generic term used to define a construct with no predefined language semantics that influences how a synthesis tool will synthesize VHDL code into an equivalent hardware representation. (C/DA) 1076.6-1999

**preallocation** The reservation of resources in a system for a particular use. Preallocation does not imply that the resources are immediately allocated to that use, but merely indicates that they are guaranteed to be available in bounded time when needed. (C/PA) 9945-1-1996

**preamble (1)** In networking, a sequence of bits at the start of each new transmission to allow synchronization of clocks and other physical layer circuitry at other stations. *See also:* postamble; abnormal preamble. (C) 610.7-1995

**(2)** A sequence of bits recorded at the beginning of each block on a magnetic tape for the purpose of synchronization. *Contrast:* postamble. (C) 610.10-1994w

**preamble breakpoint** *See:* prolog breakpoint.

**preamplifier (1)** An amplifier connected to a low-level signal source to present suitable input and output impedances and provide gain so that the signal may be further processed without appreciable degradation in the signal-to-noise ratio. *Notes:* 1. A preamplifier may include provision for equalizing and.or mixing. 2. Further processing frequently includes further amplification in a main amplifier. *See also:* amplifier. (SP) 151-1965w

**(2)** The input section of an amplifier chain, usually located as close to the detector element as possible. (NPS) 325-1996

**preamplifier, pulsed optical feedback** *See:* pulsed optical feedback preamplifier.

**pre-arbitrated (PA) access function** The *access control function* in this part of ISO/IEC 8802 that uses assigned *offsets* in *Pre-Arbitrated (PA) slots* for the transfer of *isochronous service octets.* (LM/C) 8802-6-1994

**pre-arbitrated (PA) segment** A multiuser *segment* transferred using *Pre-Arbitrated Access (PA) functions.* The payload of the *PA segment* contains *isochronous service octets* from zero or more *Isochronous Service Users* (*ISUs*). (LM/C) 8802-6-1994

**pre-arbitrated (PA) slot** A *slot* that is dedicated by the *Head of Bus function* for transfer of *isochronous service octets* in the payload of a *PA segment.* (LM/C) 8802-6-1994

**pre-arcing time** *See:* melting time.

**preassigned multiple access (communication satellite)** A method of providing multiple access in which the satellite channels are preassigned at both ends of the path. (COM) [19]

**precedence call (telephone switching systems)** A call on which the calling party has elected to use one of several levels of priority available to him. (COM) 312-1977w

**precedented system** A system for which design examples exist within its class, so as to provide guidance for establishing the design architecture, engineering and technical plans, specifications, or low risk alternatives. (C/SE) 1220-1998

**precession (1) (navigation aid terms)** The change in the direction of the axis of rotation of a spinning body, as a gyroscope, when acted upon by a torque. (AES/GCS) 172-1983w

**(2) (gyros)** A rotation of the spin axis produced by a torque, *T,* applied about an axis mutually perpendicular to the spin axis and the axis of the resulting rotation. A constant precession rate, ω, is related to rotor angular momentum, *H,* and applied torque, *T,* by the equation $T = H\omega$. (AES/GYAC) 528-1994

**precipitation clutter** Unwanted echoes from rain, snow, hail, sleet and other hydrometeorological particles. (AES) 686-1997

**precipitation intensity (overhead power lines)** The rate of precipitation, usually expressed in millimeters per hour (mm/h). Since precipitation intensity in general is not constant, an average over some time period shorter than one h our is most useful, unless instantaneous intensity is measured. *Note:* Rain gauge measurements can provide an indication of intensity except for light rain, where the quantization error is large. (T&D/PE) 539-1990

**precipitation scatter** Electromagnetic scattering caused by precipitating rain, hail, or snow particles. (AP/PROP) 211-1997

**precision (1) (mathematics of computing) (software) (data management)** The degree of exactness or discrimination with which a quantity is stated; for example, a precision of 2 decimal places versus a precision of 5 decimal places. *Contrast:* accuracy. *See also:* multiple precision; triple precision; double precision; single precision. (C) 610.5-1990w, 610.12-1990, 1084-1986w

**(2) (A) (monitoring radioactivity in effluents)** The degree of agreement of repeated measurements of the same property expressed in terms of dispersion of test results about the mean result obtained by repetitive testing of a homogeneous sample under specified conditions. The precision of a method is expressed quantitatively as the standard deviation computed from the results of a series of controlled determinations.

**(B) (general)** The quality of being exactly or sharply defined or stated. A measure of the precision of a representation is the number of distinguishable alternatives from which it was selected, which is sometimes indicated by the number of significant digits it contains. *See also:* double precision; accuracy. (C) 162-1963, 165-1977

**(3) (measurement process)** The quality of coherence or repeatability of measurement data, customarily expressed in terms of the standard deviation of the extended set of measurement results from a well-defined (adequately specified) measurement process in a state of statistical control. The standard deviation of the conceptual population is approximated by the standard deviation of an extended set of actual measurements. *See also:* reproducibility; accuracy. (AES/RS) 686-1982s, [42]

**(4) (pulse measurement)** The degree of mutual agreement between the results of independent measurements of a pulse characteristic, property, or attribute yielded by repeated application of a pulse measurement process. (IM/WM&A) 181-1977w

**(5) (analog computer)** Exactly or sharply defined or stated. A measure of the precision of a representation is the number of distinguishable alternatives from which it was selected, which is sometimes indicated by the number of significant digits it contains. *See also:* accuracy. (C) 165-1977w

**(6) (metric practice)** The degree of mutual agreement between individual measurements, namely repeatability and reproducibility. *See also:* accuracy. (QUL) 268-1982s

**(7) (measuring and test equipment) (nuclear power generating station)** The quality of an instrument scale or readout being exactly or sharply defined or stated. (PE/NP) 498-1985s

**(8) (plutonium monitoring) (radiological monitoring instrumentation)** The degree of agreement of repeated measurements of the same property, expressed quantitatively as the standard deviation computed from the results of the series of measurements. (NI) N320-1979r, N317-1980r, N42.12-1994

**(9) (airborne radioactivity monitoring)** The degree of agreement of repeated measurements of the same parameter. (NI) N42.17B-1989r, N42.20-1995

**(10)** The repeatability of measurement data, customarily expressed in terms of standard deviation. (ELM) C12.1-1988

**(11)** The discrepancy among individual measurements. (PE/PSIM) 4-1995

**(12)** The degree of exactness or discrimination with which a quantity is stated. *Note:* The result of a calculation may have more precision than it has accuracy; for example, the true value of pi to six significant digits is 3.14159; the value of 3.14162 is precise to six digits but only five digits are accurate. *See also:* accuracy. (C) 610.10-1994w

**(13)** A concept employed to describe dispersion of measurements with respect to a measure of location or central tendency (ANSI N15.5-1982). A measurement with small random uncertainties is said to have high precision. (NI) N42.23-1995

**(14)** The degree of mutual agreement between individual measurements, namely their repeatability and reproducibility. *See also:* accuracy. (SCC14) SI 10-1997

**precision-approach radar (PAR) (navigation aid terms)** A radar system located on an airfield for observation of the position of an aircraft with respect to an approach path and specifically intended to provide guidance to the aircraft during the approach. (AES/GCS) 686-1997, 172-1983w

**precision connector (waveguide or transmission line)** A connector that has the property of making connections with a high degree of repeatability without introducing significant reflections, loss or leakage. *See also:* auxiliary device to an instrument. (IM/HFIM) [40]

**precision device (packaging machinery)** A device that will operate within prescribed limits and will consistently repeat operations within those limits. (IA/PKG) 333-1980w

**precision statistic** An estimator of precision calculated from a finite sample of data using a specified formula. (NI) N42.23-1995

**precision wound (rotating machinery)** A coil wound so that maximum nesting of the conductors occurs, usually with all crossovers at one end, with conductor aligned and positioned with respect to each adjacent conductor. *See also:* rotor; stator. (PE) [9]

**precompiler (software)** A computer program or routine that processes source code and generates equivalent code that is acceptable to a compiler. For example, a routine that converts structured FORTRAN to ANSI-standard FORTRAN. *See also:* preprocessor. (C) 610.12-1990

**precondition** A condition that is required to be true before making a property request. (C/SE) 1320.2-1998

**preconditioning** A control-function that provides for manually or automatically establishing a desired condition prior to normal operation of the system. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**preconditioning time** The interval of time required by channel equipment (e.g., modems) to ready the channel for data transmission. (SUB/PE) 999-1992w

**precursor** *See:* undershoot.

**predicted failure rate** For the stated conditions of use, and taking into account the design of an item, the failure rate computed from the observed, assessed, or extrapolated failure rates of its parts. *Note:* Engineering and statistical assumptions shall be stated, as well as the bases used for the computation (observed or assessed). (R) [29]

**predicted mean active maintenance time** The mean active maintenance time of an item calculated by taking into account the reliability characteristics and the mean active maintenance time of all of its parts and other relevant factors according to the stated conditions. *Notes:* 1. Maintenance policy, statistical assumptions and computing methods shall be stated. 2. The source of the data shall be stated. (R) [29]

**predicted mean life (non-repaired items)** For the stated conditions of use, and taking into account the design of an item, the mean life computed from the observed, assessed or extrapolated mean life of its parts. *Note:* Engineering and statistical assumptions shall be stated, as well as the bases used for the computation (observed or assessed). (R) [29]

**predicted reliability** For the stated conditions of use, and taking into account the design of an item, the reliability computed from the observed, assessed, or extrapolated reliabilities of its parts. *Note:* Engineering and statistical assumptions shall be stated, as well as the bases used for the computation (observed or assessed). (R) [29], 1413-1998

**predictive alarming (alarm monitoring and reporting systems for fossil-fueled power generating stations)** A method of alerting the operator to a potential problem in time for him to respond and initiate corrective action to mitigate the problem. (PE/EDPG) 676-1986w

**predictive assessment** The process of using a predictive metric(s) to predict the value of another metric. (C/SE) 1061-1992s

**predictive coding (image processing and pattern recognition)** An image compression technique that uses the gray levels of preceding pixels to predict the gray level of the current pixel, so that only the difference between the predicted and measured value needs to be encoded. (C) 610.4-1990w

**predictive maintenance** The practice of conducting diagnostic tests and inspections during normal equipment operations in order to detect incipient weaknesses or impending failures. (IA/PSE) 902-1998

**predictive metric** A metric applied during development and used to predict the values of a software quality factor. (C/SE) 1061-1998

**predictive metric value** A numerical target related to a quality factor to be met during system development. This is an intermediate requirement that is an early indicator of final system performance. For example, design or code errors may be early predictors of final system reliability. (C/SE) 1061-1998

**predictive model (modeling and simulation)** A model in which the values of future states can be predicted or are hypothesized; for example, a model that predicts weather patterns based on the current value of temperature, humidity, wind speed, and so on at various locations. (C) 610.3-1989w

**predissociation** A process by which a molecule that has absorbed energy dissociates before it has had an opportunity to lose energy by radiation. (ED) 161-1971w

**predistortion (system) (pre-emphasis) (transmitter performance)** A process that is designed to emphasize or de-emphasize the magnitude of some frequency components with respect to the magnitude of others. *See also:* pre-emphasis. (VT) [37]

**pre-emphasis (A) (pre-equalization)** (General). A process in a system designed to emphasize the magnitude of some frequency components with respect to the magnitude of others, to reduce adverse effects, such as noise, in subsequent parts of the system. *Note:* After transmitting the pre-emphasized signal through the noisy part of the system, de-emphasis may be applied to restore the original signal with a minimum loss of signal-to-noise ratio. **(B) (pre-equalization)** (Modulating systems) (recording). An arbitrary change in the frequency response of a recording system from its basic response (such as constant velocity or amplitude) for the purpose of improvement in signal-to-noise ratio, or the reduction of distortion. (PE) 599-1985

**pre-emphasis network** A network inserted in a system in order to emphasize one range of frequencies with respect to another. *See also:* network analysis. (AP/ANT) 145-1983s

**preempted thread** A running thread whose execution is suspended due to another thread becoming runnable at a higher priority. (C/PA) 9945-1-1996

**preempted process** A running process whose execution is suspended due to another process becoming runnable at a higher priority. (C/PA) 1003.1b-1993s

**preemption (1) (telephone switching systems)** On a precedence call, the disconnection and subsequent reuse of part of an established connection of lower priority if all the relevant circuits are busy. (COM) 312-1977w

**(2)** Process in which the current bus master relinquishes the bus because another module has requested it. In some systems any module may cause preemption; in some systems only a module with a higher priority request may cause preemption. (C/BA) 896.3-1993w

**(3)** The release of the bus by the current bus master due to the request of another module. Note that in some systems, preemption occurs when the current bus master relinquishes the bus because another module has requested it. In some systems, any module may cause preemption; in some systems, only a module with a higher priority request may cause preemption. (C/BA) 896.4-1993w

**(4)** The release of the bus by the current bus master due to the request of another module. *Note:* In some systems, any module may cause preemption; in others, only a module with a higher priority request may cause preemption. (C/BA) 10857-1994

**preemptive control (test, measurement, and diagnostic equipment)** An action or function which, by reason of preestablished priority, is able to seize or interrupt the process in progress and cause to be performed a process of higher priority. (MIL) [2]

**pre-fault (event)** A qualifying term that refers to an interval ending with the inception of a fault. (SWG/PE) C37.100-1992

**preference (channel supervisory control) (power-system communication)** An assembly of devices arranged to prevent the transmission of any signals over a channel other than supervisory control signals when supervisory control signals are being transmitted. (Std100) [123]

**preference level (speech quality measurements)** The signal-to-noise ratio (S.N) of the speech reference signal when it is isopreferent to the speech test signal. 297-1969w

**preferred (electric power system) (generating stations electric power system)** That equipment and system configuration selected to supply the power system loads under normal conditions. (PE/EDPG) 505-1977r

**preferred basic impulse insulation level (insulation strength)** A basic impulse insulation level that has been adopted as a preferred American National Standard voltage value. *See also:* basic impulse insulation level. (EEC/LB) [100]

**preferred current ratings (of distribution fuse links)** A series of distribution fuse-link ratings so chosen from a series of preferred numbers that a specified degree of coordination may be obtained between adjacent sizes. (SWG/PE) C37.40-1993

**preferred insulations system classification (electric installations on shipboard)** The preferred insulation system classifications are classes A, B, F, H, C, or 105, 130, 155, 180, or greater than 220, and as designated by the equipment standard. (IA/MT) 45-1983s

**preferred power supply (PPS)** That power supply from the transmission system to the Class 1E distribution system that is preferred to furnish electric power under accident and post-accident conditions. (PE/NP) 308-1991, 765-1995

**preferred values** The preferred values for the parameters listed for various tests are preferred in the sense that their use promotes uniformity. However, specific applications may require values other than the listed preferred values. (PE) C62.34-1996

**prefetching** In a pipelined process, to fetch the next instruction, or instruction part, before the processing unit requires it, resulting in a performance improvement by eliminating the lag between completion of one instruction and the availability of the next. (C) 610.10-1994w

**prefix code (telephone switching systems)** One or more digits preceding the national or international number to implement direct distance dialing. (COM) 312-1977w

**prefixes and symbols (International System of Units (SI))** Used to form names and symbols of the decimal mutiples and submultiples of the SI units:

| Prefix | Abbreviation | Factor |
|---|---|---|
| tera- (megamega- | T (MM*) | $10^{12}$ |
| giga- (kilomega-*) | G (kM*) | $10^{9}$ |
| mega- | M | $10^{6}$ |
| myria- | | $10^{4}$ |
| kilo- | k | $10^{3}$ |
| hecto- | h | $10^{2}$ |
| deka- | | 10 |
| deci- | d | $10^{-1}$ |
| centi- | c | $10^{-2}$ |
| milli- | m | $10^{-3}$ |
| decimilli- | dm | $10^{-4}$ |
| micro- | μ | $10^{-6}$ |
| nano- (millimicro-*) | n (mμ*) | $10^{-9}$ |
| pico- (micromicro-*) | p (μμ*) | $10^{-12}$ |

*Deprecated.

These prefixes or their symbols are directly attached to names or symbols of units, forming multiples and submultiples of the units. In strict terms these must be called "multiples and submultiples of SI units," particularly in discussing the coherence of the system. In common parlance, the base units and derived units, along with their multiples and submultiples, are all called SI units. *See also:* units and letter symbols.

**prefix multipliers** The prefixes listed in the following table, when applied to the name of a unit, serve to form the designation of a unit greater or smaller than the original by the factor indicated.

| Multiplication Factor | Prefix Symbol | |
|---|---|---|
| 1 000 000 000 000 000 000 = $10^{18}$ | exa | E |
| 1 000 000 000 000 000 = $10^{15}$ | peta | P |
| 1 000 000 000 000 = $10^{12}$ | tera | T |
| 1 000 000 000 = $10^{9}$ | giga | G |
| 1 000 000 = $10^{6}$ | mega | M |
| 1 000 = $10^{3}$ | kilo | k |
| 100 = $10^{2}$ | hecto* | h |
| 10 = $10^{1}$ | deka* | da |
| 0.1 = $10^{-1}$ | deci* | d |
| 0.01 = $10^{-2}$ | centi | c |
| 0.001 = $10^{-3}$ | milli | m |
| 0.000 001 = $10^{-6}$ | micro | μ |
| 0.000 000 001 = $10^{-9}$ | nano | n |
| 0.000 000 000 001 = $10^{-12}$ | pico | p |
| 0.000 000 000 000 001 = $10^{-15}$ | femto | f |
| 0.000 000 000 000 000 001 = $10^{-18}$ | atto | a |

*Deprecated.

270-1966w

**prefix notation (mathematics of computing)** A parenthesis-free method of forming mathematical expressions devised by the Polish logician Jan Lukasiewicz, in which each operator is immediately followed by its operands. For example, A added to B and the result multiplied by C is expressed as X + ABC. *Synonyms:* parenthesis-free notation; Lukasiewicz notation; Polish notation. *Contrast:* postfix notation; infix notation. (C) 1084-1986w

**preform (fiber optics)** A glass structure from which an optical fiber waveguide may be drawn. *See also:* ion exchange technique; chemical vapor deposition technique; optical blank. (Std100) 812-1984w

**preformed coil or coil side (rotating machinery)** An element of a preformed winding, composed of conductor strands, usually insulated and sometimes transposed, cooling ducts in some designs, turn insulation where number of turns exceeds one, and coil insulation. *See also:* rotor; stator. (PE) [9]

**preformed winding** A winding consisting of coils which are given their shape before being assembled in the machine. (PE) [9]

**P register** A special-purpose instruction address register that holds the address of the next instruction to be fetched or executed. (C) 610.10-1994w

**preheat (switch start) fluorescent lamp (illuminating engineering)** A fluorescent lamp designed for operation in a circuit requiring a manual or automatic starting switch to preheat the electrodes in order to start the arc. (EEC/IE) [126]

**preheating time (mercury-arc valve)** The time required for all parts of the valve to attain operating temperature. (ED) [45], [84]

**preheating time cathode (electron tube)** The minimum period of time during which the heater voltage should be applied before the application of other electrod voltages. *See also:* heater current. (ED) [45]

**preheat-starting (fluorescent lamps) (switch-starting systems)** The designation given to those systems in which hot-cathode electric discharge lamps are started from preheated cathodes through the use of a starting switch, either manual or automatic in its operation. *Note:* The starting switch, when closed, connects the two cathodes in series in the ballast circuit so that current flows to heat the cathodes to emission temperature. When the switch is opened, a voltage surge is produced that initiates the discharge. Only the arc current flows through the cathodes after the lamp is in operation. *See also:* fluorescent lamp. (EEC/IE) [126]

**preliminary design (A) (software)** The process of analyzing design alternatives and defining the architecture, components, interfaces, and timing and sizing estimates for a system or component. *See also:* detailed design. **(B) (software)** The result of the process in definition "A." (C) 610.12-1990

**preliminary design review (A)** A review conducted to evaluate the progress, technical adequacy, and risk resolution of the selected design approach for one or more configuration items; to determine each design's compatibility with the requirements for the configuration item; to evaluate the degree of definition and assess the technical risk associated with the selected manufacturing methods and processes; to establish the existence and compatibility of the physical and functional interfaces among the configuration items and other items of equipment, facilities, software and personnel; and, as applicable, to evaluate the preliminary operational and support documents. *See also:* critical design review; system design review. **(B)** A review, as in definition "A" of any hardware or software component. (C) 610.12-1990

**preliminary relay contacts** Contacts that open or close in advance of other contacts when the relay is operating. (EEC/REE) [87]

**premises wiring (system)** That interior and exterior wiring, including power, lighting, control, and signal circuit wiring together with all of its associated hardware, fittings, and wiring devices, both permanently and temporarily installed, which extends from the load end of the service drop, or load end of the service lateral conductors to the outlet(s). Such wiring does not include wiring internal to appliances, fixtures, motors, controllers, motor control centers, and similar equipment. (NEC/NESC) [86]

**premolded** A joint that is factory molded in the shape which it will take when installed. Installation is performed by sliding the joint over the cable. The use of heat is not a part of the installation procedure. (PE/IC) 404-1993

**pre-molded joint (power cable joints)** A joint made of premolded components assembled in the field. (PE/IC) 404-1986s

**preoperational system test (Class 1E power systems and equipment)** A test to confirm that all individual component parts of a system function as a system and the system functions as designed. A preoperational test is performed following significant modifications or additions made to the facility at later dates. (PE/NP) 415-1986w

**preoperational testing** All testing required for system components prior to energizing or operating the major system component. (PE/EDPG) 1248-1998

**preorder traversal** The process of traversing a binary tree in a recursive fashion as follows: the root is visited, then the left subtree is traversed, then the right subtree is traversed. *Con-*

*trast:* inorder traversal; postorder traversal. *See also:* converse preorder traversal. (C) 610.5-1990w

**PREP** *See:* PRogrammed Electronics Patterns.

**preparatory function (numerically controlled machines)** A command changing the mode of operation of the control such as from positioning to contouring or calling for a fixed cycle of the machine.

**prepatch panel** *See:* problem board.

**prepend** To append to the beginning. For example, a Media Access Control (MAC) frame is prepended with a preamble and appended with a frame check sequence (FCS). (C/LM) 802.3-1998

**preprocessing** An operation performed before a primary process; for example, in pattern recognition, processing in which patterns are simplified to make classification easier. (C) 610.4-1990w

**preprocessor (1) (software)** A computer program or routine that carries out some processing step prior to the primary process; for example, a precompiler or other routine that reformats code or data for processing. *Contrast:* postprocessor. *See also:* D-TRAN; LYRIC; PDEL. (C) 610.12-1990, 610.13-1993w

**(2)** A device that effects preparatory computation or organization. (C) 610.10-1994w

**pre-read head** A read head that is placed before another read head and is used to read data before the same data are read by the other read head. (C) 610.10-1994w

**prerecorded data medium** A data medium on which certain preliminary items are preset; the remaining items are entered during subsequent operations. (C) 610.10-1994w

**preregister operation (elevators)** Operation in which signals to stop are registered in advance by buttons in the car and at the landings. At the proper point in the car travel, the operator in the car is notified by a signal, visual, audible, or otherwise, to initiate the stop, after which the landing stop is automatic. *See also:* control. (EEC/PE) [119]

**prerequisite** The specification in a software object that implies it shall not be installed until after some other software object is installed, and configured until after the other software object is configured. (C/PA) 1387.2-1995

**pre-rip (cable plowing)** A process using a plow blade to loosen the earth prior to plowing and installing the cable, flexible tube, etc. (T&D/PE) 590-1977w

**prescribed surface (sound measurements)** A hypothetical surface surrounding the machine on which sound measurements are made. (PE/EM) 85-1973w

**prescriptive model** A model used to convey the required behavior or properties of a proposed system; for example, a scale model or written specification used to convey to a computer supplier the physical and performance characteristics of a required computer. *Contrast:* descriptive model. (C) 610.3-1989w

**preselector (A)** A device placed ahead of a frequency converter or other device, that passes signals of desired frequencies and reduces others. **(B)** In automatic switching, a device that performs its selecting operation before seizing an idle trunk. (EEC/PE) [119]

**presence tests (test, measurement, and diagnostic equipment)** Actions which verify the presence or absence of signals or characteristics. Such signals or characteristics are those which are not tolerance critical to operation of the item. (MIL) [2]

**present** When describing an argument to a function call, the case where a pointer to an actual object of the type specified in the declaration is supplied by the caller (as opposed to a null pointer). (C/PA) 1238.1-1994w

**presentation address (1)** An unambiguous name that is used to identify a set of presentation service access points. Loosely, it is the network address of an OSI service. (C/PA) 1328.2-1993w, 1224.2-1993w, 1326.2-1993w, 1327.2-1993w

**(2)** A name unambiguous within the OSI environment that is used to identify a set of presentation service access points. (C/PA) 1238.1-1994w

**present average demand** An average value occurring during a current demand interval or subinterval (e.g., watts or voltamperes). (AMR/SCC31) 1377-1997

**presentation graphics** The use of a computer to produce high quality, high resolution graphical output. *Contrast:* information graphics. (C) 610.2-1987

**presentation layer (1) (Layer 6)** The layer of the ISO Reference Model that frees the application processes from concern with differences in data representation. (DIS/C) 1278.2-1995

**(2)** The sixth layer of the seven-layer OSI model; responsible for general user services related to the representation of user data. *Note:* This layer provides compression, encryption, character and file conversion on messages from the application layer. *See also:* application layer; data link layer; physical layer; network layer; sublayer; transport layer; session layer; client layer; entity layer; logical link control sublayer; medium access control sublayer. (C) 610.7-1995

**preset** To establish an initial condition, such as the control values of a loop. (C/C) [20], [85]

**preset guidance (navigation aid terms)** Guidance in which a predetermined path is set into the guidance mechanism of a craft and is not altered after launching. (AES/GCS) 172-1983w

**preset speed** A control function that establishes the desired operating speed of a drive before initiating the speed change. *See also:* electric drive. (IA/ICTL/IAC/APP) [60], [75]

**preshoot (pulse terminology)** A distortion which precedes a major transition. *Note:* Colloquial term which qualitatively describes a type of distortion. (IM/WM&A) 194-1977w

**press** To push and hold a mouse button. (C) 1295-1993w

**pressing (disk recording)** A pressing is a record produced in a record-molding press from a master or stamper. *See also:* phonograph pickup. (SP) [32]

**pressure (solderless) connector** A device that establishes a connection between two or more conductors or between one or more conductors and a terminal by means of mechanical pressure and without the use of solder. (NESC/NEC) [86]

**pressure altimeter (navigation aid terms)** An altimeter that measures and indicates altitude above a datum plane by means of an aneroid which responds to the change in atmospheric pressure with height. (AES/GCS) 172-1983w

**pressure barrier seal (nuclear power generating station)** Consists of an aperture seal and an electrical conductor seal. (PE/IM/NP) 380-1975w, [76]

**pressure cable** An oil-impregnated paper-insulated cable in which positive gauge pressure is maintained on the insulation under all operating conditions. (T&D/PE) [10]

**pressure coefficient** *See:* environmental coefficient.

**pressure connector (packaging machinery)** A conductor terminal applied with pressure so as to make the connection mechanically and electrically secure. (IA/PKG) 333-1980w

**pressure-containing terminal box (rotating machinery)** A terminal box so designed that the products of an electric breakdown within the box are completely contained inside the box. (PE) [9]

**pressure controller (control systems for steam turbine-generator units)** Includes only those components and control elements that generate one or more signal(s) for the control mechanism in response to pressure set point and pressure feedback signals for the purpose of controlling pressure. (PE/EDPG) 122-1985s

**pressure control system (control systems for steam turbine-generator units)** A system that controls the pressure at a sensing point in a designated location. Typically, it includes the pressure-sensing element, the controller, the control

mechanism, and the controlled valve(s).
(PE/EDPG) 122-1985s

**pressure-gradient microphone** A microphone in which the electric output substantially corresponds to a component of the gradient (space derivative) of the sound pressure. *Note:* Pressure-gradient microphones may be of any order; for example, zero, first, second, etc. Thus, a pressure microphone is a gradient microphone of zero order. The rms response to plane waves is proportional to $\cos^n\theta$, where $\theta$ is the angle of incidence and $n$ is the order of the gradient. Because of the finite dimensions of all gradient microphones, however, the response characteristic and the directional characteristic, respectively, are only approximations of the derivative of the sound pressure and of the directional formula noted.
(T&D/PE) 539-1990

**pressure-lubricated bearing (rotating machinery)** A bearing in which a continuous flow of lubricant is forced into the space between the journal and the bearing. *See also:* bearing.
(PE) [9]

**pressure microphone** A microphone in which the electric output substantially corresponds to the instantaneous sound pressure of the impressed sound waves. *Note:* A pressure microphone is a gradient microphone of zero order and is nondirectional when its dimensions are small compared to a wavelength. *See also:* microphone.
(T&D/PE/EEC) 539-1990, [119]

**pressure reference changer (control systems for steam turbine-generator units)** A device for producing the pressure reference signal to the pressure controller in response to a manual or automatic adjustment. (PE/EDPG) 122-1985s

**pressure relay** A relay that responds to liquid or gas pressure.
(SWG/PE) C37.100-1992

**pressure-relief device (arresters)** A means for relieving internal pressure in an arrester and preventing explosive shattering of the housing, following prolonged passage of follow current or internal flashover of the arrester. (PE) [8]

**pressure-relief terminal box (rotating machinery)** A terminal box so designed that the products of an electric breakdown within the box are relieved through a pressure-relief diaphragm. (PE) [9]

**pressure-relief test (arresters)** A test made to ascertain that an arrester failure will not cause explosive shattering of the housing. (PE) [8]

**pressure retaining boundary (nuclear power generating station)** The pressure retaining boundary includes those surfaces of the aperture seal, the conductor feed-through plate, the conductor seal (or seals), and the conductor (or conductors) which are exposed to the containment environment.
(PE/NP) 380-1975w

**pressure-sensitive keyboard** *See:* membrane keyboard.

**pressure switch (1)** A switch in which actuation of the contacts is effected at a predetermined liquid or gas pressure.
(IA/ICTL/IAC) [60], [84]

**(2) (power system device function numbers)** A switch which operates on given values, or on a given rate of change, of pressure. (PE/SUB) C37.2-1979s

**pressure system (protective signaling)** A system for protecting a vault by maintaining a predetermined differential in air pressure between the inside and outside of the vault. Equalization of pressure resulting from opening the vault or cutting through the structure initiates an alarm condition in the protection circuit. *See also:* protective signaling.
(EEC/PE) [119]

**pressure-type pothead** A pressure-type pothead is a pothead intended for use on positive-pressure cable systems. *See also:* single-pressure-zone potheads; multipressure-zone pothead.
(PE) 48-1975s

**pressure-type termination** A Class 1C termination intended for use on positive pressure cable systems.

— Single pressure zone termination: A pressure-type termination intended to operate with one pressure zone.

— Multipressure zone termination: A pressure-type termination intended to operate with two or more pressure zones.
(PE/IC) 48-1996

**pressure wire connector** A device that establishes the connection between two or more conductors or between one or more conductors and a terminal by means of mechanical pressure and without the use of solder. (EEC/PE) [119]

**pressurized (rotating machinery)** Applied to a sealed machine in which the internal coolant is kept at a higher pressure than the surrounding medium. (PE) [9]

**prestartup testing** All testing required prior to rotating the generating unit under power (hydraulic or electrical) which is unique to the unit and not associated with system testing.
(PE/EDPG) 1248-1998

**prestore** To store data that are required by a computer program or routine before the program or routine is entered.
(C) 610.12-1990

**prestressed-concrete structures** Concrete structures that include metal tendons that are tensioned and anchored either before or after curing of the concrete. (NESC) C2-1997

**prestrike** The initiation of current between the contacts during a closing operation before the contacts have mechanically touched. (SWG/PE) C37.100-1992, C37.083-1999

**prestrike current (lightning)** The current that flows in a lightning stroke prior to the return stroke current. *See also:* direct-stroke protection. (T&D/PE) [10]

**presumptive address** *See:* base address.

**presumptive instruction** A computer instruction that is not an effective instruction until it has been modified in a prescribed manner. (C) 610.10-1994w

**pretersonic** Ultrasonic and with frequency higher than 500 megahertz. (UFFC) [122]

**pre-tested iteration** *See:* WHILE.

**pretransmit-receive tube** A gas-filled radio-frequency switching tube used to protect the transmit-receive tube from excessively high power and the receiver from frequencies other than the fundamental. *See also:* gas tube.
(ED) 161-1971w

**prettyprinting** The use of indentation, blank lines, and other visual cues to show the logical structure of a program.
(C) 610.12-1990

**preventive autotransformer** An autotransformer (or center-tapped reactor) used in load tap changing and regulating transformers, or step-voltage regulators to limit the circulating current when operating on a position in which two adjacent taps are bridged, or during the change of taps between adjacent position.
(PE/TR) C57.131-1995, C57.12.80-1978r

**preventive maintenance (1) (test, measurement, and diagnostic equipment)** Tests, measurement, replacements, adjustments, repairs and similar activities, carried out with the intention of preventing faults or malfunctions from occurring during subsequent operation. Preventive maintenance is designed to keep equipment and programs in proper operating condition and is performed on a scheduled basis.
(MIL) [2]

**(2)** The maintenance carried out at predetermined intervals or corresponding to prescribed criteria, and intended to reduce the probability of failure or the performance degradation of an item. (R) [29]

**(3) (software)** Maintenance performed for the purpose of preventing problems before they occur. (C) 610.12-1990

**(4)** Maintenance performed specifically to prevent faults from occurring. (C) 610.10-1994w

**(5)** The practice of conducting routine inspections, tests, and servicing so that impending troubles can be detected and reduced or eliminated. (IA/PSE) 902-1998

**(6)** A procedure in which the system is periodically checked and/or reconditioned to prevent or reduce the probability of failure or deterioration in subsequent service.
(PE/NP) 933-1999

**previously developed software** Software that has been produced prior to or independent of the project for which the Plan is prepared, including software that is obtained or purchased from outside sources. (C/SE) 1228-1994

**PRF** *See:* pulse-repetition frequency.

**PRI** *See:* pulse-repetition interval.

**Primacord** *See:* explosives.

**primaries (color) (television)** The colors of constant chromaticity and variable amount that, when mixed in proper proportions, are used to produce or specify other colors. *Note:* Primaries need not be physically realizable. (BT/AV) 201-1979w

**primary (1) (supervisory control, data acquisition, and automatic control)** An equipment or subsystem that normally contributes to system operation. *See also:* backup. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**(2) (instrument transformers)** The winding intended for connection to the circuit to be measured or controlled. (PE/TR) [57], C37.13-1993

**(3)** The part of a machine having windings that are connected to the power supply line (for a motor or transformer) or to the load (for a generator). (PE/EM) [9]

**(4) (A)** First to operate; for example, primary arcing contacts, primary detector. **(B)** First in preference; for example, primary protection. **(C)** Referring to the main circuit as contrasted to auxiliary or control circuits; for example, primary disconnecting devices. **(D)** Referring to the energy input side of transformers, or the conditions (voltages) usually encountered at this location; for example, primary unit substation. (SWG/PE) C37.100-1992

**primary address (FASTBUS acquisition and control)** An address assigned to a device by means of which a master is able to establish contact with the device or a subdivision of the device. Primary address types are logical, geographical and broadcast addresses. (NID) 960-1993

**primary address cycle** The portion of a FASTBUS operation in which a master addresses a slave on the address/data (AD) lines. The address type is specified by the EG and MS control lines. It begins with the master asserting the address sync (AS) line and terminates with the master receiving an address acknowledgment on the AK line. Logical, geographical or broadcast addresses are asserted during primary address cycles. (NID) 960-1993

**primary arcing contacts** (of a switching device) The contacts on which the initial arc is drawn and the final current, except for the arc-shunting-resistor current, is interrupted after the main contacts have parted. (SWG/PE) C37.100-1992

**primary backplane bus** A backplane bus that provides the main communications path among a cluster of modules. (C/BA) 14536-1995

**primary battery** *See:* primary cell; battery; electrochemistry.

**primary bus** The collection of signals that provides the system with the basic mechanism for exchanging data between boards. (C/BA) 896.9-1994w, 896.3-1993Gw

**primary calibration (monitoring radioactivity in effluents)** The determination of the electronic system accuracy when the detector is exposed in a known geometry to radiation from sources of known energies and activity levels traceable to the National Bureau of Standards (NBS). (NI) N42.18-1980r

**primary cell** A cell that produces electric current by electrochemical reactions without regard to the reversibility of those reactions. Some primary cells are reversible to a limited extent. *See also:* electrochemistry. (EEC/PE) [119]

**primary center (1) (telephone switching systems)** A toll office to which toll centers and toll points may be connected. Primary centers are classified as Class 3 offices. *See also:* office class. (COM) 312-1977w

**(2)** Class 3 office in the North American hierarchical routing plan; a control center connecting toll centers of the telephone system together. *See also:* regional center; sectional center; toll center; end office. (C) 610.7-1995

**primary circuit** The circuit on the input side of the regulator. (PE/TR) C57.15-1999

**primary coating (fiber optics)** The material in intimate contact with the cladding surface, applied to preserve the integrity of that surface. *See also:* cladding. (Std100) 812-1984w

**primary-color unit (television)** The area within a color cell occupied by one primary color. *See also:* television. (ED) 161-1971w

**primary current ratio (electroplating)** The ratio of the current densities produced on two specified parts of an electrode in the absence of polarization. It is equal to the reciprocal of the ratio of the effective resistances from the anode to the two specified parts of the cathode. *See also:* electroplating. (EEC/PE) [119]

**primary data element** A data element within a record that represents the subject of that record; for example, the data element "name" in a record containing "name," "city of birth," and "date of birth." *Contrast:* attribute data element. (C) 610.5-1990w

**primary detecting element (automatic control)** That portion of the feedback elements that first either utilizes or transforms energy from the controlled medium to produce a signal that is a function of the value of the directly controlled variable. (PE/EDPG) [3]

**primary detector (1) (power systems)** That portion of the measurement device which either utilizes or transforms energy from the controlled medium to produce a measurable effect which is a function of change in the value of the controlled variable. (PE/PSE) 94-1970w

**(2)** (or sensing element or initial element) The first system element or group of elements that responds quantitatively to the measurand and performs the initial measurement operation. A primary detector performs the initial conversion or control of measurement energy and does not include transformers, amplifiers, shunts, resistors, etc., when these are used as auxiliary means. *Synonyms:* sensing element; initial element. (SWG/PE) C37.100-1992

**primary disconnecting devices** (of a switchgear assembly) Self-coupling separable contacts provided to connect and disconnect the main circuits between the removable element and the housing. (SWG/PE) C37.100-1992

**primary distribution feeder** A feeder operating at primary voltage supplying a distribution circuit. *Note:* A primary feeder is usually considered as that portion of the primary conductors between the substation or point of supply and the center of distribution. (IA/CEM) [58]

**primary distribution mains** The conductors that feed from the center of distribution to direct primary loads or to transformers that feed secondary circuits. *See also:* center of distribution. (IA/CEM) [58]

**primary distribution system** A system of alternating-current distribution for supplying the primaries of distribution for supplying the primaries of distribution transformers from the generating station or substation distribution buses. *See also:* alternating-current distribution; center of distribution. (IA/CEM) [58]

**primary distribution trunk line** A line acting as a main source of supply to a distribution system. *See also:* center of distribution. (IA/CEM) [58]

**primary electric shock** An electric shock sufficiently severe to cause direct physiological harm. (T&D/PE) 539-1990

**primary electron (thermionics)** An electron in a primary emission. *See also:* electron emission. (ED) [45], [84]

**primary fault** The initial breakdown of the insulation of a conductor, usually followed by a flow of power current. *See also:* center of distribution. (IA/CEM) [58]

**primary flow (carriers)** A current flow that is responsible for the major properties of the device. (Std100) 102-1957w

**primary grid emission (thermionic)** Current produced by electrons or ions thermionically emitted from a grid. *See also:* electron emission. (ED) [45]

**primary ground electrode** A ground electrode specifically designed or adapted for discharging the ground fault current into the ground, often in a specific discharge pattern, as required (or implicitly called for) by the grounding system design. (PE/SUB) 80-2000

**primary input (1)** A node in a circuit in which the tester can apply stimulus. (SCC20) 1445-1998

**(2)** The point where a logic signal arrives at the boundary of the design as currently known to an electric design automation (EDA) application. For a complete integrated circuit design, for example, this point is the metal pad of an input or bidirectional pad cell. (C/DA) 1481-1999

**primary key (1) (A)** In sorting and searching, the key that is given the highest priority within a group of related keys. For example, after sorting, the values in the primary key will be in the given order, independent of the values of the other fields. *Synonyms:* major key; prime key. *Contrast:* secondary key. **(B)** In a relation, a specific minimal set of attributes that functionally determines all other attributes in the relation, and thus uniquely differentiates one entity from another. *Note:* More than one set of attributes with this property may exist. Each such set is known as a candidate key, but only one is chosen as the primary key. *See also:* alternate key; candidate key. (C) 610.5-1990

**(2)** The candidate key selected as the unique identifier of an entity. (C/SE) 1320.2-1998

**primary line of sight (illuminating engineering)** The line connecting the point of observation and the point of fixation. In terms of a single eye, it is the line connecting the point of fixation and the center of the entrance pupil. (EEC/IE) [126]

**primary line-to-ground voltage (coupling capacitors and capacitance potential devices)** Refers to the high-tension root-mean-square line-to-ground voltage of the phase to which the coupling capacitors or potential device, in combination with its coupling capacitor or bushing, is connected. *See also:* rated primary line-to-ground voltage. 31-1944w

**primary_message** The part of the interface event message carried by the DMA mechanism itself. The primary_message may point to message_extensions. (C/MM) 1212.1-1993

**primary network** A network supplying the primaries of transformers whose secondaries may be independent or connected to a secondary network. *See also:* center of distribution. (IA/CEM) [58]

**primary oil containment** A tank or enclosure designed for continuous containment of oil for operating or storage purposes. (SUB/PE) 980-1994

**primary outage** An outage occurrence within a related multiple outage event that occurs as a direct consequence of the initiating incident and is not dependent on any other outage occurrence. *Note:* A primary outage of a component or a unit may be caused by a fault on equipment within the unit or component or repair of a component within the unit. *See also:* related multiple outage event. (PE/PSE) 859-1987w

**primary output (1)** A node in a circuit in which the tester can observe a response. (SCC20) 1445-1998

**(2)** The point where a logic signal leaves the design as currently known to an electric design automation (EDA) application. For a complete integrated circuit design, for example, this point is the metal pad of an output or bidirectional pad cell. (C/DA) 1481-1999

**primary output patterns (POPAT)** A set of unique responses at the node in which a fault or a group of faults are detected. (SCC20) 1445-1998

**primary overcurrent protective device of apparatus (nuclear power generating station)** A device or apparatus which normally performs the function of circuit interruption. (PE/NP) 317-1976s

**primary packet (1)** A packet made up of whole quadlets that contains a transaction code in the first quadlet. Any packet that is not an acknowledge or a PHY packet. (C/MM) 1394-1995

**(2)** Any packet that is not an acknowledge or a physical layer (PHY) packet. A primary packet is an integral number of quadlets and contains a transaction code in the first quadlet. (C/MM) 1394a-2000

**primary protection** (as applied to a relay system) First-choice relay protection in contrast with backup relay protection. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**primary radar (1)** A radar system, subsystem, or mode of operation in which the return signals are the echoes obtained by reflection from the target. Since this is the normal method of radar operation, the word *primary* is omitted unless necessary to distinguish it from *secondary*. *See also:* secondary radar. (AES/GCS) 172-1983w

**(2)** A radar system in which the return signals are the echoes obtained by reflection from the target. Since this is the normal method of radar operation, the word *primary* is omitted unless necessary to distinguish it from *secondary*. *See also:* secondary radar. (AES) 686-1997

**primary radiator** The radiating element of a reflector or lens antenna that is coupled to the transmitter or receiver directly, or through a feed line. *Note:* For some applications, an array of radiating elements is employed. (AP/ANT) 145-1993

**primary reactor starter** A starter that includes a reactor connected in series with the primary winding of an induction motor to furnish reduced voltage for starting. It includes the necessary switching mechanism for cutting out the reactor and connecting the motor to the line. *See also:* starter. (IA/ICTL/IAC/APP) [60], [75]

**primary representation** The form in which the service supplies an attribute value to the client. (C/PA) 1328-1993w, 1327-1993w, 1224-19931w

**primary resistor starter** A starter that includes a resistor connected in series with the primary winding of an induction motor to furnish reduced voltage for staring. It includes the necessary switching mechanism for cutting out the resistor and connecting the motor to the line. *See also:* starter. (IA/ICTL/IAC) [60]

**primary ring** In a dual ring, this is the ring over which application data (LLC frames) are exchanged during normal operation. MAC1, which transmits the application data, is attached to the primary ring. When a dual ring station is in either WRAPA or WRAPB, MAC1 is switched to remain in the operational section of the wrapped ring. The primary ring uses the links ARx and BTx in each dual ring station. (LM/C) 802.5c-1991r

**primary section of the core** The section of the core of a ferroresonant transformer on which the primary winding is wound. (PEL) 449-1998

**primary service area (radio broadcast transmitter)** The area within which reception is not normally subject to objectionable interference or fading. *See also:* radio transmitter. (EEC/PE) [119]

**primary shock** A shock of such a magnitude that it may produce direct physiological harm. The results of primary shock are fibrillation, respiratory tetanus, and muscle contraction. (T&D/PE) 1048-1990, 524a-1993r

**primary signal** A signal at the interface between the physical device and the physical tester. Any and all information meant for test is defined on these signals; test translators need process these signals only. (C/TT) 1450-1999

**primary socket identifier (PSID)** A socket number identifying a particular endpoint on the primary device. (C/MM) 1284.4-2000

**primary space allocation (data management)** The amount of space that is reserved for a particular file when it is initially defined. *Contrast:* secondary space allocation. (C) 610.5-1990w

**primary standard (luminous standards) (illuminating engineering)** A light source by which the unit of light is established and from which the values of other standards are derived. This order of standard also is designated as the national

standard. *Note:* A satisfactory primary (national) standard must be reproducible from specifications. Primary (national) standards usually are found in national physical laboratories, such as the National Bureau of Standards. *See also:* candela. (IE/EEC) [126]

**primary state** The state on a node that is initialized by a power_reset. For example, the CSRs defined by IEEE Std 1212-1991, CSR Architecture, are part of the node's primary state. (C/MM) 1212-1991s

**primary station (1)** The station that, at any given instant, has the right to select and to transmit information to a secondary station and the responsibility to insure information transfer. *See also:* secondary station. (C) 610.7-1995

**(2)** As defined by the infrared link access protocol (IrLAP), the station on the data link that assumes responsibility for the organization of data flow and for unrecoverable data link error conditions. It issues commands to the secondary stations and gives them permission to transmit. (EMB/MIB) 1073.3.2-2000

**primary storage** *See:* main storage.

**primary supply voltage (mobile communication)** The voltage range over which a radio transmitter, a radio receiver, or selective signaling equipment is designed to operate without degradation in performance. *See also:* mobile communication system. (VT) [37]

**primary switchgear connections** *See:* main switchgear connections.

**primary transmission feeder** A feeder connected to a primary transmission circuit. *See also:* center of distribution. (T&D/PE) [10]

**primary unit substation (1) (power and distribution transformers)** A substation in which the low-voltage section is rated above 1000 V. (PE/TR) C57.12.80-1978r

**(2)** *See also:* unit substation. (SWG/PE) C37.100-1981s

**primary voltage rating of a general-purpose specialty transformer (power and distribution transformers)** The input circuit voltage for which the primary winding is designed, and to which operating and performance characteristics are referred. (PE/TR) C57.12.80-1978r

**primary winding (1) (power and distribution transformers)** The winding on the energy input side. (PE/TR) C57.12.80-1978r

**(2) (voltage regulators)** The shunt winding. *See also:* voltage regulator. (PE/TR) C57.15-1968s

**(3) (rotating machinery) (motor or generator)** The winding carrying the current and voltage of incoming power (for a motor) or power output (for a generator). The choice of what constitutes a primary circuit is arbitrary for certain machines having bilateral power flow. In a synchronous or direct-current machine, this is more commonly called the armature winding. *See also:* armature. (PE) [9]

**(4) (instrument transformers)** The winding intended for connection to the circuit to be measured or controlled. (PE/TR) C57.13-1993, [57]

**(5)** The winding of the ferroresonant transformer to which the input voltage is applied. (PEL) 449-1998

**primary window** A window in which the main interaction between the user and an object or application takes place (also known as main window). (C) 1295-1993w

**primary zone** The part of a relay's protected zone where the relay operates with no intentional time delay. (PE/PSR) C37.113-1999

**prime (charge-storage tubes)** To charge storage elements to a potential suitable for writing. *Note:* This is a form of erasing. *See also:* television; charge-storage tube. (ED) 161-1971w

**prime attribute** An attribute that forms all or part of the primary key of a relation. *Contrast:* nonprime attribute. (C) 610.5-1990w

**prime key** *See:* primary key.

**prime meridian (navigation aid terms)** The meridiam of longitude 0°, almost universally considered as Greenwich, England. (AES/GCS) 172-1983w

**prime mover (emergency and standby power)** The machine used to develop mechanical horsepower to drive an emergency or standby generator to produce electrical power. (IA/PSE) 446-1995

**prime power (1)** The maximum potential power (chemical, mechanical, or hydraulic) constantly available for transformation into electric power. *See also:* generating station. (T&D/PE) [10]

**(2)** The source of supply of electrical energy that is normally available and used continuously day and night, usually supplied by an electric utility company, but sometimes supplied by base-loaded user-owned generation. (IA/PSE) 446-1995

**prime source** In the event that several vendors offer pin-for-pin compatible components, the prime source is the vendor who introduced the component type. (TT/C) 1149.1-1990

**priming rate (charge-storage tubes)** The time rate of priming a storage element, line, or area from one specified level to another. Note the distinction between this and "priming speed." *See also:* charge-storage tube. (ED) 158-1962w

**priming speed (charge-storage tubes)** The lineal scanning rate of the beam across the storage surface in priming. Note the distinction between this and "priming rate." *See also:* charge-storage tube. (ED) 158-1962w, 161-1971w

**primitive (1) (software reliability)** Data relating to the development or use of software that is used in developing measures or quantitative descriptions of software. Primitives are directly measurable or countable, or may be given a constant value or condition for a specific measure. Examples include: error, failure, fault, time, time interval, date, number of noncommentary source code statements, edges, and nodes. (C/SE) 982.2-1988, 982.1-1988

**(2)** The lowest level for which data is collected. (C/SE) 1045-1992

**(3)** A basic or fundamental unit, often referring to the lowest level of machine instruction or the lowest unit of a language. (C) 610.10-1994w

**(4) (local area networks)** A definition of a service provided by a sublayer to the sublayer immediately above. Primitives may be initiated by either the upper or lower sublayer. (C) 8802-12-1998

**(5)** A mechanism for communicating between the entities of different layers of the medical information bus (MIB) communications standard (e.g., between the Physical layer and Data Link layer entities). A primitive may request a particular service, provide indication of a request, provide a response to an indication, or provide confirmation of a response. (EMB/MIB) 1073.4.1-2000

**(6)** *See also:* display element. (C) 610.6-1991w

**primitive attribute** A characteristic that applies to a display element. For example, color, line style, character size. (C) 610.6-1991w

**primitive Boolean function** A Boolean expression having the property that all other Boolean expressions can be constructed using it alone. (C) 1084-1986w

**primitive data structure** A data structure that can be directly operated upon by machine-level instructions. Examples include integer, real, character, logical, and pointer. *Contrast:* nonprimitive data structure. (C) 610.5-1990w

**primitive period** *See:* period.

**primitive service** A service that accesses or manipulates defined elements of AI-ESTATE–conformant models (e.g., get, put, create, delete). (SCC20) 1232.2-1998

**primitive type** *See:* atomic type.

**principal axis (1) (close-talking pressure-type microphone)** The axis of a microphone normal to the plate of the principal acoustic entrance of a microphone, and that passes through the center of the entrance. *See also:* close-talking pressure-type microphones. (SP) 258-1965w

**(2) (transducer used for sound emission or reception)** A reference direction used in describing the directional characteristics of the transducer. It is usually an axis of structural

symmetry, or the direction of maximum response, but if one of these does not coincide with the reference direction, it must be described explicitly. (SP) [32]

**principal axis of compliance (accelerometer) (gyros)** An axis along which an applied force results in a displacement along that axis only. The acceleration-squared error due to anisoelasticity is zero when acceleration is along a principal axis of compliance. (AES/GYAC) 528-1994

**principal branch** (main branch) A branch involved in the major transfer of energy from one side of the converter to the other. (IA/ID/SPC) 995-1987w, 936-1987w

**principal characteristics** *See:* principal voltage-current characteristic.

**principal-city office (telephone switching systems)** An intermediate office that has the screening and routing capabilities to accept traffic to all end office within one or more numbering-plan areas. (COM) 312-1977w

**principal current (1) (self-commutated converters) (circuit properties)** (of a converter switching element or branch) The on-state current of the semiconductor devices in a switching element or branch flowing between its principal terminals. *Note:* The principal current is often referred to as the "current" of the switching element or branch. (IA/SPC) 936-1987w

**(2) (thyristor)** A generic term for the current through the collector junction. *Note:* It is the current though both main terminals. (IA/IPC) 428-1981w

**principal E-plane (1)** For a linearly polarized antenna, the plane containing the electric field vector and the direction of maximum radiation. (AP/ANT) 145-1993

**(2) (linearly polarized antenna)** The plane containing the electric field vector and the direction of maximum radiation. *See also:* radiation; antenna. (AP/ANT) [35]

**principal half-power beamwidths** For a pattern whose major lobe has a half-power contour that is essentially elliptical, the half-power beamwidths in the two pattern cuts that contain the major and minor axes of the ellipse, respectively. (AP/ANT) 145-1993

**principal H-plane** *See:* principal H-plane.

**principal power (thyristor)** The power which is consumed in the load circuit plus the losses in the power circuit elements including switching losses. (IA/IPC) 428-1981w

**principal restraint (accelerometer)** The means by which a measurable force or torque is generated to oppose the force or torque produced by an acceleration along or about an input axis. (AES/GYAC) 528-1984s

**principal terminal (self-commutated converters) (converter circuit elements)** A terminal (of a device or circuit element) through which passes the current transmitting the power that is controlled by the device or circuit element. The term is used for distinction from control terminals, monitoring signal terminals, etc. *Note:* Examples of principal terminals are the anode and cathode of thyristor or diode devices, the collector and emitter of bipolar transistor devices, and the source and drain of field-effect transistor devices. (IA/SPC) 936-1987w, 995-1987

**principal voltage (thyristor)** The voltage between the main terminals. *Notes:* 1. In the case of reverse blocking and reverse conducting thyristors, the principal voltage is called positive when the anode potential is higher than the cathode potential, and called negative when the anode potential is lower than the cathode potential. 2. For bidirectional thyristors, the principal voltage is called positive when the potential of main terminal 2 is higher than the potential of main terminal 1. (IA/IPC) 428-1981w

**principal voltage-current characteristic (thyristor)** The function, usually represented graphically, relating the principal voltage to the principal current with gate current, where applicable, as a parameter. *Synonym:* principal characteristics. (IA/ED) 223-1966w, [46], [12]

**printable character (1)** A character in the range 0x21 through 0x7E or the range 0xA1 through 0xFE. (C/BA) 1275-1994

**(2)** One of the characters included in the print character classification of the LC_CTYPE category in the current locale. (C/PA) 9945-2-1993

**print bar** *See:* type bar.

**print chain** In a chain printer, a revolving carrier on which the type slugs of an impact printer are mounted. *Synonym:* print train. (C) 610.10-1994w

**print contrast ratio** In optical character recognition, the ratio obtained by subtracting the reflectance at an inspection area from the maximum reflectance found within a specified distance from that area, and dividing the result by that maximum reflectance. *Contrast:* print contrast signal. (C) 610.2-1987

**print contrast signal** In optical character recognition, a measure of the contrast between a printed character and the paper on which the character is printed. *Contrast:* print contrast ratio. (C) 610.2-1987

**print control character** A control character for print operations such as line spacing, page ejection, or carriage return. (C) 610.5-1990w

**print controller** The parts within a printer that perform the processing required to generate an image. *Contrast:* print engine. (C) 610.10-1994w

**print data set** A data set in which data that is to be printed are stored. (C) 610.5-1990w

**print drum** In a drum printer, a rotating cylinder that presents characters at more than one printing position. (C) 610.10-1994w

**printed card form** The layout or format of the printed matter on a card; the printed matter usually describes the purpose of the card and designates the precise location of card fields. (C) 610.10-1994w

**printed circuit (1) (soldered connections)** A pattern comprising printed wiring formed in a predetermined design in, or attached to, the surface or surfaces of a common base. (EEC/AWM) [105]

**(2)** A circuit in which the conducting wires are "printed" as conductive strips on an insulating board. *Synonym:* etched circuit. *See also:* printed circuit board. (C) 610.10-1994w

**printed circuit antenna** An antenna of some desired shape bonded onto a dielectric substrate. *Note:* The microstrip antenna is a notable example. *See also:* microstrip antenna. (AP/ANT) 145-1993

**printed-circuit assembly** A printed-circuit board on which separately manufactured component parts have been added. (EEC/AWM) [105]

**printed circuit board** A circuit board onto which the pattern of copper foil connecting the components has been etched or printed. *Note:* The term "card" is often used synonymously with "printed circuit board." *Synonym:* printed circuit card. *Contrast:* wire-wrapped board. *See also:* plugboard. (C) 610.10-1994w

**(2) (A)** A board for mounting of components on which most connections are made by printed circuitry. **(B)** A board having printed circuits on both sides. **(C)** A board having printed circuits on one side only. (Std100) [123]

**printed circuit card** *See:* printed circuit board.

**printed wiring (soldered connections)** A portion of a printed circuit comprising a conductor pattern for the purpose of providing point-to-point electric connection only. (EEC/AWM) [105]

**printed wiring board (PWB) (1)** A generic form that includes other interconnection boards. (C/BA) 1101.3-1993

**(2)** A generic term that includes any interconnection board. (C/BA) 1101.4-1993

**(3)** Any interconnection board. (C/BA) 1101.7-1995

**print element** An interchangeable unit employed in element printers that contains a complete set of type slugs. By changing the print element, one can change the character font, size,

and density. Examples include "daisy wheels," "golf balls," and "thimbles." *Synonym:* type element. (C) 610.10-1994w

**print engine (1)** The mechanism within a printer that actually transforms the desired image to the paper. *Contrast:* print controller. (C) 610.10-1994w **(2)** That set of electrical and mechanical mechanisms that move the print media or paper and marks that paper. (C/MM) 1284.1-1997

**printer (1) (teletypewriter) (teleprinter)** A printing telegraph instrument having a signal-actuated mechanism for automatically printing received messages. It may have a keyboard similar to that of a typewriter for sending messages. The term receiving-only is applied to a printer having no keyboard. *See also:* telegraphy. (COM) [49] **(2)** An output device that produces a hard copy record of data mainly in the form of discrete graphic characters belonging to one or more predetermined character sets. *See also:* graphic printer; character-at-a-time printer; teleprinter; line printer; color printer; high-speed printer; serial printer; page printer; continuous-stream printer; character printer; impact printer; bidirectional printer; nonimpact printer. (C) 610.10-1994w **(3)** An intelligent device that includes, as a primary function, the ability to convert an electrically transmitted or stored image into a physical image formed by colorant on some medium (such as paper). (C/MM) 1284.1-1997

**printer driver** An application software component that allows the computer system to control and communicate with a particular printer without concern for the printer's hardware characteristics. (C) 610.10-1994w

**printer font** A font that resides in or is intended for a printer. *Note:* Can be internal, downloaded, or on a font cartridge. *Contrast:* screen font. *See also:* online font; internal font. (C) 610.10-1994w

**printer interface control unit (PICU)** The set of electronics that interfaces external communications ports, common peripheral interfaces (such as font cards or disk drives), the logical units, and the marking engine. It is the function of the printer interface control unit to coordinate and sequence all the functions and operations of the printer. (C/MM) 1284.1-1997

**printer language** The human language used for the American National Standard Code for Information Interchange (ASCII) strings within all command and response messages, other than those to be printed or those to be displayed on the local or remote consoles (e.g., English, French, German). (C/MM) 1284.1-1997

**print formatter** *See:* text formatter.

**print formatting** *See:* text formatting.

**print head (A)** A head within a printer that mechanically controls the creation of an image on paper. **(B)** A term commonly applied to that component in a dot-matrix printer that is responsible for forming characters using a pattern of dots. (C) 610.10-1994

**printing** That set of operations implemented by the printer that results in an image rendered as marks on the selected media. (C/MM) 1284.1-1997

**printing demand meter** An integrated demand meter that prints on a paper tape the demand for each demand interval and indicates the time during which the demand occurred. *See also:* electricity meter. (EEC/PE) [119]

**printing line** The writing line on a printer. *See also:* printing position. (C) 610.10-1994w

**printing position (A)** One character position in a printing line. **(B)** The location of the printer head. (C) 610.10-1994

**printing recorder (protective signaling)** An electromechanical recording device that accepts electric signal impulses from transmitting circuits and converts them to a printed record of the signal received. *See also:* protective signaling. (EEC/PE) [119]

**print media** That consumable upon which the marking engine marks so as to form a text and/or pictorial image, typically paper. (C/MM) 1284.1-1997

**printout (1) (test, measurement, and diagnostic equipment)** The output of a device which is printed on some type of printer. (MIL) [2] **(2)** Computer output printed on paper. *See also:* playback. (C) 610.10-1994w

**print record** A record in a print data set. (C) 610.5-1990w

**print server** On a network, a server that is dedicated to queuing and sending printer output from the networked computers to a shared printer. *See also:* database server; file server; disk server; mail server; network server; terminal server. (C) 610.7-1995

**print through** An undesired transfer of a recorded signal from one part of a magnetic medium to another part when these parts are brought into close proximity. (C/SP) 610.10-1994w, [32]

**print train** In a train printer, a track in which the type slugs are engaged. *See also:* print chain. (C) 610.10-1994w

**print wheel** In a wheel printer, a rotating disk that presents the characters of a character set at a single printing position. *Synonym:* type wheel. (C) 610.10-1994w

**print wire** One of a set of wires that is used in a dot-matrix printer to transfer ink to the paper. (C) 610.10-1994w

**priority (1) (computer graphics)** A segment attribute that determines which of several overlapping segments is closer to the viewer. (C) 610.6-1991w **(2) (software)** The level of importance assigned to an item. (C) 610.12-1990 **(3) (multiprocessor architecture)** A bus request protocol in which the module with the highest arbitration number acquires the bus. (C/MM) 896.1-1987s **(4)** A nonnegative integer associated with processes or threads, whose value is constrained to a range defined by the applicable scheduling policy. Numerically higher values represent higher priorities. (C/PA) 9945-1-1996 **(5)** A rank order of status, activities, or tasks. Priority is particularly important when resources are limited. (C/SE) 1362-1998 **(6)** (use in primitives) A parameter used to convey the priority required or desired. (C/LM/CC) 8802-2-1998 **(7)** The general term for an integer-valued attribute of processes, tasks, messages, and asynchronous I/O operations, whose value is used in selecting among entities of the same kind. Numerically higher values represent higher priorities and are given preference for selection over lower priorities. The *priority of an Ada task* is an integer that indicates a degree of urgency and is the basis for resolving competing demands of tasks for resources. Unless otherwise specified, whenever tasks compete for processors or other implementation-defined resources, the resources are allocated to the task with the highest priority value. The *base priority* of a task is the priority with which it was created, or to which it was later set by `Dynamic_Priorities.Set_Priority`. At all times, a task also has an *active priority*, which generally reflects its base priority as well as any priority it inherits from other sources. *Priority inheritance* is the process by which the priority of a task or other entity (*e.g.*, a protected object is used in the evaluation of the active priority of another task. At any time, the active priority of a task is the maximum of all the priorities the task is inheriting at that instant. (C) 1003.5-1999

**priority-based scheduling** Scheduling in which the selection of a running thread is determined by the priority of the runnable threads. (C/PA) 9945-1-1996

**priority inheritance** This occurs when a lower priority message at the head of the queue uses the priority of a higher priority message that is blocked. (C/BA) 896.3-1993w

**priority interrupt** An interrupt performed to permit execution of a process that has a higher priority than the process currently executing. (C) 610.12-1990

**priority interrupt bus** One of the four buses provided by the backplane. The priority interrupt bus allows interrupter modules to send interrupt requests to interrupt-handler modules. (C/BA) 1014-1987

**priority inversion** Condition that can occur when a higher priority activity arrives while a lower priority activity is using the shared resource, and the higher priority activity cannot preempt the lower priority activity. (C/BA) 896.3-1993w

**priority queue** A list to which items may be appended to or retrieved from any position, depending on some property of the item being added or removed. *Note:* This data structure is misnamed in that it contradicts the definition of "queue." (C) 610.5-1990w

**priority resolution** A mechanism that allows a local device and its link partner to resolve to a single mode of operation given a set of prioritized rules governing resolution. (C/LM) 802.3-1998

**Priority Resolution Table** The look-up table used by Auto-Negotiation to select the network connection type where more than one common network ability exists (100BASE-TX, 100BASE-T4, 10BASE-T, etc.). The priority resolution table defines the relative hierarchy of connection types from the highest common denominator to the lowest common denominator. (C/LM) 802.3-1998

**priority string (power-system communication)** A series connection of logic circuits such that inputs are accommodated in accordance with their position in the string, one end of the string corresponding to the highest priority. *See also:* digital. (Std100) [123]

**priority-tagged frame** A tagged frame whose tag header carries priority information, but carries no VLAN identification information. *See also:* VLAN-tagged frame; untagged frame. (C/LM) 802.1Q-1998

**privacy** The service used to prevent the content of messages from being read by other than the intended recipients. (C/LM) 8802-11-1999

**privacy mode (local area networks)** A mode in which an end node receives only those packets specifically addressed to it. (C) 8802-12-1998

**privacy protection** The establishment of appropriate administrative, technical, and physical safeguards to ensure the security and confidentiality of data records and to protect both security and confidentiality against any anticipated threats or hazards that could result in substantial harm, embarrassment, inconvenience, or unfairness to any individual about whom such information is maintained. (C/SE) J-STD-016-1995

**privacy system (radio transmission)** A system designed to make unauthorized reception difficult. *See also:* radio transmission. (EEC/PE) [119]

**private (1)** A design feature intended solely for use by the component manufacturer. (TT/C) 1149.1-1990
**(2)** A responsibility that is visible only to the class or the receiving instance of the class (available only within methods of the class). *Contrast:* protected; public. *See also:* hidden. (C/SE) 1320.2-1998

**private automatic branch exchange (1) (telephone switching systems) (data transmission)** A private branch exchange that is automatic. (COM/PE) 312-1977w, 599-1985w
**(2)** *See also:* private branch exchange. (C) 610.7-1995

**private automatic exchange (1) (telephone switching systems) (data transmission)** A private nonbranch exchange that is automatic. (COM/PE) 312-1977w, 599-1985w
**(2)** A telephone exchange that provides private telephone service to an organization and does not allow calls to be transmitted to or from the public telephone network. (C) 610.7-1995

**private branch exchange (1) (telephone switching systems) (data transmission)** A private telecommunications exchange that includes access to a public telecommunications exchange. (COM/PE) 312-1977w, 599-1985w
**(2)** A telephone exchange on the user's premises, providing a switching facility for telephones on extension lines within the premises and access to the public telephone network. *Synonym:* private automatic branch exchange. (C) 610.7-1995

**private branch exchange hunting (telephone switching systems)** An arrangement for searching over a group of trunks at the central office, any one of which would provide a connection to the desired private branch exchange. (COM) 312-1977w

**private-branch-exchange trunk (telephone switching systems)** A line used as a trunk between a private branch exchange and the central office that serves it. (COM) 312-1977w

**private circuit switching network (PCSN)** A private network that only provides circuit switching functions, except that it may be able to transport packetized "user-to-user" information passed over the signalling channel. (LM/C/COM) 8802-9-1996

**private data** Data, associated with a package, that is used by the methods of that package but is not intended for use by other software. (C/BA) 1275-1994

**private exchange** A telephone exchange serving a single organization and having no means for connection with a public telephone exchange. (EEC/COM/CON) [28], [48]

**private line (1) (data transmission) (private wire)** A channel or circuit furnished to a subscriber for the subscriber's exclusive use. (PE) 599-1985w
**(2)** *See also:* leased line. (C) 610.7-1995

**private line service** A service in which the customer leases a circuit, not connected to the public switched telephone network, for the customer's exclusive use. (C) 610.7-1995

**private line telegraph network (data transmission)** A system of points interconnected by leased telegraph channels and providing hard-copy or five-track punched paper tape, or both, at both sending and receiving points. (PE) 599-1985w

**private line telephone network (data transmission)** A series of points interconnected by leased voice-grade telephone lines, with switching facilities or exchange operated by the customer. (PE) 599-1985w

**private network** A network established and operated by a private organization in which the customer leases circuits and, sometimes, switching capacity for the customer's use. *Contrast:* public data network. *See also:* software defined network. (C) 610.7-1995

**private non-branch exchange (telephone switching systems)** A series of points interconnected by leased voice-grade telephone lines, with switching facilities or exchange operated by the customer. (Std100) [123]

**private object** The internal representation of the language-independent model of an object in a service, and thus unspecified. (C/PA) 1328-1993w, 1238.1-1994w, 1327-1993w, 1224-1993w

**private OM object** The internal representation of the language-independent model of an OM object in a service, and thus unspecified. (C/PA) 1327.2-1993w, 1224.2-1993w, 1328.2-1993w, 1326.2-1993w

**private packet/frame and circuit switching network (PPCSN)** A private switching network that provides both circuit and packet/frame switching functions (i.e., all the functions of both PCSNs and PPSNs). (LM/C/COM) 8802-9-1996

**private packet/frame switching network (PPSN)** A private network that only provides packet/frame switching functions. (LM/C/COM) 8802-9-1996

**private page** A memory page that has been reserved for the exclusive use of a particular agency or function. Access credentials may be required to reference the page. (SCC32) 1455-1999

**private residence** A separate dwelling or a separate apartment in a multiple dwelling that is occupied only by the members of a single family unit. (EEC/PE) [119]

**private residence elevator** A power passenger electric elevator, installed in a private residence, and that has a rated load not in excess of 700 pounds, a rated speed not in excess of 50 feet per minute, a net inside platform area not in excess of 12 square feet, and a rise not in excess of 50 feet. *See also:* elevator. (EEC/PE) [119]

**private-residence inclined lift** A power passenger lift, installed on a stairway in a private residence, for raising and lowering persons from one floor to another. *See also:* elevator. (EEC/PE) [119]

**private switching network (PSN)** A private network that provides switching functions (circuit and/or packet/frame switching). It is operated by the user and located on user premises to cover the communications needs in the user's domain. The term private-switching network includes both the private circuit-switching network and the private packet-switching network. (LM/C/COM) 8802-9-1996

**private telecommunication exchange (telephone switching systems)** A telecommunications exchange for a single organization. (COM) 312-1977w

**private telephone network** A telephone network set up solely to meet the requirements of the particular organization. (COM/TA) 823-1989w

**private type** A data type whose structure and possible values are defined but are not revealed to the user of the type. *See also:* information hiding. (C) 610.12-1990

**privileged** An instruction (or register) that can only be executed (or accessed) when the processor is in supervisor mode (PSR.S = 1). *See also:* supervisor mode. (C/MM) 1754-1994

**privileged instruction (software)** A computer instruction that can be executed only by a supervisory program. (C) 610.12-1990

**privileged state** *See:* supervisor state.

**probabilistic model** *See:* stochastic model.

**probabilistic risk assessment (PRA)** A calculation of the probability and consequences of various known and postulated accidents. (PE/NP) 933-1999

**probability density function (1) (A) (control of system electromagnetic compatibility)** The first derivative of the probability distribution function; it represents the probability of obtaining a given value. **(B)** The derivative of the distribution function $P(x)$. (EMC) C63.12-1987

**(2) (overhead power lines)** The derivative of the probability distribution function $P(x)$. *Note:* An expression giving the probability of a discrete random variable $x$ as a function of $x$ or, for continuous random variables, the probability in an elemental range d$x$. The total probability is unity or 100%, so that the probability density function represents the proportion of probabilities for particular values of $x$. (T&D/PE) 539-1990

**(3)** Pertaining to a real random variable $x$, the derivative with respect to an arbitrary value $X$ of the variable $x$, of the probability distribution function of $X$, if a derivative exists. *Note:* The mathematical expression for this function is

$$g(X) = \frac{d}{dX}[f(X)] = \frac{d}{dX}[P(x \leq X)]$$

(CS/PE/EDPG) [3]

**probability distribution (nuclear power generating station)** The mathematical function that relates the probability of an event to an elapsed time or to a number of trials. (PE/NP) 352-1975s

**probability distribution function (1) (control of system electromagnetic compatibility)** ***[P(x)]*** The function of $x$ whose value is the probability that the amplitude is greater than, or equal to, $x$. *Notes:* 1. The probability distribution function is a nondecreasing function ranging from zero to unity. C63.12-1984

**(2) (reliability analysis of nuclear power generating station safety systems)** The mathematical function that gives $(X < x)$ where $X$ is a random variable and $x$ is a particular value of $X$. (PE/NP) 352-1987r

**(3) (overhead power lines)** ***[P(x)]*** The probability that a parameter is less than or equal to a given value $x$. *Notes:* 1. The distribution function $P(x)$ for a random variable $x$ is the total frequency of occurrence of members with particular random-variable values less than or equal to $x$. The total frequency of occurrence of all values of $x$ is unity or 100%, so that the distribution function is the proportion of members bearing values less than or equal to $x$. Similarly, for $n$ particular values of the random variable, $x_1, x_2, \ldots x_n$, the distribution function $P(x_1, x_2, \ldots x_n)$ is the frequency of values less than or equal to $x_1$ for the first values, $x_2$ for the second, and so on. 2. The terms "cumulative probability distribution" and, very often, simply "distribution" are used to denote the probability distribution function. (T&D/PE) 539-1990

**(4)** Pertaining to a real random variable x, the function of an arbitrary value $X$ - $X$ of this variable, whose value is the probability, $P$, that the random variable is less than or equal to $X$. *Note:* The mathematical expression for this function is $f(X) = P(x \leq X)$. (CS/PE/EDPG) [3]

**probability of failure indices** The probability of a component failing to respond to a command, or responding when it should not = number of failures to respond as intended/exposure operations. (PE/PSE) 859-1987w

**probability of failure to close on command** Probability of failure to close on command = number of failures to close/number of commands to close. (PE/PSE) 859-1987w

**probability of failure to open on command** Probability of failure to open on command = number of failures to open/number of commands to open. *Note:* This index can be calculated separately for commands to open under fault and without fault. (PE/PSE) 859-1987w

**probability of failure to operate on command** Probability of failure to operate on command = number of failures to operate/number of commands to operate. (PE/PSE) 859-1987w

**probability of occurrence** The asymptotic value of the frequency of occurrence of the event. (T&D/PE) 539-1990

**probability paper** A graph paper with the grid along the ordinate specially ruled so that the distribution function of a specified distribution can be plotted as a straight line against the variable on the abscissa. These specially ruled grids are available for the normal, binomial, Poisson, lognormal, and Weibull distributions, respectively. (T&D/PE) 539-1990

**probe (1) (gas) (potential)** An auxiliary electrode of small dimensions compared with the gas volume, that is placed in a gas tube to determine the space potential. (ED) [45], [84]

**(2)** A tester instrument used to observe the state of a node. (SCC20) 1445-1998

**probeable node** Any node that is physically accessible to a tester probe. (SCC20) 1445-1998

**probe address** The address of a device that is known when the associated FCode program begins execution. (C/BA) 1275-1994

**pro beam system** Tunnel lighting system or luminaires having a light distribution that is greater in the direction of travel. (RL) C136.27-1996

**probe coil** A coil (air or magnetic material core) used to sense an alternating magnetic field. (COM/TA) 1027-1996

**probe loading** The effect of a probe on a network, for example, on a slotted line, the loading represented by a shunt admittance or a discontinuity described by a reflection coefficient. *See also:* measurement system. (IM/HFIM) [40]

**probe pickup, residual** *See:* residual probe pickup.

**probe window** The period of time during a pattern when a probe can capture activity on a node. (SCC20) 1445-1998

**probing** A fault diagnostic technique that incorporates the use of a portable device (hand-held or robotic) to monitor or capture unit under test (UUT) response data. The location of the

probe placement is determined by the circuit response and the circuit topology. (SCC20) 1445-1998

**problem** *See:* benchmark problem.

**problem board** In an analog computer, a removable frame of receptacles for patch cords and plugs that offers a means for interconnecting the inputs and outputs of computing elements. *See also:* patch board; patch panel. (C) 610.10-1994w, 165-1977w

**problem check (analog computer)** One or more tests used to assist in obtaining the correct machine solution to a problem. Static check consists of one or more tests of computing elements, their interconnections, or both, performed under static conditions. Dynamic check consists of one or more tests of computing elements, their interconnections, or both, performed under dynamic conditions. Rate test is a test that verifies that the time constants of the integrators are those selected. This term also refers to the computer-control state that implements the rate test previously described. Dynamic problem check is any dynamic check used to ascertain the correct performance of some or all of the computer components. *See also:* computer-control state. (C) 165-1977w

**Problem Descriptor System (PDS/MaGen)** A programming language useful in a wide variety of operations research applications, and designed to facilitate the generation of matrices and reports for mathematical programming systems. (C) 610.13-1993w

**problem domain** A set of similar problems that occur in an environment and lend themselves to common solutions. (C/SE) 1362-1998

**problem-oriented language (1) (computers)** A programming language designed for the convenient expression of a given class of problems. (MIL/C) [2], [85], [20]
**(2) (software)** A programming language designed for the solution of a given class of problems. Examples are list processing languages, information retrieval languages, simulation languages. (C) 610.12-1990, 610.13-1993w

**problem state** In the operation of a computer system, a state in which programs other than the supervisory program can execute. *Synonyms:* user state; slave state. *Contrast:* supervisor state. (C) 610.12-1990

**problem variable** *See:* scale factor.

**procedural cohesion (software)** A type of cohesion in which the tasks performed by a software module all contribute to a given program procedure, such as an iteration or decision process. *Contrast:* temporal cohesion; logical cohesion; sequential cohesion; coincidental cohesion; functional cohesion; communicational cohesion. (C) 610.12-1990

**procedural interface (PI)** The set of C functions used by an application and a delay and power calculation module (DPCM) to exchange information and determine the timing calculation for a design. (C/DA) 1481-1999

**procedural interface function** One of the C functions that comprise the DPCS procedural interface. (C/DA) 1481-1999

**procedural language (1) (software)** A programming language in which the user states a specific set of instructions that the computer must perform in a given sequence. All widely-used programming languages are of this type. *Synonym:* procedure-oriented language. *Contrast:* nonprocedural language. *See also:* algebraic language; list processing language; logic programming language; algorithmic language. (C) 610.12-1990
**(2)** A computer language in which the user states a specific set of instructions that the computer must perform in a given sequence. Examples include BASIC, COBOL, FORTRAN, and Pascal. *Synonym:* procedure-oriented language. *Contrast:* nonprocedural language. (C) 610.13-1993w

**procedural programming language (software unit testing)** A computer programming language used to express the sequence of operations to be performed by a computer (for example, COBOL). *See also:* nonprocedural programming language. (C/SE) 1008-1987r

**procedure (1) (computers)** The course of action taken for the solution of a problem. (C) [20], [85]
**(2) (nuclear power quality assurance)** A document that specifies or describes how an activity is to be performed. (PE/NP) [124]
**(3) (A) (software)** A course of action to be taken to perform a given task. **(B) (software)** A written description of a course of action as in definition "A;" for example, a documented test procedure. **(C) (software)** A portion of a computer program that is named and that performs a specific action. (C) 610.12-1990
**(4) (software user documentation)** Ordered series of instructions that a user follows to do one or more tasks. (C/SE) 1063-1987r
**(5) (scheme programming language)** A parameterized program fragment, called a subroutine or function in some programming languages. (C/MM) 1178-1990r

**procedure-oriented language (1) (computers)** A programming language designed for the convenient expression of procedures used in the solution of a wide class of problems. (MIL/C) [2], [20], [85]
**(2) (software)** *See also:* procedural language. (C) 610.12-1990

**process (1) (automatic control)** The collective functions performed in and by the equipment in which a variable is to be controlled. *Synonym:* controlled system. (PE/EDPG) [3]
**(2) (A) (software)** A sequence of steps performed for a given purpose; for example, the software development process. **(B) (software)** An executable unit managed by an operating system scheduler. *See also:* job; task. **(C) (software)** To perform operations on data. (C) 610.12-1990
**(3)** An address space and one or more threads of control that execute within that address space, and their required system resources. (C/PA) 14252-1996
**(4)** A sequence of tasks, actions, or activities, including the transition criteria for progressing from one to the next, that bring about a result. (C/SE) 1220-1994s
**(5)** An address space and the single thread of control that executes within that address space, and its required system resources. A process is created by another process issuing the POSIX.1 *fork*() function. The process that issues *fork*() is known as the parent process, and the new process created by the *fork*() is known as the child process. The attributes of processes required by POSIX.2 form a subset of those in POSIX.1. (C/PA) 9945-2-1993
**(6)** An address space with one or more threads executing within that address space, and the required system resources for those threads. A process is created by another process issuing the *fork*() function. The process that issues *fork*() is known as the parent process, and the new process created by the *fork*() is known as the child process. Many of the system resources defined by this part of ISO/IEC 9945 are shared among all of the threads within a process. These include the process ID; the parent process ID; the process group ID; the session membership; the real, effective and saved-set user ID; the real, effective and saved-set group ID; the supplementary group IDs; the current working directory; the root directory; the file mode creation mask; and file descriptors. (C/PA) 9945-1-1996
**(7)** An address space, and the program (including any Ada tasks contained within the program) executing within that address space, and its required system resources. A process is created by another process with procedures `POSIX_Process_Primitives.Start_Process`, `POSIX_Process_Primitives.Start_Process_Search`, or the function `POSIX_Unsafe_Process_Primitives.Fork`. The process that issues `Start_Process`, `Start_Process_Search`, or `Fork` is known as the parent process, and the newly created process is the child process. (C/PA) 1003.5-1992r
**(8)** An address space, a single thread of control that executes within that address space, and its required system resources. On a system that implements threads, a process is redefined to consist of an address space with one or more threads ex-

ecuting within that address space and their required system resources. *Note:* The term process is used in contrast to "system process," or the OSI usage of the term "application process." (C/PA) 1327.2-1993w, 1224.2-1993w, 1326.2-1993w, 1328.2-1993w

**(9)** An organized set of activities performed for a given purpose; for example, the software development process. (C/SE) J-STD-016-1995

**(10)** A unit of activity characterized by a single sequential thread of execution, a current state, and an associated set of system resources. (C/MM) 855-1990

**(11)** Sequence of operations performed in and by the equipment in which a variable is to be controlled. (SCC20) 1226-1998

**(12) (A)** A set of interrelated activities, which transforms inputs into outputs. *Note:* The term "activities" covers use of resources. **(B)** A series of actions bringing about a result. (C/SE) 1490-1998

**(13)** Consists of all execution within a single distinct address space supported by the operating system of a computer. (IM/ST) 1451.1-1999

**(14)** *See also:* POSIX process. (C) 1003.5-1999

**Process** A function that must be performed in the software life cycle. A Process is composed of Activities. (C/SE) 1074-1995s

**process architect** The person or group that has primary responsibility for creating and maintaining the software life cycle process (SLCP). *See also:* software life cycle process. (C/SE) 1074-1997

**processable scored card** A scored card including at least one separable part that can be processed after separation. *See also:* stub card. (C) 610.10-1994w

**Process and Experiment Automation Realtime Language (PEARL)** A general-purpose, high-order language designed to meet the requirements of real-time programming in process and experiment automation. (C) 610.13-1993w

**Process Architect** The person or group that manages the implementation of the Standard in an organization. (C/SE) 1074.1-1995

**process bound** *See:* compute-bound.

**process control (1) (electric pipe heating systems)** The use of electric pipe heating systems to increase or maintain, or both, the temperature of fluids (or processes) in mechanical piping systems including pipes, pumps, tanks, instrumentation in nuclear power generating stations. (PE/EDPG) 622A-1984r

**(2) (automatic control)** Control imposed upon physical or chemical changes in a material. *See also:* feedback control system. (PE/EDPG) [3]

**(3) (electric heat tracing systems)** The use of electric heat tracing systems to increase or maintain, or both, the temperature of fluids (or processes) in mechanical piping systems including pipes, pumps, valves, tanks, instrumentation, etc, in power generating stations. (PE/EDPG) 622B-1988r

**(4)** Automatic control in which a computer is used to regulate continuous operations such as chemical processes, military operations, or manufacturing operations. *See also:* numerical control. (C) 610.2-1987

**process equipment (automatic control)** Apparatus with which physical or chemical changes in a material are produced. *Synonym:* plant. (PE/EDPG) [3]

**process group (1)** A collection of processes that permits the signaling of related processes. Each process in the system is a member of a process group that is identified by a process group ID. A newly created process joins the process group of its creator. (C/PA) 9945-1-1996, 9945-2-1993

**(2)** A collection of processes that permits the signaling of related processes. Each process in the system is a member of a process group that is identified by its process group ID. A newly created process joins the process group of its creator. (C) 1003.5-1999

**process group ID (1)** The unique identifier representing a process group during its lifetime. A process group ID is a positive integer that can be contained in a *pid_t*. It shall not be reused by the system until the process group lifetime ends. (C/PA) 9945-1-1996, 9945-2-1993

**(2)** A unique value identifying a process group during its lifetime. A process group ID shall not be reused by the system until the process group lifetime ends. (C) 1003.5-1999

**process group leader (1)** A process whose process ID is the same as its process group ID. (C/PA) 9945-1-1996, 9945-2-1993

**(2)** The unique process, within a process group, that created the process group. (C) 1003.5-1999

**process group lifetime (1)** A period of time that begins when a process group is created and ends when the last remaining process in the group leaves the group, due either to the end of the last process's process lifetime or to the last remaining process calling the *setsid*() or *setpgid*() functions. (C/PA) 9945-1-1996

**(2)** A period of time that begins when a process group is created and ends when the last remaining process in the group leaves the group, due either to the end of the process lifetime of the last process or to the last remaining process calling the `Set_Process_Group_ID` procedure. (C) 1003.5-1999

**process ID (1)** The unique identifier representing a process. A process ID is a positive integer that can be contained in a *pid_t*. A process ID shall not be reused by the system until the process lifetime ends. In addition, if there exists a process group whose process group ID is equal to that process ID, the process ID shall not be reused by the system until the process group lifetime ends. A process that is not a system process shall not have a process ID of 1. (C/PA) 9945-1-1996, 9945-2-1993

**(2)** A unique value identifying a process during its lifetime. The process ID is a value of the type `Process_ID` defined in the package `POSIX_-Process_Identification`. A process ID shall not be reused by the system until the process lifetime ends. In addition, if a process group exists where the process ID of the process group leader is equal to that process ID, that process ID shall not be reused by the system until the process group lifetime ends. An implementation shall reserve a value of process ID for use by system processes. A process that is not a system process shall not have this process ID. (C) 1003.5-1999

**processing** *See:* multiprocessing; parallel processing; data processing; information processing.

**processing cycle** A single, complete execution of data processing that is periodically repeated. *Synonym:* data processing cycle. *See also:* daily cycle; monthly cycle; weekly cycle; annual cycle. (C) 610.2-1987

**processing unit** A functional unit that consists of one or more processors and their storage. *See also:* central processing unit. (C) 610.10-1994w

**process lifetime (1)** The period of time that begins when a process is created and ends when its process ID is returned to the system. After a process is created with a *fork*() function, it is considered active. At least one thread of control and the address space exist until it terminates. It then enters an inactive state where certain resources may be returned to the system, although some resources, such as the process ID, are still in use. When another process executes a *wait*() or *waitpid*() function for an inactive process, the remaining resources are returned to the system. The last resource to be returned to the system is the process ID. At this time, the lifetime of the process ends. (C/PA) 9945-1-1996

**(2)** A period of time that begins when a process is created and ends when its process ID is returned to the system. After a process is created, it is considered active. Its threads of control and address space exist until it terminates. It then enters an inactive state where certain resources may be returned to the system, although some resources, such as the process ID, are still in use. When another process executes a

`Wait_For_Child_Process` procedure for an inactive process, the remaining resources are returned to the system. The last resource to be returned to the system is the process ID. At this time, the lifetime of the process ends. (C) 1003.5-1999

**process list** An ordered set of runnable processes that all have the same ordinal value for their priority. The ordering of processes on the list is determined by a scheduling policy or policies. The set of process lists includes all runnable processes in the system. (C/PA) 1003.1b-1993s

**process management** The direction, control, and coordination or work performed to develop a product or perform a service. Example is quality assurance. (C) 610.12-1990

**process metric** A metric used to measure characteristics of the methods, techniques, and tools employed in developing, implementing, and maintaining the software system. (C/SE) 1061-1998

**process model** A model of the processes performed by a system; for example, a model that represents the software development process as a sequence of phases. *Contrast:* structural model. (C) 610.3-1989w

**processor (1) (A) (computers)** (hardware). A data processor. **(B) (computers)** (pascal computer programming language). A system or mechanism that accepts a program as input, prepares it for execution, and executes the process so defined with data to produce results. *Note:* A processor may consist of an interpreter, a compiler and run-time system, or other mechanism, together with an associated host computing machine and operating system, or other mechanism for achieving the same effect. A compiler in itself, for example, does not constitute a processor. (Std100/SUB/PE) 812-1984, C37.1-1994

**(2) (software)** A computer program that includes the compiling, assembling, translating, and related functions for a specific programming language, for example, Cobol processor, Fortran processor. *See also:* multiprocessor. (C) [20], [85]

**(3)** The combination of the IU, FPU, and CP (if present). (C/MM) 1754-1994

**(4) (A)** A device that interprets and executes instructions, consisting of at least an instruction control unit and an arithmetic unit. *See also:* coprocessor; preprocessor. **(B)** A device that contains a central processing unit. (C) 610.10-1994

**Processor** A main system processor unit that executes operating system code and manages system resources. It is usually constrained on the number of CSRs it can devote to the functions of a given I/O Unit. (C/MM) 1212.1-1993

**processor architecture** The system-visible interfaces to a central processor, including its instruction set, stack and register structures, and trap and interrupt-handling methods. (C) 610.10-1994w

**process-oriented simulation** A simulation in which the process is considered more important than the outcome; for example, a model of a radar system in which the objective is to replicate exactly the radar's operation, and duplication of its results is a lesser concern. *Contrast:* outcome-oriented simulation. (C) 610.3-1989w

**processor interface (PI) (FASTBUS acquisition and control)** The interface device between a processor and a FASTBUS segment. (NID) 960-1993

**processor storage** *See:* internal storage.

**process standard** A standard that deals with the series of actions or operations used in making or achieving a product. (C) 610.12-1990

**process step** Any task performed in the development, implementation, or maintenance of software (for example, identifying the software components of a system as part of the design). (C/SE) 1061-1992s

**processtag (microprocessor operating systems parameter types)** A "tag" returned by one function for use by another. Its contents may not be examined or changed. Its form is system dependent. A processtag is only valid within a given process and should not be passed between processes. (C/MM) 855-1985s

**process-to-process communication** The transfer of data between processes. (C) 1003.5-1999

**procurement document (nuclear power quality assurance)** Purchase requisitions, purchase orders, drawings, contracts, specifications, or instructions used to define requirements for purchase. (PE/NP) [124]

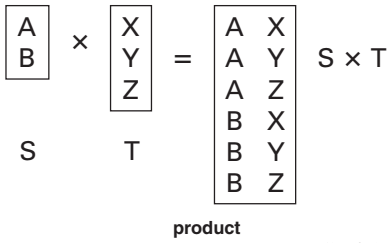
**procurement documents (nuclear power generating station)** Those documents such as specifications, contracts, letters of intent, work orders, purchase orders or proposals and their acceptance which authorize the seller to perform services or supply equipment, material or facilities to the purchaser. *Note:* This term applies specifically to the subject matter of IEEE Std 467-1980. (PE/NP) 467-1980w

**producer (1)** The node on a ringlet that transmits a send packet to the consumer and deletes the echo packet that is returned. (C/MM) 1596-1992

**(2)** A unit that adds a message to a DMA queue. (C/MM) 1212.1-1993

**product (1) (mathematics of computing)** The result of a multiplication operation. (C) 1084-1986w

**(2) (data management)** A relational operator that builds a relation from two specified relations consisting of all possible concatenated pairs of tuples, one from each of the two original relations. (See the corresponding figure.)




**product**

(C) 610.5-1990w

**(3)** An element of the physical or system architecture, specification tree, or system breakdown structure that is a subordinate element to the system and is comprised of two or more subsystems. It represents a major consumer product (e.g., automobile, airplane) of a system or a major life-cycle process product (e.g., simulator, building, robot) related to a life-cycle process that supports a product or group of products. (C/SE) 1220-1994s

**(4)** A software object used to define a set of related software. Filesets are contained within products. (C/PA) 1387.2-1995

**(5)** Any output of the software development Activities (e.g., document, code, or model). *See also:* Activity. (C/SE) 1074-1997

**product analysis** The process of evaluating a product by manual or automated means to determine if the product has certain characteristics. (C) 610.12-1990

**product and process data package** The evolving output of the systems engineering process that documents hardware designs, software designs with their associated documentation, and life-cycle processes. (C/SE) 1220-1994s

**product baseline** In configuration management, the initial approved technical documentation (including, for software, the source code listing) defining a configuration item during the production, operation, maintenance, and logistic support of its life cycle. *Contrast:* developmental configuration; functional baseline; allocated baseline. *See also:* product configuration identification. (C) 610.12-1990

**product certification** *See:* certification.

**product characteristic** An observable attribute of a product. This includes functional, physical, and performance characteristics (e.g., gain and bandwidth of an amplifier). (SCC20) 1226-1998

**product code** *See:* bar code; universal product code.

**product configuration identification** The current approved or conditionally approved technical documentation defining a configuration item during the production, operation, maintenance, and logistic support phases of its life cycle. It prescribes all necessary physical or form, fit and function characteristics of a configuration item, the selected functional characteristics designated for production acceptance testing, and the production acceptance tests. *Contrast:* functional configuration identification; allocated configuration identification. *See also:* product baseline. (C) 610.12-1990

**Product Data Exchange Specification** A computer graphics standard that provides a method for representing and exchanging complete information among computer graphics systems, without requiring human interpretation. It was developed by an international team led by the National Institute of Standards and Technology (formerly National Bureau of Standards). *See also:* Initial Graphics Exchange Specification. (C) 610.6-1991w

**Product Data Exchange using STEP** A specification for representing product data using ISO/DIS 10303 STEP. (ATLAS) 1226-1993s

**product engineering** The technical processes to define, design, and construct or assemble a product. (C) 610.12-1990

**production (routine) (power cable joints)** Tests made on joint components or subassemblies during production for the purpose of quality control. (PE/IC) 404-1986s

**production library (software)** A software library containing software approved for current operational use. *Contrast:* software repository; system library; software development library; master library. (C) 610.12-1990

**production tests (1)** Those tests made to check the quality and uniformity of the workmanship and materials used in the manufacture of switchgear or its components. (SWG/PE) C37.100-1992, C37.81-1989r

**(2) (routine) (power cable joints)** Tests made on joint components or sub-assemblies during production for the purpose of quality control. (PE/IC) 404-1986s

**(3)** Tests made for quality control by the manufacturer on every device or representative samples, or on parts or materials as required to verify during production that the product meets the design specifications and applicable standards. *Note:* Certain quality assurance tests on identified critical parts of repetitive high-production devices may be tested on a planned statistical sampling basis. *Synonym:* routine tests (SWG/PE/SWG-OLD) C37.20.1-1993r, C37.20.4-1996, C37.21-1985r, C37.20.2-1993, C37.20.3-1996, C37.20.6-1997

**(4) (circuit breakers)** Those tests made to check the quality and uniformity of the workmanship and materials used in the manufacture of gas-insulated equipment. (SUB/PE) C37.122-1983s

**(5)** Those tests made to check the quality and uniformity of workmanship and materials used in the manufacturing of generator circuit breakers. (SWG/PE) C37.013-1997

**(6)** *See also:* routine tests. (SPD/PE) C62.11-1999

**productivity ratio** The relationship of an output primitive to its corresponding input primitive. (C/SE) 1045-1992

**product line** A collection of systems that are potentially derivable from a single domain architecture. (C/SE) 1517-1999

**product management** The definition, coordination, and control of the characteristics of a product during its development cycle. Example is configuration management. (C) 610.12-1990

**product metric** A metric used to measure the characteristics of any intermediate or final product of the software development process. (C/SE) 1061-1998

**product modulator** A modulator whose modulated output is substantially equal to the product of the carrier and the modulating wave. *Note:* The term implies a device in which intermodulation between components of the modulating wave does not occur. *See also:* modulation. (EEC/PE) [119]

**product relay** A relay that operates in response to a suitable product of two alternating electrical input quantities. (SWG/PE) C37.100-1992

**product sensitivity** The ratio of Hall voltage to the product of control current and magnetic flux density at any point on the product sensitivity characteristic curve of a Hall generator. (MAG) 296-1969w

**product specification (A)** A document that specifies the design that production copies of a system or component must implement. *Note:* For software, this document describes the as-built version of the software. *See also:* design description. **(B)** A document that describes the characteristics of a planned or existing product for consideration by potential customers or users. (C) 610.12-1990

**product specification file (PSF)** The input file used to define the structure and attributes of software objects and related files to be packaged by the `swpackage` utility. (C/PA) 1387.2-1995

**product standard** A standard that defines what constitutes completeness and acceptability of items that are used or produced, formally or informally, during the software engineering process. (C) 610.12-1990

**product support** The providing of information, assistance, and training to install and make software operational in its intended environment and to distribute improved capabilities to users. (C) 610.12-1990

**product verification** The process of verification of the traceability of a calibration standard of a manufacturer by NIST. This is achieved by the submission of a source from a manufacturer to NIST for verification of the value certified by the manufacturer. The reported value is compared to the NIST value, and if appropriate, a report of traceability is issued. (NI) N42.22-1995

**professional projector** The professional projector is a type using 35- or 70-millimeter film which has a minimum width of 1 3/8 inches and has on each edge 5.4 perforations per inch, or a type using carbon arc, Xenon, or other light source equipment which develops hazardous gases, dust or radiation. (NESC/NEC) [86]

**professional standard (software)** A standard that identifies a profession as a discipline and distinguishes it from other professions. (C) 610.12-1990

**PROFILE** A computer language used to match, score, and retrieve statistical data. (C) 610.13-1993w

**profile (1) (overhead power lines)** A diagram showing the variation of a quantity or parameter with location. (T&D/PE) 539-1990

**(2) (overhead power lines)** *See also:* step index profile; power-law index profile; graded index profile; index profile; parabolic profile. 812-1984w

**(3)** A set of one or more base standards and, where applicable, the identification of chosen classes, subsets, options, and parameters of those base standards that are necessary for accomplishing a particular function. (C/PA) 14252-1996

**(4)** The thickness of the module. (C/BA/C/BA) 1101.4-1993, 1101.3-1993

**(5)** The maximum thickness of the module. (C/BA) 1101.7-1995

**(6)** A set of one or more base standards, and, where applicable, the identification of chosen classes, subsets, options, and parameters of those base standards, necessary for accomplishing a particular function. In this standard that function is to provide communication services appropriate for DIS simulation applications. (DIS/C) 1278.2-1995

**(7)** *See also:* application environment profile. (C/BA) 896.2-1991w

**(8)** A unique numeric identifier that indicates a set of communications parameter values to be used in establishing a physical session. (SCC32) 1455-1999

**Profile A module** The assembled unit, containing a Futurebus+ interface and one or more nodes complying with Profile A, that is inserted into a compatible Profile A slot. Profile A

modules may operate in systems complying with other profiles if the system meets Profile A physical requirements and if modules support a compatible transaction set when sharing data. (C/BA) 896.2-1991w

**Profile A system** The assembly of hardware elements made up of, at a minimum, the Profile A compliant backplane and subrack, power supply, fans, etc. Modules complying with other profiles may operate compatibly with Profile A systems and modules if they meet Profile A physical requirements and if their features constitute an identity or a superset of those implemented in a Profile A system as per Tables 59 and 60. (C/BA) 896.2-1991w

**Profile B module** The assembled plug-in unit, containing a Futurebus+ interface and one or two nodes complying with Profile B, which is inserted into a compatible Futurebus+ slot. Profile B modules may operate compatibly in systems complying with other profiles if the system meets Profile B mechanical requirements, and if non-Profile B nodes properly subset their transaction set when addressing Profile B modules, as specified in this profile. (C/BA) 896.2-1991w

**Profile B system** The assembly of hardware elements made up of, at a minimum, the Profile B compliant backplane and card cage, power supply, air mover, and a bridge to the rest of the system or to another bus. Modules complying with other profiles may operate compatibly with Profile B systems and modules if they meet Profile B mechanical requirements, and if their features constitute an identity or a superset of those mandated in this profile. (C/BA) 896.2-1991w

**profile dispersion (A) (fiber optics)** In an optical waveguide, that dispersion attributable to the variation of refractive index contrast with wavelength, where contrast refers to the difference between the maximum refractive index in the core and the refractive index of the homogeneous cladding. Profile dispersion is usually characterized by the profile dispersion parameter, defined by the following entry. **(B) (fiber optics)** In an optical waveguide, that dispersion attributable to the variation of refractive index profile with wavelength. The profile variation has two contributors:

1) variation in refractive index contrast, and
2) variation in profile parameter.

*See also:* distortion; refractive index profile; dispersion. (Std100) 812-1984

**profile dispersion parameter (fiber optics)**

$$P(\lambda) = \frac{n_1}{N_1}\frac{\lambda}{\Delta}\frac{d\Delta}{d\lambda}$$

where $n_1$, $N_1$ are, respectively, the refractive and group indices of the core, and

$$n_1\sqrt{1 - 2\Delta}$$

is the refractive index of the homogeneous cladding, $N_1 = n_1 - \lambda(dn_1/d\lambda)$, and $\Delta$ is the refractive index constant. Sometimes it is defined with the factor $(-2)$ in the numerator. *See also:* dispersion. (Std100) 812-1984w

**Profile F module** The assembled unit, containing a Futurebus+ interface and one or two nodes complying with Profile F, which is inserted into a compatible Futurebus+ slot. Profile F modules may operate compatibly in systems complying with other profiles if the system meets Profile F mechanical requirements, and if non-Profile F nodes properly subset their transaction set when addressing Profile F modules, as specified in this profile. (C/BA) 896.2-1991w

**Profile F system** The assembly of hardware elements made up of, at a minimum, the Profile F compliant backplane and card cage, power supply, and an air mover. Modules complying with other profiles may operate compatibly with Profile F systems and modules if they meet Profile F mechanical requirements, and if their features constitute an identity or a superset of those mandated in this profile. (C/BA) 896.2-1991w

**profile parameter (fiber optics)** The shape-defining parameter, $g$, for a power-law index profile. *See also:* refractive index profile; power-law index profile. (Std100) 812-1984w

**Profile S module** The assembled unit, containing a Futurebus+ interface and one or two nodes complying with Profile S, which is inserted into a compatible Futurebus+ slot. (C/BA) 896.10-1997

**Profile S system** The assembly of hardware elements made up of, at a minimum, the Profile S compliant backplane, card cage, and a power supply. Modules complying with other profiles may operate compatibly with Profile S systems and modules if they meet Profile S mechanical requirements, and if their features constitute an identity or a superset of those mandated in this profile. (C/BA) 896.10-1997

**prognosis (test, measurement, and diagnostic equipment)** The use of test data in the evaluation of a system or equipment for potential or impending malfunctions. (MIL) [2]

**program (1) (general)** A sequence of signals transmitted for entertainment or information. (SP) 151-1965w
**(2) (A) (electronic computation)** A plan for solving a problem. **(B) (electronic computation)** Loosely, a routine. **(C) (electronic computation)** To devise a plan for solving a problem. **(D) (electronic computation)** Loosely, to write a routine. *See also:* communication; source program; object program; target program; computer program; programmed acceleration. (ED/ED/C) 581-1978, 641-1987, 162-1963
**(3) (telephone switching systems)** A set of instructions arranged in a predetermined sequence to direct the performance of a planned action or actions. (COM) 312-1977w
**(4) (semiconductor memory)** The inputs that when true enable programming, or writing into, a programmable read only memory (PROM). (TT/C) 662-1980s
**(5) (software)** To write a computer program. (C) 610.12-1990
**(6)** A prepared sequence of instructions to the system to accomplish a defined task. The term *program* in POSIX.2 encompasses applications written in the Shell Command Language, complex utility input languages (for example, awk, lex, sed, etc.), and high-level languages. (C/PA) 9945-2-1993
**(7)** The process of incorporating digital data onto an integrated circuit. (C) 610.10-1994w
**(8)** A collection of processes working together to accomplish a common task. (C/MM) 855-1990
**(9)** The operation of injecting electrons onto the floating gate of the memory cell. (ED) 1005-1998
**(10)** A set of partitions, which can execute in parallel with one another, possibly in a separate address space and possibly on a separate computer. (C) 1003.5-1999

**program amplifier** *See:* line amplifier.

**program architecture (software)** The structure and relationships among the components of a computer program. The program architecture may also include the program's interface with its operational environment. *See also:* computer program; component. (C/SE) 729-1983s

**program attention key** *See:* attention key.

**program block (software)** In problem-oriented languages, a computer program subdivision that serves to group related statements, delimit routines, specify storage allocation, delineate the applicability of labels, or segment paths of the computer program for other purposes. *See also:* computer program; label; segment; routine. (C/SE) 729-1983s

**program correctness** *See:* correctness.

**program counter (1)** A register in the processing unit that contains the address of the next instruction to be executed. *Synonym:* instruction address register. (C) 610.10-1994w
**(2)** *See also:* instruction counter. (C) 610.12-1990

**program data set** A data set in which user programs are stored. (C) 610.5-1990w

**program definition language** *See:* program design language.

**program design language (1) (software)** A specification language with special constructs and, sometimes, verification

protocols, used to develop, analyze, and document a program design. *See also:* hardware design language. (C) 610.12-1990

**(2) (software)** *See also:* design language.

**(3)** A specification language with special constructs and verification protocols, used to develop, analyze, and document a program design. *Contrast:* hardware design language. (C) 610.13-1993w

**program disturb** The corruption of data in one location caused by the programming of data at another location. (ED) 1005-1998

**program editor** A text editor user to enter, alter, and view source code for computer programs. Such an editor may have features that make it sensitive to the syntax of the source language on which it operates. *Contrast:* document editor. (C) 610.2-1987

**program-erase cycle** The event of writing a memory cell from the programmed state to the erased state and back to the programmed state. *Note:* This event may be used as a unit of measurement for endurance. Within a sequence, program-erase cycles are indistinguishable from erase-program cycles. *See also:* erase-program cycle. (ED) 1005-1998

**program evaluation and review technique (PERT) (1)** A variation of the critical path method in which minimum, maximum, and most likely times are used to estimate the mean and standard deviation of each activity item; these values are used to compute estimated path times and to find the critical path; and the critical path values are used to find the standard deviation of the completion time for the whole project. (C) 610.2-1987

**(2)** A diagrammatic method for establishing program goals and tracking. (PE/NP) 933-1999

**program extension (software)** An enhancement made to existing software to increase the scope of its capabilities. *See also:* software; enhancement. (C/SE) 729-1983s

**program flowchart** *See:* flowchart.

**program instruction** A computer instruction in a source program. *Note:* A program instruction is distinguished from a computer instruction that results from assembly, compilation, or other interpretation process. (C) 610.12-1990

**program instrumentation (A) (software)** Probes, such as instructions or assertions, inserted into a computer program to facilitate execution monitoring, proof of correctness, resource monitoring, or other activities. **(B) (software)** The process of preparing and inserting probes into a computer program. *See also:* computer program; execution; instruction; proof of correctness; assertion. (C/SE) 729-1983

**program level** The magnitude of program in an audio system expressed in volume units. (SP) 151-1965w

**program library** *See:* software library.

**program listing** A printout or other human readable display of the source and, sometimes, object statements that make up a computer program. (C) 610.12-1990

**program loading** Placing executable instructions into the memory of a computer where they can be executed. (C) 610.10-1994w

**programmable (1) (programmable instrumentation)** That characteristic of a device that makes it capable of accepting data to alter the state of its internal circuitry to perform a specific task(s). (IM/AIN) 488.1-1987r

**(2)** Pertaining to a device such as a circuit or a keyboard that can accept instructions that alter its basic functions. *Contrast:* hardwired. *See also:* user-programmable computer; microprogrammable computer. (C) 610.10-1994w

**programmable array logic** A programmable, two-level logic device in which the input decode (AND array) logic is programmable, but the output (OR array) is fixed. *Contrast:* programmable logic array. (C) 610.10-1994w

**programmable breakpoint** A breakpoint that automatically invokes a previously specified debugging process when initiated. *See also:* prolog breakpoint; dynamic breakpoint; data breakpoint; epilog breakpoint; code breakpoint; static breakpoint. (C) 610.12-1990

**programmable connection** A connection in which information is sent over data type circuits. *See also:* RJ-11; permissive connection. (C) 610.7-1995

**programmable controller** Solid state control system with programming capability that performs functions similar to a relay logic system. (PE/EDPG) 1020-1988r

**programmable digital computer (programmable digital computer systems in safety systems of nuclear power generating stations)** A device that can store instructions and is capable of the execution of a systematic sequence of operations performed on data that is controlled by internally stored instructions. 7432-1982w

**programmable equipment (supervisory control, data acquisition, and automatic control)** A remote or master station having one or more of its operations specified by a program contained in a memory device. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**programmable function key** *See:* user-definable key.

**programmable logic array** A general-purpose integrated circuit that consists of an array of gates that can be programmed to perform various functions. *Contrast:* programmable array logic. *See also:* field programmable logic array. (C) 610.10-1994w

**programmable measuring apparatus (programmable instrumentation)** A measuring apparatus that performs specified operations on command from the system and may transmit the results of the measurement(s) to the system. (IM/AIN) 488.1-1987r

**programmable read-only memory** A type of read-only memory whose contents can be initialized, or burned, only once, and cannot thereafter be altered. *See also:* erasable programmable read-only memory; PROM burner; electrically erasable programmable read-only memory. (C) 610.10-1994w

**programmable stimuli (test, measurement, and diagnostic equipment)** Stimuli that can be controlled in accordance with instructions from a programming device. (MIL) [2]

**programmable terminal** *See:* intelligent terminal.

**program margin** The minimum measured difference between the programmed states and the sensing level for the array. (ED) 1005-1998

**programmed acceleration** A controlled velocity increase to the programmed rate. (IA/EEC) [61], [74]

**programmed check** A check procedure designed by the programmer and implemented specifically as a part of his program. *See also:* check problem; mathematical check. (C) [20], [85]

**programmed control** A control system in which the operations are determined by a predetermined input program from cards, tape, plug boards, cams, etc. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**programmed deceleration (numerically controlled machines)** A controlled velocity decrease to a fixed percent of the programmed rate. (IA) [61]

**PRogrammed Electronics Patterns (PREP)** A programming language for use in designing integrated circuits. *Note:* PREP is conceptually similar to APT, except that it involves description of two-dimensional figures. (C) 610.13-1993w

**Programmed Inquiry, Learning Or Teaching (PILOT)** A programming language designed for writing computer-aided instruction applications; PILOT is simple and well-suited to support an interactive "question and answer" type of system. (C) 610.13-1993w

**programmed input-output** A method for transferring data between an interface and memory in which the program polls the input-output device to see if data is available. *Contrast:* direct memory access. *See also:* direct memory transfer. (C) 610.10-1994w

**programmed instruction** A self-instructional method using materials that lead the student through a systematic sequence

of steps to a predetermined learning objective. (C) 610.2-1987

**programmer (1) (A) (test, measurement, and diagnostic equipment)** A device having the function of controlling the timing and sequencing operations. **(B) (test, measurement, and diagnostic equipment)** A person who prepares sequences of instructions for a programmable machine. (MIL) [2]

**(2)** An arrangement of operating elements or devices that initiates, and often controls, one or a series of operations in a given sequence. (SWG/PE) C37.100-1992

**programmer-comparator (A) (test, measurement, and diagnostic equipment)** A device that reads commands and data from a sequential program usually on tape or cards. **(B) (test, measurement, and diagnostic equipment)** A device that sets up delays, switching, and stimuli, and performs measurements as directed by the program. **(C) (test, measurement, and diagnostic equipment)** A device that compares the results of each measurement with fixed programmed tolerance limits to arrive at a decision. Often numerous other operations, such as branching on no-go or other conditions, are included. (MIL) [2]

**programmer manual** A document that provides the information necessary to develop or modify software for a given computer system. Typically described are the equipment configuration, operational characteristics, programming features, input/output features, and compilation or assembly features of the computer system. *See also:* diagnostic manual; installation manual; user manual; operator manual; support manual. (C) 610.12-1990

**Programmer's Hierarchical Interactive Graphics System** A computer graphics standard that provides a complete graphics system designed for interactive three-dimensional applications using complex data structures and modeling. It was developed by the American National Standards Institute (ANSI). (C) 610.6-1991w

**programming (1) (electronic computation)** The ordered listing of a sequence of events designed to accomplish a given task. *See also:* multiprogramming; automatic programming; linear programming. (MIL/IA) [2], [84], [61]

**(2) (power supplies)** The control of any power-supply functions, such as output voltage or current, by means of an external or remotely located variable control element. Control elements may be variable resistances, conductances, or variable voltage or current sources. (AES) [41]

**programming (write) algorithm** Typically for flash memories or ultraviolet-erasable programmable read-only memories (UV-EPROMs), the specified timed sequence of signals and levels necessary to cause the device to program. (ED) 1005-1998

**programming delay** D A relay whose function is to establish or detect electrical sequences. (SWG/PE) C37.100-1981s

**PROgramming in LOGic (PROLOG)** A declarative programming language that uses precise rules, in the form of a rule and fact set model, to reach solutions to problem descriptions. *Note:* Used in artificial intelligence applications for building expert systems. (C) 610.13-1993w

**programming language** A computer language used to express computer programs. *Contrast:* design language; query language; specification language; test language. *See also:* high-order language; machine language; common language; assembly language; general-purpose programming language. (C) 610.13-1993w, 610.12-1990

**Programming Language/1 (PL/1)** A programming language that is suitable for processing numerical, scientific, and business applications and that is standardized by ANSI. *See also:* LPL; ALPHA; FORMAC; block-structured language; IITRAN. (C) 610.13-1993w

**programming language API specification** The interface between applications and application platforms traditionally associated with programming language specifications, such as program control, math functions, string manipulation, etc. (C/PA) 14252-1996

**programming language binding specification** For a language-independent specification, a document that specifies, in terms of a particular programming language, the behavior that the language-independent specification specifies in language-independent terms. It may also specify additional behavior that is relevant to the usage of the particular programming language. (C/PA) 1328-1993w, 1224-1993w, 1326.1-1993w, 1224.1-1993w, 1327-1993w

**Programming Language/Data Base (PL/DB)** A dialect of PL/1 designed specifically for processing databases and including normal executable statements for arithmetic, conditional, and loop control and supports hierarchical data structures. (C) 610.13-1993w

**Programming LANguage for Interactive Teaching (PLANIT)** An instructional system consisting of a user language that supports the development of computer programs for preparing, editing, and presenting subject matters suitable for interactive presentations. (C) 610.13-1993w

**programming, linear** *See:* linear programming.

**programming linearity (power supplies)** The linearity of a programming function refers to the correspondence between incremental changes in the input signal (resistance, voltage, or current) and the consequent incremental changes in power-supply output. *Note:* Direct programming functions are inherently linear for the bridge regulator and are accurate to within a percentage equal to the supply's regulating ability. (AES) [41]

**programming, nonlinear** *See:* nonlinear programming.

**programming, quadratic** *See:* quadratic programming.

**programming relay** A relay whose function is to establish or detect electrical sequences. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**programming speed (power supplies)** Describes the time requires to change the output voltage of a power supply from one value to another. The output voltage must change across the load and because the supply's filter capacitor forms a resistance-capacitance network with the load and internal source resistance, programming speed can only be described as a function of load. Programming speed is the same as the recovery-time specification for current-regulated operation; it is not related to the recovery-time specification for voltage-regulated operation. (AES) [41]

**programming support environment (software)** An integrated collection of software tools accessed via a single command language to provide programming support capabilities throughout the software life cycle. The environment typically includes tools for specifying, designing, editing, compiling, loading, testing, configuration management, and project management. Sometimes called integrated programming support environment. *See also:* scaffolding. (C) 610.12-1990

**programming system** A set of programming languages and the support software (editors, compilers, linkers, etc.) necessary for using these languages with a given computer system. (C) 610.12-1990

**program mutation (A) (software)** A computer program that has been purposely altered from the intended version to evaluate the ability of test cases to detect the alteration. *See also:* mutation testing. **(B) (software)** The process of creating an altered program as in definition "A." (C) 610.12-1990

**program network chart** A diagram that shows the relationship between two or more computer programs. (C) 610.12-1990

**program production time** That part of system production time during which a computer program is successfully executed. (C) 610.10-1994w

**program protection (software)** The application of internal or external controls to preclude any unauthorized access or modification to a computer program. *See also:* modification; computer program. (C/SE) 729-1983s

**program register** *See:* instruction address register.

**program-sensitive fault (1) (computers)** A fault that appears in response to some particular sequence of program steps. (C) [20], [85]

**(2) (software)** A fault that causes a failure when some particular sequence of program steps is executed. *Contrast:* data-sensitive fault. (C) 610.12-1990

**program specification (software)** Any specification for a computer. program. *Synonym:* design specification. *See also:* requirements specification; performance specification; functional specification; design specification. (C/SE) 729-1983s

**program status word (PSW) (A)** A computer word that contains information specifying the current status of a computer program. The information may include error indicators, the address of the next instruction to be executed, currently enabled interrupts, and so on. **(B)** A special-purpose register that contains a program status word as in (A). (C) 610.12-1990

**program stop (numerically controlled machines)** A miscellaneous function command to stop the spindle, coolant, and feed after completion of other commands in the block. It is necessary for the operator to push a button in order to continue with the remainder of the program. (IA) [61], [84]

**program support library** *See:* software development library.

**program structure diagram** *See:* structure chart.

**program synthesis (software)** The use of software tools to aid in the transformation of a program specification into a program that realizes that specification. (C) 610.12-1990

**program test time** That part of system production time during which a computer program is tested. (C) 610.10-1994w

**program tracking (communication satellite)** A technique for tracking a satellite by pointing a high-gain antenna toward the satellite that employs a computer program for antenna pointing; known orbital parameters are used as an input to the computer program. (COM) [19]

**program validation** *See:* computer program validation; validation.

**progressive grading (telephone switching systems)** A grading in which the outlets of different grading groups are connected together in such a way that the number of grading groups connected to each outlet is larger for later choice outlets. (COM) 312-1977w

**progressive scanning*** *See:* sequential scanning.
* Deprecated.

**project (1) (unique identification in power plants)** A single- or multiple-unit power plant or major independent related facility. A project is composed of systems and structures and may be defined to include the design, construction, operation, and related activities associated with the project during its life cycle. (PE/EDPG) 803-1983r

**(2)** A subsystem that is subject to maintenance activity. (C/SE) 1219-1998

**(3)** A temporary endeavor undertaken to create a unique product or service. (C/SE) 1490-1998

**(4) (unique identification in power plants)** *See also:* projection. (C) 610.5-1990w

**project agreement** A document or set of documents baselined by the acquirer and the supplier that specifies the conditions under which the project will be conducted. A project agreement may include items such as the scope, objectives, assumptions, management interfaces, risks, staffing plan, resource requirements, price, schedule, resource and budget allocations, project deliverables, and acceptance criteria for the project deliverables. Documents in a project agreement may include some or all of the following: a contract, a statement of work, user requirements, system engineering specifications, software requirements specifications, a software project management plan, supporting process plans, a business plan, a project charter, or a memo of understanding. (C/SE) 1058-1998

**project deliverable (1)** A work product to be delivered to the acquirer. Quantities, delivery dates, and delivery locations are specified in a project agreement. Project deliverables may include the following: operational requirements, functional specifications, design documentation, source code, object code, test results, installation instructions, training aids, user's manuals, product development tools, and maintenance documentation. Project deliverables may be self-contained or may be part of a larger system's deliverables. (C/SE) 1058-1998

**(2)** The work product(s) to be delivered to the customer. The quantities, delivery dates, and delivery locations are specified in the project agreement. (C/SE) 1058.1-1987s

**projected peak point (tunnel-diode characteristic)** The point on the forward current-voltage characteristic where the current is equal to the peak-point current and where the voltage is greater than the valley-point voltage. *See also:* peak point. (ED) [46]

**projected peak-point voltage (tunnel-diode characteristic)** The voltage at which the projected peak point occurs. *See also:* peak point. (ED) [46]

**project environment** An environment that defines the objectives, success criteria, project milestones, and associated management priorities that govern the systems engineering activities in support of product development. (C/SE) 1220-1998

**project evaluation and review technique*** *See:* program evaluation and review technique.
* Deprecated.

**project file (software)** A central repository of material pertinent to a project. Contents typically include memos, plans, technical reports, and related items. *Synonym:* project notebook. (C) 610.12-1990

**project function** An activity that spans the entire duration of a software project. Examples of project functions include project management, configuration management, quality assurance, and verification and validation. (C/SE) 1058.1-1987s

**projection (1) (data management)** A relational operator that extracts specified attributes from a relation and results in a relation containing only those attributes. *Synonym:* project. *See also:* product; join; selection; intersection; union; difference.

| Name | Homeroom |
|---|---|
| Mary | 26A |
| Joe | 43 |
| Harry | 27 |
| Michael | 25 |
| Susan | 25 |
| Mickey | 41 |

**Projection** of Relation *Students* in Fig to entity/attribute matrix on Attributes NAME and HOMEROOM

**projection**

(C) 610.5-1990w

**(2) (computer graphics)** The transformation of an *N*-dimensional image into an image in less than *N* dimensions. For example, a shadow cast by the sun is a two-dimensional projection of a person or object existing in three dimensions. *See also:* perspective projection; parallel projection; stereoscopic projection. (C) 610.6-1991w

**projection/join normal form** *See:* fifth normal form.

**projection tube** A cathode-ray tube specifically designed for use with an optical system to produce a projected image. (ED) [45]

**project library** *See:* software development library.

**project life cycle** A collection of generally sequential project phases whose name and number are determined by the control needs of the organization or organizations involved in the project. (C/SE) 1490-1998

**project notebook** *See:* project file.

**projector (illuminating engineering)** A lighting unit which, by means of mirrors and lenses, concentrates the light to a limited solid angle so as to obtain a high value of luminous intensity. (EEC/IE) [126]

**project plan (software)** A document that describes the technical and management approach to be followed for a project. The plan typically describes the work to be done, the resources required, the methods to be used, the procedures to be followed, the schedules to be met, and the way that the project will be organized. For example, a software development plan. (C) 610.12-1990

**PROLOG** *See:* PROgramming in LOGic.

**prolog breakpoint (software)** A breakpoint that is initiated upon entry into a program or routine. *Synonym:* preamble breakpoint. *Contrast:* epilog breakpoint. *See also:* dynamic breakpoint; code breakpoint; static breakpoint; programmable breakpoint; data breakpoint. (C) 610.12-1990

**PROM** Programmable read-only memory. A form of nonvolatile memory that is supplied with null contents and is loaded with its contents in the laboratory or in the field. Once programmed, its contents cannot be changed. (C/BA) 14536-1995

**PROM burner** *See:* PROM programmer.

**promiscuous mode (local area networks)** A mode in which a repeater port or an end node receives all message traffic transmitted on the network. (C) 8802-12-1998

**PROM programmer** A device used to program PROM devices and to reprogram EPROM, using electrical pulses. *Synonym:* PROM burner. (C) 610.10-1994w

**prompt (A) (computer graphics) (software)** A symbol or message displayed by a computer system requesting input from the user of the system. **(B) (software) (computer graphics)** To display a symbol or message as in definition "A." (C) 610.6-1991, 610.12-1990

**proof (1) (packaging machinery)** (used as a suffix) So constructed, protected, or treated that its successful operation is not interfered with when subjected to the specified material or condition. (SWG/IA/PKG) 333-1980w

**(2) (suffix)** An apparatus is designated as dustproof, splashproof, etc., when so constructed, protected, or treated that its successful operation is not interfered with when subjected to the specified material or condition. (T&D/PE/TR) 18-1992, C57.12.80-1978r

**(3)** (used as a suffix) So constructed, protected, or treated that successful operation is not interfered with when the device is subjected to the specified material or condition. *Note:* Explosionproof requires that the fuse shall not be injured and flame shall not be transmitted to the outside of the fuse for all current interruptions within the rating of the fuse. (SWG/PE/SWG-OLD) C37.40-1993, C37.100-1992

**proof mass (accelerometer)** The effective mass whose inertia transforms an acceleration along, or about, an input axis into a force or torque. The effective mass takes into consideration flotation and contributing parts of the suspension. (AES/GYAC) 528-1994

**proof of correctness (A) (software)** A formal technique used to prove mathematically that a computer program satisfies its specified requirements. *See also:* total correctness; formal specification; assertion; partial correctness; inductive assertion method. **(B) (software)** A proof that results from applying the technique in definition "A." (C) 610.12-1990

**proof of performance** The report submitted to the regulatory body which includes field strength measurements and other information to show that the measured radiation pattern meets the conditions specified in the station license. (T&D/PE) 1260-1996

**proof test (1) (evaluation of thermal capability) (thermal classification of electric equipment and electrical insulation)** A means of evaluation in which an arbitrary fixed level of a diagnostic factor is applied periodically. In this case, the number of failures among multiple test specimens (rather than the magnitude of the diagnostic factor) defines the end-point of the test. *See also:* diagnostic factor. (EI) 1-1986r

**(2) (rotating machinery) (withstand test)** A "fail" or "no fail" test of the insulation system of a rotating machine made to demonstrate whether the electrical strength of the insulation is above a predetermined minimum value. (PE/EM) 95-1977r

**proof testing** That test used to qualify equipment for a particular application or to a particular requirement. (SWG/PE) C37.100-1992, C37.81-1989r

**proof-test load (composite insulators)** The routine mechanical load that is applied to an insulator at the time of its manufacture. (T&D/PE) 987-1985w

**propagated error** An error that occurs in a GIVEN operation and is passed along to a later operation. *Contrast:* inherited error. (C) 1084-1986w

**propagated potential (biological)** A change of potential involving depolarization progressing along excitable tissue. (EMB) [47]

**propagating mode (1) (waveguide)** A waveguide mode such that the variation of phase along the direction of the guide is not negligible. (MTT) 146-1980w

**(2)** Refers to a mode where the imaginary part of the propagation constant is much greater than the real part, (i.e., the mode is not cut-off as in a metallic wave guide). (AP/PROP) 211-1997

**propagation (data transmission) (electrical practice)** The travel of waves through or along a medium. (PE) 599-1985w

**propagation constant ($\gamma$) (1) (fiber optics)** For an electromagnetic field mode varying sinusoidally with time at a given frequency, the logarithmic rate of change, with respect to distance in a given direction, of the complex amplitude of any field component. *Note:* The propagation constant is a complex quantity. (Std100) 812-1984w

**(2) (A) (transmission lines and transducers)** (per unit length of a uniform line). The natural logarithm of the ratio of the phasor current at a point of the line, to the phasor current at a second point, at unit distance from the first point along the line in the direction of transmission, when the line is infinite in length or is terminated in its characteristic impedance. **(B) (transmission lines and transducers)** (per section of a periodic line). The natural logarithm of the ratio of the phasor current entering a section, to the phasor current leaving the same section, when the periodic line is infinite in length or is terminated in its iterative impedance. **(C) (transmission lines and transducers)** (of an electric transducer). The natural logarithm of the ratio of the phasor current entering the transducer, to the phasor current leaving the transducer, when the transducer is terminated in its iterative impedance. (Std100) 270-1966

**(3) (overhead power lines)** The complex quantity of a traveling plane wave at a given frequency whose real part is the attenuation constant in nepers per unit length and whose imaginary part is the phase constant in radians per unit length. (T&D/PE/MTT) 539-1990, 146-1980w

**(4)** The image transfer constant for a symmetrical transducer. (CAS) [13]

**(5) (planar transmission lines)** A complex parameter having the dimension of inverse length, which characterizes the variation of the field magnitude and phase of a mode in the direction of propagation. The real part is denoted as the attenuation constant and the imaginary part as the phase constant. (MTT) 1004-1987w

**(6)** The complex scalar $\gamma$ in expressions for one-dimensional wave propagation using the exponential factor $\exp(-\gamma z)$.

$$\gamma = jk = \alpha + j\beta$$

where scalar quantity $\alpha$ is the attenuation, scalar quantity $\beta$ is the phase constant, and $k$ is the wave number. *See also:* plane wave propagation factor; propagation vector. (AP/PROP) 211-1997

**propagation delay (1) (power generation) (sequential events recording systems)** The time interval between the appearance of a signal at any circuit input and the appearance of the associated signal at that circuit output. (PE/EDPG) [1]

**(2)** In networking, the delay time between when a signal enters a channel and when it is received. *See also:* time delay. (C) 610.7-1995

**(3) (A)** The amount of time between when a signal is impressed on the input of a circuit and when it is received or detected at the output. **(B)** The time delay between when a signal is input to a device and a resultant action occurs on its output. *Synonym:* latency. (C) 610.10-1994

**(4)** The time required for energy to propagate between two specified points, determined by multiplying the group velocity of the wave by the distance between the two points projected onto the direction of propagation. (AP/PROP) 211-1997

**propagation factor (radio-wave propagation)** For a time-harmonic wave propagating from one point to another, the ratio of the complex electric field strength at the second point to that value which would exist at the second point if propagation took place in a vacuum. (AP) 211-1977s

**propagation loss** The total reduction in radiant power surface density. The propagation loss for any path traversed by a point on a wave front is the sum of the spreading loss and the attenuation loss for that path. *See also:* radio transmission. (Std100) 270-1966w

**propagation mode (1) (laser maser)** (in a periodic beamguide) A form of propagation characterized by identical field distributions over cross-sections of the beam at positions separated by one period of the guide. (LEO) 586-1980w

**(2) (overhead-power-line corona and radio noise)** A concept for treating propagation of electromagnetic noise along a set of overhead power-line conductors. Modal waves form a complete set of noninteracting components into which the propagated wave may be separated. *Note:* For a three-phase horizontal single-circuit transmission line with one conductor per phase and without ground wires, the following modes are defined: Mode 1—The transmission path is between the center phase and the outside phases. It has the lowest attenuation and the lowest surge impedance. Mode 2—The transmission path is between outside phases. It has an intermediate attenuation and an intermediate surge impedance. Mode 3—The transmission path is along all three phases and returning through ground. It has the highest attenuation and the highest surge impedance. (T&D/PE) 539-1990

**propagation model** An empirical or mathematical expression used to compute propagation path loss. *See also:* electromagnetic compatibility. [53]

**propagation ratio (radio-wave propagation)** For a time-harmonic wave propagating from one point to another, the ratio of the complex field strength at the second point to that at the first point. (AP) 211-1977s

**propagation sort** *See:* bubble sort.

**propagation vector (1)** Vector-characterizing phase progression of a wave in direction normal to lines of constant phase with magnitude proportional to the reciprocal of the wavelength. (UFFC) 1037-1992w

**(2)** The complex vector $k$ in expressions for wave propagation using the exponential factor $\exp[-j(\vec{k} \cdot \vec{r})]$ is:

$\vec{k} = \vec{\beta} - j\vec{\alpha}$

where

$\vec{\beta}$ = the phase vector
$\vec{\alpha}$ = the attenuation vector
$\vec{r}$ = a position vector

(AP/PROP) 211-1997

**propagation vector in physical media** The complex vector $\overline{\gamma}$ in plane wave solutions of the form $e^{-\gamma \cdot r}$ for an $e^{jwt}$ time variation and $\overline{r}$ the position vector. *See also:* attenuation vector in physical media; wave vector in physical media; phase vector in physical media. (AP/ANT) 145-1983s

**propeller turbine** A reaction turbine with fixed or variable pitch propeller-type blades. (PE/EDPG) 1020-1988r

**propeller-type blower (rotating machinery)** An axial-flow fan with air-foil-shaped blades. *See also:* fan. (PE) [9]

**prop-encoded-array** The primitive data type, consisting of a sequence of bytes, used to represent a property value. (C/BA) 1275-1994

**proper ferroelectric (primary ferroelectric terms)** A ferroelectric in which the polarization is the primary order parameter. (UFFC) 180-1986w

**proper mode** A mode of propagation that can be excited by a physical source. (AP/PROP) 211-1997

**proper operation** The functioning of the train control or cab signaling system to create or continue a condition of the vehicle apparatus that corresponds with the condition of the track of the controlling section when the vehicle apparatus is in operative relation with the track elements of the system. (EEC/PE) [119]

**property (1)** A kind of responsibility that is an inherent or distinctive characteristic or trait that manifests some aspect of an object's knowledge or behavior. Three kinds of property are defined: attributes, participant properties due to relationships, and operations. (C/SE) 1320.2-1998

**(2)** A documenting characteristic of an entity type used to group and differentiate individual entities. *Note:* An example of a property is "Stop." This property might be associated with the entity types "ROUTE.BUS" and "ROUTE.TRAVELER." (SCC32) 1489-1999

**property encoding** A specific data format, defined by this standard, that is used to represent various types of information within a prop-encoded-array. (C/BA) 1275-1994

**property name** A text string used to specify, or name, a particular property. (C/BA) 1275-1994

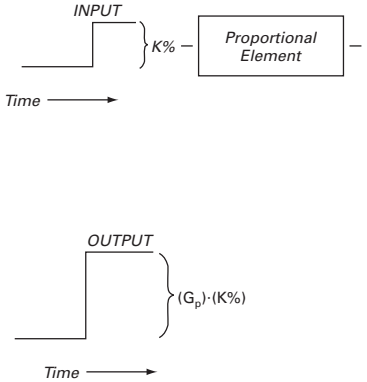
**property value** The data portion of a property, stored in property encoding format. (C/BA) 1275-1994

**proportional amplifier** An amplifier in which the output is a single value and an approximately linear function of the input over its operating range. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**proportional control action** A control mode designed to provide a linear relationship between the controller output and input, assuming both are within normal range. *See also:* proportional control action. (PE/PSE) 94-1991w

**proportional counter tube** A radiation-counter tube designed to operate in the proportional region. (C) 165-1977w

**proportional gain (hydraulic turbines)** The proportional gain $G_p$ of a proportional element is the ratio of the element's percent output to its percent input. A linear relationship is assumed.




**proportional gain**

(PE/EDPG) 125-1977s

**proportionally** *See:* linearity.

**proportional plus derivative control** *See:* control action, proportional plus derivative.

**proportional plus integral control** *See:* proportional plus integral control action.

**proportional plus integral control action** Control action in which the output is proportional to a linear combination of the input and the time integral of the input. *Note:* In the practical embodiment of proportional plus integral action the relation between output and input, neglecting high frequency terms, is

$$\frac{Y}{X} = \pm P \frac{\frac{I}{s} + 1}{\frac{bI}{s} + 1} \quad 0 \le b \ll 1$$

where
$b$ = proportional gain/static gain
$I$ = integral action rate
$P$ = proportional gain
$s$ = complex variable
$X$ = input transform
$Y$ = output transform

*Synonym:* P.I. (CS/PE/EDPG) [3]

**proportional plus integral plus derivative control** *See:* proportional plus integral plus derivative control action.

**proportional plus integral plus derivative control action** Control action in which the output is proportional to a linear combination of the input, the time integral of input and the time rate-of-change of input. *Note:* In the practical embodiment of proportional plus integral plus derivative control action the relationship of output and input, neglecting high frequency terms, is

$$\frac{Y}{X} = \pm P \frac{1 + sD}{1 + sD/a} \quad a > 1$$

where
$a$ = derivative action gain
$b$ = proportional gain/static gain
$D$ = derivative action time constant
$I$ = integral action rate
$P$ = proportional gain
$s$ = complex variable
$X$ = input transform
$Y$ = output transform

*Synonym:* P.I.D. (CS/PE/EDPG) [3]

**proportional region (radiation counter tubes)** The range of operating voltage for a counter tube in which the gas amplification is greater than unity and is independent of the amount of primary ionization. *Notes:* 1. In this region the pulse size from a counter tube is proportional to the number of ions produced as a result of the initial ionizing event. 2. The proportional region depends on the type and energy of the radiation. (ED) 161-1971w

**proportional spacing** Text formatting and output that takes into account the width of each character, rather than allocating the same amount of horizontal space to characters of all widths. (C) 610.2-1987

**proportionate mortality ratio** An index used in occupational epidemiological studies that expresses the proportion of deaths from a single cause. It is not a mortality rate and, therefore, does not necessarily indicate a risk value. Rather, it indicates within a group the relative importance of specific causes of death. (T&D/PE) 539-1990

**proprietary system (protective signaling)** A local system sounding and/or recording alarm and supervisory signals at a control center located within the protected premises, the control center being under the supervision of employees of the proprietor of the protected premises. *Note:* According to the United States Underwriters' rules, a proprietary system must be a recording system. *See also:* protective signaling. (EEC/PE) [119]

**propulsion-control transfer switch** Apparatus in the engine room for transfer of control from engine room to bridge and vice versa. *Note:* Engine-room control is provided on all ships. Bridge control with a transfer switch is optional and is used principally on small vessels such as tugs or ferries, usually with a direct-current propulsion system. (EEC/PE) [119]

**propulsion set-up switch** Apparatus providing ready means to set up for operation under varying conditions where practicable; for example, cutout of one or more generators when multiple units are provided. *See also:* electric propulsion system. (EEC/PE) [119]

**propulsion system** The system of motors, drive mechanisms, controls, and other devices that propels or retards a vehicle. (VT) 1475-1999

**prorated section** A complete, suitably housed part of an arrester, comprising all necessary components, including gaseous medium, in such a proportion as to accurately represent, for a particular test, the characteristics of a complete arrester. (SPD/PE) C62.11-1999

**prorated unit (arresters)** A completely housed prorated section of an arrester that may be connected in series with other prorated units to construct an arrester of higher voltage rating. (PE) [8]

**prospective characteristics of a test voltage causing disruptive discharge** The characteristics of a test voltage that would have been obtained if no disruptive discharge had occurred. (PE/PSIM) 4-1995

**prospective current (1) (ac high-voltage circuit breakers)** The current that would flow if it were not influenced by the circuit breaker. (SWG/PE) C37.081-1981r
**(2) (surge arresters) (available current)** The root-mean-square symmetrical short-circuit current that would flow at a given point in a circuit if the arrester(s) at that point were replaced by links of zero impedance. (PE) [8], [84]

**prospective current of a circuit** *See:* available current.

**prospective crest value** *See:* prospective peak value.

**prospective peak value (surge arresters)** (of a chopped impulse) The peak (crest) value of the full-wave impulse voltage from which a chopped impulse voltage is derived. *Synonym:* prospective crest value. (PE) [8]

**prospective peak value of test voltage (switching impulse testing)** The voltage that would be obtained if no disruptive discharge occurred before the crest. 332-1972w

**prospective short-circuit current** *See:* available short-circuit current.

**prospective (available) short-circuit current (at a given point in a circuit)** The maximum current that the power system can deliver through a given circuit point to any negligible impedance short circuit applied at the given point, or at any other point that will cause the highest current to flow through the given point. *Notes:* 1. This value can be in terms of either symmetrical or asymmetrical, peak, or rms current, as specified. 2. In some resonant circuits, the maximum available short-circuit current may occur when the short-circuit is placed at some other point than the given one where the available current is measured. (SWG/PE) C37.40-1993

**prospective study** An epidemiological study of a group exposed to some factor over time to determine if this factor is associated with the development of a particular disease, as compared to a nonexposed control group. (T&D/PE) 539-1990

**protected** A responsibility that is visible only to the class or the receiving instance of the class (available only within methods of the class or its subclasses). *Contrast:* private; public. *See also:* hidden. (C/SE) 1320.2-1998

**protected area (PA)** A controlled-access area encompassed by physical barriers. (PE/NP) 692-1997

**protected enclosure (electric installations on shipboard)** An enclosure in which all openings are protected with wire screen, expanded metal, or perforated covers. A common from of specifications for "protected enclosure" is: "The

openings should not exceed 1/2 sq. in. in area and should be of such shape as not to permit the passage of a rod larger than 1/2 in. in diameter, except where the distance of exposed live parts from the guard is more than 4 in. the openings may be 3/4 sq. in. in area and must be of such shape as not to permit the passage of a rod larger than 3/4 in. in diameter." (IA/MT) 45-1983s

**protected field** On a display device, a display field in which a user cannot enter, modify or erase data. *Contrast:* unprotected field. (C) 610.10-1994w

**protected location (1) (computers)** A storage location reserved for special purposes in which data cannot be stored without undergoing a screening procedure to establish suitability for storage therein. (C) [20], [85]
**(2)** A location whose contents are protected against accidental alteration, improper alteration, or unathorized access. (C) 610.10-1994w

**protected machine** *See:* guarded machine.

**protected outdoor transformer** A transformer that is not of weatherproof construction but that is suitable for outdoor use if it is so installed as to be protected from rain or immersion in water. *See also:* transformer. (PE/TR) [57]

**protected storage** A type of storage in which data cannot be modified by an application program except under specified conditions. (C) 610.10-1994w

**protected zone** *See:* cone of protection.

**protection (1)** The process of observing a system, and automatically initiating an action to mitigate the consequences of an operating condition that has deviated from the established acceptable performance criteria. (PE/EM) 1129-1992r
**(2) (software)** An arrangement for restricting access to or use of all, or part, of a computer system. *See also:* storage protection; computer system. (C/SE) 729-1983s

**protection character** A character used to replace a suppressed zero in order to avoid error or false statements; for example, in the string "$********50.03" the asterisk is the protection character. (C) 610.5-1990w

**protection exception (software)** An exception that occurs when a program attempts to write into a protected area in storage. *See also:* overflow exception; addressing exception; underflow exception; operation exception; data exception. (C) 610.12-1990

**protections** Limitations imposed on the radiated signal for certain azimuths. *Note:* These limitations generally are set so that interference does not occur to stations in that direction. (T&D/PE) 1260-1996

**protection system (1) (protection systems)** The electrical and mechanical devices (from measured process variables to protective action system input terminals) involved in generating those signals associated with the protective functions. These signals include those that actuate reactor trip and actuate engineered safety features (for example, containment isolation, core spray, safety injection, pressure reduction, and air cleaning). (PE/NP) 279-1971w
**(2)** The part of the sense and command features involved in generating those signals used primarily for the reactor trip system and engineered safety features. (PE/NP) 603-1998

**protective action (1) (protection systems)** The initiation of a signal or operation of equipment within the safety system for the purpose of accomplishing a protective function in response to a generating station condition having reached a limit specified in the design basis. *Notes:* 1. Protective action at the channel level is the initiation of a signal by a single channel when the sensed variable(s) reaches a specified limit. 2. Protective action at the system level is the operation of sufficient actuated equipment including the appropriate auxiliary supporting features to accomplish a protective function. Examples of protective actions at the system level are: rapid insertion of control rods, closing of containment isolation valves, and operation of safety injection and core spray. (PE/NP) 279-1971w
**(2)** The initiation of a signal within the sense and command features or the operation of equipment within the execute features for the purpose of accomplishing a safety function. (PE/NP) 603-1998

**protective action set point (nuclear power generating station)** The reference value to which the measured variable is compared for the initiation of protective action. (PE/NP) 380-1975w

**protective action system (1) (Class 1E power systems for nuclear power generating stations)** The electrical and mechanical equipment (from the protection system output to and including the actuated equipment-to-process coupling) that performs a protective action when it receives a signal from the protective system. *Note:* Examples of protective action systems are: control rods and their trip mechanisms; isolation valves, their operators and their contactors; and emergency service water pumps and associated valves, their motors and circuit breakers. In some instances protective actions may be performed by protective action system equipment that responds directly to the process conditions (for example, check valves, self-actuating relief valves). (PE/NP) 603-1978, 308-1980s
**(2) (nuclear power generating station)** An arrangement of equipment that performs a protective action when it receives a signal from the protection system. (PE/NP) 279-1971w

**protective buffer** An optional single word buffer in a slave that always contains a copy of the most recent data asserted or received by the slave. (NID) 960-1993

**protective covering (power cable joints)** A field-applied material to provide environmental protection over the joint or housing, or both. (PE/IC) 404-1986s

**protective device** A bypass gap, varistor, or other device that limits the voltage on the capacitor segment to a predetermined level when overcurrent flows through the series capacitor (that is, during system faults, system swings, or other abnormal events), and that is capable of carrying capacitor discharge, system fault, and load current for the specified duration. (T&D/PE) 824-1994

**protective function (1) (nuclear power generating station)** Any one of the functions necessary to mitigate the consequences of a design basis event (for example, reduce power, isolate containment, or cool the core). *Note:* A protective function is a design basis objective that must be accomplished; a successfully completed protective action at the system level, including the sensing of one or more variables, will accomplish the protective function. However, the design may be such that a given protective function may be accomplished by any one of several protective actions at the system level. (PE/NP) 379-1977s
**(2) (nuclear power generating station)** The completion of those protective actions at the system level required to maintain plant conditions within the allowable limits established for a design basis event (for example, reduce power, isolate containment, or cool the core). (PE/NP) 603-1978, 308-1980s
**(3) (nuclear power generating station)** The sensing of one or more variables associated with a particular generating station condition, the signal processing and the initiation and completion of the protective action at values of the variables established in the design bases. (PE/NP) 279-1971w, 379-1977s

**protective gap** A gap placed between live parts and ground to limit the maximum overvoltage that may otherwise occur. (SWG/PE/T&D) C37.100-1992, 516-1995

**protective level of the bypass gap** The maximum instantaneous voltage (including tolerance) appearing across the capacitor immediately before or during operation of the bypass gap. (T&D/PE) 824-1994

**protective level of the varistor** The maximum instantaneous voltage appearing across the capacitor at a specified current through the varistor. (T&D/PE) 824-1994

**protective lighting (illuminating engineering)** A system intended to facilitate the nighttime policing of industrial and other properties. (EEC/IE) [126]

**protective margin (PM)** The value of the protective ratio (PR), minus one, expressed in percent. PM = (PR − 1) · 100. (C/PE) 1313.1-1996, [8]

**protective power gap (series capacitor)** A bypass gap that limits the voltage on the capacitor segment to a predetermined level when system fault occurs on the line, and that is capable of carrying capacitor discharge, system fault, and load currents for specified durations. (T&D/PE) [26]

**protective ratio (1) (surge arresters)** The ratio of the insulation withstand characteristics of the protected equipment to the arrester protective level, expressed as a multiple of the latter figure. (PE) [8]

**(2)** The ratio of the insulation strength of the protected equipment to the overvoltages appearing across the insulation. (PE/C) 1313.1-1996

**protective relay (1) (power operations)** A device whose function is to detect defective lines or apparatus or other power system conditions of an abnormal or dangerous nature and to initiate appropriate control action. (PE/PSE) 858-1987s

**(2)** A relay whose function is to detect defective lines or apparatus or other power system conditions of an abnormal or dangerous nature and to initiate appropriate control circuit action. *Note:* A protective relay may be classified according to its input quantities, operating principle, or performance characteristics. (SWG/PE/PSR) C37.98-1977s, C37.90-1978s, C37.100-1992

**protective screen (burglar-alarm system)** A lightweight barrier of either solid strip or lattice construction, carrying electric protection circuits, and barring access through a normal opening to protected premises. *See also:* protective signaling. (EEC/PE) [119]

**protective signaling** Protective signaling comprises the initiation, transmission, and reception of signals involved in the detection and prevention of property loss or damage due to fire, burglary, robbery, and other destructive conditions, and in the supervision of persons and of equipment concerned with such detection and prevention. (EEC/PE) [119]

**protective switchgear (thyristor converter)** The ac circuit devices and the dc circuit devices that may be used in the thyristor converter unit to clear fault conditions. (IA/IPC) 444-1973w

**protective system (1) (Class 1E power systems for nuclear power generating stations)** The electrical and mechanical devices (from measured process variables to protective action system input terminals) involved in generating those signals associated with the protective functions. These signals include those that initiate reactor trip, engineered safety features (for example, containment isolation, core spray, safety injection, pressure reduction, and air cleaning) and auxiliary supporting features. (PE/NP) 308-1980s

**(2) (nuclear power generating station safety systems)** The part of the sense and command features involved in generating those signals used primarily for the reactor trip system and engineered safety features. 379-1988s

**protective system false operation rate** Protective system false operation rate = number of false operations/exposure time. (PE/PSE) 859-1987w

**protect notch** *See:* write-protect notch.

**protector joint** A split sleeve that fits over a conductor compression joint used to protect the joint from bending or damage if the joint must pass through travelers. The joint protector usually has split rubber collars at each end to protect the conductor from damage where it exits at each end of the sleeve. (T&D/PE) 524-1992r

**protector tube (1) (surge arresters)** An expulsion arrester used primarily for the protection of line ard switch insulation. (PE) 28-1974, [8]

**(2) (electron-tube type)** A glow-discharge cold-cathode tube that employs a low-voltage breakdown between two or more electrodes to protect circuits against overvoltage. (ED) [45]

**PROTEUS** A computer language used in signal processing. (C) 610.13-1993w

**protocol (1) (supervisory control, data acquisition, and automatic control)** A strict procedure required to initiate and maintain communication. (SWG/SUB/PE) 999-1992w, C37.1-1994, C37.100-1992

**(2)** A formal set of conventions governing the format and relative timing of message exchange between two communications terminals. *See also:* control procedure. (LM/COM) 168-1956w

**(3) (software)** A set of conventions that govern the interaction of processes, devices, and other components within a system. (C) 610.12-1990

**(4) (STEbus)** The signaling rules used to convey information or commands between boards connected to the bus. (C/MM) 1000-1987r

**(5) (MULTIBUS II)** The set of signaling rules used to convey information between agents. (C/MM) 1296-1987s

**(6)** A set of semantic and syntactic rules that determine the behavior of entities that interact. (C/PA) 14252-1996

**(7)** A set of rules and formats (semantic and syntactic) that determines the communication behavior of simulation applications. (DIS/C) 1278.1-1995, 1278.2-1995

**(8)** A set of conventions or rules that govern the interactions of processes or applications within a computer system or network. (ATLAS) 1232-1995

**(9) (A)** A formal set of conventions governing the format and relative timing of message exchange in a computer system. **(B)** A set of semantic and syntactic rules that determine the behavior of functional units in achieving meaningful communication. (C) 610.7-1995, 610.10-1994

**(10)** A set of semantic and syntactic rules for exchanging information. (C) 1003.5-1999

**protocol access** A protocol that is adopted at a specified reference point between a user and a network to enable the user to employ the services and/or facilities of that network. (C) 610.7-1995

**protocol control information (computer graphics)** Information exchanged between entities to coordinate their joint operation. (LM/C) 8802-6-1994

**protocol converter** A dedicated device that translates the protocol native to an end-user device into a different protocol, allowing communication with another end-user device. *Note:* A protocol converter converts the message formats so both systems are compatible. (C) 610.7-1995

**protocol data unit (PDU) (1)** Information that is delivered as a unit between peer entities of a *local area network (LAN)* or a *metropolitan area network (MAN)* and that contains control information, address information, and may contain user data. (LM/C) 8802-6-1994

**(2)** A block of data that is exchanged between two devices using a protocol. (C) 610.7-1995

**(3)** Information delivered as a unit between peer entities that may contain control information, address information, and data. (C/MM) 1394-1995

**(4)** A unit of data specified in a protocol and consisting of protocol information and, possibly, user data. (C/LM) 802.10g-1995

**(5)** A Distributed Interactive Simulation (DIS) data message that is passed on a network between simulation applications according to a defined protocol. (DIS/C) 1278.1-1995, 1278.2-1995, 1278.4-1997

**(6)** Information delivered as a unit between peer entities that contains control information and, optionally, data. (C/LM) 8802-5-1998

**(7)** The sequence of contiguous octets delivered as a unit to the MAC sub-layer or received as a unit from the MAC sublayer. A valid LLC PDU is at least 3 octets in length, and contains two address fields and a control field. A PDU may

or may not include an information field in addition. (C/LM/CC) 8802-2-1998

**(8)** Information delivered as a unit between peer entities that contains control information and, optionally, data. (EMB/MIB) 1073.3.2-2000

**protocol engine** A component of the DNI implementation model that is a conceptual machine that implements a particular communications protocol profile. (C) 1003.5-1999

**protocol entity (1)** An entity that provides one or more service access points for use by higher-level entities. (C) 610.7-1995

**(2)** An entity that follows a set of rules and formats (semantic and syntactic) that determines the communication behavior of other entities. (C/LM) 802.10g-1995

**protocol error counter (PEC)** A counter contained by a network station to keep track of protocol errors such as invalid frames. (EMB/MIB) 1073.3.1-1994

**protocol event** In the DNI implementation model, an event that is generated by a protocol engine and queued for attention by the event handler. (C) 1003.5-1999

**protocol implementation conformance statement (PICS) (1)** A statement of which capabilities and options have been implemented for a given Open Systems Interconnection (OSI) protocol. (C/LM) 8802-5-1998, 610.7-1995

**(2) (local area networks)** A statement of which capabilities and options have been implemented for a given interconnection protocol. (C) 8802-12-1998

**protocol independent interface** An interface that enables the application to be insulated from the specifics of the underlying protocol stack which provides the communication services. Protocol independent interfaces allow the application to be written so that it can be ported to various protocol stacks. (C) 1003.5-1999

**protocol profile** A set of one or more protocol definitions and, where applicable, the identification of chosen classes, subsets, option and parameters of those definitions, necessary for accomplishing a particular function. A protocol profile can be thought of as a vertical slice through a layered set of communications protocols. (C) 1003.5-1999

**protocol stack (1)** The hierarchy of protocols used in a computer network architecture. (C) 610.7-1995

**(2)** An instantiation of a set of protocols. (C/LM) 802.10a-1999

**protocol suite** A defined set of complementary protocols within the communication service profile. (DIS/C) 1278.2-1995

**protocol type (PTYPE)** A field in the RDE PDU information field that describes the protocol function of the PDU. (C/LM/CC) 8802-2-1998

**proton microscope** A device similar to the electron microscope but in which the charged particles are protons. *See also:* electron optics. (ED) [45], [84]

**proton range (solar cells)** The maximum distance traversed through a material by a proton of a given energy. (AES/SS) 307-1969w

**prototype (1) (modeling and simulation) (software)** A preliminary type, form, or instance of a system that serves as a model for later stages or for the final, complete version of the system. (C) 610.3-1989w, 610.12-1990

**(2)** An experimental model, either functional or nonfunctional, of the system or part of the system. A prototype is used to get feedback from users for improving and specifying a complex human interface, for feasibility studies, or for identifying requirements. (C/SE) 1233-1998

**prototype standard** A concrete embodiment of a physical quantity having arbitrarily assigned magnitude, or a replica of such embodiment. *Note:* As an illustration of the distinction between prototype standard and unit, the length of the United States Prototype Meter Bar is not exactly one meter. (Std100) 270-1966w

**prototype transformer** A transformer manufactured primarily to obtain engineering data or evaluate manufacturing or design feasibility. Prototypes may be pre-production units or units typical of current designs manufactured for test purposes to obtain data to comply with changes in industry standards or for other reasons. (PE/TR) C57.134-2000

**prototyping (software)** A hardware and software development technique in which a preliminary version of part or all of the hardware or software is developed to permit user feedback, determine feasibility, or investigate timing or other issues in support of the development process. *See also:* rapid prototyping. (C) 610.12-1990

**proximal (distal) point (pulse terminology)** A magnitude referenced point at the intersection of a waveform and a proximal (distal) line. *See also:* waveform epoch. (IM/WM&A) 194-1977w

**proximal stimuli (illuminating engineering)** The distribution of illuminance on the retina constitutes the proximal stimulus. (EEC/IE) [126]

**proximity-coupled dipole array antenna** An array antenna consisting of a series of coplanar dipoles, loosely coupled to the electromagnetic field of a balanced transmission line, the coupling being a function of the proximity and orientation of the dipole with respect to the transmission line. (AP/ANT) 145-1993

**proximity discharge** *See:* proximity ESD.

**proximity effect (electric circuits and lines)** The phenomenon of non-uniform current distribution over the cross section of a conductor caused by the time variation of the current in a neighboring conductor. *See also:* induction heating. (IA) 54-1955w, 270-1966w

**proximity-effect error (navigation systems) (navigation aid terms)** An error in determination of system performance caused by improper use of measurements made in the near field of the antenna system. (AES/GCS) 172-1983w

**proximity-effect ratio (power distribution, underground cables)** The quotient obtained by dividing the alternating-current resistance of a cable conductor subject to proximity effect, by the alternating-current resistance of an identical conductor free of proximity effect. (PE) [4]

**proximity ESD** *See:* indirect ESD event.

**proximity influence** The percentage change in indication caused solely by the fields produced from two edgewise instruments mounted in the closest possible proximity, one on each side (or above and below for horizontal-scale instruments). *Note:* Proximity influence of alternating-current instruments on either alternating-current or direct-current types is determined by energizing two instruments, one on each side of the test instrument (or above and below) at 90% of end-scale value (in phase with the current in the instrument under test, if the latter is alternating current). The current in the two outside instruments only shall be reversed. For rating purposes, the proximity influence shall be taken as one-half the difference in the readings in percentage of full scale. In direct-current permanent-magnet moving-coil instruments the field produced by the current in the instrument is small compared with the field from the permanent magnet. The proximity influence on either an alternating-current or direct-current test instrument will be the difference in reading, expressed as a percentage of full-scale value, of the instrument under test mounted alone on the panel, compared with the reading when two direct-current instruments are mounted in closest possible proximity, each with current applied to give 90% end-scale deflection. All three instruments shall be of the same manufacture and size. *See also:* accuracy rating. (EEC/AII) [102]

**proximity switch** A device that reacts to the proximity of an actuating means without physical contact or connection therewith. *See also:* switch. (IA/ICTL/IAC/APP) [60], [75]

**proxy install** A proxy install uses an alternate root directory as the target path. (C/PA) 1387.2-1995

**PSC** *See:* physical signaling components.

**P scan** *See:* plan-position indicator.

**P-scope** A cathode-ray oscilloscope arranged to present a P-display. (AES/RS) 686-1990

**PSDN** *See:* packet-switched data network.

**pseudo code (1) (software)** A combination of programming language constructs and natural language used to express a computer program design. For example: IF the data arrives faster than expected,THEN reject every third input.ELSE process all data received.ENDIF. (C) 610.12-1990

**(2) (test, measurement, and diagnostic equipment)** An arbitrary code, independent of the hardware of a computer, which has the same general form as actual computer code but which must be translated into actual computer code if it is to direct the computer. (MIL) [2]

**(3)** A combination of programming language constructs and natural language used to express a computer program design. For example:

IF the data arrives faster than expected

THEN reject every third input

ELSE process all data received

ENDIF

(C) 610.13-1993w

**pseudo-coning (inertial sensors) (strapdown inertial system)** A system error created when the system computer attempts to cancel a steady coning input term which in actuality does not exist. Because of certain coupling errors in the gyro, a rate input about only one axis can produce outputs on both axes of the gyro. If the coupling error, for example, is angular acceleration sensitivity, the two outputs produced will have the same form as if a true coning motion was applied to the gyro. (AES/GYAC) 528-1984s

**pseudo-instruction (1) (test, measurement, and diagnostic equipment)** An instruction which resembles the instructions acceptable to the computer but which must be translated into actual computer instructions in order to control the computer. (MIL) [2]

**(2) (software)** A source language instruction that provides information or direction to the assembler or compiler and is not translated into a target language instruction. For example, an instruction specifying the desired format of source code listings. *Synonyms:* pseudo operation; pragma; pseudo-op. (C) 610.12-1990

**pseudolatitude (navigation aid terms)** A latitude in a coordinate system which has been arbitrarily displaced from the earth's conventional latitude system so as to move the meridian convergence zone (polar region) away from the place of intended operation. (AES/GCS) 172-1983w

**pseudolongitude (navigation aid terms)** A longitude in a coordinate system which has been arbitrarily dosplace from the earth's conventional longitude system so as to move the meridian convergence zone (polar region) away from the place of intended operation. (AES/GCS) 172-1983w

**pseudonoise sequence (communication satellite)** A binary sequence with a very desirable transorthogonal auto-correlation property. In space communications commonly used for synchronization and ranging. Syn: PN sequence. (COM) [19]

**pseudo-op** *See:* pseudo-instruction.

**pseudo operation** *See:* pseudo-instruction.

**pseudo-random** Pertaining to the approximation of true, statistical randomness. (C) 1084-1986w

**pseudo-random number** Any member of a sequence of numbers sufficiently close to a random number sequence to permit its use in calculations formally requiring random numbers. (C) 1084-1986w

**pseudo-random number sequence (1)** A sequence of numbers, determined by some defined arithmetic process, that is satisfactorily random for a given purpose, such as by satisfying one or more of the standard statistical tests for randomness. Such a sequence may approximate any one of several statistical distributions, such as uniform distribution or normal Gaussian distribution. (C/C) [20], [85]

**(2) (mathematics of computing)** A sequence of numbers, determined by some defined arithmetic process, that is sufficiently close to a random number sequence to permit its use in calculations formally requiring a random number sequence. (C) 1084-1986w

**pseudo-random test signal** A signal consisting of a bit sequence that approximates a random signal. (COM/TA) 1007-1991r

**pseudo signal** A signal other than that at the interface between the device and the tester. This includes internal signals, derived signals, and any other signals that may be required by tools other than test translators to generate tests or test constructs. (C/TT) 1450-1999

**pseudoternary coding** A means of digital signaling in which three signal levels are used to encode binary data. (C) 610.10-1994w

**PSF** *See:* product specification file.

**PSK** *See:* phase-shift keying.

**PSN** *See:* public switched network; private switching network.

**PSPDN** *See:* packet switched public data network.

**PSS** *See:* physical source statements.

**PSTN** *See:* public switched telephone network.

**PSW** *See:* program status word.

**psychometric chroma (illuminating engineering)** A correlate of perceived chroma defined in terms of CIELUV or CIELAB. Equal scale intervals correspond approximately to equal differences in perceived chroma. (EEC/IE) [126]

**psychometric hue-angle (illuminating engineering)** A correlate of hue defined in terms of CIELUV or CIELAB. (EEC/IE) [126]

**psychometric lightness (illuminating engineering)** A correlate of lightness defined in terms of CIELUV or CIELAB. Equal scale intervals correspond approximately to equal differences in (perceived) lightness. (EEC/IE) [126]

**psychometric saturation (illuminating engineering)** A correlate of saturation defined in terms of CIELUV. Equal scale intervals correspond approximately to equal differences of (perceived) saturation. *Note:* Psychometric saturation cannot be calculated in terms of CIELAB. (EEC/IE) [126]

**psychophysics** Study of correlations between stimulus parameters and detection or perception of stimuli. (T&D/PE) 539-1990

**PTE** *See:* Port Transfer Error.

**PTM** *See:* pulse-time modulation.

**PTT** *See:* postal telephone and telegraph.

**PTYPE** *See:* protocol type.

**p-type crystal rectifier** A crystal rectifier in which forward current flows when the semiconductor is positive with respect to the metal. *See also:* rectifier. (EEC/PE) [119]

**p-type semiconductor** *See:* semiconductor, *p*-type.

**public (1)** A design feature, documented in the component data sheet, that may be used by purchasers of the component. (TT/C) 1149.1-1990

**(2)** A responsibility that is not hidden, i.e., visible to any requester (available to all without restriction). *Contrast:* private; protected. (C/SE) 1320.2-1998

**Publication Contents** The publisher-defined contents of a publication. (IM/ST) 1451.1-1999

**Publication Domain** A Domain for a specific publication. *See also:* Domain. (IM/ST) 1451.1-1999

**Publication Key** A publisher-defined identifier specifying the form and contents of a publication in a publish-subscribe communication. (IM/ST) 1451.1-1999

**Publication Topic** A configurable identifier for the name of a publication in a publish-subscribe communication. Specifically a value having datatype `PublicationTopic`. For a Publisher port, the operation `GetPublicationTopic` returns a value, `publication_topic`, that has the same value as Publication Topic. (IM/ST) 1451.1-1999

**public-address system** A system designed to pick up and amplify sounds for an assembly of people. (EEC/PE) [119]

**public circuit-switched network** A public data network using circuit-switching techniques. (C) 610.7-1995

**public data network** A network established and operated by communications common carriers or telecommunications administrations for the specific purpose of providing low error-rate data transmission services to the public. *Synonym:* public data transmission service. *Contrast:* private network. *See also:* public switched network; public packet switching network; public circuit-switched network. (C) 610.7-1995

**public data transmission service** *See:* public data network.

**public key system** An encryption system using a combination of a public encryption key and a private decryption key to provide message security or authentication. *See also:* electronic signatures. (C) 610.7-1995

**public object** The representation by the client of an object in a particular language binding. (C/PA) 1328-1993w, 1224-1993w, 1327-1993w, 1238.1-1994w

**public OM object** The representation by the client of an object in a particular programming language binding. (C/PA) 1327.2-1993w, 1326.2-1993w, 1328.2-1993w, 1224.2-1993'

**public packet switching network** A public data network that uses packet switching techniques. (C) 610.7-1995

**public page** A memory page that may be used by any agency or application. No access credentials are associated with such a page. (SCC32) 1455-1999

**public specifications** Specifications that are available, without restriction, to anyone for implementation, sublicensing, and distribution (i.e., sale) of that implementation. (C/PA) 14252-1996

**public switched network** A public data network in which dedicated communications paths are established for customers. (C) 610.7-1995

**public switched telephone network (PSTN) (1)** A telephone network in which connections are established as and when required and that is supplied, operated, and controlled by one or more telecommunications operating companies to provide telephone service that is available to the public. (COM/TA) 823-1989w

**(2)** Commonly called the switched telephone network. (AMR) 1390-1995

**(3)** A network of a complete public telephone system, including telephones, lines and exchanges. (C) 610.7-1995

**public telecommunications exchange (telephone switching systems)** A telecommunications exchange that serves the public. (COM) 312-1977w

**public telephone network** A network of public telephone system. *See also:* public switched telephone network. (C) 610.7-1995

**public telephone station (pay station)** A station available for use by the public, generally on the payment of a fee that is deposited in a coin collector or is paid to an attendant. *See also:* telephone station. (EEC/PE) [119]

**Public Transducer** A Parameter or other class instance that is the public interface or abstraction of one or more physical transducers supported by an NCAP. (IM/ST) 1451.1-1999

**Publisher object** Any object that posts publications onto the network via an Object of class `IEEE1451_BasePublisherPort` or a subclass thereof. (IM/ST) 1451.1-1999

**Publisher Port** An instance of the class `IEEE1451_PublisherPort` or of a subclass thereof. (IM/ST) 1451.1-1999

**publish-subscribe communication** A communication pattern where one or more objects, publishers, communicate information on a specific topic to one or more subscriber objects interested in that topic without the necessity of any of these objects knowing the identity of any other object. In an IEEE 1451.1 system, the pattern is established via the Publication Topic, Publication Key, and Publication Domain of the publication. (IM/ST) 1451.1-1999

**puck (computer graphics)** An input device, used as a locator, consisting of a hand-held control box with crosshairs that can be moved over a data tablet containing an image such that the user can identify a point in the image. *Note:* This term is sometimes used to refer to a mouse. (C) 610.6-1991w, 610.10-1994w

**pull (data management)** To retrieve data from a stack. *Synonym:* pop. *Contrast:* push. (C) 610.5-1990w

**pull blade (cable plowing)** A plow blade used to pull direct burial conductors into position by means of a suitable pulling grip attachment at the heel of the blade. (T&D/PE) 590-1977w

**pull box** A box with a blank cover that is inserted in one or more runs of raceway to facilitate pulling in the conductors, and may also serve the purpose of distributing the conductors. *See also:* cabinet. (EEC/PE) [119]

**pull-down menu** A menu that is brought into view by selecting a menu-bar label. *Contrast:* pop-up menu. (PE/NP) 1289-1998

**puller** *See:* bullwheel puller.

**puller, bullwheel** *See:* bullwheel puller.

**puller, drum** *See:* drum puller.

**puller, reel** *See:* reel puller.

**puller, two drum, three drum** *See:* two-drum, three-drum puller.

**pulley (1) (rotating machinery) (sheave)** A shaft-mounted wheel used to transmit power by means of a belt, chain, band, etc. *See also:* rotor. (PE) [9]

**(2)** *See also:* sheave. (T&D/PE) 524-1992r

**pull function*** *See:* dragging.

* Deprecated.

**pulling eye** A device that may be fastened to the conductor or conductors of a cable or formed by or fastened to the wire armor and to which a hook or rope may be directly attached in order to pull the cable into or from a duct. *Note:* Pulling eyes are sometimes equipped, like test caps, with facilities for oil feed or vacuum treatment. (T&D/PE) [10]

**pulling figure (oscillators)** The difference between the maximum and minimum values of the oscillator frequency when the phase angle of the load-impedance reflection coefficient varies through 360 degrees, while the absolute value of this coefficient is constant and equal to a specified value, usually 0.20. (Voltage standing-wave ratio 1.5.) *See also:* oscillatory circuit; waveguide. (ED) 161-1971w

**pulling into synchronism (rotating machinery)** The process of synchronizing by changing from asynchronous speed to synchronous. (PE) [9]

**pulling iron** An anchor secured in the wall, ceiling, or floor of a manhole or vault to attach rigging used to pull cable. (NESC) C2-1997

**pulling line (conductor stringing equipment)** A high strength line, normally synthetic fiber rope or wire rope, used to pull the conductor. However, on reconstruction jobs where a conductor is being replaced, the old conductor often serves as the pulling line for the new conductor. In such cases, the old conductor must be closely examined for any damage prior to the pulling operation. *Synonyms:* hard line; light line; sock line; pulling rope; bull line. (T&D/PE) 524a-1993r, 1048-1990, 524-1992r

**pulling out of synchronism (rotating machines)** The process of losing synchronism by changing from synchronous speed to a lower asynchronous speed (for a motor) or higher asynchronous speed (for a generator). (PE) [9]

**pulling rope** *See:* pulling line.

**pulling tension** The longitudinal force exerted on a cable during installation. (NESC) C2-1997

**pulling vehicle (conductor stringing equipment)** Any piece of mobile ground equipment capable of pulling pilot lines, pulling lines, or conductors. However, helicopters may be considered as a pulling vehicle when utilized for the same purpose. (T&D/PE) 524a-1993r, 524-1992r

**pull-in test (synchronous machines)** A test taken on a machine that is pulling into synchronism from a specified slip. (PE) [9]

**pull-in time (acquisition time) (communication satellite)** The time required for achieving synchronization in a phase-lock loop. (COM) [25]

**pull-in torque (synchronous motor)** The maximum constant torque under which the motor will pull its connected inertia load into synchronism, at rated voltage and frequency, when its field excitation is applied. *Note:* The speed to which a motor will bring its load depends on the power required to drive it and whether the motor can pull the load into step from this speed depends on the inertia of the revolving parts, so that the pull-in torque cannot be determined without having the $Wk^2$ as well as the torque of the load. (PE) [9]

**pull or transfer box** A box without a distribution panel, within which one or more corresponding electric circuits are connected or branched. (T&D/PE) [10]

**pull-out test (rotating machinery)** A test to determine the conditions under which an alternating-current machine develops maximum torque while running at specified voltage and frequency. *See also:* asynchronous machine. (PE) [9]

**pull-out torque** The maximum sustained torque that a synchronous motor will develop at synchronous speed with rated voltage applied at rated frequency and with normal excitation. (IA/MT) 45-1998

**pull rope** A rope, attached to the cable, that is used to pull the cable through the conduit system. *Synonym:* bull rope. (PE/IC) 1185-1994

**pull setting** *See:* sag section.

**pull site (conductor stringing equipment)** The location on the line where the puller, reel winder, and anchors (snubs) are located. This site may also serve as the pull or tension site (anchor) for the next sag section. *Synonyms:* reel setup; tugger setup. (T&D/PE) 524a-1993r, 524-1992r

**pull-up torque (alternating-current motor)** The minimum torque developed by the motor during the period of acceleration from rest to the speed at which breakdown torque occurs with rated voltage applied at rated frequency. (PE) [9]

**pulsating function** A periodic function whose average value over a period is not zero. For example, $f(t) = A + B \sin \omega t$ is a pulsating function where neither $A$ nor $B$ is zero. (Std100) 270-1966w

**pulse (1) (impulse) (data transmission)** A brief excursion of a quantity from normal. (PE) 599-1985w

**(2) (automatic control)** A variation of a signal whose value is normally constant; this variation is characterized by a rise and a decay, and has a finite duration. (PE/EDPG) [3]

**(3) (pulse terminology)** A wave that departs from a first nominal state, attains a second nominal state, and ultimately returns to the first nominal state. Throughout the remainder of this document the term pulse is included in the term wave. (IM/WM&A) 194-1977w

**(4)** A wave that departs from an initial level for a limited duration of time and ultimately returns to the original level. *Note:* In demand metering, the term "pulse" is also applied to a sudden change of voltage or current produced, for example, by the closing or opening of a contact. (ELM) C12.1-1988

**(5)** A variation in the value of a magnitude which is short in relation to the time schedule of interest, the final value being the same as the initial value. *Note:* In digital logic circuits, a pulse is usually a voltage. *See also:* recovery time; strobe. (C) 610.7-1995, 610.10-1994w

**(6) (relaying)** A brief excursion of a quantity from its initial level. (SWG/PE) C37.100-1992

**pulse accumulator** (or register) (of a telemeter system) A device that accepts and stores pulses and makes them available for readout on demand. (SWG/PE) C37.100-1992

**pulse advance (pulse terminology)** (delay) The occurrence in time of one pulse waveform before (after) another pulse waveform. (IM/WM&A) 194-1977w

**pulse advance interval (pulse terminology)** (delay interval) The interval by which, unless otherwise specified, the pulse start time of one pulse waveform preceded (follows), unless otherwise specified, the pulse start time of another pulse waveform. (IM/WM&A) 194-1977w

**pulse amplifier (pulse techniques)** An amplifier designed specifically for the amplification of electric pulses. *See also:* pulse. (NPS) 175-1960w

**pulse amplifier or relay** A device used to change the amplitude or waveform of a pulse for retransmission to another pulse device. (ELM) C12.1-1988

**pulse amplitude, $A_M$ (1) (pulse transformers)** That quantity determined by the intersection of a line passing through the points on the leading edge where the instantaneous value reaches 10% and 90% of $A_M$ and a straight line that is the best least-squares fit to the pulse in the pulse-top region (usually this is fitted visually rather than numerically). For pulses deviating greatly from the ideal trapezoidal pulse shape, a number of successive approximations may be necessary to determine $A_M$. *Note:* The pulse amplitude $A_M$ may be arrived at by applying the following procedure.

1) Visually or numerically determine the best straight line fit to the pulse in the pulse-top region and extend this straight line into the leading-edge region.
2) An initial estimate of $A_M$ is the first intersection of the pulse (in the late leading-edge or early pulse-top regions) with the straight line fitted to the pulse top.
3) Using the estimate of $A_M$ calculate 0.1 $A_M$ and 0.9 $A_M$ and draw a straight line through these two points of the pulse-leading edge.
4) The intersection of the leading-edge straight line and the pulse-top straight line gives an improved estimate of $A_M$.
5) Repeat steps 3 and 4 until the estimate of $A_M$ does not change. The converged estimate is the pulse amplitude $A_M$. (PEL/ET) 390-1987r

**(2)** The algebraic difference between the top magnitude and the base magnitude. (IM/WM&A) 194-1977w

**(3)** A general term indicating the magnitude of a pulse measured with respect to the normally constant value unless otherwise stated. (ED) [127]

**pulse amplitude modulation (PAM) (1) (data transmission) (pulse terminology)** Modulation in which the modulating wave is caused to amplitude modulate a pulse carrier. (IM/AP/WM&A/ANT) 194-1977w, 145-1983s

**(2)** A form of pulse modulation in which the amplitude of a pulse carrier is varied. (C) 610.7-1995

**pulse amplitude, peak** *See:* peak pulse amplitude.

**pulse amplitude, root-mean-square** *See:* root-mean-square (effective) pulse amplitude.

**pulse average time (light-emitting diodes)** The time interval between the instants at which the instantaneous pulse amplitude first and last reaches a specified fraction of the peak pulse amplitude, namely, 50%. (ED) [127]

**pulse bandwidth (pulse terminology)** The smallest continuous frequency interval outside of which the amplitude (of the spectrum) does not exceed a prescribed fraction of the amplitude at a specified frequency. Caution: This definition permits the spectrum amplitude to be less than the prescribed amplitude within the interval. *Notes:* 1. Unless otherwise stated, the specified frequency is that at which the spectrum has its maximum amplitude. 2. This term should really be pulse spectrum bandwidth because it is the spectrum and not the pulse itself that has a bandwidth. However, usage has caused the contraction and for that reason the term has been accepted. *See also:* signal. (IM/WM&A) 194-1977w

**pulse base (pulse waveform) (pulse techniques)** That major segment having the lesser displacement in amplitude from the baseline, excluding major transitions. *See also:* pulse. (IM/HFIM) [40]

**pulse, bidirectional** *See:* bidirectional pulse.

**pulse broadening (fiber optics)** An increase in pulse duration. *Note:* Pulse broadening may be specified by the impulse re-

sponse, the root-mean-square pulse broadening, or the full-duration-half-maximum pulse broadening. *See also:* root-mean-square pulse broadening; impulse response; full width (duration) half maximum. (Std100) 812-1984w

**pulse burst (1) (pulse terminology)** A finite sequence of pulse waveforms. (IM/WM&A) 194-1977w

**(2)** A sequence of closely spaced pulses. *Note:* Pulse bursts are usually generated coherently and batch-processed for Doppler resolution, and often have a total burst duration much less than the radar echo delay time. (AES) 686-1997

**pulse burst base envelope (pulse terminology)** Unless otherwise specified, the waveform defined by a cubic natural spline with knots at (A) that point of intersection of the pulse burst top envelope and the pulse burst waveform which precedes the first pulse waveform in a pulse burst, (B) each point of intersection of the base center line and the baseline between adjacent pulse waveforms in a pulse burst, and (C) that point of intersection of the pulse burst top envelope and the pulse burst waveform which follows the last pulse waveform in a pulse burst. *See also:* knot. (IM/WM&A) 194-1977w

**pulse burst time-related definitions (A) (pulse terminology)** (pulse burst duration) The interval between the pulse start time of the first pulse waveform and the pulse stop time of the last pulse waveform in a pulse burst. **(B) (pulse terminology)** (pulse burst separation) The interval between the pulse stop time of the last pulse waveform in a pulse burst and the pulse start time of the first pulse waveform of the immediately following pulse burst. **(C) (pulse terminology)** (pulse burst repetition period) The interval between the pulse start time of the first pulse waveform in a pulse burst and the pulse start time of the first pulse waveform in the immediately following pulse burst in a sequence of periodic pulse bursts. **(D) (pulse terminology)** (pulse burst reception frequency) The reciprocal of burst repetition period. (IM/WM&A) 194-1977

**pulse burst top envelope (pulse terminology)** Unless otherwise specified, the waveform defined by a cubic natural spline with knots at: the first transition mesial point of the first pulse waveform in a pulse burst; each point of intersection of the top centerline and the topline of each pulse waveform in a pulse burst; and the last transition mesial point of the last pulse waveform in a pulse burst. *See also:* knot. (IM/WM&A) 194-1977w

**pulse capacity (metering)** The number of pulses per demand interval that a pulse receiver can accept and register without loss. (ELM) C12.1-1988

**pulse capture (accelerometer) (gyros)** A technique that uses discrete quanta of torque-time (force-time) area to generate a restoring torque (force). (AES/GYAC) 528-1994

**pulse carrier (1)** A carrier consisting of a series of pulses. *Note:* Usually, pulse carriers are employed as subcarriers. *See also:* carrier. (IM/AP/WM&A/ANT) 194-1977w, 145-1983s

**(2)** A series of identical pulses intended for modulation. (C) 610.7-1995

**pulse, carrier-frequency** *See:* carrier-frequency pulse.

**pulse code (A)** A pulse train modulated so as to represent information. **(B)** Loosely, a code consisting of pulses, such as Morse code, Baudot code, binary code. *See also:* pulse. (IM/WM&A/HFIM) 194-1977, [40]

**pulse code modulation (1) (data transmission)** The type of pulse modulation where the magnitude of the signal is sampled and each sample is approximated to a nearest reference level (this process is called quantizing). Then a code, which represents the reference level, is transmitted to the distant location. The figure above is an example of one form of PCM which has eight reference levels. It can be seen that a straight binary code would require a group of three pulses to be transmitted for each sample. The main advantage of PCM is the fact that at the receiving end only the presence or absence of a pulse must be detected. (Std100) [123]

**(2) (pulse terminology)** A modulation process involving the conversion of a waveform from analog to digital form by means of coding. *Notes:* 1. This is a generic term, and additional specification is required for a specific purpose. 2. The term is commonly used to signify that form of pulse modulation in which a code is used to represent quantized values of instantaneous samples of the signal wave. (IM/WM&A) 194-1977w, 270-1964w

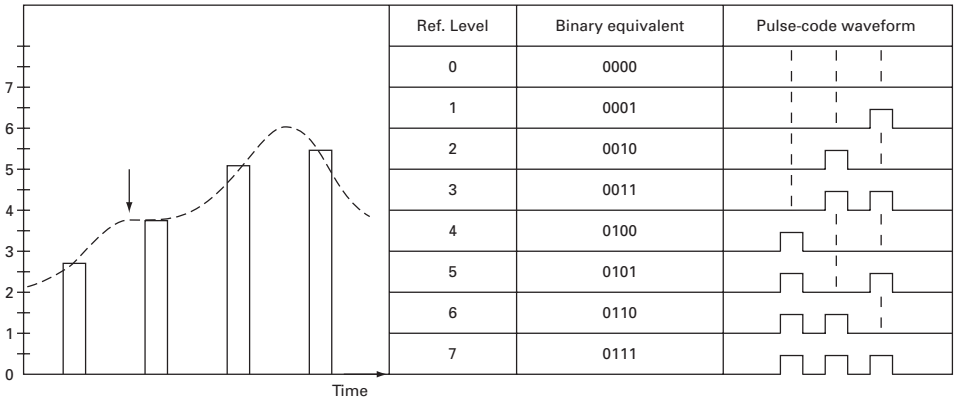
**(3)** A modulation technique in which an analog signal is converted to a bit stream for transmission. (C) 610.7-1995

**pulse coder (navigation aid terms)** A device for varying one or more of the characteristics of a pulse or of a pulse train so as to transmit information. (AES/RS/GCS) 686-1990, 172-1983w

**pulse coincidence (noncoincidence) (pulse terminology)** The occurrence (lack of occurrence) of two or more pulse waveforms in different waveforms either essentially simultaneously or for a specified interval. (IM/WM&A) 194-1977w

**pulse coincidence (noncoincidence) duration (pulse terminology)** The interval between specified points on two or more pulse waveforms in different waveforms during which pulse coincidence (noncoincidence) exists. (IM/WM&A) 194-1977w

**pulse compression** A method for obtaining the resolution of a short pulse with the energy of a long pulse of width $T$ by internally modulating the phase or frequency of a long pulse so as to increase its bandwidth $B >> 1/T$, and using a




A form of pulse code modulation

**pulse code modulation**

matched filter (also called a pulse compression filter) on reception to compress the pulse of width $T$ to a width of approximately $1/B$. Used to obtain high range resolution when peak-power limited. *See also:* chirp; coded pulse; Costas code. (AES) 686-1997

**pulse control (rotating electric machinery)** Means by which the voltage applied to a machine circuit departs from being essentially constant if unidirectional, or from being essentially sinusoidal if alternating. Pulse-control devices include, but are not limited to, choppers, inverters, and rectifiers. (PE/EM) 11-1980r

**pulse corner (pulse waveform feature)** A continuous pulse waveform feature of specified extent which includes a region of maximum curvature or a point of discontinuity in the waveform slope. (PE/PSR) [6]

**pulse corrector (telephone switching systems)** Equipment to reestablish, within predetermined limits, the make/break ratio of dial pulses. (COM) 312-1977w

**pulse count (control of system electromagnetic compatibility)** The number of pulses in some specified time interval. C63.12-1984

**pulse-count deviation (metering)** The difference between the number of recorded pulses and the number of pulses supplied to the input of terminals of a pulse recorder (true count), expressed as a percentage of the true count. Pulse-count deviation is applicable to each data channel of a pulse recorder. (ELM) C12.1-1988

**pulse counter (pulse techniques)** A device that indicates or records the total number of pulses that it has received during a time interval. *See also:* pulse. (NPS) 398-1972r

**pulsed-Doppler radar** A Doppler radar that uses pulsed transmissions. *Synonym:* pulse-Doppler radar. (AES/GCS) 686-1997, 172-1983w

**pulse decay time (1) (germanium gamma-ray detectors) (x-ray energy spectrometers)** The interval between the instants at which the instantaneous value last reaches specified upper and lower limits, namely, 90% and 10% of the peak pulse value unless otherwise stated. (In the case of a step function applied to an amplifier that has simple capacitance-resistance to resistance-capacitance (CR-RC) shaping, the decay time is given by $t_d = 3.36CR$.) (NPS/NID) 325-1986s, 301-1976s, 759-1984r

**(2) ($t_f$) (pulse fall time) (light-emitting diodes)** The interval between the instants at which the instantaneous amplitude last reaches specified upper and lower limits, namely, 90% and 10% of the peak pulse amplitude unless otherwise stated. *See also:* pulse. (NPS/BT/ED/AV/NID) 325-1971w, [34], 300-1982s, [127], 301-1976s

**(3) (data transmission)** The interval of time required for the trailing edge of a pulse to decay from 90% to 10% of the peak-pulse amplitude. (PE) 599-1985w

**(4) (laser maser)** The time duration of a laser pulse; usually measured as the time interval between the half-power points on the leading and trailing edges of the pulse. (LEO) 586-1980w

**(5) (radar)** *See also:* pulse width. (AES/RS) 686-1982s

**pulse decoder (navigation aid terms)** A device for extracting information from a pulse-coded signal. *Synonym:* constant-delay discriminator. (AES/RS/GCS) 686-1990, 172-1983w

**pulse delay (transducer)** The interval of time between a specified point on the input pulse and a specified point on the related output pulse. *Notes:* 1. This is a general term which applies to the pulse delay in any transducer, such as receiver, transmitter, amplifier, oscillator, etcetera. 2. Specifications may require illustrations. *See also:* transducer. (IM/PE/WM&A) 194-1977w, 599-1985w

**pulse delay time (light-emitting diodes)** The interval between the instants at which the instantaneous amplitudes of the input pulse and output pulses first reach a specified fraction of their peak pulse amplitudes, namely, 10%. (ED) [127]

**pulse delay, transducer** *See:* pulse delay.

**pulse delay, transmitter** *See:* pulse delay.

**pulse density violation** A violation that occurs if a signal contains more than a specified number of zeros, or the density of ones is less than specified. (COM/TA) 1007-1991r

**pulse device** (for electricity metering) The functional unit for initiating, transmitting, retransmitting, or receiving electric pulses, representing finite quantities, such as energy, normally transmitted from some form of electricity meter to a receiver unit. (ELM) C12.1-1988

**pulse distortion (pulse techniques)** The unwanted deviation of a pulse waveform from a reference waveform. *Note:* Some specific forms of pulse distortion have specific names. They include, but are not exclusive to, the following: overshoot, ringing, preshoot, tilt (droop), rounding (undershoot and dribble-up), glitch, bump, spike, and backswing. For further explanation of the forms of pulse distortion, see the following illustrations and IEEE Standard 194 (1977). *See also:* pulse. (IM/WM&A) 194-1977w

**pulsed laser (laser maser)** A laser that delivers its energy in the form of a single pulse or train of pulses. The duration of a pulse $\leq 0.25$ s. (LEO) 586-1980w

**pulse-Doppler radar** *See:* pulsed-Doppler radar.

**pulsed optical feedback preamplifier** An integrating preamplifier in which the charge that accumulates on the feedback capacitor is periodically reset by a pulse of light incident on a photosensitive element, such as the gate of the n-p junction of the input FET. (NPS) 325-1996

**pulsed oscillator** An oscillator that is made to operate during recurrent intervals by self-generated or externally applied pulses. *See also:* oscillatory circuit. (AP/ANT) 145-1983s

**pulsed-oscillator starting time** The interval between the leading-edge pulse time of the pulse at the oscillator control terminals and the leading-edge pulse time of the related output pulse. (IM/WM&A) 194-1977w

**pulse droop (television)** A distortion of an otherwise essentially flat-topped rectangular pulse characterized by a decline of the pulse top. *See also:* television. (IM/WM&A) 194-1977w

**pulse duration (1) (fiber optics)** The time between a specified reference point on the first transition of a pulse waveform and a similarly specified point on the last transition. The time between the 10%, 50%, or 1/e points is commonly used, as is the root-mean-square (rms) pulse duration. *See also:* root-mean-square pulse duration. (Std100) 812-1984w

**(2) (loosely)** The duration of a rectangular pulse whose energy and peak power equal those of the pulse in question. *Note:* When determining the peak power, any transients of relatively short duration are frequently ignored. *See also:* phase modulation; pulse. (AP/PE/ANT) 145-1983s, 599-1985w

**(3) (laser maser)** The time duration of a laser pulse; usually measured as the time interval between the half-power points on the leading and trailing edges of the pulse. (LEO) 586-1980w

**(4) (radiation counters) (telecommunications) (television)** The time interval between the first and last instants at which the instantaneous amplitude reaches a stated fraction of the peak pulse amplitude. *See also:* signal; pulse. (BT/NPS/PE/AV) [34], 398-1972r, 599-1985w

**(5) (pulse terminology)** The duration between pulse start time and pulse stop time. *See also:* waveform epoch. (IM/WM&A) 194-1977w

**(6) (charged-particle detectors)** (of an amplifier output pulse) The width of a pulse measured between the first and last transitions at designated levels. (NPS) 300-1988r

**(7) (pulse transformers)** (90%) ($t_p$) The time interval between the instants at which the instantaneous value reaches 90% of $A_M$ on the leading edge and 90% of $A_T$ on the trailing edge. *Notes:* 1. Often the input pulse tilt (droop) is only a few percentages, and in those cases pulse duration may be considered as the time interval between the first and last instants at which the instantaneous value reaches 90% of $A_M$. 2. Pulse duration may be specified at a value other than 90% $A_M$ and $A_T$ in special cases. (PEL/ET) 390-1987r

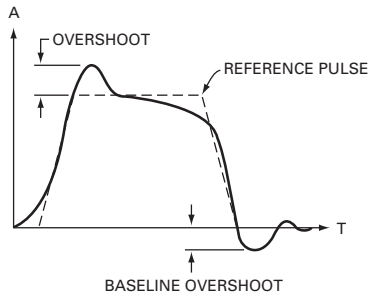
**(8)** (at the baseline) The width of a pulse measured close to the baseline, typically at 1% of the peak height (t.01). (NPS) 325-1996

**(9)** *See also:* pulse width. (AES) 686-1997

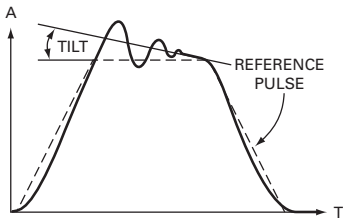
**pulse-duration discriminator** A circuit in which the output is a function of the deviation of the input pulse duration from a reference. (AES/RS) 686-1990

**pulse-duration distribution (electromagnetic site survey)** The fraction of pulse duration at level vithat exceeds time *T*. *See also:* average crossing rate. (EMC) 473-1985r

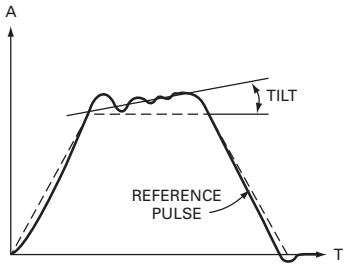
**pulse-duration modulation (1) (pulse terminology)** Pulse-time modulation in which the value of each instantaneous sample of the modulating wave is caused to modulate the duration of a pulse. *Notes:* 1. The deprecated terms pulsew-



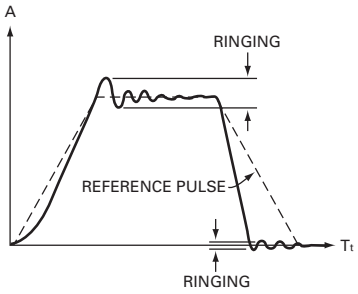
Overshoot.



Negative tilt.

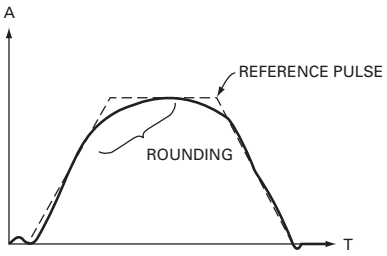


Positive tilt.

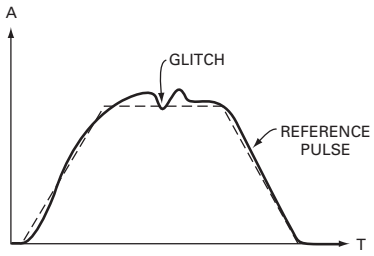


Ringing.

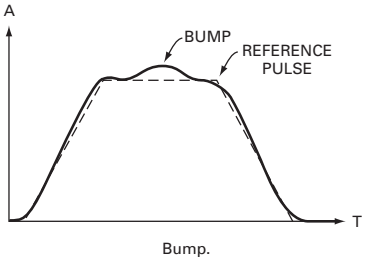
distortion, short-time waveform



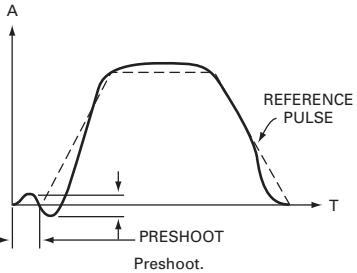
Rounding.



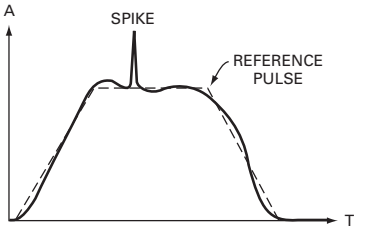
Glitch.



Bump.



Preshoot.



Spike.

**distortion, pulse**

idth modulation and pulse-length modulation also have been used to designate this system of modulation. 2. In pulse-duration modulation, the modulating wave may vary the time of occurrence of the leading edge, the trailing edge, or both edges of the pulse.
(IM/AP/WM&A/ANT) 194-1977w, 145-1983s
**(2)** *See also:* pulse-width modulation.

**pulse-duration-modulation torquing (accelerometer) (gyros)** A torquing mechanization that provides current to a sensor torquer of fixed amplitude but variable pulse duration proportional to input. The duration may be quantized to enable digital interpretation and readout. (AES/GYAC) 528-1994

**pulse-duration telemetering (electric power system) (pulse-width modulation)** A type of telemetering in which the duration of each transmitted pulse is varied as a function of the magnitude of the measured quantity. *See also:* telemetering.
(PE/PSE) 94-1970w

**pulse-duration time ($t_p$) (light-emitting diodes)** The time interval between the first and last instants at which the instantaneous amplitude reaches a stated fraction of the peak pulse amplitude, namely, 90%. (ED) [127]

**pulse duty factor (light-emitting diodes)** The ratio of the average pulse duration to the average pulse spacing. *Note:* This is equivalent to the product of the average pulse duration and the pulse-repetition rate. (IM/WM&A) 194-1977w

**pulse energy (pulse terminology)** The energy transferred or transformed by a pulse(s). Unless otherwise specified by a mathematical adjective, the total energy over a specified interval is assumed. *See also:* mathematical adjectives.
(IM/WM&A) 194-1977w

**pulse expander/pulse compressor** An expander device spreads the input energy from a relatively narrow pulse over a relatively large interval of time. The compressor acts as a matched conjugate filter that recompresses the energy spread by the expander into a relatively small interval of time (mainlobe) accompanied by a certain level of time sidelobes.
(UFFC) 1037-1992w

**pulse fall time (A) (photomultipliers for scintillation counting)** The interval between the instants at which the instantaneous amplitude last reaches specified upper and lower limits, namely, 90% and 10% of the peak pulse amplitude unless otherwise stated. **(B) (charged-particle detectors)** The interval between the instants at which the instantaneous value last reaches specified upper and lower limits, namely, 90% and 10% of the peak pulse value unless otherwise stated. (In the case of a step function applied to an amplifier that has simple capacitance-resistance to resistance-capacitance (CR-RC) shaping, the fall time is given by $t_f = 3.36$ CR.)
(NPS) 398-1972, 300-1982

**pulse-forming line** A passive electric circuit in a radar modulator whose propagation delay determines the length of the modulation pulse. (AES) 686-1997

**pulse frequency modulation (data transmission) (pulse terminology)** A form of pulse-time modulation in which the pulse-repetition rate is the characteristic varied. *Note:* A more precise term for pulse-frequency modulation would be "pulse-repetition-rate modulation."
(IM/PE/WM&A) 194-1977w, 599-1985w

**pulse frequency modulation telemetry (communication satellite)** A telemetry system where the information is coded according to subcarrier frequency, pulse duration and pulse repetition rate. Often used for satellite telemetry.
(COM) [24]

**pulse, Gaussian** *See:* Gaussian pulse.

**pulse-height analyzer (1) (radiation counters)** An instrument capable of indicating the number or rate of occurrence of pulses falling within each of one or more specified amplitude ranges. *See also:* pulse. (NPS) 398-1972r
**(2) (radiation counters)** A circuit that produces an output signal if it receives an input pulse whose amplitude falls between upper and lower assigned values. (NI) N42.15-1990

**pulse-height analyzer, multichannel** A circuit that accepts all input pulses and assigns each pulse to a memory location corresponding to its amplitude. (NI) N42.15-1990

**pulse-height discriminator (1) (liquid-scintillation counting)** A circuit that produces an output signal if it receives an input pulse whose amplitude exceeds an assigned value.
(NI) N42.15-1980s
**(2) (pulse techniques)** A circuit that produces a specified output pulse if and only if it receives an input pulse whose amplitude exceeds an assigned value. *See also:* pulse.
(NPS) 175-1960w
**(3)** A circuit that responds to pulses above a designated amplitude and generates a pulse to feed into a counting circuit but that does not respond to lower amplitude pulses.
(NI/NPS) 309-1999

**pulse height radiation** *See:* pulse-height resolution.

**pulse-height resolution** The measured FWHM, after ambient background subtraction, of a gamma-ray peak distribution, expressed as a percentage of the pulse height corresponding to the centroid of the distribution. (NI) N42.12-1994

**pulse-height resolution constant, electron (photomultipliers)** The product of the square of the electron (photomultiplier) pulse-height resolution expressed as the fractional full width at half maximum (FWHM/$A_1$), and the mean number of electrons per pulse from the photocathode. *See also:* phototube.
(NPS) 175-1960w

**pulse-height resolution, electron (photomultipliers)** A measure of the smallest change in the number of electrons in a pulse from the photocathode that can be discerned as a change in height of the output pulse. Quanitatively, it is the fractional standard deviation ($\sigma/A_1$) of the pulse-height distribution curve for output pulses resulting from a specified number of electrons per pulse from the photocathode. *Note:* The fractional full width at half maximum of the pulse-height distribution curve (FWHM/$A_1$) is frequently used as a measure of this resolution, where $A_1$ is the pulse height corresponding to the maximum of the distribution curve. *See also:* pulse.
(NPS) 398-1972r

**pulse-height selector (pulse techniques)** A circuit that produces a specified output pulse when and only when it receives an input pulse whose amplitude lies between two assigned values. *See also:* pulse. (NPS) 175-1960w

**pulse initiator (metering)** Any device, mechanical or electrical, used with a meter to initiate pulses, the number of which are proportional to the quantity being measured. It may include an external amplifier or auxiliary relay or both.
(ELM) C12.1-1988

**pulse-initiator coupling ratio (metering)** The number of revolutions of the pulse-initiating shaft for each output pulse.
(ELM) C12.1-1988

**pulse-initiator gear ratio (metering)** The ratio of meter rotor revolutions to revolutions of the pulse-initiating shaft.
(ELM) C12.1-1988

**pulse-initiator output constant (metering)** The value of the measured quantity for each outgoing pulse of a pulse initiator, expressed in kilowatt hours per pulse, kilovarhours per pulse, or other suitable units. (ELM) C12.1-1988

**pulse-initiator output ratio (metering)** The number of revolutions of the meter rotor per output pulse of the pulse initiator. (ELM) C12.1-1988

**pulse-initiator ratio (metering)** The ratio of revolutions of the first gear of the pulse initiator to revolutions of the pulse-initiating shaft. (ELM) C12.1-1988

**pulse-initiator shaft reduction (metering)** The ratio of revolutions of the meter rotor to the revolutions of the first gear of the pulse initiator. (ELM) C12.1-1988

**pulse interleaving** A process in which pulses from two or more sources are combined in time-division multiplex for transmission over a common path. (IM/WM&A) 194-1977w

**pulse interrogation** The triggering of a transponder by a pulse or pulse mode. *Note:* Interrogations by means of pulse modes

may be employed to trigger a particular transponder or group of transponders. (IM/WM&A) 194-1977w

**pulse interval** *See:* pulse spacing.

**pulse-interval modulation** A form of pulse-time modulation in which the pulse spacing is varied. (IM/WM&A) 194-1977w

**pulse jitter** A relatively small variation of the pulse spacing in a pulse train. *Note:* The jitter may be random or systematic, depending on its origin, and is generally not coherent with any pulse modulation imposed. (IM/WM&A) 194-1977w

**pulse length (fiber optics)** Often erroneously used as a synonym for pulse duration. (Std100) 812-1984w

**pulse-length modulation** *See:* pulse-duration modulation.

**pulse measurement** The assignment of a number and a unit of measurement to a characteristic, property, or attribute of a pulse wherein the number and unit assigned indicate the magnitude of the characteristic which is associated with the pulse. Typically, this assignment is accomplished by comparison of a transform of the pulse, its pulse waveform, with a scale or reference which is calibrated in the unit of measurement. *See also:* method of pulse measurement. (IM/WM&A) 181-1977w

**pulse measurement process** A realization of a method of pulse measurement in terms of specific devices, apparatus, instruments, auxiliary equipment, conditions, operators, and observers. *See also:* method of pulse measurement. (IM/WM&A) 181-1977w

**pulse mode (A)** A finite sequence of pulses in a prearranged pattern used for selecting and isolating a communication channel. **(B)** The prearranged pattern. (IM/WM&A) 194-1977

**pulse mode, spurious** *See:* spurious pulse mode.

**pulse modulated field** An electromagnetic field produced by the amplitude modulation of a continuous wave carrier by one or more pulses. (NIR) C95.1-1999

**pulse modulation (1) (continuous-wave)** Modulation of one or more characteristics of a pulse carrier. *Note:* In this sense, the term is used to describe methods of transmitting information on a pulse carrier. (IT) [7]

**(2)** The encoding of information by varying the basic characteristics of a sequence of pulses, such as width, duration, amplitude, phase or the number of pulses. *See also:* pulse amplitude modulation; pulse code modulation; pulse position modulation. (C) 610.7-1995, 610.10-1994w

**pulse modulation, width** *See:* pulse-duration modulation.

**pulse modulator** A device that applies pulses to the element in which modulation takes place. *See also:* modulation. (AP/ANT) 145-1983s

**pulse number (1) (circuit properties) (self-commutated converters)** (of a group of principal branches or of a complete converter) The number of nonsimultaneous commutations from one principal branch to another during one cycle of operation, considering the group or the complete converter, respectively. (IA/SPC) 936-1987w

**(2)** The total number of successive nonsimultaneous commutations occurring within the converter circuit during each cycle when operating without phase control. It is also equal to the order of the principal harmonic in the direct voltage, that is, the number of pulses present in the dc output voltage in one cycle of the supply voltage. (IA/SPC) 519-1992

**pulse operation** The method of operation in which the energy is delivered in pulses. *Note:* Pulse operation is usually described in terms of the pulse shape, the pulse duration, and the pulse-recurrence frequency. *See also:* pulse. (PE) 599-1985w

**pulse packet** The volume of space occupied by a single radar pulse. The dimensions of this volume are determined by the angular width of the beam, the duration of the pulse, and the distance from the antenna. (AES/RS) 686-1990

**pulse-pair resolution (photomultipliers)** The time interval between two equal-amplitude delta-function optical pulses such that the valley between the two corresponding anode pulses falls to fifty percent of the peak amplitude. (NPS) 398-1972r

**pulse period (1) (measuring the performance of tone address signaling systems)** When sending a sequence of signals, the time interval from the start of one signal present condition to the start of the next signal present condition. *Synonym:* cycle time. (COM/TA) 752-1986w

**(2) (dial-pulse address signaling systems) (telephony)** The time from the start of one break interval of a dial pulse in a train until the start of the next break interval. Milliseconds is the preferred unit of time to express the duration of the pulse period. (COM/TA) 753-1983w

**pulse permeability (magnetic core testing)** The value of amplitude permeability when the rate of change of induction (that is, the exciting voltage) is held substantially constant over a period of time during each cycle. The frequency, amplitude, duration of the exciting voltage, and the time interval for which the permeability is measured must be stated

$$\mu_\pi = \frac{1}{\mu_0}\frac{\Delta B}{\Delta H}$$

where

$\mu_\pi$ = pulse permeability, relative
$\Delta B$ = change in induction during the stated time interval
$\Delta H$ = associated change in magnetic field strength.

*Note:* When pulse permeability is to be related to a specific circuit condition, a second subscript may be used; for example, $\mu_{\pi a}$ would represent the relative amplitude permeability determined under pulsed excitation. (MAG) 393-1977s

**pulse pileup** Occurrence of two successive pulses closely associated in time but from separate decays such that they contribute to each other's pulse height and shape. Usually, the system processes the two inputs as a composite single pulse, which is stored in a spectral channel different from that at which either of the component pulses would have been stored. Pulse pileup is a function of the square of the counting rate and of the amplifier pulse width. *Synonym:* random summing. (NI) N42.14-1991

**pulse position modulation (PPM) (1) (data transmission) (pulse-phase modulation)** Pulse-time modulation in which the value of each instantaneous sample of a modulating wave is caused to modulate the position in time of a pulse. (AP/PE/ANT) 145-1983s, 599-1985w

**(2)** A form of pulse modulation in which the position in time of a pulse is varied, without modifying the pulse duration, to convey information. (C) 610.7-1995

**pulse power (pulse terminology)** The power transferred or transformed by a pulse(s). Unless otherwise specified by a mathematical adjective average power over a specified interval is assumed. *See also:* mathematical adjectives. (IM/WM&A) 194-1977w

**pulse power, carrier-frequency peak** *See:* peak pulse power, carrier-frequency.

**pulse quadrant (pulse waveform feature)** One of the four continuous and contiguous waveform features of specified extent that include a region of maximum curvature or a point of discontinuity in the waveform slope. (PE/PSR) [6]

**pulse, radio-frequency** *See:* radio-frequency pulse.

**pulse rate (watthour meter)** The number of pulses per demand interval at which a pulse device is nominally rated. *See also:* pulse-repetition frequency; auxiliary device to an instrument. (ELM) C12.1-1982s

**pulse rate—maximum** The number of pulses per second at which a pulse device is nominally rated. (ELM) C12.1-1988

**pulse rate telemetering (electric power system)** A type of telemetering in which the number of unidirectional pulses per unit time is varied as a function of the magnitude of the

measured quantity. *See also:* telemetering. (PE/PSE) 94-1970w

**pulse ratio (dial-pulse address signaling systems) (telephony)** The percentage of the total dial-pulse period during which the circuit is in each of the two interval states. This ratio is customarily expressed as % break (preferred) of % make. (COM/TA) 753-1983w

**pulse rebalance** *See:* pulse capture.

**pulse receiver (metering)** The unit that receives and registers the pulses. It may include a periodic resetting mechanism, so that a reading proportional to demand may be obtained. (ELM) C12.1-1988

**pulse recorder (metering)** A device that receives and records pulses over a given demand interval. *Note:* It may record pulses in a machine-translatable form on magnetic tape, paper tape, or other suitable media. (ELM) C12.1-1988

**pulse-recorder channel (metering)** A means of conveying information. It consists of an individual input, output, and intervening circuitry required to record pulse data on the recording media. (ELM) C12.1-1988

**pulse regeneration (data transmission)** The process of restoring a series of pulses to their original timing, form, and relative magnitude. (PE) 599-1985w

**pulse relay—totalizing** A device used to receive and totalize pulses from two or more sources for proportional transmission to another totalizing relay or to a receiver. (ELM) C12.1-1988

**pulse repeater (transponder)** A device used for receiving pulses from one circuit and transmitting corresponding pulses into another circuit. It may also change the frequency and waveforms of the pulses and perform other functions. *See also:* pulse; repeater. (AP/ANT) 145-1983s

**pulse-repetition frequency (PRF) (1)** High prf = more than 1 Hz. (LEO) 586-1980w

**(2)** The number of pulses per unit time of a periodic pulse train or the reciprocal of the pulse period. *Note:* This term also includes the average number of pulses per unit time of aperiodic pulse trains where the periods are of random duration. *See also:* pulse. (IM/HFIM) [40]

**(3)** The number of pulses per unit of time, usually per second. *Synonym:* pulse-repetition rate. (AES) 686-1997

**pulse-repetition frequency stagger** The technique of varying the time between pulses of a pulse radar. This is useful in compensating for blind speeds in pulsed moving-target indication (MTI) radars. (AES) 686-1997

**pulse-repetition interval (PRI)** The time duration between successive pulses. *Note:* PRI is the reciprocal of the pulse-repetition frequency (PRF). *Synonym:* pulse-repetition period. (AES) 686-1997

**pulse-repetition period** *See:* pulse-repetition interval.

**pulse-repetition rate** *See:* pulse-repetition frequency.

**pulse reply** The transmission of a pulse or pulse mode by a transponder as the result of an interrogation. (IM/WM&A) 194-1977w

**pulse response characteristics (pulse response curve)** The relationship between the indication of a quasi-peak voltmeter and the repetition rate of regularly repeated pulses of constant amplitude. *See also:* electromagnetic compatibility. (EMC/INT) [53], [70]

**pulse rise time (1) (germanium gamma-ray detectors) (charged-particle detectors) (x-ray energy spectrometers)** The interval between the instants at which the instantaneous value first reaches specified lower and upper limits, namely, 10% and 90% of the peak pulse value unless otherwise specified. (In the case of a step function applied to an RC (resistance-capacitance) low-pass filter, the rise time is given by $t_r = 2.2$ RC. In the case of a step function applied to an amplifier that has simple CR-RC (capacitance-resistance to resistance-capacitance) shaping, that is, one high-pass and one low-pass RC filter of equal time constants, the rise time is given by $t_r = 0.57$ RC).

(NPS/NID) 325-1986s, 759-1984r, 301-1976s, 300-1982s

**(2) (data transmission)** The interval between the instants at which the instantaneous amplitude first reaches specified lower and upper limits, namely 10% and 90% of the peak-pulse amplitude unless otherwise stated. (PE) 599-1985w

**pulse scaler (pulse techniques)** A device that produces an output signal whenever a prescribed number of input pulses has been received. It frequently includes indicating devices for interpolation. *See also:* pulse. (NPS) 175-1960w

**pulse separation (pulse terminology)** The interval between the trailing-edge pulse time of one pulse and the leading-edge pulse time of the succeeding pulse. *See also:* leading-edge pulse time; trailing-edge pulse time; pulse. (IM/WM&A) 194-1977w

**pulses, equalizing** *See:* equalizing pulses.

**pulse shape (A) (pulse terminology)** For descriptive purposes a pulse waveform may be imprecisely described by any of the adjectives, or combinations thereof, in descriptive adjectives, major (minor); polarity related adjectives; geometrical adjectives; and functional adjectives, exponential. **(B) (pulse terminology)** For tutorial purposes a hypothetical pulse waveform may be precisely defined by the further addition of the adjective ideal. *See also:* descriptive adjectives. **(C) (pulse terminology)** For measurement or comparison purposes a pulse waveform may be precisely defined by the further addition of the adjective reference. *See also:* descriptive adjectives. (IM/WM&A) 194-1977

**pulse shaper (pulse techniques)** Any transducer used for changing one or more characteristics of a pulse. *Note:* This term includes pulse regenerators. *See also:* pulse. (IM/WM&A) 194-1977w

**pulse shaping** Intentionally changing the shape of a pulse. (IM/WM&A) 194-1977w

**pulse spacing (pulse interval)** The interval between the corresponding pulse times of two consecutive pulses. *Note:* The term pulse interval is deprecated because it may be taken to mean the duration of the pulse instead of the space or interval from one pulse to the next. Neither term means the space between pulses. (IM/WM&A) 194-1977w

**pulse spacing distribution (electromagnetic site survey)** The fraction of pulse spacing time at level $v_1$ that exceeds time $T$. *See also:* average crossing rate. (EMC) 473-1985r

**pulse spectrum (signal-transmission system)** The frequency distribution of the sinusoidal components of the pulse in relative amplitude and in relative phase. *See also:* signal. (IM/WM&A) 194-1977w

**pulse speed (telephony) (dial-pulse address signaling systems)** The number of dial pulses occurring per unit of time per unit of time. Pulses per second (pls/s) is the preferred unit to express pulse speed. (COM/TA) 753-1983w

**pulse spike (automatic control)** An unwanted pulse of relatively short duration, superimposed on the main pulse. *See also:* spike. (PE/EDPG) [3]

**pulse start time (pulse terminology)** The instant specified by a magnitude referenced point on the first transition of a pulse waveform. Unless otherwise specified, the pulse start time is at the mesial point on the first transition. *See also:* waveform epoch; pulse stop time. (IM/WM&A) 194-1977w

**pulse stop time (pulse terminology)** The instant specified by a magnitude referenced point on the last transition of a pulse waveform. Unless otherwise specified, the pulse stop time is at the mesial point on the last transition. *See also:* waveform epoch; pulse start time. (IM/WM&A) 194-1977w

**pulse storage time (light-emitting diodes)** The interval between the instants at which the instantaneous amplitudes of the input and output pulses last reach a specified fraction of their peak pulse amplitudes, namely, 90 percent. (ED) [127]

**pulse stretcher (spectrum analyzer)** A pulse shaper that produces an output whose duration is greater than that of the input pulse and whose amplitude is proportional to that of the peak amplitude of that input pulse. (NPS/IM) 398-1972r, 748-1979w

**pulse string** *See:* pulse train.

**pulse stuffing** A method in which pulses are inserted into a stream of pulses to achieve synchronization between two digital communications systems. (C) 610.7-1995

**pulse techniques** *See:* burst.

**pulse tilt** A distortion in an otherwise essentially flat-topped rectangular pulse characterized by either a decline or a rise of the pulse top. *See also:* television. (IM/BT/WM&A/AV) 194-1977w, [34]

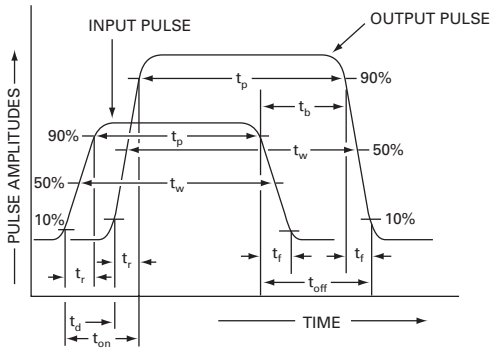
**pulse time, leading edge** *See:* leading-edge pulse time.

**pulse time, mean** *See:* mean pulse time.

**pulse-time modulation (PTM) (pulse terminology) (data transmission)** Modulation in which the value of instantaneous samples of the modulating wave are caused to modulate the time of occurrence of some characteristic of a pulse carrier. *Note:* Pulse-duration modulation, pulse-position modulation, and pulse-interval modulation, are particular forms of pulse-time modulation. (IM/PE/AP/WM&A/ANT) 194-1977w, 599-1985w, 145-1983s

**pulse-time reference points (A) (pulse terminology)** (top center point). A specified time referenced point or magnitude referenced point on a pulse waveform top. If no point is specified, the top center point is the time referenced point at the intersection of a pulse waveform and the top center line. *See also:* waveform epoch. **(B) (pulse terminology)** [first (last) base point]. Unless otherwise specified, the first (last) datum point in a pulse epoch. *See also:* pulse train time-related definitions; waveform epoch. (IM/WM&A) 194-1977

**pulse time symbology** See figure below.




**pulse-time symbology**

**pulse-time, trailing-edge** *See:* trailing-edge pulse time.

**pulse timing of video pulses (television)** The determination of an occurrence of a pulse or a specified portion thereof at a particular time. *See also:* time of rise of video pulses; television; pulse width of video pulses. (BT) 207-1950w

**pulse top (1) (pulse transformers)** That portion of the pulse occurring between the time of intersection of straight-line segments used to determine $A_T$ and $A_T$. (PEL/ET) 390-1987r

**(2)** That major segment of a pulse waveform having the greater displacement in amplitude from the baseline. *See also:* pulse. (IM/HFIM) [40]

**pulse trailing edge** The major transition towards the pulse baseline occuring before a reference time. *See also:* pulse. (IM/HFIM) [40]

**pulse train (1) (dial-pulse address signaling systems) (telephony)** In dial-pulse signaling, a series of contiguous pulses of undetermined length. (COM/TA) 753-1983w

**(2) (pulse terminology)** A continuous repetitive sequence of pulse waveforms. (IM/WM&A) 194-1977w

**(3) (thyristor)** A gate signal applied during the desired conducting interval, or parts thereof, made up of a train of pulses of predetermined duration, amplitude, and frequency. (IA/IPC) 428-1981w

**(4) (signal-transmission system)** A sequence of pulses. *See also:* signal; pulse. (BT/IE/PE/IA/ICTL/AV/EDPG/IAC) [34], 270-1966w, [43], [3], [60]

**(5)** A series of pulses with similar characteristics. *Synonym:* pulse string. (C) 610.7-1995

**(6)** A sequence of pulses at the pulse repetition frequency used to accomplish a function such as moving-target indication (MTI) or increased effective signal-to-noise ratio. *Note:* A pulse train of duration less than the radar echo delay time is usually referred to as a pulse burst. *See also:* pulse burst. (AES) 686-1997

**pulse train, periodic** *See:* periodic pulse train.

**pulse-train spectrum (pulse-train frequency-spectrum)** The frequency distribution of the sinusoidal components of the pulse train in amplitude and in phase angle. (IM/WM&A) 194-1977w

**pulse train time-related definitions (A) (pulse terminology)** (pulse repetition period) The interval between the pulse start time of a first pulse waveform and the pulse start time of the immediately following pulse waveform in a periodic pulse train. **(B) (pulse terminology)** (pulse repetition frequency) The reciprocal of pulse repetition period. **(C) (pulse terminology)** (pulse separation) The interval between the pulse stop time of a first pulse waveform and the pulse start time of the immediately following pulse waveform in a pulse train. **(D) (pulse terminology)** (duty factor) Unless otherwise specified, the ratio of the pulse waveform duration to the pulse repetition period of a periodic pulse train. **(E) (pulse terminology)** (on-off ratio) Unless otherwise specified, the ratio of the pulse waveform duration to the pulse separation of a periodic pulse train. **(F) (pulse terminology)** (base center line) The time reference line at the average of the pulse stop time of a first pulse waveform and the pulse start time of the immediately following pulse waveform in a pulse train. **(G) (pulse terminology)** (base center point) A specified time referenced point or magnitude referenced point on a pulse train waveform base. If no point is specified, the base center point is the time referenced point at the intersection of a pulse train waveform base and a base center line. **(H) (pulse terminology)** (pulse train epoch) The span of time in a pulse train for which waveform data are known or knowable and which extends from a first base center point to the immediately following base center point. (IM/WM&A) 194-1977

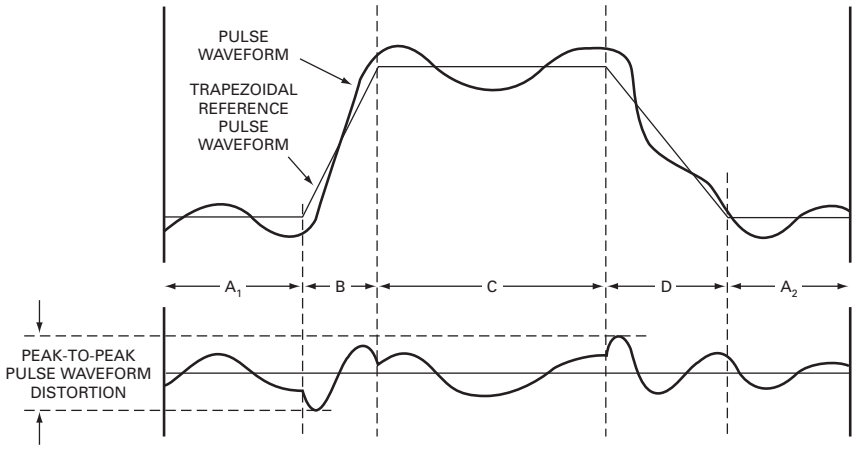
**pulse-train top (base) envelope (pulse terminology)** Unless otherwise specified, the waveform defined by a cubic natural spline with knots at each point of intersection of the top center line and topline (the base center line and the baseline) of each (between adjacent) pulse waveforms(s) in a pulse train. (IM/WM&A) 194-1977w

**pulse train, unidirectional** *See:* unidirectional pulse train.

**pulse transmitter (1)** A pulse-modulated transmitter whose peak power-output capabilities are usually large with respect to average power-output rating. *See also:* radio transmitter; pulse. (AP/ANT) 145-1983s

**(2) (power system device function numbers)** Used to generate and transmit pulses over a telemetering or pilot-wire circuit to the remote indicating or receiving device. (SUB/PE) C37.2-1979s

**pulse turn-off time (light-emitting diodes)** The arithmetic sum of the pulse storage time, and the pulse decay time of the output pulse. (ED) [127]




EXTENT OF DATA INCLUDED IN PULSEWAVEFORM FEATURE DISTORTION:
$A_1$ AND $A_2$ - PULSE BASE DISTORTION
B - FIRST TRANSITION DISTORTION
C - PULSE TOP DISTORTION
D - LAST TRANSITION DISTORTION

Pulse waveform distortion and pulse waveform feature distortion.

**pulse waveform distortion**

**pulse turn-on time (light-emitting diodes)** The arithmetic sum of the pulse delay time, and the pulse rise time of the output pulse. (ED) [127]

**pulse-type telemeter** A telemeter that employs characteristics of intermittent electric signals other than their frequency, as the translating means. *Note:* These pulses may be utilized in any desired manner to obtain the final indications, such as periodically counting the total number of pulses; or measuring their "on" time, their "off" time, or both. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**pulse waveform distortion (pulse terminology)** The algebraic difference in magnitude between all corresponding points in time of a pulse waveform and a reference pulse waveform. Unless otherwise specified by a mathematical adjective, peak-to-peak pulse waveform distortion is assumed. *See also:* mathematical adjectives; pulse waveform feature distortion. (IM/WM&A) 194-1977w

**pulse waveform feature distortion (pulse terminology)** The algebraic difference in magnitude between all corresponding points in time of a pulse waveform and a reference pulse waveform feature. Unless otherwise specified by a mathematical adjective, peak-to-peak pulse waveform feature distortion is assumed. *See also:* mathematical adjectives. (IM/WM&A) 194-1977w

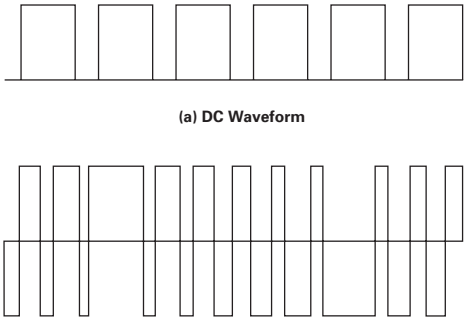
**pulse width** The time interval between the points on the leading and trailing edges at which the instantaneous value bears a specified relation to the maximum instantaneous value of the pulse, usually the time interval between the half-power points of the pulse. *Synonym:* pulse duration. (AES) 686-1997

**pulse-width at half maximum, $T_{0.5}$ (germanium gamma-ray detectors) (of an amplifier output pulse)** The time interval between the 50% of maximum amplitude points of a pulse. (NPS) 325-1986s

**pulse width discriminator (PWD)** A device that passes only those video pulses whose duration falls within specified limits. (AES) 686-1997

**pulse-width modulation (self-commutated converters) (converter characteristics)** Pulse-time modulation in which the value of each instantaneous sample of the modulating wave is caused to modulate the duration of a pulse. The modulating frequency may be fixed or variable. Examples of waveforms produced by PWM are shown in the corresponding figure. *See also:* pulse-duration modulation.

**Waveforms Produced by Pulse-Width Modulation**



**(a) DC Waveform**

**(b) AC Waveform**

**Pulse-Width Modulation**

(IA/SPC) 936-1987w

**(2)** A form of pulse modulation in which the duration of the pulse carrier is varied. (C) 610.7-1995

**pulse-width-modulation torquing** *See:* pulse-duration-modulation torquing.

**pulse width of video pulses (television)** The duration of a pulse measured at a specified level. *See also:* pulse timing of video pulses. (BT) 207-1950w

**pulse width timing check** A timing check that specifies the minimum time a signal shall remain in a specified state once it has transitioned to that state. (C/DA) 1481-1999

**pulsing (telephone switching systems)** The signaling over the communication path of signals representing one or more digits required to set up a call. (COM) 312-1977w

**pulsing circuit (peaking circuit)** A circuit designed to provide abrupt changes in voltage or current of some characteristic pattern. *See also:* electronic controller. (IA/ICTL/IAC) [60]

**pulsing transformer** Supplies pulses of voltage or current. *See also:* electronic controller. (IA/ICTL/IAC) [60]

**pump (parametric device)** The source of alternating-current power that causes the nonlinear reactor to behave as a time-varying reactance. *See also:* parametric device. (ED) [46]

**pump-back test (rotating machinery) (electrical back-to-back test)** A test in which two identical machines are me-

chanically coupled together, and they are both connected electrically to a power system. The total losses of both machines are taken as the power input drawn from the system. *See also:* asynchronous machine; direct-current commutating machine. (PE) [9]

**pumped figure of merit (parametric amplifier) (nonlinear, active, and nonreciprocal waveguide components)** The ratio of the half-amplitude fundamental Fourier component of pumped elastance to the series resistance of the varactor diode. This quantity, designated as $m_1\omega_c$, has the dimensions of angular frequency and describes the noise, gain, and impedance characteristics of parametric amplifiers. The parameter $m_1$ is the normalized fundamental component of elastance and $\omega_c$ is the total angular cutoff frequency. (MTT) 457-1982w

**pumped-storage hydro capability (power operations)** The capability supplied by hydroelectric sources under specified water conditions using a reservoir that is alternately filled by pumping and depleted by generating. (PE/PSE) 858-1987s

**pumped storage station (power operations)** A hydroelectric generating station at which electrical energy is normally generated during periods of relatively high system demand by utilizing water that has been pumped into a storage reservoir usually during periods of relatively low system demand. (PE/PSE) 858-1987s, 346-1973w

**pumped tube** An electron tube that is continuously connected to evacuating equipment during operation. *Note:* This term is used chiefly for pool-cathode tubes. (ED) [45]

**pump efficiency (laser maser)** The ratio of the power or energy absorbed from the pump to the power or energy available from the pump source. (LEO) 586-1980w

**pump-free control** *See:* antipump device.

**pump-free device** *See:* antipump device.

**pumping** The unintentional cyclical tripping and closing of a network protector. (PE/TR) C57.12.44-1994

**pumping load (power operations)** Totals of loads caused by pumping in pumped-storage stations within the system. (PE/PSE) 858-1987s

**pump runout** A pump flow condition in which the pump is operating beyond its design point due to a reduction in the system head. As a result, the pump motor's brake-horsepower and full load current demand may be increased. (PE/NP) 741-1997

**punch (A)** A device for making holes in some data medium such as a card or paper tape. *See also:* card punch; card reproducing punch; spot punch; calculating punch. **(B)** A perforation created by a device as in definition (A). *See also:* zone punch; eleven punch; numeric punch; twelve punch; digit punch. **(C)** To make a perforation as in definition (B). *See also:* gang punch; overpunch. (C) 610.10-1994

**punch card** A card into which hole patterns can be punched such that the patterns can be used to store or represent information. *Note:* This term is often used in place of "punched card" a standard-sized punch card has twelve rows of 80 columns. *Synonym:* Hollerith card. *See also:* edge-punched card; control card; data card; scored card; binder-hole card; laced card; edge-notched card; interpreted card; trailer card; edge-coated card; binary card; header card; aperture card; check card; twelve-row punch card; short card. (C) 610.10-1994w

**punched card (1)** A card on which a pattern of holes or cuts is used to represent data. (MIL/C) [2], [20]
**(2)** A card punched with hole patterns such that the patterns store or represent information. *See also:* punch card. (C) 610.10-1994w

**punched card holder** *See:* card hopper.

**punched card machine** *See:* card reader.

**punched card reader** *See:* card reader.

**punched paper tape** *See:* perforated tape.

**punched tape (computers)** A tape on which a pattern of holes or cuts is used to represent data. (MIL/C) [2], [20], [85]

**punched tape handler (test, measurement, and diagnostic equipment)** A device that handles punched tape and usually consists of a tape transport and punched tape reader with associated electrical and electronic equipments. Most units provide for tape to be wound and stored in reels; however, some units provide for the tape to be stored loosely in closed bins. (MIL) [2]

**punched tape reader (1) (test, measurement, and diagnostic equipment)** A device capable of converting information from punched tape, where it has been stored in the form of a series of holes, into a series of electrical impulses. (MIL) [2]
**(2)** An input unit that senses the hole patterns in a perforated tape, transforming the hole patterns into electrical signals representing data. (C) 610.10-1994w

**punching (rotating machinery)** A lamination made from sheet material using a punch and die. *See also:* rotor; stator. (PE) [9]

**punching station** The place in a punch where a card or paper tape is punched. (C) 610.10-1994w

**punch position (computers)** A site on a punched tape or card where holes are to be punched. (MIL/C) [2], [20], [85]

**punch tape** A tape in which hole patterns can be punched such that the patterns can be used to store or represent information. (C) 610.10-1994w

**punch-through voltage (x-ray energy spectrometers)** (of a semiconductor radiation detector) The voltage at which a junction detector becomes fully depleted. *See also:* depletion voltage. (NPS/NID) 759-1984r

**puncture (1) (voltage testing)** A disruptive discharge through the body of a solid dielectric. (PE/PSIM) [55]
**(2)** A disruptive discharge through solid insulation. (PE/PSIM) 4-1995
**(3) (A)** A disruptive discharge through the body of a solid dielectric. **(B)** A disruptive discharge through solid insulation. **(C)** Term used to denote when a disruptive discharge occurs through a solid dielectric and produces permanent loss of dielectric strength; in a liquid or gaseous dielectric, the loss may be only temporary. (SPD/PE) C62.11-1999

**puncture voltage (surge arresters)** The voltage at which the test specimen is electrically punctured. (T&D/PE) [10], [8]

**pupil (1) (laser maser)** The variable aperture in the iris through which light travels toward the interior of the eye. (LEO) 586-1980w
**(2) (pupillary aperture) (illuminating engineering)** The opening in the iris which admits light into the eye. (EEC/IE) [126]

**purchaser (1) (nuclear power quality assurance)** The organization responsible for establishment of procurement requirements and for issuance, administration, or both, of procurement documents. (PE/NP) [124]
**(2) (rotating electric machinery)** The organization placing the contract for the machinery or its repair; often called the "user." (PE/EM) 11-1980r
**(3)** An entity that contractually acts as the customer. (VT) 1475-1999

**pure alphabetic** Pertaining to data that contains only the letters of the alphabet (AaBbCcDdEeFfGgHh. . .). *Contrast:* pure numeric; pure alphanumeric. (C) 610.5-1990w

**pure alphanumeric (data management)** Pertaining to data that contains only the letters of the alphabet (AaBbCcDdEeFfGgHh. . .) and the numerals (1234567890). *Contrast:* pure alphabetic; pure numeric. (C) 610.5-1990w

**pure binary** *See:* binary.

**pure binary numeration system** *See:* binary numeration system.

**pure numeric** Pertaining to data that contains only the numerals (1234567890). *Contrast:* pure alphanumeric; pure alphabetic. (C) 610.5-1990w

**purged** Pertaining to a record that has been physically deleted from a file. *See also:* active; logically deleted; inactive. (C) 610.2-1987

**purge instruction** A purge (cache-control) instruction changes a line to the uncached state, invalidating the old cache line without copying dirty data back to memory. (C/MM) 1596-1992

**purging** A ring state that occurs when the active monitor has detected a ring error and is returning the ring to an operational state by transmitting purge frames. (C/LM) 8802-5-1998

**pure tone (1) (overhead power lines)** A sound wave, the instantaneous sound pressure of which is a simple sinusoidal function of time. (T&D/PE) 539-1990
**(2) (overhead power lines)** *See also:* simple tone. (SP) [32]

**purification of electrolyte** The treatment of a suitable volume of the electrolyte by which the dissolved impurities are removed in order to keep their content in the electrolyte within desired limits. *See also:* electrorefining. (EEC/PE) [119]

**purity** *See:* excitation purity.

**Purkinje phenomenon (illuminating engineering)** The reduction in subjective brightness of a red light relative to that of a blue light when the luminances are reduced in the same proportion without changing the respective spectral distributions. In passing from photopic to scotopic vision, the curve of spectral luminous efficiency changes, the wavelength of maximum efficiency being displaced toward the shorter wavelengths. (EEC/IE) [126]

**purple boundary (television) (illuminating engineering)** The straight line drawn between the ends of the spectrum locus on a chromaticity diagram. (BT/IE/EEC/AV) 201-1979w, [126]

**purported name** A construct that is syntactically a name but that has not (yet) been shown to be a valid name. (C/PA) 1328.2-1993w, 1224.2-1993w, 1326.2-1993w, 1327.2-1993w

**purpose statement** A brief statement of the reason for an IDEF0 model's existence that is presented in the A-0 context diagram of the model. (C/SE) 1320.1-1998

**push (data management)** To append data onto a stack. *Contrast:* pull. (C) 610.5-1990w

**push a button** The act of moving the pointer to a button widget and then selecting the button. (C) 1295-1993w

**push brace** A supporting member, usually of timber, placed between a pole or other structural part of a line and the ground or a fixed object. *See also:* tower. (T&D/PE) [10]

**push button** A visual user interface control containing a button, labeled with text, graphics, or both, that represents the action initiated when a user selects it. (C) 1295-1993w

**pushbutton** Part of an electric device, consisting of a button that must be pressed to effect an operation. *See also:* switch. (IA/ICTL/IAC) [60], [84]

**pushbutton dial (telephone switching systems)** A type of calling device used in automatic switching that has an activator per digit that generates distinctive pulsing. (COM) 312-1977w

**pushbutton station** A unit assembly of one or more externally operable pushbutton switches, sometimes including other pilot devices such as indicating lights or selector switches, in a suitable enclosure. *See also:* switch. (IA/ICTL/IAC) [60]

**pushbutton switch (pushbutton)** A master switch, usually mounted behind an opening in a cover or panel, and having an operating plunger or button extending forward in the opening. Operation of the switch is normally obtained by pressure of the finger against the end of the button. *See also:* switch. (EEC/PE) [119]

**pushbutton switching** A reperforator switching system in which selection of the outgoing channel is initiated by an operator. (COM) [49]

**pushdown list (1) (computers)** A list that is constructed and maintained so that the next item to be retrieved is the most recently stored item in the list, that is, last in, first out. *See also:* pushup list. (C) [20], [85]
**(2) (data management)** *See also:* stack. (C) 610.5-1990w

**push-down stack** *See:* stack.

**pushdown storage (1) (software)** A storage device that handles data in such a way that the next item to be retrieved is the most recently stored item still in the storage device, that is, last-in-first-out (LIFO). *See also:* stack; data. (C/SE) 729-1983s
**(2)** A type of storage in which data are ordered in such a way that the next data item to be retrieved is the most recently stored item. *Note:* Commonly characterized as "last-in-first-out," or LIFO. *Synonym:* stack storage. (C) 610.10-1994w
**(3) (software)** *See also:* stack. (C) 610.5-1990w

**pushing figure (oscillators)** The change of oscillator frequency with a specified change in current, excluding thermal effects. *See also:* electronic tuning sensitivity; oscillatory circuit; television. (ED) 161-1971w

**push-pull amplifier circuit** *See:* balanced amplifier.

**push-pull circuit** A circuit containing two like elements that operate in 180-degree phase relationship to produce additive output components of the desired wave, with cancellation of certain unwanted products. *Note:* Push-pull amplifiers and push-pull oscillators are examples. *See also:* amplifier. (Std100) [123]

**push-pull currents** Balanced currents. *See also:* waveguide. (MTT) 146-1980w

**push-pull microphone** A microphone that makes use of two like microphone elements actuated by the same sound waves and operating 180 degrees out of phase. *See also:* microphone. (EEC/PE) [119]

**push-pull operation** The operation of two similar electron devices or of an equivalent double-unit device, in a circuit such that equal quantities in phase opposition are applied to the input electrodes, and the two outputs are combined in phase. (ED) [45]

**push-pull oscillator** A balanced oscillator employing two similar tubes in phase opposition. *See also:* oscillatory circuit; balanced oscillator. (AP/ANT) 145-1983s

**push-pull voltages** Balanced voltages. *See also:* waveguide. (MTT) 146-1980w

**push-push circuit** A circuit employing two similar tubes with grids connected in phase opposition and plates in parallel to a common load, and usually used as a frequency multiplier to emphasize even-order harmonics. (AP/ANT) 145-1983s

**push-push currents** Currents flowing in the two conductors of a balanced line that, at every point along the line, are equal in magnitude and in the same direction. *See also:* waveguide. (MTT) 146-1980w

**push-push voltages** Voltages (relative to ground) on the two conductors of a balanced line that, at every point along the line, are equal in magnitude and have the same polarity. *See also:* waveguide. (MTT) 146-1980w

**push-to-type operation** That form of telegraph operation, employing a one-way reversible circuit, in which the operator must keep a switch operated in order to send from his station. It is generally used in radio transmission where the same frequency is employed for transmission and reception. *See also:* telegraphy. (EEC/PE) [119]

**pushup list (1) (computers)** A list that is constructed and maintained so that the next item to be retrieved and removed is the oldest item still in the list, that is, first in, first out. *See also:* pushdown list. (C) [20], [85]
**(2) (data management)** *See also:* queue. (C) 610.5-1990w

**pushup storage (1)** A type of storage in which data are ordered in such a way that the next data item to be retrieved is the item that was stored first. *Note:* Commonly characterized as

first-in-first-out, or FIFO order. *See also:* stack. (C) 610.10-1994w

**(2)** *See also:* queue. (C) 610.5-1990w

**put** To place an item into a set of items as in inserting a record into a file, or in representing a numerical value as a series of decimal digits. *Contrast:* get. (C) 610.5-1990w

**PV array** *See:* photovoltaic array.

**PV array subfield** *See:* photovoltaic array subfield.

**PVC (1) (cable systems in power generating stations)** Conduit fabricated from polyvinyl chloride. (PE/SUB/EDPG) 422-1977, 525-1992r

**(2)** *See also:* polyvinyl chloride; permanent virtual circuit. (C) 610.7-1995

**PV cell** *See:* photovoltaic cell.

**PV effect** *See:* photovoltaic effect.

**PV module** *See:* photovoltaic module.

**PV panel** *See:* photovoltaic panel.

**PV power system** *See:* photovoltaic power system.

**PV receiver** *See:* photovoltaic receiver.

**PV system-utility interface** *See:* photovoltaic system-utility interface.

**PVV** *See:* path variability value.

**PWB** *See:* printed wiring board.

**PWM** *See:* pulse-width modulation.

**pyramidal horn antenna** A horn antenna, the sides of which form a pyramid. (AP/ANT) [35], 145-1993

**pyroconductivity** Electric conductivity that develops with rising temperature, and notably upon fusion, in solids that are practically nonconductive at atmospheric temperatures. (EEC/PE) [119]

**pyroelectric effect (primary ferroelectric terms)** The appearance of an electric charge at the surface of a polar material when uniform heating or cooling changes the polarization. If the polar material is electroded and an external resistance is connected between the electrodes, the current that flows is a pyroelectric current. All pyroelectrics are polar; ferroelectrics are a subgroup of the polar materials and, therefore, they are both pyroelectric and piezoelectric. The differ from the more general pyroelectrics principally by the reversibility or reorientability of their spontaneous polarization $P_s$. *Note:* Due to the existence of free charge, the pyroelectric charge may be rapidly compensated. (UFFC) 180-1986w

**pyrolysate** A product of thermal decomposition. (PE/EM) 1129-1992r

**pyrolysis** Irreversible chemical decomposition caused by heat, usually without oxidation. (DEI) 1221-1993w

**pyrometer** A thermometer of any kind usable at relatively high temperatures (above 500 degrees Celsius). *See also:* electric thermometer. (EEC/PE) [119]

# S

**S** A programming language used widely in the UNIX environment for data analysis and visualization. (C) 610.13-1993w

**SA** *See:* source address; spin axis.

**sabin (audio and electroacoustics)** A unit of absorption having the dimensions of area. *Notes:* 1. The metric sabin has dimensions of square meters. 2. When used without a modifier, the sabin is the equivalent of one square foot of a perfectly absorptive surface. (SP) [32]

**SAC** *See:* slanted array compressor.

**SACK** *See:* selective acknowledgment.

**sacrificial protection** Reduction or prevention of corrosion of a metal in an environment acting as an electrolyte by coupling it to another metal that is electrochemically more active in that particular electrolyte. *See also:* stray-current corrosion. (IA) [59]

**safe** Having acceptable risk of the occurrence of a hazard. (VT/RT) 1483-2000

**safe braking model** An analytical representation of a train's performance while decelerating to a complete stop, allowing for a combination of worst-case influencing factors and failure scenarios. A communications-based train control equipped train will stop in a distance equal to or less than that guaranteed by the safe braking model. (VT/RT) 1474.1-1999

**safeguard (1) (electrolytic cell line working zone)** A precautionary measure or stipulation, or a technical contrivance to prevent accidents. (IA/PC) 463-1993w

**(2)** Security measures for the physical protection of nuclear material and vital equipment at a nuclear power generating station. (PE/NP) 692-1997

**safe let-go level** The current level passing through a hand grip contact for which 99.5% of the subject population would retain sufficient muscular control to voluntarily release the subject grip and break contact. *Note:* The safe let-go level is a function of the frequency and voltage and varies considerably for various contact areas and pressures. Individual responses vary greatly from the mean level, and different levels are obtained for men, women, and children. (T&D/PE) 539-1990

**safe shutdown earthquake (1) (seismic qualification of Class 1E equipment for nuclear power generating stations)** An earthquake that is based upon an evaluation of the maximum earthquake potential considering the regional and local geology and seismology and specific characteristics of local subsurface material. It is that earthquake that produces the maximum vibratory ground motion for which certain structures, systems, and components are designed to remain functional. These structures, systems, and components are those necessary to ensure the integrity of the reactor coolant pressure boundary, the capability to shut down the reactor and maintain it in a safe shutdown condition, and the capability to prevent or mitigate the consequences of accidents that could result in potential off-site exposures comparable to the guideline exposures of 10 CFR, Ch 1, Section 100. (PE/NP) 344-1987r

**(2) (valve actuators)** That earthquake which produces the maximum vibratory ground motion for which certain structural systems are designed to remain functional. These structures, systems, and components are those necessary to ensure:

a) The integrity of the reactor coolant pressure boundary;
b) The capability to shut down the reactor and maintain it in a safe shutdown condition;
c) The capability to prevent or mitigate the consequences of an accident which could result in potential offsite exposures comparable to the exposure guideline of CFR 10, Energy—Nuclear Regulatory Commission, Part 100 (Dec 5, 1973.)

(SWG/PE/NP/PSR) C37.81-1989r, 382-1985, C37.98-1977s

**(3) (nuclear power generating station)** That earthquake which produces the maximum vibratory ground motion for which certain structures, systems, and components are designed to remain functional. (PE/NP) 649-1980s

**(4)** That earthquake which produces the maximum vibratory ground motion for which certain structures, systems, and components are designed to remain functional. These structures, systems, and components are those necessary to ensure (1) the integrity of the reactor coolant pressure boundary, and (2) the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to the guideline exposures of Code of Federal Regulations, Title 10, Part 100 (December 5, 1973). (SWG/PE) C37.100-1992

**safety assurance** A characteristic of the implementation of a system that assures a level of safe operation. (VT/RT) 1483-2000

**safety assurance concept** A design concept applied to processor-based systems that assures the fail-safe implementation of identified functions, including safe operation in the presence of hardware failures and/or software errors. Examples are: Checked Redundancy; Diversity and Self-Checking; Numerical Assurance; and N-Version Programming. (VT/RT) 1483-2000

**safety class features (Class 1E equipment and circuits)** Structures design to protect Class 1E equipment against the effects of design basis events. *Note:* For the purposes of this standard, separate safety class structures can be separate rooms in the same building. The rooms may share a common wall. (PE/NP) 384-1981s

**safety class structures** Structures designed to protect Class 1E equipment against the effects of the design basis events. (PE/NP) 384-1992r, 308-1991

**safety, conductor** *See:* conductor safety.

**safety control feature** (deadman's feature) That feature of a control system that acts to reduce or cut off the current to the traction motors or to apply the brakes, or both, if the operator relinquishes personal control of the vehicle. *See also:* multiple-unit control. (EEC/PE) [119]

**safety control handle** (deadman's handle) A safety attachment to the handle of a controller, or to a brake valve, causing the current to the traction motors to be reduced or cut off, or the brakes to be applied, or both, if the pressure of the operator's hand on the handle is released. *Note:* This function may be applied alternatively to a foot-operated pedal or in combination with attachments to the controller or the brake valve handles, or both. *See also:* multiple-unit control. (EEC/PE) [119]

**safety critical** A term applied to a system or function, the correct performance of which is critical to safety of personnel and/or equipment; also a term applied to a system or function, the incorrect performance of which may result in an unacceptable hazard. *Note:* A safety-critical designation may require the incorporation of additional special safety design features. *See also:* fail-safe. (VT/RT) 1473-1999, 1483-2000, 1475-1999

**(2) (A)** A term applied to a system or function, the correct performance of which is critical to safety of personnel and/or equipment. **(B)** A term applied to a system or function, the incorrect performance of which may result in a hazard. *Note:* Vital functions are a subset of safety-critical functions. (VT/RT) 1474.1-1999

**safety-critical software** Software that falls into one or more of the following categories:

a) Software whose inadvertent response to stimuli, failure to respond when required, response out-of-sequence, or re-

sponse in combination with other responses can result in an accident.

b) Software that is intended to mitigate the result of an accident.

c) Software that is intended to recover from the result of an accident.

(C/SE) 1228-1994

**safety function** One of the processes or conditions (for example, emergency negative reactivity insertion, post-accident heat removal, emergency core cooling, post-accident radioactivity removal, and containment isolation) essential to maintain plant parameters within acceptable limits established for a design basis event. *Note:* A safety function is achieved by the completion of all required protective actions by the reactor trip system or the engineered safety features concurrent with the completion of all required protective actions by the auxiliary supporting features, or both.

(PE/NP) 603-1998, 338-1987r, 379-1994

**safety ground (1)** The connection between a grounding system and metallic parts that are not usually energized but that may become live due to a fault or an accident; often referred to as equipment or frame ground. (PE/EDPG) 665-1995

**(2)** *See also:* equipment grounding conductor.

(IA/PSE) 1100-1999

**safety group** A given minimal set of interconnected components, modules, and equipment that can accomplish a safety function. (PE/NP) 603-1998, 308-1991

**safety life line** A safety device normally constructed from synthetic fiber rope and designed to be connected between a fixed object and the body belt of a worker working in an elevated position when his/her regular safety strap cannot be utilized. *Synonyms:* safety line; life line; scare rope.

(T&D/PE) 524-1992r

**safety line** *See:* safety life line.

**safety outlet** *See:* grounding outlet.

**safety-related (nuclear power generating station)** Any Class IE power or protection system device included in the scope of IEEE 279-1971 or IEEE 308-1974. (PE/NP) 577-1976r

**safety ring** *See:* write-protect ring.

**safety sign** A visual alerting device in the form of a sign, label, decal, placard, or other marking that advises the observer of the nature and degree of the potential hazard(s), which can cause injury or death. It can also provide safety precautions or evasive actions to take, or provide other directions to eliminate or reduce the hazard. (NIR/SCC28) C95.2-1999

**safety strap** *See:* positioning strap.

**safety system (1) (nuclear power plants)** Those systems (the reactor trip system, an engineered safety feature, or both, including all their auxiliary supporting features and other auxiliary features) that provide a safety function. A safety system is comprised of more than one safety group of which any one safety group can provide the safety function.

(PE/NP) 338-1987r, 600-1983lw, 497-1981w

**(2) (nuclear power generating station) (design of control room complex)** The collection of systems required to minimize the probability and magnitude of release of radioactive material to the environment by maintaining plant conditions within the allowable limits established for each design basis event. *Note:* The safety system is the aggregate of one or more protective action systems. It includes, but is not necessarily limited to, the engineered safety features, the reactor trip system, and the auxiliary supporting features.

(PE/NP) 567-1980w

**(3)** A system that is relied upon to remain functional during and following design basis events to ensure: (A) the integrity of the reactor coolant pressure boundary, (B) the capability to shut down the reactor and maintain it in a safe shutdown condition, or (C) the capability to prevent or mitigate the consequences of accidents that could result in potential off-site exposures comparable to the 10 CFR Part 100 guidelines. *Note:* The electrical portion of the safety systems, that perform safety functions, is classified as Class 1E.

(PE/NP) 603-1998

**safety validation** A structured and managed set of activities that demonstrate that the system, as specified and implemented, performs the intended functions, and that those functions result in overall safe operation. Validation answers the question, "Did we build the right system?" (VT/RT) 1483-2000

**safety verification** A structured and managed set of activities that identify the vital functions required to be performed by the system, and demonstrate that the system, including its subsystems, inter faces and components, implements the vital functions fail-safely to a level that meets the allocated system safety goals. Verification answers the question, "Did we build the system right?" (VT/RT) 1483-2000

**safe working space (electrolytic cell line working zone)** The space required to safeguard personnel from hazarous electrical conditions during the conduct of their work in operating and maintaining cells and their attachments. This shall include space allowance for tools and equipment that may be involved. (IA/PC) 463-1977s

**safe working voltage to ground (electric recording instrument)** The highest safe voltage in terms of maximum peak value that should exist between any circuit of the instrument and its case. *See also:* test. (EEC/ERI) [111]

**safe work practices (electrolytic cell line working zone)** Those operating and maintenance procedures that are effective in preventing accidents. (IA/PC) 463-1993w

**SAFI** *See:* semiautomatic flight inspection.

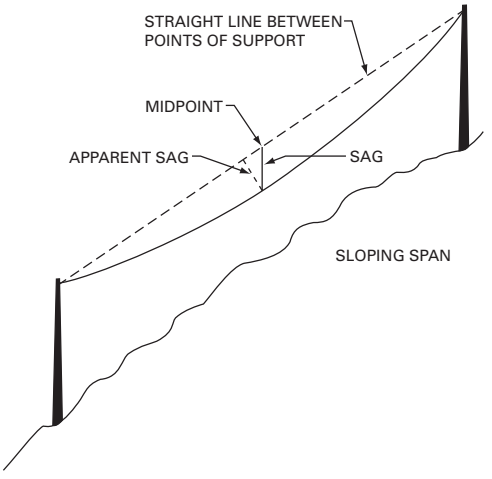
**sag (1)** The distance measured vertically from a conductor to the straight line joining its two points of support. Unless otherwise stated in the rule, the sag referred to is the sag at the midpoint of the span. *See also:* sag of a conductor at any point in a span; apparent sag at any point in the span; maximum total sag; final unloaded sag; final sag; initial unloaded sag; total sag; apparent sag.

(NESC/T&D/PE) C2-1997, 524-1992r

**(2)** A decrease in rms voltage or current at the power frequency for durations of 0.5 cycle to 1 min. Typical values are 0.1 to 0.9 pu. *Note:* To give a numerical value to a sag, the recommended usage is "a sag to 20%," which means that the line voltage is reduced down to 20% of the normal value, not reduced by 20%. Using the preposition "of" (as in "a sag of 20%," or "a 20% sag") is deprecated. (SCC22) 1346-1998

**(3)** An rms reduction in the ac voltage, at the power frequency, for durations from a half cycle to a few seconds. *See also:* notch; undervoltage. (IA/PSE) 1100-1999

**sag and appararent sag (apparent sag at any point)** The departure of the wire at the particular point in the span from the straight line between the two points of support of the span, at 60°F, with no wind loading. (See the corresponding figure.)




**sag and apparent sag**

(NESC) C2-1997

**sag board** *See:* target sag.

**sagger** *See:* wheel tractor.

**Sagnac effect (laser gyro) (interferometric fiber optic gyro)** A relativistic rotation-induced optical path length difference between electromagnetic waves that counter-propagate around a closed path. (AES/GYAC) 528-1994

**sag of a conductor at any point in a span** The distance measured vertically from the particular point in the conductor to a straight line between its two points of support. (T&D/NESC) C2-1997

**sag section (conductor stringing equipment)** The section of line between snub structures. More than one sag section may be required in order to sag properly the actual length of conductor that has been strung. *Synonyms:* stringing section; pull; setting; pull setting. (T&D/PE) 524-1992r

**sag span (conductor stringing equipment)** A span selected within a sag section and used as a control to determine the proper sag of the conductor, thus establishing the proper conductor level and tension. A minimum of two, but normally three, sag spans are required within a sag section in order to sag properly. In mountainous terrain or where span lengths vary radically, more than three sag spans could be required within a sag section. *Synonym:* control span. (T&D/PE) 524-1992r

**sag target (conductor stringing equipment)** A device used as a reference point to sag conductors. It is placed on one structure of the sag span. The sagger, on the other structure of the sag span, can use it as his reference to determine the proper conductor sag. *Synonym:* target. (T&D/PE) 524-1980s

**SAID** *See:* security association identifier.

**sal ammoniac cell** A cell in which the electrolyte consists primarily of a solution of ammonium chloride. *See also:* electrochemistry. (EEC/PE) [119]

**salient pole (rotating machinery)** A field pole that projects from the yoke or hub towards the primary winding core. *See also:* rotor. (PE) [9]

**salient-pole machine** An alternating-current machine in which the field poles project from the yoke toward the armature and/or the armature winding self-inductance undergoes a significant single cyclic variation for a rotor displacement through one pole pitch. *See also:* asynchronous machine. (PE) [9]

**salient pole synchronous induction motor (rotating machinery)** A salient pole synchronous motor having a coil winding for starting purposes embedded in the pole shoes. The terminal leads of this coil winding are connected to collector rings. (PE) [9]

**salinity indicator system** A system, based on measurement of varying electric resistance of the solution, to indicate the amount of salt in boiler feed water, the output of an evaporator plant, or other fresh water. *Note:* Indication is usually in grains per gallon. (EEC/PE) [119]

**SAM** *See:* sequential access method.

**SAM76** A list processing language widely used in artificial intelligence due to its unique suitability for interactive and user-directed applications. (C) 610.13-1993w

**sample** One or more units of product drawn from a lot, the units of sample being selected at random without regard to their quality. (PE/T&D) C135.61-1997

**sample-and-hold device** A device that senses and stores the instantaneous value of an analog signal. (C) 610.10-1994w

**sampled data** Data in which the information content can be, or is, ascertained only at discrete intervals of time. *Note:* Sampled data can be analog or digital. *See also:* feedback control system. (IA/EEC) [61], [74]

**sampled-data control system** A system that operates with sampled data. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**sampled-data system** One in which at least one sampled signal is present. *See also:* control system. (CS/IM) [120]

**sample description −1, −2, −3, −4** Four 64-character records containing a sample description. These records will provide information on the source of the sample being analyzed. If not used they should be set to spaces. (NPS/NID) 1214-1992r

**sampled format (pulse measurement)** A waveform which is a series of sample magnitudes taken sequentially or nonsequentially as a function of time. It is assumed that nonsequential samples may be rearranged in time sequence to yield the following samples formats. *See also:* aperiodically sampled equivalent time format; periodically sampled equivalent time format; periodically sampled real time format; aperiodically sampled real time format. (IM/WM&A) 181-1977w

**sampled signal** The sequence of values of a signal taken at discrete instants. *See also:* control system. (PE/EDPG) [3]

**sample edge** A time corresponding to a falling edge of the bus clock signal. (C/MM) 1196-1987w

**sample equipment (1) (nuclear power generating station)** Production equipment tested to obtain data that are valid over a range of ratings and for specific services. (PE/NP) 323-1974s, 650-1979s

**(2) (safety systems equipment in nuclear power generating stations)** Equipment, representative of a design, used to obtain data that are valid over a range of ratings and for specific service conditions. (PE/NP) 627-1980r

**sample instance diagram** A form of presenting example instances in which instances are shown as separate graphic objects. The graphic presentation of instances can be useful when only a few instances are presented. *Contrast:* sample instance table. (C/SE) 1320.2-1998

**sample instance table** A form of presenting example instances in which instances are shown as a tabular presentation. The tabular presentation of instances can be useful when several instances of one class are to be presented. *Contrast:* sample instance diagram. (C/SE) 1320.2-1998

**SAMPLE/PRELOAD** A defined instruction for the test logic defined by IEEE Std 1149.1-1990. (TT/C) 1149.1-1990

**sample size** Based on the lot size. Minimum sample sizes are given in the following table.

| Lot size | Sample size |
|---|---|
| 1–29 | 3 |
| 30–150 | 5 |
| 151–1200 | 13 |
| 1201–10 000 | 20 |
| 10 001–35 000 | 32 |

(PE/T&D) C135.61-1997

**sample software** Software selected from a current or completed project from which data can be obtained for use in preliminary testing of data collection and metric computation procedures. (C/SE) 1061-1992s

**sample time** The time of the physical collection of the sample material, as

DD/MM/YR_HH:NN:SS_

where the '_' (underscore character) is an ASCII space; DD is the day; MM is the month; YR is the year; HH is the hours; NN is the minutes; and SS is the seconds. (NPS/NID) 1214-1992r

**sample valve actuator** A representative unit manufactured in accordance with the manufacturer's quality control system and specifications for production units. (PE/NP) 382-1980s

**sample valve operator (nuclear power generating station)** A production valve operator type tested to obtain data that are valid over a range of sizes and for the specific services. *Note:* All salient factors must be shown to be common to the sample valve operator and to the intended service valve operator. Commonality of factors such as materials of construction, lubrication, mechanical stresses and clearances, manufacturing processes, and dielectric properties may be established by specification, test, or analyses. (PE/NP) 382-1980s

**sampling (1) (pulse terminology)** A process in which strobing pulses yield signals that are proportional to the magnitude (typically, as a function of time) of a second pulse or other event. (IM/WM&A) 194-1977w

**(2) (image processing)** The technique of dividing an image into disjoint regions, selecting a single point in each region to represent the region, and measuring the brightness or color of each of these points. (C) 610.4-1990w

**(3)** The process of obtaining the values of a function for regularly or irregularly spaced distinct values of an independent variable. (C) 610.10-1994w

**sampling circuit (sampler)** A circuit whose output is a series of discrete values representative of the values of the input at a series of points in time. (PE/EEC) [119]

**sampling control** *See:* sampling control system.

**sampling control system** Control using intermittently observed values of signals such as the feedback signal or the actuating signal. *Note:* The sampling is often done periodically. *See also:* feedback control system. (IM/PE/EDPG) [120], [3]

**sampling gate** A device that extracts information from the input wave only when activated by a selector pulse or sampling pulse. (AES) 686-1997

**sampling, instantaneous** *See:* instantaneous sampling.

**sampling interval (automatic control)** The time between samples in a sampling control system. *See also:* feedback control system. (IM) [120]

**sampling period (automatic control)** The time interval between samples in a periodic sampling control system. *See also:* feedback control system. (IM) [120]

**sampling rate (1)** For the purposes of "de-bouncing" and noise rejection, the receiving station (BCC or DCC) of a special function signal shall sample the signal at a specified rate for a specified length of time in order to determine the "filtered" logic sense of the signal. The clock rate used is referred to as the sampling rate. (EMB/MIB) 1073.3.1-1994

**(2)** The frequency with which the event recorder regularly monitors an input channel to determine its value. (VT) 1482.1-1999

**sampling smoke detector (fire protection devices)** A device which consists of tubing distributed from the detector unit to the area(s) to be protected. An air pump draws air from the protected area back to the detector through the air sampling ports and piping. At the detector, the air is analyzed for smoke particles. (NFPA) [16]

**sampling tests** Tests carried out on a few samples taken at random out of one consignment. *See also:* direct-current commutating machine; asynchronous machine. (PE) [9]

**sanding** Dropping or blowing of sand or similar material on the top of the rail head to increase the coefficient of friction to obtain better adhesion. (VT) 1475-1999

**SAP** *See:* service access point.

**SAR** *See:* synthetic-aperture radar.

**SAS** *See:* Statistical Analysis System.

**sash** A visual user interface control that separates areas of a window to allow the user to display alternative information. (C) 1295-1993w

**satellite (communication satellite)** A body which revolves around another body and which has a motion primarily and permanently determined by the force of attraction of this body. *Note:* A body so defined which revolves round the sun is called a planet or planetoid. By extension, a natural satellite of a planet may itself have a satellite. (COM) [19]

**satellite computer** A processor connected locally or remotely to a larger central processor, and performing certain processing tasks. *See also:* remote computer system. (C) 610.10-1994w

**satellite navigation (navigation aid terms)** Navigation using artificial earth satellites as an aid. Position is computed by determination of either angles, range and range rate, or range and angle measurements of the vehicle relative to the satellite plus satellite ephemeris data received by the vehicle. Satellite ephemeris data can be determined by tracking stations and transmitted to and stored in the satellite's memory for subsequent transmission to vehicle's receivers. (AES/GCS) 172-1983w

**satellite phasing (communication satellite)** Maintaining the center of mass of a satellite by propulsion within a prescribed small tolerance in a desired relation with respect to other satellites or a point on the earth or some other point of reference, such as the subsolar point. (COM) [19]

**saturable-core magnetometer** A magnetometer that depends for its operation on the changes in permeability of a ferromagnetic core as a function of the field to be measured. *See also:* magnetometer. (EEC/PE) [119]

**saturable-core reactor** *See:* saturable reactor.

**saturable reactor (saturable core reactor) (electrical heating applications to melting furnaces and forehearths in the glass industry)** A device that provides output voltage modulation by variation of its circuit reactance. This reactance is controlled by changing the saturation of its magnetic core through variation of a superimposed unidirectional flux. (IA) 668-1987w

**(2) (A) (power and distribution transformers)** A magnetic-core reactor whose reactance is controlled by changing the saturation of the core through variation of a super-imposed unidirection flux. **(B) (power and distribution transformers)** A magnetic-core reactor operating in the region of saturation without independent control means. *Note:* Thus a reactor whose impedance varies cyclically with the alternating current (or voltage). (PE/TR) C57.12.80-1978

**saturated relay recovery time** Recovery time of a thermal relay measured after temperature saturation has been reached. (EEC/REE) [87]

**saturated relay reoperate time** Reoperate time of a thermal relay measured when the relay is de-energized after temperature saturation (equilibrium) has been reached. (EEC/REE) [87]

**saturated signal** *See:* saturating signal.

**saturated sleeving** A flexible tubular product made from braided cotton, rayon, nylon, glass, or other fibers, and coated or impregnated with varnish, lacquer, a combination of varnish and lacquer, or other electrical insulating materials. The impregnant or coating need not form a continuous film. (EEC/PE) [119]

**saturating reactor** A magnetic-core reactor operating in the region of saturation without independent control means. *See also:* magnetic amplifier. (EEC/PE) [119]

**saturating signal (electronic navigation)** A signal of an amplitude greater than can be accommodated by the dynamic range of a circuit. *See also:* navigation. (AES/RS) 686-1982s, [42]

**saturation (1) (signal-transmission system)** A natural phenomenon or condition in which any further change of input no longer results in appreciable change of output. (IA/IA/APP/IAC) [69], [60]

**(2) (automatic control)** A condition caused by the presence of a signal or interference large enough to produce the maximum limit of response, resulting in loss of incremental response. *See also:* feedback control system; signal. (IE/PE/EDPG) [43], [3]

**(3) (A) (visual)** The attribute of a visual sensation which permits a judgment to be made of the proportion of pure chromatic color in the total sensation. *Note:* This attribute is the psychosensorial correlate (or nearly so) of the colorimetric quantity "purity." **(B) (color television)** In a tristimulus reproducer, the degree to which the color lies on the triangle as defined by the three reproducing primaries. *Note:* Full saturation is achieved when one or two of the reproduced primary colors have zero intensity. (BT/AV) 201-1979

**(4) (A) (perceived light-source color)** The attribute used to describe its departure from a light-source color of the same brightness perceived to have no hue. *See also:* color. **(B) (illuminating engineering)** (of a perceived color) The attribute according to which it appears to exhibit more or less

chromatic color judged in proportion to its brightness. In a given set of viewing conditions, and at luminance levels that result in photopic vision, a stimulus of a given chromaticity exhibits approximately constant saturation for all luminances. (EEC/IE) [126]

**(5) (diode-type camera tube)** The point on the signal transfer characteristic where an increase in the input irradiance signal does not change the resulting output current signal significantly. (ED) 503-1978w

**(6)** (of a maser, laser, maser material, or laser material) (laser-maser) A condition in which the attenuation or gain of a material or a device remains at a fixed level or decreases as the input signal is increased. (LEO) 586-1980w

**(7) (A)** In a switching device or amplifier, the fully conducting state at which the device is passing the maximum possible current. *Note:* Most commonly used in reference to circuits containing bipolar or field-effect transistors. **(B)** In color graphics and printing, the amount of color in a specified hue. *Note:* The saturation affects the vividness of the image. (C) 610.10-1994

**(8)** The amount of a particular gas that can be dissolved in a fluid at a given pressure and temperature. The saturation of all gases of interest is linearly proportional to absolute pressure. However, the effect of temperature varies with the specific gas. Some gases exhibit a decrease in saturation with increasing temperature while others tend to increase. The variation with temperature is generally small and can be neglected when evaluating samples in the lab. (PE/IC) 1406-1998

**saturation characteristics (nuclear power generating station)** A description of the steady state or dynamic conditions or limitations under which a further change in input produces an output response which no longer conforms to the specified steady-state or dynamic input-output relationship. (PE/NP) 381-1977w

**saturation current (1) (thermionics)** The value of the current in the saturation state. *See also:* electron emission. (ED) [45]

**(2) (semiconductor diode)** That portion of the steady-state reverse current that flows as a result of the transport across the junction of minority carriers thermally generated within the regions adjacent to the junction. *See also:* semiconductor device. (ED) 216-1960w

**(3) (diode-type camera tube)** The value of the output current signal saturation. Units: amperes. (ED) 503-1978w

**saturation curve (machine or other apparatus)** A characteristic curve that expresses the degree of magnetic saturation as a function of some property of the magnetic excitation. *Note:* For a direct-current or synchronous machine the curve usually expresses the relation between armature voltage and field current for no load or some specified load current, and for specified speed. (PE) [9]

**saturation factor ($K_s$) (1) (rotating machinery)** The ratio of the unsaturated value of a quantity to its saturated value. The reciprocal of this definition is also used. (PE) [9]

**(2)** The ratio of the saturation voltage of a current transformer to the excitation voltage. Saturation factor is an index of how close to saturation a current transformer is in a given application. (PE/PSR) C37.110-1996

**saturation flux density (1) (pipelines and vessels)** The maximum possible magnetic flux density in a material. (IA/PC) 844-1991

**(2)** *See also:* saturation induction. (MAG) 393-1977s

**saturation induction (magnetic core testing)** The maximum intrinsic value of induction possible in a material. *Notes:* 1. This term is often used for the maximum value of induction at a stated high value of field strength where further increase in intrinsic magnetization with increasing field strength is negligible. 2. S.I. unit: Tesla: cgs unit: Gauss (1 Tesla), $10^4$ Gauss. 3. Peak induction (Bm) is the magnetic induction corresponding to the peak applied magnetizing force specified in a test. (MAG) 393-1977s

**saturation level (storage tubes)** The output level beyond which no further increase in output is produced by further writing (then called write saturation) or reading (then called read saturation). *Note:* The word saturation is frequently used alone to denote saturation level. *See also:* storage tube. (ED) 158-1962w, [45]

**saturation region of an IGFET** *See:* saturation region of an insulated-gate field-effect transistor.

**saturation region of an insulated-gate field-effect transistor (metal-nitride-oxide field-effect transistor)** A portion of the $I_{DS}$ versus $V_{DS}$ characteristic where $I_{DS}$ is nearly constant regardless of the value of $V_{DS}$. This is true when $|V_{DS}| \geq |V_{GS} - V_T|$. *Synonym:* saturation region of an IGFET. (ED) 581-1978w

**saturation state (thermionics)** The state of working of an electron tube or valve in which the current is limited by the emission from the cathode. *See also:* electron emission. (ED) [45]

**saturation voltage ($V_x$)** The symmetrical voltage across the secondary winding of the current transformer for which the peak induction just exceeds the saturation flux density. It is found graphically by locating the intersection of the straight portions of the excitation curve on log-log axes. This is not the same as the knee-point voltage which is the point on the curve where the tangent to the curve makes an angle of 45° to the abscissa. (PE/PSR) C37.110-1996

**save area** An area of main storage in which the contents of registers are saved. (C) 610.10-1994w

**saved program state** The set of information, necessary to begin or resume the execution of a client program, describing the machine state (including CPU registers) that will be established upon resumption or initiation of client program execution. (C/BA) 1275-1994

**saved set-group-ID (1)** An attribute of a process that allows some flexibility in the assignment of the effective group ID attribute, when the saved set-user-ID option is implemented. (C/PA/C/PA) 9945-1-1996, 9945-2-1993

**(2)** When the Saved IDs option is implemented, an attribute of a process that allows some flexibility in the assignment of the effective group ID attribute, as described for `Set_Group_ID`. (C) 1003.5-1999

**saved set-user-ID (1)** An attribute of a process that allows some flexibility in the assignment of the effective user ID attribute, when the saved set-user-ID option is implemented. (C/PA) 9945-1-1996, 9945-2-1993

**(2)** When the Saved IDs option is implemented, an attribute of a process that allows some flexibility in the assignment of the effective user ID attribute, as described for `Set_User_ID`. (C) 1003.5-1999

**SAW** *See:* surface acoustic wave.

**SAW filter** A filter characterized by the use of surface acoustic waves that are usually generated by an interdigital transducer and that propagate along a substrate surface to a receiving transducer. (UFFC) 1037-1992w

**SAW oscillator** An oscillator that uses a SAW device (resonator or delay line) as the main frequency-controlling element. (UFFC) 1037-1992w

**SAW resonator filter** A type of surface acoustic wave filter that offers a high $Q(f_0/\Delta f)$ and incorporates efficient reflective arrays to form a Fabry-Perot resonant cavity. (UFFC) 1037-1992w

**sawtooth** *See:* sawtooth waveform.

**sawtooth sweep** A sweep generated by the ramp portion of a sawtooth waveform. *See also:* oscillograph. (IM/HFIM) [40]

**sawtooth wave (television)** A periodic wave whose instantaneous value varies substantially linearly with time between two values, the interval required for one direction of progress being longer than that for the other. *Note:* In television practice, the waveform during the retrace interval is not necessarily linear, since only the trace interval is used for active scanning. (BT/AV) 201-1979w

**sawtooth waveform** A waveform containing a ramp and a return to initial value, the two portions usually of unequal duration. *See also:* oscillograph. (IM/HFIM) [40]

**S-band** A radar-frequency band between 2 GHz and 4 GHz, usually in one of the International Telecommunication Union (ITU) allocated bands 2.3–2.5 GHz or 2.7–3.7 GHz. (AES) 686-1997

**S-BASIC** A dialect of the BASIC programming language. (C) 610.13-1993w

**SBS** *See:* system breakdown structure.

**SBM** *See:* Serial Bus management.

**SBus** A) The correct spelling of the noun describing the bus defined by this standard. B) The name for the Chip and Module Interconnect Bus described by this standard. (C/BA) 1496-1993w

**SBus Card** A physical printed circuit assembly that conforms to the single-width or double-width mechanical specifications; meets the connector, power, and signal assignment requirements of this standard; and contains one or more SBus Devices. (C/BA) 1496-1993w

**SBus Controller** The SBus Device that performs all the centralized services for the SBus, including bias circuitry, arbitration, and address translation for SBus Masters, and selection of and time-outs for SBus Slaves. (C/BA) 1496-1993w

**SBus Cycle** One complete operation on the SBus, consisting of a set of phases beginning with an optional Arbitration Phase and progressing through the optional Translation Phase, the optional Extended Transfer Information Phase, and the Transfer Phase. (C/BA) 1496-1993w

**SBus Device** A set of circuitry complying with the electrical and protocol requirements of the SBus and properly implementing all the signals of the SBus. An SBus Device may reside on the computer motherboard or it may be on an SBus Card. See SBus Controller, SBus Master, SBus Slave. (C/BA) 1496-1993w

**SBus Master** The SBus Device that requests data transfers to be performed by an SBus Slave. (C/BA) 1496-1993w

**SBus Master port** In an SBus Device that combines both an SBus Master and an SBus Slave, the circuitry that is associated with the SBus Master. (C/BA) 1496-1993w

**SBus Slave** The SBus Device providing the function of performing the data transfers requested by an SBus Master. The address space for the data transfers may contain data, control registers, or sense registers. (C/BA) 1496-1993w

**SBus Slave port** In an SBus Device that combines both an SBus Master and an SBus Slave, the circuitry that is associated with the SBus Slave. (C/BA) 1496-1993w

**SBus Slot** The location on a computer motherboard in which an SBus Card may be installed. The SBus Slot has the connector, the electrical characteristics, and the physical volumes and dimensions that are required by this standard. (C/BA) 1496-1993w

**SBus Specification** SBus Specification B.0, an earlier specification of SBus, now superseded by the IEEE Std 1496-1993. (C/BA) 1496-1993w

**SBus standard** IEEE Std 1496-1993, IEEE Standard for a Chip and Module Interconnect Bus: SBus. (C/BA) 1496-1993w

**SBus System** A computer system containing a motherboard with at least an SBus Controller and some combination of zero or more SBus Slots which may be populated with SBus Cards. The SBus System may additionally have SBus Devices integrated on the motherboard. The SBus System includes the electronic, powering, cooling, and mechanical support functions required by the installed SBus Devices and SBus Slots. (C/BA) 1496-1993w

**SC** *See:* station-type cubicle switchgear.

**SCADA** *See:* supervisory control data acquisition system.

**scada channel (supervisory control, data acquisition, and automatic control)** The communication path between master and remote stations. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**scaffolding** Computer programs and data files built to support software development and testing, but not intended to be included in the final product. For example, dummy routines or files, test case generators, software monitors, stubs. *See also:* programming support environment. (C) 610.12-1990

**scalability** The ability to provide functionality up and down a graduated series of application platforms that differ in speed and capacity. (C/PA) 14252-1996

**Scalable Coherent Interface (1)** The name that refers to IEEE Std 1596-1992. Though functionally behaving as a bus, the SCI's physical implementation is a collection of point-to-point unidirectional links (i.e., a ring). (C/MM) 1212-1991s

**(2)** The Scalable Coherent Interface standard, IEEE Std 1596-1992. (C/MM) 1596.3-1996

**scalable font** A font that can be scaled to produce characters in varying sizes. *See also:* derived font; outline font. (C) 610.10-1994w

**scalar (1) (computers)** A data item used to represent a single number or entity. *Contrast:* vector. (C) 610.5-1990w, 1084-1986w

**(2)** Quantity that is completely specified by a single number. (Std100) 270-1966w

**(3)** A value that is atomic, i.e., having no parts. *Contrast:* collection-valued. (C/SE) 1320.2-1998

**(4)** An integer constant. (C/DA) 1481-1999

**scalar approximation** The reduction of the vector representation of an electromagnetic field to a scalar description by assuming that the field is identically polarized at every point in space. *Note:* It usually means that cross-polarization effects are ignored. (AP/PROP) 211-1997

**scalar field** The totality of scalars in a given region represented by a scalar function $S(x, y, z)$ of the space coordinates $x$, $y$, $z$. (Std100) 270-1966w

**scalar function** A functional relationship that results in a scalar. (Std100) 270-1966w

**Scalar Parameter** An instance of the class `IEEE1451_ScalarParameter` or of a subclass thereof. (IM/ST) 1451.1-1999

**scalar product (dot product)** (of two vectors) The scalar obtained by multiplying the product of the magnitudes of the two vectors by the cosine of the angle between them. The scalar product of the two vectors A and B may be indicated by means of a dot $A \cdot B$. If the two vectors are given in terms of their rectangular components, then

$$A \cdot B = A_x B_x + A_y B_y + A_z B_z$$

Example: Work is the scalar product of force and displacement. (Std100) 270-1966w

**scalar property** *See:* scalar-valued property.

**scalar radiative transfer** A radiative transfer theory in which the vector nature of the fields is ignored. *Synonym:* scalar radiative transport. (AP/PROP) 211-1997

**scalar radiative transport** *See:* scalar radiative transfer.

**Scalar Series Parameter** An instance of the class `IEEE1451_ScalarSeriesParameter` or of a subclass thereof. (IM/ST) 1451.1-1999

**scalar solutions** Solutions of Maxwell's equations where cross-polarization effects are disregarded, i.e., coupling between transverse electric (TE) and transverse magnetic (TM) fields is ignored. (AP/PROP) 211-1997

**scalar unit** An arithmetic unit that operates on one data element at a time. (C) 610.10-1994w

**scalar-valued class** A class in which each instance is a single value. *Contrast:* collection-valued class. (C/SE) 1320.2-1998

**scalar-valued property** A property that maps to a scalar-valued class. *Contrast:* collection-valued property. (C/SE) 1320.2-1998

**scalar wave equation** *See:* homogeneous Helmholtz equation.

**scale (1)** A musical scale is a series of notes (symbols, sensations, or stimuli) arranged from low to high by a specified scheme of intervals, suitable for musical purposes. (SP/ACO) [32]

**(2) (computers)** To change a quantity by a factor in order to bring its range within prescribed limits. (C) [20], [85]

**(3) (instrument scale)** *See also:* full scale. (C) 1084-1986w

**(4) (mathematics of computing)** To multiply the representation of a number by a factor in order to bring its range within prescribed limits. (C) 1084-1986w

**(5) (A) (data management)** To adjust the representation of a quantity so that its value is brought within a specified range. **(B) (data management)** The difference between the original and resulting adjustment as in definition (A). **(C) (data management)** A system of mathematical notation such as fixed-point or floating point. (C) 610.5-1990

**(6) (computer graphics)** To change the size of a display element by multiplying its coordinates by a constant value. *Note:* An object can be scaled by the same amount in each of its dimensions (global scaling) or by a different amount in each of its dimensions. (C) 610.6-1991w

**(7)** A visual user interface control that represents a quantity and its relationship to the range of possible values for that quantity. The user can change the value of the quantity. (C) 1295-1993w

**scale class (mechanical demand registers)** Denotes, with respect to single-pointer-form, dual-range single-pointer form, or cumulative-form demand registers, the relationship between the full-scale value of the register and the kilovolt ampere (kVA) rating of the meter with which the register is used. (ELM) C12.4-1984

**scale factor (1) (high voltage testing) (measuring system)** (of a measuring system) The factor by which the output indication is multiplied to determine the measured value of the input quantity or function. (PE/PSIM) 4-1995

**(2)** In an analog computer, the multiplication factor necessary to transform problem variables into computer variables. *Note:* A problem variable is a variable appearing in the mathematical model of the problem. A computer variable is a dependent variable as represented on the computer. (C) 610.10-1994w, 165-1977w

**(3) (mathematics of computing)** A number used as a factor in a scaling operation. *See also:* scale. (C) 1084-1986w

**(4) (A) (accelerometer) (gyros)** The ratio of a change in output to a change in the input intended to be measured. Scale factor is generally evaluated as the slope of the straight line that can be fitted by the method of least squares to input-output data obtained by varying the input cyclically within the input range. **(B) (laser gyro)** The ratio of change in angular displacement about the input axis to a change in output (arc-seconds per pulse). The laser gyro scale factor is directly proportional to the total path length and operating wavelength, and inversely proportional to the effective enclosed ring area. (AES/GYAC) 528-1994

**scale factor asymmetry (accelerometer) (gyros)** The difference between the scale factor measured with positive input and that measured with negative input, specified as a fraction of the scale factor measured over the input range. Scale factor asymmetry implies that the slope of the input-output function is discontinuous at zero input. It must be distinguished from other nonlinearities. (AES/GYAC) 528-1994

**scale-factor potentiometer** *See:* parameter potentiometer.

**scale length (electric instruments)** The length of the path described by the indicating means or the tip of the pointer in moving from one end of the scale to the other. *Notes:* 1. In the case of knife-edge pointers and others extending beyond the scale division marks, the pointer shall be considered as ending at the outer end of the shortest scale division marks. In multiscale instruments the longest scale shall be used to determine the scale length. 2. In the case of antiparallax instruments of the step-scale type with graduations on a raised step in the plane of and adjacent to the pointer tip, the scale length shall be determined by the end of the scale divisions adjacent to the pointer tip. *See also:* instrument. (EEC/AII) [102]

**scale model** A physical model that resembles a given system, with only a change in scale; for example, a replica of an airplane one tenth the size of the actual airplane. (C) 610.3-1989w

**scale-of-two counter** A flip-flop circuit in which successive similar pulses, applied at a common point, cause the circuit to alternate between its two conditions of permanent stability. *See also:* trigger circuit. (EEC/PE) [119]

**scaler (radiation counters)** An instrument incorporating one or more scaling circuits and used for registering the number of counts received. *See also:* anticoincidence. (ED) [45]

**scaler, pulse** *See:* pulse scaler.

**scale span (instrument)** The algebraic difference between the values of the actuating electrical quantity corresponding to the two ends of the scale. *See also:* instrument. (EEC/PE) [119]

**scaling (A)** The formation at high temperatures of thick corrosion product layer(s) on a metal surface. **(B)** The deposition of water-insoluble constituents on a metal surface (as on the interior of water boilers). (IA) [59]

**scaling circuit (radiation counters)** A device that produces an output pulse whenever a prescribed number of input pulses has been received. *See also:* anticoincidence. (ED) [45]

**scalloping (navigation aid terms)** The irregularities in the field pattern of the ground facility due to unwanted reflections from obstructions or terrain features, exhibited in flight as cyclical variations in bearing error. *Synonym:* course scalloping. (AES/GCS) 172-1983w

**scan (1) (general)** To examine sequentially part by part. (C) [20], [85]

**(2) (oscillography)** The process of deflecting the electron beam. *See also:* uniform luminance area; graticule area; phosphor screen; oscillograph. (IM/HFIM) [40]

**(3) (supervisory control, data acquisition, and automatic control) (interrogation)** The process by which a data acquisition system interrogates remote stations or points for data. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**(4) (data management)** To examine a set of items sequentially. (C) 610.5-1990w

**(5)** The process by which a data acquisition system interrogates remote terminals or points for data. (SUB) 999-1992w

**(6)** A sampling process of observing attribute values at a specified point in time. (LM/C) 802.1F-1993r

**(7)** To examine stored information sequentially, part by part. (C) 610.10-1994w

**scan angle** The angle between the direction of the maximum of the major lobe or a directional null and a reference direction. *Notes:* 1. The term beam angle applies to the case of a pencil beam antenna. 2. The reference boresight is usually chosen as the reference direction. *Synonym:* beam angle. (AP/ANT) 145-1993

**scan conversion** The process of redefining an image from one that is composed of lines, points, and areas to one that is expressed in an array of pixels. (C) 610.6-1991w

**scan converter** A device on which a display can be written in refresh line-drawing mode and read out in raster scan mode. (C) 610.10-1994w

**scan cycle (supervisory control, data acquisition, and automatic control)** The time in seconds required to obtain a collection of data (for example, all data from one remote, all data from all remotes, and all data of a particular type from all remotes). (SWG/PE/PE) C37.100-1992, C37.1-1994

**scan design** A design technique that introduces shift-register paths into digital electronic circuits and thereby improves their testability. (TT/C) 1149.1-1990

**scan function check** Accomplished when control function check has been performed with all remotes. A check of master and remote station equipment by exercising a predefined component or capability. (SUB/PE) C37.1-1994

**scan head** A head within a scanner that sweeps across the item being scanned and transmits the contents of that item to be processed by the scanner. (C) 610.10-1994w

**scan input signal** A primary signal which may be used to serially precondition the scan register latches of the DUT. (C/TT) 1450-1999

**scanner (1) (facsimile)** That part of the facsimile transmitter which systematically translates the densities of the subject copy into signal waveform. *See also:* scanning. (COM) 168-1956w

**(2) (A)** A multiplexing arrangement that sequentially connects one channel to a number of channels. **(B)** An arrangement that progressively examines a surface for information. *See also:* feedback control system. (IA/ICTL/APP/IAC) [69], [60]

**(3) (test, measurement, and diagnostic equipment)** A device that sequentially samples a number of data points. *See also:* optical scanner; flying spot scanner; visual scanner. (MIL) [2]

**(4) (computer graphics)** A graphical input device that examines a spatial pattern and generates analog or digital signals, which can be used as input to a computer system. (C) 610.6-1991w

**(5) (A)** A graphic input device that automatically digitizes images for input to a computer. *See also:* bar code scanner; scan head; magnetic ink scanner; optical scanner. **(B)** Any device that is capable of scanning. (C) 610.10-1994

**scanning (1) (navigation aids)** A programmed motion given to the major lobe of an antenna for the purpose of searching a larger angular region than can be covered with a single direction of the beam, or for measuring angular location of a target; also, the analogous process using range gates or frequency domain filters. *See also:* supervisory control. (AES/GCS) 172-1983w, 686-1997

**(2) (television)** The process of analyzing or synthesizing successively, according to a predetermined method, the light values of picture elements constituting a picture area. (BT) 202-1954w

**(3) (facsimile)** The process of analyzing successively the densities of the subject copy according to the elements of a predetermined pattern. *Note:* The normal scanning is from left to right and top to bottom of the subject copy as when reading a page of print. Reverse direction is from right to left and top to bottom of the subject copy. (COM) 168-1956w

**(4) (telephone switching systems)** The periodic examination of circuit states under common control. (COM) 312-1977w

**(5)** (of an antenna beam) A repetitive motion given to the major lobe of an antenna. (AP/ANT) 145-1993

**(6)** The process of examining information in a systematic manner. (C) 610.10-1994w

**scanning, high-velocity** *See:* high-velocity scanning.

**scanning line (television)** A single continuous narrow strip that is determined by the process of scanning. *Note:* In most television systems, the scanning lines that occur during the retrace intervals are blanked. The total number of scanning lines is numerically equal to the ratio of line frequency to frame frequency. (BT/AV) 201-1979w

**scanning linearity (television)** A measure of the uniformity of scanning speed during the unblanked trace interval. (BT/AV) 201-1979w

**scanning line frequency** *See:* stroke speed.

**scanning line length (facsimile)** The total length of scanning line is equal to the spot speed divided by the scanning line frequency. *Note:* This is generally greater than the length of the available line. *See also:* scanning. (COM) 168-1956w

**scanning loss (radar system employing a scanning antenna)** The reduction in sensitivity, usually expressed in decibels, due to scanning across a target, compared with that obtained when the beam is directed constantly at the target. *See also:* antenna. (AP/ANT) 145-1983s

**(2) (A)** In a radar using a continuously scanning beam, the reduction in sensitivity due to motion of the beam between transmission and reception of the signal (sometimes called transit-time loss). **(B)** In an electronic scanning radar, the reduction in signal power due to scanning of the beam from broadside (the direction normal to the array face). *See also:* beamshape loss. (AES) 686-1997

**scanning, low-velocity** *See:* low-velocity scanning.

**scanning speed (television)** The time rate of linear displacement of the scanning spot. (BT/AV) 201-1979w

**scanning spot (1) (television)** The area with which the scanned area is being explored at any instant in the scanning process. *See also:* television. (PE/EEC) [119]

**(2) (facsimile)** The area on the subject copy viewed instantaneously by the pickup system of the scanner. *See also:* scanning. (COM) 168-1956w

**scanning spot, *X* dimension (facsimile)** The effective scanning-spot dimension measured in the direction of the scanning line on the subject copy. *Note:* The numerical value of this will depend upon the type of system used. *See also:* scanning. (COM) 168-1956w

**scanning spot, *Y* dimension (facsimile)** The effective scanning-spot dimension measured perpendicularly to the scanning line on the subject copy. *Note:* The numerical value of this will depend upon the type of system used. *See also:* scanning. (COM) 168-1956w

**scanning supervisory system (station control and data acquisition)** A system in which the master controls all information exchange. The normal state is usually one of repetitive communication with the remote stations. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**scanning velocity (spectrum analyzer)** Frequency span divided by sweep time. (IM) 748-1979w

**scan output signal** A primary signal which may be used to serially observe the contents of the scan register latches of the DUT. (C/TT) 1450-1999

**scan path** The shift-register path through a circuit designed using the scan design technique. (TT/C) 1149.1-1990

**scan pitch (facsimile)** The number of scanning lines per unit length measured perpendicular to the direction of scanning. (COM) 167-1966w

**scan rate (data transmission)** The quantity of remote functions or stations that a master station can poll in a given time period. (PE) 599-1985w

**scan sector** The angular interval over which the major lobe of an antenna is scanned. (AP/ANT) 145-1993

**scan test methodology** A test methodology that utilizes shift register latches to precondition and observe modeled faults within the DUT. Scan tests typically consist of a serial preconditioning (load via scan inputs), parallel vectors to clock/transition the DUT, and then a serial observation (unload via the scan outputs). (C/TT) 1450-1999

**scan time (1) (sequential events recording systems)** The time required to examine the state of all inputs. (PE/EDPG) [1]

**(2) (acousto-optic deflector)** The time for the light beam to be scanned over the angular swing of the deflector. (UFFC) [17]

**scan vectors** A representation of test information containing lists of states that are to be shifted into or out of the scan pins on the device. *Note:* Scan vectors imply the use of scan test methodology in the design of the device under test. (C/TT) 1450-1999

**scare rope** *See:* safety life line.

**scatterband (navigation aids) (interrogation systems)** The total bandwidth occupied by the various received signals from interrogators operating with carriers on the same nominal radio frequency; the scatter results from the individual deviations from the nominal frequency. (AES/GCS) 172-1983w

**scattered radiation** An electromagnetic field resulting from currents induced in a secondary, conducting or dielectric object by electromagnetic waves incident on that object from one or more primary sources. (NIR) C95.1-1999

**scattered wave** An electromagnetic wave that results when an incident wave encounters the following:

— One or more discrete scattering objects
— A rough boundary between two media
— Continuous irregularities in the complex constitutive parameters of a medium

(AP/PROP) 211-1997

**scatter/gather** Data structures in memory that are sequentially ordered in virtual space may be sparcely ordered in physical space. In order to access this data structure with a physical device (such as a DMA controller), the device may need to redirect its address pointer to different physical pages of memory while transferring that data. (C/BA) 1014.1-1994w

**scattering (1) (laser maser)** The angular dispersal of power from a beam of radiation (or the perturbation of the field distribution of a resonance mode) either with or without a change in frequency, caused for example by inhomogeneities or nonlinearities of the medium or by irregularities in the surfaces encountered by the beam. (LEO) 586-1980w

**(2) (fiber optics)** The change in direction of light rays or photons after striking a small particle or particles. It may also be regarded as the diffusion of a light beam caused by the inhomogeneity of the transmitting medium. *See also:* leaky mode; unbound mode; Rayleigh scattering; waveguide scattering; refractive index; mode; nonlinear scattering; material scattering. (Std100) 812-1984w

**(3) (data transmission)** The production of waves of changed direction, frequency, or polarization when radio waves encounter matter. *Note:* The term is frequently used in a narrower sense, implying a disordered change in the incident energy. (PE) 599-1985w

**(4)** A process in which the energy of a traveling wave is dispersed in direction by means other than reflection and refraction. (AP/PROP) 211-1997

**scattering coefficient** Element of the scattering matrix. *See also:* scattering matrix. (IM/HFIM) [40]

**(2) (A)** The scattering cross-section per unit illuminated area of a surface expressed in square meters per square meter:

$$\sigma^0_{pq} = \frac{d\sigma_{pq}}{dA}$$

where $p$ and $q$ are polarization indices. **(B)** The scattering cross-section per unit volume of a medium containing discrete scatterers or random variations of refractive index. It is expressed in meters squared per cubic meter and is often designated $\sigma_v$. *Note:* The scattering coefficient may be monostatic (backscatter), when the transmitter and receiver are collocated, or bistatic, when they are not. *See also:* scattering cross section. (AP/PROP) 211-1997

**scattering cross section (1) (radio-wave propagation)** The projected area required to intercept and isotropically radiate the same power as a scatterer (target) scatters toward the receiver. The scattering cross-section is calculated from the relationship:

$$\sigma_{pq} = \lim_{R\to\infty}\left[4\pi R^2 \frac{\langle|\vec{E}^s_p|^2\rangle}{\langle|\vec{E}^i_q|^2\rangle}\right]$$

where

$R$ = the distance between the scatterer and the receiver
$\vec{E}^s_p$ = the p-polarized component of the scattered electric field at the receiver
$\vec{E}^i_q$ = a q-polarized incident electric field at the scatterer.

The incident field is assumed to be planar over the extent of the target. (AP/PROP) 211-1997

**(2)** For a scattering object and an incident plane wave of a given frequency, polarization, and direction, an area that, when multiplied by the power flux density of the incident wave, would yield sufficient power that could produce, by isotropic radiation, the same radiation intensity as that in a given direction from the scattering object. *Note:* The scattering cross section is equal to $4\pi$ times the ratio of the radiation intensity of the scattered wave in a specified direction to the power flux density of the incident plane wave. *See also:* monostatic cross section; radar cross section; bistatic cross section. (AP/ANT) 145-1993

**scattering loss (1) (laser maser)** That portion of the loss in received power which is due to scattering. (LEO) 586-1980w

**(2)** That part of the transmission loss that is due to scattering within the medium or due to roughness of the reflecting surface. (SP/ACO) [32]

**scattering matrix (1) (waveguide components)** A square array of complex numbers consisting of the transmission and reflection coefficients of a waveguide component. As most commonly used, each of these coefficients relates the complex electric field strength (or voltage) of a reflected or transmitted wave to that of an incident wave. The subscripts of a typical coefficient $S_{ij}$ refer to the output and input ports related by the coefficient. These coefficients, which may vary with frequency, apply at a specified set of input and output reference planes. (MTT/AP/ANT) 148-1959w, [35]

**(2)** An n × n (square) matrix used to relate incident waves and reflected waves for an n-port network. If the incident wave quantities for the ports are denoted by the vector $A$ and the reflected wave quantities by the vector $B$ then the scattering matrix S is defined such that $B = SA$. where:

$$a_i = \frac{1}{\sqrt{R_e Z_i}}(V_i + Z_i I_i)$$

$$b_i = \frac{1}{\sqrt{R_e Z_i}}(V_i - Z_i I_i)$$

$Z_i$ is the port normalization impedance with $R_e Z_i > 0$. One formula for the scattering matrix is $S = [Z + R]^{-1}[Z - R]$ where $Z$ is the open circuit impedance matrix that describes the network and $R$ is a diagonal matrix representing the source or load resistances at each port. It should be noted that the scattering matrix is defined with respect to a specific set of port terminations. Physical interpretations can be given to the scattering coefficients for example, $|S_{ij}|^2$ is the fraction of available power that is delivered to the port termination at port i due to a source at port j. (CAS) [13]

**(3)** An $n \times n$ (square) matrix used to relate incident waves and reflected waves for an $n$-port network. (EMC) 1128-1998

**(4)** A 2 × 2 complex matrix which characterizes the polarized field scattered by a given object. (AP/PROP) 211-1997

**scattering pattern** *See:* scattering phase function.

**scattering phase function** The angular spectrum of a scatterer when illuminated by a plane wave. *Synonym:* scattering pattern. (AP/PROP) 211-1997

**scatter read** A read operation in which data from an input record is placed into non-adjacent storage areas. *Contrast:* gather write. (C) 610.10-1994w

**scatter storage** *See:* hashing.

**SC device** A static configuration device, whose logical address is set manually and cannot be changed by DC protocols. (C/MM) 1155-1992

**scenario** A set of initial conditions and a sequence of events used to develop, test, or apply a system, model, or simulation. (C) 610.3-1989w

**(2) (A)** A description of an exercise (initial conditions). A scenario is part of the session database that configures the units and platforms and places them in specific locations with specific missions. **(B)** An initial set of conditions and time line of significant events imposed on trainees or systems to achieve exercise objectives. (DIS/C) 1278.3-1996

**(3) (A)** A step-by-step description of a series of events that may occur concurrently or sequentially. **(B)** An account or

synopsis of a projected course of events or actions. (C/SE) 1362-1998

**scheduled frequency (electric power system)** The frequency that a power system or an interconnected system attempts to maintain. (PE/PSE) 94-1970w

**scheduled frequency offset (electric power system)** Scheduled system frequency minus rated frequency. This offset is usually initiated to correct the system time error. (PE/PSE) 94-1991w

**scheduled interruption (1) (electric power system)** An interruption caused by a scheduled outage. *See also:* outage. (PE/PSE) [54], 346-1973w

**(2)** A loss of electric power that results when a component is deliberately taken out of service at a selected time, usually for the purposes of construction, preventative maintenance, or repair. *Notes:* 1. This derives from transmission and distribution applications and does not apply to generation interruptions. 2. The key test to determine if an interruption should be classified as a forced or scheduled interruption is as follows. If it is possible to defer the interruption when such deferment is desirable, the interruption is a scheduled interruption; otherwise, the interruption is a forced interruption. Deferring an interruption may be desirable, for example, to prevent overload of facilities or interruption of service to customers. (PE/T&D) 1366-1998

**scheduled maintenance (generation)** Capability which has been scheduled to be out of service for maintenance. (PE/PSE) 346-1973w

**scheduled net interchange (control area) (electric power system)** The net power flow that a control area strives to maintain on its area tie lines in the absence of control biases. (PE/PSE) 94-1991w

**scheduled outage (1) (electric power system)** A loss of electric power that results when a component is deliberately taken out of service at a selected time, usually for purposes of construction, preventive maintenance, or repair. *Notes:* 1. This derives from transmission and distribution applications and does not necessarily apply to generation outages. 2. The key test to determine if an outage should be classified as forced or scheduled is as follows. If it is possible to defer the outage when such deferment is desirable, the outage is a scheduled outage; otherwise, the outage is a forced outage. Deferring an outage may be desirable, for example, to prevent overload of facilities or an interruption of service to consumers. (PE/PSE) 346-1973w

**(2) (electrical transmission facilities)** An intentional manual outage that could have been deferred without increasing risk to human life, risk to property, or damage to equipment. *Note:* A manual outage is classified as scheduled if it is possible to defer the outage occurrence when such deferment is desirable. Otherwise, the outage occurrence is a forced outage. Deferring an outage occurrence may be desirable, for example,to prevent overload of facilities or an interruption of service to consumers. (PE/PSE) 859-1987w

**(3)** An outage that results when a component is deliberately taken out of service at a selected time, usually for purposes of construction, maintenance, or repair. (IA/PSE) 493-1997, 399-1997

**scheduled outage duration (1) (electric power system)** The period from the initiation of the outage until construction, preventive maintenance, or repair work is completed. (PE/PSE) 346-1973w

**(2)** The period from the initiation of a scheduled outage until construction, preventive maintenance, or repair work is completed and the affected component is made available to perform its intended function. (IA/PSE) 493-1997, 399-1997

**scheduled outage rate (1) (electrical transmission facilities)** The number of scheduled outages per unit of service time = number of scheduled outages/service time. In some studies, scheduled outage rate may be defined as the number of outage occurrences per unit of exposure time (including both service time and outage time). (PE/PSE) 859-1987w

**(2)** The mean number of scheduled outages of a component per unit exposure time. (IA/PSE) 493-1997, 399-1997

**scheduled system frequency** The frequency that a power system or an interconnected system attempts to maintain. (PE/PSE) 94-1991w

**schedule, electric rate** *See:* electric rate schedule.

**scheduler** A computer program, usually part of an operating system, that schedules, initiates, and terminates jobs. (C) 610.12-1990

**schedule setter or set-point device (speed governing systems)** A device for establishing or setting the desired value of a controlled variable. *See also:* speed-governing system. (PE/PSE) 94-1970w

**scheduling** The application of a policy to select a runnable thread to become a running thread, or to alter one or more of the thread lists. (C/PA) 9945-1-1996

**scheduling allocation domain** The set of processors on which an individual thread can be scheduled at any given time. (C/PA) 9945-1-1996

**scheduling contention scope** A property of a thread that defines the set of threads against which that thread competes for resources. For example, in a scheduling decision, threads sharing scheduling contention scope compete for processor resources. In this standard, a thread has a scheduling contention scope of either PTHREAD_SCOPE_SYSTEM or PTHREAD_SCOPE_PROCESS. (C/PA) 9945-1-1996

**scheduling policy** A set of rules that is used to determine the order of execution of threads to achieve some goal. In the context of this standard, a scheduling policy affects thread ordering

1) When a thread is a running thread and it becomes a blocked thread
2) When a thread is a running thread and it becomes a preempted thread
3) When a thread is a blocked thread and it becomes a runnable thread
4) When a running thread calls a function that can change the priority or scheduling policy of a thread
5) In other scheduling-policy-defined circumstances

Conforming implementations shall define the manner in which each of the scheduling policies may modify the priorities or otherwise affect the ordering of threads at each of the occurrences listed above. Additionally, conforming implementations shall define at what other circumstances and in what manner each scheduling policy may modify the priorities or affect the ordering of threads. (C/PA) 9945-1-1996

**schema (1)** A description of the logical structure of a database. *See also:* data model. (C) 610.5-1990w

**(2)** The set of rules and constraints concerning DIT structure, object class definitions, attribute types, and syntaxes that characterize the DIB. (C/PA) 1328.2-1993w, 1326.2-1993w, 1327.2-1993w, 1224.2-1993w

**(3)** The structure or framework used to define a data record. This includes each field's name, type, shape, dimension, and mapping. (SCC20) 1226-1998

**schema definition language** *See:* data definition language.

**schema language** *See:* data definition language.

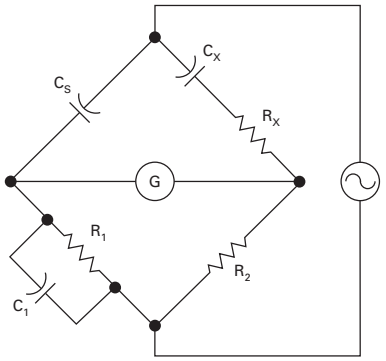
**schematic diagram (elementary diagram)** A diagram that shows, by means of graphic symbols, the electrical connections and functions of a specific circuit arrangement. The schematic diagram facilitates tracing the circuit and its functions without regard to the actual physical size, shape, or location of the component device or parts. (GSD) 315-1975r

**SCHEME** A dialect of LISP. (C) 610.13-1993w

**Scherbius machine (rotating machinery)** A polyphase alternating-current commutator machine capable of generator or motor action, intended for connection in the secondary circuit of a wound-rotor induction motor supplied from a fixed-frequency polyphase power system, and used for speed and/or power-factor control. The magnetic circuit components are

laminated and may be of the salient-pole type or of the cylindrical-rotor uniformly slotted type, either type having a series-connected armature reaction compensating winding as part of the field system. The control field winding may be separately or shunt-excited with or without an additional series-excited field winding. *See also:* asynchronous machine. (PE) [9]

**Schering bridge** A four-arm alternating-current bridge in which the unknown capacitor and a standard loss-free capacitor form two adjacent arms, while the arm adjacent to the standard capacitor consists of a resistor and a capacitor in parallel, and the fourth arm is a nonreactive resistor. (See the corresponding figure.) *Note:* Normally used for the measurement of capacitance and dissipation factor. Usually, one terminal of the source is connected to the junction of the unknown capacitor with the standard capacitor. With this connection, if the impedances of the capacitance arms are large compared to those of the resistance arms, most of the applied voltage appears across the former, the maximum test voltage being limited by the rating of the standard capacitor. If the detector and the source of electromotive force are interchanged the resulting circuit is called a conjugate Schering bridge. The balance is independent of frequency. *See also:* bridge.




$C_X R_2 = C_S R_1$
$C_X R_X = C_1 R_1$

**Schering bridge**

(EEC/PE) [119]

**Schlieren method** The technique by which light refracted by the density variations resulting from acoustic waves is used to produce a visible image of a sound field. (SP/ACO) [32]

**Schmitt trigger** A solid state element that produces an output when the input exceeds a specified turn-on level, and whose output continues until the input falls below a specified turn-off level. (SWG/PE) C37.100-1981s

**Schottky-barrier contact (charged-particle detectors)** A metal-semiconductor contact structure in which rectification occurs that is heavily influenced by the difference in the work functions of the materials. The contacts frequently consist of an interfacial metal/semiconductor compound such as a silicide. (NPS) 325-1986s, 300-1988r, 325-1996

**Schottky-barrier detector** A semiconductor radiation detector in which the blocking contact is of the Schottky barrier type. (NPS) 325-1996, 300-1988r

**Schottky effect** *See:* Schottky emission.

**Schottky emission (electron tube)** The increased thermionic emission resulting from an electric field at the surface of the cathode. *See also:* electron emission. (ED) 161-1971w

**Schottky noise (electron tube)** The variation of the output current resulting from the random emission from the cathode. (ED) [45], [84]

**Schuler tuning (inertial navigation system) (navigation aids)** The application of parameter values such that accelerations do not deflect the platform system from any vertical to which it has been set; a Schuler-tuned system, if fixed to the mean surface of a nonrotating earth, exhibits a natural period of 84.4 min. (AES/GCS) 172-1983w

**SCI** *See:* SCI standard.

**SCI standard** Refers to IEEE Std 1596-1992, which provides computer-bus-like services using a collection of point-to-point unidirectional links. (C/MM) 1596.5-1993, 1596.4-1996, 1596-1992

**scientific notation** A notation system in which a number is expressed as a coefficient multiplied by a power of ten. (C) 1084-1986w

**scintillation (1) (scintillators)** The optical photons emitted as a result of the incidence of a particle or photon of ionizing radiation on a scintillator. *Note:* Optical photons unless otherwise specified are photons with energies corresponding to wavelengths between 2000 and 15 000 angstroms. *See also:* ionizing radiation; radiation. (NPS) 398-1972r

**(2) (laser maser)** The rapid changes in irradiance levels in a cross section of a laser beam. (LEO) 586-1980w

**(3)** The phenomenon of fluctuation of the amplitude of a wave caused by irregular changes in the transmission path or paths with time. *Note:* The term scintillation is sometimes used to describe fluctuations of phase and angle of arrival. *See also:* fading. (AP/PROP) 211-1997

**(4)** Random variations in the received signal from a complex target that can occur due to changes in aspect angle or other causes. *Note:* Because this term has been applied variously to target fluctuation and scintillation error, use of one of these more specific terms is recommended to avoid ambiguity. (AES) 686-1997

**scintillation counter** The combination of scintillation-counter heads and associated circuitry for detection and measurement of ionizing radiation. (NPS) 398-1972r

**scintillation-counter cesium resolution** The scintillation-counter energy resolution for the gamma ray or conversion electron from cesium-137. *See also:* scintillation counter. (NPS) 398-1972r

**scintillation-counter energy resolution** A measure of the smallest difference in energy between two particles or photons of ionizing radiation that can be discerned by the scintillation counter. Quantitatively, it is the fractional standard deviation ($\sigma/E_1$) of the energy distribution curve. *Note:* The fractional full width at half maximum of the energy distribution curve (FWHM/$E_1$) is frequently used as a measure of the scintillation-counter energy resolution where $E_1$ is the mode of the distribution curve. *See also:* scintillation counter. (NPS) 398-1972r

**scintillation-counter energy-resolution constant** The product of the square of the scintillation-counter energy resolution, expressed as the fractional full width at half maximum (FWHM/$E_1$), and the specified energy. *See also:* scintillation counter. (NPS) 175-1960w

**scintillation counter head** The combination of scintillators and phototubes or photocells that produces electric pulses or other electric signals in response to ionizing radiation. *See also:* scintillation counter; phototube. (NPS) 175-1960w

**scintillation-counter time discrimination** A measure of the smallest interval of time between two individually discernible events. Quantitatively, it is the standard deviation of the time-interval curve. *Note:* The full width at half maximum of the time-interval curve is frequently used as a measure of the time discrimination. *See also:* scintillation counter. 160-1957w

**scintillation decay time** The time required for the rate of emission of optical photons of a scintillation to decrease from 90% to 10% of its maximum value. *Note:* Optical photons, for the purpose of this Standard, are photons with energies corresponding to wavelengths between 2000 and 15 000 angstroms. *See also:* scintillation counter. (NPS) 398-1972r

**scintillation duration** The time interval from the emission of the first optical photon of a scintillation until 90% of the optical photons of the scintillation have been emitted. *Note:* Optical photons are photons with energies corresponding to wavelengths between 2000 and 15 000 angstroms. *See also:* scintillation counter. (NPS) 398-1972r

**scintillation error** Error in radar-derived target position or Doppler frequency caused by interaction of the scintillation spectrum with frequencies used in sequential measurement techniques. *Note:* Not to be confused with glint. (AES) 686-1997

**scintillation index** The ratio of the second moment to the first moment squared of the intensity. (AP/PROP) 211-1997

**scintillation rise-time** The time required for the rate of emission of optical photons of a scintillation to increase from 10% to 90% of its maximum value. *Note:* Optical photons are photons with energies corresponding to wavelengths between 2000 and 15 000 angstroms. *See also:* scintillation counter. (NPS) 398-1972r

**scintillator** The body of scintillator material together with its container. *See also:* scintillation counter. (NPS) 398-1972r

**scintillator conversion efficiency** The ratio of the optical photon energy emitted by a scintillator to the incident energy of a particle or photon of ionizing radiation. *Note:* The efficiency is generally a function of the type and energy of ionizing radiation. Optical photons are photons with energies corresponding to wavelengths between 2000 and 15 000 angstroms. *See also:* scintillation counter. (NPS) 175-1960w

**scintillator material** A material that emits optical photons in response to ionizing radiation. *Notes:* 1. There are five major classes of scintillator materials, namely:

a) inorganic crystals such as NaI(Tl) single crystals, ZnS(Ag) screens;
b) organic crystals (such as, anthracene, trans-stilbene);
c) solution scintillators: (1) liquid, (2) plastic, (3) glass;
d) gaseous scintillators;
e) Cerenkov scintillators.

2. Optical photons are photons with energies corresponding to wavelengths between 2000 and 15 000 angstroms. *See also:* scintillation counter. (NPS) 398-1972r

**scintillator-material total conversion efficiency** The ratio of the optical photon energy produced to the energy of a particle or photon of ionizing radiation that is totally absorbed in the scintillator material. *Note:* The efficiency is generally a function of the type and energy of the ionizing radiation. Optical photons are photons with energies corresponding to wavelengths between 2000 and 15 000 angstroms. *See also:* scintillation counter. (NPS) 398-1972r

**scintillator photon distribution** (in number) The statistical distribution of the number of optical photons produced in the scintillator by total absorption of monoenergetic particles. *Note:* Optical photons are photons with energies corresponding to wavelengths between 2000 and 15 000 angstroms. *See also:* scintillation counter. (NPS) 398-1972r

**scissoring** A computer graphics technique in which portions of display elements that lie outside of the physical bounds of a window or view volume are removed. *See also:* wrap-around; clipping. (C) 610.6-1991w

**SCN** *See:* specification change notice.

**scope (1) (navigation aids)** The face of a cathode-ray tube or a display of similar appearance. A colloquial abbreviation of oscilloscope. (AES/GCS) 172-1983w

**(2) (scheme programming language)** The region of a program's source text that is associated with a linguistic construct. Normally used with "variable" to describe the region over which a variable is bound: "the scope of a variable." (C/MM) 1178-1990r

**(3)** The face of a cathode-ray tube or a display of similar appearance. *Note:* The term *scope* is a colloquial abbreviation of the word *oscilloscope*. (AES) 686-1997

**(4)** *See also:* transit. (T&D/PE) 524-1992r

**scored card** A special card that contains one or more scored lines to facilitate precise folding or separation of certain parts of the card. *See also:* processable scored card. (C) 610.10-1994w

**scoring system (motion-picture production) (electroacoustics)** A recording system used for recording music to be reproduced in timed relationship with a motion picture. (SP) [32]

**scotopic spectral luminous efficiency function (light-emitting diodes)** (photometric standard observer for scotopic vision) ($V'$) The ratio of the radiant flux at wavelength m, to that at wavelength $\lambda$, when the two fluxes produce the same scotopic luminous sensations under specified photometric conditions, lm, being chosen so that the maximum value of this ratio is unity. Unless otherwise indicated, the values used for the spectral luminous efficiency function relate to scotopic vision by the photometric standard observer having the characteristics laid down by the International Commission on Illumination. (ED) [127]

**scotopic vision (illuminating engineering)** Vision mediated essentially or exclusively by the rods. It is generally associated with adaptation to a luminance below about 0.034 cd/m$^2$, (2.2 $\times$ 10$^{-5}$ cd/in$^2$), (0.01 fL). (EEC/IE) [126]

**Scott-connected transformer, interlacing impedance voltage** The single-phase voltage applied from the midtap of the main transformer winding to both ends, connected together, that is sufficient to circulate in the supply lines a current equal to the three-phase line current. The current in each half of the winding is 50% of this value. *See also:* efficiency. (IA) [61]

**Scott-connected transformer per-unit resistance** The measured watts expressed in per-unit on the base of the rated kilovolt-ampere of the teaser winding. (IA) [61]

**Scott or T-connected transformer (power and distribution transformers)** An assembly used to transfer energy from a three-phase circuit to a two-phase circuit, or vice versa; or from a three-phase circuit to another three-phase circuit. The assembly consists of a main transformer with a tap at its midpoint connected directly between of the phase wires of a three-phase circuit, and of a teaser transformer connected between the mid-tap of the main transformer and a third phase wire of the three-phase circuit. The other windings of the transformers may be connected to provide either a two-phase or a three-phase output. Alternatively, this may be accomplished with an assembly utilizing a three-legged core with main and teaser coil assemblies located on the two outer legs, and with a center leg which has no coil assembly and provides a common magnetic circuit for the two outer legs. *See also:* teaser transformer; interlacing impedance voltage of a Scott-connected transformer; main transformer. (PE/TR) C57.12.80-1978r

**SCR** *See:* semiconductor controlled rectifier; silicon controlled rectifier; reverse-blocking triode thyristor.

**scram (power operations)** The rapid shutdown of a nuclear reactor. Usually, a scram is accomplished by rapid insertion of safety or control rods, or both. Emergencies or deviations from normal operation may require scramming the reactor by manual or automatic means. (PE/PSE) 858-1987s

**scraper hoist** A power-driven hoist operating a scraper to move material (generally ore or coal) to a loading point. (EEC/PE) [119]

**scratch (A)** To physically erase data from its medium. **(B)** To logically delete the identification of data from its medium. (C) 610.5-1990

**scratch file** A file used as a work area to hold data temporarily. (C) 610.5-1990w

**scratchpad area (SPA)** A portion of computer memory shared by a set of computer programs or processes for some special purpose. For example, memory used by two programs for interprocess communication. *Synonym:* scratchpad RAM. (C) 610.5-1990w, 610.10-1994w

**scratchpad memory** *See:* temporary storage.

**scratchpad RAM** *See:* scratchpad area.

**screen (1) (rotating machinery)** A port cover with multiple openings used to limit the entry of foreign objects. (IA/APP) [90]

**(2) (cathode-ray tubes)** The surface of the tube upon which the visible pattern is produced. *See also:* electrode. (ED) 161-1971w

**(3)** A rectangular region of columns and lines on a terminal display. A screen may be a portion of a physical display device or may occupy the entire physical area of the display device. (C/PA) 9945-2-1993

**(4)** The portion of a display that is visible on the display device. A screen may show part of a page, an entire page, or several pages. *See also:* display device. (PE/NP) 1289-1998

**(5)** *See also:* display screen. (C) 610.10-1994w

**screened conductor cable** A cable in which the insulated conductor or conductors is/are enclosed in a conducting envelope or envelopes. (PE/IC/TR) C57.15-1968s

**screen editor** *See:* full-screen editor.

**screen factor (electron-tube grid)** The ratio of the actual area of the grid structure to the total area of the surface containing the grid. *See also:* electron tube. (ED) [45], [84]

**screen font** A font designed for use on a display device. *Note:* Usually matches closely the font used when printing. *Synonym:* graphical user interface font. (C) 610.10-1994w

**screen grid** A grid placed between a control grid and an anode, and usually maintained at a fixed positive potential, for the purpose of reducing the electrostatic influence of the anode in the space between the screen grid and the cathode. *See also:* grid; electrode. (ED) 161-1971w

**screen-grid modulation** Modulation produced by application of a modulating voltage between the screen grid and the cathode of any multigrid tube in which the carrier is present. (BT) 182A-1964w

**screen image** *See:* display image.

**screening (telephone switching systems)** The ability to accept or reject calls by using trunk or line class or trunk or line number information. (C) [85]

**screening measurements** Measurements made to detect radioactive material under routine conditions, but not used to quantify the amount of a given radionuclide. (NI) N42.23-1995

**screening test** A test, or combination of tests, intended to remove unsatisfactory items or those likely to exhibit early failures. *See also:* reliability. (R) [29]

**screen protected** *See:* guarded.

**screen size** The diameter of a cathode ray tube outside of its housing or, for a non-round tube, the length of the maximum diagonal of the display space after the tube has been mounted inside its housing. (C) 610.6-1991w

**screen, viewing** *See:* viewing area.

**SC resource manager** A resource manager that supports static configuration and does not support dynamic configuration of VXIbus devices. (C/MM) 1155-1992

**screw machine (elevators)** An electric driving machine, the motor of which raises and lowers a vertical screw through a nut with or without suitable gearing, and in which the upper end of the screw is connected directly to the car frame or platform. The machine may be of direct or indirect drive type. (EEC/PE) [119]

**SCRIBE** A text-formatting language in which formatting commands are embedded in the text, then processed into a formatted document. (C) 610.13-1993w

**SCRIPT** A text-formatting language in which formatting commands are embedded in the text, then processed into a formatted document. *Note:* SCRIPT is a forerunner to DCF. (C) 610.13-1993w

**script** An area of nonvolatile memory reserved for user interface commands to be evaluated at particular times during the Open Firmware start-up sequence. (C/BA) 1275-1994

**scroll** To move the representation of data vertically or horizontally relative to the terminal screen. There are two types of scrolling:

1) The cursor moves with the data
2) The cursor remains stationary while the data moves

(C/PA) 9945-2-1993

**scroll bar** A visual user interface control, associated with a scrollable area, that indicates to a user that more information is available and can be scrolled into view. (C) 1295-1993w

**scrolled window** A window that presents information that exceeds the space available for display. The user uses the scroll bar to bring the contents currently outside the display area into view. (C) 1295-1993w

**scrolling (1) (word processing)** The process of moving text across a display screen to create the effect of a viewing window moving on a large page of a document. An operator may scroll left, right, up, or down in a document. *See also:* reverse scrolling. (C) 610.2-1987

**(2) (computer graphics)** The process of moving an entire display image in such a manner that new data appears within the viewport as old data disappears, to give a visual impression of vertical movement of the image. *Note:* The term scrolling is sometimes used to mean vertical or horizontal movement. *Contrast:* panning. (C) 610.6-1991w

**(3)** A method of viewing and moving the data displayed in which the data rolls continuously behind a fixed display frame. (PE/NP) 1289-1998

**scrubber** The node that marks packets as they go past in a ringlet, and discards any previously marked packet. This prevents damaged or misaddressed packets from circulating indefinitely. The scrubber also performs other housekeeping tasks for the ringlet. There is always exactly one scrubber on a ringlet. Normal nodes may all have scrubber capability built in, but exactly one is enabled as scrubber per ringlet. Often the scrubber will take responsibility for initializing a ringlet, but this could be done by another (unique) node. (C/MM) 1596-1992

**SC system** A VXIbus system with no DC devices. (C/MM) 1155-1992

**sculling error (inertial sensors) (strapdown inertial system)** A system error resulting from the combined input of linear vibration along one axis and an angular oscillation, at the same frequency, around a perpendicular axis. In the computer processing, an apparent rectified acceleration is produced along an axis perpendicular to these two axes. (AES/GYAC) 528-1994

**scuzzy** Colloquial pronunciation for "SCSI." *See also:* small computer systems interface. (C) 610.10-1994w

**SDC** *See:* self-damping conductor.

**SDD** *See:* software design description.

**SDL** *See:* Specification and Description Language; software development library.

**SDN** *See:* software defined network.

**SDP** *See:* software development plan.

**SDR** *See:* system design review.

**SDS** *See:* sparse data scan; sequential data set.

**SDU** *See:* service data unit.

**SDV (segment delay value (ARCHIVE))** *See:* Segment Delay Value.

**SE** *See:* segment extender.

**seal** (window) (in a waveguide) A gastight or watertight membrane or cover designed to present no obstruction to radio-frequency energy. *See also:* waveguide. (AP/ANT) [35]

**sealable equipment** Equipment enclosed in a case or cabinet that is provided with a means of sealing or locking so that live parts cannot be made accessible without opening the enclosure. The equipment may or may not be operable without opening the enclosure. (NESC/NEC) [86]

**seal, double electric conductor (nuclear power generating station)** An assembly of two single electric conductor seals in series and arranged in such a way that there is a double pressure barrier seal between the inside and the outside of the

containment structure along the axis of the conductors. (IM) [76]

**sealed (1) (power and distribution transformers)** So constructed that the enclosure will remain hermetically sealed within specified limits of temperature and pressure. (PE/TR) C57.12.80-1978r

**(2) (rotating machinery)** Provided with special seals to minimize either the leakage of the internal coolant out of the enclosure or the leakage of medium surrounding the enclosure into the machine. *See also:* asynchronous machine. (IA/APP) [90]

**sealed-beam headlamp (illuminating engineering)** An integral optical assembly designed for headlighting purposes, identified by the name "Sealed Beam" branded on the lens. (EEC/IE) [126]

**sealed bushing** An oil-filled bushing in which the oil is contained within the bushing and not allowed to mix with the oil of the apparatus on which it is used. (PE/TR) C57.19.03-1996

**sealed cell (1) (lead storage batteries) (nuclear power generating station)** A cell in which the only passage for the escape of gases from the interior of the cell is provided by a vent of effective spray-trap design adapted to trap and return to the cell particles of liquid entrained in the escaping gases. (PE/EDPG) 484-1987s

**(2)** A sealed cell (or battery) is one that has no provision for the addition of water or electrolyte or for external measurement of electrolyte specific gravity. (NESC/NEC) [86]

**sealed dry-type transformer, self-cooled (power and distribution transformers)** (class GA) A dry-type self-cooled transformer with a hermetically sealed tank. *Note:* The insulating gas may be air, nitrogen, or other gases (such as fluorocarbons) with high dielectric strength. (PE/TR) C57.94-1982r, C57.12.80-1978r

**sealed end (cable) (shipping seal)** The end fitted with a cap for protection against the loss of compound or the entrance of moisture. (EEC/AWM) [91]

**sealed refrigeration compressor (hermetic type)** A mechanical compressor consisting of a compressor and a motor, both of which are enclosed in the same sealed housing, with no external shaft or shaft seals, the motor operating in the refrigerant atmosphere. *See also:* appliance. (NESC) [86]

**sealed relay contacts** A contact assembly that is sealed in a compartment separate from the rest of the relay. (EEC/REE) [87]

**sealed-tank system (1) (power and distribution transformers)** A method of oil preservation in which the interior of the tank is sealed from the atmosphere and in which the gas plus the oil volume remains constant over the temperature range. (PE/TR) C57.12.80-1978r

**(2)** A method of oil preservation in which the interior of the tank is sealed from the atmosphere and in which the gas volume plus the oil volume remains constant. (PE/TR) C57.15-1999

**sealed transformer (power and distribution transformers)** A dry-type transformer with a hermetically sealed tank. (PE/TR) C57.12.80-1978r

**sealed tube** An electron tube that is hermetically sealed. *Note:* This term is used chiefly for pool-cathode tubes. (ED) [45]

**sealing current** *See:* sealing voltage.

**sealing gap** The distance between the armature and the center of the core of a magnetic circuit-closing device when the contacts first touch each other. *See also:* electric controller. (IA/ICTL) 74-1958w

**sealing voltage (contactors)** The voltage (or current) necessary to complete the movement of the armature of a magnetic circuit-closing device from the position at which the contacts first touch each other. *Synonym:* sealing current. *See also:* control switch; contactor. (QUL) 268-1982s

**seal-in relay** An auxiliary relay that remains picked up through one of its own contacts which bypasses the initiating circuit until deenergized by some other device. (SWG/PE) C37.100-1992

**seal, pressure barrier** *See:* pressure barrier seal.

**seal, single electric conductor** *See:* single electric conductor seal.

**search (1) (information processing)** To examine a set of items for those that have a desired property. *See also:* dichotomizing search; binary search. (C/C) [20], [85]

**(2) (test, measurement, and diagnostic equipment)** The scanning of information contained on a storage medium by comparing the information of each field with a predetermined standard until an identity is obtained. (IM/WM&A) 194-1977w

**(3) (A) (data management)** The examination of a set of items to find all those having a desired property or properties. For example, to find all items in a file that meet some search criterion. **(B) (data management)** To examine a set of items as in definition (A). **(C) (data management)** To retrieve the results of an examination as in definition (A). **(D) (data management)** To retrieve the first item witin a set of items as in definition (A). *Note:* The use of the term "search" in place of the term "seek" is deprecated in IEEE Std 610.5-1990. (C) 610.5-1990

**search argument** In a search, the value compared with the search key of each item in the set being searched. *See also:* condition. (C) 610.5-1990w

**search criterion** In a search, the relationship that a search key must have to the search argument in order for the search to be successful. For example, "NAME equals 'SMITH;'" "SALARY greater than 10000." (C) 610.5-1990w

**search cycle** That portion of a search that is repeated for each item in the set being searched. (C) 610.5-1990w

**search key** In a search, the key within each item in the set being searched that is compared to the search argument. *Synonym:* seek key. (C) 610.5-1990w

**search length (A)** For a node in a search tree, the number of nodes that must be examined in order to find that node. **(B)** For a search tree, the average search length as in definition (A) for all nodes in the tree. (C) 610.5-1990

**searchlight (illuminating engineering)** A projector designed to produce an approximately parallel beam of light. *Note:* The optical system of a searchlight has an aperture of greater than 20 cm (8 in). (EEC/IE) [126]

**searchlighting** The process of projecting a radar beam continuously at a particular object or in a particular direction as contrasted to scanning. (AES) 686-1997

**search memory** *See:* associative memory.

**search radar (1) (navigation aids)** A radar used primarily for the detection of targets in a particular volume of interest. (AES/GCS) 172-1983w

**(2)** A radar used primarily for the initial detection of targets in a particular volume of interest. (AES) 686-1997

**search time (A)** The time required to locate a particular item of data in a storage medium. **(B)** The time interval required for the read/write head of a rotating storage device to locate a particular record on a track corresponding to a given address or key. *See also:* rotational delay; seek time. (C) 610.10-1994

**search tree (A)** A tree into which items in a set are placed in order for the set to be searched. The tree is traversed according to some searching algorithm, making key comparisons until the search argument is found or the algorithm is halted. For example, a B-tree. **(B)** A multiways tree of order $m$ in which each nonterminal node may contain $(m - 1)$ key values and each terminal node, called a leaf, contains associated data for one of the key values contained in its parent node. Each subtree is used to contain all the items with key values falling in the intervals formed by the key values contained in its root node. *See also:* B-tree; binary search tree; digital search tree. (C) 610.5-1990

**sea return (navigation aids)** The radar response from the sea surface. (AES/GCS) 686-1997, 172-1983w

**season** A calendar-specified period used for activation of rate schedules. (AMR/SCC31) 1377-1997

**seasonal derated hours (power system measurement) (electric generating unit reliability, availability, and productivity)** The available hours during which a seasonal derating was in effect. (PE/PSE) 762-1987w

**seasonal derating (electric generating unit reliability, availability, and productivity)** The difference between maximum capacity and dependable capacity. (PE/PSE) 762-1987w

**seasonal diversity** Load diversity between two or more electric systems that occurs when their peak loads are in different seasons of the year. (PE/PSE) 858-1993w, 346-1973w

**seasonal unavailable generation (electric generating unit reliability, availability, and productivity)** The difference between the energy that would have been generated if operating continuously at maximum capacity and the energy that would have been generated if operating continuously at dependable capacity, calculated only during the time the unit was in the available state.

$$\text{SUG} = \text{equivalent seasonal derated hours} \cdot \text{maximum capacity} = \text{ESDH} \cdot \text{MC}$$

(PE/PSE) 762-1987w

**season cracking** Cracking resulting from the combined effect of corrosion and internal stress. A term usually applied to stress-corrosion cracking of brass. (IA) [59]

**SEC** *See:* secondary-electron conduction; secondary-electron conduction camera tube.

**second (metric practice)** The duration of 9 192 631 770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the cesium-133 atom. (adopted by 13 General Conference on Weights and Measures 1967). *Note:* This definition supersedes the ephemeris second as the unit of time. (QUL) 268-1982s

**secondary (A)** Operates after the primary device; for example, secondary arcing contacts. **(B)** Second in preference. **(C)** Referring to auxiliary or control circuits as contrasted with the main circuit; for example, secondary disconnecting devices, secondary and control wiring. **(D)** Referring to the energy output side of transformers or the conditions (voltages) usually encountered at this location; for example, secondary fuse, secondary unit substation. (SWG/PE) C37.100-1992

**secondary access method** A collection of techniques designed to allow efficient access to all the target data or data records associated with a set of stated secondary key values in a query. (C) 610.5-1990w

**secondary address** An address for use within a device. It is provided by a secondary address cycle that loads the NTA register of the device following a primary address cycle or a data cycle. (NID) 960-1993

**secondary address cycle** A data cycle in which a master uses the address/data (AD) lines to load a secondary address into the NTA register of a device. (NID) 960-1993

**secondary alarm station (SAS)** A continuously manned location that is capable of providing backup security system monitoring and communications functions. (PE/NP) 692-1997

**secondary and control wiring** Wire used with switchgear assemblies for control circuits and for connections between instrument transformers' secondaries, instruments, meters, relays, or other equipment. *Synonym:* small wiring. (SWG/PE) C37.100-1992

**secondary arcing contacts** (of a switching device) The contacts on which the arc of the arc-shunting-resistor current is drawn and interrupted. (SWG/PE) C37.100-1992

**secondary arrester** A surge protective device that is intended to be connected to the low-voltage ac supply mains (1000 V rms and less, frequency between 48 and 62 Hz) at locations between and including the secondary terminals of the distribution transformer and the main service entrance panel. (PE) C62.34-1996

**secondary boot program** A client program whose purpose is to load and execute another client program. (C/BA) 1275-1994

**secondary bus** A collection of signals that provides the system with an alternate mechanism for exchanging data between boards as a means to recover from faults in the primary bus. (C/BA) 896.9-1994w, 896.3-1993w

**secondary calibration (nuclear power generating station)** (monitoring radioactivity in effluents) The determination of the response of a system with an applicable source whose effect on the system was established at the time of a primary calibration. (NI/EEC) N42.18-1980r, [81]

**secondary current rating** The secondary current existing when the transformer is delivering rated kilovolt-amperes at rated secondary voltage. *See also:* transformer. (PE/TR) [57]

**secondary disconnecting devices** (of a switchgear assembly) Self-coupling separable contacts provided to connect and disconnect the auxiliary and control circuits between the removable element and the housing. (SWG/PE) C37.100-1992

**secondary distribution feeder** A feeder operating at secondary voltage supplying a distribution circuit. (EEC/AWM) [91]

**secondary distribution mains** The conductors connected to the secondaries of distribution transformers from which consumers' services are supplied. *See also:* center of distribution. (EEC/AWM) [91]

**secondary distribution network** A network consisting of secondary distribution mains. *See also:* center of distribution. (EEC/AWM) [91]

**secondary distribution system** A low-voltage alternating-current system that connects the secondaries of distribution transformers to the consumers' services. *See also:* alternating-current distribution; center of distribution. (EEC/AWM) [91]

**secondary distribution trunk line** A line acting as a main source of supply to a secondary distribution system. *See also:* center of distribution. (EEC/AWM) [91]

**secondary electric shock** An electric shock not sufficiently severe to cause direct physiological harm. Nevertheless, such a shock could result in injury from involuntary muscular response. (T&D/PE) 539-1990

**secondary electron (thermionics)** An electron detached from a surface during secondary emission by an incident electron. *See also:* electron emission. (ED) [45], [84]

**secondary-electron conduction (SEC)** The transport of charge under the influence of an externally applied field in low-density structured materials by free secondary electrons traveling in the interparticle spaces (as opposed to solid-state conduction). *See also:* camera tube. (ED) [45]

**secondary-electron conduction camera tube (SEC)** A camera tube in which an electron image is generated by a photocathode and focused on a target composed of a backplate and a secondary-electron-conduction layer that provides charge amplification and storage. *See also:* camera tube. (ED) [45]

**secondary emission** Electron emission from solids or liquids due directly to bombardment of their surfaces by electrons or ions. *See also:* electron emission. (ED) 161-1971w

**secondary-emission characteristic (thermionics) (surface)** The relation, generally shown by a graph, between the secondary-emission rate of a surface and the voltage between the source of the primary emission and the surface. *See also:* electron emission. (ED) [45], [84]

**secondary-emission crossover voltage (charge-storage tubes)** The voltage of a secondary-emitting surface, with respect to cathode voltage, at which the secondary-emission ratio is unity. The crossovers are numbered in progression with increasing voltage. *Note:* The qualifying phrase secondary-emission is frequently dropped in general usage. *See also:* charge-storage tube. (ED) 158-1962w

**secondary-emission ratio (electrons)** The average number of electrons emitted from a surface per incident primary electron. *Note:* The result of a sufficiently large number of events should be averaged to ensure that statistical fluctuations are negligible. (ED) 161-1971w

**secondary failure** *See:* failure.

**secondary fault** An insulation breakdown occurring as a result of a primary fault. *See also:* center of distribution. (EEC/AWM) [91]

**secondary fuse** A fuse used on the secondary-side circuits of transformers. *Note:* In high-voltage fuse parlance such a fuse is restricted for use on a low-voltage secondary distribution system that connects the secondaries of distribution transformers to consumers' services. (SWG/PE) C37.100-1992

**secondary grid emission** Electron emission from a grid resulting directly from bombardment of its surface by electrons or other charged particles. *See also:* electron emission. (ED/ED) 161-1971w, [45]

**secondary index (A)** A list associated with an inverted file in which entries in the list point to records in the file that contain identical values for the key field on which the file is inverted. **(B)** In a hierarchical database, an index used to establish access to a physical or logical segment by a path different from the one provided by the primary key within the root segment. *Note:* A secondary index allows access on the basis of any field within the segment or any of its dependent segments with secondary indices. *See also:* source segment; secondary processing sequence. (C) 610.5-1990

**secondary key (A)** In sorting and searching, a key that is given lower priority than the primary key within a group of related keys. That is, after sorting, all items having the same primary key will be in order by the secondary key or keys. *Synonym:* minor key. *Contrast:* primary key. **(B)** Within a record, a key that is used to index that record but which does not necessarily uniquely identify that record. (C) 610.5-1990

**secondary neutral grid** A network of neutral conductors, usually grounded, formed by connecting together within a given area all the neutral conductors of individual transformer secondaries of the supply system. *See also:* center of distribution. (EEC/AWM) [91]

**secondary oil containment** A system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure. (SUB/PE) 980-1994

**secondary outage** An outage occurrence that is the result of another outage occurrence. *Notes:* 1. Secondary outages of components or units may be caused by repair of other components or units requiring physical clearance, failure of a circuit breaker to clear a fault, or a protective relay system operating incorrectly and overreaching into the normal tripping zone of another unit. 2. Some secondary outages are solely the result of system configuration; for example, two components connected in series will always go out of service together. These secondary outages may be given special treatment when compiling outage data. 3. At present, primary outages have been referred to in the industry as independent outage occurrences, and secondary outages as dependent or related outage occurrences. *See also:* related multiple outage event. (PE/PSE) 859-1987w

**secondary power** The excess above firm power to be furnished when, as, and if available. *See also:* generating station. (EEC/AWM) [91]

**secondary processing sequence** In a hierarchical database, the hierarchical order of segment types in a physical or logical database resulting from a secondary index. (C) 610.5-1990w

**secondary radar (1) (A) (navigation aids)** A radar technique or mode of operation in which the return signals are obtained from a beacon, transponder, or repeater carried by the target, as contrasted with primary radar in which the return signals are obtained by reflection from the target. **(B) (navigation aids)** A radar, or that portion of a radar, that operates on this principle. *See also:* primary radar. (AES/GCS) 172-1983 **(2)** A cooperative target identification system such as the military identification, friend or foe (IFF) Mark XII or the civil air traffic control radar beacon system (ATCRBS) in which an interrogator transmits a coded signal that asks for a reply. The transponder on the vehicle or platform queried answers with a coded reply. *Notes:* 1. The term secondary radar is more widely used in Europe than in the U.S. 2. The interrogator antenna is often mounted on the radar antenna and the reply from the transponder is often included on the radar display with the echo detection. *See also:* primary radar. (AES) 686-1997

**secondary radiator** That portion of an antenna having the largest radiating aperture, consisting of a reflecting surface or a lens, as distinguished from its feed. (AP/ANT) 145-1993

**secondary representation** A second form, an alternative to the primary representation, in which the client may supply an attribute value to the service. (C/PA) 1328-1993w, 1327-1993w, 1224-1993w

**secondary ring** The alternate paths of the dual ring that are not normally connected to MAC1. It uses links BRx and ATx. Application data may be transmitted on this ring, but not when the primary ring is being used for transmitting application data. (LM/C) 802.5c-1991r

**secondary section of the core** The section of the ferroresonant transformer on which the output and resonating windings are wound. In steady-state operation, this section of the core is normally driven into magnetic saturation. (PEL) 449-1998

**secondary-selective type (low voltage-selective type)** A unit substation that has two stepdown transformers each connected to an incoming high-voltage circuit. The outgoing side of each transformer is connected to a separate bus through a suitable switching and protective device. The two sections of bus are connected by a normally open switching and protective device. Each bus has one or more outgoing radial (stub-end) feeders. (PE/TR) C57.12.80-1978r

**secondary service area (radio broadcast station)** The area within which satisfactory reception can be obtained only under favorable conditions. *See also:* radio transmitter. (PE/EEC) [119]

**secondary shock** A shock of a magnitude such that it will not produce direct physiological harm, but may cause involuntary muscle reactions. The results of secondary shock are annoyance, alarm, and aversion. (T&D/PE) 524a-1993r, 1048-1990

**secondary short-circuit current rating of a high-reactance transformer (power and distribution transformers)** One that designates the current in the secondary winding when the primary winding is connected to a circuit of rated primary voltage and frequency and when the secondary terminals are short-circuited. (PE/TR) C57.12.80-1978r

**secondary, single-phase induction motor** The rotor or stator member that does not have windings that are connected to the supply line. *See also:* induction motor; asynchronous machine. (IA/APP) [90]

**secondary socket identifier (SSID)** A socket number identifying a particular endpoint on the secondary device. (C/MM) 1284.4-2000

**secondary space allocation** The amount of space that is reserved for a particular file after the primary space allocation has been exhausted. *Note:* Some systems allow multiple secondary space allocation operations. When a secondary space allocation is granted to a particular file, that file is said to "increase its extents." *Contrast:* primary space allocation. (C) 610.5-1990w

**secondary standard (luminous standards) (illuminating engineering)** A stable light source calibrated directly or indirectly by comparison with a primary standard. This order of standard also is designated as a reference standard. *Note:* National secondary (reference) standards are maintained at national physical laboratories; laboratory secondary (reference)

standards are maintained at other photometric laboratories. (IE/EEC) [126]

**secondary station (1)** A station that has been temporarily selected to receive a transmission from the primary station. *See also:* primary station. (C) 610.7-1995

**(2)** As defined by the infrared link access protocol (IrLAP), any station on the data link that does not assume the role of the primary station. It will initiate transmission only as a result of receiving explicit permission to do so from the primary station. (EMB/MIB) 1073.3.2-2000

**secondary storage** A type of storage which is used to store information for extended periods, while still allowing for online access. *See also:* mass storage; auxiliary storage. (C) 610.10-1994w

**secondary unit substation (power and distribution transformers)** A substation in which the low-voltage section is rated 1000 V (volts) and below. *See also:* unit substation. (PE/TR) C57.12.80-1978r

**secondary voltage (capacitance potential devices)** The root-mean-square voltage obtained from the main secondary winding, and when provided, from the auxiliary secondary winding. *See also:* rated secondary voltage; outdoor coupling capacitor. 31-1944w

**secondary voltage rating (power and distribution transformers)** The load circuit voltage for which the secondary winding is designed. (PE/TR) C57.12.80-1978r

**secondary winding (1) (A) (power and distribution transformers)** The winding on the energy output side. **(B) (instrument transformers) (power and distribution transformers)** The winding that is intended to be connected to the measuring or control devices. (PE/TR) C57.12.80-1978

**(2) (rotating machinery)** Any winding that is not a primary winding. *See also:* asynchronous machine; voltage regulator. (IA/APP) [90]

**(3) (voltage regulators)** The series winding. *See also:* voltage regulator. (PE/TR) C57.15-1968s

**(4)** The winding intended for connection to the measuring, protection, or control devices. (PE/TR) C57.13-1993

**second-channel attenuation** *See:* selectance.

**second-channel interference** Interference in which the extraneous power originates from a signal of assigned (authorized) type in a channel two channels removed from the desired channel. *See also:* interference; radio receiver. 188-1952w

**second contingency incremental transfer capability (power operations)** The amount of power, incremental above normal base power transfers, that can be transferred over the transmission network in a reliable manner, based on the following conditions:

a) With all transmission facilities in service, all facility loadings are within normal ratings and all voltages are within normal limits.

b) The bulk power system is capable of absorbing the dynamic power swings and remaining stable following a disturbance resulting in the sequential and overlapping outage of two facilities, either being a generating unit, transmission circuit, or transformer with system adjustments made between the two outages as required.

c) After the dynamic power swings following a disturbance resulting in the loss of the second facility, either a generating unit, transmission circuit, or transformer, but before further operator-directed system adjustments are made, all transmission facility loadings are within emergency ratings and all voltages are within emergency limits.

*Note:* The term second contingency is used to specifically exclude simultaneous outages. Use of the term double contingency has been avoided, since it is often used to include both simultaneous and sequential outages. (PE/PSE) 858-1987s

**second generation** A period during the evolution of electronic computers in which transistors were used to replace the first generation vacuum tubes. *Note:* Introduced in 1959, thought to have been the state of the art until the introduction of integrated circuits. *See also:* fourth generation; first generation; fifth generation. (C) 610.10-1994w

**second generation language** *See:* assembly language.

**second-level address** *See:* n-level address; indirect address.

**second normal form** One of the forms used to characterize relations; a relation is said to be in second normal form if it is in first normal form and if every nonprime attribute is fully functionally dependent on each candidate key of the relation.

**FIRST NORMAL FORM**

ORDER1 = {ORDER-NO} + DATE + CUSTOMER-NO
+ CUSTOMER-NAME + CUSTOMER-ADDRESS
+ TOTAL-ORDER-AMOUNT
ITEM1 = {ORDER-NO + SEQUENCE-NO} + ITEM-NO
+ ITEM-DESCRIPTION + QUANTITY-ORDERED
+ UNIT-PRICE + EXTENDED-PRICE

**SECOND NORMAL FORM**

ORDER2 = {ORDER-NO} + DATE + CUSTOMER-NO
+ CUSTOMER-NAME + CUSTOMER-ADDRESS
+ TOTAL-ORDER-AMOUNT
ORDER-ITEM2 = {ORDER-NO + ITEM-NO}
+ QUANTITY-ORDERED
+ EXTENDED-PRICE
ITEM2 = {ITEM-NO} + ITEM-DESCRIPTION
+ UNIT-PRICE

In first normal form, nonprime attributes ITEM- DESCRIPTION and UNIT-PRICE are not functionally dependent on candidate key SEQUENCE- NO. Keys shown in brackets.

(C) 610.5-1990w

**second-order distortion** *See:* intermodulation distortion.

**second-order lag (automatic control)** In a linear system or element, lag which results from changes of energy storage at two separate points in the system, or from effects such as acceleration. *Note:* It is representable by a second-order differential equation, or by a quadratic factor such as $s^2 + 2z\omega_n s + \omega_n^2$ in the denominator of a transfer function. *Synonym:* quadratic lag. *See also:* lag. (PE/EDPG) [3]

**second-order nonlinearity coefficient (accelerometer)** The proportionality constant that relates a variation of the output to the square of the input, applied parallel to the input reference axis. (AES/GYAC) 528-1994

**second source** In the event that several vendors offer pin-for-pin compatible components, second-source suppliers are vendors of the component other than the prime source. *See also:* prime source. (TT/C) 1149.1-1990

**seconds since the Epoch** A value to be interpreted as the number of seconds between a specified time and the Epoch. A Coordinated Universal Time name [specified in terms of seconds (*tm_sec*), minutes (*tm_min*), hours (*tm_hour*), days since January 1 of the year (*tm_yday*), and calendar year minus 1900 (*tm_year*)] is related to a time represented as seconds since the Epoch, according to the expression below. If the year $<$ 1970 or the value is negative, the relationship is undefined. If the year $\geq$ 1970 and the value is nonnegative, the value is related to a Coordinated Universal Time name according to the expression:

*tm_sec* + *tm_min**60 + *tm_hour**3600 + tm_yday*86400
+ (*tm_year-70*)*31536000 + ((*tm_year-69*)/4)*86400

(C/PA) 9945-1-1996, 9945-2-1993

**second-time-around echo** An echo received after a time delay exceeding one pulse-repetition interval but less than two pulse-repetition intervals. *Note:* Third-time-around, etc., echoes are defined in a corresponding manner. The generic term "multiple-time-around" is sometimes used. (AES) 686-1997

**second Townsend discharge (gas)** A semi-self-maintained discharge in which the additional ionization is due to the secondary electrons emitted by the cathode under the action of the bombardment by the positive ions present in the gas. *See also:* discharge. (ED) [45]

**second voltage range** *See:* voltage range.

**secretary/librarian (software)** The software librarian on a chief programmer team. *See also:* software librarian; chief programmer team. (C/SE) 729-1983s

**secret key** The traditional cryptographic key known only to the communicating parties and used for both encipherment and decipherment. (C/LM) 802.10-1998

**section (1) (rectifier unit)** A part of a rectifier unit with its auxiliaries that may be operated independently. *See also:* rectification. (IA) [62]
**(2) (thyristor converter)** Those parts of a thyristor converter unit containing the power thyristors (and when also used, the power diodes) together with their auxiliaries (including individual transformers or cell windings of double converters and circulating current reactors, if any), in which the main direct current when viewed from the converter unit dc terminals always flows in the same direction. A thyristor converter section is supposed to be operated independently. *Note:* A converter equipment may have either only one section or one forward and one reverse section. (IA/IPC) 444-1973w
**(3)** A length of coaxial cable which forms the transmission medium for a network. *See also:* segment. (C) 610.7-1995
**(4) (A)** To divide a program into parts such that some portions reside in internal storage and others in auxiliary storage. *See also:* page. **(B)** One of the parts as in (A). **(C)** To divide a program or data into parts of varying lengths, known as sections, such that each section is placed in a main memory area of corresponding size, not necessarily contiguously or in logical order. (C) 610.10-1994

**sectional center (1) (telephone switching systems)** A toll office to which may be connected a number of primary centers, toll centers, or toll points. Sectional centers are classified as Class 2 offices. *See also:* office class. (C) [85]
**(2)** Class 2 office in the North American hierarchical routing plan; a control center connecting primary centers of the telephone system together. *See also:* regional center; toll center; end office; primary center. (C) 610.7-1995

**sectionalized linear antenna** A linear antenna in which reactances are inserted at one or more points along the length of the antenna. *Synonym:* loaded linear antenna. (AP/ANT) 145-1993

**sectionalizer** *See:* automatic line sectionalizer.

**section locking** Locking effective while a train occupies a given section of a route and adapted to prevent manipulation of levers that would endanger the train while it is within that section. *See also:* interlocking. (EEC/PE) [119]

**section, sag** *See:* sag section.

**sector** *See:* block.

**sectoral horn antenna** A horn antenna with two opposite sides of the horn parallel and the two remaining sides diverging. (AP/ANT) 145-1983s

**sector cable** A multiple-conductor cable in which the cross section of each conductor is substantially a sector of a circle, an ellipse, or a figure intermediate between them. *Note:* Sector cables are used in order to obtain decreased overall diameter and thus permit the use of larger conductors in a cable of given diameter. (EEC/AWM) [91]

**sector display (1) (continuously rotating radar-antenna system)** A range-amplitude display used with a radar set, the antenna system of which is continuously rotating. The screen, which is of the long-persistence type, is excited only while the beam of the antenna is within a narrow sector centered on the object. *See also:* radar. (AES) [42]
**(2)** A limited display in which only a sector of the total service area of the radar system is shown. *Note:* Usually the sector to be displayed is selectable. (AES) 686-1997

**sector impedance relay** A form of distance relay that by application and design has its operating characteristic limited to a sector of its operating circle on the *R-X* diagram. (SWG/PE) C37.100-1992

**sector scanning (1)** A modification of circular scanning in which the direction of the antenna beam generates a portion of a cone or a plane. (AP/ANT) 145-1993
**(2)** The repeated scanning of a limited volumetric sector by a radar. *See also:* sector display. (AES) 686-1997

**sector select line** The line, determined by the row addresses (output of the X decoder), that is used to access the appropriate sector select transistor. (ED) 1005-1998

**sector select transistor** The transistor, controlled by the sector select line, that isolates the sector source from other sectors. (ED) 1005-1998

**secure data exchange Layer Manager** The SDE portion of the Layer 2 Manager. (C/LM) 802.10-1998

**secure modem** *See:* port protection system.

**secure path** *See:* trusted path.

**security (1) (software)** The protection of computer hardware and software from accidental or malicious access, use, modification, destruction, or disclosure. Security also pertains to personnel, data, communications, and the physical protection of computer installations. *See also:* software; modification; data; protection; hardware. (C/SE) 729-1983s
**(2)** The protection of computer resources (e.g., hardware, software, and data) from accidental or malicious access, use, modification, destruction, or disclosure. Tools for the maintenance of security are focused on availability, authentication, accountability, confidentiality, and integrity. (C/PA) 14252-1996
**(3)** (of a relay or relay system) That facet of reliability that relates to the degree of certainty that a relay or relay system will not operate incorrectly. (SWG/PE) C37.100-1992

**security association** A cooperative relationship between entities formed by the sharing of cryptographic keying information and security management objects. This shared information need not be identical, but it must be compatible. (C/LM) 802.10-1998

**security association identifier (SAID)** A value placed in the clear header of the SDE PDU that is used to identify the security association. (C/LM) 802.10-1998

**security attribute** A security-related quality of an object. Security attributes may be represented as hierarchical levels, bits in a bit map, or numbers. Compartments, caveats, and release markings are examples of security attributes. (C/LM) 802.10g-1995, 802.10-1998

**security code** A group of data bits calculated by a transmitting terminal from the information within its message by use of a prearranged algorithm, appended to the transmitted message, and tested by the receiving terminal to determine the validity of the received message. (SUB/PE) 999-1992w

**security dispatch control** An automatic generation control subsystem that allocates unit generation levels within a control area based upon system security considerations. (PE/PSE) 94-1991w

**security kernel (software)** A small, self-contained collection of key security-related statements that works as a privileged part of an operating system, specifying and enforcing criteria that must be met for programs and data to be accessed. (C) 610.12-1990

**security label** A marking bound to a resource (which may be a data unit) that names or designates the security attributes of that resource. (C/LM) 802.10g-1995

**security level (1)** The sensitivity of information represented, for example, by a combination of hierarchical classifications and nonhierarchical categories. (C/BA) 896.3-1993w
**(2)** A hierarchical level whose purpose is to indicate degree of sensitivity to a designated security threat. It indicates a specific level of protection as specified by the security policy being enforced. (C/LM) 802.10g-1995, 802.10-1998

**security management** In networking, a management function defined for controlling, authenticating, and authorizing access to network resources. (C) 610.7-1995

**security management information base (SMIB)** A management information base (MIB) that stores security-relevant objects. (C/LM) 802.10a-1999, 802.10-1998

**security policy** The objectives and mandates for protecting information, services, and other resources in a system, and the philosophy of protection for meeting those objectives. (C/BA) 896.3-1993w

**security service (1)** A service, provided by a layer of communicating open systems, that ensures adequate security of the systems or of data transfers. Note that these security services need not be directly requested at the (N)- and (N+)-layer boundary as is required for an OSI (N)-service. (LM/C) 802.10-1992

**(2)** The capability of the system to ensure the security of system resources or data transfers. Access controls, authentication, data confidentiality, data integrity, and nonrepudiation are traditional data communications security services. (C/BA) 896.3-1993w

**security system** The aggregate assemblage of hardware and associated software that includes all components, equipment, barriers, etc., necessary for the physical protection of nuclear power generating stations against the design basis threat of radiological sabotage. (PE/NP) 692-1997

**security tag** An information unit containing a representation of certain security-related information (e.g., a restrictive attribute bit map). (C/LM) 802.10g-1995, 802.10-1998

**security threat** A potential violation of security. (LM/C) 802.10-1992, 802.10g-1995

**SED** Static Electric Discharge; an alternate name for ESD. (SPD/PE) C62.47-1992r

**sedimentation potential (electrobiology)** The electrokinetic potential gradient resulting from unity velocity of a colloidal or suspended material forced to move by gravitational or centrifugal forces through a liquid electrolyte. *See also:* electrobiology. (EMB) [47]

**sediment separator (rotating machinery)** Any device, used to collect foreign material in the lubricating oil. *See also:* oil cup. (IA/APP) [90]

**Seebeck coefficient (for homogeneous conductors)** (of a couple) The limit of the quotient of: the Seebeck electromotive force by the temperature difference between the junctions as the temperature difference approaches zero: by convention, the Seebeck coefficient of a couple is positive if the first-named conductor has a positive potential with respect to the second conductor at the cold junction. *Note:* The Seebeck coefficient of a couple is the algebraic difference of either the relative or absolute Seebeck coefficients of the two conductors. *See also:* thermoelectric device. (ED) [46]

**Seebeck coefficient, absolute** *See:* absolute Seebeck coefficient.

**Seebeck coefficient, relative** *See:* relative Seebeck coefficient.

**Seebeck effect** The generation of an electromotive force by a temperature difference between the junctions in a circuit composed of two homogeneous electric conductors of dissimilar composition: or, in a nonhomogeneous conductor, the electromotive force produced by a temperature gradient in a nonhomogeneous region. *See also:* thermoelectric device; thermoelectric effect. (ED) [46]

**Seebeck electromotive force** The electromotive force resulting from the Seebeck effect. *See also:* thermoelectric device. (ED) [46]

**Seed** In 10BROAD36, the 23 bits residing in the scrambler shift register prior to the transmission of a packet. (C/LM) 802.3-1998

**seeding** *See:* fault seeding.

**SEE-IN** *See:* Significant Event Evaluation and Information Network.

**seek (1)** To position the head or access mechanism of a direct-access device to a specified location. *Synonym:* position. (C) 610.10-1994w

**(2)** An activity that positions a pointer at a specific location within a data file. (C/MM) 855-1990

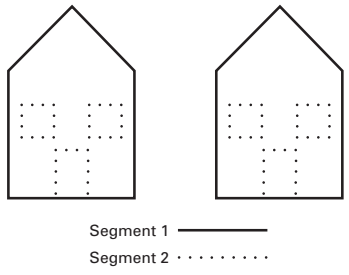
**(3) (data management)** *See also:* search; search cycle. (C) 610.5-1990w

**seek key** *See:* search key.

**seek time** The time it takes to position the head or access mechanism of a rotating storage device to a specified location. *Synonym:* positioning time. *See also:* access time; search time. (C) 610.10-1994w

**segment (1) (A) (data management) (software)** One of the subsystems or combinations of subsystems that make up an overall system; for example, the accounts payable segment of a financial system. **(B) (data management) (software)** In storage allocation, a self-contained portion of a computer program that can be executed without maintaining the entire program in main storage. *See also:* page. **(C) (data management) (software)** A collection of data that is stored or transferred as a unit. **(D) (software) (data management)** In path analysis, a sequence of computer program statements between two consecutive branch points. **(E) (data management) (software)** To divide a system, computer program, or data file into segments as in (A), (B), or (C). **(F) (data management) (software)** A fixed-length unit of data that contains one or more data items. **(G) (software) (data management)** In some databases, the smallest unit of data that can be retrieved or stored. *Synonym:* database segment. *See also:* twin segment; parent segment; dependent segment; logical segment; child segment; physical segment; root segment. (C) 610.5-1990, 610.12-1990

**(2) (computer graphics)** A logically related collection of display elements with their associated attributes such that the collection can be manipulated as a unit. (See corresponding figure.) *Synonym:* display group; entity; display segment. *See also:* segment attribute.




**segment**

(C) 610.6-1991w

**(3)** The medium connection, including connectors, between medium dependent interfaces in a LAN. (C/LM) 802.9a-1995w

**(4)** The portion of a ringlet between the producer and consumer along which a packet is sent. The segment traversed by a send packet is the send segment, and the segment traversed by an echo is the echo segment. (C/MM) 1596-1992

**(5)** A specific transmission medium that supports the FASTBUS protocol and to which FASTBUS devices may attach. A segment is capable of supporting autonomous operation and communicating with other segments via segment interconnects. (NID) 960-1993

**(6)** The protocol data unit (PDU) of 52 octets transferred between peer DQDB Layer entities as the information payload of a slot. It contains a segment header of 4 octets and a segment payload of 48 octets. There are two types of segments: Pre-Arbitrated (PA) segments and Queued Arbitrated (QA) segments. (LM/C) 8802-6-1994

**(7)** One or more sections of coaxial cable that form the transmission medium for a network. (C) 610.7-1995

**(8)** A portion of a session that is contiguous in simulation time and in wall clock (sidereal) time. (DIS/C) 1278.3-1996

**(9)** On a magnetic drum or disk, one of a series of addressable segments within a track or a band on which information is stored. *See also:* cluster; storage element. (C) 610.10-1994w

**(10)** Zero or more contiguous elements of a string. (C/PA) 1328-1993w, 1224-1993w, 1327-1993w

**(11)** The medium connection, including connectors, between Medium Dependent Interfaces (MDIs) in a CSMA/CD local area network. (C/LM) 802.3-1998

**(12)** A portion of an interconnect structure treated as a unit for the purposes of extracting or estimating its electrical properties. *See also:* parasitics. (C/DA) 1481-1999

**segmental conductor** A stranded conductor consisting of three or more stranded conducting elements, each element having approximately the shape of the sector of a circle, assembled to give a substantially circular cross section. The sectors are usually lightly insulated from each other and, in service, are connected in parallel. *Note:* This type of conductor is known as type-M conductor in Canada. *See also:* conductor. (EEC/AWM) [91]

**segmental-rim rotor (rotating machinery)** A rotor in which the rim is composed of interleaved segmental plates bolted together. *See also:* rotor. (IA/APP) [90]

**segmentation (1)** The function in the DQDB Layer that fragments a variable length Initial MAC Protocol Data Unit (IMPDU) into fixed-length segmentation units for transfer in Derived MAC Protocol Data Units (DMPDUs) (cf., reassembly). (LM/C) 8802-6-1994

**(2) (image processing and pattern recognition)** *See also:* image segmentation. (C) 610.4-1990w

**segmentation unit** The fixed-length data units of 44 octets formed by the fragmentation of an Initial MAC Protocol Data Unit (IMPDU). (LM/C) 8802-6-1994

**segment attribute** A characteristic that applies to a segment. For example, detectability, highlighting, priority, transformation, visibility. (C) 610.6-1991w

**segment, cable** *See:* cable segment.

**segment, crate** *See:* crate segment.

**Segment Delay Value (SDV)** A number associated with a given segment that represents the delay on that segment including repeaters and end stations, if present, used to assess path delays for 10 Mb/s CSMA/CD networks. (C/LM) 802.3-1998, 802.9a-1995w

**segment, extended** *See:* extended segment.

**segment extender (SE) (FASTBUS acquisition and control)** A device for connecting two segments to form an extended segment or part of an extended segment. (NID) 960-1993

**segment header** The protocol control information in a segment. (LM/C) 8802-6-1994

**segmenting** A technique used in memory mapping whereby the address space is broken into several various-size blocks; physical addresses are obtained by biasing each of the individual segments. (C) 610.10-1994w

**segment interconnect (SI)** A device that implements an intersegment connection such that the FBP on the two segments is synchronized. When an operation is passing through an SI, the SI acts as a slave on the near-side and as a master on the far-side. (NID) 960-1993

**segment interconnect, active** *See:* active segment interconnect.

**segment interconnect, reserved** *See:* reserved segment interconnect.

**segment number** A four-character number identifying the subsection of the ADC used for the data. Leading spaces are interpreted as leading zeros. This will be used in a system where the ADC is shared by several data inputs and is multiplexed among the inputs. Each input could be a separate detector, and there is not necessarily any correlation between any two detector inputs. The subsystem identification, ADC number, and segment number should provide sufficient data to be able to trace this data to the apparatus that collected it. This will enable other data, such as calibration spectra or background spectra, which are stored separately, to be identified with this spectrum. In large distributed systems, the ADC and segment numbers are not enough to uniquely identify the data. (NPS/NID) 1214-1992r

**segment payload** The unit of data carried by a segment. (LM/C) 8802-6-1994

**segment shoe (rotating machinery) (bearing shoe)** A pad that is part of the bearing surface of a pad-type bearing. *See also:* bearing. (IA/APP) [90]

**Segment Variability Value (SVV)** A number associated with a given segment that represents the delay variability on that segment (including a repeater) for 10 Mb/s CSMA/CD networks. (C/LM) 802.3-1998, 802.9a-1995w

**segregated-phase bus** One in which all phase conductors are in a common metal enclosure, but are segregated by metal barriers between phases. (SWG/PE/EDPG) C37.100-1992, 665-1987s

**segregated phase comparison** Similar to phase comparison, except data on each phase and ground is sent separately to the remote terminal for comparison with the local phase data at that terminal. (PE/PSR) C37.113-1999

**seismic category I (nuclear power generating station)** The classification assigned to those structures, systems, and components of a nuclear power plant, including foundations and supports, which must be designed to withstand the effects of the Safe Shutdown Earthquake (SSE) and remain functional. (PE/NP) 567-1980w

**seismic outline drawing** A 280 × 432 mm (11 × 17 in) or 216 × 280 mm (8 1/2 × 11 in) drawing that shows key information concerning the seismic qualification of the equipment. It shows information such as the resonant frequencies of the equipment, important loads, an outline drawing of the equipment, the center of gravity of the equipment, and other key information about the equipment. (PE/SUB) 693-1997

**seizure signal (telephone switching systems)** A signal transmitted from the sending end of a trunk to the far end to indicate that its sending end has been selected. (C) [85]

**select (1)** To identify, within a set of items, all items that meet a particular criterion. *See also:* extract; selection. (C) 610.5-1990w

**(2)** Context determines which of the following applies:

— To establish a particular device node as the active package.
— To establish a particular device as either the console input device or console output device.
— To establish a particular instance as the current instance.

(C/BA) 1275-1994

**(3)** To identify and fix (for the duration of the current message) a port to which data of a Data Transfer class message are to be directed. (TT/C) 1149.5-1995

**selectable element** A display element that can be selected by a pick device. (C) 610.6-1991w

**selectance (amplitude-modulation broadcast receivers)** The ratio of the ordinates of a selectivity graph, described in Section 4.05.03 of IEEE Std 186-1948w, between the resonant frequency and another frequency differing from the resonant frequency by a specified multiple of the width of one channel. (The width of one broadcast channel is 10 kilocycles.) It is expressed in decibels or voltage ratios. The ratio at a frequency $n$ channels above the resonant frequency is denoted by $S_{+n}$ and at a frequency $n$ channels below the resonant frequency is denoted by $S_{-n}$. The geometric mean of these ratios is denoted by $S_n$. Expressed in decibels, the value of $S_n$ is the average value of $S_{+n}$ and $S_{-n}$. The terms adjacent-channel attenuation" (ACA) and "second-channel attenuation" (2ACA) are used to refer to $S_1$ and $S_2$, respectively. (CE) 186-1948w

**selected emphasis** A visual cue that indicates the current selection. (C) 1295-1993w

**selected slave (1)** A slave that is selected during the connection phase by the master when it recognizes its address on the bus lines. (C/BA/C/BA/C/BA) 10857-1994, 896.4-1993w, 896.3-1993w

**(2)** *See also:* slave. (C/MM) 1096-1988w

**selected test data register** A test data register is selected when it is required to operate by an instruction supplied to the test logic. (TT/C) 1149.1-1990

**selecting (telephone switching systems)** Choosing a particular group of one or more servers in the establishment of a call connection. (C) [85]

**selection (A) (data management)** A relational operator that extracts specified tuples from a relation and results in a relation containing only those tuples. Also called **select**.

| Student No. | Name | Grade | Homeroom |
|---|---|---|---|
| 15 | Mary | 4 | 26A |
| 21 | Harry | 4 | 27 |

*See also:* product; projection; coincident-current selection; difference; union; join; amplitude selection; intersection. **(B) (data management)** The process of identifying, within a set of items, all items that meet a particular criterion. (C) 610.5-1990

Selection of Relation *Students* in Fig to entity/attribute matrix where GRADE is ≤ 5

**selection box** A boxed area on the user interface that presents a list of items to select from and a text field where selected items are displayed.The user can also directly type in an item into the text field. (C) 1295-1993w

**selection check (electronic computation)** A check (usually an automatic check) to verify that the correct register, or other device, is selected in the interpretation of an instruction. (C) 162-1963w, [85], [20]

**selection phase** The set of steps performed by software administration utility to process selections and options. (C/PA) 1387.2-1995

**selection ratio** The least ratio or a magnetomotive force used to select a cell to the maximum magnetomotive force used that is not intended to select a cell. *See also:* coincident-current selection. (Std100) 163-1959w

**selection sort** A sort in which the items in a set are examined to find an item that fits a specified criterion; for example, the smallest item; this item is appended to the sorted set and removed from further consideration; and the process is repeated until all items are in the sorted set. *Synonym:* straight selection sort. *See also:* repeated selection sort; tree selection sort; heapsort. (C) 610.5-1990w

**selective acknowledgment** An acknowledgment mechanism used with a sliding window protocol that allows the receiver to acknowledge packets that are received out of order. *Synonym:* extended acknowledgment. (C) 610.7-1995

**selective calling** The ability of a transmitting station to specify which of several stations on the same line is in condition to receive a message. (C) 610.7-1995

**selective choice construct** *See:* branch.

**selective collective automatic operation (elevators)** Automatic operation by means of one button in the car for each landing level served and by UP and DOWN buttons at the landings, wherein all stops registered by the momentary actuation of the car buttons are made as defined under nonselective collective automatic operation, but wherein the stops registered by the momentary actuation of the landing buttons are made in the order in which the landings are reached in each direction of travel after the buttons have been actuated. With this type of operation, all UP landing calls are answered when the car is traveling in the up direction and all DOWN landing calls are answered when the car is traveling in the down direction, except in the case of the uppermost or lowermost calls, which are answered as soon as they are reached irrespective of the direction of travel of the car. *See also:* control. (PE/EEC) [119]

**selective coordination** *See:* selectivity.

**selective dump (1) (computers)** A dump of a selected area of storage. (C) [20], [85]

**(2) (software)** A dump of designated storage location areas only. *See also:* postmortem dump; snapshot dump; dynamic dump; change dump; static dump; memory dump. (C) 610.12-1990

**selective erase** The removal of one or more display elements or parts of an element without affecting the rest of the display image. *See also:* erase. (C) 610.6-1991w

**selective erasing (storage tubes)** Erasing of selected storage elements without disturbing the information stored on other storage elements. *See also:* storage tube. (ED) 158-1962w

**selective fading** *See:* frequency selective fading.

**selective listing in combination index (SLIC)** An automatic index in which the entries are combinations of terms taken from a set of preselected keywords. (C) 610.2-1987

**selective opening (tripping)** The application of switching devices in series such that (of the devices carrying fault current) only the device nearest the fault will open and the devices closer to the source will remain closed and carry the remaining load. (SWG/PE) C37.100-1992

**selective overcurrent trip** *See:* overcurrent release; selective release.

**selective overcurrent tripping** *See:* overcurrent release; selective opening.

**selective pole switching** The practice of tripping and reclosing one or more poles of a multipole circuit breaker without changing the state of the remaining pole(s), with tripping being initiated by protective relays that respond selectively to the faulted phases. *Note:* Circuit breakers applied for selective pole switching must inherently be capable of individual pole opening. (SWG/PE) C37.100-1992

**selective release (trip)** A delayed release with selective settings that will automatically reset if the actuating quantity falls and remains below the release setting for a specified time. (SWG/PE) C37.100-1992

**selective retransmission** A transmission scheme where the transmitter may send multiple PDUs without waiting for an acknowledgment. If the receiver indicates that an error occurred in a given PDU, the sender will retransmit only the errored PDU. *Note:* In this scheme, the receiver will accept PDUs that are out-of-sequence. *Contrast:* Go-Back-N. (C) 610.7-1995

**selective ringing (telephone switching systems)** Ringing in which only the ringer at the desired main station on a party line responds. (C) [85]

**selective signaling equipment (mobile communication)** Arrangements for signaling, selective from a base station, of any one of a plurality of mobile stations associated with the base station for communication purposes. *See also:* mobile communication system. (VT) [37]

**selective trace** A variable trace that involves only selected variables. *See also:* symbolic trace; subroutine trace; retrospective trace; execution trace; variable trace. (C) 610.12-1990

**selectivity (1)** The characteristic of a filter that determines the extent to which the filter is capable of altering the frequency spectrum of a signal. A highly selective filter has an abrupt transition between a pass-band region and a stop-band region. (CAS/MTT) 146-1980w

**(2)** A general term describing the interrelated performance of relays and breakers, and other protective devices; complete selectivity being obtained when a minimum amount of equipment is removed from service for isolation of a fault or other abnormality. (SWG/PE/IA/PSP) C37.100-1992, 1015-1997

**selector, amplitude** *See:* pulse-height selector.

**selector channel** An input-output channel that can transfer data to or from only one peripheral device at a time. *See also:* multiplexer. (C) 610.10-1994w

**selector field** A five-bit field in the Base Link Code Word encoding that is used to encode up to 32 types of messages that define basic abilities. For example, selector field 00001 indicates that the base technology is IEEE 802.3. (C/LM) 802.3-1998

**selector pen** *See:* light pen.

**selector pulse (navigation aids)** A pulse which is used to identify, for selection, one event in a series of events. (AES/GCS) 172-1983w

**selector, pulse-height** *See:* pulse-height selector.

**selectors** Those who execute the selection process described in this recommended practice. They may also act in other roles (for example, users). (C/SE) 1209-1992w

**selector switch (1)** A switch arranged to permit connecting a conductor to any one of a number of other conductors. (SWG/PE) C37.30-1971s, C37.100-1992

**(2)** A manually operated multiposition switch for selecting alternative control circuits. (IA/ICTL/IAC) [60]

**self-adapting** Pertaining to the ability of a system to change its performance characteristics in response to its environment. (C) [20], [85]

**self-adapting computer** A computer that can change its performance characteristics in response to its environment. (C) 610.10-1994w

**self-aligning bearing (rotating machinery)** A sleeve bearing designed so that it can move in the end shield to align itself with the journal of the shaft. *See also:* bearing. (IA/APP) [90]

**self-ballasted lamp (illuminating engineering)** Any arc discharge lamp of which the current-limiting device is an integral part. (EEC/IE) [126]

**self-capacitance (conductor) (total capacitance) (grounded capacitance)** In a multiple-conductor system, the capacitance between this conductor and the other $(n - 1)$ conductors connected together. *Note:* The self-capacitance of a conductor equals the sum of its $(n - 1)$ direct capacitances to the other $(n - 1)$ conductors. (Std100) 270-1966w

**self-checking** (by a relay) Self-testing by microprocessor-based relays that checks operation of the processor software. (PE/PSR) C37.113-1999

**self-checking circuit** A circuit which is capable of withstanding a specified number of non-fatal failures while continuing to operate. (C) 610.10-1994w

**self-checking code (electronic computation)** A code that uses expressions such that one (or more) error(s) in a code expression produces a forbidden combination. *See also:* error-detecting code; parity. (C) 162-1963w

**self-closing door or gate (elevators)** A manually opened hoistway door and/or a car door or gate that closes when released. *See also:* hoistway. (PE/EEC) [119]

**self-commutated converter (self-commutated converters) (forced-commutated converter)** A converter in which commutation is accomplished by components within the converter. *Note:* In converters using switching devices that can interrupt or turn off current, such as transistors or gate turn-off thyristors, rejection of the current produces a voltage across the device to commutate the current to another device. In converters using circuit-commutated thyristors, the commutating voltages required to transfer current from one device to another are usually supplied by capacitors. (IA/SPC) 936-1987w

**self-commutated inverters** An inverter in which the commutation elements are included within the power inverter. (IA) [62]

**self-complementing code** A binary code in which the complement of each decimal digit represented equals the complement of its binary representation. *See also:* excess-three code. (C) 1084-1986w

**self-contained** Pertaining to a database management system having a programming language that contains all of the necessary facilities for the control and processing of a database. (C) 610.5-1990w

**self-contained electromechanical watthour meter** A self-contained electromechanical watthour meter is one in which the terminals are arranged for connection to the circuit being measured without using external instrument transformers. (ELM) C12.10-1987

**self-contained instrument** An instrument that has all the necessary equipment built into the case or made a corporate part thereof. *See also:* instrument. (EEC/AII) [102]

**self-contained navigation aid (navigation aids)** An aid that consists only of facilities carried by the vehicle. (AES/GCS) 172-1983w

**self-contained pressure cable** A pressure cable in which the container for the pressure medium is an impervious flexible metal sheath, reinforced if necessary, that is factory assembled with the cable core,. *See also:* oil-filled cable; pressure cable. (EEC/AWM) [91]

**self-coupling separable contacts (switchgear assembly disconnecting device)** Contacts, mounted on the stationary and removable elements of a switchgear assembly, that align and engage or disengage automatically when the two elements are brought into engagement or disengagement. (SWG/PE) [56]

**self-damping (conductor self-damping measurements)** Of a conductor subjected to a load $T$ is defined by the power dissipated per unit length of a conductor vibrating in a natural mode, with a loop length $l$ and an antinode displacement amplitude $y$ and a frequency $f$. The power per unit conductor length $P$ is expressed as a function in the $n$th mode.

$$P = f_n(T, l, f, y)$$

(T&D/PE) 563-1978r

**self-damping conductor (SDC)** ACSR that is designed to control aeolian vibration by integral damping. Trapezoidal aluminum wires and annular gaps are utilized. (T&D/PE) 524-1992r

**self-descriptiveness** The degree to which a system or component contains enough information to explain its objectives and properties. *See also:* maintainability; usability; testability. (C) 610.12-1990

**self diagnostics** Programs automatically executed, at predetermined intervals, in the master station or RTU, to check the health of the system. (SUB/PE) C37.1-1994

**self-discharge** The process by which the available capacity of a battery is reduced by internal chemical reactions (local action). (PV) 1013-1990, 1144-1996

**self-discharge rate** The amount of capacity reduction occurring per unit of time in a battery as the result of self-discharge. (PV) 1013-1990, 1144-1996

**self-documented** Pertaining to source code that contains comments explaining its objectives, operation, and other information useful in understanding and maintaining the code. (C) 610.12-1990

**self-excitation** A condition in which an induction generator, operating in an isolated power system, derives its excitation from shunt capacitors or the natural capacitance of the power lines. Applies only to induction machines. (DESG) 1094-1991w

**self-excited** A qualifying term applied to a machine to denote that the excitation is supplied by the machine itself. *See also:* direct-current commutating machine. (IA/APP) [90]

**self-field (Hall generator)** The magnetic field caused by the flow of control current through the loop formed by the control current leads and the relevant conductive path through the Hall plate. (MAG) 296-1969w

**self-filling bushing** An oil-filled bushing in which the oil is allowed to circulate freely between the inside of the bushing and the apparatus on which it is used. (PE/TR) C57.19.03-1996

**self-heating** The result of exothermic reactions, occurring in some materials under certain conditions, whereby heat is liberated at a rate sufficient to raise the temperature of the material. (DEI) 1221-1993w

**Self Identifying Publisher Port** An instance of the class `IEEE1451_SelfIdentifyingPublisherPort` or of a subclass thereof. (IM/ST) 1451.1-1999

**self-ID packet (1)** A special packet sent by a cable PHY during the self-ID phase following a reset. One to four self-ID packets are sent by a given node depending on the maximum number of ports it has. (C/MM) 1394-1995

**(2)** A physical layer (PHY) packet transmitted by a cable PHY during the self-ID phase or in response to a PHY ping packet. (C/MM) 1394a-2000

**self-ignition** Ignition resulting from self-heating. (DEI) 1221-1993w

**self-impedance** (of an array element) The input impedance of a radiating element of an array antenna with all other elements in the array open-circuited. (AP/ANT) 145-1993

**self-inductance** The property of an electric circuit whereby an electromotive force is induced in that circuit by a change of current in the circuit. *Notes:* 1. The coefficient of self-inductance $L$ of a winding is given by the following expression:

$$L = \frac{\delta\lambda}{\delta i}$$

where $\lambda$ is the total flux-linkage of the winding and $i$ is the current in the winding. 2. The voltage e induced in the winding is given by the following equation:

$$e = -\left[L\frac{\mathrm{d}i}{\mathrm{d}t} + i\frac{\mathrm{d}L}{\mathrm{d}t}\right]$$

If $L$ is constant

$$e = -L\frac{\mathrm{d}i}{\mathrm{d}t}$$

3. The definition of self-inductance $L$ is restricted to relatively slow changes in $i$, that is, to low frequencies, but by analogy with the definitions, equivalent inductances may often be evolved in high-frequency applications such as resonators, waveguide equivalent circuits, etc. Such inductances, when used, must be specified. The definition of self-inductance $L$ is also restricted to cases in which the branches are small in physical size compared with a wavelength, whatever the frequency. Thus, in the case of a uniform 2-wire transmission line, it may be necessary even at low frequencies to consider the parameters as distributed rather than to have one inductance for the entire line. (BT) 270-1966w, [33]

**self-information** *See:* information content.

**self-locking gear train** A power transmission gear train designed such that the power train will hold its position and not back-drive whenever the primary driving force is removed. A valve actuator with a self-locking gear train will hold the valve in its last position when the VAM is de-energized. (PE/NP) 1290-1996

**self-lubricating bearing (rotating machinery)** A bearing lined with a material containing its own lubricant such that little or no additional lubricating fluid need be added subsequently to ensure satisfactory lubrication of the bearing. *See also:* bearing. (IA/APP) [90]

**self-maintained discharge (gas)** A discharge characterized by the fact that it maintains itself after the external ionizing agent is removed. *See also:* discharge. (ED) [45], [84]

**self-operated controller (automatic control)** A control device in which all the energy to operate the final controlling element is derived from the controlled system through the primary detecting element. (PE/EDPG) [3]

**self-organizing** Pertaining to the ability of a system to arrange its internal structure. (C) [20], [85]

**self-organizing computer** A computer that can change its internal structure. (C) 610.10-1994w

**self-phasing array antenna system** A receiving antenna system that introduces a phase distribution among the array elements so as to maximize the received signal, regardless of the direction of incidence. *Contrast:* retrodirective antenna. (AP/ANT) 145-1993

**self-propelled electric car** An electric car requiring no external source of electric power for its operation. *Note:* Diesel-electric, gas-electric, and storage-battery-electric cars are examples of self-propelled cars. The prefix self-propelled is also applied to buses. *See also:* electric motor car. (EEC/PE) [119]

**self-propelled electric locomotive** An electric locomotive requiring no external source of electric power for its operation. *Note:* Storage-battery, diesel-electric, gas-electric and turbine-electric locomotives are examples of self-propelled electric locomotives. *See also:* electric locomotive. (EEC/PE) [119]

**self-pulse modulation** Modulation effected by means of an internally generated pulse. *See also:* blocking oscillator; oscillatory circuit. (AP/ANT) 145-1983s

**self-quenched counter tube** A radiation counter tube in which reignition of the discharge is inhibited by internal processes. (EEC/PE) [119]

**self-rectifying x-ray tube** An x-ray tube operating on alternating anode potential. (ED) [45]

**self-refresh** A RAM-refresh protocol, where RAM-local hardware schedules the timing and specifies addresses for RAM refresh cycles. (C/MM) 1596.4-1996

**self-relative address** An address that must be added to the address of the instruction in which it appears to obtain the address of the storage location to be accessed. *See also:* offset; indexed address; base address; relative address. (C) 610.12-1990

**self-repairing circuit** A circuit capable of automatically correcting for the effects of a failure so that the presence of the failure is not perceptible. (C) 610.10-1994w

**self-reset manual release (control)** A manual release that is operative only while it is held manually in the release position. *See also:* electric controller. (IA/ICTL/IAC) [60]

**self-reset relay (automatically reset relay) (automatic reset relay)** A relay that is so constructed that it returns to its reset position following an operation after the input quantity is removed. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**self-restoring fire detector (fire protection devices)** A restorable fire detector whose sensing element is designed to be returned to normal automatically. (EEC/LB) [97]

**self-restoring insulation (1)** Insulation that completely recovers its insulating properties after a disruptive discharge caused by the application of a test voltage; insulation of this kind is generally, but not necessarily, external insulation. (SWG/C/PE/TR) 1313.1-1996, C57.12.80-1978r, C37.100-1992

**(2)** Insulation that completely recovers its insulating properties after a disruptive discharge. (PE/PSIM) 4-1995

**(3)** Insulation that completely recovers its insulating properties after a disruptive discharge caused by the application of an overvoltage; insulation of this kind is generally, but not necessarily, external insulation. (SPD/PE) C62.22-1997

**self-rest relay (automatically reset relay)** A relay that is so constructed that it returns to its reset position following an operation after the input quantity is removed. (SWG/PE) C37.100-1981s

**self-retracting lanyard** A device which contains a drum-wound line which may be slowly extracted from or retracted onto the drum under slight tension during normal movement of the user. The line has means for attachment to the fall arrest attachment on the body support. After onset of a fall, the device automatically locks the drum and arrests the fall.The device may have integral means for energy absorption. (T&D/PE) 1307-1996

**self-revealing component failures** Component failures whose effects on system operation are immediately and clearly apparent to a properly trained person. (VT/RT) 1483-2000

**self-saturation (magnetic amplifier)** The saturation obtained by rectifying the output current of a saturable reactor. (EEC/PE) [119]

**self-screening range** Range at which a specified target carrying its own specified active jamming [electronic countermeasures (ECM)] can be detected by a specified radar with specified probabilities of detection and false-alarm. *Note:* Also called "burn-through range." (AES) 686-1997

**self-supported aerial cable** A cable that includes a messenger cable that has an outer jacket that covers the messenger and the shield. The messenger is available for support, gripping, pulling, and tensioning. *See also:* aerial cable. (PE/PSC) 789-1988w

**self-supporting aerial cable** A cable consisting of one or more insulated conductors factory assembled with a messenger that supports the assemblage, and that may or may not form a part of the electric circuit. *See also:* conductor. (EEC/AWM) [91]

**self-surge impedance** *See:* surge impedance.

**self-test (test, measurement, and diagnostic equipment)** A test or series of tests, performed by a device upon itself, which shows whether or not it is operating within designed limits. This includes test programs on computers and automatic test equipment which check out their performance status and readiness. (IM/WM&A) 194-1977w

**self-test capability (test, measurement, and diagnostic equipment)** The ability of a device to check its own circuitry and operation. The degree of self-test is dependent on the ability to fault detect and isolate. (IM/WM&A) 194-1977w

**self-testing circuit** A circuit in which for every signal line an error is detected for both stuck-at-zero and stuck-at-one failures. (C) 610.10-1994w

**self-triggered gap** A bypass gap that is designed to sparkover on the voltage that appears across the gap terminals. The sparkover of the gap is normally initiated by a trigger circuit set at a specified voltage level. A self-triggered bypass gap may be used for the primary protection of the capacitor. The self-triggered gap may sparkover during external as well as internal faults. (T&D/PE) 824-1994

**self-ventilated machine** A machine that has its ventilating air circulated by means integral with the machine. (IA/MT) 45-1998

**SELV** Safety extra low voltage. (C/BA) 896.2-1991w

**semianechoic absorber-lined chamber (SALC)** A room or enclosure (either shielded or unshielded) with all its surfaces, except the floor, lined with radio-frequency (RF) absorber material. The floor is covered with a good conductor. (EMC) 1128-1998

**semantic error** An error resulting from a misunderstanding of the relationship of symbols or groups of symbols to their meanings in a given language. *Contrast:* syntactic error. (C) 610.12-1990

**semantics (1) (software)** The relationships of symbols or groups of symbols to their meanings in a given language. (C) [20], 610.12-1990, [85]

**(2)** The connotative meaning of words within an ATLAS statement. (SCC20) 771-1998

**(3)** The meaning of the syntactic components of a language. (C/SE) 1320.2-1998

**(4)** The meaning, including concept(s), associated with a given entity. (SCC32) 1489-1999

**semaphore (1) (software)** A shared variable used to synchronize concurrent processes by indicating whether an action has been completed or an event has occurred. *See also:* indicator; flag. (C) 610.12-1990

**(2)** A shareable resource that has a nonnegative integral value. When the value is zero, there is a (possibly empty) set of threads awaiting the availability of the semaphore. (PA/C) 9945-1-1996

**(3)** A system variable used to synchronize concurrent processes by indicating whether an action has been completed or an event has occurred. (C/MM) 855-1990

**(4)** A shareable resource that has a nonnegative integer value. When the value is zero, there is a (possibly empty) set of tasks is awaiting the availability of the semaphore. (C) 1003.5-1999

**semaphore decrement operation** An operation that decrements the value of a semaphore, blocking until this is possible. If, prior to the operation, the value of the semaphore is zero, the semaphore decrement operation shall cause the calling task to be blocked and added to the set of tasks (possibly in different processes) awaiting the semaphore. Otherwise, the semaphore value is decremented. (C) 1003.5-1999

**semaphore increment operation** An operation that increments the value of a semaphore or unblocks a waiting task. If, prior to the operation, any tasks are awaiting the semaphore, then some task from that set shall be removed from the set and be unblocked. Otherwise, the semaphore value shall be incremented. (C) 1003.5-1999

**semaphore lock operation** An operation that is applied to a semaphore. If, prior to the operation, the value of the semaphore is zero, the semaphore lock operation shall cause the calling thread to be blocked and added to the set of threads awaiting the semaphore. Otherwise, the value is decremented. (C/PA) 9945-1-1996

**semaphore unlock operation** An operation that is applied to a semaphore. If, prior to the operation, there are any threads in the set of threads awaiting the semaphore, then some thread from that set shall be removed from the set and become unblocked. Otherwise, the semaphore value is incremented. (C/PA) 9945-1-1996

**semiactive guidance** A bistatic-radar homing system in which a receiver in the guided vehicle derives guidance information from electromagnetic signals scattered from a target which is illuminated by a transmitter at a third location. *See also:* illuminator. (AES) 686-1997

**semiactive homing guidance (navigation aids)** Guidance in which a craft is directed toward a destination by means of information received from the destination in response to transmissions from a source other than the craft. (AES/GCS) 172-1983w

**semianalytic inertial navigation equipment** The same as geometric inertial navigation equipment except that the horizontal measuring axes are not maintained in alignment with a geographic direction. *Note:* The azimuthal orientations are automatically computed. *See also:* navigation. (AES/RS) 686-1982s, [42]

**semiautomatic** Combining manual and automatic features so that a manual operation is required to supply to the automatic feature the actuating influence that causes the automatic feature to function. (EEC/PE) [119]

**semiautomatic controller** An electric controller in which the influence directing the performance of some of its basic functions is automatic. *See also:* electric controller. (IA/IAC) [60]

**semiautomatic flight inspection (SAFI) (navigation aid terms)** A specialized and largely automatic system for evaluating the quality of information in signals from ground-based navigational aids; data from navigational aids along and adjacent to any selected air route are simultaneously received by a specially equipped SAFI aircraft as it proceeds under automatic control along the route, evaluated at once for gross errors, and recorded for subsequent processing and detailed analysis at a computer-equipped central ground facility. *Note:* Flight inspection means the evaluation of performance of navigational aids by means of in-flight measurements. (AES/GCS) 172-1983w

**semiautomatic gate (elevators)** A gate that is opened manually and that closes automatically as the car leaves the landing. *See also:* hoistway. (PE/EEC) [119]

**semiautomatic holdup-alarm system** An alarm system in which the signal transmission is initiated by the indirect and secret action of the person attacked or of an observer of the attack. *See also:* protective signaling. (EEC/PE) [119]

**semiautomatic load throw-over equipment** Equipment that automatically transfers a load to another (emergency) source of power when the original (preferred) source to which it has been connected fails, but that requires manual restoration of the load to the original source. (SWG/PE) C37.100-1992

**semiautomatic plating** Mechanical plating in which the cathodes are conveyed automatically through only one plating tank. *See also:* electroplating. (EEC/PE) [119]

**semiautomatic signal** A signal that automatically assumes a stop position in accordance with traffic conditions, and that can be cleared only by cooperation between automatic and manual controls. (EEC/PE) [119]

**semiautomatic station (station control and data acquisition)** A station that requires both automatic and manual modes to maintain the required character of service. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**semiautomatic telephone systems** A telephone system in which operators receive orders orally from the calling parties and establish connections by means of automatic apparatus. (EEC/PE) [119]

**semiautomatic test equipment (test, measurement, and diagnostic equipment)** Any automatic testing device which requires human participation in the decision-making, control, or evaluative functions. (IM/WM&A) 194-1977w

**semiconducting jacket** A jacket of such resistance that its outer surface can be maintained at substantially ground potential by contact at frequent intervals with a grounded metallic conductor, or when buried directly in the earth. (PE/EEC/AWM) [4], [91]

**semiconducting material (1)** A conducting medium in which the conduction is by electrons, and holes, and whose temperature coefficient of resistivity is negative over some temperature range below the melting point. *See also:* semiconductor device; semiconductor. (Std100) 270-1966w

**(2)** A solid material that conducts limited electric current by means of a small number of free electrons and additional electrons that can be freed from their local bonds by the addition of other elements or "doping." For example, silicon is a semiconducting material. *Contrast:* conducting material; insulating material. *See also:* hole. (C) 610.10-1994w

**semiconducting paint (rotating machinery)** A paint in which the pigment or portion of pigment is a conductor of electricity and the composition is such that when converted into a solid film, the electrical conductivity of the film is in the range between metallic substances and electrical insulators. (IA/APP) [90]

**semiconducting tape (power distribution, underground cables)** A tape of such resistance that when applied between two elements of a cable the adjacent surfaces of the two elements will maintain substantially the same potential. Such tapes are commonly used for conductor shielding and in conjunction with metallic shielding over the insulation. (PE/TR) C57.15-1968s

**semiconductive ignition cable** High-tension ignition cable, the core of which is made of semiconductive material. *Note:* Semiconductive is understood here as referring to conductivity and no other physical properties. *See also:* electromagnetic compatibility. (EMC/INT) [53], [70]

**semiconductive slot coating** The partially conductive paint or tape layer in intimate contact with the groundwall insulation in the slot portion of the stator core. This coating ensures that there is little voltage between the surface of the coil or bar and the grounded stator core. (DEI) 1043-1996

**semiconductor (1)** An electronic conductor, with resistivity in the range between metals and insulators, in which the electric-charge-carrier concentration increases with increasing temperature over some temperature range. *Note:* Certain semiconductors possess two types of carriers, namely, negative electrons and positive holes. (ED) 216-1960w

**(2)** A device that is made of semiconducting material. For example: a diode, an integrated circuit, or a transistor. (C) 610.10-1994w

**(3)** Material in which the conductivity is due to charge carriers of both signs (electrons and holes), is normally in the range between metals and insulators, and in which the charge-carrier density can be changed by external means. (NPS) 325-1996

**semiconductor, compensated** *See:* compensated semiconductor.

**semiconductor controlled rectifier (SCR)** An alternative name used for the reverse-blocking triode-thyristor. *Note:* The name of the actual semiconductor material (selenium, silicon, etc.) may be substituted in place of the word semiconductor in the name of the components. *See also:* thyristor. (ED) 216-1960w

**semiconductor converters, classification** The following designations are intended to describe the functional characteristics of converters, but not necessarily the circuits or components used. *Note:* Forms A through D refer only to the converters. Rotational direction of motors may be changed by field or armature reversal. (form A converter) A single converter unit in which the direct current can flow in one direction only and which is not capable of inverting energy from the load to the ac supply. Operates in quadrant I only (semiconverter). (form B converter) A double converter unit in which the direct current can flow in either direction but which is not capable of inverting energy from the load to the ac supply. Operates in quadrants I and III only. (form C converter) A single converter unit in which the direct current can flow in one direction only and which is capable of inverting energy from the load to the ac supply. Operates in quadrants I and IV. (form D converter) A double converter unit in which the direct current can flow in either direction and which is capable of inverting energy from the load to the ac supply. Operates in quadrants I, II, III, and IV. (IA/IPC) 444-1973w

**semiconductor device** An electron device in which the characteristic distinguishing electronic conduction takes place within a semiconductor. *See also:* semiconductor. (Std100) 270-1966w

**semiconductor device circuit breaker (thyristor)** A circuit breaker of special characteristics used to isolate or protect semiconductor devices from overcurrent. (IA/IPC) 428-1981w

**semiconductor device fuse (thyristor)** A fuse of special characteristics connected in series with one or more semiconductor devices to isolate or protect the semiconductor. (IA/IPC) 428-1981w

**semiconductor device lead inductance (nonlinear, active, and nonreciprocal waveguide components)** The inductance of a semiconductor device associated with the strap, mesh, or wire connections used to contact the semiconductor chip. In general, a larger cross-sectional contacting area results in decreased lead inductance. (MTT) 457-1982w

**semiconductor device, multiple unit** A semiconductor device having two or more sets of electrodes associated with independent carrier streams. *Note:* It is implied that the device has two or more output functions that are independently derived from separate inputs, for example, a duo-triode transistor. *See also:* semiconductor. (PE/EDPG) [93]

**semiconductor device, single unit** A semiconductor device having one set of electrodes associated with a single carrier stream. *Note:* It is implied that the device has a single output function related to a single input. *See also:* semiconductor. (PE/EDPG) [93]

**semiconductor diode** A two-terminal device formed of a semiconductor junction having a nonlinear characteristic that will conduct electric current more in one direction than in the other. (CAS/MTT) 146-1980w

**semiconductor-diode parametric amplifier** A parametric amplifier using one or more varactors. *See also:* parametric device. (ED) [46]

**semiconductor, extrinsic** *See:* extrinsic semiconductor.

**semiconductor frequency changer** A complete equipment employing semiconductor devices for changing from one alternating-current frequency to another. *See also:* semiconductor rectifier stack. (IA) [62]

**semiconductor, intrinsic** *See:* intrinsic semiconductor.

**semiconductor junction (light-emitting diodes)** A region of transition between semiconductor regions of different electrical properties. (ED) [127]

**semiconductor laser** *See:* injection laser diode.

**semiconductor, *n*-type (A)** An extrinsic semiconductor in which the conduction electron concentration exceeds the mobile hole concentration. *Note:* It is implied that the net ionized impurity concentration is donor type. *See also:* semiconductor. **(B)** An *n*-type semiconductor in which the excess conduction electron concentration is very large. *See also:* semiconductor. (ED) 216-1960

**semiconductor, *n*+-type** An *n*-type semiconductor in which the excess conduction electron concentration is very large. *See also:* semiconductor. (ED) 216-1960w

**semiconductor, *p*+-type** A *p*-type semiconductor in which the excess mobile hole concentration is very large. *See also:* semiconductor. (ED) 216-1960w

**semiconductor power converter** A complete equipment employing semiconductor devices for the transformation of electric power. *See also:* semiconductor rectifier stack. (IA) [62]

**semiconductor, *p*-type** An extrinsic semiconductor in which the mobile hole concentration exceeds the conduction electron concentration. *Note:* It is implied that the net ionized impurity concentration is acceptor type. *See also:* semiconductor. (ED) 216-1960w

**semiconductor radiation detector (1) (germanium gamma-ray detectors)** A semiconductor device that utilizes the production and motion of excess free charge carriers in the semiconductor for the detection and measurement of particles or photons of incident radiation. (NPS/NID) 300-1988r, 759-1984r

**(2)** A semiconductor device in which the production and motion of excess free carriers is used for the detection and measurement of incident particles or photons. (NPS) 325-1996

**semiconductor rectifier** A device consisting of a conductor and semiconductor forming a junction. The junction exhibits a difference in resistance to current flow in the two directions through the junction. This results in effective current flow in one direction only. The semiconductor rectifier stack is a single columnar structure of one or more semiconductor rectifier cells. (IA/MT) 45-1998

**semiconductor rectifier cell** A semiconductor device consisting of one cathode, one anode, and one rectifier junction. *See also:* semiconductor rectifier stack; semiconductor. (IA) 59-1962w, [12]

**semiconductor rectifier cell combination** The arrangement of semiconductor rectifier cells in one rectifier circuit, rectifier diode, or rectifier stack. The semiconductor rectifier cell combination is described by a sequence of four symbols written in the order 1-2-3-4 with the following significances:

1) Number of rectifier circuit elements.
2) Number of semiconductor rectifier cells in series in each rectifier circuit element.
3) Number of semiconductor rectifier cells in parallel in each rectifier circuit element.
4) Symbol designating circuit. If a semiconductor rectifier stack consists of sections of semiconductor rectifier cells insulated from each other, the total semiconductor rectifier cell combination becomes the sum of the semiconductor rectifier cell combinations of the individual insulated sections. If the insulated sections have the same semiconductor rectifier cell combination, the total semiconductor rectifier cell combination may be indicated by the semiconductor rectifier cell combination of one section preceded by a figure showing the number of insulated sections. Example: 4(4-1-1-B) indicates four single-phase full-wave bridges insulated from each other assembled as one semiconductor rectifier stack.

*Notes:* 1. The total number of semiconductor rectifier cells in each semiconductor rectifier cell combination is the product of the numbers in the combination. 2. This arrangement can also be applied by analogy to give a semiconductor rectifier diode combination.

| Symbol | Circuit | Example |
|---|---|---|
| H | half wave | 1-1-1-H |
| C | center tap | 2-1-1-C |
| B | bridge | 4-1-1-B |
| | | 6-1-1-B |
| Y | wye | 3-1-1-Y |
| S | star | 6-1-1-S |
| D | voltage doubler | 2-1-1-D |

*See also:* semiconductor rectifier cell. (IA) 59-1962w, [12]

**semiconductor rectifier diode (thyristor)** A semiconductor diode having an asymmetrical voltage-current characteristic, used for the purpose of rectification, and including its associated housing, mounting, and cooling attachment if integral with it. (IA/IPC) 428-1981w

**semiconductor rectifier stack** An integral assembly, with terminal connections, of one or more semiconductor rectifier diodes, and includes its associated mounting and cooling attachments if integral with it. *Note:* It is a subassembly of, but not a complete semiconductor rectifier. (IA) 59-1962w, [12], [62]

**semiconductor storage** A type of storage whose elements are formed as solid state electronic components on an integrated circuit. *Contrast:* magnetic storage; core memory. (C) 610.10-1994w

**semiconverter, bridge** *See:* bridge semiconverter.

**semi-direct lighting (illuminating engineering)** Lighting involving luminaires that distribute 60−90% of the emitted light downward and the balance upward. (EEC/IE) [126]

**semienclosed (A)** Having the ventilating openings in the case protected with wire screen, expanded metal, or perforated covers. **(B)** Having a solid enclosure except for a slot for an operating handle or small openings for ventilation, or both. (EEC/PE) [119]

**semienclosed brake** A brake that is provided with an enclosure that covers the brake shoes and the brake wheel but not the brake actuator. *See also:* control. (IA/ICTL/IAC/APP) [60], [75]

**semi-flush-mounted device** A device in which the body of the device projects in front of the mounting surface a specified distance between the distance specified for flush-mounted and surface-mounted devices. (SWG/PE) C37.100-1992

**semiguarded enclosure** An enclosure in which all of the openings, usually in the top half, are protected as in the case of a "guarded enclosure," but the others are left open. (IA/MT) 45-1998

**semiguarded machine (rotating machinery)** One in which part of the ventilating openings, usually in the top half, are guarded as in the case of a guarded machine but the others are left open. (IA/APP) [90]

**semi-high-speed low-voltage dc power circuit breaker (1)** A low-voltage dc power circuit breaker that, during interruption, limits the magnitude of the fault current so that its crest is passed not later than a specified time after the beginning of the fault current transient, where the system fault current, determined without the circuit breaker in the circuit, falls between specified limits of current at a specified time. *Note:* The specified time in present practice is 0.03 second. (SWG/PE) C37.100-1981s

**(2) (low-voltage dc power circuit breakers used in enclosures)** A circuit breaker which, when applied in a circuit with the parameter values specified in American National Standard C37.16-1979, Tables 11 and 11A, tests "b" (1.7 A μs initial rate of rise of current), forces a current crest during interruption within 0.030 s after the current reaches the pickup setting of the instantaneous trip device. *Note:* For total performance at other than test circuit parameters values, consult the manufacturer. (SWG/PE) C37.14-1979s

**semi-indirect lighting (illuminating engineering)** Lighting involving luminaires which distribute 60% to 90% of the emitted light upward and the balance downward. (EEC/IE) [126]

**semimagnetic controller** An electric controller having only part of its basic functions performed by devices that are operated by electromagnets. (IA/MT) 45-1998

**semi-manual hyphenation** In text formatting, hyphenation in which most line-ending and word break decisions are made automatically, the user being asked to assist only when a determination cannot be made automatically. *See also:* manual hyphenation; hot zone hyphenation; automatic hyphenation. (C) 610.2-1987

**semi-Markov model (modeling and simulation)** A Markov chain model in which the length of time spent in each state is randomly distributed. (C) 610.3-1989w

**semi-Markov process (modeling and simulation)** A Markov process in which the duration of each event is randomly distributed. (C) 610.3-1989w

**semioutdoor reactor** A reactor suitable for outdoor use provided that certain precautions in installation (specified by the manufacturer) are observed. For example, protection against rain. C57.16-1958w

**semiprotected enclosure (electric installations on shipboard)** An enclosure in which all of the openings, usually in the top half, are protected as in the case of a "protected enclosure," but the others are left open. (IA/MT) 45-1983s

**semi-random-access** A mode of data access that, in the search for the desired item, combines a form of direct access with a limited sequential search. (C) 610.10-1994w

**semiremote control** A system or method of radio-transmitter control whereby the control functions are performed near the transmitter by means of devices connected to but not an integral part of the transmitter. *See also:* radio transmitter. (AP/ANT) 145-1983s

**semi-reverberant facility** A room with a solid floor and an undetermined amount of sound-absorbing materials on the walls and ceiling. (PE/TR) C57.12.90-1999

**semiselective ringing (telephone switching systems)** Ringing wherein the ringers at two or more of the main stations on a party line respond simultaneously, differentiation being by the number of rings. (C) [85]

**semistop joint (power cable joints)** A joint which is designed to restrict movement of the dielectric fluid between cables being joined. (PE/IC) 404-1986s

**semistrain insulator (semitension assembly)** Two insulator strings at right angles, each making an angle of about 45 degrees with the line conductor. *Note:* These assemblies are used at intermediate points where it may be desirable to partially anchor the conductor to prevent too great movement in case of a broken wire. *See also:* tower. (EEC/AWM) [91]

**semit** *See:* semitone.

**semitone (half-step)** (semit) The interval between two sounds having a basic frequency ratio approximately the twelfth root of two. *Note:* In equally tempered semitones, the interval between any two frequencies is 12 times the logarithm to the base 2 (or 39.86 times the logarithm to the base 10) of the frequency ratio. (SP) [32]

**semitransparent photocathode (camera tubes or phototubes)** A photocathode in which radiant flux incident on one side produces photoelectric emission from the opposite side. *See also:* phototube; electrode. (ED) 161-1971w

**senary (A)** Pertaining to a selection in which there are six possible outcomes. **(B)** Pertaining to the numeration system with a radix of 6. (C) 1084-1986

**send (1)** The first of two packets within a request or response subaction (the second packet is an echo). The send packet contains a 16-byte header (containing command and status) and may optionally contain a data component (up to 256 bytes). (C/MM) 1596-1992
**(2)** The electrical output of a handsfree telephone due to an acoustic input. (COM/TA) 1329-1999

**send attenuation during double talk ($A_{SDT}$)** Attenuation in the send path, seen at the send electrical test point, inserted during double talk. The receive talker initiates the double talk. (COM/TA) 1329-1999

**send channel** *See:* transmit channel.

**send electrical test point (SETP)** The point in a battery feed circuit, reference codec, or wireless reference base station at which signals coming from the handsfree telephone (HFT) in the send direction are accessed. (COM/TA) 1329-1999

**sender (A)** The agent that supplies the data for a solicited message. *See also:* solicited messages. **(B) (telephone switching systems)** Equipment that generates and transmits signals in response to information received from another part of the system. (C/MM) 1296-1987, [85]

**send front-end syllabic clipping during double talk ($T_{SFDT}$)** The length of time that speech undergoes syllabic clipping, as seen at the send electrical test point, just after the onset of double talk. The send talker initiates the double talk. (COM/TA) 1329-1999

**sending-end crossfire** The crossfire in a telegraph channel from one or more adjacent telegraph channels transmitting from the end at which the crossfire is measured. *See also:* telegraphy. (EEC/PE) [119]

**sending-end impedance** (line) The ratio of an applied potential difference to the resultant current at the point where the potential difference is applied. The sending-end impedance of a line is synonymous with the driving-point impedance of the line. *Note:* For an infinite uniform line the sending-end impedance and the characteristic impedance are the same: and for an infinite periodic line the sending-end impedance and the iterative impedance are the same. *See also:* waveguide; self-impedance. (EEC/PE) [119]

**send loudness rating directionality (SLRD)** Send loudness rating versus angles around the handsfree telephone (HFT), normalized to the loudness rating at the 50 cm test point (50TP). (COM/TA) 1329-1999

**send noise level** Electrical noise at send electrical test point (SETP), measured in units of decibels relative to 1 mW (dBm), psophometrically weighted (dBmp). (COM/TA) 1329-1999

**send-only equipment** Data communication channel equipment capable of transmitting signals, but not arranged to receive signals. (COM) [49]

**sensation level** *See:* level above threshold.

**sense (navigation aids)** The pointing direction of a vector representing some navigation parameter. (AES/GCS) 172-1983w

**sense amplifier voltage window (1)** The minimum difference in threshold voltage required by a sense amplifier to differentiate between the low- and high-conductance MNOS thresholds for the two logic states. (ED) 641-1987w
**(2)** Sense amplifier sensitivity between differential state or reference voltage and sensed state. (ED) 1005-1998

**sense and command features** The electrical and mechanical components and interconnections involved in generating those signals associated directly or indirectly with the safety functions. The scope of the sense and command features extends from the measured process variables to the execute features' input terminals. (PE/NP) 603-1998

**sense finder** That portion of a direction-finder that permits determination of direction without 180-degree ambiguity. *See also:* radio receiver. (EEC/PE) [119]

**sense of polarization** For an elliptical or circularly polarized field vector, the sense of rotation of the extremity of the field vector when its origin is fixed. *Note:* When the plane of polarization is viewed from a specified side, if the extremity of the field vector rotates clockwise [counterclockwise] the sense is right-handed [left-handed]. For a plane wave, the plane of polarization shall be viewed looking in the direction of propagation. (AP/ANT) 145-1993

**sense signal** The response taken or measured from a test subject. (SCC20) 1226-1998

**sense switch** A switch found on the front panel or console of a computer. *Note:* The computer can be programmed to check a switch and to take some action depending on whether the switch is on or off. (C) 610.10-1994w

**SENSE/INT/SYNC-IN** A special function signal from the bedside ommunications controller (BCC) to the device communications controller (DCC) in a BCC-to-DCC interconnection cable used for three purposes. The signal allows the DCC to sense whether it has been physically connected to a BCC port, allows a BCC to send sync pulses to the DCC, and allows the BCC to send interrupt deactivate pulses to the DCC. (EMB/MIB) 1073.3.1-1994, 1073.4.1-2000

**SENSE/INT/SYNC-OUT** A special function signal from the device communications controller (DCC) to the bedside communications controller (BCC) in a BCC-to-DCC interconnection cable used for three purposes. The signal allows the BCC port to sense whether a DCC has been physically connected, allows a DCC to send sync pulses to the BCC, and allows the DCC to send interrupt activate and interrupt deactivate pulses to the BCC. (EMB/MIB) 1073.3.1-1994, 1073.4.1-2000

**sensibility, deflection** *See:* deflection sensibility.

**sensing (navigation aids)** The process of finding the sense, as, for example, in direction finding, the resolution of the 180° ambiguity in bearing indication; and, as in phase or amplitude-comparison systems such as ILS (instrument landing system) and VOR (very high-frequency omnidirectional range), the establishment of a relation between course displacement signal and the proper response in the control of the vehicle. (AES/GCS) 172-1983w

**sensing circuit** A circuit whose function is to detect the occurrence of some event at its input terminals. (C) 610.10-1994w

**sensing coil (interferometric fiber optic gyro)** A coil of optical fiber in which counter-propagating light waves differ in phase as a consequence of the Sagnac effect when the coil is rotated about an axis normal to the plane of the coil. (AES/GYAC) 528-1994

**sensing element** *See:* primary detector; sensor.

**sensing station** *See:* read station.

**sensitive** A condition of an object that allows it to accept input events. (C) 1295-1993w

**sensitive relay** A relay that operates on comparatively low input power, commonly defined as 100 mW or less. *See also:* relay. (EEC/REE) [87]

**sensitive volume** That portion of the radiation counter gas volume having sufficient potential gradient to operate in the Geiger-Mueller region. (NI/NPS) 309-1999

**sensitivity (1) (A) (general comment)** Definitions of sensitivity fall into two contrasting categories. In some fields, sensitivity is the ratio of response to cause. Hence increasing sensitivity is denoted by a progressively larger number. In other fields, sensitivity is the ratio of cause to response. Hence increasing sensitivity is denoted by a progressively smaller number. *See also:* sensitivity coefficient. **(B) (electric pipe heating systems)** The ratio of the magnitude of a device response to the magnitude of the quantity measured. In electric pipe heating systems, sensitivity is usually associated with temperature controls and alarms and addresses their response function. **(C) (nuclear power generating station)** The ratio of a change in output magnitude to the change in input which causes it, after the steady-state has been reached. (PE/EDPG/NP) 622A-1984, 381-1977

**(2) (electric heat tracing systems)** The ratio of the magnitude of a device response to the magnitude of the quantity measured. In electric heat tracing systems, sensitivity is usually associated with temperature controls and alarms and addresses their response function. (PE/EDPG) 622B-1988r

**(3) (monitoring radioactivity in effluents)** The minimum amount of contaminant that can repeatedly be detected by an instrument. (NI/PE/NP) N42.18-1980r, 381-1977w

**(4) (measuring devices)** The ratio of the magnitude of its response to the magnitude of the quantity measured. *Notes:* 1. It may be expressed directly in divisions per volt, millimeters per volt, milliradians per microampere, etc., or indirectly by stating a property from which sensitivity can be computed (for example, ohm per volt for a stated deflection. 2. In the case of mirror galvanometers it is customary to express sensitivity on the basis of a scale distance of 1 m. (MIL) [2]

**(5) (radio receiver or similar device)** Taken as the minimum input signal required to produce a specified output signal having a specified signal-to-noise ratio. *Note:* This signal input may be expressed as power or as voltage, with input network impedance stipulated. (PE) 599-1985w

**(6) (transmission lines, waveguides, and nuclear techniques)** The least signal input capable of causing an output signal having desired characteristics. *See also:* ionizing radiation. (IM/HFIM) [40]

**(7) (camera tubes or phototubes)** The quotient of output current by incident luminous flux at constant electrode voltages. *Notes:* 1. The term output current as here used does not include the dark current. 2. Since luminous sensitivity is not an absolute characteristic but depends on the special distribution of the incident flux, the term is commonly used to designate the sensitivity to light from a tungsten-filament lamp operating at a color temperature of 2870 kelvins. *See also:* phototube; cathode luminous sensitivity. (EEC/PE) [119]

**(8) (A) (electrothermic unit)** (dissipated power) The ratio of the dc output voltage of the electrothermic unit to the microwave power dissipated within the electrothermic unit at a prescribed frequency, power level, and temperature. **(B) (electrothermic unit)** (incident power) The ratio of the dc output voltage of the electrothermic unit to the microwave power incident upon the electrothermic unit at a prescribed frequency, power level, and temperature. **(C) (electrothermic-coupler unit)** The ratio of the dc output voltage of the electrothermic unit on the side arm of the directional coupler to the power incident upon a nonreflecting load connected to the output port of the main arm of the directional coupler at a prescribed frequency, power level, and temperature. If the electrothermic unit is attached to the main arm of the directional coupler, the sensitivity is the ratio of the dc output voltage of the electrothermic unit attached to the main arm of the directional coupler to the microwave power incident upon a nonreflecting load connected to the output port of the side arm of the directional coupler at a prescribed frequency, power level, and temperature. (IM) 544-1975

**(9) (non-real time spectrum analyzer) (volts, decibels above or below one milliwatt)** Measure of a spectrum analyzer's ability to display minimum level signals. IF (intermediate frequency) bandwidth, display mode, and any other influencing factors must be given. *Notes:* 1. equivalent input noise. The average level of a spectrum analyzer's internally generated noise referenced to the input. 2. input signal level. The input signal level that produces an output equal to twice the value of the average noise alone. This may be power or voltage relationship, but must be so stated. (IM) [14]

**(10) (automatic control)** Of a control system or element, or combination, the ratio of a change in output magnitude to the change of input which causes it, after the steady state has been reached. *Note:* ASA C85 deprecates use of "sensitivity" to describe smallness of a dead-band. *See also:* gain. (PE/EDPG) [3]

**(11) (fiber optics)** Imprecise synonym for responsivity. In optical system receivers, the minimum power required to achieve a specified quality of performance in terms of output signal-to-noise ratio or other measure. (Std100) 812-1984w

**(12) (radiation protection)** The ratio of a change in response to the corresponding change in the field being measured. (NI) N323-1978r

**(13) (spectrum analyzer)** Measure of a spectrum analyzer's ability to display minimum level signals, (V, dBm). Intermediate frequency (IF) bandwidth, display mode, and any other influencing factors must be given. *See also:* input signal level sensitivity; equivalent input noise sensitivity. (IM) 748-1979w

**(14) (accelerometer) (gyros)** The ratio of a change in output to a change in an undesirable or secondary input. For example: a scale factor temperature sensitivity of a gyro or accelerometer is the ratio of change in scale factor to a change in temperature. (AES/GYAC) 528-1994

**sensitivity analysis (1) (nuclear power generating station)** An analysis that determines the variation of a given function caused by changes in one or more parameters about a selected reference value. (PE/NP) 380-1975w

**(2) (reliability analysis of nuclear power generating station safety systems)** An analysis that assesses the variation in the value of a given function caused by changes in one or more arguments of the function. (PE/NP) 352-1987r

**sensitivity, cathode luminous** *See:* cathode luminous sensitivity.

**sensitivity, cathode radiant** *See:* cathode radiant sensitivity.

**sensitivity coefficient (1) (automatic control)** The partial derivative of a system signal with respect to a system parameter. *See also:* control system. (CS/PE/EDPG) [3]

**(2)** A coefficient used to relate the change of a system function F due to the variation of one of its parameters x. In some applications (for example control theory) absolute changes are important and the sensitivity coefficient is defined as the $\partial F/\partial x$. In other applications (for example, filter theory) relative changes are important and then sensitivity is defined as $\partial(\text{Ln } F)/\partial(\text{Ln}x) = (\partial F/\partial x)/(F/x)$. (CAS) [13]

**sensitivity, deflection** *See:* deflection sensitivity.

**sensitivity, dynamic** *See:* dynamic sensitivity.

**sensitivity, illumination** *See:* illumination sensitivity.

**sensitivity, incremental** *See:* incremental sensitivity.

**sensitivity label** Representation of the security level of an object describing the sensitivity (e.g., classification) of information in the object. (C/BA) 896.3-1993w

**sensitivity level** (in electroacoustics) (in decibels) (of a transducer) 20 times the logarithm to the base 10 of the ratio of the amplitude sensitivity *SA* to the reference sensitivity $S_0$, where the amplitude is a quantity proportional to the square root of power. The kind of sensitivity and the reference sensitivity must be indicated. *Note:* For a microphone, the free-field voltage/pressure sensitivity is the kind often used and a common reference sensitivity is $S_0$, one volt per newton per square meter. The square of the sensitivity is proportional to a power ratio. The free-field voltage sensitivity-squared level, in decibels, is therefore $SA = 10 \log (S_A^2/S_0^2) = 20 \log (S_A/S_0)$. Often, sensitivity-squared level in decibels can be shortened, without ambiguity, to sensitivity level in decibels, or simply sensitivity in decibels. *Synonyms:* sensitivity; response. (SP) [32]

**sensitivity, luminous** *See:* luminous sensitivity.

**sensitivity, quieting** *See:* quieting sensitivity.

**sensitivity, radiant** *See:* radiant sensitivity.

**sensitivity response** The net number of counts registered by the detector system per unit of time, divided by the activity of the radionuclide. (NI) N42.12-1994

**sensitivity, threshold** *See:* threshold sensitivity.

**sensitivity time control (STC)** Programmed variation of the gain (sensitivity) of a radar receiver as a function of time within each pulse-repetition interval or observation time in order to prevent overloading of the receiver by strong echoes from targets or clutter at close ranges. *Note:* Also called swept gain, especially in British usage. (AES) 686-1997

**sensitizing (electrostatography)** The act of establishing an electrostatic surface charge of uniform density on an insulating medium. *See also:* electrostatography. (ED) 224-1965w, [46]

**sensitometry** The measurement of the light response characteristics of photographic film under specified conditions of exposure and development. (SP) [32]

**sensor (1) (electrical heating applications to melting furnaces and forehearths in the glass industry)** A device that responds to a physical stimulus (such as heat and light) and transmits a resulting signal. (IA) 668-1987w

**(2) (A) (nuclear power generating station)** That portion of a channel which first responds to changes in, and performs the primary measurement of, a plant variable or condition. **(B) (nuclear power generating station)** A device directly responsive to the value of the measured quantity. (PE/NP) 381-1977

**(3) (electric heat tracing systems)** The first system element that responds quantitatively to the measure and performs the initial measurement operation. Sensors, as used in electric heat tracing systems, respond to the temperature of the system and may be directly connected to controllers, alarms, or both. Sensors can be mechanical (bulb, bimetallic) or electrical (thermocouple, RTD, thermistor). (PE/EDPG) 622A-1984r, 622B-1988r

**(4) (temperature measurement)** That portion of a temperature-measuring system that responds to the temperature being measured. (PE/PSIM) 119-1974w

**(5) (test, measurement, and diagnostic equipment)** A transducer which converts a parameter at a test point to a form suitable for measurement by the test equipment. (MIL) [2]

**(6)** The portion of a channel that responds to changes in a plant variable or condition and converts the measured process variable into an electric, optic, or pneumatic signal. (PE/NP) 603-1998

**(7)** A transducer that converts a physical, biological, or chemical parameter into an electrical signal. (IM/ST) 1451.2-1997

**(8)** (as applied to a circuit-breaker with an electronic trip unit) A current sensing element such as a current transformer within a circuit-breaker frame. The sensor will have a current rating less than or equal to the frame size and will provide the sensing function for a specific group of current ratings within the frame size. (IA/PSP) 1015-1997

**(9)** A component providing a useful output in response to a physical, chemical, or biological phenomenon. This component may already have some signal conditioning associated with it. Examples: platinum resistance temperature detector, humidity sensor with voltage output, light sensor with frequency output, pH probe, and piezoresistive bridge. (IM/ST) 1451.1-1999

**sensor, active** *See:* active sensor.

**sensor-based system** An organization of components, including a computer, whose primary source of input is data from sensors and whose output can be used to control the related physical process being sensed. (C) 610.10-1994w

**sensor, passive** *See:* passive sensor.

**sensory saturation (nuclear power generating station)** The impairment of effective operator response to an event due to excessive amount of display information that must be evaluated prior to taking action. (PE/NP) 566-1977w

**sentinel** *See:* flag.

**separable insulated connector (1) (separable insulated connectors)** A fully insulated and shielded system for terminating and electrically connecting an insulated power cable to electrical apparatus, other power cables, or both, so designed that the electrical connection can be readily established or broken by engaging or separating the connector at the operating interface. (T&D/PE) 386-1995

**(2) (power and distribution transformers)** A system for terminating and electrically connecting an insulated power cable to electrical apparatus, other power cables, or both, so designed that the electrical connection can be readily established or broken by engaging or separating mating parts of the connector at the operating interface. (PE/TR) C57.12.80-1978r

**separate chaining** Hashing in which collision resolution is handled by building a linked list, called a collision chain, for each position in the hash table to hold the items whose hash values correspond to that position in the hash table. *Synonyms:* direct chaining; external chaining. *Contrast:* open-address hashing. (C) 610.5-1990w

**separate excitation (1) (emergency and standby power)** A source of generator field excitation power derived from a source independent of the generator output power. (IA/PSE) 446-1995

**(2) (power system device function numbers)** A device that connects a circuit, such as the shunt field of a synchronous converter, to a source of separate excitation during the starting sequence; or one that energizes the excitation and ignition circuits of a power rectifier. (SUB/PE) C37.2-1979s

**separately excited (rotating machinery)** A qualifying term applied to a machine to denote that the excitation is obtained from a source other than the machine itself. (PE) [9]

**separately ventilated machine** A machine that has its ventilating air supplied by an independent fan or blower external to the machine. (IA/MT) 45-1998

**separate parts of a network** The parts that are not connected. *See also:* network analysis. (Std100) 270-1966w

**separate terminal enclosure (rotating machinery)** A form of termination in which the ends of the machine winding are connected to the incoming supply leads inside a chamber that need not be fully enclosed and may be formed by the foundations beneath the machine. (PE) [9]

**separating character** *See:* information separator.

**separation (1) (frequency modulation)** The process of deriving individual channel signals (for example, for stereophonic systems) from a composite transmitted signal. *Note:* Separation describes the ability of a receiver to produce left and right stereophonic channel signals at its output terminals and is a measured parameter for stereo receivers only. Left-channel signal separation is defined as the ratio in decibels of the output voltage of the left output of the receiver to that of the right output when an "L"-only signal is received. Right-channel separation is similarly defined. (BT) 185-1975w

**(2) (nuclear power generating station) (separation and identification)** Physical independence of redundant circuits, components, and equipment. (Physical independence may be achieved by space, barriers, shields, etc.) (PE/EDPG) 690-1984r

**(3)** The distance between two objects, measured surface to surface, and usually filled with a solid or liquid material. (NESC) C2-1997

**separation criteria** Curves that relate the frequency displacement to the minimum distance between a receiver and an undesired transmitter to insure that the signal-to-interference ratio does not fall below a specified value. *See also:* electromagnetic compatibility. (EMC) [53]

**separation distance** Space that has no interposing structures, equipment, or materials that could aid in the propagation of fire or that could otherwise disable Class 1E systems or equipment. (PE/NP) 384-1992r

**separation plane** A reference plane, used to separate two objects. This plane shall not be encroached upon by the object on either side except in clearly specified interface areas. (C/BA) 1301.4-1996

**separation sort** *See:* distribution sort.

**separator (1) (storage cell)** A spacer employed to prevent metallic contact between plates of opposite polarity within the cell. (Perforated sheets are usually called retainers.) *See also:* battery. (PE/EEC) [119]

**(2)** A visual user interface control consisting of a line boundary that provides a visual distinction between two adjacent areas. The line may be drawn using various graphics styles. (C) 1295-1993w

**(3)** *See also:* delimiter. (C) 610.5-1990w, 610.12-1990

**separator, insulation slot** *See:* insulation slot separator.

**septenary (A)** Pertaining to a selection in which there are seven possible outcomes. **(B)** Pertaining to the numeration system with a radix of 7. (C) 1084-1986

**septendecimal (A)** Pertaining to a selection in which there are 17 possible outcomes. **(B)** Pertaining to the numeration system with a radix of 17. (C) 1084-1986

**septet (1)** A group of seven adjacent digits operated upon as a unit. *Synonym:* seven-bit byte. (C) 610.5-1990w, 1084-1986w

**(2)** A byte composed of seven bits. *Synonym:* seven-bit byte. (C) 610.10-1994w

**sequence (1) (A)** To place items in a linear arrangement in accordance with the order of the natural numbers. *Note:* Methods or procedures may be specified for other natural linear orders by mapping onto the natural numbers. For example, the sequence may be alphabetic or chronological. *See also:* sort; collating sequence. **(B)** The order in which items are arranged. *See also:* random number sequence; collating sequence; recursively defined sequence. **(C)** A set of items that have been sequenced. *See also:* collating sequence; order. (C) 610.5-1990

**(2) (STEbus)** An indivisible bus transaction comprising one or more transfers. *See also:* pseudo-random number sequence; calling sequence. (MM/C) 1000-1987r

**(3)** A set of bits, packets, or messages ordered in time and that are, or that are intended to be, transmitted consecutively without interruption. (TT/C) 1149.5-1995

**sequence by merging** *See:* sort by merging.

**sequence check** A check that verifies that a set of items are in a certain sequence. (C) 610.5-1990w

**sequence control register** *See:* instruction address register.

**sequence field** *See:* key.

**sequence filter** *See:* sequence network.

**sequence network** An electrical circuit that produces an output proportional to one or more of the sequence components of a polyphase system of voltages or currents, e.g., positive sequence network, negative sequence network, or zero-sequence network. (SWG/PE) C37.100-1992

**sequence number (1)** A number identifying the relative location of blocks or groups of blocks on a tape. (IA) [61]

**(2)** Each I frame is sequentially numbered with a number listed in the control field, from 0 to 7. The sequence numbers cycle through the entire range. (EMB/MIB) 1073.3.1-1994

**sequence-number readout** Display of the sequence number punched on the tape. *See also:* block count readout. (IA) [61]

**sequence-of-events (SOE)** Digital input points that are time tagged to include relative or absolute time of occurrence. (SUB/PE) C37.1-1994

**sequence of events function** *See:* supervisory control functions.

**sequence-of-events point interface** Master station or RTU (or both) element(s) that accept(s) a digital input signal to perform the function of time tagging the occurrence of an event. *See also:* sequence-of-events. (SUB/PE) C37.1-1994

**sequence-of-events SCADA function** The capability of a supervisory system to recognize each predefined event, associate a time of occurrence with each event, and present the event data in order of occurrence of the events. (SUB/PE) C37.1-1994

**sequence of operation (packaging machinery)** A written detailed description of the order in which electrical devices and other parts of the industrial equipment should function. (IA/PKG) 333-1980w

**sequence point** A certain point in the execution sequence of a program where all side effects of previous evaluations are complete and no side effects of subsequent evaluations have occurred. (C/DA) 1481-1999

**sequencer (1)** A mechanical device or computer program that sequences the items in a set. *See also:* sorter. (C) 610.5-1990w

**(2)** An object that controls the execution flow of programs. (SCC20) 1226-1998

**sequence switch** A remotely controlled power-operated switching device used as a secondary master controller. *See also:* multiple-unit control. (EEC/PE) [119]

**sequence table (electric controller)** A table indicating the sequence of operation of contactors, switches, or other control apparatus for each step of the periodic duty. *See also:* multiple-unit control. (VT/LT) 16-1955w

**sequence variable** A flow-control component involving a public location in System Memory or a CSR, holding the sequence number of the current message. The first message corresponds to sequence number one, etc. This sequence number is operated modulo the variable size (i.e., when the maximum value is reached, it rolls over to zero). (C/MM) 1212.1-1993

**sequencing key** *See:* sort key.

**sequential (1) (formatted system) (telecommunications)** If the signal elements are transmitted successively in time over a channel, the transmission is said to be sequential. If the signal elements are transmitted at the same time over a multiwire circuit, the transmission is said to be coincident. *See also:* bit. (COM) [49]

**(2) (software)** Pertaining to the occurrence of two or more events or activities in such a manner that one must finish before the next begins. *Synonym:* serial. *See also:* consecutive. (C) 610.12-1990

**(3)** Pertaining to a circuit whose output values, at a given instant, depend upon its input values and internal state at that instant, and whose internal state depends upon the immediately preceding input values and the preceding internal state. *Contrast:* combinational. (C) 610.10-1994w

**sequential access (1) (test, measurement, and diagnostic equipment)** A system in which the information becomes available in a one after the other sequence only, whether all of it is desired or not. (MIL) [2]

**(2) (data management)** Pertaining to the process of storing and retrieving data using the sequential access mode. *Synonyms:* serial access; physical sequential access. *Contrast:* random access; direct access. *See also:* indexed access; indexed sequential access. (C) 610.5-1990w

**(3)** *See also:* nano; access. (C) 610.10-1994w

**sequential access method (SAM)** A technique for accessing data using sequential access mode. That is, to process a given data record, all data records previous to it must be accessed. *See also:* basic sequential access method. (C) 610.5-1990w

**sequential access mode** An access mode in which data records are stored and retrieved in such a way that each successive access defines the next record to be retrieved. *Contrast:* indexed sequential access mode; direct access mode. (C) 610.5-1990w

**sequential access storage** A type of storage that provides only sequential access to data. For example, magnetic tape storage. *Synonym:* serial access storage. (C) 610.10-1994w

**sequential circuit** A logic circuit whose output values, at a given instant, depend upon its input values and internal state at that instant, and whose internal state depends upon the immediately preceding input values and the preceding internal state. *Contrast:* combinational circuit. *See also:* trigger circuit; toggle. (C) 610.10-1994w

**sequential cohesion** A type of cohesion in which the output of one task performed by a software module serves as input to another task performed by the module. *Contrast:* temporal cohesion; logical cohesion; coincidental cohesion; procedural cohesion; communicational cohesion; functional cohesion. (C) 610.12-1990

**sequential commutation (circuit properties) (self-commutated converters)** Commutation occurs from one to the next of three or more principal switching branches arranged as a multipulse group that conduct in cyclic sequential order for usually (but not always) equal time intervals. The commutation may be direct or indirect. (IA/SPC) 936-1987w

**sequential computer** A computer in which events occur in time sequence, with little or no simultaneity or overlap of events. *Contrast:* simultaneous computer; parallel computer. (C) 610.10-1994w

**sequential construct** *See:* serial construct.

**sequential control (computers)** A mode of computer operation in which instructions are executed consecutively unless specified otherwise by a jump. (MIL/C) [2], [20], [85]

**sequential data set (SDS)** *See:* sequential file.

**sequential detection** A method of automatic detection in two or more steps. Normally the first step uses a high probability of false alarm and the last uses a low probability of false alarm. *Note:* In radars with controllable scanning, the first detection can be used to order the scan to return to, stop at, or stay longer at the suspected target position. (AES) 686-1997

**sequential events recording system** A system that monitors bistable equipment operations and process status and records changes of state in the order of detected occurrences. This monitoring may be accomplished using a device dedicated solely to this function, or using a multifunction system such as a data acquisition computer system. (PE/EDPG) [5], [1]

**sequential file** A file that must be accessed using sequential access; for example, a data file on a magnetic tape. *Synonyms:* serial file; sequential data set. *Contrast:* partitioned data set; direct data set; indexed file. (C) 610.5-1990w

**sequential lobing** *See:* lobe switching.

**sequential logic function** A logic function in which there exists at least one combination of input states for which there is more than one possible resulting combination of states at the outputs. *Note:* The outputs are functions of variables in addition to the present states of the inputs, such as time, previous internal states of the element, etc. (GSD) 91-1984r

**sequential memory (sequential events recording systems)** The memory that stores events in the same order in which they were received by the system. The memory capacity can be expressed as the number of events or levels. *See also:* level; event. (PE/EDPG) [5], [1]

**sequential operation** Pertaining to the performance of operations one after the other. (C) [20], [85]

**sequential precedential database** *See:* hierarchical database.

**sequential processes (software)** Processes that execute in such a manner that one must finish before the next begins. *See also:* concurrent processes; process. (C/SE) 729-1983s

**sequential processing** *See:* serial processing.

**sequential programming (test, measurement, and diagnostic equipment)** The programming of a device by which only one arithmetical or logical operation can be executed at one time. (MIL) [2]

**sequential relay** A relay that controls two or more sets of contacts in a predetermined sequence. *See also:* relay. (EEC/REE) [87]

**sequential scanning (television)** A rectilinear scanning process in which the distance from center to center of successively scanned lines is equal to the nominal line width. *See also:* television. (PE/EEC) [119]

**sequential search** A search in which the items in a set are examined in order, starting from the first item in the set, until the search is successful or the end of the set is encountered. *Synonym:* linear search. (C) 610.5-1990w

**sequential-stress aging** A form of accelerated aging in which two or more individual stresses are applied or intensified in sequence. (DEI/RE) 775-1993w

**sequential transfer** A transfer operation with multiple data transfers during the reply phase. *See also:* transfer operation; reply phase. (C/MM) 1296-1987s

**sequential tripping** A situation where one or more relay terminals of a line cannot detect an internal line fault, typically because of infeed, until one or more terminals has already opened and removed the infeed. (PE/PSR) C37.113-1999

**serial (1) (A)** Pertaining to the time sequencing of two or more processes. **(B)** Pertaining to the time sequencing of two or more similar or identical processes, using the same facilities for the successive processes. **(C)** Pertaining to the time-sequential processing of the individual parts of a whole, such as the bits of a character, the characters of a word, etc., using the same facilities for successive parts. *See also:* serial-parallel. (C) 162-1963

**(2) (software)** Pertaining to the sequential transfer, occurrence, or processing of the individual parts of a whole, such as the bits of a character, using the same facilities for successive parts. *Contrast:* parallel. *See also:* sequential. (C) 610.12-1990

**(3)** One bit following another over a single pathway. *Contrast:* parallel. *See also:* bit serial. (C) 610.10-1994w

**serial access (1) (computers)** Pertaining to the process of obtaining data from, or placing data into, storage when there is a sequential relation governing the access time to successive storage locations. (C) [20], [85]

**(2) (data management)** *See also:* sequential access. (C) 610.5-1990w

**serial access storage** *See:* sequential access storage.

**serial adder** An adder in which addition is performed by adding, digit place after digit place, the corresponding digits of the operands. *Contrast:* parallel adder. (C) 610.10-1994w

**serial addition** Addition that is performed by adding the corresponding digits of the operands, one digit place at a time. *Contrast:* parallel addition. (C) 1084-1986w

**serial by bit** *See:* serial transmission.

**serial bus (1)** Intended as a low-cost peripheral connect or an alternate diagnostic and control path. One instantiation of a serial bus is the "Serial Bus" as specified in IEEE P1394. (C/BA) 896.2-1991w

**(2)** A peripheral interconnect and an alternate diagnostic and control path. (C/BA) 896.10-1997

**Serial Bus (1)** The name that refers to the IEEE project, P1394, which specifies a serial bus intended as a low-cost peripheral connect or an alternate diagnostic and control path. (C/MM) 1212-1991s

**(2)** A bit-serial interconnect defined by IEEE P1394. (C/MM) 1212.1-1993

**(3)** Refers to the IEEE P1394 project, which defines an inexpensive serial network that can be used as an alternate control or diagnostic path, as an I/O connection, or in place of a parallel bus in some systems. (C/MM) 1596.5-1993, 1596-1992

**Serial Bus management** The set of protocols, services, and operating procedures that monitors and controls the various Serial Bus layers: physical, link, and transaction. See figure 34 for the relation of Serial Bus management to the Serial Bus protocol stack. (C/MM) 1394-1995

**serial clock driver** A functional module that provides a periodic timing signal that synchronizes the operation of IEEE P1132 serial bus. Two backplane signal lines are reserved for use by a serial bus. However, the protocols of the serial bus are completely independent of this standard, and the inclusion of a serial bus is not a required feature of IEEE Std 1014-1987. (C/BA) 1014-1987

**serial communication (1) (supervisory control, data acquisition, and automatic control)** A method of transmitting information between devices by sending all bits serially over a single communication channel. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**(2)** Method of transferring information between devices by transmitting a sequence of individual bits in a prearranged order of significance. (SUB/PE) 999-1992w

**serial computer (A)** A computer that has a single arithmetic and logic unit. **(B)** A computer, some specified characteristic of which is serial; for example, a computer that manipulates all bits of a word serially. *Contrast:* parallel computer. (C) 610.10-1994

**serial construct** A program construct consisting of a sequence of steps not involving a decision or loop. *Synonym:* sequential construct. (C) 610.12-1990

**serial digital computer** A digital computer in which the digits are handled serially. Mixed serial and parallel machines are frequently called serial or parallel according to the way arithmetic processes are performed. An example of a serial digital computer is one that handles decimal digits serially although it might handle the bits that comprise a digit either serially or in parallel. *See also:* parallel digital computer. (Std100) 270-1966w

**serial file** *See:* sequential file.

**serial interface** An interface that transmits data bit by bit rather than in whole bytes. (C) 610.10-1994w

**serialization** Serialization is the process of transmitting coded characters one bit at a time. *See also:* deserialization. (C/BA) 1355-1995

**serializer** A device that converts a set of simultaneous signals into a corresponding time sequence of signals. *Synonyms:* parallel-serial converter; dynamicizer. (C) 610.10-1994w

**serially correlated variable** *See:* lag variable.

**serial medium** A medium that contains a POSIX.1 extended tar or extended `cpio` archive. (C/PA) 1387.2-1995

**serial mouse** A mouse that is connected to a computer system through a serial port. *Contrast:* bus mouse. (C) 610.10-1994w

**serial operation (data transmission) (telecommunications)** The flow of information in time sequence, using only one digit, word, line, or channel at a time. (PE) 599-1985w

**serial-parallel** Pertaining to processing that includes both serial and parallel processing, such as one that handles decimal digits serially but handles the bits that comprise a digit in parallel. (C) 162-1963w

**serial port** A port that transfers data one bit at a time. *Contrast:* parallel port. (C) 610.10-1994w

**serial printer** A printer that receives its input data in the form of a serial stream of data. *Contrast:* parallel printer. *See also:* character-at-a-time printer. (C) 610.10-1994w

**serial processing** Pertaining to the sequential execution of processes in a single device, such as a processing unit or channel. *Synonym:* sequential processing. *Contrast:* parallel processing. (C) 610.10-1994w

**serial protocol** Any communication protocol in which data is transferred serially to or from a fixed location. (C/MM) 1155-1992

**serial transmission (1) (data transmission) (telecommunications)** Used to identify a system wherein the bits of a character occur serially in time. Implies only a single transmission channel. *Synonym:* serial by bit. (PE) 599-1985w

**(2)** In data communications, the conveying of a character of information one bit at a time on a single path. *Contrast:* parallel transmission. (C) 610.7-1995

**series** In a propulsion system, the motor connection in which all motors are connected in a series circuit for the purpose of applying to them some fraction (usually one half) of the maximum available per-motor voltage. (VT) 1475-1999

**series capacitor** A device that has the primary purpose of introducing capacitive reactance in series with an electric circuit. (T&D/PE) 824-1994

**series capacitor bank (series capacitor)** An assembly of capacitors and associated auxiliaries, such as structures, support insulators, switches, and protective devices, with control equipment required for a complete operating installation. (T&D/PE) 824-1994

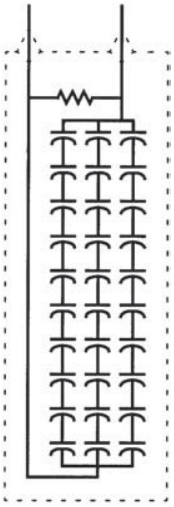
**series circuit** A circuit supplying energy to a number of devices connected in series, that is, the same current passes through each device in completing its path to the source of supply. *See also:* center of distribution. (T&D/PE) [10]

**series circuit lighting transformer (power and distribution transformers)** Dry-type individual lamp insulating transformer, autotransformer, and group series loop transformers

for operation of incandescent or memory lamps on series lighting circuits such as for street and airport lighting. (PE/TR) C57.12.80-1978r

**series coil sectionalizer** A sectionalizer in which main circuit current impulses above a specified value, flowing through a solenoid or operating coil, provide the energy required to operate the counting mechanism. (SWG/PE) C37.100-1992

**series-connected capacitor unit** A capacitor unit with the elements connected in series with each other between the line terminals, with more than one such series strings within a capacitor unit (see the below figure).power systems relaying.



*Series-connected capacitor unit with three strings of 10 elements (showing two shorted elements in one string*

**series-connected capacitor unit**

(PE) C37.99-2000

**series-connected starting-motor starting (rotating machinery)** The process of starting a motor by connecting its primary winding to the supply in series with the primary windings of a starting motor, this latter being short-circuited for the running condition. (PE) [9]

**series connection** The arrangement of cells in a battery made by connecting the positive terminal of each successive cell to the negative terminal of the next adjacent cell so that their voltages are additive. *See also:* battery. (EEC/PE) [119]

**series distribution system** A distribution system for supplying energy to units of equipment connected in series. *See also:* direct-current distribution; alternating-current distribution. (T&D/PE) [10]

**series elements (A) (networks)** Two-terminal elements are connected in series when they form a path between two nodes of a network such that only elements of this path, and no other elements, terminate at intermediate nodes along the path. **(B) (networks)** Two-terminal elements are connected in series when any mesh including one must include the others. *See also:* network analysis. (Std100) 270-1966

**series-fed vertical antenna** A vertical antenna that is insulated from ground and whose feed line connects between ground and the lower end of the antenna. (AP/ANT) 145-1993

**series filter** A type of filter that reduces harmonics by putting a high series impedance between the harmonic source and the system to be protected. (IA/SPC) 519-1992

**series gap (1) (surge arresters)** An intentional gap(s) between spaced electrodes: it is in series with the valve or expulsion element of the arrester, substantially isolating the element from line or ground, or both, under normal line-voltage conditions. (PE/SPD) C62.1-1981s

**(2)** An intentional gap(s) between spaced electrodes in series with the valve elements across which all or part of the impressed arrester terminal voltage appears. (SPD/PE) C62.22-1997, C62.11-1999

**(3)** An intentional gap(s) between spaced electrodes. The gap is in series with the valve or expulsion element of the protective device, substantially isolating the element from line or ground, or both, under normal line-voltage conditions. (SPD/PE) C62.62-2000

**series heater (electrical heat tracing for industrial applications)** Heating elements that are designed to have a specific resistance at a given temperature for a given length. (BT/AV) 152-1953s

**series heating cable** Heating elements that are electrically connected in series with a single current path and have a specific resistance at a given temperature for a given length. (IA/PC) 515.1-1995, 515-1997

**series loading** Loading in which reactances are inserted in series with the conductors of a transmission circuit. *See also:* loading. (EEC/PE) [119]

**series-mode interference** *See:* differential-mode interference.

**series modulation** Modulation in which the plate circuits of a modulating tube and a modulated amplifier tube are in series with the same plate voltage supply. (EEC/PE) [119]

**series noise** (of a device) The fraction of electrical noise that can be attributed to a hypothetical white noise generator connected in series with the input of the device. (NPS) 325-1996

**series operation (power supplies)** The output of two or more power supplies connected together to obtain a total output voltage equal to the sum of their individual voltages. Load current is equal and common through each supply. The extent of series connection is limited by the maximum specified potential rating between any output terminal and ground. For series connection of current regulators, master/slave (compliance extension) or automatic crossover is used. *See also:* isolation voltage. (AES) [41]

**series overcurrent tripping** *See:* overcurrent release; direct release.

**series-parallel connection** The arrangement of cells in a battery made by connecting two or more series-connected groups, each having the same number of cells so that the positive terminals of each group are connected together and the negative terminals are connected together in a corresponding manner. *See also:* battery. (EEC/PE) [119]

**series-parallel control** A method of controlling motors wherein the motors, or groups of them, may be connected successively in series and in parallel. *See also:* multiple-unit control. (EEC/PE) [119]

**series-parallel network** Any network, containing only two-terminal elements, that can be constructed by successively connecting branches in series and/or in parallel. *Note:* An elementary example is the parallel combination of two branches, one containing resistance and inductance in series, the other containing capacitance. This network is sometimes called a simple parallel circuit. *See also:* network analysis. (Std100) 270-1966w

**series-parallel primary current transformer** One that has two insulated primary windings that are intended for connection in series or parallel to provide different rated currents. (PE/TR) C57.13-1993, [57]

**series-parallel starting (rotating machinery)** The process of starting a motor by connecting it to the supply with the primary winding phase circuits initially in series, and changing them over to a parallel connection for running operation. *See also:* asynchronous machine. (PE) [9]

**Series Parameter** A Scalar Series Parameter or a Vector Series Parameter. (IM/ST) 1451.1-1999

**series rating** The interrupting rating of a tested combination of a line-side (main) overcurrent protective device and a load-side (branch) circuit-breaker in which the interrupting rating of the combination is greater than the interrupting rating of the branch circuit-breaker. The interrupting rating of the se-

ries combination does not exceed the interrupting rating of the main overcurrent protective device. (IA/PSP) 1015-1997

**series rectifier circuit** A rectifier circuit in which two or more simple rectifier circuits are connected in such a way that their direct voltages add and their commutations coincide. *See also:* rectifier circuit element; rectification. (IA) [12]

**series regulator (power supplies)** A device placed in series with a source of power that is capable of controlling the voltage or current output by automatically varying its series resistance. (AES) [41]

**series relay** *See:* relay; current relay.

**series resistor (electric instruments)** A resistor that forms an essential part of the voltage circuit of an instrument and generally is used to adapt the instrument to operate on some designated voltage or voltages. The series resistor may be internal or external to the instrument. *Note:* Inductors, capacitors, or combinations thereof are also used for this purpose. *See also:* auxiliary device to an instrument. (EEC/AII) [102]

**series snubber (ac adjustable-speed drives)** Circuit elements, usually including an inductor, connected in series with a switching device to limit the rate of rise or fall of current through the device when switching on or off, respectively. *See also:* snubber. (IA/ID/SPC) 995-1987w, 936-1987w

**series street-lighting transformer (power and distribution transformers)** A series transformer that receives energy from a current-regulating series circuit and that transforms the energy to another winding at the same or different current from that in the primary. *See also:* specialty transformer. (PE/TR) C57.12.80-1978r, [57]

**series system** The arrangement in a multielectrode electrolytic cell whereby in each cell an anode connected to the positive bus bar is placed at one end and a cathode connected to the negative bus bar is placed at the other end, with the intervening unconnected electrodes acting as bipolar electrodes. *See also:* electrorefining. (EEC/PE) [119]

**series tee junction** *See:* E-plane tee junction.

**series thyristor converter** A thyristor converter in which two or more simple converters are connected in such a way that their direct voltages add and their commutations coincide. (IA/IPC) 444-1973w

**series transformer (1) (power and distribution transformers)** A transformer with a "series" winding and an "exciting" winding, in which the "series" winding is placed in a series relationship in a circuit to change voltage or phase, or both, in that circuit as a result of input received from the "exciting" winding. *Note:* Applications of series transformers include:

1) Use in a transformer such as a load-tap-changing or regulating transformer to change the voltage or current duty of the load-tap-changing mechanism.
2) Inclusion in a circuit for power factor correction to indirectly insert series capacitance in a circuit by connecting capacitors to the exciting winding.

(PE/TR) C57.12.80-1978r

**(2)** A transformer in which the primary winding is connected in series with a power-supply circuit, and that transfers energy to another circuit at the same or different current from that in the primary circuit. *See also:* transformer. (PE/TR) [57]

**series transformer rating (power and distribution transformers)** The lumen rating of the series lamp, or the wattage rating of the multiple lamps, that the transformer is designed to operate. (PE/TR) C57.12.80-1978r

**series-trip recloser** A recloser in which main-circuit current above a specified value, flowing through a solenoid or operating coil, provides the energy necessary to open the main contacts. (SWG/PE) C37.100-1992

**series two-terminal pair networks** Two-terminal pair networks are connected in series at the input or at the output terminals when their respective input or output terminals are in series. *See also:* network analysis. (BT) 153-1950w

**series undercurrent tripping** *See:* direct release; undercurrent release.

**series unit (power and distribution transformers)** The core and coil unit which has one winding connected in series in the line circuit. (PE/TR) C57.12.80-1978r

**series weighting** Response weighting by separating a finger into individual elements with capacitive coupling between them; the elements may be separated from the bus bar. (UFFC) 1037-1992w

**series winding (1) (A) (autotransformer) (power and distribution transformers)** That portion of the autotransformer winding which is not common to both the primary and the secondary circuits, but is connected in series between the input and output circuits. **(B) (power and distribution transformers)** The winding of the series unit which is connected in series in the line circuit. *Note:* If the main unit of a two-core transformer is an autotransformer, both units will have a series winding. In such cases, one is referred to as the series winding of the autotransformer and the other, the series winding of the series unit. (PE/TR) C57.12.80-1978
**(2)** That portion of the autotransformer winding that is not common to both the primary and secondary circuits, but is connected in series between the input and output circuits. (PE/TR) C57.15-1999

**series-wound (rotating machinery)** A qualifying term applied to a machine to denote that the excitation is supplied by a winding or windings connected in series with or carrying a current proportional to that in the armature winding. *See also:* asynchronous machine. (PE) [9]

**series-wound motor (1)** The conductors and equipment for delivering energy from the electricity supply system to the wiring system of the premises served. (NESC/NEC) [86]
**(2)** A dc motor in which the field circuit and armature circuit are connected in series. Speed is inversely proportional to the square root of load torque. Motor operates at a much higher speed at light load than at full load. (IA/MT) 45-1998

**servant** A device that is controlled by a commander. There are message-based and register-based servants. (C/MM) 1155-1992

**server (1) (telecommunications switching systems)** A system component that performs operations required for the processing of a call. *See also:* traffic usage count. (COM/TA) 973-1990w
**(2) (MULTIBUS II)** An agent that performs a service for clients. *See also:* client. (C/MM) 1296-1987s
**(3)** In a network, a device or computer system that is dedicated to providing specific facilities to other devices attached to the network. *Contrast:* client. *See also:* mail server; disk server; file server; terminal server; network server; database server; print server. (C) 610.7-1995
**(4)** The facility in the terminal or work station that provides input (keyboard, mouse) and output (screen graphics) services to the application. *Synonym:* X server. (C) 1295-1993w
**(5)** The software component on one device that provides services for use by clients on the same or another device. (C/MM) 1284.4-2000
**(6)** *See also:* batch server.

**Server Object** Any Object that executes one or more of its operations in response to a request from a Client object. (IM/ST) 1451.1-1999

**Server Object Tag** An attribute of a Client Port that identifies the Object Tag of the Server Object with which the Port communicates in client-server communications. (IM/ST) 1451.1-1999

**Service** An instance of a subclass of `IEEE1451_Service`. (IM/ST) 1451.1-1999

**service (1) (electric systems)** The conductors and equipment for delivering electric energy from the secondary distribution or street main, or other distribution feeder, or from the transformer, to the wiring system of the premises served. *Note:* For overhead circuits, it includes the conductors from the last line pole to the service switch or fuse. The portion of an

overhead service between the pole and building is designated as service drop. (NESC) [86]

**(2) (controller)** The specific application in which the controller is to be used, for example: general purpose; definite purpose (for example, crane and hoist, elevator, machine tool, etc). *See also:* electric controller. (IA/ICTL/IAC) [60]

**(3)** A distinct part of the functionality that is provided by an entity on one side of an interface to an entity on the other side of the interface. (C/PA) 14252-1996

**(4)** The delivery, installation, maintenance, training, and other labor-intensive activities providing life-cycle support associated with the products and processes of the system. (C/SE) 1220-1994s

**(5)** System behavior as perceived by the system user. (C/BA) 896.9-1994w

**(6)** Software that implements the interface. (C/PA) 1351-1994w, 1224-1993w, 1224.1-1993w, 1327-1993w, 1328-1993w

**(7)** Capabilities provided by a tool or user to get a job done. (ATLAS) 1232-1995

**(8)** A software interface, frequently implemented as a software function, providing a means for communicating information between two applications. (SCC20) 1232.1-1997

**(9)** Operation or run-time call whose behavior and interface are standardized. *See also:* method. (SCC20) 1226-1998

**(10)** The operation of the vehicles under normal conditions with or without revenue passengers. (VT) 1475-1999

**(11)** An action or response initiated by a process (i.e., a server) at the request of some other process (i.e., a client). (SCC20) 1232.2-1998

**(12) (local area networks)** The capabilities and action provided by one layer for another. (C) 8802-12-1998

**(13)** The capabilities and features provided by an N-layer to an N-user. (C/LM/CC) 8802-2-1998

**service access point (SAP) (1)** The point at which services are provided by one layer (or sublayer) to the layer (or sublayer) immediately above it (ISO 7498). (LM/C) 610.7-1995, 8802-6-1994

**(2)** An address that identifies a user of the services of a protocol entity. (C/EMB/MIB) 610.7-1995, 1073.3.2-2000

**service area (1) (navigation) (navigation aids)** The area within which a navigational aid provides either generally satisfactory service or a specific quality of service. (AES/GCS) 172-1983w

**(2)** The territory in which a utility system is required or has the right to supply or make available electric service to the ultimate customer. (PE/PSE) 858-1993w

**service band** A band of frequencies allocated to a given class of radio service. *See also:* radio transmission. (AP/BT/ANT) 145-1983s, 182-1961w

**service bits (telecommunications)** Those bits that are neither check nor information bits. *See also:* bit. (COM) [49]

**service brake** (maximum) A nonemergency brake application that obtains the (maximum) brake rate that is consistent with the design of the brake system, retrievable under the control of master control. (VT) 1475-1999

**service braking** *See:* service brake.

**service cable** Service conductors made up in the form of a cable. (NESC/NEC) [86]

**service capacity** (cell or battery) The electric output (expressed in ampere-hours, watthours, or similar units) on a service test before its working voltage falls to a specified cutoff voltage. *See also:* battery. (EEC/PE) [119]

**service circuit (telephone switching systems)** A circuit used for signaling purposes connected to and disconnected from a communication path during the progress of a call. (COM) 312-1977w

**service circuits** Common or shared equipment units or software facilities (e.g., registers) associated with lines or trunks to provide specialized functions. Examples of service circuits include the following:

1) Customer digit receivers
2) Interoffice receivers
3) Interoffice transmitters
4) Ringing circuits
5) Universal announcement circuits
6) Tone circuits
7) Conference circuits
8) Memory registers

(COM/TA) 973-1990w

**service class** (use in primitives) A parameter used to convey the class of service required or desired. (C/LM/CC) 8802-2-1998

**service code (telephone switching systems)** Any of the destination codes for use by customers to obtain directory assistance or repair service, or to reach the business office of the telecommunications company. (COM) 312-1977w

**service condition (thermal classification of electric equipment and electrical insulation)** A combination of factors of influence, which are to be expected in a specific application of electric equipment. (EI) 1-1986r

**service conditions (nuclear power generating station) (valve actuators) (safety systems equipment in nuclear power generating stations)** Environmental, loading, power and signal conditions expected as a result of normal operating requirements, expected extremes (abnormal) in operating requirements, and postulated conditions appropriate for the design-basis events of the station. (PE/NP/EDPG) 382-1985, 323-1974as, 650-1979s, 317-1983r, 649-1980s, 690-1984r, 627-1980r

**service conductors** The supply conductors that extend from the street main or from transformers to the service equipment of the premises supplied. (NESC/NEC) [86]

**service controls** Parameters conveyed as part of a directory operation that constrain various aspects of its performance. (C/PA) 1328.2-1993w, 1327.2-1993w, 1224.2-1993w, 1326.2-1993w

**service corrosion (dry cell)** The consumption of the negative electrode as a result of useful current delivered by the cell. *See also:* electrolytic cell. (EEC/PE) [119]

**service current, continuous** *See:* continuous service current.

**service data unit (SDU) (1)** Information that is delivered as a unit between peer service access points (SAPs). *See also:* service access point. (LM/C/EMB/MIB) 8802-6-1994, 1073.3.2-2000

**(2)** The 48-byte data payload of an asynchronous transfer mode (ATM) Cell. (C/BA) 1393-1999

**(3)** The data associated with a service primitive. (SCC32) 1455-1999

**(4)** Information delivered as a unit between adjacent entities that may also contain a PDU of the upper layer. (C/LM) 8802-5-1998

**service date (power system measurement)** The date a unit first enters the active state. On this date the reporting of performance data shall begin. *Note:* The service date is not to be confused with the installation date (the date the unit was first electrically connected to the system) or with the commercial operation date (usually related to the satisfactory completion of acceptance tests as specified in the purchase contract). (PE/PSE) 762-1980s

**service delay** In data communications, the time that elapses from the release of a message by an originator to its receipt by the addressee. (C) 610.7-1995

**service discovery** The function of providing transport clients with the ability to dynamically query service availability within a peer transport entity. (C/MM) 1284.4-2000

**service drop (1)** The overhead conductors between the electric supply or communication line and the building or structure being served. (NESC) C2-1997

**(2)** The overhead service conductors from the last pole or other aerial support to and including the splices, if any, connecting to the service-entrance conductors at the building or other structure. (NEC) [86]

**service-entrance cable** A single conductor or multiconductor assembly provided with or without an overall covering, primarily used for services and of the following types:

a) Type SE, having a flame-retardant, moisture-resistant covering, but not required to have inherent protection against mechanical abuse.

b) Type USE, recognized for underground use, having a moisture-resistant covering, but not required to have a flame-retardant covering or inherent protection against mechanical abuse. Single-conductor cables having an insulation specifically approved for the purpose do not require an outer covering. Cabled single-conductor Type USE constructions recognized for underground use may have a bare copper conductor cabled with the assembly. Type USE single, parallel, or cabled conductor assemblies recognized for underground use may have a bare copper concentric conductor applied. These constructions do not require an outer overall covering.

c) If Type SE or USE cable consists of two or more conductors, one shall be permitted to be uninsulated.

(NESC/NEC) [86]

**service entrance conductors (1) (electric systems) (overhead system)** The service conductors between the terminals of the service equipment and a point usually outside the building, clear of building walls, where joined by tap or splice to the service drop. (NESC) [86]

**(2) (underground system)** The service conductors between the terminals of the service equipment and the point of connection to the service lateral. *Note:* Where service equipment is located outside the building walls, there may be no service-entrance conductors, or they may be entirely outside the building. (NESC/T&D/PE) [10], [86]

**service environment (diesel-generator unit)** The aggregate of conditions surrounding the diesel-generator unit in its enclosure, while serving the design load during normal, accident, and post-accident operation.

(PE/NP) 387-1995, 387-1984s

**service equipment** The necessary equipment, usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors to a building or other structure, or an otherwise defined area, and intended to constitute the main control and means of cutoff of the supply. (NESC/NEC) [86]

**service evaluation (telephone switching systems)** Determination of the quality of service received by the customer.

(COM) 312-1977w

**service factor (general-purpose alternating-current motor)** A multiplier that, when applied to the rated power, indicates a permissible power loading that may be carried under the conditions specified for the service factor. *See also:* asynchronous machine. (PE/NP) [9], 741-1997

**service ground** A ground connection to a service equipment or a service conductor or both. *See also:* ground.

(T&D/PE) [10]

**service hours (power system measurement) (electric generating unit reliability, availability, and productivity)** The number of hours a unit was in the in-service state.

(PE/EDPG) [3]

**service interface** The interface as realized, for the benefit of the client, by the service as a whole.

(C/PA) 1328-1993w, 1224.1-1993w, 1327-1993w, 1224-1993w

**service laboratory** A laboratory, either internal to an agency (or company) or commercially contracted, which performs radioassay measurements for the purpose of providing analytical results, exclusive of the purpose of monitoring or testing. The term "service laboratory" is synonymous with "processing laboratory." (NI) N42.23-1995

**service lateral** The underground service conductors between the street main, including any risers at a pole or other structure or from transformers, and the first point of connection to the service-entrance conductors in a terminal box or meter or other enclosure with adequate space, inside or outside the building wall. Where there is no terminal box, meter, or other enclosure with adequate space, the point of connection shall be considered to be the point of entrance of the service conductors into the building. (NESC/NEC) [86]

**service life (1) (primary cell or battery)** The period of useful service before its working voltage falls to a specified cutoff voltage. (EEC/PE) [119]

**(2) (storage cell or battery)** The period of useful service under specified conditions, usually expressed as the period elapsed before the ampere-hour capacity has fallen to a specified percentage of the rated capacity. *See also:* battery; charge. (EEC/PE) [119]

**(3)** The actual period from initial operation to retirement of a system, structure, or component. (PE/NP) 1205-1993

**service life capacity** Minimum battery capacity needed to meet design requirements, including temperature correction but excluding margin. (PE/EDPG) 1106-1987s

**service life of cable (cable systems)** The time during which satisfactory cable performance can be expected for a specific set of service conditions.

(PE/SUB/EDPG) 422-1986w, 525-1992r

**service order process time** A command to a switching system to install, remove, or rearrange trunking, routing, or a customer's service. The time required for input of a service order and its implementation in the switch under specified traffic conditions may be defined separately for manual or computer-generated input. (COM/TA) 973-1990w

**service period (illuminating engineering)** The number of hours per day for which the daylighting provides a specified illuminance level. It often is stated as a monthly average.

(EEC/IE) [126]

**service pipe** The pipe or conduit that contains underground service conductors and extends from the junction with outside supply wires into the customer's premises. *See also:* service; distributor duct. (T&D/PE) [10]

**service-point** The point of connection between the facilities of the serving utility and the premises' wiring. *Note:* For clearances of conductors of over 600 V, see the National Electrical Safety Code. (NESC/NEC) [86]

**service pole** *See:* structure.

**service primitive (1)** A specific service provided by a particular protocol layer entity. (C/MM) 1394-1995

**(2)** An abstract, implementation-independent interaction between a service user and the service provider. *Synonym:* primitive. (LM/C) 8802-6-1994

**(3)** A function in the external interface of a kernel element (KE) that may be invoked to access services provided by the KE. (SCC32) 1455-1999

**service provider** An implementation of the ACSE and Presentation Layer protocols, to which the APS API provides access.

(C/PA) 1351-1994w

**service raceway** The raceway that encloses the service-entrance conductors. (NESC/NEC) [86]

**service rating (rectifier transformer)** The maximum constant load that, after a transformer has carried its continuous rated load until there is no further measurable increase in temperature rise, may be applied for a specified time without injury. *See also:* rectifier transformer. (Std100) C57.18-1964w

**service recovery** Actions or strategies that restore the service capabilities of a switching system from detected troubles, both internal and external to the switching system, in order to protect service with minimal impact on customers, consistent with reliability and service objectives.

(COM/TA) 973-1990w

**service request** A solicitation of services from a client to a server. A service request may entail the exchange of any number of messages between the client and the server. In this amendment, the term *request* denotes a service request. When naming specific types of requests, the term *request* is qualified

by the type of request, as in Queue Job Request and Delete Job Request. (C/PA) 1003.2d-1994

**service request handler (SRH)** A Master responsible for monitoring the service request line, SR, on a segment or a group of segments. When SR=1 the SRH requests bus mastership and after obtaining mastership determines which module(s) is asserting SR, either by polling or by a broadcast operation. The SRH may subsequently service the pending request(s) itself, or may issue interrupt messages to other devices on behalf of the module(s) asserting SR. SR is usually asserted only by modules which lack Mastership capability. (NID) 960-1993

**service requirement (thermal classification of electric equipment and electrical insulation)** The specified performance to be expected in a specific application under a specified service condition. (EI) 1-1986r

**service routine (computers)** A routine in general support of the operation of a computer, for example, an input-output, diagnostic, tracing, or monitoring routine. *See also:* utility routine. (MIL/C) [2], [85], [20]

**services (1) (logical link control)** The capabilities and features provided by an *N*-layer to an *N*-user. (PE/TR) 799-1987w
**(2)** A set of capabilities provided by one protocol layer entity for use by a higher layer or by management entities. (C/MM) 1394-1995

**service specification** The formal description of the services provided by an entity of the OSI model to the next higher layer. *See also:* physical layer; sublayer; network layer; presentation layer; data link layer; transport layer; entity layer; session layer; client layer; application layer; logical link control sublayer; medium access control sublayer. (C) 610.7-1995

**service, standby** *See:* standby service.

**service, station** *See:* station service.

**service test (1) (primary battery)** A test designed to measure the capacity of a cell or battery under specified conditions comparable with some particular service for which such cells are used. (EEC/PE) [119]
**(2) (meter)** A test made during the period that the meter is in service. *Note:* A service test may be made on the consumer's premises without removing the meter from its support, or by removing the meter for test, either on the premises or in a laboratory or meter shop. *See also:* field tests. (ELM) C12.1-1982s
**(3)** A test, in the "as found" condition, of the battery's capability to satisfy the battery duty cycle. (PE/EDPG) 1106-1995, 450-1995
**(4) (battery)** A special test of the battery's capability, as found, to satisfy the design requirements (battery duty cycle) of the dc system. (SB) 1188-1996

**service time** The accumulated time one or more components or units are in the in-service state during the reporting period. (PE/PSE) 859-1987w

**service voltage (1) (system voltage ratings) (elecrtic power systems in commercial buildings)** The voltage at the point where the electric system of the supplier and the electric system of the user are connected. *See also:* high voltage; maximum system voltage; medium voltage; low voltage; nominal system voltage; system voltage; utilization voltage; service voltage. (IA/APP/PSE) [80], 241-1990r
**(2)** The root-mean-square phase-to-phase or phase-to-neutral voltage at the point where the electrical system of the supplier and the user are connected. (SPD/PE) C62.62-2000

**servicing** Planned servicing of the circuit breaker including lubricating and replacing minor parts. (SWG/PE) C37.10-1995

**servicing time (electric drive)** The portion of down time that is necessary for servicing due to breakdowns or for preventive servicing measures. *See also:* electric drive. (VT/LT) 16-1955w

**serving (cable)** A wrapping applied over the core of a cable before the cable is leaded, or over the lead if the cable is armored. *Note:* Materials commonly used for serving are jute or cotton. The serving is for mechanical protection and not for insulating purposes. (T&D/PE) [10]

**servo** *See:* servomechanism.

**servo amplifier** In an analog computer, an amplifier used as part of a servomechanism that supplies power to the electrical input terminals of a mechanical actuator. (C) 610.10-1994w, 165-1977w

**servo function generator** A function generator consisting of a position servo driving a function potentiometer. *See also:* electronic analog computer. (C) 165-1977w

**servomechanism (A)** A feedback control system in which at least one of the systems signals represents mechanical motion. **(B)** Any feedback control system. **(C)** An automatic feedback control system in which the controlled variable is mechanical position or any of its time derivatives. *See also:* feedback control system. (C) [85]
**(2) (A)** An automatic device that uses feedback to govern the physical position of an element; for example, a tracking servo. *See also:* rate servomechanism; servo potentiometer; repeater servomechanism; positional servomechanism. **(B)** A feedback control system in which at least one of the system signals represents mechanical motion. (C) 610.10-1994

**servomechanism, positional** *See:* positional servomechanism.

**servomechanism, rate** *See:* rate servomechanism.

**servomechanism, repeater** *See:* repeater servomechanism.

**servomechanism type number** In control systems in which the loop transfer function is

$$\frac{K(1 + a_1 s + a_2 s^2 + \ldots + a_i s^i)}{s^n(1 + b_1 s + b_2 s^2 + \ldots + b_k s^k)}$$

where $K$, $a_1$, $b_1$, $b_2$, etc., are constant coefficients, the value of the integer $n$. *Note:* The value of $n$ determines the low-frequency characteristic of the transfer function. The log-gain−log-frequency curve (Bode diagram) has a zero-frequency slope of zero for $n = 0$, slope $-1$ for $n = 1$, etc. *See also:* feedback control system. (NESC) [86]

**servomotor** An actuating device used to position turbine wicket gates, runner blades, deflectors, or other turbine control devices. (PE/EDPG) 1020-1988r

**servomotor limit (hydraulic turbines)** A device that acts on the governor system to prevent the turbine-control servomotor from opening beyond the position for which the device is set. (PE/EDPG) 125-1988r

**servomotor position (hydraulic turbines)** The instantaneous position of the turbine control servomotor expressed as a percent of the servomotor stroke. This is commonly referred to as gate position, needle position, blade position, or deflector position, although the relationship between servomotor stroke and the position of the controlled device may not always be linear. (PE/EDPG) 125-1977s

**servomotor stroke (speed governing systems)** Travel of the turbine control servomotor from zero to maximum without overtravel at the maximum position or "squeeze" at the minimum position. *Notes:* 1. For a gate servomotor this shall be established as the change in gate position from no discharge to maximum discharge. 2. For a blade servomotor this shall be established as the change in blade position from "flat" to "steep." 3. For a deflector servomotor this shall be established as the change in deflector position from "no deflection" position to "full flow deflected" position with maximum discharge under maximum specified head including overpressure due to water hammer. (PE/EDPG) [5], 125-1977s

**servomotor time (hydraulic turbines)** The equivalent elapsed time for one servomotor stroke (either opening or closing) corresponding to maximum servomotor velocity. Servomotor time can be qualified as:

a) gate;
b) blade;
c) deflector;
d) needle.

(PE/EDPG) 125-1977s

**servomotor velocity limit (hydraulic turbines)** A device that functions to limit the servomotor velocity in either the opening, closing, or both directions exclusive of the operation of the slow closure device. (PE/EDPG) 125-1977s

**servomotor velocity limiter** A device that functions to limit the servomotor velocity in either the opening, closing, or both directions exclusive of the operation of the slow closure device (above). (PE/EDPG) 125-1988r

**servo multiplier** An analog multiplier in which one variable is used to position one or more ganged potentiometers across which the other variable voltages are applied. (C) 610.10-1994w, 165-1977w

**servo potentiometer** A potentiometer driven by a positional servomechanism. *See also:* electronic analog computer. (C) 165-1977w, 166-1977w, 610.10-1994w

**session (1)** The period of time during which a user of a terminal can communicate with an interactive system, usually equal to elapsed time between logon and logoff. (C) 610.10-1994w

**(2)** An execution of a software administration command from initiation to completion on all applicable roles. (C/PA) 1387.2-1995

**(3)** A collection of process groups established for job control purposes. Each process group is a member of a session. A process is considered to be a member of the session of which its process group is a member. A newly created process joins the session of its creator. A process can alter its session membership. Implementations that support the *setpgid*() function can have multiple process groups in the same session. (PA/C) 9945-1-1996, 9945-2-1993

**(4)** A portion of an exercise that is contiguous in wall clock (sidereal) time and is initialized per a session database. (DIS/C) 1278.3-1996

**(5)** A sequence of directory operations requested by a particular user of a particular DUA using the same session OM object. (PA/C) 1328.2-1993w, 1326.2-1993w, 1327.2-1993w, 1224.2-1993w

**(6)** A printer state that allows the logical grouping of one or more jobs into a sequential, referenceable collection. (C/MM) 1284.1-1997

**(7)** A portion of an exercise that is contiguous in wall clock (sidereal) time and is initialized by a session database that includes network, entity, and environment initialization and control data. (C/DIS) 1278.4-1997

**(8)** A series of transactions exchanged between the roadside and the vehicle while the vehicle is within a beacon's communications zone. (SCC32) 1455-1999

**(9)** A collection of process groups established for job control purposes. Each process group is a member of a session. A process is considered to be a member of the session of which its process group is a member. A newly created process joins the session of its creator. A process can alter its session membership by the procedure `Create_Session` in the package `POSIX_Process_Identification`. Implementations that support `Set_Process_Group_ID` can have multiple process groups in the same session. (C) 1003.5-1999

**session database** A database that includes network, entity, and environment initialization and control data. It contains the data necessary to start a session. (DIS/C) 1278.3-1996

**session layer (1) (Layer 5)** The layer of the ISO Reference Model that provides the mechanisms for organizing and structuring the interaction between two entities. (C/DIS) 1278.2-1995

**(2)** The fifth layer of the seven-layer OSI model, responsible for coordination of the communications in an orderly manner. *See also:* entity layer; client layer; application layer; logical link control sublayer; physical layer; presentation layer; transport layer; network layer; data link layer; sublayer; medium access control sublayer. (C) 610.7-1995

**session leader** A process that has created a session. (C/PA) 9945-1-1996, 9945-2-1993, 1003.5-1999

**session lifetime** The period between when a session is created and the end of the lifetime of all the process groups that remain as members of the session. (C/PA) 9945-1-1996, 9945-2-1993, 1003.5-1999

**set (1) (A) (test, measurement, and diagnostic equipment)** A collection. **(B) (test, measurement, and diagnostic equipment)** To place a storage device into a specified state, usually other than that denoting zero or blank. **(C) (test, measurement, and diagnostic equipment)** To place a binary cell into the one state. *See also:* reset; preset. (MIL/C) [2], 162-1963

**(2) (electric and electronics parts and equipment)** A unit or units and necessary assemblies, subassemblies, and basic parts connected or associated together to perform an operational function. Typical examples: search radar set, radio transmitting set, sound measuring set; these include such parts, assemblies, and units as cables, microphone, and measuring instruments. (GSD) 200-1975w

**(3) (A) (data management)** In a CODASYL model or network model, a named collection of records. *Synonym:* CODASYL set. **(B) (data management)** In database design, of entities, or of concepts, that have a given property or properties in common. (C) 610.5-1990

**(4)** To force the contents of one or more storage elements to a logic 1. (TT/C) 1149.5-1995

**(5)** The language-independent syntax for a family of datatypes constructed from a base datatype. A value of a set datatype contains an unordered collection of values of the base datatype, each occurring at most once. (C/PA) 1351-1994w

**(6)** To place a binary cell in the true or one state. *See also:* reset. (C) 610.10-1994w

**(7)** A datatype constructed from a base datatype; a value of a set datatype contains an unordered collection of values of the base datatype, each occurring only once. The is-member operation returns a Boolean value that depends on whether the specified value is a member of the set. Applying an operation to all members of a set may be supported through either of two programming paradigms. In the first, the sequencing control is provided by the application; in the second, it is provided by the implementation. (C/PA) 1224.1-1993w

**(8) (A)** (of $m$ phases) A group of $m$ interrelated alternating currents, each in a separate phase conductor, that have the same primitive period but normally differ in phase. They may or may not differ in amplitude and waveform. The equations for a set of $m$ phase currents, when each is sinusoidal, and has the primitive period, are

$$i_a = (2)^{1/2} I_a \cos(\omega t + \beta_{a1})$$
$$i_b = (2)^{1/2} I_b \cos(\omega t + \beta_{b1})$$
$$i_c = (2)^{1/2} I_c \cos(\omega t + \beta_{c1})$$
$$\ldots$$
$$i_m = (2)^{1/2} I_m \cos(\omega t + \beta_{m1})$$

where the symbols have the same meaning as for the general case given later. The general equations for a set of $m$-phase alternating currents are

$$i_a = (2)^{1/2}[I_a \cos(\omega t + \beta_{a1}) + I_{a2} \cos(2\ \omega t + \beta_{a2}) + \ldots + I_{aq} \cos(q\omega t + \beta_{aq}) + \ldots]$$
$$i_b = (2)^{1/2}[I_b \cos(\omega t + \beta_{b1}) + I_{b2} \cos(2\ \omega t + \beta_{b2}) + \ldots + I_{bq} \cos(q\omega t + \beta_{bq}) + \ldots]$$
$$i_b = (2)^{1/2}[I_b \cos(\omega t + \beta_{b1}) + I_{b2} \cos(2\ \omega t + \beta_{b2}) + \ldots + I_{bq} \cos(q\omega t + \beta_{bq}) + \ldots]$$
$$i_m = (2)^{1/2}[I_m \cos(\omega t + \beta_{m1}) + I_{m2} \cos(2\ \omega t + \beta_{m2}) + \ldots + I_{aq} \cos(q\omega t + \beta_{mq}) + \ldots]$$

here $i_a, i_b, \ldots, i_m$ are the instantaneous values of the currents, and $I_{a1}, I_{a2}, \ldots, I_{aq}$ are the root-mean-square amplitudes of the harmonic components of the individual currents. The first subscript designates the individual current and the second subscript denotes the number of the harmonic component. If there is no second subscript, the quantity is assumed to be

sinusoidal. $\beta_{a1}$ $\beta_{a2}$, . . ., $\beta_q$ are the phase angles of the components of the same subscript determined with relation to a common reference. *Note:* If the circuit has a neutral conductor, the current in the neutral conductor is generally not considered as a separate current of the set, but as the negative of the sum of all the other currents (with respect to the same reference direction). *See also:* network analysis; voltage sets. **(B)** A group of *m* interrelated alternating voltages that have the same primitive period but normally differ in phase. They may or may not differ in amplitude and wave form. The equations for a set of *m*-phase voltages, when each is sinusoidal and has the primitive period, are

$$e_a = (2)^{1/2}E_a\cos(\omega t + \alpha_{a1})$$
$$e_b = (2)^{1/2}E_b\cos(\omega t + \alpha_{b1})$$
$$e_c = (2)^{1/2}E_c\cos(\omega t + \alpha_{c1})$$
. . .
$$e_m = (2)^{1/2}E_m\cos(\omega t + \alpha_{m1})$$

where the symbols have the same meaning as for the general case given below. The general equations for a set of *m*-phase alternating voltages are

$$e_a = (2)^{1/2}[E_{a1}\cos(\omega t + \alpha_{a1}) + E_{a2}\cos(2\omega t + \alpha_{a2}) + . . . + E_{ar}\cos(r\omega t + \alpha_{ar}) + . . .]$$
$$e_b = (2)^{1/2}[E_{b1}\cos(\omega t + \alpha_{b1}) + E_{b2}\cos(2\omega t + \alpha_{b2}) + . . . + E_{br}\cos(r\omega t + \alpha_{br}) + . . .]$$
$$e_m = (2)^{1/2}[E_{m1}\cos(\omega t + \alpha_{m1}) + E_{m2}\cos(2\omega t + \alpha_{m2}) + . . . + E_{mr}\cos(r\omega t + \alpha_{mr}) + . . .]$$

where $e_a$, $e_b$, . . ., $e_m$ are the instantaneous values of the voltages, and $E_{a1}$, $E_{a2}$, . . ., $E_{ar}$ the root-mean-square amplitudes of the harmonic components of the individual voltages. The first subscript designates the individual voltage and the second subscript denotes the number of the harmonic component. If there is no second subscript, the quantity is assumed to be sinusoidal. $a_{a1}$, $a_{a2}$, . . ., $a_{ar}$ are the phase angles of the components with the same subscript determined with relation to a common reference. *Note:* This definition may be applied to a two-phase four-wire or five-wire circuit if *m* is considered to be 4 instead of 2. A two-phase three-wire circuit should be treated as a special case. (Std100) 270-1966

**(9)** (used as a verb) To position the various adjusting devices so as to secure the desired operating characteristic. *Note:* Typical adjustment devices are taps, dials, levers, and scales suitably marked, rheostats that may be adjusted during tests, and switches with numbered positions that refer to recorded operating characteristics. (SWG/PE) C37.100-1992

**(10)** A kind of collection class with no duplicate members and where order is irrelevant. *Contrast:* bag; list. (C/SE) 1320.2-1998

**set difference** *See:* difference.

**set light (illuminating engineering)** The separate illumination of the background or set, other than that provided for principal subjects or areas. (EEC/IE) [126]

**set normal response mode (SNRM)** A high-level data link control (HDLC) message sent by a bed-side communications controller (BCC) to a device communications controller (DCC) when a successful connection to the network has occurred. (EMB/MIB) 1073.3.2-2000, 1073.3.1-1994

**set of commutating groups (rectifier)** Two or more commutating groups that have simultaneous commutations. *See also:* rectifier circuit element; rectification. (IA) [62], [12]

**set of fours** *See:* block.

**set of fives** *See:* block.

**set of sixes** *See:* block.

**set point (1) (electric pipe heating systems)** A fixed or constant (for relatively long time periods) command. With respect to electric pipe heating systems, set points are usually associated with temerature controllers or alarms and are the position of of the dials, taps, levels, scales, etc., so as to secure the desired operating characteristics. (PE/EDPG) 622A-1984r

**(2) (electric heat tracing systems)** A fixed or constant (for relatively long time periods) command. With respect to electric heat tracing systems, set points are usually associated with temperature controllers or alarms and are the position of the dials, taps, levels, scales, etc., so as to secure the desired operating characteristics. (PE/EDPG) 622B-1988r

**(3) (nuclear power generating station)** A predetermined point within the range of an instrument where protective or control action is initiated. 336-1980s

**set pulse** A drive pulse that tends to set a magnetic cell. (Std100) 163-1959w

**setting (1)** (of circuit breaker) The value of current and/or time at which an adjustable circuit breaker is set to trip. (NESC/NEC) [86]

**(2)** (used as a noun) The desired characteristic, obtained as a result of having set a device, stated in terms of calibration markings or of actual performance bench marks such as pickup current and operating time at a giving value of input. *Note:* When the setting is made by adjusting the device to operate as desired in terms of a measured input quantity, the procedure may be the same as in calibration. However, since it is for the purpose of finding one particular position of an adjusting device, which in the general case may have several marked positions that are not being calibrated, the term *setting* is to be preferred over the term *calibration.* (SWG/PE) C37.100-1992

**setting error** The departure of the actual performance from the desired performance resulting from errors in adjustment or from limitations in testing or measuring techniques. (SWG/PE) C37.100-1992

**setting limitation** The departure of the actual performance from the desired performance resulting from limitations of adjusting devices. (SWG/PE) C37.100-1992

**settling time (1) (hybrid computer linkage components)** The time required from the instant after the "load" has been completed until the digital-to-analog converter (KDAC) or digital-to-analog multiplier (DAM) output voltage is available within a given accuracy (under the condition of a jam transfer for a double-buffered DAC). (C) 166-1977w

**(2) (automatic control)** The time required, following the initiation of a specified stimulus to a linear system, for the output to enter and remain within a specified narrow band centered on its steady-state value. *Note:* The stimulus may be a step, impulse, ramp, parabola, or sinusoid. For a step or impulse, the band is often specified as ±2%. For nonlinear behavior, both magnitude and pattern of the stimulus should be specified. (PE/EDPG) [3]

**(3) (STEbus)** The time taken for a signal line to settle unambiguously to a logical state when making a transition from one state to another. (MM/C) 1000-1987r

**(4)** Measured from the mesial point (50%) of the output, the time at which the step response enters and subsequently remains within a specified error band around the final value. The final value is defined to occur 1 s after the beginning of the step. (IM/WM&A) 1057-1994w

**(5)** Time required by channel or terminal equipment to reach an acceptable operating condition. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**(6) (A)** Following the initiation of a specified input signal to a system, the time required for the output signal to enter and remain within a specified narrow range centered on its steady-state value. *Note:* The input may be step, impulse, ramp, parabola, or sinusoidal signal. **(B)** In a hybrid computer, the time required after a load has been completed until the digital-to-analog converter or digital-to-analog multiplier output voltage is available within a given accuracy. *Synonym:* switching time. (C) 610.10-1994

**(7)** The duration from a step change in control signal input until the static var compensator (SVC) output settles to within ±5% of the required output. (PE/SUB) 1031-2000

**setup (television)** The ratio between reference black level and reference white level, both measured from blanking level. It

is usually expressed in percent. *See also:* television. (BT/AV) [34]

**setup/hold timing check** A timing check that establishes an interval with respect to a reference signal transition during which some other signal may not change value. This timing check is frequently applied to flip-flops and latches to establish a stable interval for the data input with respect to the active edge of the clock or the active-to-inactive transition of the gate. Two limit values are necessary to define the stable interval. The setup time is the time before the reference signal transition when the stable interval begins and shall be negative if the stable interval begins after the reference signal transition. The hold time is the time after the reference signal transition when the stable interval ends, and shall be negative if the stable interval ends before the reference signal transition. If the data signal changes during the stable interval, the reliability of the resulting state of the flip-flop or latch is unknown. (C/DA) 1481-1999

**setup time (1)** The period of time during which a system or component is being prepared for a specific operation. *See also:* busy time; down time; idle time. (C/IM/ST) 610.12-1990, 1451.2-1997

**(2)** *See also:* nochange timing check; setup/hold timing check. (C/DA) 1481-1999

**setup timing check** A timing check that establishes only the beginning of the stable interval for a setup/hold timing check. If no hold timing check is provided for the same arc, transitions, and state, the stable interval is assumed to end at the reference signal transition and a negative value for the setup time is not meaningful. *See also:* setup/hold timing check. (C/DA) 1481-1999

**seven-bit byte** *See:* septet.

**seven bolt** *See:* conductor grip; grip, conductor.

**severe lightning current** Lightning currents greater than 65 kA, but not greater than 100 kA. (SPD/PE) C62.11-1999

**severely errored second** A second during which the error ratio is worse than a specified limit, or an OOF event occurs. (COM/TA) 1007-1991r

**severity** *See:* criticality.

**sexadecimal (A)** Pertaining to a characteristic or property involving a selection, choice, or condition in which there are sixteen possibilities. **(B)** Pertaining to the numeration system with a radix of sixteen. *Note:* More commonly called hexadecimal. *See also:* hexadecimal; positional notation. (C) [20]

**sexagenary (A)** Pertaining to a selection in which there are 60 possible outcomes. **(B)** Pertaining to the numeration system with a radix of 60. *Synonym:* sexagesimal. (C) 1084-1986

**sexagesimal** *See:* sexagenary.

**sextant (navigation aids)** A double-reflecting instrument for measuring angles—primarily altitudes—of the celestial bodies. (AES/GCS) 172-1983w

**sextet (1)** A group of six adjacent digits operated upon as a unit. *Synonym:* six-bit byte. (C) 610.5-1990w, 1084-1986w

**(2)** A byte composed of six bits. *Synonym:* six-bit byte. (C) 610.10-1994w

**(3) (local area networks)** A contiguous string of six bits. (C) 8802-12-1998

**$SF_6$** *See:* sulfur hexafluoride.

**sferics** *See:* atmospherics.

**SGML** *See:* Standard Generalized Markup Language.

**shade (illuminating engineering)** A screen made of opaque or diffusing material which is designed to prevent a light source from being directly visible at normal angles of view. (EEC/IE) [126]

**shaded-pole motor (rotating machinery)** A single-phase induction motor with a main winding and one or more short-circuited windings (or shading coils) disposed about the air gap. The effect of the winding combination is to produce a rotating magnetic field which in turn induces the desired motor action. (PE) [9]

**shading (1) (A)** The rendering of surfaces in the graphical display image of a three-dimensional object by taking into account surface characteristics and the position and orientation of the surfaces with respect to light sources. **(B) (storage tubes)** The type of spurious signal, generated within a tube, that appears as a gradual variation or a small number of gradual variations in the amplitude of the output signal. These variations are spatially fixed with reference to the target area. Note the distinction between this and disturbance. *See also:* storage tube; television. (C/ED) 610.6-1991, 158-1962

**(2) (audio and electroacoustics)** A method of controlling the directional response pattern of a transducer through control of the distribution of phase and amplitude of the transducer action over the active face. *See also:* television. (SP) [32]

**(3) (camera tubes)** A brightness gradient in the reproduced picture, not present in the original scene, but caused by the tube. (ED) 161-1971w

**shading coil (1) (rotating machinery)** The short-circuited winding used in a shaded-pole motor, for the purpose of producing a rotating component of magnetic flux. (PE) [9]

**(2) (direct-current motors and generators)** A short-circuited winding used on a main (excitation) pole to delay the shift in flux caused by transient armature current. Transient commutation is aided by the use of this coil. *See also:* rotor; stator. (PE) [9]

**shading wedge (rotating machinery)** A strip of magnetic material placed between adjacent pole tips of a shaded-pole motor to reduce the effective separation between the pole tips. The shading wedge usually has a slot running most of its length to provide some separation effect. *See also:* stator; rotor. (PE) [9]

**shadow class** A class presented in a view that is specified in some other view. (C/SE) 1320.2-1998

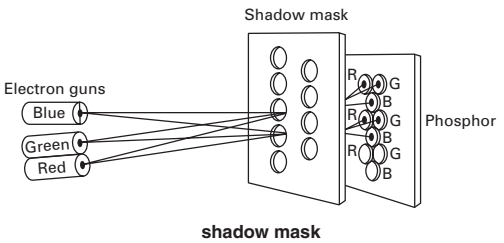
**shadow factor (radio-wave propagation)** The ratio of the electric field strength which would result from propagation over a convex curved surface to that which would result from propagation over a plane, other factors being the same. (AP) 211-1977s

**shadowing (shielding)** The interference of any part of an anode, cathode, rack, or tank with uniform current distribution upon a cathode. (EEC/PE) [119]

**shadow loss (mobile communication)** The attenuation to a signal caused by obstructions in the radio propagation path. *See also:* mobile communication system. (VT) [37]

**shadow mask (1) (color picture tubes)** A color-selecting-electrode system in the form of an electrically conductive sheet containing a plurality of holes that uses masking to effect color selection. *See also:* television. (ED) 161-1971w

**(2) (computer graphics)** A metal plate with small holes, positioned behind the display surface of a display device, such that when the electron guns for red, green, and blue colors are focused through each hole, the beam strikes only the phosphor of its associated color. (See the corresponding figure.)




**shadow mask** (C) 610.6-1991w

**shadow region** The region in space that, because of an intervening obstacle, cannot be reached by an incident geometric-optic ray. (AP/PROP) 211-1997

**shaft (rotating machinery)** That part of a rotor that carries other rotating members and that is supported by bearings in which it can rotate. *See also:* rotor. (PE) [9]

**shaft current (rotating machinery)** Electric current that flows from one end of the shaft of a machine through bearings, bearing supports, and machine framework to the other end of the shaft, driven by a voltage between the shaft ends that results from flux linking the shaft caused by irregularities in the magnetic circuit. *See also:* rotor. (PE) [9]

**shaft extension (rotating machinery)** The portion of a shaft that projects beyond the bearing housing and away from the core. *See also:* armature. (PE) [9]

**shaft recorder** A sensor that is attached to the wheels of an input device such as a mouse; used for delivering electrical pulses as the wheel rotates. (C) 610.10-1994w

**shaft revolution indicator** A system consisting of a transmitter driven by a propeller shaft and one or more remote indicators to show the speed of the shaft in revolutions per minute, the direction of rotation and (usually) the total number of revolutions made by the shaft. *See also:* electric propulsion system. (EEC/PE) [119]

**shaft voltage test (rotating machinery)** A test taken on an energized machine to detect the induced voltage that is capable of producing shaft currents. *See also:* rotor. (PE) [9]

**shaker-type conveyor** A conveyor designed to transport material along a line of troughs by means of a reciprocating or shaking motion. *See also:* conveyor. (EEC/PE) [119]

**shallow and deep dose equivalent** The dose equivalents ($H_s$ and $H_d$) at the depths in tissue of 0.007 cm and 1.0 cm, respectively. (NI) N42.20-1995

**sham control** In an experiment, a group of organisms that is not exposed to the treatment, but is maintained, handled, observed, etc., in an identical manner as the treatment group, and whose overall characteristics are as similar as possible to the treatment organisms. (T&D/PE) 539-1990

**shank (cable plowing)** A portion of the plow blade to which a removable wear point is fastened. *See also:* wear point. (T&D/PE) 590-1977w

**shaped-beam antenna** An antenna that is designed to have a prescribed pattern shape differing significantly from that obtained from a uniform-phase aperture of the same size. (AP/ANT) 145-1993

**shaped pulse** The pulse shape produced by passing the output signal from the preamplifier (approximately a step function) through the pulse-shaping network in the main amplifier (shaping amplifier). (NPS) 325-1996

**shaped wire compact conductor (TW)** ACSR or AAC that is designed to increase the aluminum area for a given diameter of conductor by the use of trapezoidal shaped aluminum wires. (T&D/PE) 524-1992r

**shape factor (1) (spectrum analyzer)** A measure of the asymptotic shape of the resolution bandwidth response curve of a spectrum analyzer. Shape factor is defined as the ratio between bandwidths at two widely spaced points on the response curve, such as the 3 dB and 60 dB down points. (IM) 748-1979w

**(2) (induction and dielectric heating equipment)** *See also:* coil shape factor.

**shaping (pulse terminology)** (operations on a pulse) A process in which the shape of a pulse is modified to one which is ideal or more suitable for the intended application wherein time magnitude parameters may be changed. Typically, some property(ies) of the original pulse is preserved.

a) (regeneration) A shaping process in which a pulse with desired reference characteristics is developed from a pulse which lacks certain desired characteristics.
b) (stretching) A shaping process in which pulse duration is increased.
c) (clipping) A shaping process in which the magnitude of a pulse is constrained at one or more predetermined magnitudes.
d) (limiting) A clipping process in which the pulse shape is preserved for all magnitudes between predetermined clipping magnitudes.
e) (slicing) A clipping process in which the pulse shape is preserved for all magnitudes less (greater) than a predetermined clipping magnitude.
f) (differentiation) A shaping process in which a pulse is converted to a wave whose shape is or approximates the time derivative of the pulse.
g) (integration) A shaping process in which a pulse is converted to a wave whose shape is or approximates the time integral of the pulse. (IM) 194-1977w

**shaping amplifier** *See:* main amplifier.

**shaping constant** An arbitrary indicator of shaped pulse width. The use of this designation is discouraged. *See also:* shaping index. (NPS) 300-1988r

**shaping index (1)** The width of a unipolar pulse at 50% of its peak height. (NPS) 300-1988r

**(2)** In a main amplifier, the width of the shaped unipolar pulse measured at 50% of its peak height, designated as t0.5. (NPS) 325-1996

**shaping pulse** The intentional processing of a pulse waveform to cause deviation from a reference waveform. *See also:* pulse. (IM/HFIM) [40]

**shaping time** *See:* amplifier shaping time.

**shaping time constant (semiconductor radiation detectors)** The time constants of the bandwidth defining CR (capacitance-resistance) differentiators and RC (resistance-capacitance) integrators used in pulse amplifiers. (NID) 301-1976s

**Shareable List** A DMA queue composed of a linked list of items. Each item contains a pointer to the next item and the message being passed to the consumer. Swap transactions are used to support shared access by multiple producers. (C/MM) 1212.1-1993

**shared lock** A lock that allows several processes concurrent access to data. *Note:* at most, only one of the processes is allowed to modify the data and the other processes may only read the data. *Contrast:* exclusive lock. (C) 610.5-1990w

**shared-logic word processing** Word processing performed on a system composed of multiple work stations that share the logic and storage sections of a single central processor. *Contrast:* shared-resource word processing; dedicated word processing; clustered word processing; stand-alone word processing. (C) 610.2-1987

**shared memory (1)** The address space in the system accessible to all modules. (C/BA) 1014.1-1994w, 896.3-1993w

**(2)** The address space in the system accessible to all caching modules. (C/BA) 10857-1994, 896.4-1993w

**shared memory object (1)** An object that represents memory that can be mapped concurrently into the address space of more than one process. (PA/C) 9945-1-1996

**(2)** An object that represents memory that can be mapped concurrently into the address space of more than one process. These named regions of storage may be independent of the file system and can be mapped into the address space of one or more processes to allow them to share the associated memory. (C) 1003.5-1999

**shared port** An output or bidirectional port where some other output port of the cell derives its logic function. The output load at a shared port affects not only the delay to that port itself, but also the delay to any ports sharing it. (C/DA) 1481-1999

**shared-resource word processing** Word processing performed on a system composed on multiple work stations, each with its own processor but sharing certain resources such as printers and disk drives. *Contrast:* shared-logic word processing; dedicated word processing; clustered word processing; stand-alone word processing. (C) 610.2-1987

**shared service** A CSMA/CD network in which the collision domain consists of more than two DTEs so that the total network bandwidth is shared among them. (C/LM) 802.3-1998

**shared systems** Structures, systems, and components that can perform functions for more than one unit in multiunit stations. *Note:* This definition includes the following:

1) systems that are simultaneously shared by both units;
2) time sequential sharing or systems that would be shared by two units at different times, according to the sequence of events; and
3) systems that would only be used by one unit, at any given time, but that could be disconnected from that unit and placed in the other unit on demand.

(PE/NP) 379-1994

**shared unmodified (SU)** An attribute assigned to a cache line if there is an up-to-date copy of the line in the module's cache and the module is to assume that a copy also exists in another module's cache. (C/BA) 896.4-1993w

**Shared Virtual Local Area Network (VLAN) Learning (SVL)** Configuration and operation of the Learning Process and the Filtering Database such that, for a given set of VLANs, if an individual MAC Address is learned in one VLAN, that learned information is used in forwarding decisions taken for that address relative to all other VLANs in the given set. *Note:* In a Bridge that supports only SVL operation, the "given set of VLANs" is the set of all VLANs. (C/LM) 802.1Q-1998

**Shared Virtual Local Area Network (VLAN) Learning (SVL) Bridge** A type of Bridge that supports only Shared VLAN Learning. (C/LM) 802.1Q-1998

**Shared Virtual Local Area Network (VLAN) Learning (SVL)/Independent Virtual Local Area Network (VLAN) Learning (IVL) Bridge** An SVL/IVL Bridge is a type of Bridge that simultaneously supports both Shared VLAN Learning and Independent VLAN Learning. (C/LM) 802.1Q-1998

**sharing** *See:* time sharing.

**sharing transformer and current balancing transformer (current balancing reactor) (electrical heating applications to melting furnaces and forehearths in the glass industry)** Two-winding, iron core devices used in paralleled current paths, connected so that any difference in current between the paths causes an induced voltage that opposes the current difference. (IA) 668-1987w

**sharp** Pertaining to elements in an image that are well defined and readily discernable. *Contrast:* blurred. (C) 610.4-1990w

**sharpening** Any image enhancement technique in which the effect of blurring in the original image is reduced. *Synonym:* deblurring. *See also:* unsharp masking. (C) 610.4-1990w

**shearing machine** An electrically driven machine for making vertical cuts in coal. (EEC/PE) [119]

**shear pin (1) (rotating machinery)** A dowel designed to shear at a predetermined load and thereby prevent damage to other parts. *See also:* rotor; shear section shaft. (PE) [9]
**(2) (small hydraulic power plants)** Replaceable protective device that fails by shearing when an obstruction prevents a wicket gate from closing. (PE/EDPG) 1020-1988r

**shear section shaft (rotating machinery)** A section of shaft machined to a controlled diameter, or area, designed to shear at a predetermined load and thereby prevent damage to connected machinery. *See also:* shear pin; rotor. (PE) [9]

**shear wave (rotational wave)** A wave in an elastic medium that causes an element of the medium to change its shape without a change of volume. *Notes:* 1. Mathematically, a shear wave is one whose velocity field has zero divergence. 2. A shear plane wave in an isotropic medium is a transverse wave. 3. When shear waves combine to produce standing waves, linear displacements may result. (SP/ACO) [32]

**sheath (1) (cable systems in power generating stations) (jacket)** The overall protective covering for the insulated cable. (PE/EDPG) 422-1977
**(2)** A continuous covering for a cable. (BT/IA/AV/PC) 152-1953s, 515.1-1995
**(3)** A uniform and continuous covering, metallic or nonmetallic, enclosing the insulated conductor(s), used to protect the cable against influences from the surroundings (corrosion, moisture, etc.). (IA) 515-1997

**sheath/shield sectionalizers** A sectionalizer that is used to minimize induced current in the cable metallic shield/shield by electrically interrupting the semiconducting shield and conducting metallic sheath or shield of two cable lengths that are joined together. These sectionalizers are primarily used on cable systems operating at 60 kV and above. (PE/IC) 404-1993

**sheath temperature (1)** The temperature of the outermost sheath that may be exposed to the surrounding atmosphere. (BT/IA/AV/PC) 152-1953s, 515.1-1995
**(2)** The temperature of the outermost continuous covering of a heating cable or surface heating device that may be exposed to the surrounding atmosphere. (IA) 515-1997

**sheave (A) (grounding of power lines)** The grooved wheel of a traveler or rigging block. Travelers are frequently referred to as sheaves. **(B) (grounding of power lines)** A shaft-mounted wheel used to transmit power by means of a belt, chain, band, etc. *See also:* pulley. (T&D/PE) 1048-1990
**(2) (A) (conductor stringing equipment)** The grooved wheel of a traveler or rigging block. Travelers are frequently referred to as sheaves. *Synonym:* pulley; wheel; roller. **(B)** A shaft-mounted wheel used to transmit power by means of a belt, chain, band, etc. (PE/T&D) 524a-1993, 524-1992

**sheet** A cut piece of print media, such as a sheet of paper. (C/MM) 1284.1-1997

**Sheffer stroke** *See:* NAND.

**shelf corrosion (dry cell)** The consumption of the negative electrode as a result of local action. *See also:* electrolytic cell. (EEC/PE) [119]

**shelf depreciation** The depreciation in service capacity of a primary cell as measured by a shelf test. *See also:* battery. (EEC/PE) [119]

**shelf test** A storage test designed to measure retention of service ability under specified conditions of temperature and cutoff voltage. *See also:* battery. (EEC/PE) [119]

**Shell, The** The Shell Command Language Interpreter, a specific instance of a shell. (C/PA) 9945-2-1993

**shell (1) (insulators)** A single insulating member, having a skirt or skirts without cement or other connecting devices intended to form a part of an insulator or an insulator assembly. *See also:* insulator. (EEC/IEPL) [89]
**(2) (electrolysis)** The external container in which the electrolysis of fused electrolyte is conducted. *See also:* fused electrolyte. (EEC/PE) [119]
**(3) (electrotyping)** A layer of metal (usually copper or nickel) deposited upon, and separated from, a mold. (PE/EEC) [119]
**(4) (software)** A computer program or routine that provides an interface between the user and a computer system or program. (C) 610.12-1990
**(5) (A)** A software interface between the user and the operating system in which the shell interprets commands and communicates them to the operating system of the computer. **(B)** Software that allows a kernel program to run under different computing environments. (C) 610.13-1993
**(6)** A program that interprets sequences of text input as commands. It may operate on an input stream or it may interactively prompt and read commands from a terminal. (C/PA) 9945-2-1993

**shell-form transformer (power and distribution transformers)** A transformer in which the laminations constituting the iron core surround the windings and usually enclose the greater part of them. (PE/TR) C57.12.80-1978r

**shell script** A file containing shell commands. If the file is made executable, it can be executed by specifying its name as a simple command. Execution of a shell script causes a shell to execute the commands within the script. Alternatively, a shell can be requested to execute the commands in a shell script

by specifying the name of the shell script as the operand to the `sh` utility. (C/PA) 9945-2-1993

**Shell's method** *See:* diminishing increment sort.

**Shell sort** *See:* diminishing increment sort.

**shell, stator** *See:* stator shell.

**shell token string** A sequence of shell tokens. A shell token string shall be a portable character string. (C/PA) 1387.2-1995

**shell-type motor** A stator and rotor without shaft, end shields, bearings or conventional frame. *Note:* A shell-type motor is normally supplied by a motor manufacturer to an equipment manufacturer for incorporation as a built-in part of the end product. Separate fans or fans larger than the rotor are not included. *See also:* asynchronous machine. (PE) [9]

**sheltered equipment (test, measurement, and diagnostic equipment)** Equipment so housed or otherwise protected that the extreme of natural and induced environments are partially or completely excluded or controlled. Examples are laboratory and shop equipment, equipment shielded from sun by a canopy or roof, and so forth. (MIL) [2]

**SHF** *See:* super high frequency.

**shield (1) (nuclear power generating station) (instrumentation cables)** Braid copper, metallic sheath, or metallic coated polyester tape (usually copper or aluminum), applied over the insulation of a conductor or conductors for the purpose of reducing elecrostatic coupling between the shielded conductors and others that may be either susceptible to, or generators of, electrostatic fields (noise). When electromagnetic shielding is intended, the term electromagnetic is usually included to indicate the difference in shielding requirement and material. (PE/IA/EDPG/PSE) 690-1984r, 1100-1999

**(2) (cable systems in power generating stations)** As normally applied to instrumentation cables, refers to metallic sheath (usually copper or aluminum), applied over the insulation of a conductor or conductors for the purpose of providing means for reducing electrostatic coupling between the conductors so shielded and others which may be susceptible to or which may be generating unwanted (noise) electrostatic fields. When electromagnetic shielding is intended, the term "electromagnetic" is usually included to indicate the difference in shielding requirements as well as material. To be effective at power system frequencies, electromagnetic shields would have to be made of high-permeability steel. Such shielding material is expensive and is not normally applied. Other less expensive means for reducing low-frequency electromagnetic coupling, as described herein, are preferred. (PE/EDPG) 422-1977

**(3) (power and distribution transformers)** A conductive protective member placed in relationship to apparatus or test components to control the shape of magnitude, or both, of electric or magnetic fields, thereby improving performance of apparatus or test equipment by reducing losses, voltage gradients, or interface. (PE/TR) C57.12.80-1978r

**(4) (electromagnetic)** A housing, screen, or other object, usually conducting, that substantially reduces the effect of electric or magnetic fields on one side thereof, upon devices or circuits on the other side. *See also:* signal; induction heating. (PE/EM) [4], 43-1974s

**(5) (rotating machinery) (mechanical protection)** An internal part used to protect rotating parts or parts of the electric circuit. In general, the word shield will be preceded by the name of the part that is being protected. (PE) [9]

**(6) (induction heating)** A material used to suppress the effect of an electric or magnetic field within or beyond definite regions. (IA) 54-1955w

**(7) (instrumentation cables) (cable systems)** A metallic sheath (usually copper or aluminum), applied over the insulation of a conductor or conductors for the purpose of providing means for reducing electrostatic coupling between the conductors so shielded and others which may be susceptible to or which may be generating unwanted (noise) electrostatic fields. (SUB/PE) 525-1992r

**(8)** A barrier, usually metallic, within a coaxial cable that is designed to contain the high-powered broadcast signal within the coaxial cable to reduce electromagnetic interference and signal loss. (C) 610.7-1995

**(9) (magnetrons)** *See also:* end shield. (IA) 54-1955w

**shielded conductor cable** A cable in which the insulated conductor or conductors is/are enclosed in a conducting envelope or envelopes. 30-1937w

**shielded ignition harness** A metallic covering for the ignition system of an aircraft engine, that acts as a shield to eliminate radio interference with aircraft electronic equipment. The term includes such items as ignition wiring and distributors when they are manufactured integral with an ignition shielding assembly. (EEC/PE) [119]

**shielded insulated splice (power cable joints)** An insulated splice in which a conducting material is employed over the full length of the insulation for electric stress control. (PE/IC) 404-1986s

**shielded joint** A cable joint having its insulation so enveloped by a conducting shield that substantially every point on the surface of the insulation is at ground potential or at some predetermined potential with respect to ground. (T&D/PE) [10]

**shielded line** A planar transmission line whose cross section is completely enclosed within conducting boundaries. (MTT) 1004-1987w

**shielded-loop antenna (probe)** An electrically small antenna consisting of a tubular electrostatic shield formed into a loop with a small gap, and containing one or more wire turns for external coupling. (AP/ANT) 145-1993

**shielded-loop probe** *See:* shielded-loop antenna.

**shielded nonmetallic-sheathed cable** A factory assembly of two or more insulated conductors in an extruded core of a moisture-resistant, flame-resistant nonmetallic material, covered with an overlapping spiral metal tape and wire shield and jacketed with an extruded moisture-, flame-, oil-, corrosion-, fungus-, and sunlight-resistant nonmetallic material. *Synonym:* SNM cable. (NESC/NEC) [86]

**shielded pair (signal-transmission system)** A two-wire transmission line surrounded by a sheath of conducting material to protect it from the effects of external fields, or to confine fields produced by the transmission line. *See also:* signal; waveguide. (MTT) 146-1980w

**shielded strip transmission line** A strip conductor between two ground planes. Some common designations are: Stripline (trade mark); Tri-plate (trade mark); slab line (round conductor); balanced strip line. *See also:* unshielded strip transmission line; strip-type transmission line. (AP/ANT) [35]

**shielded transmission line (1) (signal-transmission system)** A transmission line surrounded by a sheath of conducting material to protect it from the effects of external fields, or to confine fields produced by the transmission line. *See also:* signal; waveguide. (IE) [43]

**(2) (waveguide)** A transmission line whose elements essentially confine propagated electrical energy to a finite space inside a conducting sheath. (MTT) 146-1980w

**shielded twisted pair (STP) (1)** A twisted pair medium surrounded by a metallic shield to minimize electrical interference and noise. *Note:* Specifications are provided in IEEE Std 802.5. *Contrast:* unshielded twisted pair. (C) 610.7-1995

**(2)** Normally refers to those shielded cables with individual pairs of conductors twisted, or with a group of four conductors in a quad configuration, with any characteristic impedance. Specifically refers to those shielded cables whose pairs have a high-frequency characteristic impedance of 150 Ω and with two pair of conductors shielded from any other individual pairs. (C/LM) 8802-5-1998

**shielded twisted-pair (STP) cable** An electrically conducting cable, comprising one or more elements, each of which is individually shielded. There may be an overall shield, in which case the cable is referred to as shielded twisted pair cable with an overall shield. Specifically for IEEE 802.3

100BASE-TX, 150 Ω balanced inside cable with performance characteristics specified to 100 MHz (i.e., performance to Class D link standards as per ISO/IEC11801:1995). In addition to the requirements specified in ISO/IEC11801:1995, IEEE 802.3 clauses 23 and 25 provide additional performance requirements for 100BASE-T operation over STP. (LM/C) 802.3u-1995s

**shielded-type cable** A cable in which each insulated conductor is enclosed in a conducting envelope so constructed that substantially every point on the surface of the insulation is at ground potential or at some predetermined potential with respect to ground under normal operating conditions. (T&D/PE) [10]

**shield factor (telephone circuit)** The ratio of noise, induced current, or voltage when a source of shielding is present, to the corresponding quantity when the shielding is absent. (PE/EEC) [119]

**shield grid (gas tube)** A grid that shields the control electrode in a gas tube from the anode or the cathode, or both, with respect to the radiation of heat and the deposition of thermionic activating material and also reduces the electrostatic influence of the anode. It may be used as a control electrode. *See also:* grid; electrode. (ED) 161-1971w

**shielding (1) (power cable joints)** (screening) A conducting layer, applied to control the dielectric stresses within tolerable limits and minimize voids. It may be applied over the entire joint insulation, on the tapered insulation ends only, or over irregular conductor or connector surfaces. (PE/IC) 404-1986s

**(2) (x-radiation limits for ac high-voltage power vacuum interrupters used in power switchgear)** Barrier of attenuating material used to reduce radiation hazards. 553-1986

**(3)** The process of applying a conducting barrier between a potentially disturbing noise source and electronic circuitry. Shielding is used to protect cables (data and power) and electronic circuits. Shielding may be accomplished by the use of metal barriers, enclosures, or wrappings around source circuits and receiving circuits. (IA/PSE) 1100-1999

**shielding angle (1) (illuminating engineering)** (of a luminaire) The angle between a horizontal line through the light center and the line of sight at which the bare source first becomes visible. (IE/EEC) [126]

**(2)** The angle between a vertical line through the overhead ground wire and a line connecting the overhead ground wire to the shielded conductor. *See also:* direct-stroke protection (T&D/PE/SPD) [10], C62.23-1995, 1410-1997

**(3) (A)** (of shield wires with respect to conductors). The angle formed by the intersection of a vertical line drawn through a shield wire and a line drawn from the shield wire to a protected conductor. The angle is chosen to provide a zone of protection for the conductor so that most lightning strokes will terminate on the shield wire rather than on the conductor. **(B)** (of a lightning mast). The angle formed by the intersection of a vertical line drawn through the tip of the mast and another line drawn through the tip to earth at some selected angle with the vertical. Rotation of this angle around the structure forms a cone-shaped zone of protection for objects located within the cone. The angle is chosen so that lightning strokes will terminate on the mast rather than on an object contained within the protective zone so formed. *See also:* negative shielding angle; positive shielding angle. (SUB/PE) 998-1996

**shielding effectiveness (SE) (1)** For a given external source, the ratio of electric or magnetic field strength at a point before and after the placement of the shield in question. (EMC) [53]

**(2)** The ratio of the signal received (from a transmitter) without the shield, to the signal received inside the shield; the insertion loss when the shield is placed between the transmitting antenna and the receiving antenna. (EMC/STCOORD) 299-1997

**shielding electrode** An electrode intended for the reduction of electromagnetic interference signals and that is usually located between input and output transducers. (UFFC) 1037-1992w

**shielding enclosure** A structure that protects its interior from the effect of an exterior electric or magnetic field, or conversely, protects the surrounding environment from the effect of an interior electric or magnetic field. A high-performance shielding enclosure is generally capable of reducing the effects of both electric and magnetic field strengths by one to seven orders of magnitude depending upon frequency. An enclosure is normally constructed of metal with provisions for continuous electrical contact between adjoining panels, including doors. (EMC/STCOORD) 299-1997

**shielding failure (lightning protection)** The occurrence of a lightning stroke that bypasses the overhead ground wire and terminates on the phase conductor. *See also:* direct-stroke protection. (T&D/PE) [10]

**shielding failure flash-over rate (SFFOR)** The annual number of flashovers on a circuit or tower-line length basis caused by shielding failures. (PE/T&D) 1243-1997

**shielding failure rate (SFR)** The annual number of lightning events on a circuit or tower-line length basis, which bypass the overhead ground/shield wire and terminate directly on the phase conductor. This event may or may not cause flashover. (PE/T&D) 1243-1997

**shield wire (1) (electromagnetic fields)** A wire employed to reduce the effects on electric supply or communication circuits from extraneous sources. *See also:* inductive coordination. (SPD/PE/EEC) C62.23-1995, [119]

**(2) (overheard power line or substation)** A wire suspended above the phase conductors positioned with the intention of having lightning strike it instead of the phase conductor(s). *Synonyms:* overhead ground wire; static wire. (SUB/PE) 998-1996

**(3)** Grounded wire(s) placed near the phase conductors for the purposes of

a) Protecting phase conductors from direct lightning strokes,
b) Reducing induced voltages from external electromagnetic fields,
c) Lowering the self-surge impedance of an OHGW system, or
d) Raising the mutual surge impedance of an OHGW system to the protected phase conductors.

They may be electrically bonded directly to the structure or indirectly through short gaps. (PE/T&D/PE/T&D) 1410-1997, 1243-1997

**shift (mathematics of computing)** A displacement of an ordered set of characters one or more places to the left or right. If the characters are the digits of a numeral, a shift may be equivalent to multiplying by a power of the base. *See also:* arithmetic shift; logical shift. (C) 1084-1986w

**shift character** A control character that determines the alphabetic or numeric shift of character codes in a message. (C) 610.5-1990w

**shift clock (semiconductor memory)** The inputs that when operated in a prescribed manner shift internal data in a serial memory. (TT/C) 662-1980s

**shift, direct-current** *See:* direct-current shift.

**shift-in character (SI)** A code extension character, used to terminate a sequence that has been introduced by the shift-out character, that makes effective the graphic characters of the original character set. *Contrast:* shift-out character. (C) 610.5-1990w

**shift key** A control key that controls the interpretation of other keys. That is, when used in conjunction with another key, the representation of that other key is different from that of the key alone. *Note:* Often used to form uppercase characters. *See also:* alternate key. (C) 610.10-1994w

**shift operation** An operation for which the VHDL operator is **sll**, **srl**, **sla**, **sra**, **rol**, or **ror**. (C/DA) 1076.3-1997

**shift-out character (SO)** A code extension character that substitutes, for the graphic characters of the original character set, an alternative set of graphic characters upon which agreement has been reached or that has been designated using code extension procedures. *Contrast:* shift-in character. (C) 610.5-1990w

**shift pulse** A drive pulse that initiates shifting of characters in a register. (Std100) 163-1959w

**shift register (1)** A register in which the stored data can be moved to the right or left. (C) [20], [85]
**(2)** A register in which the data bits can be shifted in one direction or both; for example, if the contents are 11010010 and the register is shifted to the right, the result is x1101001; where x is a zero, one, or the bit shifted off the right end, depending on the type of shift register. *See also:* circulating register. (C) 610.10-1994w

**shim (A) (rotating machinery)** (mechanical) A lamination usually machined to close-tolerance thickness, for assembly between two parts to control spacing. **(B) (rotating machinery)** (magnetic) A lamination added to adjust or change the effective air gap in a magnetic circuit. *See also:* rotor; stator. (PE) [9]

**shingle (photoelectric converter)** Combination of photoelectric converters in series in a shingle-type structure. *See also:* semiconductor. (AES) [41]

**ship control telephone system** A system of sound-powered telephones (requiring no external power supply for talking) with call bells, exclusively for communication among officers responsible for control and operation of a ship. *Note:* Call bells are usually energized by hand-cranked magneto generators. (EEC/PE) [119]

**shipping brace (rotating machinery)** Any structure provided to reduce motion or stress during shipment, that must be removed before operation. (PE) [9]

**shipping seal** *See:* sealed end.

**ship's service electric system** On any vessel, all electric apparatus and circuits for power and lighting, except apparatus provided primarily either for ship propulsion or for the emergency system. *Note:* Emergency and interior communication circuits are normally supplied with power from the ship's service system, upon failure of which they are switched to an independent emergency generator or other sources of supply. *See also:* marine electric apparatus. (EEC/PE) [119]

**shock excitation (oscillatory systems)** The excitation of natural oscillations in an oscillatory system due to a sudden acquisition of energy from an external source or a sudden release of energy stored with the oscillatory system. *See also:* oscillatory circuit. (PE/EEC) [119]

**shock motion (mechanical system)** Transient motion that is characterized by suddenness, by significant relative displacements, and by the development of substantial internal forces in the system. *See also:* mechanical shock. (SP) [32]

**shock, primary** *See:* primary shock.

**shockproof electric apparatus** Electric apparatus designed to withstand, to a specified degree, shock of specified severity. *Note:* The severity is stated in footpounds impact on a special test stand equivalent to shock of gunfire, explosion of mine or torpedo, etc. *See also:* marine electric apparatus. (EEC/PE) [119]

**shock, secondary** *See:* secondary shock.

**shoe (ramp shoe)** Part of a vehicle-carried apparatus that makes contact with a ramp. (EEC/PE) [119]

**shop instruments** Instruments and meters that are used in regular routine shop or field operations. (ELM) C12.1-1982s

**shop—meter** A place where meters are inspected, repaired, tested, and adjusted. (ELM) C12.1-1988

**shop test (laboratory test)** A test made upon the receipt of a meter from a manufacturer, or prior to reinstallation. Such tests are made in a shop or a laboratory of a meter department. *See also:* service test. (EEC/PE) [119]

**shoran (navigation aid terms)** A radio navigation system that provides circular lines of position. The term is derived from the words short-range navigation. (AES/GCS) 172-1983w

**shore feeder** Permanently installed conductors from a distribution switchboard to a connection box (or boxes) conveniently located for the attachment of portable leads for supply of power to a ship from a source on shore. *See also:* marine electric apparatus. (EEC/PE) [119]

**short answer interaction** An instruction method employed by some computer-assisted instruction systems, in which the student is asked to provide a word or phrase in response to a question. (C) 610.2-1987

**short card** A special-purpose punch card that is shorter in length than a standard 80-column punch card; For example, a 51 column card. (C) 610.10-1994w

**short circuit (1) (gas-tube surge protective devices)** An abnormal connection of relatively low impedance, whether made accidentally or intentionally, between two points of different potential in a circuit. (SPD/PE) C62.31-1987r, C62.32-1981s
**(2)** An abnormal connection (including an arc) of relatively low impedance, whether made accidentally or intentionally, between two points of different potential. *Note:* The term *fault* or *short-circuit fault* is used to describe a short circuit. (SWG/IA/PE/PSP) 1015-1997, C37.100-1992
**(3)** The condition in which the output terminals of the power supply are directly connected together, resulting in near-zero output voltage. (PEL) 1515-2000

**short circuit, adjustable, waveguide (waveguide components)** A longitudinally movable obstacle which reflects essentially all the incident energy. (MTT) 147-1979w

**short-circuit current (1) (electric power systems in commercial buildings)** An overcurrent resulting from a fault of negligible impedance between live conductors having a difference in potential under normal operating conditions. The fault path may include the path from active conductors via earth to neutral. (IA/PSE) 241-1990r
**(2) (protection and coordination of industrial and commercial power systems)** An overcurrent usually defined as being in excess of ten times normal continuous rating. *See also:* overload. (IA/PSP) 242-1986r
**(3) (overhead power lines)** The current between a conductive object and ground through a zero impedance connection or in a closed circuit, as a result of induction or deposition of charge. (T&D/PE) 539-1990
**(4)** (of a battery charger) The current magnitude at the output terminals, when the terminals are short circuited and with nominal input voltage supplied to the charger. (IA/PSE) 602-1996
**(5) (transformer-rectifier system)** The steady-state value of the input alternating current that flows when the output direct current terminals are short-circuited and rated line alternating voltage is applied to the line terminals. This current is normally of interest when using current limiting transformers or checking current limiting devices. (PEL/ET) 295-1969r

**short-circuit dc current** The dc current between a conductive object and ground through a zero impedance, as a result of deposition of charge. (T&D/PE) 539-1990

**short-circuit driving-point admittance** *See:* admittance, short-circuit driving-point.

**short-circuit duration rating (magnetic amplifier)** The length of time that a short circuit may be applied to the load terminals nonrecurrently without reducing the intended life of the amplifier or exceeding the specified temperature rise. (MAG) 107-1964w

**short-circuiter** A device designed to short circuit the commutator bars when the motor has attained a predetermined speed in some forms of single-phase commutator-type motors. *See also:* asynchronous machine. (EEC/PE) [119]

**short circuit, external dc** *See:* external dc short circuit.

**short-circuit feedback admittance** *See:* admittance, short-circuit feedback.

**short-circuit flux (magnetic sound records)** That flux from a magnetic record which flows across a plane normal to the recorded medium, through a magnetic short circuit placed in intimate contact with the record. (SP) 347-1972w

**short-circuit flux per unit width (magnetic sound records)** The measured short-circuit flux divided by the measured width of the recorded track. *Note:* The term fluxivity has been proposed for the quantity short-circuit flux per unit width. (SP) 347-1972w

**short-circuit forward admittance** *See:* admittance, short-circuit forward.

**short-circuit impedance (1)** A qualifying adjective indicating that the impedance under consideration is for the network with a specified pair or group of terminals short-circuited. *See also:* network analysis; self-impedance. (Std100) 270-1966w

**(2) (line or four-terminal network)** The driving-point impedance when the far-end is short-circuited. *See also:* self-impedance. (PE/EEC) [119]

**short-circuit induced current** The rms power frequency current between a conductive object and ground through a zero impedance or in a closed circuit, as a result of induction. (T&D/PE) 539-1990

**short-circuit inductance** The apparent inductance of a winding of a transformer with one or more specified windings short circuited often taken as a means of determining the leakage inductance of a winding. (CAS/CHM) [13], [51]

**short-circuiting device (power system device function numbers)** A primary circuit switching device that functions to short circuit or to ground a circuit in a response to automatic or manual means. *Synonym:* grounding device. (PE/SUB) C37.2-1979s

**short-circuiting relays** Telecommunication circuit grounding relays are used to ground an exposed telecommunication or telephone pair, usually on open-wire "joint-use" facilities during periods of severe power system disturbance. *Synonym:* grounding relays. (PE/PSC) 487-1992

**short-circuiting switch** A single-pole double-throw (make-before-break) transfer switch used to transfer current away from the meter. (ELM) C12.9-1993

**short-circuit input admittance** *See:* admittance, short-circuit input.

**short-circuit input capacitance (*n*-terminal electron device)** The effective capacitance determined from the short-circuit input admittance. *See also:* electron-tube admittances. (ED) 161-1971w

**short-circuit input voltamperes** The product of the input voltage and input current (rms values) with the resonating winding short circuited. (PEL) 449-1998

**short circuit, internal** *See:* internal short circuit.

**short-circuit loss (rotating machinery)** The difference in power required to drive a machine at normal speed, when excited to produce a specified balanced short-circuit armature current, and the power required to drive the unexcited machine at the same speed. *See also:* asynchronous machine. (PE) [9]

**short-circuit output admittance** *See:* admittance, short-circuit output.

**short-circuit output capacitance (*n* -terminal electron device)** The effective capacitance determined from the short-circuit output admittance. *See also:* electron-tube admittances. (ED) 161-1971w

**short-circuit protection (power supplies)** (automatic). Any automatic current-limiting system that enables a power supply to continue operating at a limited current, and without damage, into any output overload including short circuits. The output voltage must be restored to normal when the overload is removed, as distinguished from a fuse or circuit-breaker system that opens at overload and must be closed to restore power. (AES) [41]

**short-circuit ratio (SCR) (1)** For a semiconductor converter, the ratio of the short-circuit capacity of the bus, in MVA, at the point of converter connection to the rating of the converter, in MW. (IA/SPC) 519-1992

**(2)** The ratio of the ac system three-phase short-circuit MVA (expressing the ac system impedance) to dc power. (PE/T&D) 1204-1997

**short-circuit saturation curve (synchronous machines)** The relationship between the current in the short-circuited armature winding and the field current. (PE) [9]

**short-circuit time constant (rotating machinery) (primary winding)** The time required for the direct-current component present in the short-circuit primary-winding current following a sudden change in operating conditions to decrease to 1/e Δ 0.368 of its initial value, the machine running at rated speed. *See also:* asynchronous machine. (PE) [9]

**short-circuit transfer admittance** *See:* admittance, short-circuit transfer.

**short-circuit transfer capacitance (electron tube)** The effective capacitance determined from the short-circuit transfer admittance. *See also:* electron-tube admittances. (ED) 161-1971w

**short dimension** Incremental dimensions whose number of digits is the same as normal dimensions except the first digit is zero, that is 0.XXXX for the example under normal dimension. *See also:* normal dimension; dimension; incremental dimension; long dimension. (IA) [61]

**short-distance navigation** Navigation utilizing aids usable only at comparatively short distances; this term covers navigation between approach navigation and long-distance navigation, there being no distinct, universally accepted demarcation between them. *See also:* navigation. (AES/RS) 686-1982s, [42]

**short field** Where two field strengths are required for a series machine, short field is the minimum-strength field connection. *Note:* The use of the term tapped field is deprecated. *See also:* asynchronous machine; direct-current commutating machine. (EEC/PE) [119]

**shorting cap** A device that provides a closed circuit between line and load when a photocontrol is not used. (RL) C136.10-1996

**short-lever relay armature** An armature with an armature ratio of 1 : 1 or less. (EEC/REE) [87]

**short-line-fault transient recovery voltage** The transient recovery voltage obtained when a circuit-switching device interrupts a nearby fault on the line. *Note:* Short-line-fault transient recovery voltage differs from terminal fault conditions in that the length of line adds a high-frequency saw-tooth component to the transient recovery voltage. As the distance to the fault becomes greater, the amplitude of the saw-tooth component increases, the rate of rise of the saw-tooth component decreases, and the fault current decreases. The increased amplitude adversely affects the interrupting capability of the circuit-switching device while the decrease in the rate of rise and the decrease in current makes interruption easier. The effects are not proportional and a distance is reached where interruption is most severe even though the current is less than for a terminal fault. The critical value varies considerably with the type of circuit-switching device (oil, air-blast, gas-blast, etc.), and with the particular design. The critical distance may be in the order of a mile at the higher voltages. The critical distance is less as lower voltages are considered. (SWG/PE) C37.100-1992

**short packet** A packet with a length of less than 64 bytes. *Synonym:* under-sized packet. *Contrast:* long packet. (C) 610.7-1995, 610.10-1994w

**short stack** A stack of protocols with less than seven layers. *See also:* thin stack. (C) 610.7-1995

**short-time-delay phase or ground trip element** A direct-acting trip device element that functions with a purposely delayed action (measured in milliseconds). (SWG/PE) C37.100-1992

**short-term exposure** Exposure for durations less than the corresponding averaging time. (NIR) C95.1-1999

**short-term settling time** Measured from the mesial point (50%) of the output, the time at which the step response enters and subsequently remains within a specified error band around the final value. The final value is defined to occur at a specified time less than one second after the beginning of the step. (IM/WM&A) 1057-1994w

**short-term timing instability** *See:* aperture uncertainty.

**short-time current** (of an air switch) The current carried by a device, an assembly, or a bus for a specified short-time interval. *See also:* short-time rating; rated short-time withstand current. (SWG/PE/IA/PSP/TR) C37.100-1992, 1015-1997, C57.12.44-1994

**short-time current rating** The designated rms current that a connector can carry for a specified time under specified conditions. (T&D/PE) 386-1995

**short-time current ratings (of a switching device or assembly)** The maximum rms total currents, including the transient direct-current component, that the device or assembly is required to carry successfully for specified short-time intervals. (SWG/PE) C37.30-1992s

**short-time current tests (high-voltage switchgear)** Tests that consist of the application of a current higher than the rated continuous current for specified short periods to determine the adequacy of the device to withstand short-circuit currents for the specified short times. (SWG/PE) C37.40-1981s

**short-time delay** An intentional time delay in the tripping of a circuit-breaker which is above the overload pickup setting. (IA/PSP) 1015-1997

**short-time delay phase** A direct-acting trip device element that functions with a purposely delayed action (measured in milliseconds). (IA/PSP) 1015-1997

**short-time duty (power and distribution transformers)** A duty that demands operation at a substantially constant current for a short and definitely specified time. (NESC/PE/TR) C57.12.80-1978r, [86], C57.16-1996

**short-time overload rating (rotating electric machinery)** The output that the machine can sustain for a specified time starting hot under the conditions of Section 4 of IEEE Std 11-1980, without exceeding the limits of temperature rise of Section 5. (PE/EM) 11-1980r

**short-time pickup** The current at which the short-time delay function is initiated. (IA/PSP) 1015-1997

**short-time rating (1) (packaging machinery)** The rating that defines the load which can be carried for a short and definitely specified time, the machine apparatus, or device being at approximately room temperature at the time the load is applied. (IA/PKG) 333-1980w

**(2) (power and distribution transformers)** Defines the maximum constant load that can be carried for a specified short time without exceeding established temperature-rise limitations, under prescribed conditions. (PE/TR) C57.12.80-1978r

**(3)** (of diesel-generator unit) The electric power output capability that the diesel-generator unit can maintain in the service environment for 2 h in any 24 h period, without exceeding the manufacturer's design limits and without reducing the maintenance interval established for the continuous rating. *Note:* Operation at this higher rating does not limit the use of the diesel-generator unit at its continuous rating. (PE/NP) 387-1995

**(4)** (of a relay) The highest value of current or voltage or their product that the relay can stand, without injury, for specified short-time intervals (for alternating-current circuits, root-mean-square total value including the direct-current component is used). The rating recognizes the limitations imposed by both the thermal and electromagnetic effects. (SWG/PE/SWG-OLD) C37.100-1992

**(5)** A rating applied to a circuit-breaker that, for reason of system coordination, causes tripping of the circuit-breaker to be delayed beyond the time when tripping would be caused by an instantaneous element. *See also:* rated short-time withstand current; short-time current. (IA/PSP) 1015-1997

**short-time test current (thyristor converter)** The value of direct current that may be applied to a unit or section for a short period (seconds) following continuous operation at a specified lower dc value under specific conditions. (IA/IPC) 444-1973w

**short-time thermal current rating (current transformer)** The 1 s thermal current rating of a current transformer is the root-mean-square (rms) symmetrical primary current that can be carried for 1 s with the secondary winding short-circuited without exceeding in any winding the limiting temperature. (PE/TR) [57]

**short-time waveform distortion (linear waveform distortion)** Distortion of time components from 125 ns to 1 μs; that is, time components of the short-time domain. (PE/BT/NP) 382-1980s, 511-1979w

**short-time (symmetrical) withstand current (1)** (of an air switch) The current carried by a device, an assembly, or a bus for a specified short-time interval. (SWG/PE) C37.34-1994

**(2)** An abnormal power-frequency current, the initial portion of which may have a dc offset (expressed in rms symmetrical amperes) that a switch is required to carry. (SWG/PE) 1247-1998

**short-time (symmetrical) withstand current duration** The maximum duration of short-time (symmetrical) withstand current that a switch is required to carry. (SWG/PE) 1247-1998

**short-wave fade-out** *See:* sudden ionospheric disturbance.

**shot noise (1) (fiber optics)** Noise caused by current fluctuations due to the discrete nature of charge carriers and random or unpredictable (or both) of charged particles from an emitter. *Note:* There is often a (minor) inconsistency in referring to shot noise in an optical system: many authors refer to shot noise loosely when speaking of the mean square shot noise current ($amp^2$) rather than noise power (watts). *See also:* quantum noise. (Std100) 812-1984w

**(2)** *See also:* noise. (LM/C) 802.7-1989r

**shoulder** The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles for emergency use and for lateral support of base and surface course. (NESC) C2-1997

**shoulder lobe** A radiation lobe that has merged with the major lobe, thus causing the major lobe to have a distortion that is shoulder-like in appearance when displayed graphically. *Synonym:* vestigial lobe. (AP/ANT) 145-1993

**show window** Any window used or designed to be used for the display of goods or advertising material, whether it is fully or partly enclosed or entirely open at the rear and whether or not it has a platform raised higher than the street floor level. (NESC/NEC) [86]

**shrink link (rotating machinery)** A bar with an enlarged head on each end for use like a rivet but slipped into place after expansion by heat. It tightens on cooling by shrinkage only. (IA/APP) [90]

**Shugart Associates System Interface** *See:* small computer systems interface.

**shunt (1) (general)** A device having appreciable resistance or impedance connected in parallel across other devices or apparatus, and diverting some (but not all) of the current from it. Appreciable voltage exists across the shunted device or apparatus and an appreciable current may exist in it. (Std100) 270-1966w

**(2) (air switch)** A flexible electrical conductor comprised of braid, cable, or flat laminations designed to conduct current around the mechanical joint between two conductors. (SWG/PE) C37.100-1992

**shunt capacitance** *See:* auxiliary capacitance.

**shunt capacitor bank current** Current, including harmonics, supplied to a shunt capacitor bank. *Note:* Current is expressed in rms amperes. (SWG/PE) C37.100-1992

**shunt control** A method of controlling motors employing the shunt method of transition from series to parallel connections of the motors. *See also:* multiple-unit control. (EEC/PE) [119]

**shunt excitation (emergency and standby power)** A source of generator field excitation power taken from the generator output, normally through power potential transformers connected directly or indirectly to the generator output terminals. (IA/PSE) 446-1995

**shunt-fed vertical antenna (1)** A vertical antenna connected to ground at the base and excited (or connected to a receiver) at a point suitably positioned above the grounding point. (T&D/PE) 539-1990

**(2)** A vertical antenna that is connected directly to ground at its base and whose feed line connects to the antenna between ground and a point suitably positioned above the base. (AP/ANT) 145-1993

**shunt filter** A type of filter that reduces harmonics by providing a low-impedance path to shunt the harmonics from the source away from the system to be protected. (IA/SPC) 519-1992

**shunt gap** An intentional gap(s) between spaced electrodes that is electrically in parallel with one or more valve elements. (SPD/PE) C62.11-1999

**shunting or discharge switch (power system device function numbers)** A switch that serves to open or to close a shunting circuit around any piece of apparatus (except a resistor), such as a machine field, a machine armature, a capacitor, or a reactor. *Note:* This excludes devices that perform such shunting operatings as may be necessary in the process of starting a machine by devices 6 or 42 [a starting circuit breaker or a running circuit breaker], or their equivalent, and also excludes device function 73 [a load-resistor contactor], which serves for the switching of resistors. (SUB/PE) C37.2-1979s

**shunting transition** *See:* shunt transition.

**shunt leads (instrument)** Those leads that connect a circuit of an instrument to an external shunt. The resistance of these leads is taken into account in the adjustment of the instrument. *See also:* auxiliary device to an instrument; instrument. (EEC/AII) [102]

**shunt loading** Loading in which reactances are applied in shunt across the conductors of a transmission circuit. *See also:* loading. (EEC/PE) [119]

**shunt noninterfering fire-alarm system** A manual fire-alarm system employing stations and circuits such that, in case two or more stations in the same premises are operated simultaneously, the signal from the operated box electrically closest to the control equipment is transmitted and other signals are shunted out. *See also:* protective signaling. (EEC/PE) [119]

**shunt reactor (power and distribution transformers)** A reactor intended for connection in shunt to an electric system for the purpose of drawing inductive current. *Note:* The normal use for shunt reactors is to compensate for capacitive currents from transmission lines, cable, or shunt capacitors. The need for shunt reactors is most apparent at light load. (PE/TR) C57.117-1986r, C57.21-1981s, C57.12.80-1978r

**shunt regulator (power supplies)** A device placed across the output that controls the current through a series dropping resistance to maintain a constant voltage or current output. (AES) [41]

**shunt release** A release energized by a source of voltage. *Note:* The voltage may be derived either from the main circuit or from an independent source. *Synonym:* shunt trip. (SWG/PE/TR) C37.100-1992, C57.12.44-1994

**shunt snubber (ac adjustable-speed drives)** Circuit elements, usually including a capacitor and a resistor connected in shunt with a switching device to limit the rate of rise of voltage or the peak voltage across the device (or both) when switching from a conducting to a blocking state or when subjected to an external voltage transient. *See also:* snubber. (IA/ID/SPC) 995-1987w, 936-1987w

**shunt tee junction** *See:* H-plane tee junction.

**shunt transformer** A transformer in which the primary winding is connected in shunt with a power-supply circuit, and that transfers energy to another circuit at the same or different voltage from that of the primary circuit. *See also:* transformer. (PE/TR) [57]

**shunt transition (shunting transition)** A method of changing the connection of motors from series to parallel in which one motor, or group of motors, is first shunted or short circuited, then open circuited, and finally connected in parallel with the other motor or motors. *See also:* multiple-unit control. (PE/EEC) [119]

**shunt trip** *See:* shunt release.

**shunt-trip device** A trip mechanism energized by a source of voltage that may be derived either from the main circuit or from an independent source. (IA/PSP) 1015-1997

**shunt-trip recloser** A recloser in which the tripping mechanism, by releasing the holding means, permits the main contacts to open, with both the tripping mechanism and the contact opening mechanism deriving operating energy from other than the main circuit. (SWG/PE) C37.100-1992

**shunt winding** *See:* common winding.

**shunt-wound** A qualifying term applied to a direct-current machine to denote that the excitation is supplied by a winding connected in parallel with the armature in the case of a motor, with the load in the case of a generator, or is connected to a separate source of voltage. (EEC/PE) [119]

**shunt-wound generator** A dc generator in which the entire field excitation is ordinarily derived from one winding consisting of many turns with a relatively high resistance. This winding is connected in parallel with the armature circuit in a self-excited generator. In a separately excited generator, the winding is connected to the load side of another generator or another dc source. (IA/MT) 45-1998

**shunt-wound motor** A dc motor in which the field circuit is connected either in parallel with the armature circuit or to a separate source of excitation voltage. (IA/MT) 45-1998

**Shupe effect** A time-variant non-reciprocity due to temperature changes along the length of the fiber. (AES) 952-1997

**shutDown** The lowest-power operating mode of RamLink slaves, in which all signals, except for a bused *linkOn* signal, may be ignored. (C/MM) 1596.4-1996

**shutOff** An unpowered state of RamLink slaves, in which a drop in the supply voltage may have caused a loss of volatile memory state. The contents of DRAM storage become undefined; storage on special RAM-devices (such as FLASH memory) may be unaffected by the shutOff state. (C/MM) 1596.4-1996

**shutter (1)** A protective covering used to close, or to close partially, an opening in a stator frame or end shield. In general, the word shutter will be preceded by the name of the part to which it is attached. As used for an electric machine, a shutter is rigid and hence not adjustable. *See also:* stator. (IA/EM/APP) [90]

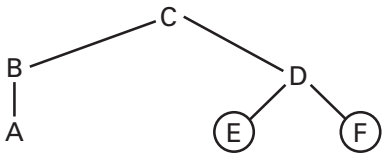
**(2)** (of a switchgear assembly) A device that is automatically operated to completely cover the stationary portion of the primary disconnecting devices when the removable element is either in the disconnected position, test position, or has been removed. (SWG/PE) C37.100-1992

**shuttle car** A vehicle on rubber tires or caterpillar treads and usually propelled by electric motors, electric energy for which is supplied by a diesel-driven generator, by storage batteries, or by a power distribution system through a portable cable. Its chief function is the transfer of raw materials, such as coal and ore, from loading machines in trackless areas of a mine to the main transportation system. (EEC/PE) [119]

**shuttle car, explosion-tested** *See:* explosion-tested shuttle car.

**SI** *See:* International System of Units; segment interconnect; shift-in character; units and letter symbols.

**sibling node** Relative to a node in a tree, a second node that has the same immediate predecessor or parent node. (See the corresponding figure.) *Synonym:* brother; sister.




*Nodes E and F are sibling nodes*

**sibling node**

(C) 610.5-1990w

**side** The physical portion of a cartridge that is accessible by a drive after one mount operation. A side contains one or more partitions. (C/SS) 1244.1-2000

**side A** By convention, the side of the module closest to the connector "A" row, and the same side as the keying pins. (C/BA) 1101.4-1993, 1101.3-1993

**side B** By convention, the side of the module farthest from the connector "A" row, and the opposite side from the keying pins. (C/BA) 1101.4-1993, 1101.3-1993

**side back light (illuminating engineering)** Illumination from behind the subject in a direction not parallel to a vertical plane through the optical axis of the camera. (EEC/IE) [126]

**sideband attenuation** That form of attenuation in which the transmitted relative amplitude of some component(s) of a modulated signal (excluding the carrier) is smaller than that produced by the modulation process. *See also:* wavefront. (AP/ANT) 145-1983s

**sideband null (navigation aids) (rectilinear navigation system)** The surface of position along which the resultant energy from a particular pair of sideband antennas is zero. (AES/GCS) 172-1983w

**sideband-reference glide slope (instrument landing systems) (navigation aids)** A modified null reference glide-slope antenna system in which the upper (sideband) antenna is replace with two antennas, both at lower heights, and fed out of phase, so that a null is produced at the desired glide-slope angle. *Note:* This system is used to reduce unwanted reflections of energy into the glide-slope sector at locations where rough terrain exists in front of the approach end of the runway, by producing partial cancellation of energy at low elevation angles. (AES/GCS) 172-1983w

**sidebands (1) (A)** The frequency bands on both sides of the carrier frequency within which fall the frequencies of the wave produced by the process of modulation. **(B)** The wave components lying within such bands. *Note:* In the process of amplitude modulation with a sine-wave carrier, the upper sideband includes the sum (carrier plus modulating) frequencies: the lower sideband includes the difference (carrier minus modulating) frequencies. *See also:* amplitude modulation; radio receiver. (AP/ANT) 145-1983
**(2) (data transmission)** A band of frequencies containing components of either the sum (upper side band) or difference (lower sideband) of the carrier and modulation frequencies. (PE) 599-1985w

**sideband suppression (power-system communication)** A process that removes the energy of one of the sidebands from the modulated carrier spectrum. (AP/ANT) [35]

**side-break switch** One in which the travel of the blade is in a plane parallel to the base of the switch. (SWG/PE) C37.100-1992

**side circuit (data transmission)** A circuit arranged for deriving a phantom circuit. *Note:* In the case of two-wire side circuits, the conductors of each side circuit are placed in parallel to form a side of the phantom circuit. In the case of four-wire side circuits, the lines of the two side circuits that are arranged for transmission in the same direction provide a one-way phantom channel for transmission in that same direction, the two conductors of each line being placed in parallel to provide a side for that phantom channel. Similarly, the conductors of the other two lines provide a phantom channel for transmission in the opposite direction. (PE) 599-1985w

**side-circuit loading coil** A loading coil for introducing a desired amount of inductance in a side circuit and a minimum amount of inductance in the associated phantom circuit. *See also:* loading. (EEC/PE) [119]

**side-circuit repeating coil (side-circuit repeat coil)** A repeating coil that functions simultaneously as a transformer at a terminal of a side circuit and as a device for superposing one side of a phantom circuit on that side circuit. (PE/EEC) [119]

**side effect (1) (software)** Processing or activities performed, or results obtained, secondary to the primary function of a program, subprogram, or operation. *See also:* subprogram; program; function. (C/SE) 729-1983s
**(2)** Loosely speaking, an expression has a side effect if it performs some observable action in addition to returning a value. For example, a variable assignment is a side effect. (C/MM) 1178-1990r

**sideflash (lightning)** A spark occurring between nearby metallic objects or from such objects to the lightning protection system or to ground. *See also:* direct-stroke protection. (T&D/PE/NFPA) [10], [114]

**side flashover (lightning)** A flashover of insulation resulting from a direct lightning stroke that bypasses the overhead ground wire and terminates on a phase conductor of a transmission line. *See also:* direct-stroke protection. (T&D/PE) [10]

**side frequency** One of the frequencies of a sideband. *See also:* amplitude modulation. (AP/ANT) 145-1983s, [123]

**side lobe** A radiation lobe in any direction other than that of the major lobe. *See also:* minor lobe; maximum relative side lobe level; back lobe; relative side lobe level; relative cross-polar side lobe level; mean side lobe level. (AP/ANT) 145-1993

**sidelobe blanker** A device that employs an auxiliary wide-angle antenna and receiver to sense whether a received pulse originates in the sidelobe region of the main antenna and if so, to gate it from the output signal. (AES) 686-1997

**sidelobe canceler** A device that employs one or more auxiliary antennas and receivers to allow linear subtraction of interfering signals from the desired output if they are sensed to originate in the sidelobes of the main antenna. (AES) 686-1997

**side lobe level, maximum relative** *See:* maximum relative side lobe level.

**side lobe level, relative** *See:* relative side lobe level.

**sidelobes** Normally undesired amplitude responses that lie outside a specified frequency or time interval. These amplitude responses are inherently related to the impulse response of the device and not to other effects, such as bulk-wave, harmonic, multiple transit echoes, or direct electromagnetic feedthrough responses. (UFFC/FT) 1037-1992w

**side lobe suppression** Any process, action, or adjustment to reduce the level of the side lobes or to reduce the degradation of the intended antenna system performance resulting from the presence of side lobes. (AP/ANT) 145-1993

**side-lock** Spurious synchronization in an automatic frequency synchronizing system by a frequency component of the applied signal other than the intended component. *See also:* television. (BT/AV) [34]

**sidelooking airborne radar (SLAR)** A high-resolution (in both range and angle) airborne imaging radar, without synthetic-aperture radar (SAR) processing, directed sidelooking (perpendicular to the line of flight) using large, narrow-beamwidth antennas. (AES) 686-1997

**sidelooking radar** A ground mapping radar used aboard aircraft involving the use of a fixed antenna beam pointing out the side of an aircraft either abeam or squinted with respect to the aircraft axis. The beam is usually a vertically oriented fan beam having a narrow azimuth width. The narrow azimuth

resolution can either be obtained with a long aperture mounted along the axis of the aircraft [sidelooking airborne radar (SLAR)] or by the use of synthetic-aperture radar (SAR) processing. (AES/GCS) 686-1997, 172-1983w

**side marker lights (illuminating engineering)** Lamps indicating the presence of a vehicle when seen from the front and sometimes serving to indicate its width. When seen from the side they may also indicate its length. (EEC/IE) [126]

**side panel (rotating machinery)** A structure enclosing or partly enclosing one side of a machine. (PE) [9]

**sidereal (navigation aids)** Of or pertaining to the stars. (AES/GCS) 172-1983w

**sidereal period (communication satellite)** The time duration of one orbit measured relative to the stars. (COM) [19]

**side relay armature** An armature that rotates about an axis parallel to that of the core, with the pole face on a side surface of the core. (EEC/REE) [87]

**side stream scrambling** A data scrambling technique, used by 100BASE-T2, to randomize the sequence of transmitted symbols and avoid the presence of spectral lines in the signal spectrum. Synchronization of the scrambler and descrambler of connected PHYs is required prior to operation. (C/LM) 802.3-1998

**side thrust (disk recording) (skating force)** The radial component of force on a pickup arm caused by the stylus drag. *See also:* phonograph pickup. (SP) [32]

**sidetone** The acoustic output of a telephone set receiver due to an acoustic input to the transmitter of the same telephone set. *Note:* Where the handset is mounted on a test fixture that includes the artificial mouth and artificial ear, the definition includes transmission through the handset proper; there may be also some vibration effect that is expected to be insignificant for handsets of modern design. There are two types of sidetone to be considered: **listener sidetone** and **talker sidetone**. (COM/TA) 269-1992

**sidetone objective loudness rating (loudness ratings of telephone connections)**

$$\mathrm{SOLR} = -20\log_{10}\frac{S_E}{S_M}$$

where

$S_M$ = sound pressure at the mouth reference point (in pascals)

$S_E$ = sound pressure at the ear reference point (in pascals)

(COM/TA) 661-1979r

**sidetone path loss (telephony)** The difference in dB of the acoustic output level of the receiver of a given telephone set to the acoustic input level of the transmitter of the same telephone set. (COM/TA) 269-1971w

**sidetone telephone set** A telephone set that does not include a balancing network for the purpose of reducing sidetone. *See also:* telephone station. (EEC/PE) [119]

**sidewalk elevator** A freight elevator that operates between a sidewalk or other area exterior to the building and floor levels inside the building below such area, that has no landing opening into the building at its upper limit of travel, and that is not used to carry automobiles. *See also:* elevator. (EEC/PE) [119]

**side-wall pressure** The crushing force exerted on a cable during installation. (NESC) C2-1997

**sideways sum (mathematics of computing)** A sum obtained by adding the digits of a numeral without regard to position or significance. (C) 1084-1986w

**siemens (metric practice)** The electric conductance of a conductor in which a current of one ampere is produced by an electric potential difference of one volt. (QUL) 268-1982s

**sievert (metric practice)** The dose equivalent when the absorbed dose of ionizing radiation multiplied by the dimensionless factors $Q$ (quality factor) and $N$ (product of any other multiplying factors) stipulated by the International Commission on Radiological Protection is one joule per kilogram. (QUL) 268-1982s

**sifting sort** *See:* bubble sort.

**sigma ($\sigma$)** The term sigma designates a group of telephone wires, usually the majority or all wires of a line, that is treated as a unit in the computation of noise or in arranging connections to ground for the measurement of noise or current balance ratio. (PE/EEC) [119]

**sign (1) (power or energy)** Positive, if the actual direction of energy flow agrees with the stated or implied reference direction: negative, if the actual direction is opposite to the reference direction. *See also:* network analysis. (Std100) 270-1966w

**(2) (test, measurement, and diagnostic equipment)** The symbol that distinguishes positive from negative numbers. (MIL) [2]

**(3)** *See also:* electric sign. (NESC) [86]

**signal (1) (signals and paths) (microcomputer system bus)** The physical representation of data. (MM/C) 796-1983r

**(2) (signals and paths, 696 interface devices)** The physical representation which conveys data from one point to another. For the purpose of IEEE Std 696-1983, this applies to digital electrical signals only. (MM/C) 696-1983w

**(3) (A) (data transmission)** A visual, audible or other indication used to convey information. **(B) (data transmission)** The intelligence, message or effect to be conveyed over a communication system. **(C) (data transmission)** A signal wave; the physical embodiment of a message. (PE/PSCC) 599-1985

**(4) (overhead-power-line corona and radio noise)** The intelligence, message, or effect conveyed over a communication system. (T&D/PE) 539-1990

**(5) (programmable instrumentation)** The physical representation of information. *Note:* For the purposes of IEEE Std 488.1-1987, this term refers to digital electrical signals only. (IM/AIN) 488.1-1987r

**(6) (computers)** The event or phenomenon that conveys data from one point to another. (C) [20], [85]

**(7)** Information about a variable that can be transmitted in a system. (IA/ICTL/IAC) [60]

**(8) (telephone switching systems)** An audible, visual or other indication of information. (C) [85]

**(9)** A phenomenon (visual, audible, or otherwise) used to convey information. The signal is often coded, such as a modulated waveform, so that it requires decoding to be intelligible. (CAS) [13]

**(10) (SBX bus)** The physical representation of a logical value. (C/MM) 959-1988r

**(11) (STEbus)** The physical representation of data. (C/MM) 1000-1987r

**(12)** Any communication between message-based devices consisting of a write to a signal register. (C/MM) 1155-1992

**(13)** A measurable quantity (e.g., a voltage) which varies in time in order to transmit information. A signal propagates along a wire or an optic fiber. It is interpreted as a sequence of bits, which is grouped into a sequence of characters by the character layer of the protocol stack. Signals are generated by a link output and are absorbed by a link input. (C/BA) 1355-1995

**(14)** In networking, an electrical pulse that conveys information through a transmission medium. *See also:* baseband signaling; digital signal; analog signal; broadband signaling; out-of-band signaling. (C) 610.7-1995

**(15) (A)** A variation of a physical quantity, used to convey data. **(B)** A time-dependent value attached to a physical phenomenon and conveying data. (C/Std100) 610.10-1994

**(16)** A mechanism by which a process may be notified of, or affected by, an event occurring in the system. Examples of such events include hardware exceptions and specific actions by processes or threads. The term *signal* is also used to refer to the event itself. (C/PA) 9945-1-1996, 9945-2-1993

**(17) (A)** The behavior controlled or observed by a test resource. **(B)** A visual, audible, or other indication used to convey information. (SCC20) 1226-1998

**(18)** A point in the design from which a stimulus may be directly applied or a response directly measured. (C/TT) 1450-1999

**(19)** A mechanism by which a process may be notified of, or affected by, an event occurring in the system. Examples of such events include hardware exceptions and specific actions by processes. The term *signal* is also used to refer to the event itself. (C) 1003.5-1999

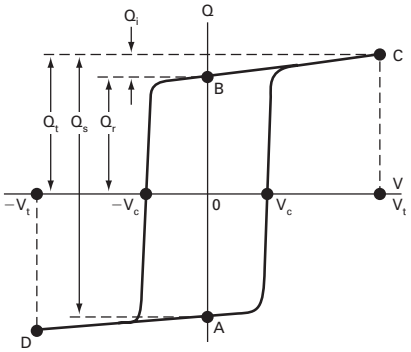
**signal, actuating** *See:* actuating signal.

**signal aspect** The appearance of a fixed signal conveying an indication as viewed from the direction of an approaching train: the appearance of a cab signal conveying an indication as viewed by an observer in the cab. (EEC/PE) [119]

**signal assertion** A) The act of driving a signal to the true state. B) The act of driving a bus of signals to the correct pattern of ones and zeros. (C/BA) 1496-1993w

**signal back light** A light showing through a small opening in the back of an electrically lighted signal, used for checking the operation of the signal lamp. (EEC/PE) [119]

**signal charge** The charge that flows when the condition of the device is changed from that of zero applied voltage (after having previously been saturated with either a positive or negative voltage) to at least that voltage necessary to saturate in the reverse sense. *Note:* The signal charge $Q_s$ equals the sum of $Q_r$ and $Q_t$, as illustrated in the corresponding figure. It is dependent on the magnitude of the applied voltage, which should be specified in describing this characteristic of ferroelectric devices. *See also:* ferroelectric domain.




*Hysteresis loop for a ferroelectric device.*

**signal charge**

(UFFC) 180w

**signal circuit (1)** Any electric circuit that supplies energy to an appliance that gives a recognizable signal. Such circuits include circuits for door bells, buzzers, code-calling systems, signal lights, and the like. *See also:* appliance. (NESC) [86]

**(2) (protective relay system)** Any circuit other than input voltage circuits, input current circuits, power supply circuits, or those circuits that directly or indirectly control power circuit breaker operation. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**(3) (protective relay system)** Any circuit other than an input voltage circuit, input current circuit, power supply circuit, or an output circuit. (PE/PSR) C37.90.1-1989r

**signal conditioning** Sensor signal processing involving operations such as amplification, compensation, filtering, and normalization. (IM/ST) 1451.2-1997

**signal contrast (facsimile)** The ratio expressed in decibels between white signal and black signal. *See also:* facsimile signal. (COM) 168-1956w

**signal converter (test, measurement, and diagnostic equipment)** A device for changing a signal from one form or value to another form or value. (MIL) [2]

**signal current (diode-type camera tube)** The change in target current which occurs when the target is irradiated with photons, or electrons, compared to the case where no radiation is incident on the target. (ED) 503-1978w

**signal decay time (measuring the performance of tone address signaling systems)** The time interval between the end of the signal present condition and the beginning of the signal off condition at the end of the signal under consideration. (COM/TA) 752-1986w

**signal decorrelation time** *See:* decorrelation time.

**signal delay** The transmission time of a signal through a network. The time is always finite, may be undesired, or may be purposely introduced. *See also:* oscillograph; delay line. (IM/HFIM) [40]

**signal, difference** *See:* differential signal.

**signal distance (1) (computers)** The number of digit positions in which the corresponding digits of two binary words of the same length are different. *See also:* hamming distance. (COM/C) 312-1977w, [20]

**(2) (mathematics of computing)** *See also:* hamming distance. (C) 1084-1986w

**signal distributing (telephone switching systems)** Delivering of signals from a common control to other circuits. (COM) 312-1977w

**signal-driven mode** A mode of operation in which the signal `POSIX_Signals.Signal_IO` is sent to the owner of a socket whenever an I/O operation becomes possible on that socket. In this mode, `POSIX_Signals.Signal_IO` is sent when additional data could be sent on the socket, when new data arrives to be received on a socket, or a state transition occurs that would allow a send or receive call to return status without blocking. Signal-driven mode is enabled by setting the `POSIX_IO.Signal_When_Socket_Ready` flag on the socket and disabled by resetting the `POSIX_IO.Signal_When_Socket_Ready` flag. The default mode for signal driven mode is disabled. (C) 1003.5-1999

**signal duration (measuring the performance of tone address signaling systems)** The time interval during which a signal present condition exists continuously. (COM/TA) 752-1986w

**signal electrode (camera tubes)** An electrode from which the signal output is obtained. *See also:* electrode. (BT/AV) [34]

**signal electronics power (thyristor converter)** The power used for the analog or digital system power supplies, or both, required for the thyristor converter control and protection systems. (IA/IPC) 444-1973w

**signal element (1) (unit interval) (data transmission)** The part of a signal that occupies the shortest interval of signaling code. It is considered to be of unit duration in building up signal combinations. (PE) 599-1985w

**(2)** The logical signal during one half of a bit time which may take on the values of Logic_1 or Logic_0. (C/LM) 8802-5-1998

**signal, error** *See:* error signal.

**signal, feedback** *See:* feedback signal.

**signal flow graph (network analysis)** A network of directed branches in which each dependent node signal is the algebraic sum of the incoming branch signals at that node. *Note:* Thus,

$$x_1 t_{1k} + x_2 t_{2k} + \ldots + x_n t_{nk} = x_k$$

at each dependent node $k$, where $t_{jk}$ is the branch transmittance of branch $jk$. (CAS) 155-1960w

**signal frequency shift (frequency-shift facsimile system)** The numerical difference between the frequencies corresponding to white signal and black signal at any point in the system. *See also:* facsimile signal. (COM) 168-1956w

**signal generator** A shielded source of voltage or power, the output level and frequency of which are calibrated, and usually variable over a range. *Note:* The output of known waveform is normally subject to one or more forms of calibrated modulation. (IM/HFIM) [40]

**signal ground** For the purpose of this guide, shall be the grounding system to which signals are referenced. (PE/EDPG) 1050-1996

**signal identifier (spectrum analyzer)** A means to identify the frequency of the input when spurious responses are possible. A front panel control used to identify the input frequency when spurious responses are present. (IM) 748-1979w

**signal indication** The information conveyed by the aspect of a signal. (EEC/PE) [119]

**signaling (1) (data transmission)** The production of an audible or visible signal at a station or switchboard by means of an alternating or pulsating current. In a telephone system, any of several methods used to alert subscribers or operators or to establish and control connections. (PE) 599-1985w

**(2) (telephone switching systems)** The transmission of address and other switching information between stations and central offices and between switching entities. (COM) 312-1977w

**(3)** The exchange of information specifically concerned with the establishment and control of connections, and the transfer of user-to-user and management information in a circuit-switched network. (C/LM) 802.9a-1995w

**(4)** The exchange of information specifically concerned with the establishment and control of connections, and the transfer of user-to-user and management information in a telecommunication network, e.g., in a PPSN. (LM/C/COM) 8802-9-1996

**signaling, analog** *See:* analog signaling.

**signaling and doorbell transformers (power and distribution transformers)** Step-down transformers (having a secondary of 30 V or less), generally used for the operation of signals, chimes, and doorbells. (PE/TR) C57.12.80-1978r

**signaling, binary** *See:* binary signaling.

**signaling circuit** Any electric circuit that energizes signaling equipment. (NESC/NEC) [86]

**signaling light (illuminating engineering)** A projector used for directing light signals toward a designated target zone. (EEC/IE) [126]

**signal, input** *See:* input signal.

**signal interface** The interface between a test device and the unit under test (UUT) through which signals pass. Stimuli pass from the test device to the UUT. Measured signals generally pass from the UUT to a test device. (SCC20) 993-1997

**signal integration** The summation of a succession of signals by writing them at the same location on the storage surface. *See also:* storage tube. (ED) 158-1962w

**signal interphasing** A method of simultaneously overlapping multiple transmission signals to achieve higher transmission rates. (C) 610.7-1995

**signal layer** The layer of the protocol stack at which signals are specified. (C/BA) 1355-1995

**signal level (1) (signals and paths) (696 interface devices)** The magnitude of a signal when considered in relation to an arbitrary reference magnitude. (IM/MM/C/AIN) 488.1-1987r, 696-1983w

**(2) (SBX bus)** The relative magnitude of a signal when compared to a reference. (MM/C) 959-1988r

**(3) (STEbus)** The relative magnitude of a signal when considered in relation to an arbitrary reference. The unit of representation is the volt. (C/MM/C/MM) 796-1983r, 1000-1987r

**(4) (broadband local area networks)** The measured voltage or power of a signal usually stated in dBmV. (LM/C) 802.7-1989r

**signal line (1) (programmable instrumentation) (696 interface devices) (signals and paths) (microcomputer system bus)** One of a set of signal conductors in an interface system used to transfer messages among interconnected devices. (IM/C/MM/AIN) 488.1-1987r, 796-1983r, 696-1983w, 959-1988r

**(2) (STEbus)** One of a set of signal conductors in an interface system used to transfer data among interconnected boards. (MM/C) 1000-1987r

**(3) (NuBus)** A conductor on the backplane other than ground, or power. (C/MM) 1196-1987w

**(4)** An electrical or optical information-carrying facility, such as a differential pair of wires or an optical fiber, with associated transmitter and receiver, carrying binary true/false logic values. (C/MM) 1596-1992

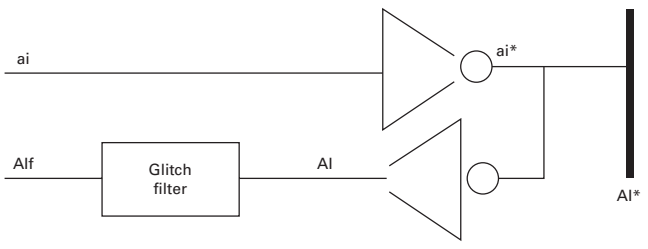
**(5)** An electrical or optical information-carrying facility, such as a differential pair of wires or an optical fiber, with associated driver and receiver, carrying binary true/false logic values. (C/MM) 1596.3-1996

**signal lines** The passive transmission lines through which the signal passes from one to another of the elements of the signal transmission system. *See also:* signal. (IE) [43]

**signal names (1)** Where a group of bus lines are represented by the same letters, the lines within the group are numbered; e.g., AD0*, AD1*, AD2*, etc. In order to represent a group of lines or signals in more convenient form, notation such as AD[63..0]* is used. Also, in these examples, the notation AD[ ]* is used to refer to all of the lines within the group. (C/BA) 896.2-1991w, 10857-1994, 896.4-1993w

**(2)** The simplified alphanumeric notation used to represent a group of lines or signals. For example, where a group of bus lines are represented by the same letters, the lines within the group are numbered, e.g., **AD0**, **AD1**, **AD2**, etc. In order to represent a group of lines or signals in more convenient form, the notation **AD[31..0]** is used. Also, the notation **AD[ ]** is used to refer to all of the lines within the group. The signal that a module applies to the module-side input of its driver is designated by a lowercase label, e.g., **ai**. The signal that a specific module applies to a bus line is designated by a lowercase label with an asterisk, e.g., **ai***. The signal that appears on a bus line as the result of the combined signals applied to it by all modules is designated by an uppercase label with an asterisk, e.g., **AI***. When appended to a signal name, the suffix "f" (filtered) refers to the bus line signal after it has passed through a receiver and a wire-or glitch filter (integrator). For example, **AIf** refers to the signal on the **AI*** line, after it has passed through an inverting receiver to become **AI** and the wire-or glitch filter to become **AIf**. See the figure below. (C/BA) 896.10-1997

**signal negation** The act of driving a signal to the false state. (C/BA) 1496-1993w




*Signal naming convention*

**Signal names**

**signal off (measuring the performance of tone address signaling systems)** Any condition where all the constituent tones of a tone signaling system are below a specified OFF level for each tone. In a single-tone signaling system, tone off and signal off are synonymous terms. *Note:* During a signal off condition, tones that are not used in the signaling system may be at a higher level. (COM/TA) 752-1986w

**signal operation (elevators)** Operation by means of single buttons or switches (or both) in the car, and up-or-down direction buttons (or both) at the landings, by which predetermined landing stops may be set up or registered for an elevator or for a group of elevators. The stops set up by the momentary actuation of the car buttons are made automatically in succession as the car reaches those landings, irrespective of its direction of travel or the sequence in which the buttons are actuated. The stops set up by the momentary actuation of the up-and-down buttons at the landing are made automatically by the first available car in the group approaching the landing in the corresponding direction, irrespective of the sequence in which the buttons are actuated. With this type of operation, the car can be started only by means of a starting switch or button in the car. *See also:* control. (EEC/PE) [119]

**signal, output** *See:* output signal.

**signal output current (camera tubes or phototubes)** The absolute value of the difference between output current and dark current. *See also:* phototube. (ED/BT/AV) 161-1971w, [34], [45]

**signal overload point (electronic navigation)** The maximum input signal amplitude at which the ratio of output to input is observed to remain within a prescribed linear operating range. *See also:* navigation. (AES/RS) 686-1982s, [42]

**signal parameter (programmable instrumentation)** That parameter of an electrical quantity whose values or sequence of values convey information. (IM/MM/C/AIN) 488.1-1987r, 1000-1987r, 796-1983r, 696-1983w

**signal phase** The initial phase of an exception operation in which all agents are notified of an error condition. *See also:* exception operation. (C/MM) 1296-1987s

**signal present (measuring the performance of tone address signaling systems)** Any condition where the presence of tone or tones is sufficient to be recognized as a valid digital or supervisory signal. In a single-tone signaling system, tone present and signal present are synonymous terms; in a two-tone signaling system the signal present state exists where two and only two tones each meet the signal present condition, and the two tones represent a valid combination. (COM/TA) 752-1986w

**signal processing antenna system** An antenna system having circuit elements associated with its radiating element(s) that perform functions such as multiplication, storage, correlation, and time modulation of the input signals. (AP/ANT) 145-1993

**signal propagation delay or transmission delay** Total time for a signal to pass through the switching system. For digital-to-digital interfaces (DS1) where bit integrity is maintained, the delay is the time elapsed between transmission and reception of the bit that starts a known test pattern. For analog-to-analog, digital-to-analog, or analog-to-digital transmission, T1Q1 (a study group of the Exchange Carriers Standards Association) proposes that the delay be measured as the shift in time of the envelope of a 50% amplitude modulated test signal (or its digital equivalent) at the carrier frequency of minimum delay in the voiceband channel. (COM/TA) 973-1990w

**signal purity (network analyzers)** A measure of freedom from frequency components other than the desired measurement frequency. It includes harmonics, subharmonics, spurious mixer products, and unwanted components of signal or local oscillator leakage. *Note:* The resulting error in measurement is a function of the detection system and of the frequency response of the network under test, as well as the signal purity. (IM/HFIM) 378-1986w

**signal quality error heartbeat** A signal from the transceiver to a node peripheral indicating that the transceiver is functioning properly. *Note:* This term is contextually specific to IEEE Std 802.3. (C) 610.7-1995

**signal queueing** When queueing is enabled for a signal, occurrences of that signal are queued in FIFO order and information is included if the signal is from a source that supplies information. Otherwise, the signal queue may be only one occurrence deep and it is implementation defined whether the data are included. Support for signal queueing is governed by the Realtime Signals option. Not all signals may support queueing. (C) 1003.5-1999

**signal, rate** *See:* rate signal.

**signal, reference input** *See:* reference input signal.

**signal reference structure** A system of conductive paths among interconnected equipment that reduces noise-induced voltages to levels that minimize improper operation. Common configurations include grids and planes. (IA/PSE) 1100-1999

**signal relay** *See:* alarm relay.

**signal release** The act of removing electronic drive to a signal thereby placing the driver in a high-impedance condition. Release of an SBus signal will leave the SBus signal in its last state unless the signal is specified to have bias circuits attached that return the signal to a specified state. (C/BA) 1496-1993w

**signal repeater lights** A group of lights indicating the signal displayed for humping and trimming. (EEC/PE) [119]

**signal, return** *See:* return signal.

**signal rise time (measuring the performance of tone address signaling systems)** The time interval between the end of the signal off condition and the beginning of the signal present condition at the beginning of a tone signal. (COM/TA) 752-1986w

**signal, sampled** *See:* sampled signal.

**signal-shaping amplifier (telegraph practice)** An amplifier and associated electric networks inserted in the circuit, usually at the receiving end of an ocean cable, for amplifying and improving the waveshape of the signals. *See also:* telegraphy. (EEC/PE) [119]

**signal-shaping network (wave-shaping set)** An electric network inserted (in a telegraph circuit) for improving the waveshape of the received signals. *See also:* telegraphy. (PE/EEC) [119]

**signal shutter (illuminating engineering)** A device which modulates a beam of light by mechanical means for the purpose of transmitting intelligence. (EEC/IE) [126]

**signal skew** The time difference a data bus may have relative to its corresponding strobe signal. Signal skew is a positive quantity when the strobe signal delay exceeds the bus signal delay. (C/BA) 896.2-1991w

**signal state** *See:* logic state.

**signal threshold (dial-pulse address signaling systems) (telephony)** The current or voltage value representing a transition between make and break states. The threshold may be expressed either as an absolute value (for example, 15 mA or 21 V) or as a percentage deviation between steady-state conditions (for example, the value which is 70% of the difference between make and break values, added to the off-hook value). Signaling detectors having hysteresis will have different signal threshold values for the make-break and break-make transition. (COM/TA) 753-1983w

**signal-to-clutter ratio** The ratio of target echo power to the power received from clutter sources lying within the same resolution element. (AES) 686-1997

**signal-to-distortion ratio (C-notched noise)** The ratio of input signal power to C-message weighted output distortion power. The signal level is measured with a holding tone (typically 1004 Hz) present with a wideband (200 Hz–10 kHz) level detector. The C-notch noise should be measured with a C-message filter after the holding tone has been reduced in am-

plitude by at least 50 dB with a 1010 Hz notch filter. (COM/TA) 973-1990w

**signal-to-interference ratio** The ratio of the magnitude of the signal to that of the interference or noise. *Note:* The ratio may be in terms of peak values or root-mean-square values and is often expressed in decibels. The ratio may be a function of the bandwidth of the system. *See also:* signal. (IE) [43]

**signal-to-noise ratio (1) (video magnetic-tape recording systems)** The ratio of the peak-to-peak amplitude of the video luminance signal from blanking level to reference white level (100 IRE units), 714 megavolts (mV) to the root-mean-square (rms) amplitude of the random noise, expressed in decibels.

$$\mathrm{SNR} = 20\log_{10}\frac{E_V}{E_N}$$

where

$E_V$ = peak-to-peak amplitude of the maximum video luminance component (714 mV)

$E_N$ = rms amplitude of random noise.

*Notes:* 1. Unless otherwise specified, the definition for signal-to-noise is as defined here. (BT) 618-1984w

**(2) (camera tubes)** The ratio of peak-to-peak signal output current to root-mean-square noise in the output current. *Note:* Magnitude is usually not measured in tubes where the signal output is taken from target. *See also:* camera tube; television. (PE/EEC) [119]

**(3) (television transmission)** The signal-to-noise ratio at any point is the ratio in decibels of the maximum peak-to-peak voltage of the video television signal, including synchronizing pulse, to the root-mean-square voltage of the noise. *Note:* The signal-to-noise ratio is defined in this way because of the difficulty of defining the root-mean-square value of the video signal or the peak-to-peak value of random noise. *See also:* television. (EEC/PE) [119]

**(4) (mobile communication)** The ratio of a specified speech-energy spectrum to the energy of the noise in the same spectrum. *See also:* television. (VT) [37]

**(5) (sound recording and reproducing system)** The ratio of the signal power output to the noise power in the entire pass band. 191-1953w

**(6) (digital delay line)** Ratio of the peak amplitude of the output doublet to the maximum peak of any noise response (or signal) outside of the doublet interval. (Includes overshoot.) (UFFC) [22]

**(7) (speech quality measurements)** In decibels of a speech signal, the difference between its speech level and the noise level. 297-1969w

**(8) (overhead-power-line corona and radio noise)** The ratio of the value of the signal to that of the noise. *Notes:* 1. This ratio is usually in terms of measured peak values in the case of impulse noise and in terms of the root-mean-square (rms) values in the case of random noise. 2. Where there is a possibility of ambiguity, suitable definitions of the signal and noise should be associated with this term; as, for example, peak signal to peak noise ratio, rms signal to rms noise ratio, peak-to-peak signal to peak-to-peak noise ratio, etc. In measurements of transmission line noise in the AM frequency range, the ratio of average station signal level to quasi-peak line noise level is generally used. 3. This ratio often may be expressed in decibels (dB). 4. This ratio may be a function of the bandwidth of the transmission or measuring system. (PE/T&D/AP/ANT) 539-1990, 599-1985w, 145-1993

**(9)** The ratio of a signal to the noise. (IM/WM&A) 1057-1994w

**(10)** The ratio of relative power of the usable signal to the noise present, expressed in decibels. (C) 610.7-1995, 610.10-1994w

**(11)** The ratio in dB of the power of a single- or multiple-tone test signal to the power of the background noise (after a D Filter) not related to the application of the test signal, plus all spurious signals resulting from the application of the test signal, except for 2nd-order and 3rd-order intermodulation (IMD) distortion. (COM/TA) 743-1995

**(12)** "Signal" refers to peak signal and "noise" refers to rms noise. (NPS) 325-1996

**(13)** In radar, the ratio of the power corresponding to a specified target measured at some point in the receiver to the noise power at the same point in the absence of the received signal. (AES) 686-1997

**signal-to-total-distortion ratio (S/TD)** The ratio in dB of the power of a single or multiple-tone test signal to the power of all spurious signals (after a D Filter) resulting from the application of the test signal plus the power from background noise. (COM/TA) 743-1995

**signal transfer characteristic (diode-type camera tube)** The relationship between the input image irradiance incident on the camera tube and the resulting output current signal. It is presented as a plot of the logarithm of the output signal as a function of the logarithm of the input signal. (ED) 503-1978w

**signal-transfer point (telephone switching systems)** A switching entity where common channel signaling facilities are interconnected. (COM) 312-1977w

**signal transition distortion** The deviation from the ideal time between signal transitions of a signal on a serial communication link. Contributing factors to signal transition distortion include clock oscillator frequency differences, variations in transmitter delay times and rise/fall times, and phase shifts introduced by cables. For a 1 Mb/s Manchester-encoded signal, the ideal times between transitions are 500 ns and 1 μs. A transition is defined as the time that a differential signal passes through 0 V. (EMB/MIB) 1073.4.1-2000

**signal transmission system** *See:* carrier.

**signal, TV waveform** *See:* TV waveform signal.

**signal, unit-impulse** *See:* unit-impulse signal.

**signal, unit-ramp** *See:* unit-ramp signal.

**signal, unit-step** *See:* unit-step signal.

**signal wave** A wave whose shape conveys some intelligence, message, or effect. [53]

**signal winding (input winding) (saturable reactor)** A control winding to which the independent variable (signal wave) is applied. (EEC/PE) [119]

**signal word** The word or words that designate a degree of safety alerting. The words shall always be located in a distinctive panel located in the uppermost portion of a safety sign or label. (NIR/SCC28) C95.2-1999

**signature (1)** Those characteristics of a waveform that help identify an event or conditions. (SWG/PE) C37.100-1992

**(2)** A statement of what the interface to a responsibility "looks like." A signature consists of the responsibility name, along with a property operator and the number and type of its arguments, if any. A type (class) may be specified for each argument in order to limit the argument values to being instances of that class. (C/SE) 1320.2-1998

**signature analysis** A technique for compressing a sequence of logic values output from a circuit under test into a small number of bits of data (signature) that, when compared to stored data, will indicate the presence or absence of faults in the circuit. (TT/C) 1149.1-1990

**signature diagnosis (test, measurement, and diagnostic equipment)** The examination of signature of an equipment for deviation from known or expected characteristics and consequent determination of the nature and location of malfunctions. (IM/WM&A) 194-1977w

**sign bit** A binary digit used to indicate the algebraic sign of a number. (C) 1084-1986w

**sign character** A character within a picture specification that represents the sign of a data item. *Note:* S, +, and − are commonly used as sign characters. (C) 610.5-1990w

**sign digit (electronic computation)** A character used to designate the algebraic sign of a number. (C) 162-1963w, 1084-1986w

**signed (1)** Pertaining to a representation of a number with which an algebraic sign is associated. (C) 610.5-1990w

**(2)** The condition of information that has an enciphered summary appended to it that is used to ensure the integrity of the data, the authenticity of the originator, and the unambiguous relationship between the originator and the data. (C/PA) 1328.2-1993w, 1326.2-1993w, 1224.2-1993w, 1327.2-1993w

**signed binary arithmetic** *See:* sign-magnitude arithmetic.

**significance (1) (test, measurement, and diagnostic equipment)** The value or weight given to a position, or to a digit in a position, in a positional numeration system. In most positional numeration systems positions are grouped in sequence of significance, usually more significant towards the left. (MIL) [2]
**(2)** *See also:* weight. (C) 1084-1986w

**significand (1) (binary floating-point arithmetic)** The component of a binary floating-point number that consists of an explicit or implicit leading bit to the left of its implied binary point and a fraction field to the right. (C/MM) 754-1985r
**(2) (mathematics of computing)** The component of a floating-point number that consists of an explicit or implicit leading digit to the left of its implied radix point and a fraction field to the right. *Synonyms:* fixed-point part; mantissa. *Contrast:* exponent. (C/MM) 854-1987r, 1084-1986w

**significant (nuclear power generating station)** Demonstrated to be important by the safety analysis of the station. (PE/NP) 381-1977w, 308-1991l

**Significant Event Evaluation and Information Network (SEE-IN)** An information database maintained by the Institute of Nuclear Power Operations (INPO). (PE/NP) 933-1999

**significant aging mechanism** An aging mechanism that, if in the normal and abnormal service environment, causes degradation during the installed life of the equipment that progressively and appreciably renders the equipment vulnerable to failure to perform its safety function(s) during design basis event conditions (DBE). (PE/NP) 1205-1993

**significant code** A code that identifies a particular item and also yields further information about the properties or classification of the item. *Contrast:* nonsignificant code. (C) 610.5-1990w

**significant digit (1) (mathematics of computing)** A digit that contributes to the accuracy or precision of a numeral. *See also:* least significant digit; most significant digit. (C) [20], 610.5-1990w, 1084-1986w
**(2) (metric practice)** Any digit that is necessary to define a value or quantity. (QUL) 268-1982s
**(3)** Any digit in a number that is necessary to define a numerical value. (SCC14) SI 10-1997

**significant-digit arithmetic** A method of making calculations using a modified form of floating-point representation in which the number of significant digits in the result is determined by the number of significant digits in the operands, the operations performed, and the degree of precision available. (C) 1084-1986w

**significant figure*** *See:* significant digit.
* Deprecated.

**significant human interface** An interface between personnel and equipment, facilities, software, or documentation, where the resulting human performance is a determinant in the achievement of system performance.

**sign-magnitude arithmetic** Computer arithmetic using numerals expressed in sign-magnitude notation. *Synonym:* signed binary arithmetic. (C) 1084-1986w

**sign-magnitude notation** A numeration system in which the left-most bit is interpreted as the sign bit and the remaining bits represent the magnitude. *Contrast:* twos-complement notation. (C) 1084-1986w

**sign-off** *See:* logoff.

**sign-on** *See:* login.

**sign position** The position at which the sign of a number is located. (C) [20], [85], 1084-1986w

**silent lobing** A method for scanning an antenna beam to achieve angle tracking without revealing the scanning pattern on the transmitted signal. (AES) 686-1997

**silent zone** Part of the skip zone at a distance greater than the range of the ground wave. (AP/PROP) 211-1997

**silicon (A)** A semiconducting material used in many devices such as integrated circuits and solar cells that in its pure form is a lightweight metal resembling aluminum. **(B)** A colloquial reference to an integrated circuit. (C) 610.10-1994

**silicon controlled rectifier (SCR) (thyristor)** An alternative name for the reverse blocking triode thyristor. *Note:* Although not an official definition, the term "unidirectional" is sometimes used to describe the single switching class of thyristors consisting of reverse-blocking and reverse-conducting thyristors. This term is useful for comparing or contrasting this class of thyristors with bidirectional thyristors. (IA/IPC) 428-1981w

**silicone oil (insulating oil)** A generic term for a family of relatively inert liquid organosiloxane polymers used as electrical insulation. (PE/TR) 637-1985r

**silvering (electrotyping)** The application of a thin conducting film of silver by chemical reduction upon a plastic or wax matrix. (PE/EEC) [119]

**silver oxide cell** A cell in which depolarization is accomplished by oxide of silver. *See also:* electrochemistry. (EEC/PE) [119]

**silver storage battery** An alkaline storage battery in which the positive active material is silver oxide and the negative contains zinc. *See also:* battery. (EEC/PE) [119]

**silver-surfaced or equivalent** Metallic materials having satisfactory long-term performance that operate within the temperature rise limits established for silver-surfaced electrical contact parts and conducting mechanical joints. (SWG/PE) C37.100-1992

**SIM++** A programming language used for simulations on distributed computing systems. (C) 610.13-1993w

**SIMD** *See:* single instruction, multiple data.

**similar design bar/coil** A similar design bar/coil is a bar/coil of the same design and manufacture using same materials and processes as the actual production bar/coil except that it may be longer in the slot section, and/or larger in the copper and/or groundwall cross section than the actual production bar/coil. The variance in the slot section length and the cross section of the 'similar design bar/coil' and the actual production bar/coil must be identified prior to the start of the thermal cycling test. (PE/EM) 1310-1996

**simple arc** An arc that does not cross itself. (C) 610.4-1990w

**simple buffering** A buffering technique in which a buffer is allocated to a computer program for the duration of the program's execution. *Contrast:* dynamic buffering. (C) 610.12-1990

**simple circuit (A)** A circuit permitting the transmission of signals in either direction, but not in both simultaneously. *Contrast:* two-way circuit. **(B)** A circuit permitting the transmission of signals in one specific direction only. (C) 610.10-1994

**simple combination of insulating materials (thermal classification of electric equipment and electrical insulation)** A number of insulating materials, which together make possible the evaluation of any interaction between them. (EI) 1-1986r

**simple electrical ground and test device** A device with one terminal set and a power-operated ground-making switch for connecting the terminal set to the device ground connection system, complete with necessary isolation barriers and suitable interlocking. Voltage test ports may be provided. (SWG/PE) C37.20.6-1997

**simple GCL circuit** *See:* simple parallel circuit; simple series circuit.

**simple interconnect** A connection between two or more component pins consisting only of a net. *Contrast:* extended interconnect. (C/TT) 1149.4-1999

**simple manual ground and test device** A device with one or two terminal sets with provisions for connecting either terminal set through manually installed cables to the device ground connection system, complete with necessary isolation barriers and suitable interlocking. *Note:* Cables are synonymous with manually installed cords of any type. (SWG/PE) C37.20.6-1997

**simple message** An MTM-Bus message that consists of no more than a HEADER and, optionally, an ACKNOWLEDGE/PACKET COUNT packet pair. (TT/C) 1149.5-1995

**simple network management protocol (SNMP)** A protocol used for the management of network nodes and devices, used extensively on internet and other networks. The protocol provides for the communication of status and setup information between a management console and a managed device using values of objects defined in the management information base (MIB) for the managed object. (C/MM) 1284.1-1997

**simple parallel circuit** A linear, constant-parameter circuit consisting of resistance, inductance, and capacitance in parallel. *Synonym:* simple GCL circuit. *See also:* network analysis. (Std100) 270-1966w

**simple path** A path in which all vertices except the first and last in the sequence are distinct. (C) 610.5-1990w

**simple rectifier** A rectifier consisting of one commutating group if single-way or two commutating groups if double-way. *See also:* rectification. (IA) [62]

**simple rectifier circuit** A rectifier circuit consisting of one commutating group if single-way, or two commutating groups if double-way. *See also:* rectifier circuit element; rectification. (IA) [12]

**simple scanning (facsimile)** Scanning of only one scanning spot at a time during the scanning process. (ELM) C12.1-1982s

**simple series circuit** A resistance, inductance, and capacitance in series. *See also:* network analysis. (Std100) 270-1966w

**simple sine-wave quantity** A physical quantity that is varying with time $t$ as either $A\sin(\omega t + q_A)$ or $A\cos(\omega + \theta_B)$ where $A$, $\omega$, $_A$, $\theta_B$ are constants. (Simple denotes that $A$, $\theta_A$, $\theta_B$ are constants.). *Notes:* 1. It is immaterial whether the sin or cos form is used, so long as no ambiguity or inconsistency is introduced. 2. $A$ is the amplitude or maximum value, $wt + \theta_A$ (or $\omega t + \theta_B$) the phase, $\theta_A$ (or $\theta_B$) the phase angle. However, when no ambiguity may arise, phase angle may be abbreviated phase. 3. In certain special applications, for example, modulation, $\omega t + \theta$ is called the angle (of a sine wave), (not phase angle) in order to clarify particular uses of the word "phase." Another permissible term for ($\omega t + \theta$) is argument (sine wave). (Std100) 270-1966w

**simple sound source** A source that radiates sound uniformly in all directions under free-field conditions. (SP) [32]

**simple target** A target which can be represented by only one major scattering center so that its radar cross section is relatively insensitive to viewing aspect over small angular displacements. *Note:* Examples are a sphere or an object shorter than a half wavelength. Also called a point target. (AES) 686-1997

**simple thyristor converter** A thyristor converter that consists of one commutating group. (IA/IPC) 444-1973w

**simple tone (A) (pure tone)** A sound wave, the instantaneous sound pressure of which is a simple sinusoidal function of the time. **(B) (pure tone)** A sound sensation characterized by its singleness of pitch. *Note:* Whether or not a listener hears a tone as simple or complex is dependent upon the ability, experience, and listening attitude. *See also:* complex tone. (SP) [32]

**simplex (1)** A communication channel that permits information transfer in one direction only. Duplex channels consist of two simplex channels simultaneously operating in opposing directions. (SUB/PE) 999-1992w
**(2) (local area networks)** A link segment configuration capable of transferring signals in one direction only. (C) 8802-12-1998

**simplex channel (data transmission) (simplex operation)** A method of operation in which communication between two stations takes place in one direction at a time. *Note:* This includes ordinary transmit-receive operation, press-to-talk operation, voice-operated carrier and other forms of manual or automatic switching from transmit to receive. (PE) 599-1985w

**simplex circuit (1) (data transmission)** A circuit derived from a pair of wires by using the wires in parallel with ground return. (PE) 599-1985w
**(2)** In networking, a circuit permitting the transmission of signals in one specific direction only. *See also:* four-wire circuit; leased circuit; channel; two-wire circuit; foreign exchange circuit; dial-up circuit. (C) 610.7-1995

**Simplex Fiber Optic Link Segment** A single fiber path between two Medium Attachment Units (MAUs) or PHYs, including the terminating connectors, consisting of one or more fibers joined serially with appropriate connection devices, for example, patch cables and wall plates. (C/LM) 802.3-1998

**simplex lap winding (rotating machinery)** A lap winding in which the number of parallel circuits is equal to the number of poles. (PE) [9]

**simplex link segment** A path between two Medium Dependent Interfaces (MDIs), including the terminating connectors, consisting of one or more segments of twisted pair cable joined serially with appropriate connection devices, for example, patch cords and wall plates. (C/LM) 802.3-1998

**simplex operation (1) (radio transmitters)** A method of operation in which communication between two stations takes place in one direction at a time. *Note:* This includes ordinary transmit-receive operation, press-to-talk operation, voice-operated carrier and other forms of manual or automatic switching from transmit to receive. *See also:* radio transmission; telegraphy. (AP/BT/ANT) 145-1983s, 182-1961w
**(2)** *See also:* one-way-only operation. (C) 610.7-1995

**simplex signaling (telephone switching systems)** A method of signaling over a pair of conductors by producing current flow in the same direction through both of the conductors. (COM) 312-1977w

**simplex supervision (telephone switching systems)** A form of supervision employing simplex signaling. (COM) 312-1977w

**simplex transmission** Transmission in which data is sent in one specific direction only. *Contrast:* duplex transmission; half-duplex transmission. (C) 610.7-1995

**simplex wave winding (rotating machinery)** A wave winding in which the number of parallel circuits is two, whatever the number of poles. (PE) [9]

**simplicity (software)** The degree to which a system or component has a design and implementation that is straightforward and easy to understand. *Contrast:* complexity. (C) 610.12-1990

**simply connected region (two-dimensional space)** A region, such that any closed curve in the region encloses points all of which belong to the region. (Std100) 270-1966w

**simply mesh-connected circuit** A circuit in which two, and only two, current paths extend from the terminal of entry of each phase conductor, one to the terminal of entry that precedes and the other to the terminal of entry that follows the first terminal in the normal sequence, and from which the amplitude of the voltages to the first terminal is normally the smallest (when the number of phases is greater than three). *See also:* network analysis. (Std100) 270-1966w

**SIMSCRIPT** A high-order language designed for use in performing general-purpose digital simulations. *Note:* Allows for the description of a system in terms of its "attributes," which are properties associated with "entities," which are groups of "sets." *See also:* ECSS II. (C) 610.13-1993w

**SIMULA** A general-purpose programming language based on ALGOL 60, with special features designed to aid the description and simulation of active processes. (C) 610.13-1993w

**simuland** The system being simulated by a simulation. (C) 610.3-1989w

**simulate (1) (computers)** To represent the functioning of one system by another, for example, to represent one computer by another, to represent a physical system by the execution of a computer program, to represent a biological system by a mathematical model. *See also:* electronic analog computer. (C) [20], [85]

**(2) (modeling and simulation)** To represent a system by a model that behaves or operates like the system. *See also:* emulate. (C) 610.3-1989w

**simulated ESD** An ESD that originates from an ESD simulator. (EMC) C63.16-1993

**simulated fly ash** The entrained ash produced by suspension firing in a small-scale pulverized coal combustor designed and operated with the objective of closely approximating certain selected properties of the fly ash produced in the full-scale steam generator of interest. The combustor should have the capability of providing approximately the same time/temperature profile for combustion as would occur in a full-scale boiler furnace. This process is applicable particularly when coal from a new source has never been burned in a full-scale boiler. (PE/EDPG) 548-1984w

**simulated meter** A simulated meter is an assembly consisting of a watthour meter cover, base, and jumper bars constructed to represent the thermal characteristics of a specific class of watthour meter to be used in the testing of a meter socket for temperature rise at continuous ampere rating. (ELM) C12.10-1987

**simulated source** A radioactive source consisting of one or more long-lived radionuclides that are chosen to simulate the radiations from a short-lived or unavailable radionuclide of interest. (NI) N42.12-1994

**simulated sources (ionization chambers) ("dose calibrator" ionization chambers)** Simulated sources usually contain long-lived radionuclides, alone or in combination, that are chosen to simulate, in terms of photon or particle emission, a short-lived radionuclide of interest. (NI) N42.13-1986

**simulated times** Time as represented within a simulation. *Synonym:* virtual time. *See also:* real time; fast time; slow time. (C) 610.3-1989w

**simulation (1) (analog computer)** The representation of an actual or proposed system by the analogous characteristics of some device easier to construct, modify, or understand. (C) 165-1977w

**(2) (A) (modeling and simulation) (software)** A model that behaves or operates like a given system when provided a set of controlled inputs. *Synonym:* simulation model. *See also:* emulation. **(B) (modeling and simulation) (software)** The process of developing or using a model as in definition (A). (C) 610.3-1989, 610.12-1990

**(3)** An instruction method employed by some computer-assisted instruction systems, in which a situation is simulated and the student must respond appropriately. *Contrast:* instructional game. (C) 610.2-1987

**(4) (mathematical)** The use of a model of mathematical equations generally solved by computers to represent an actual or proposed system. (C) 165-1977w

**simulation application** The executing software on a host computer that models all or part of the representation of one or more simulation entities. The simulation application represents or simulates real-world phenomena for the purpose of training or experimentation. Examples of simulation applications include manned vehicle simulators, computer generated forces, environment simulators and computer interfaces between a DIS network and real equipment. The simulation application receives and processes information concerning entities created by peer simulation applications through the exchange of DIS PDUs. More than one simulation application may simultaneously execute on a host computer. The simulation application is the application layer protocol entity that implements standard DIS protocol. *Note:* The term *simulation application* is used to avoid confusion between protocol entities and simulation entities. The term *simulation* may also be used in place of simulation application. (DIS/C) 1278.1-1995, 1278.3-1996, 1278.2-1995

**simulation clock** A counter used to accumulate simulated time. (C) 610.3-1989w

**simulation entity** An element of the synthetic environment that is created and controlled by a simulation application and affected by the exchange of DIS PDUs. Examples of types of simulated entities are: tank, submarine, carrier, fighter aircraft, missiles, bridges, or other elements of the synthetic environment. It is possible that a simulation application may be controlling more than one simulation entity. *Note:* Simulation entities may also be referred to as *entities*. (DIS/C) 1278.1-1995, 1278.3-1996, 1278.2-1995

**simulation environment** The operational environment surrounding the simulation entities. This environment includes terrain, atmospheric, and oceanographic information. It is assumed that participants in the same DIS exercise will be using environment information that is adequately correlated for the type of exercise to be performed. (DIS/C) 1278.1-1995

**simulation exercise** An exercise that consists of one or more interacting simulation applications. Simulations participating in the same simulation exercise share a common identifying number called the exercise identifier. These simulations also utilize correlated representations of the synthetic environment in which they operate. *See also:* exercise. (DIS/C) 1278.1-1995, 1278.2-1995, 1278.3-1996

**simulation fidelity (A)** The similarity, both physical and functional, between the simulation and that which it simulates. **(B)** A measure of the realism of a simulation. **(C)** The degree to which the representation within a simulation is similar to a real world object, feature, or condition in a measurable or perceivable manner. (DIS/C) 1278.3-1996

**simulation game** A simulation in which the participants seek to achieve some agreed-upon objective within an established set of rules. For example, a management game, a war game. *Note:* The objective may not be to compete, but to evaluate the participants, increase their knowledge concerning the simulated scenario, or achieve other goals. *Synonym:* gaming simulation. (C) 610.3-1989w

**simulation host** *See:* host computer.

**simulation language** An application-oriented programming language used to implement simulations. *See also:* continuous simulation language. (C/C) 610.13-1993w, 610.3-1989w

**simulation management** A process that provides centralized control of the simulation exercise. Functions of simulation management include: start, restart, maintenance, shutdown of the exercise, and collection and distribution of certain types of data. (DIS/C) 1278.1-1995

**simulation model** *See:* simulation.

**Simulation Program with Integrated Circuit Emphasis (SPICE)** A simulation language used widely to design electrical circuits. (C) 610.13-1993w

**simulation site** Location of one or more simulation hosts connected by a LAN. (DIS/C) 1278.2-1995

**simulation time** The reference time (e.g., UTC) within a simulation exercise. This time is established ahead of time by the simulation management function and is common to all participants in a particular exercise. (DIS/C) 1278.1-1995

**simulation time unit (STU)** A fixed unit of time that is utilized during simulation for evaluation of data. (SCC20) 1445-1998

**simulator (1) (analog computer)** A device used to represent the behavior of a physical system by virtue of its analogous characteristics. In this general sense, all computers are, or can be, simulators. However in a more restricted definition, a simulator is a device used to interact with, or to train, a human operator in the performance of a given task or tasks. (C) 165-1977w

**(2) (modeling and simulation) (software)** A device, computer program, or system that performs simulation. *See also:* emulator. (C) 610.3-1989w, 610.10-1994w, 610.12-1990
**(3) (test, measurement, and diagnostic equipment)** A device or program used for test purposes that simulates a desired system or condition providing proper inputs and terminations for the equipment under test. (MIL) [2]

**simulator approach speed** The rate at which an air discharge ESD simulator approaches the EUT or coupling plane. (EMC) C63.16-1993

**simultaneous** Pertaining to the occurrence of two or more events at the same instant of time. *Contrast:* concurrent. (C) 610.12-1990

**simultaneous access** *See:* immediate access.

**simultaneous computer** A parallel computer that contains a separate processing unit to perform each portion of the computation concurrently, allowing the units to be interconnected in a manner determined by the computation. *Contrast:* sequential computer. *See also:* parallel computer. (C) 610.10-1994w

**simultaneous line downtime** *See:* partial system downtime.

**simultaneous lobing (1) (electronic navigation)** A direction-determining technique utilizing the received energy of two concurrent and partially overlapped signal lobes: the relative phase, or the relative power, of the two signals received from a target is a measure of the angular displacement of the target from the equiphase or equisignal direction. Compare with lobe switching. (AP/AES/ANT) 149-1979r, [42], [35]
**(2) (radar)** A direction-determining technique utilizing the signals of overlapping lobes existing at the same time. *Synonym:* monopulse. (AES/AP/RS/ANT) 686-1982s, 145-1993

**simultaneous peripheral output on-line** *See:* spool.

**simultaneous recursion (software)** A situation in which two software modules call each other. (C) 610.12-1990

**sin$^2$** *See:* sin-square.

**sin$^2$ pulse** *See:* sine-square pulse.

**sin$^2$ step** *See:* sine-square step.

**SINAD** signal plus noise plus distortion to noise plus distortion ratio expressed in decibels (dB), where the "signal plus noise plus distortion" is the audio power recovered from a modulated radio frequency carrier, and the "noise plus distortion" is the residual audio power present after the audio signal is removed. This ratio is a measure of audio output signal quality for a given receiver audio power output level. (EMC) 377-1980r

**sinad ratio (mobile communication)** A measure expressed in decibels of the ratio of: the signal plus noise plus distortion to noise plus distortion produced at the output of a receiver that is the result of a modulated-signal input. *See also:* mobile communication system. (VT) 184-1969w

**sinad sensitivity (receiver performance)** The minimum standard modulated carrier-signal input required to produce a specified sinad ratio at the receiver output. (VT) [37]

**sine beats** A continuous sinusoid of one frequency, the amplitude of which is modulated by a sinusoid of a lower frequency. (PE/SUB/NP) 693-1997, 344-1987r

**sine-cosine potentiometer** A function potentiometer with movable contacts attached to a rotating shaft so that the voltages appearing at the contacts are proportional to the sine and cosine of the angle of rotation of the shaft, the angle being measured from a fixed referenced position. *See also:* electronic analog computer. (C) 165-1977w

**sine-current coercive force (toroidal magnetic amplifier cores)** The instantaneous value of sine-current magnetizing force at which the dynamic hysteresis loop passes through zero induction. (Std100) 106-1972

**sine-current differential permeability (toroidal magnetic amplifier cores)** The slope of the sides of the dynamic hysteresis loop obtained with a sine-current magnetizing force. (Std100) 106-1972

**sine-current magnetizing force (toroidal magnetic amplifier cores)** The applied magnetomotive force per unit length for a core symmetrically cyclicly magnetized with sinusoidal current. (Std100) 106-1972

**sinen shaping** In an amplifier, the pulse shape produced by one CR high-pass filter section (differentiator) followed by n RC low-pass filter sections (integrators), all with different time constants, but following a particular pattern related to the differentiating time constant t. If the input signal is a step function and no other high-pass sections are in the signal path, the pulse shape is unipolar and is described by Ke-3t/t sinn(t/t), where K is a constant, t is time, and t is the time constant of the differentiator. (NPS) 325-1996

**sine-square pulse (video signal transmission measurement)** One cycle of a sine wave, starting and finishing at its negative peaks with an added constant amplitude component of half the peak-to-peak value, thus raising the negative peaks to zero. *Note:* A sin$^2$ pulse is obtained by squaring a half-cycle of a sine wave. (BT) 511-1979w

**sine-square step (video signal transmission measurement)** A step function whose transition from zero to the final value is the sum of a ramp and a negative sinusoid of equal durations, with zero slope at both the zero and the final value of the step. *Notes:* 1. A sin$^2$ step is obtained by integrating a sin$^2$ pulse. 2. The attractiveness of both the sin$^2$ pulse and the sin$^2$ step lies in the fact that their frequency spectra are limited: that is, they are effectively at zero amplitude beyond a given frequency. For the sin$^2$, pulse this frequency is a function of the half-amplitude duration (HAD) of the pulse: for the sin$^2$ step the frequency is a function of the 10% to 90% rise time. (Std100) 270-1964w

**sine sweep test** A sinusoidal input with continuously varying frequency covering the range of interest. (SWG/PE) C37.100-1992, C37.81-1989r

**sine wave** A wave that can be expressed as the sine of a linear function of time, or space, or both. (AP/ANT) 145-1983s

**sine-wave generator** An alternating-current generator whose output voltage waveform contains a single main frequency with low harmonic content of prescribed maximum level. *See also:* asynchronous machine. (PE) [9]

**sine-wave response** *See:* amplitude response.

**sine-wave sweep (1)** A sweep generated by a sine function. *See also:* oscillograph. (IM/HFIM) [40]
**(2)** A sweep generated by a sinusoidal function. *See also:* oscillograph. (IM) 311-1970w

**singing** An undesired self-sustained oscillation existing in a transmission system or transducer. *Note:* Very-low-frequency oscillation is sometimes called motor-boating. (AP/PE/ANT) 145-1983s, 599-1985w

**singing margin (gain margin)** The excess of loss over gain around a possible singing path at any frequency, or the minimum value of such excess over a range of frequencies. *Note:* Singing margin is usually expressed in decibels. (SP) 151-1965w

**singing point (data transmission)** For a circuit which is coupled back to itself, the point at which the gain is just sufficient to make the circuit break into oscillation. (PE) 599-1985w

**singing point margin (data transmission)** The amount of additional gain (dB) which can be inserted into a loop without sustained oscillations developing. (PE) 599-1985w

**singing return loss (1)** The return loss of a circuit measured with two separately transmitted signals with a flat spectral distribution between 3 dB frequencies of 260 Hz and 500 Hz (SRL low) and 2200 Hz and 3400 Hz (SRL high). The lower of the two return losses (SRL low or SRL high) will be the best measure of the margin of the circuit against singing. (COM/TA) 743-1995
**(2)** The minimum of SRL-low (SRL-L) and SRL-high (SRL-H). SRL-low is the frequency weighted average of the return losses in a low-frequency band (with 3 dB bandwidth from 260 Hz to 500 Hz). SRL-high is the frequency weighted average of the return loss in a high-frequency band (with 3 dB

bandwidth from 2200 Hz to 3400 Hz). The weightings are given in IEEE Std 743-1984. (COM/TA) 1007-1991r

**single-address** Pertaining to an instruction that has one address part. In a typical single-address instruction the address may specify either the location of an operand to be taken from storage, the destination of a previously prepared result, the location of the next instruction to be interpreted, or an immediate address operand. *See also:* one-address. (C) [20]

**single-address instruction** *See:* one-address instruction.

**single-anode tank (single-anode tube)** An electron tube having a single main anode. *Note:* This term is used chiefly for pool-cathode tubes. (ED) [45]

**single aperture seal (electric penetration assemblies) (nuclear power generating station)** A single seal between the containment aperture and the electric penetration assembly. (PE/NP) 317-1983r

**single automatic operation (elevators)** Automatic operation by means of one button in the car for each landing level served and one button at each landing so arranged that if any car or landing button has been actuated, the actuation of any other car or landing operating button will have no effect on the operation of the car until the response to the first button has been completed. *See also:* control. (EEC/PE) [119]

**single-blind study** A study in which the subject is unaware of his or her role as experimental or control subject in an experiment. (T&D/PE) 539-1990

**single-break switch** One that opens each conductor of a circuit at one point only. (SWG/PE) C37.100-1992

**single-buffered DAC (hybrid computer linkage components)** A digital-to-analog converter (DAC) or a digital-to-analog multiplier (DAM) with one dynamic register, which also serves as the holding register for the digital value. *Synonym:* single-buffered DAM. (C) 166-1977w

**single-buffered DAM** *See:* single-buffered DAC.

**single cable system** A type of broadband system that uses a single cable for the transmission of the inbound and outbound paths. (LM/C) 802.7-1989r

**single capacitance** (as applied to interrupter switches) A capacitance is defined to be a single capacitance when the crest of its inrush current does not exceed the switch inrush current capability for single capacitance. (SWG/PE) C37.100-1992

**singlecast** A mode of operation in which the M-module transmits data to a single S-module. Also, a message transmitted in this mode. (TT/C) 1149.5-1995

**single-circuit system (protective signaling)** A system of protective wiring that employs only the nongrounded side of the battery circuit, and consequently depends primarily on an open circuit in the wiring to initiate an alarm. *See also:* protective signaling. (EEC/PE) [119]

**single-cycle instruction** An instruction that is completely executed in one machine cycle. (C) 610.10-1994w

**single-degree-freedom gyro** A gyro in which the rotor is free to precess (relative to the case) about only the axis orthogonal to the rotor spin axis. *See also:* navigation. (AES/RS) 686-1982s, [42]

**single electric conductor seal (1) (electric penetration assemblies) (nuclear power generating station)** A mechanical assembly arranged in such a way that there is a single pressure barrier seal between the inside and the outside of the containment structure along the axis of the electric conductor. (PE/NP) 317-1983r

**(2) (nuclear power generating station)** A mechanical assembly providing a single pressure barrier between the electric conductors and the electric penetration. (IM) [76]

**single electron distribution (scintillation counting)** The pulse-height distribution associated with single electrons originating at the photocathode. (NPS) 398-1972r

**single-electron PHR** *See:* single-electron pulse-height resolution.

**single-electron pulse-height resolution (scintillation counting)** The fractional FWHM (full width at half maximum) of the single-electron distribution of a photomultiplier. (NPS) 398-1972r

**single-electron rise time (scintillation counting)** The anode-pulse rise time associated with single electrons originating at the photocathode. (NPS) 398-1972r

**single-electron transit-time spread (scintillation counting)** Transit-time spread measured with single-electron events. (NPS) 398-1972r

**single-element fuse** A fuse having a current-responsive element comprising one or more parts with a single fusing characteristic. (SWG/PE) C37.100-1992

**single-element relay** An alternating-current relay having a set of coils energized by a single circuit. (EEC/PE) [119]

**single-end control (single-station control)** A control system in which provision is made for operating a vehicle from one end or one location only. *See also:* multiple-unit control. (EEC/PE) [119]

**single-ended amplifier** An amplifier in which each stage normally employs only one active element (tube, transistor, etc.) or, if more than one active element is used, in which they are connected in parallel so that operation is asymmetric with respect to ground. *See also:* amplifier. (AP/ANT) 145-1983s

**single-ended push-pull amplifier circuit (electroacoustics)** An amplifier circuit having two transmission paths designed to operate in a complementary manner and connected so as to provide a single unbalanced output without the use of an output transformer. *See also:* amplifier. (SP) 151-1965w

**single-ended recorder** A non-differential waveform recorder, i.e., one that does not subtract the signals at two input terminals. (IM/WM&A) 1057-1994w

**single event effect (SEE)** Any measurable or observable change in state or performance of a microelectronic device, component, subsystem, or system (digital or analog) resulting from the passing or traversal of a single particle. (C/BA) 1156.4-1997

**single-event upset (SEU)** The loss of data that is caused by passage of a single ionizing particle through an array. (ED) 1005-1998

**single-faced tape** Fabric tape finished on one side with rubber or synthetic compound. (T&D/PE) [10]

**single feeder** A feeder that forms the only connection between two points along the route considered. (T&D/PE) [10]

**single-font character recognition** Character recognition of one character font. *Contrast:* omni-font character recognition. (C) 610.2-1987

**single frequency distortion** The production of frequency components other than the applied single frequency; these components may not necessarily be harmonic components. (COM/TA) 1007-1991r

**single-frequency pulsing (telephone switching systems)** Dial pulsing using the presence or absence of a single frequency to represent break or make intervals, respectively or vice versa. (COM) 312-1977w

**single-frequency signaling (telephone switching systems)** A method for conveying dial pulse and supervisory signals from one end of a trunk to the other using the presence or absence of a single specified frequency. (COM) 312-1977w

**single-frequency signal-to-noise ratio (sound recording and reproducing system)** The ratio of the single-frequency signal power output to the noise power in the entire pass band. *See also:* noise. 191-1953w

**single-frequency simplex operation (radio communication)** The operation of a two-way radio-communication circuit on the same assigned radio-frequency channel, which necessitates that intelligence can be transmitted in only one direction at a time. *See also:* channel spacing. (VT) [37]

**single hoistway (elevators)** A hoistway for a single elevator or dumbwaiter. *See also:* hoistway. (PE/EEC) [119]

**single instruction, multiple data** Pertaining to a computer architecture in which all processors receive instructions from a common source but receive data from multiple, disjoint sources. *Contrast:* single instruction, single data; multiple instruction, multiple data. (C) 610.10-1994w

**single instruction, single data (SISD)** Pertaining to a computer architecture in which the processors receive instructions from a common source and receive data from a common source. *See also:* multiple instruction, single data; single instruction, multiple data. (C) 610.10-1994w

**single-layer winding (rotating machinery)** A winding in which there is only one actual coil side in the depth of the slot. (Also known as one-coil-side-per-slot winding). *See also:* asynchronous machine. (PE) [9]

**single-level encoding (software)** A microprogramming technique in which different microoperations are encoded as different values in the same field of a microinstruction. *Contrast:* two-level encoding. (C) 610.12-1990

**single-level interrupt** A signal causing transfer of processor control to a preassigned memory location at which an interrupt processing routine starts. *Note:* The program must poll all possible sources of interrupt to determine which one requires service. (C) 610.10-1994w

**single-level network subject** A network subject that causes information to flow through the network at a single security level. *Contrast:* multilevel network subject. (C) 610.7-1995

**single-level security** The capability of protecting only one security level during processing. (C/BA) 896.3-1993w

**single-line diagram** *See:* one-line diagram.

**single-mode bandwidth** The range of frequencies between the cutoff of the dominant mode of propagation and that of the lowest higher order guided mode. (MTT) 1004-1987w

**single-mode fiber (interferometric fiber optic gyro)** An optical fiber waveguide in which only the lowest-order bound mode (which may consist of a pair of orthogonally polarized fields) can propagate at the wavelength of interest. (AES/GYAC) 528-1994

**single-mode optical fiber** An optical fiber in which a single concentrated light beam travels straight down the center of the fiber, maximizing its information-carrying capacity. *See also:* multi-mode optical fiber. (C) 610.7-1995

**single mode optical waveguide (fiber optics)** An optical waveguide in which only the lowest order bound mode (which may consist of a pair of orthogonally polarized fields) can propagate at the wavelength of interest. In step index guides, this occurs when the normalized frequency, $V$, is less than 2.405. For power-law profiles, single mode operation occurs for normalized frequency, $V$, less than approximately

$$2.405\sqrt{(g+2)/g}$$

where $g$ is the profile parameter. *Note:* In practice, the orthogonal polarizations may not be associated with degenerate modes. *Synonym:* monomode optical waveguide. *See also:* normalized frequency; multimode optical waveguide; step index optical waveguide; profile parameter; power-law index profile; mode; bound mode. (Std100) 812-1984w

**single-mode surface acoustic wave oscillator** A surface acoustic wave oscillator in which there is only one frequency that satisfies the oscillation conditions of having positive excess gain and total phase shift of $N2\pi$ (where $N$ is a positive integer). (UFFC) 1037-1992w

**single-office exchange (telephone switching systems)** A telecommunications exchange served by one central office. (COM) 312-1977w

**single-operand instruction** *See:* one-address instruction.

**single-operator arc welder** An arc-welding power supply designed to deliver current to only one welding arc. (EEC/AWM) [91]

**single outage event** An outage event involving only one component or one unit. (PE/PSE) 859-1987w

**single-phase ac fields** Fields whose space components are in phase. These fields will be produced by single-phase power lines. The field at any point can be described in terms of a single direction in space and its time-varying magnitude. *Note:* Such fields are sometimes referred to as being linearly polarized. (T&D/PE) 644-1994

**single-phase circuit (1) (power and distribution transformers)** An ac circuit consisting of two or three intentionally interrelated conductors that enter (or leave) a delimited region at two or three terminals of entry. If the circuit consists of two conductors, it is intended to be so energized that, in the steady state, the voltage between the two terminals of entry is an alternating voltage. If the circuit consists of three conductors, it is intended to be so energized that, in steady state, the alternating voltages between any two terminals of entry have the same period and are in phase or in phase opposition. (PE/TR) C57.12.80-1978r

**(2)** A circuit energized by a single alternating electromotive force. *Note:* A single-phase circuit is usually supplied through two conductors. The currents in these two conductors, counted outward from the source, differ in phase by 180° or a half cycle. (IA/MT) 45-1998

**single-phase electric locomotive** An electric locomotive that collects propulsion power from a single phase of an alternating-current distribution system. *See also:* electric locomotive. (EEC/PE) [119]

**single-phase enclosure** A metallic enclosure containing the buses and/or devices associated with one phase of a multiple-phase system. *Note:* A single gas-insulated substation need not be composed of all single-phase or all three-phase enclosures. A common compromise is to use buses in three-phase enclosures mated with equipment in single-phase enclosures. (SUB/PE) C37.122.1-1993

**single-phase machine** A machine that generates or utilizes single-phase alternating-current power. *See also:* asynchronous machine. (PE) [9]

**single-phase motor (rotating machinery)** A machine that converts single-phase alternating-current electric power into mechanical power, or that provides mechanical force or torque. (PE) [9]

**single-phase symmetrical set (A) (polyphase voltages)** A symmetrical set of polyphase voltages in which the angular phase difference between successive members of the set is $\nu$ radians or odd multiples thereof. The equations of symmetrical set (polyphase voltages) represent a single-phase symmetrical set of polyphase voltages if k/m is 1/2 or an odd multiple thereof. (The symmetrical set of voltages represented by the equations of symmetrical set (polyphase voltages) may be said to have single-phase symmetry if k/m is an odd (positive or negative) multiple of 1/2). *Notes:* 1. A set of polyphase voltages may have single-phase symmetry only if m, the number of members of the set, is an even number. 2. This definition may be applied to a two-phase four-wire or five-wire circuit if $m$ is considered to be 4 instead of 2. It is not applicable to a two- phase three-wire circuit. *See also:* network analysis. **(B) (polyphase currents)** This definition is obtained from the corresponding definitions for voltage by substituting the word current for voltage, and the symbol I for E and b for a wherever they appear in the equations of symmetrical set (polyphase voltages). The subscripts are unaltered. *See also:* network analysis. (Std100) 270-1966

**single-phase synchronous generator** A generator that produces a single alternating electromotive force at its terminals. It delivers electric power that pulsates at double frequency. (IA/MT) 45-1998

**single-phase three-wire circuit** A single-phase circuit consisting of three conductors, one of which is identified as the neutral conductor. *See also:* network analysis. (Std100) 270-1966w

**single-phase two-wire circuit** A single-phase circuit consisting of only two conductors. *See also:* network analysis. (Std100) 270-1966w

**single-phasing (rotating machinery)** An abnormal operation of a polyphase machine when its supply is effectively single-phase. *See also:* asynchronous machine. (PE) [9]

**single-pointer form demand register (metering)** An indicating demand register from which the demand is obtained by reading the position of a pointer relative to the markings on a scale. The single pointer is resettable to zero. (ELM) C12.1-1982s

**single point failure analysis** A reliability analysis that identifies single components or subsystems whose failure results in system failure. (PE/NP) 933-1999

**single point of failure** With respect to a system, a failure that would result in the inability of that system to perform its intended function. (C/BA) 896.9-1994w, 896.3-1993w

**single-polarity pulse** A pulse in which the sense of the departure from normal is in one direction only. *See also:* pulse. (EEC/PE) [119]

**single-pole relay** A relay in which all contacts connect, in one position or another, to a common contact. (EEC/REE) [87]

**single-pole switching** The practice of tripping and reclosing one pole of a multiple circuit breaker without changing the state of the remaining poles, with tripping being initiated by protective relays that respond selectively to the faulted phase. *Notes:* 1. Circuit breakers used for single-pole switching must inherently be capable of individual pole opening. 2. In most single-pole switching schemes, it is the practice to trip all poles for any fault involving more than one phase. (SWG/PE) C37.100-1992

**single precision (data management) (mathematics of computing)** Pertaining to the use of a single computer word to represent a number. *Note:* Single precision is implied in number representation and in computer arithmetic unless multiple precision is specified. *Contrast:* triple precision; double precision; multiple precision. (C) 610.5-1990w, 1084-1986w

**single-pressure-zone potheads** A pressure-type pothead intended to operate with one pressure zone. *See also:* multiple-pressure-zone pothead; pressure-type pothead. (PE) 48-1975s

**single-pressure zone termination** *See:* pressure-type termination.

**single processor architecture** A computer architecture that uses a single processor. *Contrast:* multiprocessor architecture. (C) 610.10-1994w

**single pulse (thyristor)** A gate signal applied at the commencement of the conducting interval in the form of a single pulse of predetermined duration, amplitude, and frequency. (IA/IPC) 428-1981w

**single quote** The character "′", also known as *apostrophe*. (C/PA) 9945-2-1993

**single ring station** A station that offers one attachment to the network on the primary ring. (LM/C) 802.5c-1991r

**single-scan probability of detection** *See:* blip-scan ratio.

**single scatter approximation** An approximation used in the calculation of wave scattering by a surface, volume or a collection of particles. In this approximation, the field that excites the surface element or particle, the exciting field, is assumed to be the same field that would have been present in the absence of all other surface or volume elements or particles (i.e., the exciting field is equal to the incident field). *See also:* Born approximation. (AP/PROP) 211-1997

**single service** One service only supplying a consumer. *Note:* Either or both lighting and power load may be connected to the service. *See also:* service. (T&D/PE) [10]

**single-sheet feed** A mechanism enabling a printer to print on individual sheets of paper. *Note:* Usually uses friction feed. *See also:* cut-sheet feed. (C) 610.10-1994w

**single-shot blasting unit** A unit designed for firing only one explosive charge at a time. *See also:* blasting unit. (EEC/PE) [119]

**single-shot blocking oscillator** A blocking oscillator modified to operate as a single-shot trigger circuit. *See also:* trigger circuit. (EEC/PE) [119]

**single-shot multivibrator (single-trip multivibrator)** A multivibrator modified to operate as a single-shot trigger circuit. *See also:* trigger circuit. (EEC/PE) [119]

**single-shot trigger circuit (single-trip trigger circuit)** A trigger circuit in which a triggering pulse intiates one complete cycle of conditions ending with a stable condition. *See also:* trigger circuit. (PE/EEC) [119]

**single-sideband modulation (data transmission)** Modulation whereby the spectrum of the modulating function is translated in frequency by a specified amount either with or without inversion. *See also:* modulation. (AP/BT/ANT) 145-1983s, 511-1979w

**single-sideband transmission (data transmission)** The method of operation in which one sideband is transmitted and the other sideband is suppressed. The carrier wave may be either transmitted or suppressed. (PE) 599-1985w

**single-sideband transmitter** A transmitter in which one sideband is transmitted and the other is effectively eliminated. (AP/ANT) 145-1983s

**single-sided board** A board with components on one side only. Often single-sided boards are used with right-angle connectors. (C/BA) 14536-1995

**single-sided disk** A floppy disk on which information can be stored reliably on only one side. (C) 610.10-1994w

**single-speed floating control system (automatic control)** A floating control system in which the manipulated variable changes at a fixed rate, increasing or decreasing depending on the sign of the actuating signal. *Note:* A neutral zone of values of the actuating signal, in which no action occurs, may be used. (PE/EDPG) [3]

**single-station control** *See:* single-end control.

**single-stator electromechanical watthour meter** A single-stator electromechanical watthour meter (single-phase electromechanical watthour meter or single element electromechanical watthour meter) is an electromechanical watthour meter containing only one stator. (ELM) C12.10-1987

**single step (computers)** Pertaining to a method of operating a computer in which each step is performed in response to a single manual operation. (C) [20], [85]

**single-step execution** *See:* single-step operation.

**single-step operation** A debugging technique in which a single computer instruction, or part of an instruction, is executed in response to an external signal. *Synonyms:* step-by-step operation; single-step execution. (C) 610.12-1990

**single-stress aging** A form of accelerated aging in which the level of one aging stress is intensified, while the others are minimized or held constant. (DEI/RE) 775-1993w

**single-stroke bell** An electric bell that produces a single stroke on its gong each time its mechanism is actuated. *See also:* protective signaling. (EEC/PE) [119]

**single sweep (spectrum analyzer)** Operating mode for a triggered sweep instrument in which the sweep must be reset for each operation, thus preventing unwanted multiple displays. This mode is useful for trace photography. In the interval after the sweep is reset and before it is triggered, it is said to be an armed sweep. (IM) 748-1979w

**single-talk (ST)** One talker speaking while the opposite transmission direction is silent. (COM/TA) 1329-1999

**single throw (switching device)** A qualifying term used to indicate that the device has an open and a closed circuit position only. (SWG/PE) C37.100-1992

**single-throw relay** A relay in which each contact form included is a single contact pair. (EEC/REE) [87]

**single thyristor converter unit** A thyristor converter unit connected to a dc circuit such that the direct current supplied by the converter is flowing in only one direction. The single converter section is referred to as a forward converter section. *Note:* When used without a reversing switch a single con-

verter can be used in a reversible power sense only in those cases where single-way thyristor connections or symmetrical double-way thyristor connections are used and where the dc circuit can change from accepting energy to giving up energy without the need for current reversal, for example, a heavily inductive load. When used with a reversing switch, a single converter can be used in a reversible power sense in all cases where single-way thyristor connections or uniform double-way thyristor connections are used. (IA/IPC) 444-1973w

**single-tone keying (modulation systems)** That form of keying in which the modulating function causes the carrier to be modulated by a single tone for one condition, which may be either a mark or a space, the carrier being unmodulated for the other condition. *See also:* telegraphy. (COM/AP/ANT) [49], 145-1983s, 270-1964w

**single-track (standard track) (electroacoustics)** A variable-density or variable-area sound track in which both positive and negative halves of the signal are linearly recorded. *See also:* phonograph pickup. (SP) [32]

**single-transfer read cycle** A cycle that is used to transfer 1, 2, 3, or 4 bytes from the responding slave to the active master, and possibly to participating slaves. The cycle begins when the active master broadcasts the addressing information on the address/data lines. Each slave checks the address to see if it is to respond to the cycle. If so, it acknowledges the address and retrieves the data from its internal storage. When the master releases the address/data lines, the responding slave places its data on them and acknowledges the transfer. The master as well as participating slaves capture the data. After all selected slaves signal their agreement, the master terminates the cycle. (C/MM) 1096-1988w

**single-transfer write cycle** A cycle that is used to transfer 1, 2, 3, or 4 bytes from the active master to the selected slaves(s). The cycle begins when the master broadcasts the addressing information on the address/data lines. Each slave checks the address to see if it is to participate in the cycle. The responding slave acknowledges the address broadcast. The master then switches the address/ data lines to carry data, and places its data on the bus. The selected slaves can then store the data. The responding slave acknowledges the transfer. After all selected slaves signal their agreement, the master terminates the cycle. (C/MM) 1096-1988w

**single-transistor cell** A memory cell consisting of one transistor. (ED) 641-1987w

**single-trip multivibrator** *See:* single-shot multivibrator.

**single-trip trigger circuit** *See:* single-shot trigger circuit.

**single-tuned amplifier** An amplifier characterized by a resonance at a single frequency as indicated by the s-plane representation of its gain, which is $A(s) = A_0 s/(s^2 + \omega_0 \xi s + \omega_0^2)$. It rejects low and high frequencies while having a peak gain at a center frequency $s = j\omega_0$. *See also:* amplifier. (CAS) [13]

**single-tuned circuit** A circuit that may be represented by a single inductance and a single capacitance, together with associated resistances. (EEC/PE) [119]

**single-valued** *See also:* function. (C/SE) 1320.2-1998

**single-valued function** A function $u$ is single valued when to every value of $x$ (or set of values of $x_1, x_2, \ldots, x_n$) there corresponds one and only one value of $u$. Thus, $u = ax$ is single valued if $a$ is an arbitrary constant. (Std100) 270-1966w

**single-valued property** A property with a single-valued mapping. *Contrast:* multivalued property. (C/SE) 1320.2-1998

**single-valve unit** A single structure comprising only one valve. (SUB/PE) 857-1996

**single-way rectifier** A rectifier unit that makes use of a single-way rectifier circuit. (IA) [12]

**single-way rectifier circuit** A rectifier circuit in which the current between each terminal of the alternating voltage circuit and the rectifier circuit element or elements conductively connected to it flows in only one direction. (IA) [12]

**single-way thyristor converter** A thyristor converter in which the current between each terminal of the alternating-voltage circuit and the thyristor converter circuit element or elements conductively connected to it flows only in one direction. (IA/IPC) 444-1973w

**single-winding multispeed motor** A type of multispeed motor having a single winding capable of reconnection in two or more pole groupings. *See also:* asynchronous machine. (EEC/PE) [119]

**single-wire line (waveguide)** A surface-wave transmission line consisting of a single conductor so treated as to confine the propagated energy to the neighborhood of the wire. The treatment may consist of a coating of dielectric. (MTT) 146-1980w

**singly linked list** *See:* linked list.

**singular point** Synonymous with equilibrium point. *See also:* control system. (CS/IM) [120]

**sink (1) (oscillators)** The region of a Rieke diagram where the rate of change of frequency with respect to phase of the reflection coefficient is maximum. Operation in this region may lead to unsatisfactory performance by reason of cessation or instability of oscillations. *See also:* oscillatory circuit. (ED) 161-1971w

**(2)** A consumer of normal characters at a link interface. *See also:* normal character. (BA/C) 1355-1995

**(3)** The end of a delay arc; that is, the destination of the logic signal. For arcs across cell instances, the sink is the driver pin; for arcs across interconnect, the sink is the receiver pin. (C/DA) 1481-1999

**sink node (network analysis)** A node having only incoming branches. (CAS) 155-1960w

**sin-square (linear waveform distortion)** A step function whose transition from zero to the final value is the sum of a ramp and a negative sinusoid of equal durations, with zero slope at both the zero and the final value of the step. *Notes:* 1. A $\sin^2$ step is obtained by integrating a $\sin^2$ pulse. 2. The attractiveness of both the $\sin^2$ pulse and the $\sin^2$ step lies in the fact that their frequency spectra are limited; that is, they are effectively at zero amplitude beyond a given frequency. For the $\sin^2$ pulse this frequency is a function of the half-amplitude duration (HAD) of the pulse; for the $\sin^2$ step the frequency is a function of the 10% to 90% rise time. (BT) 511-1979w

**sin-square pulse** *See:* sine-square pulse.

**S interface** The interface provided at the S reference point for ISDN user-to-network interface. (LM/C/COM) 8802-9-1996

**sinusoidal electromagnetic wave (radio-wave propagation)** In a homogeneous medium, a wave whose electric field vector is proportional to the sine (or cosine) of an angle that is a linear function of time, or of a distance, or of both. (AP) 211-1977s

**sinusoidal field** A field in which the field quantities vary as a sinusoidal function of an independent variable, such as space or time. (Std100) 270-1966w

**sinusoidal function** A function of the form $A\sin(xa)$. $A$ is the amplitude, $x$ is the independent variable, and $a$ the phase angle. Note that $\cos(x)$ may be expressed as sin1$x$ (6.2)0. *See also:* simple sine-wave quantity. (Std100) 270-1966w

**sinusoidal response (sine-force)** The forced response due to a sinusoidal stimulus. *Note:* A set of steady-state sinusoidal responses for sinusoidal inputs at different frequencies is called the frequency-response characteristic. *See also:* feedback control system. (IM) [120]

**siphon recorder** A telegraph recorder comprising a sensitive moving-coil galvanometer with a siphon pen that is directed by the moving coil across a traveling strip of paper. *See also:* telegraphy. (EEC/PE) [119]

**SISD** *See:* single instruction, single data.

**sister** *See:* sibling node.

**site attenuation (1)** The ratio of the power input of a matched, balanced, lossless, tuned dipole radiator to that at the output

of a similarly matched, balanced, lossless, tuned dipole receiving antenna for specified polarization, separation, and heights above a flat reflecting surface. It is a measure of the transmission path loss between two antennas. (EMC) C63.4-1991, 1128-1998

**(2)** The ratio of the power input to a matched balanced lossless tuned dipole radiator to that at the output of a similarly balanced matched lossless tuned dipole receiving antenna for specified polarization, separation, and heights above a flat reflecting surface. (EMC) C63.5-1988

**(3)** The ratio of the power input to a matched, balanced, lossless, wideband dipole radiator to that at the output of a similarly balanced, matched, lossless, wideband dipole receiving antenna for specified polarization, separation, and heights above a flat reflecting surface. (EMC) 1128-1998

**site-attenuation deviation (SAD)** The difference, in dB, of the site attenuation and the free-space distance attenuation between the transmit and receive antennas in an open-area test site (OATS), absorber-lined open-area test site (ATS), semi-anechoic chamber, or anechoic chamber. *See also:* absorber-lined open-area test site; open-area test site. (EMC) 1128-1998

**site error (navigation) (navigation aids)** Error due to the distortion in the electromagnetic field by objects in the vicinity of the navigational equipment. (AES/GCS) 172-1983w

**site marker** *See:* transit.

**site, pull** *See:* pull site.

**site, tension** *See:* tension site.

**SI unit of luminance (illuminating engineering)** Candela per square meter ($cd/m^2$); also, lumen per steradian × square meter ($lm/(sr/m^2)$ also, lumen per steradian × square meter ($lm/(sr/m^2)$). This also is called the nit. (EEC/IE) [126]

**SI units** Units belonging to the International System of Units. (SCC20) 771-1998

**six-bit byte** *See:* sextet.

**six bolt** *See:* conductor grip.

**six-phase circuit (power and distribution transformers)** A combination of circuits energized by alternating electromotive forces which differ in phase by one-sixth of a cycle, that is, 60°. *Note:* In practice, the phases may vary several degrees from the specified angle. (PE/TR) C57.12.80-1978r

**64-bit supportive** Uses 64-bit addresses when accessing System Memory. (C/MM) 1212.1-1993

**63% response time** *See:* apparent time constant.

**size distribution (fly ash resistivity)** Size distribution of particulate matter is the cumulative frequency of particle diameter, generally expressed on a mass basis. It describes the probability that a particle diameter $x$ takes a value equal to or less than probability $P$. Size distribution rather than mean particle size shall be reported. (PE/EDPG) 548-1984w

**size metric** A value used to estimate properties of interconnect wholly contained in a region. The metric may be freely chosen (for example, square microns or gate sites), but it needs to be consistent between the cells and the wireload models. *See also:* wireload model. (C/DA) 1481-1999

**size threshold (illuminating engineering)** The minimum perceptible size of an object. It also is defined as the size which can be detected some specific fraction of the times it is presented to an observer, usually 50%. It usually is measured in minutes of arc. (EEC/IE) [126]

**sizing (software)** The process of estimating the amount of computer storage or the number of source lines required for a software system or component. (C) 610.12-1990

**skate machine** A mechanism, electrically controlled, for placing on, or removing from, the rails a skate that, if allowed to engage with the wheels of a car, provides continuous braking until the car is stopped and that may be electrically or pneumatically operated. (EEC/PE) [119]

**skates** Devices used in the climbing of flanged structures. (T&D/PE) 1307-1996

**skating force** *See:* side thrust.

**skeleton frame (rotating machinery)** A stator frame consisting of a simple structure that clamps the core but does not enclose it. (PE) [9]

**skew (1) (measuring the performance of tone address signaling systems)** In a two-tone signal, the time interval from the start of the higher-frequency tone present condition. Skew is negative if the higher-frequency tone starts before the lower-frequency tone. (COM/TA) 752-1986w

**(2) (facsimile)** The deviation of the received frame from rectangularity due to asynchronism between scanner and recorder. Skew is expressed numerically as the tangent of the angle of the deviation. (COM) 168-1956w

**(3) (magnetic storage)** The angular displacement of an individual printed character, group of characters, or other data, from the intended or ideal placement. (MIL/C) [2], [20], [85]

**(4) (MULTIBUS)** The time difference between signals because of timing differences for logic and backplane delays. (C/MM) 1296-1987s

**(5)** The difference between the propagation delays of two or more signals on any bus line. (BA/C) 10857-1994, 896.4-1993w

**(6)** The angular or longitudinal deviation of a tape or disk track from a specified reference. (C) 610.10-1994w

**(7)** The difference in time that is unintentionally introduced between changing signal levels (incident edges) that occur on parallel signal lines. This difference results in an uncertain position with respect to time among parallel signals. (C/MM) 1596.3-1996

**(8)** The timing ambiguity associated with the occurrence of an automatic test equipment (ATE) Input/Output (I/O) event that is due to the physical limitations of the ATE digital driver and detector electronics. (SCC20) 1445-1998

**skew between pairs** The difference in arrival times of two initially coincident signals propagated over two different pairs, as measured at the receiving end of the cable. Total skew includes contributions from transmitter circuits as well as the cable. (C/LM) 802.3-1998

**skewed slot (rotating machinery)** A slot of a rotor or stator of an electric machine, placed at an angle to the shaft so that the angular location of the slot at one end of the core is displaced from that at the other end. Slots are commonly skewed in many types of machines to provide more uniform torque, less noise, and better voltage waveform. *See also:* rotor; stator. (PE) [9]

**skewing factor S0.1 or S.02** (of a peak) The ratio (FW.1M)/(1.823 FWHM) or (FW.02M)/(2.376 FWHM). For an ideal Gaussian shape, the factors are 1.000. If the peak is wider at FW.1M or FW.02M than it should be relative to FWHM, the factors are >1.000. (For a perfect Gaussian peak, FW.1M/FWHM = [(ln 0.1)/(ln 0.5)]1/2 = 1.823 and FW.02M/FWHM = [(ln 0.02)/(ln 0.5)]1/2) = 2.376). (NPS) 325-1996

**skew ray (fiber optics)** A ray that does not intersect the optical axis of a system (in contrast with a meridional ray). *See also:* optical axis; meridional ray; geometric optics; axial ray; hybrid mode; paraxial ray. (Std100) 812-1984w

**skew time (FASTBUS acquisition and control)** The minimum time that the assertion of a FASTBUS timing signal must be delayed after the assertion of information and/or control signals to allow for differences in propagation time of signals on a FASTBUS segment. (NID) 960-1993

**skew timing check** A timing check that specifies the maximum time between two signal transitions. This timing check is frequently applied to dual-clock flip-flops to specify the maximum separation of the active edges of the two phases of the clock. (C/DA) 1481-1999

**skiatron**† **(A)** A dark-trace storage-type cathode-ray tube. **(B)** A display employing an optical system with a dark-trace tube. *See also:* dark-trace tube. (AES/RS) 686-1990

† Obsolete.

**skidder** *See:* wheel tractor.

**skid wire (pipe-type cable)** (power distribution, underground cables) Wire or wires, usually D shaped, applied open spiral with curved side outward with a suitable spacing between turns over the outside surface of the cable. Its purpose is to facilitate cable pulling and to provide mechanical protection during installation. (PE) [4]

**skill** A cognitive and/or physical control process so highly practiced as to require little or no conscious supervision. (PE/NP) 1082-1997

**skim tape** Filled tape coated on one or both sides with a thin film of uncured rubber or synthetic compound to produce a coating suitable for vulcanization. (T&D/PE) [10]

**skin depth (1) (waveguide)** Of a conducting material, at a given frequency, the depth at which the surface current density is reduced by one neper. (MTT) 146-1980w

**(2)** *See also:* penetration depth. (AP/PROP) 211-1997

**skin effect (induction heating)** Tendency of an alternating current to concentrate in the areas of lowest impedance. (IA) 54-1955w

**skin effect heating (electrical heating systems)** An electric heating system where a conductor inside a ferromagnetic material generates heat via $I^2R$ losses in the conductor and ferromagnetic material. (IA/PC) 844-1991

**skip (1) (computers)** To ignore one or more instructions in a sequence of instructions. (C/C) [20], [85]

**(2)** In Physical Design Exchange Format (PDEF), skip is the spacing between the ordered cell, spare_cell, and/or cluster instances in rows and/or columns of a datapath. (C/DA) 1481-1999

**skip distance (1) (data transmission) (navigation aids)** The minimum separation for which radio waves of a specified frequency can be transmitted at a specified time (interval) between two points on the earth by reflection from the regular ionized layers of the ionosphere. (PE/AES/GCS) 599-1985w, 172-1983w

**(2)** For a given frequency, the minimum distance at which the sky wave is returned to the Earth. *Note:* Given frequency is the maximum usable frequency for the skip distance. (AP/PROP) 211-1997

**skip distance focusing** Ionospheric focusing observed in the vicinity of the skip distance. (AP/PROP) 211-1997

**skip zone** An area of the surface of the Earth surrounding a transmission point bounded by the skip distance in all directions. (AP/PROP) 211-1997

**skiving (A)** The process of assembling a fitting to a hose. **(B)** The process of trimming outside of a hose to fit the inside dimensions of a fitting. (T&D/PE) 957-1995

**skookum** *See:* snatch block.

**sky compass (navigation aids)** A type of astro compass, designed for use in the arctic during long periods of twilight. (AES/GCS) 172-1983w

**sky condition** *See:* cloudy sky; overcast sky; partly cloudy sky; clear sky.

**sky factor (illuminating engineering)** The ratio of the illuminance on a horizontal plane at a given point inside a building due to the light received directly from the sky, to the illuminance due to an unobstructed hemisphere of sky of uniform luminance equal to that of the visible sky. (EEC/IE) [126]

**sky light (illuminating engineering)** Visible radiation from the sun redirected by the atmosphere. (EEC/IE) [126]

**sky noise (communication satellite)** Noise contribution of the sky (often the galaxies). *See also:* background noise. (COM) [25]

**sky radiometric temperature** The observed brightness temperature of the sky, caused by emissions from the Earth's atmosphere as well as cosmic and galactic radiation. (AP/PROP) 211-1997

**sky wave** A radio wave propagated obliquely toward, and returned from, the ionosphere. *Note:* This term has sometimes been called an ionospheric wave but that term is intended to connote internal waves in ionospheric plasmas. (AP/PE/T&D/PROP) 211-1997, 1260-1996

**sky-wave contamination (navigation aids)** Degradation of the received ground-wave signal, or of the desired sky-wave signal, by the presence of delayed ionospheric-wave components of the same transmitted signal. (AES/GCS) 172-1983w

**sky-wave correction (navigation aids) (navigation)** A correction for sky-wave propagation errors applied to measured position data; the amount of the correction is established on the basis of an assumed ionosphere height. (AES/GCS) 172-1983w

**sky-wave station-error (sky-wave synchronized loran) (navigation aid terms)** The error of station synchronization due to the effect of variations of the ionosphere on the time of transmission of the synchronizing signal from one station to the other. (AES/GCS) 172-1983w

**sky wire** *See:* overhead ground wire.

**sky wire-coupling protector** *See:* static wire-coupling protector.

**SL** *See:* special link.

**slabbing or arcwall machine** A power-driven mobile-cutting machine that is a single-purpose cutter in that it cuts only a horizontal kerf at variable heights. (EEC/PE) [119]

**slab interferometry (fiber optics)** The method for measuring the index profile of an optical fiber by preparing a thin sample that has its faces perpendicular to the axis of the fiber, and measuring its index profile by interferometry. *Synonym:* axial slab interferometry. *See also:* interferometer. (Std100) 812-1984w

**slab line (waveguide)** A uniform transmission line consisting of a round conductor between two extended parallel conducting surfaces, so that the propagating wave is essentially confined between the surfaces. (MTT) 146-1980w

**slack-rope switch (elevators)** A device that automatically causes the electric power to be removed from the elevator driving-machine motor and brake when the hoisting ropes of a winding-drum machine become slack. *See also:* control. (PE/EEC) [119]

**slack stringing** The method of stringing conductor slack without the use of a tensioner. The conductor is pulled off the reel by a pulling vehicle and is dragged along the ground, or the reel is carried along the line on a vehicle and the conductor is deposited on the ground. As the conductor is dragged to, or past, each supporting structure, the conductor is placed in the travelers, normally with the aid of finger lines. (T&D/PE) 524-1992r

**slant distance (1) (navigation aids)** The distance between two points that are not at the same elevation. (AES/GCS) 172-1983w

**(2)** The distance between two points that are not at the same elevation. Used in contrast to ground distance. (AES) 686-1997

**slanted array compressor (SAC)** A device containing dispersive transducer arrays that have a length-wise centerline that is inclined at an oblique angle to the incident propagation direction. (UFFC) 1037-1992w

**slant range (navigation aids)** The slant distance between a radar and a target. (AES/GCS) 686-1997, 172-1983w

**slant-voltage-rated (multiple voltage rated) distribution cutout** A distribution cutout intended primarily for application on three-phase solidly grounded neutral (multi-grounded) systems where prescribed conditions exist. (SWG/PE) C37.40-1993, C37.100-1992

**slant voltage (multiple voltage) ratings of a distribution cutout** A pair of maximum voltage ratings assigned to a distribution cutout intended primarily for application on three-phase solidly grounded neutral (multigrounded) systems where construction conditions are such that two cutouts will normally operate in series to clear phase-to-phase faults. In applying these cutouts, the system line-to-line voltage must be equal to or less than the maximum voltage rating to the right of the slant (/), and the system line-to-ground voltage must be equal to or less than the maximum voltage rating to

the left of the slant (/). *Note:* Slant voltage rated cutouts may be used in single-phase applications where the normal frequency recovery voltage across the cutout does not exceed the maximum voltage rating to the left of the slant (/). (SWG/PE) C37.100-1992

**SLAR** *See:* sidelooking airborne radar.

**slash** The literal character "/". This character is also known as *solidus*. (C/PA) 9945-1-1996, 9945-2-1993, 1003.5-1999

**slave (1) (test, measurement, and diagnostic equipment)** A device that follows an order given by a master remote control. (MIL) [2]

**(2) (VSB)** A functional module that detects bus cycles initiated by the active master and, when those cycles select it, transfers data between itself and the master. The VSB specification defines a mechanism through which any number of slaves can participate in a bus cycle. All slaves that are selected by the cycle are called "selected slaves." However, only one of the selected slaves is allowed to acknowledge the cycle and respond to the active master. This slave is called the "responding slave." All other selected slaves are called "participating slaves." Slaves that are not selected by the cycle are called "idle slaves." (MM/C) 1096-1988w

**(3) (VMEbus)** A functional module that detects data transfer bus (DTB) cycles initiated by a master and, when those cycles specify its participation, transfers data between itself and the master. (BA/C) 1014-1987

**(4) (STD bus)** A card that responds to a bus transaction. (MM/C) 961-1987r

**(5) (NuBus)** A bus device that responds to a transaction. (C/MM) 1196-1987w

**(6)** A module that can be addressed and is capable of participating in bus transactions. (C/BA) 10857-1994, 896.4-1993w, 896.3-1993w

**(7)** A module that can be addressed and is capable of participating in, but not initiating, bus transactions. (C/BA) 1014.1-1994w

**(8)** A device that responds to masters according to the FBP. (NID) 960-1993

**(9)** An input-output device that is driven or controlled by a master unit. (C) 610.10-1994w

**(10)** The entity that responds to RamLink transactions (the transaction addressing is sufficient to support up to 63 slaves on each RamLink ringlet). (C/MM) 1596.4-1996

**(11)** A device that gathers data or performs control operations in response to requests from the master, and sends response messages in return. A slave device may also generate unsolicited responses (DNP 3.0 specific). (PE/SUB) 1379-1997

**Slave** *See:* SBus Slave.

**slave, attached** *See:* attached slave.

**Slave Busy (BSY) bit** A bit in the Slave Status register of every S-module that is set by the S-module when the application logic of the S-module is executing a previously transmitted MTM-bus instruction or is executing its power-up sequence. (TT/C) 1149.5-1995

**Slave Controller state** A state of the fsm required of S-modules that controls S-module Link Layer behavior during message transmission to the module. (TT/C) 1149.5-1995

**Slave Data Fault (SDF) bit** A bit in the Bus Error register of all S-modules. An S-module sets this bit when it is transmitting on the MSD signal and detects a fault on that signal. (TT/C) 1149.5-1995

**slave drive** *See:* electric drive; follower drive.

**slaved tracking (power supplies)** A system of interconnection of two or more regulated supplies in which one (the master) operates to control the others (the slaves). The output voltage of the slave units may be equal or proportional to the output voltage of the master unit. (The slave output voltages track the master output voltage in a constant ratio). *See also:* master/slave operation; complementary tracking. (AES/PE) [41], [78]

**slave Physical Layer** In a 100BASE-T2 link containing a pair of PHYs, the PHY that recovers its clock from the received signal and uses it to determine the timing of transmitter operations. It also uses the slave transmit scrambler generator polynomial for side stream scrambling. Master and slave PHY status is determined during the Auto-Negotiation process that takes place prior to establishing the transmission link. *See also:* master physical layer. (C/LM) 802.3-1998

**slave relay** *See:* auxiliary relay; relay.

**slave state** *See:* problem state.

**slave station (navigation) (navigation aids)** A station in which some characteristic of its emission is controlled by a master station. (AES/GCS) 172-1983w

**Slave Status register** A status register that is required to be implemented in the MTM-Bus interface logic of every S-module. Bits in this register are used to record such items of module status as interrupt enable status, whether an error condition has occurred, whether a module application-related error has occurred, whether the module has failed its Built-In Self Test, etc. (TT/C) 1149.5-1995

**slave-sweep switching (oscilloscopes)** A combination of sweep switching and multiple-trace operation in which a specific channel is displayed with a specific sweep. (IM) 311-1970w

**slaving (gyros)** The use of a torquer to maintain the orientation of the spin axis relative to an external reference, such as a pendulum or magnetic compass. (AES/GYAC) 528-1994

**SLC** *See:* software life cycle.

**sled** *See:* running board.

**sleet hood** (of a switch) A cover for the contacts to prevent sleet from interfering with successful operation of the switch. (SWG/PE) C37.100-1992

**sleetproof (1) (general)** So constructed or protected that the accumulation of sleet will not interfere with successful operation. (SWG/PE) C37.30-1971s, C37.100-1981s

**(2) (power and distribution transformers)** So constructed or protected that the accumulation of sleet (ice) under specified test conditions will not interfere with the successful operation of the apparatus. (PE/TR) C57.12.80-1978r

**sleeve (1)** (plug) (three-wire telephone-switchboard plug). A cylindrically shaped contacting part, usually placed in back of the tip or ring but insulated therefrom. (EEC/PE) [119]

**(2) (rotating machinery)** A tubular part designed to fit around another part. *Note:* In a sleeve bearing, the sleeve is that component that includes the cylindrical inner surface within which the shaft journal rotates. (PE) [9]

**(3)** *See also:* compression joint. (T&D/PE) 524-1992r

**sleeve bearing (rotating machinery)** A bearing with a cylindrical inner surface in which the journal of a rotor (or armature) shaft rotates. *See also:* rotor. (PE) [9]

**sleeve conductor** *See:* sleeve wire.

**sleeve-dipole antenna** A dipole antenna surrounded in its central portion by a coaxial conducting sleeve. *See also:* antenna. (AP/ANT) 145-1993

**sleeve-monopole antenna** An antenna consisting of half of a sleeve-dipole antenna projecting from a ground plane. *Synonym:* sleeve-stub antenna. (AP/ANT) 145-1993

**sleeve-stub antenna** *See:* sleeve-monopole antenna.

**sleeve supervision** The use of the sleeve circuit for transmitting supervisory signals. (EEC/PE) [119]

**sleeve-type suppressor** A suppressor designed for insertion in a high-tension ignition cable. *See also:* electromagnetic compatibility. (EMC/INT) [53], [70]

**sleeve wire (telephone switching systems)** That conductor, usually accompanying the tip and ring leads of a switched connection, that provides for miscellaneous functions necessary to the control and supervision of the connection. In cord-type switchboards, the sleeve wire is that conductor associated with the sleeve contacts of the jacks and plugs. (COM) 312-1977w

**sleeving trailer** *See:* splicing cart.

**slew** A measure of the shape of the waveform constituting a logic state transition. A slew value can have the dimensions of time, in which case it is a slew time, or the dimensions of voltage-per-time, in which case it is a slew rate. The delay and power calculation system (DPCS) allows either interpretation if used consistently. (C/DA) 1481-1999

**slew-dependent delay** That part of an input-to-output delay that can be attributed to the signal at the input of the arc taking longer to make a transition than is considered ideal. (C/DA) 1481-1999

**slewing (gyros)** The rotation of the spin axis about an axis parallel to that of the applied torque causing the rotation. (AES/GYAC) 528-1994

**slewing rate (1) (power supplies)** A measure of the programming speed or current-regulator-response timing. The slewing rate measures the maximum rate-of-change of voltage across the output terminals of a power supply. Slewing rate is normally expressed in volts per second ($\Delta E/\Delta T$) and can be converted to a sinusoidal frequency-amplitude product by the equation ($E_{pp}$) = slewing rate/$\pi$, where $E_{pp}$ is the peak-to-peak sinusoidal volts. Slewing rate = $\pi f(E_{pp})$. *See also:* high-speed regulator. (AES) [41]

**(2) (thyristor)** A rate at which the output changes in response to a step change in control signal input. (IA/IPC) 428-1981w

**slewing speed (test, measurement, and diagnostic equipment)** A continuous speed, usually the maximum at which a tape reader or other rotating device can search for information. (MIL) [2]

**slew limit** The value of output transition rate of change for which an increased amplitude input step causes no change. (IM/WM&A) 1057-1994w

**slew rate (1)** Rate of change of (ac voltage) frequency. (IA/PSE) 1100-1999

**(2)** A measure of how quickly a signal takes to make a transition; that is, a voltage-per-unit time. Slew rate is inversely related to slew time and is sometimes used incorrectly where slew time is intended. (C/DA) 1481-1999

**slew time** A measure of how long a signal takes to make a transition; that is, the rise time or fall time. Slew time is inversely related to slew rate. The way a slew time value is abstracted from the continuous waveform at a cell pin varies with different cell characterization methods. (C/DA) 1481-1999

**SLIC** *See:* selective listing in combination index.

**slicer (amplitude gate) (clipper-limiter)** A transducer that transmits only portions of an input wave lying between two amplitude boundaries. *Note:* The term is used especially when the two amplitude boundaries are close to each other as compared with the amplitude range of the input. (PE/EEC) [119]

**slide rail (rotating machinery)** A special form of soleplate which is long in the direction of the machine axis to permit sliding the stator frame in the axial direction. (PE) [9]

**slide-screw tuner (1) (transmission lines and waveguides)** An impedance or matching transformer that consists of a slotted waveguide or coaxial-line section and an adjustable screw or post that penetrates into the guide or line and can be moved axially along the slot. *See also:* waveguide. (IM/HFIM) [40]

**(2) (waveguide components)** A waveguide or transmission line tuner employing a post of adjustable penetration, adjustable in position along the longitudinal axis of the waveguide. (MTT) 147-1979w

**sliding contact** An electric contact in which one conducting member is maintained in sliding motion over the other conducting member. *See also:* contactor. (EEC/PE) [119]

**sliding load** A load sliding inside or along a fixed length of waveguide or transmission line. *See also:* waveguide. (IM/HFIM) [40]

**sliding short circuit** A short-circuit termination that consists of a section of waveguide or transmission line fitted with a sliding short-circuiting piston (contacting or noncontacting) that ideally reflects all the energy back toward the source. *See also:* waveguide. (IM/HFIM) [40]

**sliding window** A protocol used to allow a sender to transmit multiple packets before waiting for an acknowledgment. *Note:* The protocol places a small window in the sequence and transmits all packets that lie inside the window. The window size is adjusted based on the successful rate of packet transmission. *See also:* Go-Back-N; selective retransmission. (C) 610.7-1995

**sliding window demand** The block demand calculated over an integration period that includes sub-intervals of previous demand calculations. (AMR/SCC31) 1377-1997

**slime, anode** *See:* anode slime.

**slinging wire** A wire used to suspend and carry current to one or more cathodes in a plating tank. *See also:* electroplating. (EEC/PE) [119]

**sling, traveler** *See:* traveler sling.

**slip (1) (A) (rotating machinery)** The quotient of: the difference between the synchronous speed and the actual speed of a rotor, to the synchronous speed, expressed as a ratio, or as a percentage. **(B) (rotating machinery)** The difference between the speed of a rotating magnetic field and that of a rotor, expressed in revolutions per minute. **(C) (rotating machinery)** (electric couplings) The difference between the speeds of the two rotating members. *See also:* asynchronous machine. (PE) [9]

**(2)** In an induction machine, the difference between its synchronous speed and its operating speed. It may be expressed in the following ways:

a) As a percent of synchronous speed
b) As a decimal fraction of synchronous speed
c) Directly in revolutions per minute

(IA/MT) 45-1998

**SLIP** *See:* Symmetric List Processing Language.

**slip, controlled** *See:* controlled slip.

**slip-grip** *See:* conductor grip.

**slip regulator (rotating machinery)** A device arranged to produce a reduction in speed below synchronous speed greater than would be obtained inherently. Such a device is usually in the form of a variable impedance connected in the secondary circuit of a slip ring induction motor. (PE) [9]

**slip relay** A relay arranged to act when one or more pairs of driving wheels increase or decrease in rotational speed with respect to other driving wheels of the same motive power unit. *See also:* multiple-unit control. (EEC/PE) [119]

**slip ring** *See:* collector ring.

**slip-ring induction motor** *See:* wound-rotor induction motor.

**slip-ring short-circuiting device** *See:* brush-operating device.

**slip, uncontrolled** *See:* uncontrolled slip.

**sliver** A pulse with a duration less than that specified for that signal (e.g., truncated clock signal). (C/LM) 802.3-1998

**slope (1)** The gain (or loss) versus frequency characteristic of cable, amplifiers, and other devices. (LM/C) 802.7-1989r

**(2)** The ratio of the voltage change to the current change over the full (inductive plus capacitive) linearly controlled range of the static var compensator (SVC) at nominal voltage, expressed as a percentage. (PE/SUB) 1031-2000

**slope angle** *See:* glide-slope angle.

**slope compensation** The action of a slope-compensated gain control. The gain of the amplifier and the slope of amplifier equalization are changed simultaneously to provide equalization for different lengths of cable; normally specified in terms of cable loss. (LM/C) 802.7-1989r

**slope detector (telephony) (dial-pulse address signaling systems)** A circuit that provides a means of accurately measuring the open and closed intervals of a contact even though the contact may be shunted by a contact protection network or

measured from the far end of a metallic loop, or both. (COM/TA) 753-1983w

**slot (1) (rotating machinery)** A channel or tunnel opening onto or near the air gap and passing essentially in an axial direction through the rotor or stator core. A slot usually contains the conductors of a winding, but may be used exclusively for ventilation. *See also:* rotor; stator. (PE) [9]
**(2) (VMEbus)** A position where a printed-circuit board (pcb) can be inserted into the backplane. When the system has a J1 and a J2 backplane (or a combination J1/J2 backplane) each slot provides a pair of 96-pin connectors. When the system has only a J1 backplane, then each slot provides a single 96-pin connector. (C/BA) 1014-1987
**(3) (VSB)** A position where a board can be inserted into a backplane. Each VSB slot provides at least one 96-pin connector. (C/MM) 1096-1988w
**(4) (NuBus)** A backplane location that accepts a NuBus module. (C/MM) 1196-1987w
**(5)** A module-insertion position provided by the backplane and associated card cage. (C/MM) 1596-1992
**(6)** A position where a module can be inserted into an VXIbus backplane. Each slot provides the 96-pin J connectors to interface with the board P connectors. It may have to provide one, two, or three connectors. (C/MM) 1155-1992
**(7)** A mechanical location on a backplane. (C/BA) 896.2-1991w, 896.10-1997
**(8)** A module connector position on a crate segment backplane (see position). (NID) 960-1993
**(9)** The protocol data unit (PDU) of 53 octets used to transfer segments. It contains a segment of 52 octets and a 1 octet Access Control Field (ACF). There are two type of slots: Pre-Arbitrated (PA) slots and Queued Arbitrated (QA) slots. (LM/C) 8802-6-1994
**(10)** *See also:* expansion slot. (C) 610.10-1994w

**slot antenna (data transmission)** A radiating element formed by a slot in a conducting surface. (PE/AP/ANT) 599-1985w, 145-1993

**slot array** An antenna array formed of slot radiators. *See also:* antenna. (Std100) [84]

**slot cell (rotating machinery)** A sheet of insulation material used to line a slot before the winding is placed in it. *See also:* rotor; stator. (PE) [9]

**slot coupling factor (navigation aid terms) (slot-antenna array)** The ratio of the desired slot current to the available slot current, controlled by changing the depth of penetration of the slot probe into the waveguide. (AES/GCS) 172-1983w

**slot current ratio (slot-antenna array) (navigation aid terms)** The relative slot currents in the slots of the waveguide reading from its center to its end, with the maximum taken as 1; this ratio is dependent upon the slot spacing factor and the slot coupling factor. (AES/GCS) 172-1983w

**slot discharge (rotating machine)** Sparking between the outer surface of coil insulation and the grounded slot surface, caused by capacitive current between conductors and iron. The resulting current pulses have a fundamental frequency of a few kilohertz. *See also:* asynchronous machine. (PE) [9]

**slot-discharge analyzer (rotating machinery)** An instrument designed for connection to an energized winding of a rotating machine, to detect pulses caused by slot discharge, and to discriminate between them and pulses otherwise caused. *See also:* asynchronous machine. (PE) [9]

**slot insulation (rotating machinery)** A sheet or deposit of insulation material used to line a slot before the winding is placed in it. *See also:* asynchronous machine. (PE) [9]

**slot line** A planar transmission line consisting of two semi-infinite coplanar conductors affixed to the same side of an insulating substrate of arbitrary thickness and separated by a finite gap. (MTT) 1004-1987w

**slot liner (rotating machinery)** Separate insulation between an embedded coil side and the slot which can provide mechanical and electrical protection. (PE) [9]

**slot packing (rotating machinery)** Additional insulation used to pack embedded coil sides to ensure a tight fit in the slots. *See also:* stator; rotor. (PE) [9]

**slot pitch (rotating machinery)** The peripheral distance between fixed points in corresponding positions in two consecutive slots. *Synonym:* tooth pitch. (PE) [9]

**slot section** Portion of the stator bar/coil which after installation in the rotating electric machine is enclosed in the stator core slot. The outer surface of the slot section of bars/coils is treated with semiconducting (or conducting) materials, commonly referred to as semiconducting (or conducting) tapes or paints. (PE/EM) 1310-1996

**slot separator insulation** *See:* insulation slot separator.

**slot space factor (rotating machinery)** The ratio of the cross-sectional area of the conductor metal in a slot to the total cross-sectional area of the slot. *See also:* asynchronous machine. (PE) [9]

**slot spacing factor (slot-antenna array) (navigation aids)** A value proportional to the size of the angle between the slot location and the null of the internal standing wave; this factor is dependent upon frequency. (AES/GCS) 172-1983w

**slotted armature (rotating machine)** An armature with the winding placed in slots. *See also:* armature. (PE) [9], [84]

**slotted section (slotted waveguide) (slotted line)** A section of a waveguide or shielded transmission line the shield of which is slotted to permit the use of a carriage and travelling probe for examination of standing waves. *See also:* auxiliary device to an instrument. (AP/IM/ANT/HFIM) [35], [40], [84]

**slot time** A multipurpose parameter used in CSMA/CD technique that describes the contention behavior of the MAC sublayer of a LAN. *Note:* This value represents the amount of time during which a collision will occur if two stations transmit simultaneously. It is calculated as a function of the propagation delay of the network. *Synonym:* contention interval. (C) 610.7-1995

**slot-type antenna (aircraft)** A slot in the normal streamlined metallic surface of an aircraft, excited electromagnetically by a structure within the aircraft. Radiation is thus obtained without projections that would disturb the aerodynamic characteristics of the aircraft. Radiation from a slot is essentially directive. (EEC/PE) [119]

**slot wedge (rotating machinery)** The element placed above the turns or coil sides in a stator or rotor slot, and held in place by engagement of wedge (slots) grooves along the sides of the coil slot, or by projections from the sides of the slot tending to close the top of the slot. *Note:* A wedge may be a thin strip of material provided solely as insulation or to provide temporary retention of the coils during the manufacturing process. It may be a piece of structural insulating material or high-strength metal to hold the coils in the slot. Slots in laminated cores are normally wedged with insulating material. *See also:* stator; rotor. (PE) [9]

**slow-closure device (hydraulic turbines)** A cushioning device that retards the closing velocity of the servomotor from a predetermined servomotor position to zero servomotor position. (PE/EDPG) 125-1988r

**slow-operate relay** A slugged relay that has been specifically designed for long operate time but not for long release time. Caution: The usual slow-operate relay has a copper slug close to the armature, making it also at least partially slow to release. (PE/EM) 43-1974s

**slow-operating relay** A relay that has an intentional delay between energizing and operation. *See also:* electromagnetic relay. (EEC/PE) [119]

**slow-release relay** A relay that has an intentional delay between de-energizing and release. *Note:* The reverse motion need not have any intentional delay. *See also:* electromagnetic relay. (PE/EM) 43-1974s

**slow release time characteristic, relay** *See:* relay slow-release time characteristic.

**slow-speed starting** A control function that provides for starting an electric drive only at the minimum-speed setting. *See also:* starter. (IA/ICTL/IAC) [60]

**slow time (A)** Simulated time with the property that a given period of actual time represents less than that period of time in the system being modeled; for example, in a simulation of the internal workings of a computer, running the simulation for one second may result in the model advancing time by only a microsecond; that is, simulated time advances slower than actual time. **(B)** The duration of activities within a simulation in which simulated time advances slower than actual time. *Contrast:* real time; fast time. (C) 610.3-1989

**slow wave** An electromagnetic wave propagating close to a boundary with a phase velocity less than that which would exist in an unbounded medium having the same electromagnetic properties. *See also:* fast wave. (AP/PROP) 211-1997

**slow-wave circuit (microwave tubes)** A circuit whose phase velocity is much slower than the velocity of light. For example, for suitably chosen helixes the wave can be considered to travel on the wire at the velocity of light but the phase velocity is less than the velocity of light by the factor that the pitch is less than the circumference. (ED) [45]

**slug** *See:* connector link.

**slug, relay** *See:* relay slug.

**slug tuning** A means for varying the frequency of a resonant circuit by introducing a slug of material into either the electric or magnetic fields or both. *See also:* radio transmission; network analysis. (AP/ANT) 145-1983s

**sluice** Open water trough, also used to describe operation of a turbine when operated under free discharge conditions to release flood flows. (PE/EDPG) 1020-1988r

**slush compound** A non-drying oil, grease, or similar organic compound that, when coated over a metal, affords at least temporary protection against corrosion. (IA) [59]

**small computer systems interface** A data-transfer interface used to connect multiple peripheral devices, such as disk drives, tapes, or printers to computer systems while taking up only one slot in the computer. *Note:* Previously, this was known as Shugart Associates Systems Interface. (C) 610.10-1994w

**small ion (dc electric-field strength and ion-related quantities)** An ion comprised of molecules or molecular clusters bound together by charge. Mobilities are in the range of $10^{-5}$ $m^2/Vs$ to $2 \times 10^{-4}$ $m^2/Vs$. Typical radius is less than $1 \times 10^{-9}$ m. *Note:* To avoid confusion with the more general term "ion," the use of the term "small ion" is encouraged. (T&D/PE) 539-1990, 1227-1990r

**small-perturbation method** An approximate technique for estimating the scattering from a perturbed boundary or from perturbations in the constitutive parameter(s) of a medium applicable when the perturbation is small compared to a reference parameter or scale such as the wavelength in the boundary case. (AP/PROP) 211-1997

**small-power producer** A non-utility generation source that is a qualifying small-power production facility under PURPA and the Federal Energy Regulatory Commission (FERC). (SUB/PE) 1109-1990w

**small scale integration (SSI) (A)** Pertaining to an integrated circuit containing less than 100 transistors in its design. *Contrast:* ultra-large scale integration; medium scale integration; very large scale integration; large scale integration. **(B)** Pertaining to an integrated circuit containing fewer than 10 elements. (C) 610.10-1994

**small-signal (light-emitting diodes)** A signal which when doubled in magnitude does not produce a change in the parameter being measured that is greater than the required accuracy of the measurement. (ED) [127]

**small-signal forward transadmittance** The value of the forward transadmittance obtained when the input voltage is small compared to the beam voltage. *See also:* electron-tube admittances. (ED) 161-1971w

**small signal performance (1) (excitation systems for synchronous machines)** The response of an excitation cotrol system, excitation system, or elements of an excitation system to signals that are small enough that nonlinearities can be disregarded in the analysis of the response, and operation can be considered to be linear. (PE/EDPG) 421.1-1986r **(2) (excitation systems)** The response to signals that are small enough so that nonlinearities are insignificant. (PE/EDPG) 421.2-1990

**small-signal permittivity** The incremental change in electric displacement per unit electric field when the magnitude of the measuring field is very small compared to the coercive electric field. (Measurements are usually made at a frequency of one kilohertz or higher). The small signal relative permittivity $\kappa$ is equal to the ratio of the absolute permittivity e to the permittivity of free space $e_0$, that is, $\kappa = \epsilon / \epsilon_0$. *Note:* The value of the small-signal permittivity may depend on the remanent polarization, electric field, mechanical stress, sample history, or frequency of the measuring field. *See also:* remanent polarization; Curie-Weiss temperature. (UFFC) [21]

**small-signal resistance (semiconductor rectifiers)** The resistive part of the quotient of incremental voltage by incremental current under stated operating conditions. *See also:* rectification. (IA) [12]

**SMALLTALK** A high-order language based on the metaphor of objects sending messages to one another. *See also:* object-oriented language. (C) 610.13-1993w

**small wiring** *See:* secondary and control wiring.

**smart actuator** An actuator version of a smart transducer. (IM/ST) 1451.2-1997

**smart sensor** A sensor version of a smart transducer. (IM/ST) 1451.2-1997

**smart terminal** An intelligent terminal that is preprogrammed for a particular application, for example, a word processing workstation with integrated spell checking. (C) 610.10-1994w

**Smart Transducer** A transducer that provides functions over and above that necessary for generating a correct representation of a sensed or controlled physical quantity. This functionality typically simplifies the integration of the transducer into applications in a networked environment. (IM/ST) 1451.1-1999, 1451.2-1997

**Smart Transducer Interface Module (STIM) (1)** A module that contains the Transducer Electronic Data Sheet, logic to implement the transducer interface, the transducer(s) and any signal conversion or signal conditioning. This standard expressly requires that no operating mode of the Smart Transducer Interface Module ever permit these components to be physically separated. They may, however, be separated during manufacturing and repair. (IM/ST) 1451.2-1997 **(2)** The supporting electronics on the transducer side of the hardware interface to the NCAP. In IEEE 1451.1, an STIM and an NCAP combined form a Networked Smart Transducer. In the various IEEE 1451.X standards, for example IEEE 1451.2, the term STIM may have a more precise meaning within the scope of the particular standard. (IM/ST) 1451.1-1999

**Smart Transducer object model** An object model for a Smart Transducer. The model includes an interface to a transducer object and a transducer bus. (IM/ST) 1451.1-1999

**smashboard signal** A signal so designed that the arm will be broken when passed in the stop position. (EEC/PE) [119]

**SME** *See:* subject matter expert; systems management entity.

**SMFA** *See:* specific management functional areas.

**SMIB** *See:* security management information base.

**smog** *See:* fog.

**smoke** The airborne solid and liquid particulates and gases evolved when a material undergoes pyrolysis or combustion. (DEI) 1221-1993w

**smoke detector (fire protection devices)** A device which detects the visible or invisible particles of combustion. (NFPA) [16]

**smooth** To apply procedures that decrease or eliminate rapid fluctuations in data. (C) 1084-1986w

**smooth current (rotating electric machinery)** Current that remains unidirectional and the ripple of which does not exceed 3%. (PE/EM) 11-1980r

**smoothing** Any image enhancement technique in which the effect of noise in the original image is reduced. *Synonyms:* noise suppression; noise cleaning. (C) 610.4-1990w

**smoothing reactor for HVDC transmission** A smoothing reactor for HVDC application is a reactor intended for connection in series with an HVDC converter, or an HVDC transmission line or insertion in the intermediate dc circuit of a back-to-back link, for the purpose of

— Reducing harmonics in the dc line.
— Complying, in conjunction with dc filters, with the dc side telephone interference requirements.
— Limiting the surge-current amplitude during faults and disturbances; especially the limitation of cable discharge currents in the case of a long dc cable.
— Providing a high impedance to the flow of harmonics in the case of a cable link (high capacitance of cable).
— Limiting the rate of rise of inverter dc current in the case of inverter ac network disturbances; thus reducing the risk of commutation failures.
— Improving the dynamic stability of the dc transmission system (commutation failures).

Smoothing reactors may be built using either of two designs: dry-type air cooled or oil-immersed. Dry-type smoothing reactors are of air-core design. Oil-immersed smoothing reactors utilize magnetic-core materials as an inherent part of their design. (PE/TR) 1277-2000

**smothered-arc furnace** A furnace in which the arc or arcs is covered by a portion of the charge. (EEC/PE) [119]

**SMT** *See:* station management.

**S/N** *See:* signal-to-noise ratio.

**SNA** *See:* systems network architecture.

**snake** *See:* conductor cover; fish tape.

**snap-action relay contacts** A contact assembly having two or more equilibrium positions, in one of which the contacts remain with substantially constant contact pressure during the initial motion of the actuating member, until a condition is reached at which stored energy snaps the contacts to a new position of equilibrium. (EEC/REE) [87]

**snaphook** A connector comprised of a hook-shaped member with a normally closed keeper or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. There are two types of snaphooks: a) The locking type with a self-closing, self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection, or b) The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection. (T&D/PE) 1307-1996

**snapover** When used in connection with alternating-current testing, a quasi-flashover or quasi-sparkover, characterized by failure of the alternating-current power source to maintain the discharge, thus permitting the dielectric strength of the specimen to recover with the test voltage still applied. (PE/PSIM) [55]

**snapshot** A copy of all or portions of the data contained in storage or in a database at a particular point in time. *Note:* Considered a "picture" of the data. (C) 610.5-1990w

**snapshot dump (A)** A dynamic dump of the contents of one or more specified storage areas. *See also:* dynamic dump; change dump; postmortem dump; static dump; selective dump; memory dump. **(B) (computers)** A selective dynamic dump performed at various points in a machine run. (C) 610.12-1990, [20], [85]

**snarf** The action taken by a a module when it takes a copy of data passing by on the bus, even though it did not request it. (C/BA) 10857-1994, 896.3-1993w, 896.4-1993w

**snatch block (power line maintenance) (conductor stringing equipment)** A device normally designed with a single sheave, a shell, and an attachment hook or shackle. One side of the shell can be opened to eliminate the need for threading of the line. It is commonly used for lifting loads on a single line, or as a device to control the position or direction, or both, of a fall line or pulling line *Synonyms:* skookum; Washington; Western. (T&D/PE) 516-1995, 524-1992r

**Snell's law** The relationship between angles of incidence, reflection and transmission, and material constitutive parameters, for a plane wave incident on a planar boundary between media of differing electromagnetic constitutive parameters. Often expressed as:

$\theta_i = \theta_r$

and

$n_i \sin\theta_i = n_t \sin\theta_t$

where

$\theta_i$ = the angle of incidence
$\theta_r$ = the angle of reflection
$\theta_t$ = the angle of transmission
$n_i$ = the real part of the refractive index of the material in which the wave is incident
$n_t$ = the real part of the refractive index of the other material

(AP/PROP) 211-1997

**SNM cable** *See:* shielded nonmetallic-sheathed cable.

**SNOBOL** *See:* StriNg-Oriented symBOlic Language.

**snoop** The action taken by a module on a transaction when it is not the master that originated the transaction or the repository of last resort for the data, but it still monitors the transaction. Cache memories snoop transactions to maintain coherence. (C/BA) 10857-1994, 896.4-1993w, 896.3-1993w

**snow (1) (intensity-modulated display)** A varying speckled background caused by noise. *See also:* television; radar. (BT/AV) [34]

**(2) (overhead power lines)** Precipitation composed of white or translucent ice crystals, chiefly in complex branched hexagonal form and often agglomerated into snowflakes. For weather observation purposes, the intensity of snow is characterized as:

a) "Very light," when scattered flakes do not completely cover or wet an exposed surface, regardless of duration;
b) "Light," when the visibility is 1.0 km or more;
c) "Moderate," when the visibility is less than 1.0 km but more than 0.5 km;
d) "Heavy," when the visibility is less than 0.5 km The classification of snowfall according to its intensity is identical to that of rain, where the equivalent amount of water accumulated in millimeters per hour is measured. An easier but less accurate approach uses the depth of the accumulated snow.

(T&D/PE) 539-1990

**snow brake** A constant application of light friction brake intended to create enough heat to mitigate the buildup of snow and ice, which would interfere with the brake actuators. (VT) 1475-1999

**S/N ratio** *See:* signal-to-noise ratio.

**SNRM** *See:* set normal response mode.

**snr psoph (data transmission)** Signal-to-noise ratio measured with psophometrically weighted receiver; expressed in dB (decibels). (PE) 599-1985w

**snub** *See:* anchor.

**snubber (1) (converter circuit elements) (self-commutated converters)** An auxiliary circuit element or combination of elements employed to modify the transient voltage or current of a semiconductor device. *See also:* shunt snubber; series snubber; polarized snubber. (IA/SPC) 936-1987w

**(2) (load commutated inverter synchronous motor drives)** An auxiliary circuit element or combination of elements employed to modify the transient voltage or current of a semi-

conductor device during switching. (A) (shunt snubber) Circuit elements, usually including a capacitor and a resistor connected in shunt with a switching device to limit the rate of rise of voltage or the peak voltage across the device (or both) when switching from a conducting to a blocking state or when subjected to an external voltage transient. (B) (series snubber) Circuit elements, usually including an inductor, connected in series with a switching device to limit the rate of rise or fall of current through the device when switching on or off, respectively. (IA/ID) 995-1987w

**snub structure** A structure located at one end of a sag section and considered as a *zero* point for sagging and clipping offset calculations. The section of line between two such structures is the sag section, but more than one sag section may be required in order to sag properly the actual length of conductor that has been strung. *Synonyms:* zero structure; O structure. (T&D/PE) 524-1992r

**SO** *See:* shift-out character.

**soak, relay** *See:* relay soak.

**sock** *See:* woven wire grip.

**socket** A file of a particular type that is used as a communications endpoint for process-to-process communication. (C) 1003.5-1999

**socket address** An address associated with a socket or remote endpoint. The address may include multiple parts, such as a network address associated with a host system and an identifier for a specific endpoint. (C) 1003.5-1999

**socket cover** The removable portion of the enclosure that provides access to the meter socket wiring. (ELM) C12.7-1993

**socket identifier (socket ID)** A byte used to uniquely identify the socket. A socket ID can be well known or can be dynamically assigned. (C/MM) 1284.4-2000

**socket rim** That part of a ring-type meter socket that is required to accommodate the socket sealing ring that holds a detachable watthour meter in place. The socket rim may be a part of the cover that is secured in place by a fastener such as a latch or crossbar. (ELM) C12.7-1993

**sockets** An interface to transport protocol. (C/PA) 1003.23-1998

**socket sealing ring (watthour meter sockets)** A ring used to overlap the socket rim and the detachable watthour meter cover ring to hold and provide means for sealing a detachable watthour meter in place. C12.7-1993

**sock line** *See:* pulling line.

**sodium vapor lamp transformers (power and distribution transformers) (multiple-supply type)** Transformers, autotransformers, or reactors for operating sodium vapor lamps for all types of lighting applications, including indoor, outdoor area, roadway, and other process and specialized lighting. (PE/TR) C57.12.80-1978r

**SOE** *See:* sequence-of-events.

**sofar (navigation aids)** A system of navigation providing hyperbolic lines of position determined by shore listening stations. (AES/GCS) 172-1983w

**soft copy** A copy of computer output in a form other than a printed page. For example, data displayed on a display device. *Contrast:* hard copy. (C) 610.2-1987, 610.6-1991w

**soft error*** *See:* transient error.

* Deprecated.

**soft failure** A failure that permits continued operation of a system with partial operational capability. *Contrast:* hard failure. (C) 610.12-1990

**soft font** *See:* downloadable font.

**soft hyphen** *See:* discretionary hyphen.

**soft limiting** *See:* limiter circuit.

**soft region** A cluster which does not have a specified physical location in a floorplan. It may have constraints on how closely the cells within the cluster are placed relative to each other. A soft region may be located within a hard region. (C/DA) 1481-1999

**soft-sector** Pertaining to a magnetic disk that is segmented by recorded data marks on the disk; the location of a sector is determined by the distance from a magnetically or photoelectrically sensed starting mark, known as an index mark. *Note:* This can refer to either a floppy diskette or a hard disk but generally refers to the former, which has one punched hole, known as an index hole, which marks the first sector. *Contrast:* hard-sector. (C) 610.10-1994w

**soft start (1) (thyristor)** At turn-on, a gradual increase in output at a predetermined rate from zero or a set minimum to a desired maximum. (IA/IPC) 428-1981w

**(2)** The ability of a controlling device to apply power to a load upon energization in a proportional manner, irrespective of values of the controlling signals. (IA/PC) 844-1991

**soft start reset (thyristor)** Reset of soft start to initial conditions when ac power is interrupted. (IA/IPC) 428-1981w

**software (1)** Computer programs, procedures, and possibly associated documentation and data pertaining to the operation of a computer system. (SE/C) 610.12-1990

**(2) (programmable digital computer systems in safety systems of nuclear power generating stations)** Computer programs and data. 7432-1982w

**(3)** The programs, procedures, rules, and any associated documentation pertaining to the operation of an information processing system. (C/PA) 14252-1996

**(4)** A generic term referring to software objects or a structured set of files. This term can refer to the objects forming the hierarchical structure (software objects), or to the actual files and control_files (software files). (C/PA) 1387.2-1995

**(5)** Computer programs and computer databases. (C/SE) J-STD-016-1995

**(6)** Computer programs, procedures, and associated documentation and data pertaining to the operation of a computer system. (C/SE) 1062-1998

**software accuracy (programmable digital computer systems in safety systems of nuclear power generating stations)** The software attribute that provides a quantitative measure of the magnitude of error. 7432-1982w

**software acquisition process** The period of time that begins with the decision to acquire a software product and ends when the product is no longer available for use. The software acquisition process typically includes nine steps associated with planning the organizational strategy, implementing an organization's process, determining the software requirements, identifying potential suppliers, preparing contract requirements, evaluating proposals and selecting the supplier, managing supplier performance, accepting the software, and using the software. (C/SE) 1062-1998

**software characteristic (software)** An inherent, possibly accidental, trait, quality, or property of software (for example, functionality, performance, attributes, design constraints, number of states, lines or branches). (C/SE) 610.12-1990, 1008-1987r

**software_collection** A grouping of software objects that are managed by the software_administration utilities. Software_collections are the sources and targets of these utilities. This standard defines two types of software_collections: installed _ software and distributions. (C/PA) 1387.2-1995

**software common class** The common class describing the common attributes associated with the hierarchical structure of software objects defined by this standard. (C/PA) 1387.2-1995

**software component** A general term used to refer to a software system or an element, such as module, unit, data, or document. (C/SE) 1061-1998

**software configuration item, or subsystem** A collection of software elements treated as a unit for the purpose of configuration management. (C/SE) 1016.1-1993w

**software configuration management** *See:* configuration management.

**software consistency (programmable digital computer systems in safety systems of nuclear power generating sta-**

**tions)** The software attribute that provides uniform design and implementation techniques and notation. 7432-1982w

**software data base** A centralized file of data definitions and present values for data common to, and located internal to, an operational software system. *See also:* data; file. (C/SE) 729-1983s

**software data protection (SDP)** A means of preventing inadvertent write or access to different operating modes. (ED) 1005-1998

**software defined network** A network based on a public circuit-switched network that gives the user the appearance of a private network. (C) 610.7-1995

**software definition files** The files containing the software structure and detailed attributes for distributions, installed_software, bundles, products, subproducts, filesets, files, and control_files. This includes the INDEX and INFO files and the PSF. To communicate metadata information relating to both distributions and installed software, software definition files serve as input to, or output from, the various software administration utilities. The format used by software administration utilities to store metadata relating to installed software is undefined. (C/PA) 1387.2-1995

**software design description (SDD)** A representation of software created to facilitate analysis, planning, implementation, and decision making. The software design description is used as a medium for communicating software design information, and may be thought of as a blueprint or model of the system. (C/SE) 1012-1998, 1016-1998

**software design document** The output of design process in a presentable format, traditionally, a paper-based document. (C/SE) 1016.1-1993w

**software design process** Organized tasks and activities of design, having appropriate specification. (C/SE) 1016.1-1993w

**software design process specification** Know-how, technology of design, that specify operationally how to use methodology of design (standardized itself) together with standards for evaluating design, tools to support design automation, and documentation required to represent design information. (C/SE) 1016.1-1993w

**software development** A set of activities that results in software products. Software development may include new development, modification, reuse, reengineering, maintenance, or any other activities that result in software products. (C/SE) J-STD-016-1995

**software development cycle (software)** The period of time that begins with the decision to develop a software product and ends when the software is delivered. This cycle typically includes a requirements phase, design phase, implementation phase, test phase, and sometimes, installation and checkout phase. *Notes:* 1. The phases listed above may overlap or be performed iteratively, depending upon the software development approach used. 2. This term is sometimes used to mean a longer period of time, either the period that ends when the software is no longer being enhanced by the developer, or the entire software life cycle. *Contrast:* software life cycle. (C) 610.12-1990

**software development file (1)** A collection of material pertinent to the development of a given software unit or set of related units. Contents typically include the requirements, design, technical reports, code listings, test plans, test results, problem reports, schedules, and notes for the units. *Synonyms:* software development folder; software development notebook; unit development folder. (C) 610.12-1990
**(2)** A repository for material pertinent to the development of a particular body of software. Contents typically include (either directly of by reference) considerations, rationale, and constraints related to requirements definition, design, and implementation; developer-internal test information; and schedule and status information. (C/SE) J-STD-016-1995

**software development folder** *See:* software development file.

**software development library (SDL) (1)** A software library containing computer readable and human readable information relevant to a software development effort. *Synonyms:* program support library; project library. *Contrast:* system library; master library; software repository; production library. (C) 610.12-1990
**(2)** A controlled collection of software, documentation, other intermediate and final software products, and associated tools and procedures used to facilitate the orderly development and subsequent maintenance of software. (C/SE) J-STD-016-1995

**software development notebook** *See:* software development file.

**software development plan (SDP)** A project plan for a software development project. (C) 610.12-1990

**software development process (1)** The process by which user needs are translated into a software product. The process involves translating user needs into software requirements, transforming the software requirements into design, implementing the design in code, testing the code, and sometimes, installing and checking out the software for operational use. *Note:* These activities may overlap or be performed iteratively. *See also:* incremental development; spiral model; waterfall model; rapid prototyping. (C) 610.12-1990
**(2)** An organized set of activities performed to translate user needs into software products. (C/SE) J-STD-016-1995

**software diversity** A software development technique in which two or more functionally identical variants of a program are developed from the same specification by different programmers or programming teams with the intent of providing error detection, increased reliability, additional documentation, or reduced probability that programming or compiler errors will influence the end results. *See also:* diversity. (C) 610.12-1990

**software documentation** Technical data or information, including computer listings and printouts, in human-readable form, that describe or specify the design or details, explain the capabilities, or provide operating instructions for using the software to obtain desired results from a software system. *See also:* data; documentation; software; system; system documentation; design; user documentation. (C/SE) 729-1983s

**software element** A deliverable or in-process document produced or acquired during software development or maintenance. Specific examples include but are not limited to:

a) Project planning documents (for example, software development plans, and software verification and validation plans);
b) Software requirements and design specifications;
c) Test effort documentation;
d) Customer-deliverable documentation;
e) Program source code;
f) Representation of software solutions implemented in firmware;
g) Reports (for example, review, audit, projectect status) and data (for example, defect detection test).

(C/SE) 1028-1988s

**software engine** An engine characterized by a self-contained software module that performs a set of low-level tasks when called by an application program; for example, a database engine or an inference engine. (C) 610.10-1994w

**software engineering (A)** The application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software; that is, the application of engineering to software. **(B)** The study of approaches as in definition (A). (C/SE) 1209-1992, 610.12-1990

**software engineering environment** The hardware, software, and firmware used to perform a software engineering effort. Typical elements include computer equipment, compilers, assemblers, operating systems, debuggers, simulators, emulators, test tools, documentation tools, and database management systems. (C/SE) 610.12-1990, 1348-1995

**software error** An error in a software element which, when executed, results in unintended system operation. (VT/RT) 1483-2000

**software error tolerance (programmable digital computer systems in safety systems of nuclear power generating stations)** The software attribute that provides continuity of operation under postulated non-nominal conditions. 7432-1982w

**software experience data** Data relating to the development or use of software that could be useful in developing models, reliability predictions, or other quantitative descriptions of software. (C/SE) 729-1983s

**software feature (1) (software unit testing)** A software characteristic specified or implied by requirements documentation (for example, functionality, performance, attributes, or design constraints). (C/SE) 1008-1987r, 610.12-1990

**(2)** A distinguishing characteristic of a software item (e.g., performance, portability, or functionality). (C/SE) 829-1998

**software file** A generic term referring to the files and control_ files that are contained within software objects and managed by the utilities in this standard. (C/PA) 1387.2-1995

**software_file common class** The common class that relates the two types of files defined by this standard, namely the actual files that make up the software, plus the control_files that are executed by the utilities when operating on software. (C/PA) 1387.2-1995

**software_files** A generic term referring to file andcontrol_ file objects (those that share the same software_file common class). (C/PA) 1387.2-1995

**software hazard** A software condition that is a prerequisite to an accident. (C/SE) 1228-1994

**software hierarchy** Hierarchical organization of objects that are managed by the software administration utilities. (C/PA) 1387.2-1995

**software implementation-defined behavior** Behavior, for a correct program construct and correct data, that depends on the software implementation and that each implementation shall document. (C/DA) 1481-1999

**software implementation limits** Restrictions imposed by an implementation. (C/DA) 1481-1999

**software-intensive system** A system for which software is a major technical challenge and is perhaps the major factor that affects system schedule, cost, and risk. In the most general case, a software-intensive system is comprised of hardware, software, people, and manual procedures. (C/SE) 1362-1998

**software item (1)** An aggregation of software, such as a computer program or database, that satisfies an end use function and is designated for purposes of specification, qualification testing, interfacing, configuration management, or other purposes. Software items are selected based on tradeoffs among software function, size, host or target computers, developer, support strategy, plans for reuse, criticality, interface considerations, need to be separately documented and controlled, and other factors. A software item is made up of one or more software units. (C/SE) J-STD-016-1995

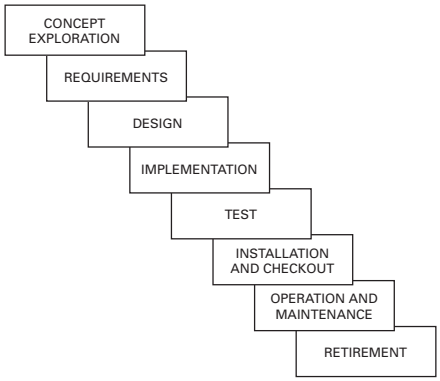
**(2)** Source code, object code, job control code, control data, or a collection of these items. (C/SE) 829-1998

**software librarian** The person responsible for establishing, controlling, and maintaining a software library. *See also:* software library. (C/SE) 729-1983s

**software library (1)** A controlled collection of software and related documentation designed to aid in software development, use, or maintenance. Types include master library, production library, software development library, software repository, system library. *Synonym:* program library. (C) 610.12-1990

**(2)** A collection of object code units that may be linked, either statically or at run-time, with other libraries and/or object code modules to produce a software program. (C/DA) 1481-1999

**software life cycle (1)** The period of time that begins when a software product is conceived and ends when the software is no longer available for use. The software life cycle typically includes a concept phase, requirements phase, design phase, implementation phase, test phase, installation and checkout phase, operation and maintenance phase, and, sometimes, retirement phase. (See the corresponding figure.) *Note:* These phases may overlap or be performed iteratively.




**sample software life cycle**

(C) 610.12-1990

**(2)** The various phases for software development from initial conception to final release and maintenance. (PE/EDPG) 1150-1991w

**(3)** The system or product cycle initiated by a user need or a perceived customer need and terminated by discontinued use of the product. The software life cycle typically includes a concept phase, requirements phase, design phase, implementation phase, test phase, installation and checkout phase, operation and maintenance phase, and, sometimes, retirement phase. These phases may overlap in time or may occur iteratively. (C/SE) 1362-1998

**(4)** The period of time that begins when a software product is conceived and ends when the software is no longer available for use. (C/SE) 1490-1998

**software life cycle process (SLCP)** The project-specific description of the process that is based on a project's software life cycle (SLC) and the Organizational Process Assets (OPA). *See also:* Organizational Process Asset. (C/SE) 1074-1997

**software location** The directory relative to the installed_software root directory where the relocatable files of the software have been located. (C/PA) 1387.2-1995

**software maintenance (1)** The set of activities that takes place to ensure that software installed for operational use continues to perform as intended and fulfill its intended role in system operation. Software maintenance includes improvements, aid to users, and related activities. (C/SE) J-STD-016-1995

**(2)** Modification of a software product after delivery to correct faults, to improve performance or other attributes, or to adapt the product to a modified environment. (C/SE) 1219-1998

**(3) (software)** *See also:* maintenance. (C) 610.12-1990

**software model** A symbolic model whose properties are expressed in software; for example, a computer program that models the effects of climate on the world economy. *Contrast:* narrative model; mathematical model; graphical model. (C) 610.3-1989w

**software modularity (programmable digital computer systems in safety systems of nuclear power generating stations)** The software attribute that provides a structure of highly independent computer program units that are discrete and identifiable with respect to compiling, combining with other units, and loading. 7432-1982w

**software monitor (software)** A software tool that executes concurrently with another program and provides detailed infor-

mation about the execution of the other program. *See also:* monitor; hardware monitor. (C) 610.12-1990

**software object** An object that inherits attributes of the software common class, meaning a bundle, product, subproduct, or fileset object. (C/PA) 1387.2-1995

**software packaging layout** The format for software in a distribution. It contains the metadata for the distribution catalog in a well-defined exported form, as well as the files for the software objects in that distribution. (C/PA) 1387.2-1995

**software pattern match string** A sequence of one of more strings, each made up of a sequence of one or more characters from the shell "Pattern Matching Notation" strings described in 3.13, of POSIX.2, and with the meaning defined in that clause. If there are two or more strings, the strings are separated by the | character. A software pattern match shall be portable character string. (C/PA) 1387.2-1995

**software product (1)** Software or associated information created, modified, or incorporated to satisfy a contract. Examples include plans, requirements, design, code, databases, test information, and manuals. (C/SE) J-STD-016-1995
**(2) (A)** A complete set of computer programs, procedures, and associated documentation and data. **(B)** One or more of the individual items in (A). (C/SE) 1028-1997
**(3)** The complete set of computer programs, procedures, and associated documentation and data designated for delivery to a user. (C/SE) 1062-1998

**software product requirements document** The document that describes the full requirements for the software product that is to be developed. *Note:* Equivalent names used in the software industry are: user requirements, segment specification, software product requirements specification, and technical requirements section of the contract. (C/SE) 1298-1992w

**software project** The set of work activities, both technical and managerial, required to satisfy the terms and conditions of a project agreement. A software project should have specific starting and ending dates, well-defined objectives and constraints, established responsibilities, and a budget and schedule. A software project may be self-contained or may be part of a larger project. In some cases, a software project may span only a portion of the software development cycle. In other cases, a software project may span many years and consist of numerous subprojects, each being a well-defined and self-contained software project. (C/SE) 1058-1998, 1490-1998

**software project management** The process of planning, organizing, staffing, monitoring, controlling, and leading a software project. (C/SE) 1058.1-1987s

**software project management plan** The controlling document for managing a software project. A software project management plan defines the technical and managerial project functions, activities, and tasks necessary to satisfy the requirements of a software project, as defined in the project agreement. (C/SE) 1058.1-1987s

**software quality (1) (A)** The totality of features and characteristics of a software product that bear on its ability to satisfy given needs; for example, conform to specifications. **(B)** The degree to which software possesses a desired combination of attributes. **(C)** The degree to which a consumer or user perceives that software meets his or her composite expectations. **(D)** The composite characteristics of software that determine the degree to which the software in use will meet the expectations of the customer. *See also:* software; specification; software product. (C/SE) 729-1983
**(2)** The ability of software to satisfy its specified requirements. (C/SE) J-STD-016-1995

**software quality assurance** *See:* quality assurance.

**software quality management** That aspect of the overall software management function:Software management that determines and implements the software quality policy. (C/SE) 1074-1995s

**software quality metric** A function whose inputs are software data and whose output is a single numerical value that can be interpreted as the degree to which software possesses a given attribute that affects its quality. (C/SE) 1061-1998

**software quality policy** The overall quality intentions and direction of an organization as regards software quality, as expressed by top management. (C/SE) 1074-1995s

**software reliability (1) (software reliability)** The probability that software will not cause the failure of a system for a specified time under specified conditions. The probability is a function of the inputs to and use of the system as well as a function of the existence of faults in the software. The inputs to the system determine whether existing faults, if any, are encountered. (SE/C) 982.2-1988, 982.1-1988, 729-1983s
**(2)** The ability of a program to perform a required function under stated conditions for a stated period of time. *See also:* software; program; function; system; failure. (C/SE) 729-1983s

**software reliability management** The process of optimizing the reliability of software through a program that emphasizes software error prevention, fault detection and removal, and the use of measurements to maximize reliability in light of project constraints such as resources (cost), schedule, and performance. (C/SE) 982.2-1988, 982.1-1988

**software repository** A software library providing permanent, archival storage for software and related documentation. *Contrast:* system library; software development library; master library; production library. (C) 610.12-1990

**software requirements review (SRR) (A)** A review of the requirements specified for one or more software configuration items to evaluate their responsiveness to and interpretation of the system requirements and to determine whether they form a satisfactory basis for proceeding into preliminary design of the configuration items. *Note:* This review is called software specification review by the U.S. Department of Defense. *See also:* system requirements review. **(B)** A review as in definition (A) for any software component. (C) 610.12-1990

**software requirements specification (SRS)** Documentation of the essential requirements (i.e., functions, performance, design constraints, and attributes) of the software and its external interfaces. The software requirements are derived from the system specification. (C/SE) 1012-1998

**software reuse** The reapplication of previously developed software or information associated with that software. (SCC20) 1226-1998

**software reuse resources** Reuse libraries, stores of reusable assets, software reuse services, and suppliers. (C/SE) 1430-1996

**software safety** Freedom from software hazards. (C/SE) 1228-1994

**software safety program** A systematic approach to reducing software risks. (C/SE) 1228-1994

**software sneak analysis** A technique applied to software to identify latent (sneak) logic control paths or conditions that could inhibit a desired operation or cause an unwanted operation to occur. *See also:* software. (C/SE) 729-1983s

**software_spec** A string that is used to identify one or more software objects for input to a software administration utility. (C/PA) 1387.2-1995

**software specification review (SSR)** *See:* software requirements review.

**software system (1)** Software that is the subject of a single software project. (C/SE) 1074-1995s
**(2)** A system consisting solely of software and possibly the computer equipment on which the software operates. (C/SE) J-STD-016-1995
**(3)** A software-intensive system for which software is the only component to be developed or modified. *See also:* software-intensive system. (C/SE) 1362-1998

**software test incident (software unit testing) (software)** Any event occurring during the execution of a software test that requires investigation. (C/SE) 610.12-1990, 1008-1987r

**software tools (1)** A computer program used in the development, testing, analysis, or maintenance of a program or its documentation. Examples include comparator, cross reference generator, decompiler, driver, editor, flowcharter, monitor, test case generator, and timing analyzer. (PE/C/NP) 7-4.3.2-1993, 610.12-1990

**(2)** Computer programs used to aid in the development, testing, analysis, or maintenance of a computer program or its documentation. (C/SE) 730.1-1995

**software transition** The set of activities that enables responsibility for software development to pass from one organization, usually the organization that performs initial software development, to another, usually the organization that will perform software maintenance. (C/SE) J-STD-016-1995

**software unit** An element in the design of a software item; for example, a major subdivision of a software item, a component of that subdivision, a class, object, module, function, routine, or database. Software units may occur at different levels of a hierarchy and may consist of other software units. Software units in the design may or may not have a one-to-one relationship with the code and data entities (routines, procedures, databases, data files, etc.) that implement them or with the computer files containing those entities. (C/SE) J-STD-016-1995

**software user document** Body of material that provides information to users; typically printed or stored on some medium in the format of a printed document. (C/SE) 1063-1987r

**software verification and validation plan (SVVP)** A plan describing the conduct of software V&V. (C/SE) 1012-1998

**software verification and validation report (SVVR)** Documentation of V&V results and software quality assessments. (C/SE) 1012-1998

**soil structure interaction (SSI)** A general concept for effects caused by the influence of the soil dynamic behavior on the response of a structure. (SUB/PE) C37.122.1-1993

**solar activity** The emission of electromagnetic radiation and particles from the sun, including slowly varying components and transient components caused by phenomena such as solar flares. (AP/PROP) 211-1997

**solar activity center** A region on the sun containing the sources of variable electromagnetic and corpuscular radiation. (AP/PROP) 211-1997

**solar activity index** A number characterizing solar activity. Examples are international relative sunspot number, twelve-month running mean sunspot number, and monthly mean solar radio-noise flux. (AP/PROP) 211-1997

**solar array (photovoltaic power system)** A group of electrically interconnected solar cells assembled in a configuration suitable for oriented exposure to solar flux. (AES) [41]

**solar constant (1) (illuminating engineering)** The irradiance (averaging 1 353 $W/m^2$ (125.7 $W/ft^2$), from the sun at its mean distance from the earth $92.9 \times 10^6$ miles ($1.5 \times 10^{11}$m), before modification by the earth's atmosphere. (EEC/IE) [126]

**(2) (electric power systems in commercial buildings)** The solar intensity incident on a surface that is oriented normal to the sun's rays and located outside the earth's atmosphere at a distance from the sun that is equal to the mean distance between the earth and the sun. (IA/PSE) 241-1990r

**solar cycle** The magnitude of slowly varying components of solar activity as a function of time. The solar cycle has a period of approximately 11 years. *Note:* The cycle is not symmetrical. It rises to a maximum in approximately 4 years and declines to a minimum in approximately 7 years. (AP/PROP) 211-1997

**solar induced currents (power fault effects)** Spurious, quasi-direct currents flowing in grounded power differences due to geomagnetic storms resulting from the particle emission of solar flares erupting from the surface of the sun. *Synonym:* geomagnetically induced currents. *See also:* auroral effects. (PE/PSC) 367-1987s

**solar noise (communication satellite)** Electrical noise generated by the sun. Exceeds other background noise sources by several orders of magnitude. (COM) [25]

**solar panel** *See:* solar array.

**solar radiation simulator (illuminating engineering)** A device designed to produce a beam of collimated radiation having a spectrum, flux density, and geometric characteristics similar to those of the sun outside the earth's atmosphere. (EEC/IE) [126]

**solar wind (communication satellite)** Energetic particles emitted by the sun and travelling through space. (COM) [19]

**solderability** That property of a metal surface to be readily wetted by molten solder. (EEC/AWM) [105]

**soldered joints** The connection of similar or dissimilar metals by applying molten solder, with no fusion of the base metals. (EEC/AWM) [105]

**solder projections** Icicles, nubs, and spikes are undesirable protrusions from a solder joint. (EEC/AWM) [105]

**solder side** By convention, the side of the module opposite to the component side. This is the left side when looking at an IEEE 1101.1 system through the front door. (C/MM) 1101.2-1992

**solder splatter** Unwanted fragments of solder. (EEC/AWM) [105]

**solenoid** An electric conductor wound as a helix with a small pitch, or as two or more coaxial helixes. *See also:* solenoid magnet. (Std100) 270-1966w

**solenoid magnet (solenoid)** An electromagnet having an energizing coil approximately cylindrical in form, and an armature whose motion is reciprocating within and along the axis of the coil. (IA/ICTL/IAC) 270-1966w, [60]

**solenoid relay** *See:* plunger relay.

**soleplate (rotating machinery)** A support fastened to a foundation on which a stator frame foot or a bracket arm can be mounted. *See also:* slide rail. (PE) [9]

**solicited messages** A negotiated data transfer in message space. *See also:* message space; data transfer. (C/MM) 1296-1987s

**solicited status** Information generated by the peripheral in response to a command from the host. (C/MM) 1284-1994

**solid angle (ω) (laser maser)** The ratio of the area on the surface of a sphere to the square of the radius of that sphere. It is expressed in steradians. (LEO) 586-1980w

**solid angle factor (Q) (illuminating engineering)** A function of the solid angle (ω) subtended by a source and is given by

$$Q = 20.4\omega = 1.52\omega^{0.2} - 0.075$$

*See also:* index of sensation. (EEC/IE) [126]

**solid-beam efficiency** The ratio of the power received over a specified solid angle when an antenna is illuminated isotropically by uncorrelated and unpolarized waves to the total power received by the antenna. *Note:* This term is sometimes used to mean the ratio of the power received corresponding to a particular polarization over the solid angle to the total power received. Equivalently, the term is used to mean the ratio of the power radiated over a specified solid angle by the antenna corresponding to a particular polarization to the total power radiated. (AP/ANT) 145-1993

**solid bushing (outdoor electric apparatus)** A bushing in which the major insulation is provided by a ceramic or analogous material. (PE/TR) 21-1976

**solid conductor** A conductor consisting of a single wire. *See also:* conductor. (T&D/PE) [10]

**solid contact** A contact having relatively little inherent flexibility and whose contact pressure is supplied by another member. (SWG/PE) C37.100-1981s

**solid coupling (rotating machinery)** A coupling that makes a rigid connection between two shafts. *See also:* rotor. (PE) [9]

**solid electrolytic capacitor** A capacitor in which the dielectric is primarily an anodized coating on one electrode, with the

remaining space between the electrodes filled with a solid semiconductor. (PE/EM) 43-1974s

**solid enclosure** An enclosure that will neither admit accumulations of flyings or dust nor transmit sparks or flying particles to the accumulations outside. (EEC/PE) [119]

**solid insulations (cable-insulation materials)** Firm, essentially homogeneous, dielectric materials comprising virtually complete solid-phase structures and having no liquid phase. (PE) 402-1974w

**solid-iron cylindrical-rotor generator** *See:* cylindrical-rotor generator.

**solidly grounded (power and distribution transformers)** Grounded through an adequate ground connection in which no impedance has been inserted intentionally. *Note:* Adequate as used herein means suitable for the purpose intended. (PE/TR) C57.12.80-1978r

**solid-material fuse unit** A fuse unit in which the arc is drawn through a hole in solid material. (SWG/PE) C37.40-1993, C37.100-1992

**solid modeling** A method of displaying solid constructions on a graphical display device using geometric forms such as cubes, cones, spheres, and cylinders. (C) 610.6-1991w

**solid-pole synchronous motor** A salient-pole synchronous motor having solid steel pole shoes, and either laminated or solid pole bodies. (PE) [9]

**solid rotor (A) (rotating machinery)** A rotor, usually constructed of a high-strength forging, in which slots may be machined to accommodate the rotor winding. **(B) (rotating machinery)** A spider-type rotor in which spider hub is not split. *See also:* rotor. (PE) [9]

**solid-state component** A component whose operation depends on the control of electric or magnetic phenomena in solids, for example, a transistor, crystal diode, ferrite core. (C) [20], [85]

**solid state controller** An electric controller that utilizes a static power converter as the primary switching device. (IA/MT) 45-1998

**solid-state converter static (induction and dielectric heating equipment)** A solid state generator or power source that utilizes semiconductor devices to control the switching of currents through inductive and capacitive circuit elements and thus generate a useable alternating current at a desired output frequency. (IA) 54-1955w

**solid-state device (control equipment)** A device that may contain electronic components that do not depend on electronic conduction in a vacuum or gas. The electrical function is performed by semiconductors or the use of otherwise completely static components such as resistors, capacitors, etc. (PE/PSE) 94-1970w

**solid state network relay** A solid state relay which performs the combined functions of the master and phasing relays. (PE/TR) C57.12.44-1994

**solid-state protector** A protective device that employs solid-state circuit elements that provide a combination of high speed voltage and current sensing. These protectors are a combination of voltage clamps (avalanche diodes) and crowbar devices (multilayer diodes similar to SCRs), and are designed to limit the voltage to a specific value and to reduce current flow to low values of milliamperes within nanoseconds. They are usually integrated into the terminal apparatus. (PE/PSC) 487-1992

**solid-state relay** (or relay unit) A static relay or relay unit constructed exclusively of solid-state components. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

**solid-state scanning (facsimile)** A method in which all or part of the scanning process is due to electronic commutation of a solid-state array of thin-film photosensitive elements. *See also:* facsimile. (COM) [49]

**solid-type paper-insulated cable** Oil-impregnated, paper-insulated cable, usually lead covered, in which no provision is made for control of internal pressure variations. (T&D/PE) [10]

**solitary wave** A propagating wave disturbance where the effects of media dispersion and non-linearity compensate one another to produce a self-preserving wave shape. *Synonym:* soliton. (AP/PROP) 211-1997

**soliton** *See:* solitary wave.

**solution** *See:* check solution.

**solution domain** The environment in which a solution or set of solutions resides. *See also:* problem domain. (C/SE) 1362-1998

**solvent cleaning (electroplating)** Cleaning by means of organic solvents. *See also:* electroplating. (PE/EEC) [119]

**solventless (rotating machinery)** A term applied to liquid or semiliquid varnishes, paints, impregnants, resins, and similar compounds that have essentially no change in weight or volume when converted into a solid or semisolid. (PE) [9]

**somatic cells** *See:* genetic effect.

**son** *See:* child node.

**sonar (navigation aids)** A general name for sonic and ultrasonic ranging, sounding and communication systems. (AES/GCS) 172-1983w

**son file** A file that contains data that have been updated from those in another file, called the father file. *See also:* grandfather file; father file. (C) 610.5-1990w

**sonic delay line** *See:* acoustic delay line.

**sonic depth finder (navigation aids)** A direct reading instrument which determines the depth of water by measuring the time interval between emission of sound and the return of its echo from the bottom. (AES/GCS) 172-1983w

**sonic pen** A pick device that is sensitive to audio signals. *See also:* light pen. (C) 610.6-1991w, 610.10-1994w

**sonne (navigation aid terms)** A radio navigation aid that provides a number of characteristic signal zones which rotate in a time sequence; a bearing may be determined by observation (by interpolation) of the instant at which transition occurs from one zone to the following zone. *See also:* consol. (AES/GCS) 172-1983w

**sonobuoy (navigation aid terms)** A buoy with equipment for automatically transmitting a radio signal when triggered by an underwater sound signal. (AES/GCS) 172-1983w

**sort** To arrange data or items in an ordered sequence by applying specific rules. (MIL/C) [2], [85], [20]
**(2) (A) (data management)** To arrange items according to a specified order of their sort keys. For example, to arrange the records of a personnel file into alphabetical sequence using the sort key "Employee-name." *See also:* radix sort; internal sort; distribution sort; merge sort; exchange sort; selection sort; insertion sort; external sort. **(B) (data management)** To segregate items into subsets according to specified criteria. **(C) (data management)** A process that achieves the arrangement or segregation described in definition (A) or (B). (C) 610.5-1990

**sort by merging (data management)** To sort the items of a set by splitting the set into subsets, sorting the subsets, and merging the subsets. *Synonym:* sequence by merging. *See also:* order-by-merging. (C) 610.5-1990w

**sorter (1)** A person, device, or computer routine that sorts. (C) [20], [85]
**(2) (data management)** A mechanical device that deposits punched cards in pockets based on the hole patterns in the cards. (C) 610.5-1990w
**(3)** *See also:* card sorter. (C) 610.10-1994w

**sorting item (A)** That item of a set that is actively being exchanged or manipulated with other elements during the sorting process. *See also:* sort selection. **(B)** Any element of a set that has a probability of being selected by a sort selection. (C) 610.5-1990

**sorting rewind time** In a tape merge sort, the length of time needed to rewind a tape to its original position. (C) 610.5-1990w

**sorting-sequencing key** *See:* sort key.

**sorting string** A string of characters used as a sort key. (C) 610.5-1990w

**sort key** A key field whose value is used to determine the position of items within a sorted set. *Synonyms:* sorting-sequencing key; sequencing key. *See also:* sorting string; sort. (C) 610.5-1990w

**sort order*** *See:* order.

* Deprecated.

**sort pass (A)** In a sorting algorithm, a single processing of all the items of a set. **(B)** A phase of a merge sort that reads a subset of unsorted data items, orders them, and places the ordered subset on a data medium. This process is repeated until all input data is placed in some subset. The merge phase is then begun to merge the subsets into one ordered set. (C) 610.5-1990

**sort selection (A)** The choice of a particular sorting algorithm. **(B)** The process of choosing an item to be exchanged with another item as part of a selection sorting process. *See also:* sorting item. (C) 610.5-1990

**SOS** *See:* radio distress signal.

**sound (A)** An oscillation in pressure, stress, particle displacement, particle velocity, etc., in a medium with internal forces (for example, elastic, viscous), or the superposition of such propagated oscillations. **(B)** An auditory sensation evoked by the oscillation described above. *Note:* In case of possible confusion, the term sound wave or elastic wave may be used for concept (A) and the term sound sensation for concept (B). Not all sound waves can evoke an auditory sensation, for example, an ultrasonic wave. 2. The medium in which the sound exists is often indicated by an appropriate adjective, for example, air-borne, water-borne, structure-borne. (SP) [32]

**sound absorption (A)** The change of sound energy into some other form, usually heat, in passing through a medium or on striking a surface. **(B)** The property possessed by material and objects, including air, of absorbing sound energy. (SP) [32]

**sound-absorption coefficient (surface)** The ratio of sound energy absorbed or otherwise not reflected by the surface, to the sound energy incident upon the surface. Unless otherwise specified, a diffuse sound field is assumed. (SP) [32]

**sound analyzer** A device for measuring the band pressure level, or pressure spectrum level, of a sound at various frequencies. *Notes:* 1. A sound analyzer usually consists of a microphone, an amplifier and wave analyzer, and is used to measure amplitude and frequency of the components of a complex sound. 2. The band pressure level of a sound for a specified frequency band is the effective root-mean-square sound pressure level of the sound energy contained within the bands. *See also:* instrument. 157-1951w

**sound articulation (percent sound articulation)** The percent articulation obtained when the speech units considered are fundamental sounds (usually combined into meaningless syllables). *See also:* volume equivalent. (PE/EEC) [119]

**sound buoy (navigation aid terms)** A buoy equipped with a characteristic sound signal. *See also:* buoy. (AES/GCS) 172-1983w

**sound-detection system (protective signaling)** A system for the protection of vaults by the use of sound-detecting devices and relay equipment to pick up and convert noise, caused by burglarious attack on the structure, to electric impulses in a protection circuit. *See also:* protective signaling. (EEC/PE) [119]

**sound-effects filter (electroacoustics)** A filter used to adjust the frequency response of a system for the purpose of achieving special aural effects. *See also:* filter. (SP) 151-1965w

**sound energy** Of a given part of a medium, the total energy in this part of the medium minus the energy that would exist in the same part of the medium with no sound waves present. (SP) [32]

**sound field** A region containing sound waves. (SP) [32]

**sounding, active** *See:* active sounding.

**sound intensity (1) (power station noise control)** The average rate of sound energy radiated by a source per unit time. (PE/EDPG) 640-1985w

**(2) (sound-energy flux density) (sound power density)** (in a specified direction at a point) The average rate of sound energy transmitted in the specified direction through a unit area normal to this direction at the point considered. *Notes:* 1. The sound intensity in any specified direction a of a sound field is the sound-energy flux through a unit area normal to that direction. This is given by the expression

$$I_a = \frac{1}{T}\int_0^T p v_a \mathrm{d}t$$

where

$T$ = an integral number of periods or a long time compared to a period
$p$ = the instantaneous sound pressure
$v_a$ = the component of the instantaneous particle velocity in the direction $a$
$t$ = time

2. In the case of a free plane or spherical wave having an effective sound pressure, $p$, the velocity of propagation $c$, in a medium of density $\rho$, the intensity in the direction of propagation is given by

$$I = \frac{p^2}{\rho c}$$

(SP) [32]

**sound level (1) (measurement of sound pressure levels of ac power circuit breakers)** Weighted sound pressure level obtained by the use of a metering characteristic and the weightings A, B, C (or other) as specified. The weighting used must be indicated. (SWG/PE) C37.100-1992, C37.082-1982r

**(2) (overhead power lines)** A weighted sound pressure level, obtained by the use of metering characteristics and the weightings A, B, C, or D specified in ANSI S1.4-1983. The weightings employed must always be stated. The reference pressure is always 20 μPa. *Notes:* 1. The meter reading (in decibels) corresponds to a value of the sound pressure integrated over the audible frequency range with a specified frequency weighting and integration time. 2. A suitable method of stating the weighting is, for example, "The A-weighted sound level was 43 dB," or "The sound level was 490 dB (A)." 3. Weightings are based on psychoacoustically determined time or frequency responses in objective measuring equipment. This is done to obtain data that better predict the subjective listener reaction than would wide-band measurements with a meter having either an instantaneous time response or a slow average or rms response. (T&D/PE) 539-1990

**sound level, A-weighted** *See:* A-weighted sound level.

**sound-level meter** An instrument including a microphone, an amplifier, an output meter, and frequency-weighting networks for the measurement of noise and sound levels in a specified manner. *Notes:* 1. The measurements are intended to approximate the loudness level of pure tones that would be obtained by the more-elaborate ear balance method. 2. Loudness level in phons of a sound is numerically equal to the sound pressure level in decibels relative to 0.0002 μbar of a simple tone of frequency 1000 Hz that is judged by the listeners to be equivalent in loudness. 3. Specifications for sound-level meters are given in American National Standard Specification for Sound-Level Meters, S1.4-1971 (or latest revision thereof). *See also:* instrument. (SP) [32]

**sound power (power station noise control)** The total sound energy radiated by a source per unit time. (PE/EDPG) 640-1985w

**sound power level ($L_w$) (1) (airborne sound measurements on rotating electric machinery)** The sound power level, in

decibels, is equal to 10 times the logarithm to the base 10 of the ratio of a given power to the reference power, $10^{-12}$ W.

$$L_W = 10\log_{10}\left(\frac{W}{W_0}\right)$$

where
$L_w$ = sound power level
$W$ = measured sound power in watts
$W_0$ = reference power

(PE/EM) 85-1973w

**(2)** (in decibels) Ten times the logarithm to the base ten of the emitted sound power ($w$) to the reference power of $10^{-12}$ W, ($w_o$), or

$$L_W = 10 \times \log_{10}\left(\frac{W}{W_0}\right)$$

(PE/TR) C57.12.90-1999

**sound power level, A-weighted** *See:* A-weighted sound power level.

**sound pressure (1) (power station noise control)** The instantaneous pressure measured in a sound wave, that is, the variation in atmospheric pressure. (PE/EDPG) 640-1985w

**(2) (transmission performance of telephone sets)** The sound pressure at a point, is the total instantaneous pressure at that point, in the presence of a sound wave, minus the static pressure at that point. (COM/TA) 269-1983s

**sound pressure, effective** *See:* effective sound pressure.

**sound pressure, instantaneous** *See:* instantaneous sound pressure.

**sound pressure level (1) (overhead power lines)** Twenty times the logarithm to the base 10 of the ratio of the pressure of a sound to the reference pressure, expressed in decibels. The reference pressure shall be explicitly stated. *Notes:* 1. The following reference pressures are in common use: 20 micropascals (μPa), and (2) 0.1 pascal (Pa). Reference pressure (A) is in general use for measurements concerned with hearing and with sound in air and liquids, while reference pressurehas gained widespread acceptance for calibration of transducers and various kinds of sound measurements in liquids. 2. Unless otherwise explicitly stated, it is to be understood that the sound pressure is the effective (rms) sound pressure. 3. It is to be noted that in many sound fields the sound pressure ratios are not the square roots of the corresponding power ratios.

(SWG/T&D/PE) 539-1990, C37.082-1982r

**(2)** The sound pressure level, in decibels, of a sound is 20 times the logarithm to the base 10 of the ratio of the pressure of this sound to the reference pressure.

(COM/TA) 269-1992, 1206-1994

**(3)** Twenty times the logarithm to the base 10 of the ratio of the pressure of a sound to the reference sound pressure. Unless otherwise specified, the effective rms pressure to be used. The reference sound pressure is 20 μPa. Unit: decibel (dB).

(SWG/PE) C37.100-1992

**(4)** [in decibels (dB)] Twenty times the logarithm to the base 10 of the ratio of the measured sound pressure ($p$) to a reference pressure ($p_o$) of 20 (μPa), or

$$L_p = (20 \times \log_{10})\frac{p}{p_o}$$

(PE/TR) C57.12.90-1993s

**(5)** Twenty times the logarithm to the base 10 of the ratio of the pressure of the sound to the reference pressure. The reference pressure is normally 1 Pascal (Pa), and sound pressure levels are expressed in dB re 1 Pa (dBPa). When a reference pressure of 20 μPa is used, the sound pressure level will be expressed as dBSPL. Unless otherwise indicated, rms values of pressure are used. Most telephony acoustic measurements are referenced to 1 Pa. However, measurements such as receive noise and room noise are generally referenced to 20 uPa. *Note:* 0 dB Pa = 94 dBSPL, 0 dBSPL = 20 μPa, 1 Pa = 1 $N/m^2$. An A-weighted sound pressure level in dB (dBSPL, A-weighted) is often abbreviated as dBA or dB(A).

(COM/TA) 1329-1999

**sound probe** A device that responds to some characteristic of an acoustic wave (for example, sound pressure, particle velocity) and that can be used to explore and determine this characteristic in a sound field without appreciably altering the field. *Note:* A sound probe may take the form of a small microphone or a small tubular attachment added to a conventional microphone. *See also:* instrument. (SP) [32]

**sound recording system** A combination of transducing devices and associated equipment suitable for storing sound in a form capable of subsequent reproduction. *See also:* phonograph pickup. (SP) [32]

**sound reflection coefficient (surface)** The ratio of the sound reflected by the surface to the sound incident upon the surface. Unless otherwise specified, reflection of sound energy in a diffuse sound field is assumed. (SP) [32]

**sound reproducing system** A combination of transducing devices and associated equipment for reproducing recorded sound. (SP) [32]

**sound spectrum analyzer (sound analyzer)** A device or system for measuring the band pressure level of a sound as a function of frequency. (SP) [32]

**sound tract (electroacoustics)** A band that carries the sound record. In some cases, a plurality of such bands may be used. In sound film recording, the band is usually along the margin of the film. *See also:* phonograph pickup. (SP) [32]

**sound transmission coefficient (interface or partition)** The ratio of the transmitted to incident sound energy. Unless otherwise specified, transmission of sound energy between two diffuse sound fields is assumed. (SP) [32]

**source (1) (laser maser)** Taken to mean either laser of laser-illuminated reflecting surface. (LEO) 586-1980w

**(2) (metal-nitride-oxide field-effect transistor)** Region in the device structure of an insulated-gate-field-effect transistor (IGFET) which contains the terminal from which charge carries flow into channel toward the drain. It has the potential which is less attractive than the drain for the carriers in the channel. (ED) 581-1978w

**(3)** The node that creates a send or echo packet. The source nodeId is contained in the third symbol of the packet.

(C/MM) 1596-1992

**(4)** A generator of normal characters at a link interface. *See also:* normal character. (C/BA) 1355-1995

**(5)** The specification of a source distribution object for a software administration utility. The source host provides a means to locate the source role and the source path is a path accessible to the source host. (C/PA) 1387.2-1995

**(6)** A node that initiates a bus transfer.

(C/MM) 1394-1995

**(7)** The start of a delay arc; that is, the origin of the logic signal. For arcs across cell instances, the source is the receiver pin; for arcs across interconnect, the source is the driver pin.

(C/DA) 1481-1999

**source address (SA) (1)** The address of a device or storage location from which data is to be transferred. *Contrast:* destination address; destination.

(C) 610.12-1990, 610.10-1994w

**(2) (local area networks)** A field in the message packet format identifying the sending end node. (C) 8802-12-1998

**source, calibrated** *See:* calibrated source.

**source, check** *See:* check source.

**source code (1)** Computer instructions and data definitions expressed in a form suitable for input to an assembler, compiler, or other translator. *Note:* A source program is made up of source code. *Contrast:* object code. (C) 610.12-1990

**(2)** When dealing with the Shell Command Language, source code is input to the command language interpreter; the term *shell script* is synonymous with this meaning. When dealing with the C-Language Bindings Option, source code is input to a C compiler conforming to the C Standard. When dealing with another ISO/IEC conforming language, source code is input to a compiler conforming to that ISO/IEC standard. Source code also refers to the input statements prepared for

the following standard utilities: `awk`, `bc`, `ed`, `lex`, `localedef`, `make`, `sed`, and `yacc`. Source code can also refer to a collection of sources meeting any or all of these meanings. (C/PA) 9945-2-1993

**(3)** A piece of software that has not yet been compiled or assembled, and appears in the language used by the programmer, and thus cannot yet run on a machine. (PE/SUB) 1379-1997

**source code generator** *See:* code generator.

**source data card** A data card which contains manually or mechanically recorded data that are to be subsequently punched into the same card. (C) 610.10-1994w

**source document** A document containing information that is to be input to a computer. For example, an original invoice, a library charge-out card, or a machine-readable document. (C) 610.2-1987

**source domain** The MD that supplies a piece of trace information. (C/PA) 1224.1-1993w

**source efficiency (fiber optics)** The ratio of emitted optical power of a source to the input electrical power. (Std100) 812-1984w

**source ground (signal-transmission system)** Potential reference at the physical location of a source, usually the signal source. *See also:* signal. (IE) [43]

**source host** The host portion of a source specification. (C/PA) 1387.2-1995

**source impedance (1)** The impedance presented by a source of energy to the input terminals of a device, or network. *See also:* self-impedance; network analysis; input impedance. (SP/IM/HFIM) 151-1965w, [40]

**(2)** The Thevenin equivalent impedance of an electrical system at the terminal of a transmission line. In network applications, this impedance can vary depending on the location of the fault on the transmission line and the status (i.e., opened or closed) of other terminals associated with the transmission line. (PE/PSR) C37.113-1999

**(3)** The source impedance is defined to begin at the power source termination and end at the power source return termination. Hence, all cabling is included in the source impedance. The cables and interconnects used in the system should be used during test. Line impedance stabilization networks (LISNs) may be used in series with each input line to provide a uniform standard for source impedance. Different LISNs may be used for different test applications to test the UUT. (PEL) 1515-2000

**source language (software)** The language in which the input to a machine-aided translation process is represented. For example, the language used to write a computer program. *Contrast:* target language. (C) 610.2-1987, 610.12-1990

**source/load impedance (loudness ratings of telephone connections)** The source/load impedance used for determining loudness ratings is considered to be 900 Ω resistive. *See also:* source impedance; load impedance. (COM/TA) 661-1979r

**source node (1) (network analysis)** A node having only outgoing branches. (CAS) 155-1960w

**(2)** A terminal node which originates data. *See also:* destination node. (C/BA) 1355-1995

**source of fault current** A terminal that contributes a significant amount of current to a fault on the protected line. Note that it is not necessary for generation to be connected to a terminal for it to be a source of fault current. For instance, large synchronous motor loads can contribute significant amounts of fault current for a few cycles within the duration of fault clearing. Transformers can also be a significat source of zero-sequence currents to unbalanced faults involving ground if they have winding with a grounded neutral connected to the line, and also have a delta or zig-zag winding. (PE/PSR) C37.113-1999

**source path** The pathname portion of a source specification. (C/PA) 1387.2-1995

**source program (software)** A computer program that must be compiled, assembled, or otherwise translated in order to be executed by a computer. *Contrast:* object program. (C) 610.12-1990

**source quench** In networking, a method for controlling congestion in which a device detects the congestion and requests that the source stop transmitting. *See also:* fair queuing. (C) 610.7-1995

**source, radioactive** *See:* radioactive source.

**source, radioactivity standard** *See:* radioactivity standard source.

**source resistance** The resistance presented to the input of a device by the source. *See also:* measurement system. (EEC/EMI) [112]

**source resistance rating** The value of source resistance that, when injected in an external circuit having essentially zero resistance, will either double the dead band or shift the dead band by one-half its width. *See also:* measurement system. (EEC/EMI) [112]

**source role** Where the software exists in a form suitable for distribution, forming a context for the establishment of a repository of software from which the manager may choose to distribute to targets. Software exists in the source until it is removed by a task initiated by the manager. The source role provides a repository where software may be stored and provides access for those roles that require the software. (C/PA) 1387.2-1995

**source routing (1)** A bridging technique where frames contain the list of bridges and networks that must be traversed for the frame to reach the destination. In this scheme, the transmitter must know the route to the destination before sending the frame. *Contrast:* spanning tree. (C) 610.7-1995

**(2)** A mechanism to route frames through a bridged LAN. Within the source routed frame, the station specifies the route that the frame will traverse. (C/LM) 8802-5-1998

**(3)** The capability for a source to specify the path that a frame will use to traverse the bridged network. (C/LM/CC) 8802-2-1998

**Source Routing Transparent (SRT)** The bridging technology defined by ISO/IEC 10038:1993, annex C, as an extension to the transparent bridging rules allowing the source station to specify the path through the bridged network (source routing). (C/LM/CC) 8802-2-1998

**source segment** In a hierarchical database, a segment that contains the data used to construct a secondary index. (C) 610.5-1990w

**source/sink device** Source devices originate signals, whereas sink devices terminate signals. Examples of source/sink devices include channel banks and digital crossconnect systems. (COM/TA) 1007-1991r

**source statements (SS)** The encoded logic of the software product. (C/SE) 1045-1992

**source-to-line impedance ratio (SIR)** The ratio of the source impedance behind a relay terminal to the line impedance. (PE/PSR) C37.113-1999

**SP** *See:* space character.

**SPA** *See:* scratchpad area.

**space (1) (data transmission)** One of the two possible conditions of an element (bit); an open line in a neutral circuit. In Morse code, a duration of two unit intervals between characters and six unit intervals between words. (PE) 599-1985w

**(2) (A)** To advance the reading or display position according to a prescribed format. **(B) (data management)** A site intended for the storage of data such as a location in a storage medium. **(C) (data management)** A basic unit of area such as the size of a single character. **(D) (data management)** One or more space characters. (C) [20], 610.5-1990

**(3)** The absence of a signal; for example, in data communications, the "zero's" state. *Contrast:* mark. (C) 610.10-1994w

**(4)** The lighter element of a bar code—usually formed by the background between the darker elements of the bar code. (PE/TR) C57.12.35-1996

⟨space⟩ The character defined as ⟨space⟩. The ⟨space⟩ character is a member of the space character class of the current locale, but represents the single character and not all of the possible members of the class. (C/PA) 9945-2-1993

**space character (1)** A graphic character that is usually represented by a blank site in a series of graphics. The space character, though not a control character, has the function equivalent to that of a format effector that causes the print or display position to move one position forward without producing the printing or display of any graphic. Similarly, the space character may have a function equivalent to that of an information separator. *See also:* null character; space. (C) 610.5-1990w

**(2)** A byte (hex 20) used in text strings that represents a space. (C/MM) 1284.1-1997

**space charge (1) (general)** A net excess of charge of one sign distributed throughout a specified volume. (ED) 161-1971w

**(2) (thermionics)** Electric charge in a region of space due to the presence of electrons and/or ions. *See also:* electron emission. (ED) 161-1971w

**space-charge-control tube** *See:* density-modulated tube.

**space-charge debunching** Any process in which the mutual interactions between electrons in the stream disperse the electrons of a bunch. (ED) 161-1971w

**space-charge density (thermionics)** The space charge per unit volume. *See also:* electron emission. (ED) 161-1971w

**space-charge filter (A)** A device used to measure net space-charge density in which a filter medium is used to remove the charge from an air stream. **(B)** A device, used to measure net space-charge density, in which a filter medium is used to remove the charge from an airstream. (T&D/PE) 1227-1990, 539-1990

**space-charge–free electric field** The electric field due to a system of energized electrodes, excluding the effect of space charge present in the interelectrode space. (T&D/PE) 539-1990

**space-charge generation (1) (germanium gamma-ray detectors) (charged-particle detectors) (x-ray energy spectrometers) (semiconductor radiation detectors)** The thermal generation of free charge carriers in the space-charge region. (NPS/NID) 759-1984r, 301-1976s, 300-1988r

**(2)** (in a semiconductor radiation detector) The thermal generation of free charge carriers in the depletion region. (NPS) 325-1996

**space-charge grid** A grid, usually positive, that controls the position, area, and magnitude of a potential minimum or of a virtual cathode in region adjacent to the grid. *See also:* electrode; grid. (ED) 161-1971w

**space-charge-limited current (electron vacuum tubes)** The current passing through an interelectrode space when a virtual cathode exists therein. *See also:* electrode current. (ED) 161-1971w

**space-charge perturbation of the electric field in the interelectrode space** A change in the electric field caused by the presence of space charge in the interelectrode space. *Note:* The electric field at ground level under dc transmission lines is generally increased due to the presence of monopolar space charge having the same polarity as the nearest conductor. This increase is generally termed "field enhancement." (T&D/PE) 539-1990

**space-charge region (1) (x-ray energy spectrometers) (charged-particle detectors)** (of a semiconductor radiation detector) A region in which the net charge density is significantly different from zero. *See also:* depletion region. (NPS/ED/NID) 759-1984r, 216-1960w, 301-1976s, 300-1988r

**(2)** *See also:* depletion region. (NPS) 325-1996

**space correction** A method of register control that takes the form of a sudden change in the relative position of the web. (IA/ICTL/IAC) [60]

**spacecraft (communication satellite)** Any type of space vehicle, including an earth satellite or deep-space probe, whether manned or unmanned, and also rockets and high-altitude balloons which penetrate the earth's outer atmosphere. (COM) [19]

**space current (electron tube)** Synonym in a diode or equivalent diode of cathode current. *See also:* electrode current; leakage current; load current; quiescent current. (ED) [45], [84]

**space diversity** *See:* space diversity reception.

**space diversity reception (data transmission)** That form of diversity reception that utilizes receiving antennas placed in different locations. (PE) 599-1985w

**space-division digital switching (telephone switching systems)** Digital switching with separate paths for each call. (COM) 312-1977w

**space-division switching (1) (telephone switching systems)** A method of switching that provides a separate path for each of the simultaneous calls. (COM) 312-1977w

**(2)** A circuit-switching method in which each connection through the switch takes a physically separate and dedicated path. *See also:* circuit switching; message switching; time multiplexed switching. (C) 610.7-1995

**space factor (rotating machinery)** The ratio of the sum of the cross-sectional areas of the active or specified material to the cross-sectional area within the confining limits specified. *See also:* asynchronous machine; slot space factor. (PE) [9]

**space, head** *See:* head space.

**space heater (1)** A heater that warms occupied spaces. (PE) [9]

**(2) (rotating machinery)** A device that warms the ventilating air within a machine and prevents condensation of moisture during shut-down periods. (PE) [9]

**space pattern (television)** A geometrical pattern on a test chart designed for the measurement of geometric distortion. (BT) 202-1954w

**space potential** The electric potential at any point in space relative to some reference potential, usually ground. It is the electric potential difference between the reference point and the point in question. (T&D/PE) 539-1990

**space probe (communication satellite)** A spacecraft with a trajectory extending into deep space. (COM) [19]

**spacer (insulators)** An insulator used to support the inner conductor in the enclosure. (SUB/PE) C37.122-1993, C37.122.1-1993

**spacer buggy** *See:* conductor car.

**spacer cable** A type of electric supply line construction consisting of an assembly of one or more covered conductors, separated from each other and supported from a messenger by insulating spacers. (NESC) C2-1997

**spacer cart** *See:* conductor car.

**space-referenced navigation data (navigation aids)** Data in terms of a coordinate system referenced to inertial space. (AES/GCS) 172-1983w

**spacer insulator** As used in a gas-insulated system an insulator used to support the inner conductor in the enclosure. (SWG/SUB/PE) C37.122-1983s, C37.100-1992

**spacer shaft (rotating machinery)** A separate shaft connecting the shaft ends of two machines. *See also:* armature. (PE) [9]

**space, state** *See:* state space.

**space-tapered array antenna** An array antenna whose radiation pattern is shaped by varying the density of driven radiating elements over the array surface. *Synonym:* density-tapered array antenna. (AP/ANT) 145-1993

**space-time adaptive processing (STAP)** In airborne moving-target indication (MTI), a method of processing that compensates for the adverse effects of platform motion by adaptively

placing antenna nulls in the directions of large clutter echoes and/or large noise or jamming sources. *Note:* It simultaneously employs the signals received from the multiple elements of an adaptive phased array antenna (spatial domain) and the signals from multiple pulse repetition periods (time domain) to provide adaptive processing in both the time and spatial domains. (AES) 686-1997

**spacing (data transmission)** A term which originated with telegraph to indicate an open key condition. Present usage implies the absence of current or carrier on a circuit. It also indicates the binary digit 0 in computer language. (PE) 599-1985w

**spacing bicycle** *See:* conductor car.

**spacing pulse (data transmission)** A spacing pulse or space is the signal pulse that, in direct-current neutral operation, corresponds to a circuit open or no current condition. *See also:* pulse. (COM) [49]

**spacing wave (telegraph communication)** (back wave) The emission that takes place between the active portions of the code characters or while no code characters are being transmitted. *See also:* radio transmitter. (AP/ANT) 145-1983s

**spalling** Spontaneous separation of a surface layer from a metal. (IA) [59]

**span (measuring devices)** The algebraic difference between the upper and lower values of a range. *Notes:* 1. For example:

a) Range 0 to 150, span 150;
b) Range −20 to 200, span 220;
c) Range 20 to 150, span 130;
d) Range −100 to −20, span 80.

2. The following compound terms are used with suitable modifications in the units: measured variable span, measured signal span, etc. 3. For multirange devices, this definition applies to the particular range that the device is set to measure. *See also:* instrument. (EEC/EMI) [112]

**(2) (A) (overhead conductors)** The horizontal distance between two adjacent supporting points of a conductor. **(B) (overhead conductors)** That part of any conductor, cable, suspension strand, or pole line between two consecutive points of support. *See also:* cable. (T&D/PE) [10]

**span frequency-response rating** The maximum frequency in cycles per minute of sinusoidal variation of measured signal for which the difference in amplitude between output and input represents an error no greater than five times the accuracy rating when the instrument is used under rated operating conditions. The peak-to-peak amplitude of the sinusoidal variation of measured signal shall be equivalent to full span of the instrument. It must be recognized that the span frequency-response rating is a measure of dynamic behavior under the most adverse conditions of measured signal (that is, the maximum sinusoidal excursion of the measured signal). The frequency response for an amplitude of measured signal less than full span is not proportional to the frequency response for full span. The relationship between the frequency response of different instruments at any particular amplitude of measured signal is not indicative of the relationship that will exist at any other amplitude. *See also:* accuracy rating. (EEC/EMI) [112]

**span length** The horizontal distance between two adjacent supporting points of a conductor. (NESC) C2-1997

**spanned record** A record that is partially contained in more than one block; that is, it spans a block boundary. *See also:* unblocked record; blocked record. (C) 610.5-1990w

**spanning tree** A bridging technique where a network of randomly interconnected bridges can automatically build a logical tree structure so as to guarantee a unique path between any pair of stations on the network. In this scheme, the transmitter does not have to know how to route the frame to the destination; that is the job of the bridges. *Contrast:* source routing. (C) 610.7-1995

**spanning tree algorithm** The abstract distributed algorithm that determines the active topology of an ISO/IEC 10038 Bridged Local Area Network. (C/LM) 802.1G-1996

**spanning tree explorer (STE)** A type of source-routed frame that will traverse the network following the spanning tree path created by the transparent bridging rules. (C/LM/CC) 8802-2-1998

**spanning tree protocol** The protocol that MAC Bridges use in exchanging information across Local Area Networks, in order to compute the active topology of a Bridged Local Area Network in accordance with the Spanning Tree Algorithm. (C/LM) 802.1G-1996

**spanning tree route (STR)** A term used to denote the configuration of transparent bridges such that every segment is connected to the root of the network through exactly one path. A frame sent without routing information (NSR) traverses the network on the spanning tree path according to the rules for transparent bridging. A frame sent with a routing type of STE is forwarded through the network on the spanning tree path, but is forwarded by the rules for SRT bridges (note that a bridge that does not support source routing will not forward STE frames). (C/LM/CC) 8802-2-1998

**span, ruling** *See:* ruling span.

**span, sag** *See:* sag span.

**span step-response-time rating** The time that the step-response time will not exceed for a change in measured signal essentially equivalent to full span when the instrument is used under rated operating conditions. The actual span step-response time shall not be less than 2/3 of the span step-response-time rating. (For example, for an instrument of 3-second span step-response-time rating, the span step-response time, under rated operating conditions, will be between 3 and 2 seconds.) It must be recognized that the step-response time for smaller steps is not proportional to the step-response time for full span. *Note:* The end device shall be considered to be at rest when it remains within a band of plus and minus the accuracy rating from its final position. *See also:* accuracy rating. (EEC/EMI) [112]

**span wire** An auxiliary suspension wire that serves to support one or more trolley contact conductors or a light fixture and the conductors that connect it to a supply system. (NESC) C2-1997

**spare** This record is unused at this time. It is reserved for expansion of the standard. (NPS/NID) 1214-1992r

**spare_cell** A cell instance that is presently not part of the logical function of a design, and therefore is not included in the design's logical netlist. A spare_cell is typically reserved for future logic modifications to be implemented through changes in the interconnect layers of the chip. (C/DA) 1481-1999

**spare equipment** Equipment complete or in parts, on hand for repair or replacement. *See also:* reserve equipment. (T&D/PE) [10]

**spare only point interface** Point for which cabinet space only is provided for the future addition of wiring and other necessary plug-in equipment. (SUB/PE) C37.1-1994

**spare point** (for supervisory control or indication or telemeter selection) A point that is not being utilized but is fully equipped with all of the necessary devices for a point. (SWG/PE) C37.100-1992

**spare point interface** Point equipment that is not being utilized but is fully wired and equipped. (SUB/PE) C37.1-1994

**spark (overhead-power-line corona and radio noise)** A sudden and irreversible transition from a stable corona discharge to a stable arc discharge. It is a luminous electrical discharge of short duration between two electrodes in an insulating medium. It is generally brighter and carries more current than corona, and its color is mainly determined by the type of insulating medium. It generates radio noise of wider frequency spectrum (extending into hundreds of megahertz) and wider magnitude range than corona. A spark is not classified as corona. (T&D/PE) 539-1990

**spark capacitor** A capacitor connected across a pair of contact points, or across the inductance that causes the spark, for the purpose of diminishing sparking at these points. *Note:* The

use of the term "spark condenser" for the term spark capacitor is deprecated. (PE) [9]

**spark condenser*** *See:* spark capacitor.
* Deprecated.

**spark gap (1)** An air dielectric between two electrodes that may be a combination of several basic shapes that is used to protect telecommunication circuits from damage due to voltage stress in excess of their dielectric capabilities. It may or may not be adjustable. (PE/PSC) 487-1992
**(2)** Any short-air space between two conductors electrically insulated from or remotely electrically connected to each other. (PE/T&D/NFPA) 1410-1997, [114]

**spark-gap converter, mercury-hydrogen** *See:* mercury-hydrogen spark-gap converter.

**spark-gap modulation** A modulation process that produces one or more pulses or energy by means of a controlled spark-gap breakdown for application to the element in which modulation takes place. *See also:* oscillatory circuit. (AP/ANT) 145-1983s

**spark gaps (wire-line communication facilities)** Spark gaps consist of air dielectric between two electrodes which may be a combination of several basic shapes. Spark gaps are used to protect communication circuits from damage due to voltage stress in excess of their dielectric capabilities. (PE/PSC) 487-1980s

**spark killer** An electric network, usually consisting of a capacitor and resistor in series, connected across a pair of contact points, or across the inductance that causes the spark, for the purpose of diminishing sparking at these points. *See also:* network analysis. (EEC/PE) [119]

**sparkover (1)** A disruptive discharge between electrodes in a gas or liquid. (PE/PSIM) 4-1995
**(2)** A disruptive discharge between electrodes of a measuring gap, voltage-control gap, or gap-type protective device. (SPD/PE) C62.11-1999
**(3)** A disruptive discharge between electrodes of a measuring gap, voltage-control gap, or protective device. (SPD/PE) C62.62-2000

**spark-plug suppressor** A suppressor designed for direct connection to a spark plug. *See also:* electromagnetic compatibility. (EMC) [53]

**spark transmitter** A radio transmitter that utilizes the oscillatory discharge of a capacitor through an inductor and a spark gap as the source of its radio-frequency power. *See also:* radio transmitter. (AP/BT/ANT) 145-1983s, 182-1961w

**sparse data scan (SDS)** A technique by which arrays of modules with low data occupancy may be scanned efficiently, i.e, without accessing every potential data site. (NID) 960-1993

**sparse medium** A medium with a low volume fraction of discrete objects, typically less than 1%. In such a medium, multiple scattering is negligibly small. *See also:* homogeneous dense medium; inhomogeneous dense medium. (AP/PROP) 211-1997

**spatial average** The root mean square of the field over an area equivalent to the vertical cross section of the adult human body, as applied to the measurement of electric or magnetic fields in the assessment of whole-body exposure. The spatial average is measured by scanning (with a suitable measurement probe) a planar area equivalent to the area occupied by a standing adult human (projected area). In most instances, a simple vertical, linear scan of the fields over a 2 m height (approximately 6 ft), through the center of the projected area, will be sufficient for determining compliance with the maximum permissible exposures (MPEs). (NIR) C95.1-1999

**spatial coherence (1) (laser maser) (electromagnetic)** The correlation between electromagnetic fields at points separated in space. *See also:* coherence area. (LEO) 586-1980w
**(2) (fiber optics)** *See also:* coherent. 812-1984w

**spatial disturbance (diode-type camera tube)** In the output signal from a television camera consists of a broad variety of spurious signals, some of which are observable when no optical input is present, while others are input-level dependent. Spatial disturbances are characterized as either independent of time or as having a temporal variation long with respect to a frame interval, provided the operating conditions, including position and temperature, remain fixed. Tolerance for spatial distrubance covers a broad range, depending upon the application. Cosmetic considerations ultimately reduce to a cost decision. Spurious signals have been classified in the following categories:

a) (Fixed pattern) This is a modulation of a uniform background which may be either spatially periodic or random.
b) (Shading) This consists of a broad area continuous variation in the background signal, with or without an optical input. The signal corresponding to uniform irradiance is either curved or tilted, causing a brightness variation in the display.
c) (Moire) This is a periodic amplitude modulation in the output which is not present in the input, usually due to the interaction of two or more periodic tube elements such as the field mesh, scanning raster, and target.
d) (Blemishes) These are bright or dark spots or streaks whose effect is equivalent to viewing the scene through a dirty window. Blemishes affect limited portions of the raster.
e) (Geometric distortion) This includes any skewing, bending, displacement or rotation of the image. It can be localized or include the entire raster.

*See also:* image storage. (ED) 503-1978w

**spatial locality** The tendency for a program to reference closely related clusters of memory addresses over short time intervals. (C/BA) 10857-1994

**spatially aligned bundle** *See:* aligned bundle.

**spatially coherent radiation** *See:* coherent.

**SPCS** *See:* stored program control.

**SPD** *See:* surge-protective device.

**special addition*** *See:* double-precision addition.
* Deprecated.

**special-billing call (telephone switching systems)** A call charged to a special number. (COM) 312-1977w

**special character (character set)** A character that is neither a numeral, a letter, nor a blank, for example, virgule, asterisk, dollar sign, equals sign, comma, period. (C) [20], [85]
**(2) (A) (data management)** A character that is not in the alphabet, but that is used for punctuation or another special purpose. For example, blank, comma, period, or asterisk. **(B) (data management)** A graphic character in a character set that is not a letter, not a digit, and not a space character. **(C) (data management)** In COBOL, a character that is neither numeric nor alphabetic. (C) 610.5-1990

**special color rendering index (illuminating engineering)** Measure of the color shift of various standardized special colors including saturated colors, typical foliage, and Caucasian skin. It also can be defined for other color samples when the spectral reflectance distributions are known. (EEC/IE) [126]

**special combination protective devices (wire-line communication facilities) (open-wire or hot-line protectors)** Combined isolating and drainage transformer type protectors used in conjunction with, but not limited to, horn gaps and grounding relays, are used on open-wire lines to provide protection against lightning, power contacts, or high values or induced voltage. (PE/PSC) 487-1980s

**special-date logic** Logic found in programs using specific reserved dates to trigger exceptions to normal date data processing. *Note:* The normally valid (abbreviated) date-specifiers 99-12-31 or 99-09-09 might be used as an expiration date on tape archives to mean "never expire" or the normally valid date of 00-01-01 might be used to indicate an unknown or out-of-range date, all being ambiguous reserved dates, since they conflict with actual valid date representations which, when encountered, would trigger the special-date

logic erroneously. On the other hand, unconditionally invalid date-specifiers 99-99-99 or 00-00-00 used as reserved dates would not erroneously trigger the special-date logic because such unambiguous reserved dates do not conflict with any real (valid) intrinsic dates. (C/PA) 2000.1-1999

**special-dial tone (telephone switching systems)** A tone for certain features that indicates that a customer can use his or her calling device. (COM) 312-1977w

**special function signal** A signal line in a connecting cable from a bedside communications controller (BCC) to a device communications controller (DCC) that conducts other than serial data or power. The two special function signals are $\overline{\text{SENSE/INT/SYNC-IN}}$ and $\overline{\text{SENSE/INT/SYNC-OUT}}$. Special function signals convey indications of physical connection and disconnection, use of interrupts, frame transmission, interrupt requests, and synchronization pulses. (EMB/MIB) 1073.4.1-2000

**specialId** A reserved nodeId value associated with special-send packets. (C/MM) 1596-1992

**specialize** A change by an instance from being an instance of its current class to being additionally an instance of one (or more) of the subclasses of the current subclass. A specialized instance acquires a different (lower) lowclass. *Contrast:* respecialize; unspecialize. (C/SE) 1320.2-1998

**specialized common carrier (1)** A company that provides private line communications services, for example, voice, teleprinter, data, facsimile transmission. *See also:* value-added service; common carrier. (LM/COM) 168-1956w

**(2)** A common carrier providing a limited set of services. For example, only private line services. (C) 610.7-1995

**special link (SL)** A transmission system that replaces the normal medium. (C/LM) 802.3-1998

**special logic** Many programs use specific dates to trigger exceptions to normal date processing. A common example is expiration date on tape archives. Rather than adding another flag to the tape header, the date 1999-9-9 is used by many systems to mean never expire. Other dates have been used to indicate an unknown or out-of-range date. Since there is no standard for this practice, the specific dates used may be difficult to trace. The potential for dramatic failures increases in 1999 due to date code flags and various other Year 2000 problems. (C/PA) 2000.2-1999

**special parameter** In the shell command language, a parameter named by a single character from the following list:

* @ # ? ! − $ 0

(C/PA) 9945-2-1993

**special permission** The written consent of the authority having jurisdiction. (NESC/NEC) [86]

**special process (replacement parts for Class 1E equipment in nuclear power generating stations) (nuclear power quality assurance)** A process, the results of which are highly dependent on the control of the process or the skill of the operators, or both, and in which the specified quality cannot be readily determined by inspection or test of the product. (PE/NP) 934-1987w, [124]

**special-purpose computer** A computer designed to solve a restricted class of problems. *Contrast:* general-purpose computer. *See also:* incremental computer; dedicated computer. (C) [20], [85], 610.10-1994w

**special-purpose electronic test equipment** *See:* special-purpose test equipment.

**special-purpose motor** A motor with special operating characteristics or special mechanical construction, or both designed for a particular application and not falling within the definition of a general-purpose or definite-purpose motor. *See also:* direct-current commutating machine; asynchronous machine. (PE/IA/APP) [9], [82]

**special-purpose test equipment (test, measurement, and diagnostic equipment)** Equipment used for test, repair and maintenance of a specified system, subsystem or module, having application to only one or a very limited number of systems. (MIL) [2]

**special send** A packet having one of a particular set of special addresses and a special format used for initialization, such as "reset" or "clear." (C/MM) 1596-1992

**specialty transformer (power and distribution transformers)** A transformer generally intended to supply electric power for control, machine tool, Class 2, signaling, ignition, luminous-tube, cold-cathode lighting series street-lighting, low-voltage general purpose, and similar applications. See the following types of transformers: individual-lamp; series street-lighting; energy-limiting; high-reactance; non-energy-limiting; high power factor; low power factor; insultating; individual-lamp insulating; group-series loop insulating; luminous tube; ignition; series circuit lighting; signaling and doorbell; control; machine tool control; general-purpose; mercury vapor lamp (multiple-supply type); sodium vapor lamp (multiple-supply type); saturable reactor (saturable-core reactor); electronic. *See also:* secondary voltage rating; Class 2 transformer; secondary short-circuit current rating of a high-reactance transformer; IR-drop compensation transformer; kVA or volt-ampere short-circuit input rating of a high-reactance transformer; series transformer rating. (PE/TR) C57.12.80-1978r

**special unit capacity purchases (electric power supply)** That capacity that is purchased or sold in transactions with other utilities and that is from a designated unit on the system of the seller. It is understood that the seller does not provide reserve capacity for this type of capacity transaction. *See also:* generating station. (PE/PSE) [54]

**specific** With respect to a class, the attribute types that may appear in an instance of the class but not in an instance of its superclasses. (C/PA) 1328-1993w, 1224-1993w, 1327-1993w

**specific absorption (SA)** The quotient of the incremental energy ($dW$) absorbed by (dissipated in) an incremental mass ($dm$) contained in a volume ($dV$) of a given density ($\rho$).

$$SA = \frac{dW}{dm} = \frac{dW}{\rho dV}$$

The specific absorption is expressed in units of joules per kilogram (J/kg). (NIR) C95.1-1999

**specific absorption rate (SAR)** The time derivative of the incremental energy ($dW$) absorbed by (dissipated in) an incremental mass ($dm$) contained in a volume element ($dV$) of given density ($\rho$).

$$SAR = \frac{d}{dt}\left(\frac{dW}{dm}\right) = \frac{d}{dt}\left(\frac{dW}{\rho dV}\right)$$

SAR is expressed in units of watts per kilogram (W/kg). (NIR) C95.1-1999

**specific acoustic impedance (unit area acoustic impedance)** (at a point in the medium) The complex ratio of sound pressure to particle velocity. (SP) [32]

**specific acoustic reactance** The imaginary component of the specific acoustic impedance. (SP) [32]

**specific acoustic resistance** The real component of the specific acoustic impedance. (SP) [32]

**specific address** *See:* absolute address.

**specifically routed frame (SRF)** A frame sent with a routing information field that describes the exact path that the frame will take through the bridged network. (C/LM/CC) 8802-2-1998

**specification (1) (software)** A document that specifies, in a complete, precise, verifiable manner, the requirements, design, behavior, or other characteristics of a system or component, and, often, the procedures for determining whether these provisions have been satisfied. *See also:* formal specification; requirements specification; product specification. (C) 610.12-1990

**(2)** A document that prescribes, in a complete, precise, verifiable manner, the requirements, design, behavior, or characteristics of a system or system component. (C/PA) 14252-1996

**(3)** A document that fully describes a design element or its interfaces in terms of requirements (functional, performance, constraints, and design characteristics) and the qualification conditions and procedures for each requirement. (C/SE) 1220-1998

**Specification and Description Language (SDL)** A specification language for telecommunications and distributed systems that provides both textual and graphic description techniques. (C) 610.13-1993w

**specification change notice** A document used in configuration management to propose, transmit, and record changes to a specification. *See also:* engineering change; notice of revision; configuration control. (C) 610.12-1990

**specification element** A product, subsystem, assembly, component, subcomponent, subassembly, or part of the specification tree described by a specification. (C/SE) 1220-1994s

**specification language (1)** An application-oriented computer language, often a machine-processible combination of natural and formal language, used to express the requirements, design, behavior, or other characteristics of a system or component. For example, a design language or requirements specification language. *Contrast:* compiler specification language; programming language; query language. *See also:* design language. (C) 610.13-1993w, 610.12-1990

**(2)** *See also:* Rule and Constraint Language. (C/SE) 1320.2-1998

**specification, system** *See:* system specification.

**specification tree (1)** A diagram that depicts all of the specifications for a given system and shows their relationships to one another. (C) 610.12-1990

**(2)** A hierarchy of specification elements and their interface specifications that identifies the elements and the specifications related to design elements of the system configuration which are to be controlled. (C/SE) 1220-1998

**specification verification** *See:* verification.

**specific code** *See:* absolute code.

**specific coordinated methods** Those additional methods applicable to specific situations where general coordinated methods are inadequate. *See also:* inductive coordination. (EEC/PE) [119]

**specific creepage distance** For bushings for pure dc application, the specific creepage distance is the creep distance divided by the rated voltage for the DC system where the bushing is intended to be used. For bushings for combined voltage application, the specific creepage distance is the creep distance divided by Z * Vd where:

Z = number of six pulse bridges in series

$V_d$ = dc rated voltage per valve bridge.

(PE/TR) C57.19.03-1996

**specific detectivity** *See:* D*.

**specific emission** The rate of emission per unit area. (Std100) [84]

**specific heat (electric power systems in commercial buildings)** The ratio of the quantity of heat required to raise the temperature of a given mass of a substance 1° to the heat required to raise the temperature of an equal amount of water by 1°. (IA/PSE) 241-1990r

**specific inductive capacitance** *See:* relative capacitivity.

**specific intensity (*I*)** A positive real quantity $I$, in general a function of position $r$, direction $s$, frequency $f$, and time $t$, representing the quantity of power $dP$ flowing outward through an elemental area $dA$ at a particular location $r$, within an elemental solid angle $d\Omega$ containing a particular direction $s$, within a frequency interval $(f, f+df)$:

$$dP = I(r, s, f, t)s\ dA\ d\Omega\ df$$

(AP/PROP) 211-1997

**specific management functional areas** A category of systems management user requirements. (C) 610.7-1995

**specific repetition frequency (navigation aids)** (loran) One of a set of closely-spaced pulse repetition frequencies derived from the basic repetition frequency and associated with a specific set of synchronized stations. (AES/GCS) 172-1983w

**specific repetition rate** *See:* specific repetition frequency.

**specific unit capacity (power operations)** Capacity which is purchased, or sold, in transactions with other systems and which is from a designated unit on the system of the seller. (PE/PSE) 858-1987s

**specified achromatic lights (A)** Light of the same chromaticity as that having an equi-energy spectrum. **(B)** The standard illuminants of colorimetry A, B, and C, the spectral energy distributions of which were specified by the International Commission on Illumination (CIE) in 1931, with various scientific applications in view. Standard A: incandescent electric lamp of color temperature 2854 K. Standard B: Standard A combined with a specified liquid filter to give a light of color temperature approximately 4800 K. Standard C: Standard A combined with a specified liquid filter to give a light of color temperature approximately 6500 K. **(C)** Any other specified white light. *See also:* color. (BT/AV) [34], [84]

**specified breakaway torque (rotating machinery)** The torque which a motor is required to develop to break away its load from rest to rotation. (PE) [9]

**specified mechanical load (SML)** The bending moment load at which irreversible visible damage may be evident. SML is supplied from the manufacturer. (PE/SUB) 693-1997

**speckle (1)** The random distribution of intensity in space. (AP/PROP) 211-1997

**(2)** A mottled effect in coherent radar images, such as those from synthetic-aperture radar (SAR) and laser radar caused by random additive and subtractive interference of signals from individual scatterers within each resolution cell. *Note:* This is the same as target fluctuation for isolated targets. (AES) 686-1997

**speckle noise** *See:* modal noise.

**speckle pattern (fiber optics)** A power intensity pattern produced by the mutual interference of partially coherent beams that are subject to minute temporal and spatial fluctuations. *Note:* In a multimode fiber, a speckle pattern results from a superposition of mode field patterns. If the relative modal group velocities change with time, the speckle pattern will also change with time. If, in addition, differential mode attenuation is experienced, modal noise results. *See also:* modal noise. (Std100) 812-1984w

**spectral bandwidth (light-emitting diodes)** The difference between the wavelengths at which the spectral radiant intensity is 50% (unless otherwise stated) of the maximum value. The term spectral linewidth is sometimes used. (ED) [127]

**spectral brightness** (of an object) The total power radiated by an object per unit solid angle per unit projected area per unit bandwidth. *Note:* In radiative transfer theory it is called the spectral specific intensity. In infrared radiometry it is called the spectral radiance. (AP/PROP) 211-1997

**spectral characteristic (A)** (television) The set of spectral responses of the color separation channels with respect to wavelength. *Notes:* 1. The channel terminals at which the characteristics apply must be specified, and an appropriate modifier, such as pickup spectral characteristic or studio spectral characteristic may be added to the term. 2. Because of nonlinearity, some spectral characteristics depend on the magnitude of radiance used in the measurement. 3. Nonlinearizing and matrixing operations may be performed within the channels. 4. The spectral taking characteristics are uniquely related to the chromaticities of the display primaries. **(B)** (camera tube) A relation, usually shown by a graph, between wavelength and sensitivity per unit wavelength interval. **(C)** (luminescent screen) The relation, usually shown by a graph, between wavelength and emitted radiant power per unit wavelength interval. *Note:* The radiant power is commonly expressed in arbitrary units. **(D)** (phototube) A relation, usually shown by

a graph, between the radiant sensitivity and the wavelength of the incident radiant flux. (BT/AV) 201-1979

**spectral-conversion luminous gain (optoelectronic device)** The luminous gain for specified wavelength-intervals of both incident and emitted luminous flux. *See also:* optoelectronic device. (ED) [46]

**spectral-conversion radiant gain (optoelectronic device)** The radiant gain for specified intervals of both incident and emitted radiant flux. *See also:* optoelectronic device. (ED) [46]

**spectral data** The channel data are stored with the channel number at the beginning of each record. The channel number is six characters. The first channel is channel 0. The channel data is 10 characters per number, separated by a space. There are 5 channels per line giving a total line length of 61 characters, including the end-of-record character. Leading spaces are interpreted as zeros. (NPS/NID) 1214-1992r

**spectral-directional emissivity** $\varepsilon(\theta, \tau, \lambda, T)$ (of an element of surface of a temperature radiator at any wavelength and in a given direction) The ratio of its spectral radiance at that wavelength and in the given direction to that of a black body at the same temperature and wavelength.

$$\varepsilon(\lambda, \theta, \phi, T) = L_{\lambda}(\lambda, \theta, \phi, T)/L_{\text{blackbody}}(\lambda, T)$$

(EEC/IE) [126]

**spectral emissivity (element of surface of a temperature radiator at any wavelength)** The ratio of its radiant flux density per unit wavelength interval (spectral radiant exitance) at that wavelength to that of a blackbody at the same temperature. *See also:* radiant energy. (IE/EEC) [126]

**spectral-hemispherical emissivity,** $\boldsymbol{\varepsilon(\lambda, T)}$ (of an element of surface of a temperature radiator) The ratio of its spectral radiant exitance to that of a blackbody at the same temperature. *Note:* Hemispherical emissivity is frequently called "total" emissivity. "Total" by itself is ambiguous, and should be avoided since it may also refer to "spectral-total" (all wavelengths) as well as "directional-total" (all directions). (EEC/IE) [126]

**spectral irradiance (fiber optics)** Irradiance per unit wavelength interval at a given wavelength, expressed in watts per unit area per unit wavelength interval. *See also:* irradiance; radiometry. (Std100) 812-1984w

**spectral line (1) (fiber optics)** A narrow range of emitted or absorbed wavelengths. *See also:* line spectrum; monochromatic; spectral width; line source. (Std100) 812-1984w
**(2)** A sharply peaked portion of the spectrum that represents a specific feature of the incident radiation, usually the full energy of a monoenergetic radiation. (NPS) 300-1988r

**spectral luminous efficacy (illuminating engineering)** (of radiant flux) $(K(\lambda) = \Phi_{\omega\lambda}/\Phi_{e\lambda})$ The quotient of the luminous flux at a given wavelength by the radiant flux at that wavelength. It is expressed in lumens per watt. *Note:* This term formerly was called "luminosity factor." The reciprocal of the maximum luminous efficacy of radiant flux is sometimes called "mechanical equivalent of light;" that is, the ratio between radiant and luminous flux at the wavelength of maximum luminous efficacy. The most probable value is 0.00146 W/lm, corresponding to 683 lm/W as the maximum possible luminous efficacy. For scotopic vision values (13.7) the maximum luminous efficacy is 1754 "scotopic" lm/W. (EEC/IE) [126]

**spectral luminous efficiency (illuminating engineering)** (of radiant flux) The ratio of the luminous efficacy for a given wavelength to the value at the wavelength of maximum luminous efficacy. It is dimensionless. *Note:* The term "spectral luminous efficiency" replaces the previously used terms "relative luminosity" and "relative luminosity factor." (EEC/IE) [126]

**spectral luminous flux (light-emitting diodes)** The luminous flux per unit wavelength interval at wavelength l that is, lumens per nanometer. (ED) [127]

**spectral luminous gain (optoelectronic device)** Luminous gain for a specified wavelength interval of either the incident or the emitted flux. *See also:* optoelectronic device. (ED) [46]

**spectral luminous intensity (light-emitting diodes)** The luminous intensity per unit wavelength (at wavelength λ), that is, candela per nanometer. (ED) [127]

**specific MAC service** The service provided by the MAC protocol and procedures of a specific Local Area Network technology (which can contain features not present in other specific MAC services or in the ISO/IEC 10039 MAC service). (C/LM) 802.1G-1996

**spectral-noise density (sound recording and reproducing system)** The limit of the ratio of the noise output within a specified frequency interval to the frequency interval, as that interval approaches zero. *Note:* This is approximately the total noise within a narrow frequency band divided by that bandwidth in hertz. *See also:* noise. 191-1953w

**spectral power density** Power per unit bandwidth, in watts per Hertz. (AP/PROP) 211-1997

**spectral power flux density** The power density per unit bandwidth in watts per square meter per Hertz. (AP/PROP) 211-1997

**spectral quantum efficiency (diode-type camera tube)** $\boldsymbol{(\eta\lambda)}$ The average number of electrons produced in the output signal per photon incident on the camera tube faceplate at a particular photon energy or wavelength. It is a dimensionless quantity that can be conveniently calculated from the spectral response *R*l through the relation

$$\eta\lambda = \frac{1241\ R_{\lambda}}{\lambda}$$

where $R\lambda$ is in amperes per watt and λ in nanometers. (ED) 503-1978w

**spectral quantum yield (photocathodes)** The average number of electrons photoelectrically emitted from the photocathode per incident photon of a given wavelength. *Note:* The spectral quantum yield may be a function of the angle of incidence and of the direction of polarization of the incident radiation. *See also:* phototube. (NPS) 175-1960w

**spectral radiance (1) (fiber optics)** Radiance per unit wavelength interval at a given wavelength, expressed in watts per steradian per unit area per wavelength interval. *See also:* radiance; radiometry. (Std100) 812-1984w
**(2) (laser maser)** The power transmitted in a radiation field per unit frequency (or wavelength) interval unit solid angle unit area normal to a given direction $(W \cdot nm^{-1} \cdot sr^{-1} \cdot m^{-2})$. (LEO) 586-1980w

**spectral radiant energy (light-emitting diodes)** $(Q_{\lambda} = dQ_e/d_{\lambda})$ Radiant energy per unit wavelength interval at wavelength l; that is, joules per nanometer. (ED) [127]

**spectral radiant flux (light-emitting diodes)** $\boldsymbol{(\phi\lambda = d\phi_e/d\lambda)}$ Radiant flux per unit wavelength interval at wavelength l: that is watts per nanometer. (IE/EEC/ED) [126], [127]

**spectral radiant gain (optoelectronic device)** Radiant gain for a specified wavelength interval of either the incident or the emitted radiant flux. *See also:* optoelectronic device. (ED) [45]

**spectral radiant intensity (light-emitting diodes)** $\boldsymbol{(I\lambda = dI_e/d\lambda)}$ The radiant intensity per unit wavelength interval: for example watts per (steradian-nanometer). (IE/EEC/ED) [126], [127]

**spectral range (acoustically tunable optical filter)** The wavelength region over which the dynamic transmission is greater than some specified minimum value. (UFFC) [17]

**spectral reflectance (illuminating engineering)** $(\rho(\lambda) = \Phi_{r\lambda}/\Phi_{i\lambda})$ The ratio of the reflected flux to the incident flux at a particular wavelength, l, or within a small band of wavelengths, Dl, about l. *Note:* The various geometrical aspects of reflectance may each be considered restricted to a specific region of the spectrum and may be so designated by the addition of the adjective "spectral." (EEC/IE) [126]

**spectral response (diode-type camera tube)** The spectral response ($R_\mu$) of a camera is the current produced in the output signal per incident radiant power in the input signal as a function of the photon energy frequency, or wavelength. Units: amperes watt$^{-1}$ (AW$^{-1}$). (ED) 503-1978w

**spectral response characteristic** *See:* spectral sensitivity characteristic.

**spectral responsivity (fiber optics)** Responsivity per unit wavelength interval at a given wavelength. *See also:* responsivity. (Std100) 812-1984w

**spectral selectivity (photoelectric device)** The change of photoelectric current with the wavelength of the irradiation. *See also:* photoelectric effect. (ED) [45], [84]

**spectral sensitivity characteristic (camera tubes or phototubes)** The relation between the radiant sensitivity and the wavelength of the incident radiation, under specified conditions of irradiation. *Note:* Spectral sensitivity characteristic is usually measured with a collimated beam at normal incidence. *See also:* phototube. (BT/ED/AV) [34], [45]

**spectral temperature (laser maser)** (of a radiation field) The temperature of a black body which produces the same spectral radiance as the radiation field at a given frequency and in a given direction. (LEO) 586-1980w

**spectral-total directional emissivity (illuminating engineering)** ($\varepsilon$, $\phi$, $T$) (of an element of surface of a temperature radiator in a given direction) The ratio of its radiance to that of a blackbody at the same temperature.

$$\varepsilon(\theta, \phi, T) = = L(\theta, \phi, T)/L_{\text{blackbody}}) (T)$$

where $\theta$ and $\phi$ are directional angles and $T$ is temperature. (EEC/IE) [126]

**spectral-total hemispherical emissivity, $\varepsilon$** (of an element of surface of a temperature radiator) The ratio of its radiant exitance to that of a blackbody at the same temperature.

$$\varepsilon = \frac{1}{\pi} \int \varepsilon(\theta, \phi) \cdot \cos\theta \cdot d\omega = \frac{1}{\pi} \int \int \varepsilon$$

$$(\lambda, \theta, \phi) \cdot \cos\theta \cdot d\omega \cdot d\lambda = = M(T)/M_{\text{blackbody}} (T)$$

(EEC/IE) [126]

**spectral transmittance (illuminating engineering)** ($\tau(\lambda) = \Phi_{t\lambda}/\Phi_{i\lambda}$) The ratio of the transmitted flux to the incident flux at a particular wavelength, l, or within a small band of wavelengths, Dl, about l. *Note:* The various geometrical aspects of transmittance may each be considered restricted to a specific region of the spectrum and may be so designated by the addition of the adjective "spectral." (EEC/IE) [126]

**spectral tristimulus values** Values per unit wavelength interval and unit spectral radiant flux. *Note:* Spectral tristimulus values have been adopted by the International Commission on Illumination (CIE). They are tabulated as functions of wavelength throughout the spectrum and are the basis for the evaluation of radiant energy as light. (EEC/IE) [126]

**spectral width (fiber optics)** A measure of the wavelength extent of a spectrum. *Notes:* 1. One method of specifying the spectral linewidth is the full width at half maximum (FWHM), specifically the difference between the wavelengths at which the magnitude drops to one half of its maximum value. This method may be difficult to apply when the line has a complex shape. 2. Another method of specifying spectral width is a special case of root-mean-square (rms) deviation where the independent variable is wavelength ($\lambda$), and $f(\lambda)$ is a suitable radiometric quantity. 3. The relative spectral width ($\Delta\lambda/\lambda$) is frequently used, where $\Delta\lambda$; is obtained according to Note 1 or Note 2. *See also:* root-mean-square deviation; coherence length; line spectrum; material dispersion. (Std100) 812-1984w

**spectral width, full-width half maximum (FWHM)** The absolute difference between the wavelengths at which the spectral radiant intensity is 50% of the maximum. (C/LM) 802.3-1998

**spectral window (fiber optics)** A wavelength region of relatively high transmittance, surrounded by regions of low transmittance. *Synonym:* transmission window. (Std100) 812-1984w

**spectrophotometer (illuminating engineering)** An instrument for measuring the transmittance and reflectance of surfaces and media as a function of wavelength. (EEC/IE) [126]

**spectroradiometer (illuminating engineering)** An instrument for measuring radiant flux as a function of wavelength. (EEC/IE) [126]

**spectrum (1) (germanium gamma-ray detectors) (radiation) (x-ray energy spectrometers) (charged-particle detectors)** A distribution of the intensity of radiation as a function of energy or its equivalent electric analog (such as charge or voltage) at the output of a radiation detector. (NPS/NID) 325-1986s, 759-1984r, 301-1976s

**(2) (fiber optics)** *See also:* optical spectrum. 812-1984w

**(3) (data transmission)** The distribution of the amplitude (and sometimes phase) of the components of a wave as a function of frequency. Spectrum is also used to signify a continuous range of frequencies, usually wide in extent, within which waves have some specified common characteristic. (PE) 599-1985w

**(4) (radiation)** A distribution of the intensity of radiation as a function of energy, or a distribution of the amplitudes of the electrical pulses caused by the radiation. (NPS) 300-1988r

**spectrum amplitude (impulse strength and impulse bandwidth)** The voltage spectrum of a pulse can be expressed as

$$V(\omega) = R(\omega) + jX(\omega) = \int_{-\infty}^{+\infty} v(t)\, e^{-j\omega t} dt$$

where

$$R(\omega) = \int_{-\infty}^{+\infty} v(t) \cos \omega t\, dt$$

$$X(\omega) = \int_{-\infty}^{+\infty} v(t) \sin \omega t\, dt$$

and

$$\omega = 2\pi f$$

*Notes:* 1. See IEEE Std 263-1965, Measurement of Radio Noise Generated by Motor Vehicles and Affecting Mobile Communications Receivers in the Frequency Range 25 to 1000 megahertz. The spectrum then has the amplitude characteristic

$$A(\omega) = \sqrt{R^2(\omega) + X^2(\omega)} \qquad (V/\text{rad})/\text{s}$$

and the phase characteristic

$$\varphi(\omega) = \tan^{-1} \frac{X(\omega)}{R(\omega)}$$

The inverse transform can be written

$$v(t) = \frac{1}{\pi} \int_0^{\infty} A(\omega) \cos [\omega t + \varphi(\omega)]\, d\omega$$

for real $v(t)$. The spectrum amplitude is also expressible in volts per hertz (volt-seconds) as follows:

$$S(f) = 2A(\omega)$$

It is this form that is used as the basis for calibration of commercially available impulse generators. A practical impulse is a function of time duration short compared with the reciprocals of all frequencies of interest. 2. For a rectangular pulse, the spectrum is flat within about 1 dB up to a frequency for which the pulse duration is equal to 1/4 cycle. Its spectrum amplitude $S(f)$ is substantially uniform in this frequency range and is equal to twice the area under the impulse time function or 2s. At frequencies higher than this it is still of interest to define the spectrum amplitude that will usually be less than $2\sigma$. In most broadband impulse generators a dc voltage is used to charge a calibrated coaxial transmission line. The pulses are produced when the line is discharged into its

terminating impedance through mechanically activated contacts. These mechanical contacts may be parts of either a vibrating diaphragm or mercury wetted relay switches. By proper choice of transmission line length and resistive termination, it is possible to produce impuls es having a predictable uniform spectrum amplitude range. The advent of solid-state switches has made it possible to switch on a sine wave for a precisely measurable time interval ($\tau$), producing in the frequency band in the vicinity of the sine wave a spectrum simulating that produced by an impulse. The spectrum amplitude at that particular frequency can be measured in terms of a measurement of the amplitude of the sine wave when not switched, and a measurement of the on time ($\tau_0$) for the switch. (EMC) 376-1975r

**spectrum analyzer (1)** An instrument generally used to display the power distribution of an incoming signal as a function of frequency. *Notes:* 1. Spectrum analyzers are useful in analyzing the characteristics of electrical waveforms in general since, by repetitively sweeping through the frequency range of interest, they display all components of the signal. 2. The display format may be a cathode ray tube or chart recorder. (IM) [14]

**(2)** An instrument that measures the power of a complex signal in many bands. The frequency bands can be either constant absolute bandwidth or constant percentage bandwidth. (COM/TA) 269-1992

**(3)** An instrument that measures the power of a signal in multiple frequency bands. The frequency bands may be constant bandwidth (e.g., fast Fourier transform (FFT) analyzer), or constant percentage bandwidth (e.g., real-time filter analyzer). (COM/TA) 1329-1999

**(4)** A test instrument which measures and displays the measurements of amplitude versus frequency for a given signal. Its frequency range should be at least 100 Hz to 1500 MHz; resolution bandwidth should be at least 10 Hz to 3 MHz; the video bandwidth should be at least 1 Hz to 3 MHz, and amplitude range should be at least −135 to +35 dBm. (PEL) 1515-2000

**spectrum, angular** *See:* angular spectrum.

**spectrum, angular power** *See:* angular power spectrum.

**spectrum, energy** *See:* energy spectrum.

**spectrum intensity (impulse strength and impulse bandwidth)** (For spectra which have a continuous distribution of components components are not discrete over the frequency range of interest). The spectrum intensity is the ratio of the power contained in a given frequency range to the frequency range as the frequency range approaches zero. It has the dimensions watt-seconds or joules and is usually stated quantitatively in terms of watts per hertz. (EMC) 376-1975r

**spectrum level (spectrum density level) (specified signal at a particular frequency)** The level of that part of the signal contained within a band 1 Hz wide, centered at the particular frequency. Ordinarily, this has significance only for a signal having a continuous distribution of components within the frequency range under consideration. The words spectrum level cannot be used alone but must appear in combination with a prefatory modifier: for example, pressure, velocity, voltage. *Note:* For illustration, if $L_{ps}$ is a desired pressure spectrum level, $p$ the effective pressure measured through the filter system, $p_0$ reference sound pressure, $\Delta f$ the effective bandwidth of the filter system, and $\Delta_0 f$ the reference bandwidth (1 Hz), then

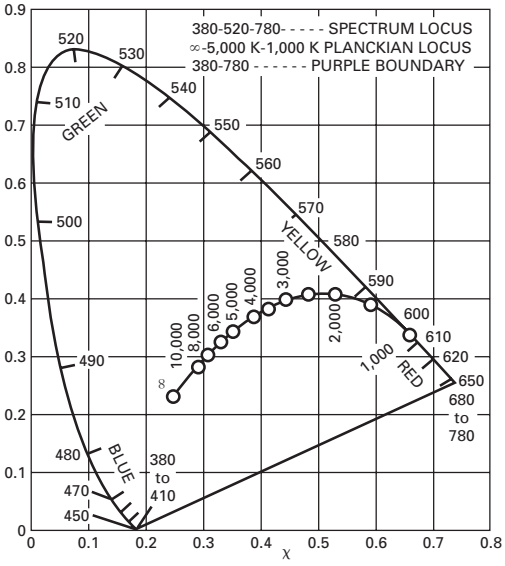
$$L_{ps} = L_p - 10\log_{10}\frac{\Delta df}{\Delta_0 f}$$

For computational purposes, if $L_{ps}$ is the band pressure level observed through a filter of bandwidth $\Delta$f, the above relation reduces to

$$L_{ps} = \log_{10}\frac{p^2/\Delta f}{p_0^2/\Delta_0 f}$$

(SP/ACO) [32]

**spectrum locus (1) (color)** The locus of points representing the chromaticities of spectrally pure stimuli in a chromaticity diagram. (See the corresponding figure.)




*Chromaticity diagram*

**spectrum locus**

(BT/AV) 201-1979w

**(2) (illuminating engineering)** The locus of points representing the colors of the visible spectrum in a chromaticity diagram. (EEC/IE) [126]

**spectrum mask** A graphic representation of the required power distribution as a function of frequency for a modulated transmission. (C/LM) 802.3-1998

**specular angle (illuminating engineering)** That angle between the perpendicular to the surface and the reflected ray that is numerically equal to the angle of incidence and that lies in the same plane as the incident ray and the perpendicular but on the opposite side. (EEC/IE) [126]

**specular reflection (1) (laser maser)** A mirrorlike reflection. (LEO) 586-1980w

**(2)** The reflection of a wave when incident on an infinite planar surface. The angle of incidence is equal to the angle of reflection. (EMC) 1128-1998

**(3)** The process by which all or part of a wave, incident on a smooth surface, is returned to the original medium, in accordance with Snell's law of reflection. (AP/PROP) 211-1997

**(4) (fiber optics)** *See also:* reflection. 812-1984w

**specular surface (illuminating engineering)** A surface from which the reflection is predominantly regular. *See also:* regular reflection. (EEC/IE) [126]

**(2) (A)** A surface, smooth enough that all energy is reflected from it or transmitted across it in those directions specified by Snell's law. **(B)** A planar interface separating two media. (AP/PROP) 211-1997

**speech interpolation** The method of obtaining more than one voice channel per voice circuit by giving each subscriber a speech path in the proper direction only at times when his speech requires it. (EEC/PE) [119]

**speech level (speech quality measurements)** The speech level defined and measured subjectively by comparison of the speech signal with a signal obtained by passing pink noise through a filter with A-weighting characteristics that has been judged to be equal to it in loudness. *Note:* The value of the speech level is defined to be the A-weighted sound pressure level of this noise [dB(A)]. 297-1969w

**speech network (transmission performance of telephone sets)** An electrical circuit that connects the transmitter and the receiver to a telephone line or telephone test loop and to each other. (COM/TA) 269-1983s

**speech quality (speech quality measurements)** A characteristic of a speech signal that can be described in terms of subjective and objective parameters. Speech quality is evaluated only in terms of the subjective parameter of preference. 297-1969w

**speech reference signal (speech quality measurements)** Used as a standard of reference for the purpose of preference testing, a speech signal which is artificially degraded in a measurable and reproducible way. 297-1969w

**speech signals** Utterances in their acoustical form or electrical equivalent. 297-1969w

**speech synthesizer** An input-output device that can process or generate the sound of human speech. *See also:* voice-operated device. (C) 610.10-1994w

**speech test signal (speech quality measurements)** A speech signal whose speech quality is to be evaluated. 297-1969w

**speed (hydraulic turbines)** The instantaneous speed of rotation of the turbine expressed as a percent of rated speed. (PE/EDPG) 125-1977s

**speed adjustment (control)** A speed change of a motor accomplished intentionally through action of a control element in the apparatus or system governing the performance of the motor. *Note:* For an adjustable-speed direct-current motor, the speed adjustment is expressed in percent (or per unit) of base speed. Speed adjustment of all other motors is expressed in percent (or per unit) of rated full-load speed. *See also:* base speed; electric drive; adjustable-speed motor. (IA/IAC) [60]

**speed changer (1) (hydraulic turbines)** A device for changing the governor speed reference. (PE/EDPG) 125-1988r
**(2) (gas turbines)** A device by means of which the speed-governing system is adjusted to change the speed or power output of the turbine during operation. *See also:* asynchronous machine. (PE/EDPG) 282-1968w, [5]

**speed-changer high-speed stop (gas turbines)** A device that prevents the speed changer from moving in the direction to increase speed or power output beyond the position for which the device is set. *See also:* asynchronous machine. (PE/EDPG) 282-1968w, [5]

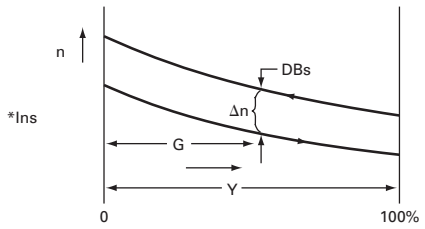
**speed code (1)** The code used to indicate various bit rates for Serial Bus: S25 indicates 24.576 Mbit/s for TTL backplanes; S50 indicates 49.152 Mbit/s for BTL and ECL backplanes; S100 indicates the 98.304 Mbit/s base rate for cable; S200 and S400 indicate 196.608 Mbit/s and 393.216 Mbit/s for the cable. (C/MM) 1394-1995
**(2)** The code used to indicate bit rates for Serial Bus. (C/MM) 1394a-2000

**speed controller (control systems for steam turbine-generator units)** Includes only those components and control elements that are responsive to speed and speed reference, and that supplies an input signal to the control mechanism for the purpose of controlling speed. (PE/EDPG) 122-1985s

**speed-control mechanism (electric power system)** All equipment such as relays, servomotors, pressure or power-amplifying devices, levers, and linkages between the speed governor and the governor-controlled valves. (PE/PSE) 94-1991w

**speed deadband (hydraulic turbines)** The total magnitude of the change in steady-state speed, expressed in percent of rated speed, required to reverse the direction of travel of the turbine control servomotor. (See the corresponding figure.) One half of the governor speed deadband is termed the governor speed insensitivity.

$DB_S = \Delta n$




**speed deadband**

(PE/EDPG) 125-1977s, [5]

**speed deviation (hydraulic turbines)** The instantaneous difference between the actual speed and a reference speed. (PE/EDPG) 125-1977s

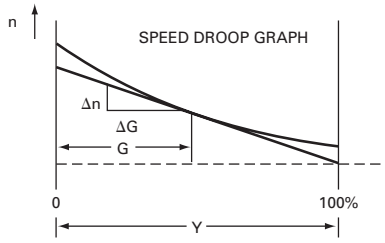
**speed droop (hydraulic turbines)** The speed droop and speed regulation graphs may indicate a nonlinear relationship between the two measured variables depending on the adjustment of the governor speed changer and the quantity (servomotor position or generator power output) used to develop the feedback signal used in the governor system. Speed droop and speed regulation are considered positive when speed increases with a decrease in gate position or power output. (See the corresponding figure.) The slope of the speed droop graph at a specified point of operation *G*. The change in a steady-state speed expressed in percent of rated speed corresponding to the 100% turbine servomotor stroke with no change in setting of any governor adjustments and with the turbine supplying power to a load independently of any other power source.

$$D_S = \left(\frac{-\Delta n}{\Delta G}\right) \cdot (100)$$

Speed droop is classified as either permanent or temporary:

a) *(permanent speed droop).* The speed droop that remains in steady state after the decay action of the damping device has been completed.

b) *(temporary speed droop).* The speed droop in steady state that would occur if the decay action of the damping device were blocked and the permanent speed droop were made inactive.




**speed droop graph**

(PE/EDPG) 125-1977s

**speed-droop changer (hydraulic turbines)** A device for changing the speed droop. (PE/EDPG) 125-1988r

**speed-governing system (1) (automatic generation control on electric power systems)** The control system used to maintain the rotational speed of a turbine-generator unit. The system consists of the speed governor, the speed-control mechanism, and the governor-controlled valves on a steam turbine or gates on a hydro turbine. (PE/PSE) 94-1991w
**(2)** Control elements and devices for the control of the speed or power output of a gas turbine. This includes a speed governor, speed changer, fuel-control mechanism, and other devices and control elements. (PE/EDPG) 282-1968w, [4]

**speed governor (1) (electric power system)** Includes only those elements that are directly responsive to speed and that position or influence the action of other elements of the speed-governing system. *See also:* asynchronous machine; speed-governing system. (PE/EDPG) 282-1968w, [5]

**(2) (electric power system)** A device that varies the governor-controlled valves to adjust energy input levels to maintain a uniform speed of a rotating machine. (PE/PSE) 94-1991w

**speed limit** A control function that prevents a speed from exceeding prescribed limits. Speed-limit values are expressed as percent of maximum rated speed. If the speed-limit circuit permits the limit value to change somewhat instead of being a single value, it is desirable to provide either a curve of the limit value of speed as a function of some variable, such as load, or to give limit values at two or more conditions of operation. *See also:* feedback control system. (IA/ICTL/APP/IAC) [69], [60]

**speed-limit indicator** A series of lights controlled by a relay to indicate the speeds permitted corresponding to the track conditions. (EEC/PE) [119]

**speed/load control system (control systems for steam turbine-generator units)** A system that controls the speed and load of a steam turbine-generator. The system typically includes the speed and load sensing and referencing elements, the controller(s), the control mechanism(s), and the control valve(s). (PE/EDPG) 122-1985s

**speed/load reference changer (control systems for steam turbine-generator units)** A device or devices by means of which the control system reference may be adjusted to change the speed or load of the turbine while the turbine is in operation. (PE/EDPG) 122-1985s

**speed of transmission (data transmission)** The instantaneous rate of which information is processed by a transmission facility. This quantity is usually expressed in characters per unit time or bits per unit time. (Rate of transmission is in more common use.) (PE) 599-1985w

**speed of transmission, effective** *See:* effective speed of transmission.

**speed of vision (illuminating engineering)** The reciprocal of the duration of the exposure time required for something to be seen. (EEC/IE) [126]

**speed or frequency matching device (power system device function numbers)** A device that functions to match and hold the speed or the frequency of a machine or of a system equal to, or approximately equal to, that of another machine, source or system. (PE/SUB) C37.2-1979s

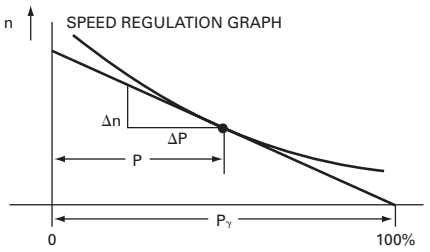
**speed range** All the speeds that can be obtained in a stable manner by action of part (or parts) of the control equipment governing the performance of the motor. The speed range is generally expressed as the ratio of the maximum to the minimum operating speed. *See also:* electric drive. (IA/ICTL/IAC) [60]

**speed ratio (1) (high-voltage switchgear)** The ratio between 0.1s and 300 s or 600 s minimum melting currents, whichever is specified, which designates the relative speed of the fuse link. (SWG/PE) C37.40-1981s
**(2)** *See also:* clearing time; fuse tube; melting-speed ratio. (SWG/PE) C37.100-1992

**speed ratio control** A control function that provides for operation of two drives at a preset ratio of speed. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**speed-regulating rheostat** A rheostat for the regulation of the speed of a motor. *See also:* control. (IA/ICTL/IAC) [60], [84]

**speed regulation (speed governing of hydraulic turbines)** The slope of the speed regulation graph at a specified point P of operation. The change in steady-state speed expressed in percent of rated speed when the power output of the unit is reduced from rated power output to zero power output under rated head with no change in setting of any governor adjustments and with the unit supplying power to a load independently of any other power source. (See the corresponding figure.)




$$R_S = \left(\frac{-\Delta n/100}{\Delta P/P_r}\right) \cdot (100)$$

**speed regulation graph**

**speed regulation changer (hydraulic turbines)** A device for changing the speed regulation. (PE/EDPG) 125-1988r

**speed regulation characteristic (rotating machinery)** The relationship between speed and the load of a motor under specified conditions. *See also:* asynchronous machine. (PE) [9]

**speed regulation of a constant-speed direct-current motor** The change in speed when the load is reduced gradually from the rated value to zero with constant applied voltage and field-rheostat setting, expressed as a percent of speed at rated load. (EEC/PE) [119]

**speed-sensing elements (hydraulic turbines)** The speed-responsive elements that determine speed and influence the action of other elements of the governing system. Included are the means used to transmit a signal proportional to the speed of the turbine to the governor. (PE/EDPG) 125-1988r

**speed variation** Any change in speed of a motor resulting from causes independent of the control-system adjustment, such as line-voltage changes, temperature changes, or load changes. *See also:* electric drive. (IA/ICTL/IAC) [60]

**SPeedy ImplemenTation of SNOBOL** A version of SNOBOL that requires less memory and provides faster execution than SNOBOL. (C) 610.13-1993w

**sphere illumination (illuminating engineering)** The illumination on a task from a source providing equal illuminance in all directions about that task, such as a uniformly illuminated sphere with the task located at the center. (EEC/IE) [126]

**spherical array** A two-dimensional array of elements whose corresponding points lie on a spherical surface. (AP/ANT) 145-1993

**spherical diffraction** Transhorizon propagation due to diffraction by the spherical surface of the Earth, or more generally by any rounded obstacle which is extremely large in relation to the wavelength. (AP/PROP) 211-1997

**spherical hyperbola (navigation aid terms)** The locus of the points on the surface of a sphere having a specified constant difference in great circle distances from two fixed points on the sphere. (AES/GCS) 172-1983w

**spherical propagation function** The function given by:

$$f(r) = \frac{e^{-jkr}}{r}$$

where
$r$ = the range from the source
$jk$ = the propagation constant of the medium
(AP/PROP) 211-1997

**spherical reduction factor (illuminating engineering)** The ratio of the mean spherical luminous intensity to the mean horizontal intensity. (EEC/IE) [126]

**spherical reflector** A reflector that is a portion of a spherical surface. *See also:* antenna. (AP/ANT) 145-1993

**spherical-seated bearing (rotating machinery) (self-aligning bearing)** A journal bearing in which the bearing liner is supported in such a manner as to permit the axis of the journal to be moved through an appreciable angle in any direction. *See also:* bearing. (PE) [9]

**spherical support seat (rotating machinery)** A support for a journal bearing in which the inner surface that mates with the bearing shell is spherical in shape, the center of the sphere coinciding approximately with the shaft centerline, permitting the axis of the bearing to be aligned with that of the shaft. *See also:* bearing. (PE) [9]

**spherical wave** A wave with equiphase surfaces that form a family of concentric spheres. (AP/PROP) 211-1997

**SPICE** *See:* Simulation Program with Integrated Circuit Emphasis.

**spider (rotating machinery) (rotor spider)** A structure supporting the core or poles of a rotor from the shaft, and typically consisting of a hub, spokes, and rim, or some modified arrangement of these. (PE) [9]

**spider rim** *See:* rim.

**spider web (rotating machinery)** The component of a rotor that provides radial separation between the hub or shaft and the rim or core. *See also:* rotor. (PE) [9]

**spike (1) (pulse terminology)** A distortion in the form of a pulse waveform of relatively short duration superimposed on an otherwise regular or desired pulse waveform. *See also:* preshoot. (IM/WM&A) 194-1977w

**(2)** (as applied to relaying) An output signal of short duration and limited crest derived from an alternating input of specified polarity. *Note:* The duration of a spike usually does not exceed 1 ms. (SWG/PE) C37.100-1992

**spike leakage energy (microwave gas tubes)** The radio-frequency energy per pulse transmitted through the tube before and during the establishment of the steady-state radio-frequency discharge. *See also:* gas tube. (ED) 161-1971w

**spikes** *See:* transient overvoltages.

**spike train (electrotherapy) (courant iteratif)** A regular succession of pulses of unspecified shape, frequency, duration, and polarity. *See also:* electrotherapy. (EMB) [47]

**spill (1) (charge-storage tubes)** The loss of information from a storage element by redistribution. (ED) 161-1971w

**(2) (liquid-filled power transformers)** Spills, leaks, and other uncontrolled discharges of polychlorinated biphenyls (PCBs) constitute the disposal of PCBs. *See also:* disposal. (LM/C) 802.2-1985s

**spillover** In the transmit mode of a reflector antenna, the power from the feed that is not intercepted by the reflecting elements. (AP/ANT) 145-1993

**spillover loss (radar)** In a transmitting antenna having a focusing device such as a reflector or lens illuminated by a feed, spillover loss is the reduction in gain due to the portion of the power radiated by the feed in directions that do not intersect the focusing device. By reciprocity, the same loss occurs when the same antenna is used for reception. (AES/RS) 686-1982s

**spillway** Section of dam, or structure near dam, for flow of excess water. (PE/EDPG) 1020-1988r

**spinaxis (navigation aids)** The axis of rotation of a gyroscope. (AES/GCS) 172-1983w

**spin axis (SA) (gyros)** The axis of rotation of the rotor. (AES/GYAC) 528-1994

**spin-axis-acceleration detuning error (dynamically tuned gyro)** The error in a dynamically tuned gyro whereby deflection of the flexure, resulting from acceleration along the spin axis, can cause a shift in the tuning frequency. This will result in a change in the gyro output when there also exists a pickoff or capture loop offset. (AES/GYAC) 528-1994

**spindle** A device within a disk drive that maintains the axis of rotation and the force to rotate the disk. (C) 610.10-1994w

**spindle speed (numerically controlled machines)** The rate of rotation of the machine spindle usually expressed in terms of revolutions per minute. (IA) [61]

**spindle wave (electrobiology)** A sharp, rather large wave considered of diagnostic importance in the electroencephalogram. *See also:* electrocardiogram. (EEC/PE) [119]

**spin-input-rectification drift rate (gyros)** The drift rate in a single-degree-of-freedom gyro resulting from coherent oscillatory rates about the spin reference axis (SRA) and input reference axis (IRA). It occurs only when gyro and loop dynamics allow the gimbal to move away from null in response to the rate about the input reference axis, resulting in a cross coupling of the spin reference axis rate. This drift rate is a function of the input rate amplitudes and the phase angle between them. (AES/GYAC) 528-1994

**spinner**† Rotating part of a radar antenna, together with directly associated equipment, used to impart any subsidiary motion, such as conical scanning, in addition to the primary slewing of the beam. (AES/RS) 686-1990

† Obsolete.

**spinning reserve** Unloaded generation that is synchronized and ready to serve additional demand. (PE/PSE) 858-1993w

**spin-offset coefficient (accelerometer)** The constant of proportionality between bias change and the square of angular rate for an accelerometer that is spun about an axis parallel to its input reference axis and that passes through its effective center of mass for angular velocity. (AES/GYAC) 528-1994

**spin-output-rectification drift rate (gyros)** The drift rate in a single-degree-of-freedom gyro resulting from coherent oscillatory rates about the spin reference axis (SRA) and output reference axis (ORA). It occurs only when gyro and loop dynamics allow the float motion to lag case motion when subjected to a rate about the output reference axis, resulting in a cross coupling of the spin reference axis rate. This drift rate is a function of the input rate amplitudes and the phase angle between them. (AES/GYAC) 528-1994

**spin reference axis (SRA) (gyros)** An axis normal to the input reference axis and nominally parallel to the spin axis when the gyro output has a specified value, usually null. (AES/GYAC) 528-1994

**spin-wait** A condition during multi-unit synchronization where a processor remains in a tight loop, retesting a variable while waiting for the value to be changed by another unit. This condition may waste processor time and cost considerable bus bandwidth if the test variable must be read from system memory in another unit. (C/MM) 1212.1-1993

**spiral antenna** An antenna consisting of one or more conducting wires or tapes arranged as a spiral. *Note:* Spiral antennas are usually classified according to the shape of the surface to which they conform (for example, conical or planar spirals), and according to the mathematical form (for example, equiangular or archimedean). (AP/ANT) 145-1993

**spiral distortion (camera tubes or image tubes using magnetic focusing)** A distortion in which image rotation varies with distance from the axis of symmetry of the electron optical system. (ED) 161-1971w

**spiral four (1)** A quad in which the four conductors are twisted about a common axis, the two sets of opposite conductors being used as pairs. *Synonym:* star quad. *See also:* cable. (EEC/PE) [119]

**(2)** A cable element that comprises four insulated connectors twisted together. Two diametrically facing conductors form a transmission pair. *Note:* Cables containing star quads can be used to interchangeably with cables consisting of pairs, provided the electrical characteristics meet the same specifications. *Synonym:* star quad. (LM/C) 802.3u-1995s

**spiral model** A model of the software development process in which the constituent activities, typically requirements analysis, preliminary and detailed design, coding, integration, and testing, are performed iteratively until the software is complete. *Contrast:* waterfall model. *See also:* prototyping; incremental development. (C) 610.12-1990

**spiral scanning (electronic navigation)** Scanning in which the direction of maximum response describes a portion of a spiral. *See also:* antenna. (AP/ANT) [35]

**SPL (sound-pressure level)** *See:* sound pressure level.

**s-plane** In the Laplace transform, the notation $\sigma = \sigma + \varphi\omega$ is introduced. The s-plane is a coordinate system with s as the abscissa and w as the ordinate. The letter "p" is sometimes used instead of "s." (CAS) [13]

**splashproof (packaging machinery)** So constructed and protected that external splashing will not interfere with successful operation. *See also:* traction motor. (SWG/PE/VT/IA/ICTL/LT/PKG) C37.30-1971s, C37.100-1981s, 16-1955w, 333-1980w

**splashproof enclosure** An enclosure in which the openings are so constructed that drops of liquid or solid particles falling on the enclosure or coming towards it in a straight line at any angle not greater than 100° from the vertical cannot enter the enclosure either directly or by striking and running along a surface. (IA/MT) 45-1998

**splashproof machine** An open machine in which the ventilating openings are so constructed that drops of liquid or solid particles falling on the machine or coming towards it in a straight line at any angle not greater than 100° downward from the vertical cannot enter the machine either directly or by striking and running along a surface. *See also:* asynchronous machine. (PE) [9]

**splice (1) (power cable joints)** The physical connection of two or more conductors to provide electrical continuity. (PE/IC) 404-1986s

**(2) (optical waveguide)** *See also:* optical waveguide splice 812-1984w

**(3)** *See also:* compression joint. (T&D/PE) 524-1992r

**splice box** (mine type) An enclosed connector permitting short sections of cable to be connected together to obtain a portable cable of the required length. *See also:* mine feeder circuit.

**splice loss** *See:* insertion loss.

**splice release block** *See:* hold-down block.

**splice site** The location along the line where the conductors are temporarily anchored to join the conductors together to form a splice. (T&D/PE) 524a-1993r

**splice, wire rope** *See:* wire rope splice.

**splicing cart (conductor stringing equipment)** A unit which is equipped with a hydraulic pump and compressor (press) and all other necessary equipment for performing splicing operations on conductors. *Synonyms:* splicing truck; splicing trailer; sleeving trailer. (T&D/PE) 524a-1993r, 524-1992r

**splicing chamber** *See:* manhole.

**splicing trailer** *See:* splicing cart.

**splicing truck** *See:* splicing cart.

**split acceptor** A master module that splits the current transaction upon detecting SR* asserted. (C/BA) 896.4-1993w

**split-anode magnetron** A magnetron with an anode divided into two segments, usually by slots parallel to its axis. *See also:* magnetron. (ED) 161-1971w

**split-beam cathode-ray tube (double-beam cathode-ray tube)** A cathode-ray tube containing one electron gun producing a beam that is split to produce two traces on the screen. (ED) [45]

**split brush** Either an industrial or fractional-horsepower brush consisting of two pieces that are used in place of one brush. The adjacent sides of the split brush are parallel to the commutator bars. *Note:* A split brush is normally mounted so that the plane formed by the adjacent contacting brush sides is parallel to or passes through the rotating axis of the rotor. *See also:* brush; asynchronous machine. (EEC/EM/LB) [101]

**split collector ring (rotating machinery)** A collector ring that can be separated into parts for mounting or removal without access to a shaft end. *See also:* rotor. (PE) [9]

**split-conductor cable** A cable in which each conductor is composed of two or more insulated conductors normally connected in parallel. *See also:* segmental conductor. (T&D/PE) [10]

**split-core-type current transformer** *See:* current transformer.

**split fitting** A conduit split longitudinally so that it can be placed in position after the wires have been drawn into the conduit, the two parts being held together by screws or other means. *See also:* raceway. (EEC/PE) [119]

**split-gate tracker** A form of range tracker using a pair of time gates called an *early gate* and a *late gate*, contiguous or partly overlapping in time. *Note:* When tracking is established, the pair of gates straddles the received pulse that is being tracked. The position of the pair of gates then gives a measure of the time of arrival of the pulse (i.e., the range of the target from which the echo is received). Deviation of the pair of gates from the proper tracking position increases the signal energy in one gate and decreases it in the other, thus producing an error signal that moves the pair of gates so as to reestablish equilibrium. (AES) 686-1997

**split hub (rotating machinery)** A hub that can be separated into parts for ease of mounting on removal from a shaft. *See also:* rotor. (PE) [9]

**split hydrophone** *See:* split transducer.

**split initiator** A slave module that asserts sr* to require that the current transaction be split. (C/BA) 896.4-1993w

**split key** A foreign key containing two or more attributes, where at least one of the attributes is a part of the entity's primary key and at least one of the attributes is not a part of the primary key. (C/SE) 1320.2-1998

**split node (network analysis)** A node that has been separated into a source node and a sink node. *Notes:* 1. Splitting a node interrupts all signal transmission through that node. 2. In splitting a node, all incoming branches are associated with the resulting sink node, and all outgoing branches with the resulting source node. (CAS) 155-1960w

**split operation** A request to exchange data or an event that cannot be satisfied while all its participants remain interlocked. Rather, the participants record the requested action and, at a later time, when the exchange can be completed, reestablish a communication path to complete it. (C/BA) 1014.1-1994w

**split-phase electric locomotive** A single-phase electric locomotive equipped with electric devices to change the single-phase power to polyphase power without complete conversion of the power supply. *See also:* electric locomotive. (EEC/PE) [119]

**split-phase motor** A single-phase induction motor having a main winding and an auxiliary winding, designed to operate with no external impedance in either winding. The auxiliary winding is energized only during the starting operation of the auxiliary-winding circuits and is open-circuited during running operation. *See also:* asynchronous machine. (PE) [9]

**split projector** *See:* split transducer.

**split rotor (rotating machinery)** A rotor that can be separated into parts for mounting or removal without access to a shaft end. *See also:* rotor. (PE) [9]

**split-sleeve bearing (rotating machinery)** A journal bearing having a bearing sleeve that is split for assembly. *See also:* bearing. (PE) [9]

**splitter** Splitters divide or combine power. The power division causes an insertion loss and a small amount of internal loss that contributes to the attenuation of the signals passing through the device. The splitter has a common port and split port(s). The signals between the common and split port(s) has an insertion loss of 10 log $n$, where $n$ equals the number of power splits. The splitter also has an isolation that attenuates signals passing between port(s). (LM/C) 802.7-1989r

**splitter, optical** *See:* optical directional coupler.

**split-throw winding (rotating machinery)** A winding wherein the conductors that constitute one complete coil side in one slot do not all appear together in another slot. *See also:* asynchronous machine. (PE) [9]

**split transaction (1)** An operation in which the request is transmitted in one bus transaction and the response is transmitted in a separate subsequent bus transaction. (C/BA) 896.3-1993w, 896.4-1993w

**(2)** A transaction that consists of separate request and response subactions. On a backplane bus, for example, a split transaction is one in which bus mastership is relinquished between the request and response subactions. Few buses permit split transactions. *See also:* unified transaction. (C/MM) 1596-1992

**(3)** A transaction that consists of separate request and response subactions. On a backplane bus, for example, bus ownership is relinquished between the request and response subactions. A transaction that is not split is called a unified transaction. (C/MM) 1212-1991s

**(4)** A system transaction in which the request is transmitted in one bus transaction and the response is transmitted in a separate subsequent bus transaction. (C/BA) 10857-1994

**(5)** A transaction where the responder releases control of the bus after sending the acknowledge and then some time later starts arbitrating for the bus so it can start the response subaction. Other subactions may take place on the bus between the request and response subactions for the transaction. (C/MM) 1394-1995

**(6)** A transaction where unrelated subactions may take place on the bus between its request and response subactions. (C/MM) 1394a-2000

**split transducer (audio and electroacoustics)** A directional transducer in which electroacoustic transducing elements are so divided and arranged that each division is electrically separate. (SP) [32]

**split-winding protection** A form of differential protection in which the current in all or part of the winding is compared to the normally proportional current in another part of the winding. (SWG/PE) C37.100-1992

**SPMP** *See:* software project management plan.

**spoiler resistors (power supplies)** Resistors used to spoil the load regulation of regulated power supplies to permit parallel operation when not otherwise provided for. (AES) [41]

**s pole** *See:* junction pole.

**sponge (electrodeposition)** A loose cathode deposit that is fluffy and of the nature of a sponge, contrasted with a reguline metal. (EEC/PE) [119]

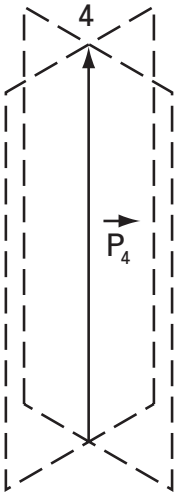
**spontaneous emission (1) (fiber optics)** Radiation emitted when the internal energy of a quantum mechanical system drops from an excited level to a lower level without regard to the simultaneous presence of similar radiation. *Note:* Examples of spontaneous emission include:

1) radiation from a light emitting diode (LED), and
2) radiation from an injection laser below the lasing threshold.

*See also:* superradiance; light-emitting diode; injection laser diode; stimulated emission. (Std100) 812-1984w

**(2) (laser maser)** The emission of radiation from a single electron, atom, molecule, or ion in an excited state at a rate independent of the presence of applied external fields. (LEO) 586-1980w

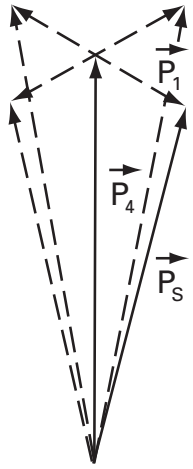
**spontaneous polarization (primary ferroelectric terms)** Magnitude of the polarization within a single ferroelectric domain in the absence of an external electric field. A spontaneous polarization $P_s$ is a fundamental property of all pyroelectric crystals, although it is reversible or reorientable only in ferroelectrics. Most ferroelectric phases originate from a nonpolar prototypic phase and all of the polarization is reorientable. However, if the prototypic phase is polar, only a portion of the total spontaneous polarization may be reoriented. This reorientable or reversible portion is commonly called the spontaneous polarization. The corresponding figures illustrate an example of a case where the prototypic phase is tetragonal (4*mm*) and the ferroelectric phase is monoclinic (*m*), one of the two special polar groups. The spontaneous polarization, $P_s$ in the second part of the figure, is composed of a switchable part, $P_1$, and a nonswitchable component, $P_4$; thus $P_s$ is reorientable when $P_1$ switches between any of its four allowed states. In this example the pyroelectric vector is not collinear with the polar axis $P_s$, and both $P_1$ and $P_s$ may independently change direction with temperature. The unit cell is the smallest group of atoms within a crystal whose repetition in space generates the whole crystal. It is electrically neutral in all states of the crystal, but on this microscopic scale, $P_s$ is associated with a polar displacement of the ionic and electronic charges within the crystalline unit cell, and this, in turn, gives rise to a microscopic electric dipole moment. In ferroelectric crystals, dipoles in adjacent unit cells are aligned in the same direction, resulting in a net $P_s$ within a macroscopic volume (much larger than a unit cell) called a domain.




*Note*: The polar axis lies along the four-fold axis of symmetry.

*Polar prototype phase, tetragonal (4 mm)*

**spontaneous polarization**




*Note*: The spontaneous polarization is not collinear with the prototype four-fold axis.

*Ferroelectric phase in the monoclinic symmetry (m), derived from the tetragonal prototype phase*

(UFFC) 180-1986w

**spontaneous strain (primary ferroelectric terms)** The summation of all the strains necessary to convert a ferroelastic crystal from the nonferroelastic prototype state to one of the ferroelastic orientation states. The prototype state, by definition, has zero spontaneous strain. A ferroelastic crystal can be switched from one ferroelastic orientation state to another by mechanical stress. Any two of the states are identical or enantiomorphous in crystal structure but different in mechanical strain tensor at zero mechanical stress (and at zero electrical field). (UFFC) 180-1986w

**spool** To read input data, or write output data, to auxiliary or main storage for later processing or output, in order to permit input/output devices to operate concurrently with job execution. Derived from the acronym SPOOL for Simultaneous Peripheral Output On Line. (C) 610.12-1990, 610.10-1994w

**(2) (A)** Secondary storage used as an interim holding area for output waiting to be printed as in definition (1) above. **(B)** A cylinder without flanges on which tape may be wound. *Synonym:* hub. *Contrast:* reel. *See also:* bore. (C) 610.10-1994

**spooler** A program that initiates and controls spooling. (C) 610.12-1990

**spool insulator** An insulating element of generally cylindrical form having an axial mounting hole and a circumferential groove or grooves for the attachment of a conductor. *See also:* insulator; tower. (T&D/PE/EEC/IEPL) [10], [89]

**sporadic E layer** An ionospheric layer of the E region which is thin, transient and of limited geographical extent. *Note:* An equatorial sporadic E layer occurs regularly during the day in association with the equatorial electrojet. *Synonym:* Es layer. (AP/PROP) 211-1997

**sporadic ionization** Ionization of the upper atmosphere, irregularly distributed in space and time, and abnormally high relative to the average ionization level of the region in which it is produced. (AP/PROP) 211-1997

**sporadic tasks** Asynchronous tasks that may have hard (rigid) deadlines that must be met, but have a minimum interarrival duration between instances (typically by enforcement). (C/BA) 896.3-1993w

**spot (oscilloscopes) (cathode-ray tubes)** The illuminated area that appears where the primary electron beam strikes the phosphor screen of a cathode-ray tube. *Note:* The effect of the impact on this small area of the screen is practically instantaneous. *See also:* oscillograph; cathode-ray tube. (IM/ED/HFIM) [40], [45], [84]

**spotlight (illuminating engineering)** A form of floodlight usually equipped with lens and reflectors to give a fixed or adjustable narrow beam. (EEC/IE) [126]

**spotlight synthetic-aperture radar** A form of SAR in which very high resolution is obtained by steering the real antenna beam to dwell longer on a scene or target than allowed by a fixed antenna. (AES) 686-1997

**spot measurement (point-in-time measurement)** A measurement that is performed at some instant and point in space that does not provide information regarding temporal or spatial variations of the field. (T&D/PE) 1308-1994

**spot network** A small network, usually at one location, consisting of two or more primary feeders, with network units and one or more load service connections. (PE/TR) C57.12.44-1994

**spot-network type** A unit substation which has two stepdown transformers, each connected to an incoming high-voltage circuit. The outgoing side of each transformer is connected to a common bus through circuit breakers equipped with relays which are arranged to trip the circuit breaker on reverse power flow to the transformer and to reclose the circuit breaker upon the restoration of the correct voltage, phase angle and phase sequence at the transformer secondary. The bus has one or more outgoing radial (stub end) feeders. (PE/TR) C57.12.80-1978r

**spot noise figure (spot noise factor) (transducer at a selected frequency)** The ratio of the output noise power per unit bandwidth to the portion thereof attributable to the thermal noise in the input termination per unit-bandwidth, the noise temperature of the input termination being standard (290 kelvins). The spot noise figure is a point function of input frequency. *See also:* signal-to-noise ratio; noise figure. (PE/EEC) [119]

**spot projection (facsimile)** The optical method of scanning or recording in which the scanning or recording spot is defined in the path of the reflected or transmitted light. *See also:* recording; scanning. (COM) 168-1956w

**spot punch** A punch device used for punching one hole at a time into a punch card. (C) 610.10-1994w

**spot size** The diameter of a pixel on a display surface. *Synonym:* beam spot size. (C) 610.6-1991w

**spot speed (facsimile)** The speed of the scanning or recording spot within the available line. *Note:* This is generally measured on the subject copy or on the record sheet. *See also:* recording; scanning. (COM) 168-1956w

**spotting (electroplating)** The appearance of spots on plated or finished metals. (PE/EEC) [119]

**spot-type fire detector (fire protection devices)** A device whose detecting element is concentrated at a particular location. (NFPA) [16]

**spot wobble (television)** A process wherein a scanning spot is given a small periodic motion transverse to the scanning lines at a frequency above the picture signal spectrum. (BT/AV) 201-1979w

**spray plume** *See:* positive prebreakdown streamers.

**spread, Doppler** *See:* Doppler spread.

**spread F** A phenomenon observed on ionograms displaying a wide range of delays of echo pulses, near the F region critical frequencies. *Notes:* 1. The echoes usually are spread in the frequency and virtual height domains on an ionogram. 2. Spread F commonly occurs at night at low latitudes (e.g., near the magnetic dip equator) and at high latitudes. (AP/PROP) 211-1997

**spreading factor** For propagation in isotropic unbounded media, that amplitude factor that accounts for geometric spreading of the field intensity. *Note:* In the far field region of plane, cylindrical, and spherical waves this factor is 1, $r^{-1/2}$, and $r^{-1}$ respectively, where $r$ is the distance from the source to the observation point. (AP/PROP) 211-1997

**spreading loss (1) (wave propagation)** The reduction in radiant-power surface density due to spreading. (Std100) 270-1966w

**(2)** The decrease in power or power density due to divergence of the outward energy flow of cylindrical and spherical waves. (AP/PROP) 211-1997

**spread sheet** *See:* electronic spread sheet.

**spread spectrum** A modulation technique for multiple access, or for increasing immunity to noise and interference. (C/COM) 610.7-1995, [19]

**spread, time delay** *See:* time delay spread.

**spring-actuated stepping relay** A stepping relay that is cocked electrically and operated by spring action. *See also:* relay. (EEC/REE) [87]

**spring attachment (burglar-alarm system)** (trap) A device designed for attachment to a movable section of the protected premises, such as a door, window, or transom, so as to carry the electric protective circuit in or out of such section, and to indicate an open- or short-circuit alarm signal upon opening of the movable section. *Synonym:* spring contact. *See also:* protective signaling. (PE/EEC) [119]

**spring barrel** The part that retains and locates the short-circuiter. *See also:* rotor. (EEC/PE) [119]

**spring buffer** A buffer that stores in a spring the kinetic energy of the descending car or counterweight. *See also:* elevator. (EEC/PE) [119]

**spring-buffer load rating (elevators)** The load required to compress the spring an amount equal to its stroke. *See also:* elevator. (EEC/PE) [119]

**spring-buffer stroke (elevators)** The distance the contact end of the spring can move under a compressive load until all coils are essentially in contact. *See also:* elevator. (PE/EEC) [119]

**spring contact** An electric contact that is actuated by a spring. (EEC/PE) [119]

**spring-loaded bearing (rotating machinery)** A ball bearing provided with a spring to ensure complete angular contact

between the balls and inner and outer races, thereby removing the effect of diametral clearance in both bearings of a machine provided with ball bearing at each end. *See also:* bearing. (PE/EEC) [119]

**spring operation** Stored-energy operation by means of spring-stored energy. (SWG/PE) C37.100-1992

**sprinkler supervisory system** A supervisory system attached to an automatic sprinkler system that initiates signal transmission automatically upon the occurrence of abnormal conditions in valve positions, air or water pressure, water temperature or level, the operability of power sources necessary to the proper functioning of the automatic sprinkler, etc. *See also:* protective signaling. (EEC/PE) [119]

**sprite engine** A graphics controller that supports sprites; small, high-resolution objects that can be moved about the display surface. (C) 610.10-1994w

**sprocket feed** *See:* tractor feed.

**sprocket hole (1) (test, measurement, and diagnostic equipment)** The hole in a tape that is used for electrical timing or mechanically driving the tape. (MIL) [2]
**(2)** *See also:* feed hole. (C) 610.10-1994w

**sprocket track** *See:* feed track.

**SPS** *See:* Symbolic Programming Systems.

**SPSS** *See:* Statistical Package for Social Sciences.

**spurious bulk-wave signals** Unwanted signals caused by bulk wave excitation existing at the surface acoustic wave filter output. (UFFC) 1037-1992w

**spurious components** Persistent sine waves at frequencies other than the harmonic frequencies. *See also:* harmonic distortion. (IM/WM&A) 1057-1994w

**spurious count (1) (nuclear techniques)** A count from a scintillation counter other than one purposely generated or one due directly to ionizing radiation. *See also:* scintillation counter. (NPS) 398-1972r
**(2)** A count caused by any event other than the passage into or through the counter tube of the ionizing radiation to which it is sensitive. (NI/NPS) 309-1999

**spurious emission power (land-mobile communications transmitters)** Any part of the radio frequency output that is not a component of the theoretical output, as determined by the type of modulation and specified bandwidth limitations. (EMC) 377-1980r

**spurious emission power radiation field (land-mobile communications transmitters)** That portion of the spurious emission power which may be radiated from a transmitter enclosure and which can be measured in the near or far field regions. (EMC) 377-1980r

**spurious emissions (transmitter performance)** Any part of the radio-frequency output that is not a component of the theoretical output, as determined by the type of modulation and specified bandwidth limitations. *See also:* audio-frequency distortion. (VT) [37]

**spurious initiation** Attempts to establish a communication connection or association, using a false identity or through the replay of a previous, legitimate initiation sequence. Spurious initiation includes spoofing or masquerading attempts in the communication system, and coupled with other attacks, could result in unauthorized disclosure or modification of information, unauthorized receipt of services, or denial of service to legitimate users or critical functions. (C/BA) 896.3-1993w

**spurious output (signal generators)** (nonharmonic) Those signals in the output of a source that have a defined amplitude and frequency and are not harmonically related to the fundamental frequency. This definition excludes sidebands due to residual and intentional modulation. *See also:* signal generator. (IM/HFIM) [40]

**spurious pulse (1) (nuclear techniques)** A pulse in a scintillation counter other than one purposely generated or one due directly to ionizing radiation. *See also:* scintillation counter. (NPS) 398-1972r
**(2) (dial-pulse address signaling systems) (telephony)** The intermittent and undesired change of state in a circuit from its on-hook condition (spurious make) or off-hook condition (spurious break) lasting more than 1ms. (COM/TA) 753-1983w

**spurious pulse mode** An unwanted pulse mode, formed by the chance combination of two or more pulse modes, that is indistinguishable from a pulse interrogation or pulse reply. (IM/WM&A) 194-1977w

**spurious radiation (radio-noise emissions)** Any emission from an electronic communications equipment at frequencies outside its occupied bandwidth. (EMC) C63.4-1988s

**spurious reflections** Unwanted signals caused by reflection of surface acoustic wave or bulk waves from substrate edges or electrodes. (UFFC) 1037-1992w

**spurious response (1) (general)** Any response, other than the desired response, of an electric transducer or device. (PE) 599-1985w
**(2) (mobile communication or electromagnetic compatibility)** Output, from a receiver, due to a signal or signals having frequencies other than that to which the receiver is tuned. *See also:* electromagnetic compatibility. (VT) [37]
**(3) (spectrum analyzer)** A characteristic of a spectrum analyzer wherein the displayed frequency does not conform to the input frequency. (IM) 748-1979w
**(4) (frequency-modulated mobile communications receivers)** Any receiver response that occurs because of frequency conversions other than the desired frequency translations in the receiver. (VT) 184-1969w

**spurious-response ratio (radio receivers)** The ratio of: A) the field strength at the frequency that produces the spurious response to B) the field strength at the desired frequency, each field being applied in turn, under specified conditions, to produce equal outputs. *Note:* Image ratio and intermediate-frequency-response ratio are special forms of spurious response ratio. *See also:* radio receiver. 188-1952w

**spurious transmitter output (1) (A) (general)** Any part of the radio-frequency output that is not implied by the type of modulation (amplitude modulation, frequency modulation, etc.) and specified bandwidth. *See also:* radio transmitter.
**(B) (conducted)** Any spurious output of a radio transmitter conducted over a tangible transmission path. *Note:* Power lines, control leads, radio-frequency transmission lines and waveguides are all considered as tangible paths in the foregoing definition. Radiation is not considered as tangible path in the foregoing definition. Radiation is not considered a tangible path in this definition. *See also:* radio transmitter.
**(C) (inband)** Spurious output of a transmitter within its specified band of transmission. *See also:* radio transmitter.
**(D) (radiated)** Any spurious output radiated from a radio transmitter. *Note:* The radio transmitter does not include the associated antenna and transmission lines. *See also:* radio transmitter. (BT) 182-1961
**(2) (extraband)** *See also:* extraband spurious transmitter output. (EMC) 377-1980r

**spurious tube counts (radiation counter tubes)** Counts in radiation-counter tubes, other than background counts and those caused by the source measured. *Note:* Spurious counts are caused by failure of the quenching process, electric leakage, and the like. Spurious counts may seriously affect measurement of background counts. (ED) 161-1971w

**sputtering (cathode sputtering) (electroacoustics)** A process sometimes used in the production of the metal master wherein the original is coated with an electric conducting layer by means of an electric discharge in a vacuum. *Note:* This is done prior to electroplating a heavier deposit. *See also:* phonograph pickup. (SP) [32]

**SQL** *See:* Structured Query Language.

**SQL engine** A relational engine that accepts SQL commands and accesses the database in order to obtain the requested data. (C) 610.10-1994w

**square-law detection** The form of detection of an amplitude-modulated signal in which the output voltage is a linear function of the square of the envelope of the input wave. (IT) [123]

**squareness ratio (magnetic storage)** (material in a symmetrically cyclically magnetized condition) The ratio of the flux density at zero magnetizing force to the maximum flux density; the ratio of the flux density when the magnetizing force has changed halfway from zero toward its negative limiting value, to the maximum flux density. *Note:* Both these ratios are functions of the maximum magnetizing force. (C) [20]

**square wave (1) (data transmission)** A periodic wave that alternately for equal lengths of time assumes one of two fixed values, the time of transition being negligible in comparison. (PE) 599-1985w

**(2) (pulse terminology)** A periodic rectangular pulse train with a duty factor of 0.5 or an on-off ratio of 1.0. (IM/WM&A) 194-1977w

**square-wave response (1) (camera tubes)** The ratio of the peak-to-peak signal amplitude given by a test pattern consisting of alternate black and white bars of equal widths to the difference in signal between large-area blacks and large-area whites having the same illuminations as the black and white bars in the test pattern. *Note:* Horizontal square-wave response is measured if the bars run perpendicular to the direction of horizontal scan. Vertical square-wave response is measured if the bars run parallel to the direction of horizontal scan. *See also:* amplitude response. (ED) 161-1971w

**(2) (diode-type camera tube)** Square-wave spatial inputs may be used, in which case the response curve is called the contrast transfer function or square-wave amplitude response. Units: lines per picture height. (ED) 503-1978w

**square-wave response characteristic (camera tubes)** The relation between square-wave response and the ratio of a raster dimension to the bar width in the square-wave response test pattern. *Note:* Unless otherwise specified, the raster dimension is the vertical height. *See also:* amplitude response characteristic; television. (ED) 161-1971w

**squaring amplifier** (as applied to relaying). A circuit that produces a block. (SWG/PE) C37.100-1992

**squeezable waveguide** A variable-width waveguide for shifting the phase of the radio-frequency wave traveling through it by mechanically squeezing the dimensions of a rectangular waveguide. (AES) 686-1997

**squeeze section (transmission lines and waveguides)** A length of rectangular waveguide so constructed as to permit alteration of the broad dimension with a corresponding alteration in electrical length. *See also:* waveguide. (IM/HFIM) [40]

**squeeze trace (electroacoustics)** A variable-density sound track wherein, by means of adjustable masking of the recording light beam and simultaneous increase of the electric signal applied to the light modulator, a track having variable width with greater signal-to-noise ratio is obtained. *See also:* phonograph pickup. (SP) [32]

**squelch (1) (radio receivers)** A circuit function that acts to suppress the audio output of a receiver when noise power that exceeds a predetermined level is present. (VT) 184-1969w

**(2)** Facility incorporated in radio receivers to disable their signal output while the received carrier signal level is less than a preset value. (SUB/PE) 999-1992w

**squelch circuit (1) (data transmission)** A circuit for preventing a radio receiver from producing audio-frequency output in the absence of a signal having predetermined characteristics. A squelch circuit may be operated by signal energy in the receiver pass band, by noise quieting, or by a combination of the two (ratio squelch). It may also be operated by a signal having special modulation characteristics (selective squelch). (PE) 599-1985w

**(2)** A circuit for preventing production of an unwanted output in the absence of a signal having predetermined characteristics. (SWG/PE) C37.100-1992

**squelch clamping (frequency-modulated mobile communications receivers)** The characteristic of the receiver, when receiving a normal signal, in which the squelch circuit under certain conditions of modulation will cause suppression of the audio output. (VT) 184-1969w

**squelch selectivity (frequency-modulated mobile communications receivers)** The characteristic that permits the receiver to remain squelched when a radio-frequency signal not on the receiver's tuned frequency is present at the input. (VT) 184-1969w

**squelch sensitivity (frequency-modulated mobile communications receivers)** The minimum radio-frequency signal input level, with standard test modulation required to increase the audio power output from the reference threshold squelch adjustment condition to within 6 dB of the reference audio power output. (VT) 184-1969w

**squiggle** A short "s"-shaped line attached at one end to an arrow label and at the other end to an arrow segment. A squiggle binds an object type set (arrow label) to an object set (arrow segment). (C/SE) 1320.1-1998

**squint** A condition in which a specified axis of an antenna, such as the direction of maximum directivity or of a directional null, departs slightly from a specified reference axis. *Notes:* 1. Squint is often the undesired result of a defect in the antenna; but in certain cases, squint is intentionally designed in in order to satisfy an operational requirement. 2. The reference axis is often taken to be the mechanically defined axis of the antenna; for example, the axis of a paraboloidal reflector. (AP/ANT) 145-1993

**(2) (A)** The angle between the major lobe axis of each lobe and the central axis in a lobe-switching or simultaneous-lobing (monopulse) antenna. **(B)** The angular difference between the axis of antenna radiation and a selected geometric axis, such as the axis of the reflector, the center of the cone formed by movement of the radiation axis, or the broadside direction of a moving vehicle. (AES) 686-1997

**squint angle** The angle between a specified axis of an antenna, such as the direction of maximum directivity or a directional null, and the corresponding reference axis. (AP/ANT) 145-1993

**squint-mode synthetic-aperture radar** A SAR in which the beam is pointed other than at right angles to the flight path of the airborne radar platform. (AES) 686-1997

**squirrel-cage induction motor** A motor in which the secondary circuit consists of a squirrel-cage winding suitably disposed in slots in the secondary core. (IA/MT) 45-1998

**squirrel-cage rotor (rotating machinery)** A rotor core assembly having a squirrel-cage winding. *See also:* rotor. (PE) [9]

**squirrel-cage winding (1) (rotating machinery)** A winding, usually on the rotor of a machine, consisting of a number of conducting bars having their extremities connected by metal rings or plates at each end. (PE) [9]

**(2)** A permanently short-circuited winding, usually uninsulated (primarily used in induction machines) having its conductors uniformly distributed around the periphery of the machine and joined by continuous end rings. (IA/MT) 45-1998

**squitter** Random output pulses from a transponder caused by ambient noise or by an intentional random triggering system, but not by the interrogation pulses. (AES) 686-1997

**SR** *See:* symbol rate.

**SRA** *See:* spin reference axis.

**SRAM** *See:* static random-access memory.

**SRF** *See:* specifically routed frame.

**SRH** *See:* service request handler.

**SRM** *See:* standard reference material.

**SRR** *See:* software requirements review; system requirements review.

**SRS** *See:* standard response spectrum; software requirements specification.

**SRT** *See:* Source Routing Transparent.

**SS** *See:* source statements.

**SSAC** *See:* steel supported aluminum conductor.

**SSAP** *See:* address fields.

**SSB** *See:* single-sideband modulation.

**SSD** *See:* start of stream delimiter.

**SSI** *See:* small scale integration; soil structure interaction.

**SSR** *See:* software specification review.

**ST** *See:* symbol time.

**stability (1)** An aspect of system behavior associated with systems having the general property that bounded input perturbations result in bounded output perturbations. *Notes:* 1. A stable system will ultimately attain a steady state. 2. Deviations from this steady state due to component aging or environmental changes do not indicate instability, but a change in the system. *See also:* transient stability; steady-state stability. (CAS) [13]

**(2) (perturbations)** For convenience in defining various stability concepts, only those parameters or signals that are perturbed are explicitly exhibited, or mentioned, that is, for perturbations in initial states, a perturbed solution is denoted

$$\varphi(\mathbf{x}(t_0) + \Delta\mathbf{x}(t_0);t)$$

where $\Delta\mathbf{x}(t_0)$ represents the perturbation in initial state. Finally, the perturbed-state solution is denoted $\Delta\varphi = \varphi(\mathbf{x}(t_0) + \Delta\mathbf{x}(t_0);t) - \varphi(\mathbf{x}(t_0);t)$. (IM) [120]

**(3) (power system stability)** In a system of two or more synchronous machines connected through an electric network, the condition in which the difference of the angular positions of the rotors of the machines either remains constant while not subjected to a disturbance, or becomes constant following an aperiodic disturbance. *Note:* If automatic devices are used to aid stability, their use will modify the steady-state and transient stability terms to: steady-state stability with automatic devices; transient stability with automatic devices. Automatic devices as defined for this purpose are those devices that are operating to increase stability during the period preceding and following a disturbance as well as during the disturbance. Thus relays and circuit breakers are excluded from this classification and all forms of voltage regulators included. Devices for inserting and removing shunt or series impedance may or may not come within this classification depending upon whether or not they are operating during the periods preceding and following the disturbance. *See also:* transient stability; steady-state stability. (T&D/PE) [10]

**(4) (oscilloscopes)** The property of retaining defined electrical characteristics for a prescribed time and environment. *Notes:* 1. Deviations from a stable state may be called drift if it is slow, or jitter or noise if it is fast. In triggered-sweep systems, triggering stability may refer to the ability of the trigger and sweep systems to maintain jitter-free displays of high- frequency waveforms for long (seconds to hours) periods of time. 2. Also, the name of the control used on some oscilloscopes to adjust the sweep for triggered, free-running, or synchronized operation. *See also:* sweep mode control. (IM) 311-1970w

**(5) (hydraulic turbines)** Characteristics of the governing system pertaining to limitation of oscillations of speed or power under sustained conditions, to damping of oscillations of speed following rejection of load, and to damping of speed oscillations under isolated load conditions following sudden load changes. (PE/EDPG) 125-1977s

**(6) (electrothermic power meters)** For a constant input rf power, constant ambient temperature and constant power line voltage, the variation in rf power indication over stated time intervals. *Note:* Long term stability or drift is the maximum acceptable change in 1 h. Short-term stability or fluctuation is the maximum (peak) change in 1 min. (IM) 544-1975w

**(7) (nuclear power generating station)** The ability of a module to attain and maintain a steady state. (PE/NP) 381-1977w

**(8) (A) (software)** The ability to continue unchanged despite disturbing or disruptive events. **(B) (software)** The ability to return to an original state after disturbing or disruptive events. (C/SE) 729-1983

**(9) (accelerometer) (gyros)** A measure of the ability of a specific mechanism or performance coefficient to remain invariant when continuously exposed to a fixed operating condition. (This definition does not refer to dynamic or servo stability.) (AES/GYAC) 528-1994

**stability, absolute** *See:* absolute stability.

**stability, asymptotic** *See:* asymptomatic stability.

**stability, bounded-input-bounded-output** *See:* bounded-input-bounded-output stability.

**stability, conditional** *See:* conditional stability.

**stability drift (electric conversion)** Gradual shift or change in the output over a period of time due to change or aging of circuit components. (All other variables held constant). (T&D/PE) [26]

**stability, driven** *See:* driven stability.

**stability, equiasymptotic** *See:* equiasymptotic stability.

**stability, excitation-system** *See:* excitation-system stability.

**stability factor** The ratio of a stability limit (power limit) to the nominal power flow at the point of the system to which the stability limit is referred. *Note:* In determining stability factors it is essential that the nominal power flow be specified in accordance with the one of several bases of computation, such as rating or capacity of, or average or maximum load carried by, the equipment or the circuits. *See also:* alternating-current distribution. (T&D/PE) [10]

**stability, finite-time** *See:* finite-time stability.

**stability, global** *See:* global stability.

**stability in-the-whole** *See:* control system; global stability.

**stability, Lagrange** *See:* Lagrange stability.

**stability limit (electric systems) (power limit)** The maximum power flow possible through some particular point in the system when the entire system or the part of the system to which the stability limit refers is operating with stability. *See also:* alternating-current distribution. (T&D/PE) [10]

**stability, long-term** *See:* long-term stability.

**stability, Lyapunov** *See:* Lyapunov stability.

**stability of a limit cycle** Synonymous with orbital stability. *See also:* control system. (CS/IM) [120]

**stability of the speed-governing system (gas turbines)** A characteristic of the system that indicates that the speed-governing system is capable of actuating the turbine fuel-control valve so that sustained oscillations in turbine speed, or rate of energy input to the turbine, are limited to acceptable values by the speed-governing system. (PE/EDPG) 282-1968w, [5]

**stability of the temperature-control system (gas turbines)** A characteristic of the system that indicates that the temperature-control system is capable of actuating the turbine fuel-control valve so that sustained oscillations in rate of energy input to the turbine are limited to acceptable values by the temperature-control system during operation under constant system frequency. (PE/EDPG) 282-1968w, [5]

**stability, orbital** *See:* orbital stability.

**stability, practical** *See:* finite-time stability.

**stability, quasi-asymptotic** *See:* quasi-asymptotic stability.

**stability, relative** *See:* relative stability.

**stability, short-time** *See:* finite-time stability.

**stability, synchronous-machine regulating-system** *See:* synchronous-machine regulating-system stability.

**stability, total** *See:* total stability.

**stability, trajectory** *See:* trajectory stability.

**stability, uniform-asymptotic** *See:* uniform-asymptotic stability.

**stabilization (1) (control system feedback)** Act of attaining stability or of improving relative stability. *See also:* feedback control system. (PE/EDPG) [3]

**(2) (navigation aids) (navigation)** Maintenance of a desired orientation of a vehicle or device with respect to one or more reference directions. (AES/GCS) 172-1983w

**(3) (direct-current amplifier)** *See also:* drift stabilization.

**stabilization, drift** *See:* drift stabilization.

**stabilization network (analog computer)** As applied to operational amplifiers, a network used to shape the transfer characteristics to eliminate or minimize oscillations when feedback is provided. (C) 165-1977w

**stabilized feedback** Feedback employed in such a manner as to stabilize the gain of a transmission system or section thereof with respect to time or frequency or to reduce noise or distortion arising therein. *Note:* The section of the transmission system may include amplifiers only, or it may include modulators. *See also:* feedback. (AP/ANT) 145-1983s

**stabilized flight (navigation aids)** That type of flight which obtains control information from devices which sense orientation with respect to external references. (AES/GCS) 172-1983w

**stabilized shunt-wound generator** Same as the shunt-wound type, except that a series field winding is added. The series field winding is proportioned such that it does not require equalizers for satisfactory parallel operation. The voltage regulation of this type of generator should be the same as shunt-wound generators. (IA/MT) 45-1998

**stabilized shunt-wound motor** A shunt-wound motor that has a light series winding added to prevent a rise in speed, or to obtain a slight reduction in speed, with increase of load. (IA/MT) 45-1998

**stabilized-variable model** A model in which some of the variables are held constant and the others are allowed to vary; for example, a model of a controlled climate in which humidity is held constant and temperature is allowed to vary. (C) 610.3-1989w

**stabilizer, excitation control system** *See:* excitation control system stabilizer.

**stabilizer, power system** *See:* power system stabilizer.

**stabilizing winding (power and distribution transformers)** A delta connected auxiliary winding used particularly in Y-connected three-phase transformers for such purposes as the following:

a) To stabilize the neutral point of the fundamental frequency voltages;
b) to minimize third-harmonic voltage and the resultant effects on the system;
c) to mitigate telephone influence due to third-harmonic currents and voltages;
d) to minimize the residual direct-current magnetomotive force on the core;
e) to decrease the zero-sequence impedance of transformers with Y-connected windings.

*Note:* A winding is regarded as a stabilizing winding if its terminals are not brought out for connection to an external circuit. However, one or two points of the winding which are intended to form the same corner point of the delta may be brought out for grounding, or grounded internally to the tank. For a three-phase transformer, if other points of the winding are brought out, the winding should be regarded as a normal winding as otherwise defined. (PE/TR) C57.12.80-1978r

**stable (1) (excitation systems)** Possessing stability, where, for a feedback control system or element, stability is the property such that its output is asymptotic, that is, will ultimately attain a steady-state, within the linear range and without continuing external stimuli. For certain nonlinear systems or elements, the property such that the output remains bounded, that is, in a limit cycle of continued oscillation, when the input is bounded. *See also:* conditional stability; asymptomatic stability; bounded-input-bounded-output stability. (PE/EDPG) 421A-1978s

**(2)** Pertaining to a state of a circuit in which the circuit will remain until an input signal causes a change to another state. *Contrast:* unstable. *See also:* monostable; bistable. (C) 610.10-1994w

**stable circuit** A circuit that alternates between its two unstable states. (C) 610.10-1994w

**stable element (navigation aids) (navigation)** An instrument or device which maintains a desired orientation independently of the motion of the vehicle. (AES/GCS) 172-1983w

**stable limit cycle** One that is approached asymptotically by a state trajectory for all initial states sufficiently close. (CS/PE/EDPG) [3]

**stable oscillation** A response that does not increase indefinitely with increasing time: an unstable oscillation is the converse. *Note:* The response must be specified or understood: a steady current in a pure resistance network would be stable, although the total charge passing any cross section of a network conductor would be increasing continuously. (Std100) 270-1966w

**stable platform (navigation aids)** A gimbal-mounted platform, usually containing gyros and accelerometers, whose purpose is to maintain a desired orientation in inertial space, independent of the motion of the vehicle. (AES/GCS) 172-1983w

**stack (1) (A) (data management)** A list in which items are appended to and retrieved from the same end of the list, known as the top. That is, the next item to be retrieved is the item that has been in the list for the shortest time. *Synonyms:* storage stack; push-down stack. *Contrast:* pushdown list; queue; pushdown storage. **(B) (data management)** A line formed by items waiting for service in a system in which the next item to exit the line is the item that has been in the line for the shortest time. **(C) (data management)** To arrange in, or to form a stack as in definition (A). (C) 610.5-1990

**(2) (software)** A list that is accessed in a last-in, first-out manner. *See also:* list; queue. (C/SE) 729-1983s

**(3)** A last-in, first-out (LIFO) data structure. This document sometimes uses the phrase "the stack" to mean "the Forth data stack". (C/BA) 1275-1994

**(4)** An area in memory for the temporary storage of data. *Note:* Can be implemented using either last-in-first-out or first-in-first out. *Synonym:* pushdown storage. *See also:* evaluation stack; pushup storage. (C) 610.10-1994w

**stack architecture** A computer architecture whose design relies on a push-down stack to store data and process operands. *Contrast:* register architecture. (C) 610.10-1994w

**stack diagram** A notational convention used to show the effect of a Forth word on the data stack and, where applicable, the input buffer and return stack. See ANSI X3.215-1994 for syntactic details. (C/BA) 1275-1994

**stacked-beam radar** A radar that forms two or more simultaneous receive beams at the same azimuth but at different elevation angles. *Note:* The beams are usually contiguous or partly overlapping. Each stacked beam feeds an independent receiver channel. (AES) 686-1997

**stacker** *See:* card stacker.

**stack height** A dimension used to define the spacing between adjacent surfaces of mezzanine cards or a mezzanine card and its host. (C/BA) 1301.4-1996

**stack indicator** *See:* stack pointer.

**stack, insulator** *See:* insulator stack.

**stack pointer** A data item that specifies the address of the data item most recently stored in a stack. *Synonym:* stack indicator. (C) 610.5-1990w

**stack storage** *See:* pushdown storage.

**staff-hour** An hour of effort expended by a member of the staff. (C/SE) 1045-1992

**stage (1) (communication practice)** One step, especially if part of a multistep process, or the apparatus employed in such a step. The term is usually applied to an amplifier. *See also:* amplifier. (EEC/PE) [119]

**(2) (thermoelectric device)** One thermoelectric couple or two or more similar thermoelectric couples arranged thermally in parallel and electrically connected. *See also:* thermoelectric device. (ED) [46], 221-1962w

**stage efficiency** The ratio of useful power delivered to the load (alternating current) and the plate power input (direct current). *See also:* network analysis. (AP/ANT) 145-1983s

**stagger (facsimile)** Periodic error in the position of the recorded spot along the recorded line. *See also:* recording. (COM) 168-1956w

**staggered-repetition-interval moving-target indicator** A moving-target indicator with multiple interpulse intervals. The interval may vary either from pulse to pulse or from scan to scan. (AES/RS) 686-1990

**staggered-repetition-interval waveform** A waveform in which the pulse repetition interval (PRI) changes from pulse to pulse, to fill blind speeds or to distinguish echoes having ambiguous range or Doppler shifts. *Note:* Not to be confused with changing PRI from scan to scan or from one group of pulses to another, which can be described as multiple-PRI or PRI-diversity waveforms. (AES) 686-1997

**staggering** The offsetting of two channels of different carrier systems from exact sideband frequency coincidence in order to avoid mutual interference. (EEC/PE) [119]

**staggering advantage** The effective reduction, in decibels, of interference between carrier channels, due to staggering. (EEC/PE) [119]

**stagger time, relay** *See:* relay stagger time.

**stagger-tuned amplifier** An amplifier consisting of two or more single-tuned stages that are tuned to different frequencies. *See also:* amplifier. (EEC/PE) [119]

**stain spots (electroplating)** Spots produced by exudation, from pores in the metal, of compounds absorbed from cleaning, pickling plating solutions. The appearance of stain spots is called spotting out. (PE/EEC) [119]

**staircase (pulse terminology)** Unless otherwise specified, a periodic and finite sequence of steps of equal magnitude and of the same polarity. (IM/WM&A) 194-1977w

**staircase signal (television)** A waveform consisting of a series of discrete steps resembling a staircase. (BT/AV) 201-1979w

**STAIRS** A nonprocedural computer language used in manipulation of textual data. (C) 610.13-1993w

**stairstepping** The jagged effect that results from representing a diagonal line or curve by pixels arranged in horizontal or vertical rows and columns on a display surface. *Synonym:* jaggies. *See also:* aliasing. (C) 610.6-1991w

**stairstep sweep (oscilloscopes)** An incremental sweep in which each step is equal. The electric deflection waveform producing a stairstep sweep is usually called a staircase or stairstep waveform. *See also:* incremental sweep; oscillograph. (IM/HFIM) [40], 311-1970w

**stalled tension control** A control function that maintains tension in the material at zero speed. *See also:* electric drive. (IA/ICTL/IAC) [60]

**stalled torque control** A control function that provides for the control of the drive torque at zero speed. *See also:* electric drive. (IA/ICTL/IAC) [60]

**stalo (STALO)** Acronym for stable local oscillator. A highly stable radio-frequency local oscillator used for heterodyning signals to produce an intermediate frequency (IF). (AES) 686-1997

**stamper (electroacoustics)** A negative (generally made of metal by electroforming) from which finished pressings are molded. *See also:* phonograph pickup. (SP) [32]

**stand-alone (1)** Pertaining to hardware or software that is capable of performing its function without being connected to other components; for example, a stand-alone word processing system. (C) 610.12-1990

**(2)** Pertaining to a system that is self-contained and not connected to other systems or system components. (C) 610.10-1994w

**stand-alone data dictionary** *See:* passive data dictionary.

**stand-alone testing** A test of a component performed before it is assembled onto a board or other substrate; for example, using ATE. (TT/C) 1149.1-1990

**stand-alone word processing** Word processing performed on a system that does not depend on the resources of other equipment to perform word processing activities. *Contrast:* dedicated word processing; shared-resource word processing; shared-logic word processing. (C) 610.2-1987

**standard (1) (A) (radiation protection) (instrument or source)** (national standard) An instrument, source, or other system or device maintained and promulgated by the U.S. National Bureau of Standards as such. **(B) (radiation protection) (instrument or source)** (derived or secondary standard) A calibrated instrument, source, or other system or device directly relatable (that is, with no intervening steps) to one or more U.S. National Standards. **(C) (radiation protection) (instrument or source)** (laboratory standard) A calibrated instrument, source, or other system or device without direct one-step relatability to the U.S. National Bureau of Standards, maintained and used primarily for calibration and standardization. (NI) N323-1978

**(2) (transmission lines and waveguides)** A device having stable, precisely defined characteristics that may be used as a reference. (IM/HFIM) [40]

**(3) (test, measurement, and diagnostic equipment)** A laboratory type device which is used to maintain continuity of value in the units of measurement by periodic comparison with higher echelon or national standards. They may be used to calibrate a standard of lesser accuracy or to calibrate test and measurement equipment directly. (MIL) [2]

**(4) (A) (instrument or source)** (National Standard) An instrument, source, or other system or device maintained and promulgated by the U.S. National Institute of Standards and Technology (NIST). **(B) (instrument or source)** (Transfer Standard) A physical measurement standard that has been compared directly or indirectly with the national standard. This standard is typically a measurement instrument or a radiation source used as a laboratory standard. **(C) (instrument or source)** (Laboratory Standard) An instrument, source, or other system or device calibrated by comparisons with a standard other than a U.S. National Standard. (NI) N42.17B-1989

**(5)** A document, established by consensus and approved by an accredited standards development organization, that provides, for common and repeated use, rules, guidelines, or characteristics for activities or their results, aimed at the achievement of the optimum degree of order and consistency in a given context. (C/PA) 14252-1996

**(6) (A)** A set of detailed technical guidelines, used as a means of establishing uniformity in an area of computing development. **(B)** Pertaining to the set of guidelines, as in (A). For example, a standard interface or a standard definition. **(C)** An agreement among any number of organizations that defines certain characteristics, specifications, or parameters related to a particular aspect of computer technology. For example, ANSI, ISO, and IEEE are standards-making bodies. *Note:* Such organizations may include industrial, academic, or governmental entities. **(D)** In software engineering, mandatory requirements employed and enforced to prescribe a disciplined uniform approach to software development, that is, mandatory conventions and practices are in fact standards. *See also:* standard language; convention; de facto standard; language standard. (C) 610.7-1995, 610.10-1994

**(7)** An agreement among any number of organizations that defines certain characteristics, specification, or parameters related to a particular aspect of computer technology. For example, ANSI, ISO, and IEEE are standards-making bodies. *Note:* Such organizations may include industrial, academic, or governmental entities. (C) 610.10-1994w

**standard adapter** A two-port device having standard connectors for joining together two waveguides or transmission lines with nonmating standard connectors. (IM/HFIM) 474-1973w

**standard antenna (amplitude-modulation broadcast receivers)** An open single-wire antenna (including the lead-in wire) having an effective height of 4 m. (CE) 186-1948w

**standard antenna calibration site** A flat, open area site, devoid of nearby scatterers such as trees, power lines, and fences, that has a large metallic groundplane. (EMC) C63.5-1988, C63.4-1988s

**standard antenna input voltages (amplitude-modulation broadcast receivers)** Four standard antenna input voltages are specified for the purpose of certain tests, as follows:

1) A "distant signal voltage" is taken as 86 dB below 1 V, or 50 μV.
2) A "mean-signal voltage" is taken as 46 dB below 1 V, or 5 000 μV.
3) A "local signal voltage" is taken as 20 dB below 1 V, or 100 000 μV.
4) A "strong-signal voltage" is taken as 1 V.

(CE) 186-1948w

**standard atmosphere for refraction** An atmosphere for which the refractivity is determined by the equation:

$$N(h) = 315 \exp(-0.136h)$$

where $h$ is the altitude in kilometers above mean sea level. *Note:* The standard atmosphere for refraction is almost identical to the standard radio atmosphere up to a height of one kilometer. *Synonym:* reference atmosphere for refraction. *See also:* refractive index gradient. (AP/PROP) 211-1997

**standard binary** *See:* binary.

**standard bus** An abbreviated notation used throughout this document, rather than the more exact "physical bus standard that claims conformance to this specification." (C/MM) 1212-1991s

**standard cable** The standard cable formerly used for specifying transmission losses had, in American practice, a linear series resistance and linear shunt capacitance of 88 ohms and 0.054 microfarad, respectively, per loop mile, with no inductance or shunt conductance. (EEC/PE) [119]

**standard cell** A cell that serves as a standard of electromotive force. *See also:* unsaturated standard cell; electrochemistry; auxiliary device to an instrument; Weston normal cell. (EEC/PE) [119]

**standard chopped lightning impulse** A standard lightning impulse chopped by an external gap after 2–5 μs. (PE/PSIM) 4-1995

**standard chopped wave impulse voltage shape** A standard lightning impulse that is intentionally interrupted on the tail by spark over of a gap or other equivalent chopping device. Usually the time to chop is 2–3 μs. (PE/C) 1313.1-1996

**standard code** The operating, block signal, and interlocking rules of the Association of American Railroads. (EEC/PE) [119]

**standard compass** A magnetic compass so located that the effect of the magnetic mass of the vessel and other factors that may influence compass indication is the least practicable. (EEC/PE) [119]

**standard connector (fixed and variable attenuators)** A connector, the critical mating dimensions of which have been standardized to assure nondestructive mating. *Notes:* 1. It butts against its mating standard connector only in the mechanical reference plane. 2. It joins to its waveguide or transmission line with a minimum discontinuity. 3. All its discontinuities are to the maximum extent possible, self-compensated, not within the mating connector. (IM/HFIM) 474-1973w

**standard connector pair (fixed and variable attenuators)** Two standard connectors designed to mate with each other. (IM/HFIM) 474-1973w

**standard de-emphasis characteristic (frequency modulation)** A falling response with modulation frequency, complementary to the standard pre-emphasis characteristic and equivalent to an RC circuit with a time constant of 75 μs. *Note:* The de-emphasis characteristic is usually incorporated in the audio circuits of the receiver. (BT) 185-1975w

**standard development organization** An accredited organization that formally develops and coordinates standards for use by a community. (C/PA) 14252-1996

**standard deviation** The square root of the variance of a random variable. For this application, the variance is a measure of the variation of the observations within a measurement set. The standard deviation is often estimated using a set of measurements of the random variable. The standard deviation has the same units as the measured quantity, and therefore is particularly convenient when describing the variability of the measured quantity. This parameter may also be expressed as a relative standard deviation (i.e., as a percentage of the measured quantity). (NI) N42.23-1995

**standard directivity** The maximum directivity from a planar aperture of area $A$, or from a line source of length $L$, when excited with a uniform amplitude, equiphase distribution. *Notes:* 1. For planar apertures in which $A >> \lambda^2$. The value of the standard directivity is $4\pi A/\lambda^2$, with $\lambda$ the wavelength and with radiation confined to a half space. 2. For line sources with $L >> \lambda$, the value of the standard directivity is $2L/\lambda$. *Synonym:* reference directivity. (AP/ANT) 145-1993

**standard electrode potential** An equilibrium potential for an electrode in contact with an electrolyte, in which all of the components of a specified electrochemical reaction are in their standard states. The standard state for a gas is the pressure of one atmosphere, for an ionic constituent it is unit ion activity, and it is a constant for a solid. *See also:* electrochemistry. (EEC/PE) [119]

**standard error** An output stream usually intended to be used for diagnostic messages. (C/PA) 9945-2-1993

**standard form** *See:* normalized form.

**standard frequency (electric power system)** A precise frequency intended to be used for a frequency reference. *Note:* In the U.S. a frequency of 50 Hz is recognized as a standard for all ac lighting and power systems. (IA/PE/MT/PSE) 45-1983s, 94-1991w

**standard full impulse voltage wave (1) (insulation strength)** An impulse that rises to crest value of volage in 1.2 μs (virtual time) and drops to 0.5 crest value of voltage in 50 μs (virtual time), both time being measured from the same origin and in accordance with established standards of impulse testing techniques. *Note:* The virtual value for the duration of the wavefront is 1.67 times the time taken by the voltage to increase from 30% to 90% of its crest value. The origin from which time is measured is the intersection with the zero axis of a straight line drawn through points on the front of the voltage wave at 30%and 90% crest value. (EEC/LB) [100]
**(2) (mercury lamp transformers)** An impulse that rises to crest value of voltage in 1.5 μs (nominal time) and drops to 0.5 crest value of voltage in 40 μs (nominal time), both times being measured from the same time origin and in accordance with established standards of impulse testing techniques. *See also:* basic impulse insulation level. (EEC/LB) [98]

**Standard Generalized Markup Language (SGML)** A text-formatting language. (C) 610.13-1993w

**standard gravity** By international agreement, the standard value of gravity acceleration magnitude, or $g_o = 9.80665$ m/s$^2$, which corresponds closely to the plumb-bob-gravity-acceleration magnitude measured at 45° latitude and sea level. In the calibration of accelerometer scale factor, the local value $g$ of plumb-bob-gravity-acceleration magnitude is used as a reference. If an absolute measurement of scale factor is required, a conversion to the standard gravity unit $g_o$ or to m/s2 has to be made. (AES/GYAC) 1293-1998

**standard illuminant (illuminating engineering)** A hypothetical light source of specified relative spectral power distribution. *Note:* The International Commission on Illumination has specified spectral power distributions for standard illuminants A, B, and C, and several D-illuminants. (EEC/IE) [126]

**standard illuminant A (illuminating engineering)** A blackbody at a temperature of 2856 K. It is defined by its relative spectral power distribution over the range from 300 nm to 830 nm. (EEC/IE) [126]

**standard illuminant B (illuminating engineering)** A representation of noon sunlight with a correlated color temperature of approximately 4900 K. It is defined by its relative spectral power distribution over the range from 320 nm to 770 nm. *Note:* It is anticipated that at some future date, that is yet to be decided, illuminant B will be dropped from the list of recommended standard illuminants. (EEC/IE) [126]

**standard illuminant C (illuminating engineering)** A representation of daylight having a correlated color temperature of approximately 6800 K. It is defined by its relative spectral power distribution over the range from 320 nm to 770 nm. *Note:* It is anticipated that at some future date, that is yet to be decided, illuminant C will be dropped from the list of recommended standard illuminants. (EEC/IE) [126]

**standard illuminant D65 (illuminating engineering)** A representation of daylight at a correlated color temperature of approximately 6500 K. It is defined by its relative spectral power distribution over the range from 300 nm to 830 nm. *Note:* At present, no artificial source for matching this illuminant has been recommended. (EEC/IE) [126]

**standard input** An input stream usually intended to be used for primary data input. (C/PA) 9945-2-1993

**standard insulation class (instrument transformers)** Denotes the maximum voltage in kilovolts that the insulation of the primary winding is designed to withstand continuously. *See also:* instrument transformer. (ELM) C12.1-1982s

**standardization** *See:* laboratory reference standards; echelon; laboratory working standards.

**standardization coefficient** A factor used for the direct conversion of a net area counting rate of a gamma-ray peak of a given energy, *E*, and from a specific radionuclide, *i*, to the activity of that radionuclide. (NI) N42.14-1991

**standardize** *See:* check; normalize.

**standardized profile** A balloted, formal, harmonized document that specifies a profile. (C/PA) 14252-1996

**standard language** Any language that conforms to an existing language standard. For example, ALGOL 60 and ALGOL 68 are considered standard languages. (C) 610.13-1993w, 610.10-1994w

**standard lightning impulse (1) (power and distribution transformers)** An impulse that rises to crest value of voltage in 1.2 μs (virtual time) and drops to 0.5 crest value of voltage in 50 μs (virtual time), both times being measured from the same origin and in accordance with established standards of impulse testing techniques. It is described as a 1.2/50 μs impulse. *Note:* The virtual value for the duration of the wavefront is 1.67 times the time taken by the voltage to increase from 30% to 90% of its crest value. The origin from which time is measured is the intersection with the zero axis of a straight line drawn through points on the front of the voltage wave at 30% and 90% crest value. (PE/TR) C57.12.80-1978r

**(2)** A full lightning impulse having a virtual front time of 1.2 μs and a virtual time to half-value of 50 μs. (PE/PSIM) 4-1995

**(3)** The wave shape of the standard impulse used is 1.2/50 μs (when not in conflict with products standards). (SPD/PE) C62.22-1997

**(4)** A unidirectional surge having a 30–90% equivalent rise time of 1.2 μs and a time to half value of 50 μs. (PE/T&D) 1243-1997

**standard lightning impulse voltage shape** An impulse that rises to crest value of voltage in 1.2 μs (virtual time) and drops to 0.5 crest value of voltage in 50 μs (virtual time), both times being measured from the same origin and in accordance with established standards of impulse testing techniques. It is described as a 1.2/50 impulse. (PE/C) 1313.1-1996

**standard logic type** The type STD_ULOGIC defined by IEEE Std 1164-1993, or any type derived from it, including, in particular, one-dimensional arrays of STD_ULOGIC or of one of its subtypes. (C/DA) 1076.3-1997

**standard loop input signals (A) (amplitude-modulation broadcast receivers)** A "distant-signal" loop input is taken as 86 dB below 1 V/m, or 5 000 μV/m. **(B) (amplitude-modulation broadcast receivers)** A "mean-signal" loop input is taken as 46 dB below 1 V/m, or 5 000 μV/m. **(C) (amplitude-modulation broadcast receivers)** A "local-signal" loop input is taken a 26 dB below 1 V/m, or 50 000 μV/m. **(D) (amplitude-modulation broadcast receivers)** A "strong-signal" loop input is taken as 14 dB below 1 V/m, or 200 000 μV/m. *Note:* The above loop field intensities are not equivalent to the standard antenna input voltages for the corresponding class of service. For example, the "mean-signal" voltage for antenna operation is 5 000 μV. This corresponds to a field intensity if 1 250 μV/m assuming a standard 4-meter antenna, whereas the mean-signal voltage for loop receivers is arbitrarily taken as 5 000 μV/m. (CE) 186-1948

**standard maximum usable frequency** *See:* maximum usable frequency.

**standard M gradient** *See:* refractive index gradient.

**standard microphone** A microphone the response of which is accurately known for the condition under which it is to be used. *See also:* instrument. (EEC/PE) [119]

**standard N gradient** *See:* standard refractive index gradient.

**standard noise temperature (interference terminology)** The temperature used in evaluating signal transmission systems for noise factor 290 K (27°C). *See also:* interference. (IE) [43]

**standard observer (television) (color)** (CIE 1931) Receptor of radiation whose colorimetric characteristics correspond to the distribution coefficients $\bar{x}_\lambda, \bar{y}_\lambda, \bar{z}_\lambda$ adopted by the International Commission on Illumination (CIE) in 1931. (BT/AV) 201-1979w

**standard operating duty** *See:* operating duty.

**standard output** An output stream usually intended to be used for primary data output. (C/PA) 9945-2-1993

**standard pitch** *See:* standard tuning frequency.

**standard potential (standard electrode potential)** The reversible potential for an electrode process when all products and reactants are at unit activity on a scale in which the potential for the standard hydrogen half-cell is zero. (GSD) [71], 315-1975r

**standard power-frequency short-duration voltage shape** A sinusoidal voltage with frequency between 48 Hz and 62 Hz, and duration of 60 s. *Note:* Some apparatus standards (e.g., transformers) use a modified wave shape when practical test considerations or particular dielectric strength characteristics make such modification necessary. (PE/C) 1313.1-1996

**standard propagation** The propagation of radio waves over a smooth spherical Earth of uniform dielectric constant and conductivity, under conditions of standard refraction in the atmosphere. *See also:* refractive index gradient. (AP/PROP) 211-1997

**standard radio atmosphere** An atmosphere whose vertical refractivity gradient is equal to the standard refractive index gradient. *See also:* refractive index gradient. (AP/PROP) 211-1997

**standard radio horizon** The radio horizon corresponding to propagation through the standard radio atmosphere. *See also:* refractive index gradient. (AP/PROP) 211-1997

**standard reference material** Material characterized by the U.S. National Institute of Standards and Technology (NIST) for the activity of radionuclides and issued with a certificate that gives the results of the characterization. (NI) N42.23-1995

**standard reference position** (of a contact) The nonoperated or de-energized position of the associated main device to which the contact position is referred. *Note:* Standard reference positions of typical devices are shown in the following table:

| Device | Standard Reference Position |
|---|---|
| Circuit breaker | Main contacts open |
| Disconnecting switch | Main contacts open |
| Relay | De-energized position |
| Contactor | De-energized position |
| Valve | Closed position |

(SWG/PE) C37.100-1992

**standard refraction** *See:* refractive index gradient.

**standard refractive index gradient** A standard value of vertical gradient of refractivity, namely 39.2?N-Units/km, used in studies of the refraction of radio waves in the troposphere. *Note:* This value corresponds, approximately, to the median value of the gradient in the first kilometer of altitude in temperate regions. *Synonym:* standard N gradient. *See also:* refractive index gradient. (AP/PROP) 211-1997

**standard refractive index modulus gradient** *See:* refractive index gradient.

**standard register (motor meter) (dial register)** A four- or five-dial register, each dial of which is divided into ten equal parts, the division marks being numbered from zero to nine, and the gearing between the dial pointers being such that the reltive movements of the adjacent dial pointers are in opposite directions and in a 10-to-1 ratio. *See also:* watthour meter. (PE/EEC) [119]

**standard resistor (resistance standard)** A resistor that is adjusted with high accuracy to a specified value, is but slightly affected by variations in temperature, and is substantially constant over long periods of time. *See also:* auxiliary device to an instrument. (PE/EEC) [119]

**standard response spectrum (SRS)** A required response system (RRS) that is artificially created to cover the standard testing of relays and whose shape is defined. The SRS may be terminated at any convenient frequency above 35 Hz. (SWG/PE) C37.100-1992

**standard rod gap** A gap between the ends of the two one-half-inch square rods cut off squarely and mounted on suppots so that a length of rod equal to or greater than one-half the gap spacing overhangs the inner edge of each support. It is intended to be used for the approximate measurement of crest voltages. *See also:* instrument. (EEC/PE) [119]

**standards** Mandatory requirements employed to prescribe a disciplined, uniform approach to software development, maintenance, and operation. (C/SE) 730.1-1995

**standards—basic reference** Those standards with which the values of the electrical units are maintained in the laboratory, and that serve as the starting point of the chain of sequential measurements carried out in the laboratory. (ELM) C12.1-1988

**standards—dc-ac transfer** Instruments used to establish the equality of an rms current or voltage (or the average values of alternating power) with the corresponding steady-state dc quantity. (ELM) C12.1-1988

**standards—laboratory reference (metering)** Standards that are used to assign and check the values of laboratory secondary standards. (ELM) C12.1-1988, C12.1-1982s

**standards—laboratory secondary (metering)** Standards that are used in the routine calibration tasks of the laboratory. (ELM) C12.1-1988, C12.1-1982s

**standards—national** Those standards of electrical measurements that are maintained by the National Institute of Standards and Technology. (ELM) C12.1-1988

**standards—transport** Standards of the same nominal value as the basic reference standards of a laboratory (and preferably of equal quality) that are regularly intercompared with the basic group but are reserved for periodic interlaboratory comparison tests to check the stability of the basic reference group. (ELM) C12.1-1988

**standard source (illuminating engineering)** An artificial source having the same spectral distribution as a specified standard illuminant. (EEC/IE) [126]

**standard source A (illuminating engineering)** A tungsten filament lamp operated at a color temperature of 2856 K (International Practical Temperature Scale, 1968) and approximating the relative spectral power distribution of standard illuminant A. (EEC/IE) [126]

**standard source B (illuminating engineering)** An approximation of standard illuminant B obtained by a combination of Source A and a special filter. (EEC/IE) [126]

**standard source C (illuminating engineering)** An approximation of standard illuminant C obtained by a combination of Source A and a special filter. (EEC/IE) [126]

**standard source diameter (x-ray energy spectrometers)** The diameter of the x-ray emission source which is used to measure the response characteristics of the spectrometer. Unless otherwise specified, this is assumed to be a point source. (NPS/NID) 759-1984r

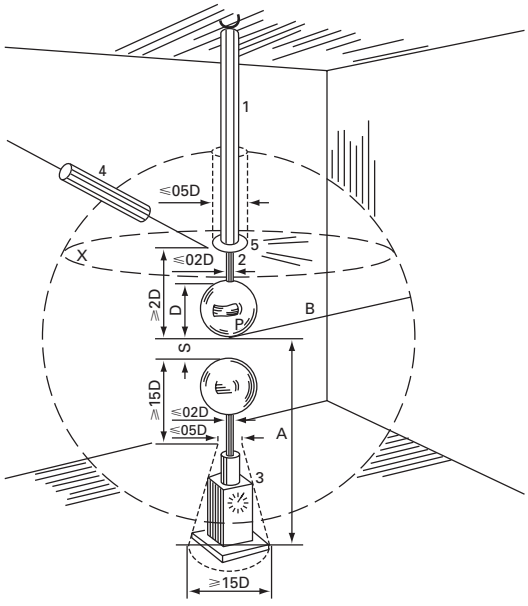
**standard sources ("dose calibrator" ionization chambers)** A general term used to refer to the standard sources listed below:

— National radioactivity standard source. A calibrated radioactive source prepared and distributed as a standard reference material by the US Bureau of Standards.

— Certified radioactivity standard source. A calibrated radioactive source, with stated accuracy, whose calibration is certified by the source supplier as traceable to the National Radioactive Measurements System.

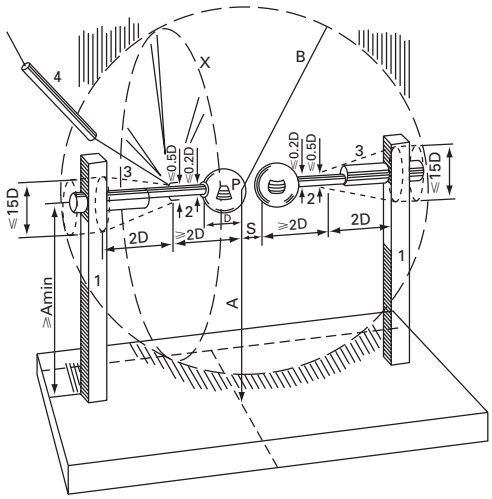
(NI) N42.13-1986

**standard sphere gap (high voltage testing)** A peak-voltage device constructed and arranged in accordance with this document. It consists of two metal spheres of the same diameter, D, with their shanks, operating gear, insulating supports, supporting frame, and leads for connections to the point at which the voltage is to be measured. Standard values of D are 625 mm, 125 mm, 250 mm, 500 mm, 750 mm, 1000 mm, 1500 mm, and 2000 mm. The spacing between the spheres is designated as S. The points on the two spheres that are closest to each other are called the sparking points. In practice, the disruptive discharge may occur between other neighboring points. The corresponding figures A and B show two arrangements; one of which is typical of sphere gaps with a vertical axis, and the other, of sphere gaps with a horizontal axis.




*Key: 1. Insulating support; 2. Sphere shank; 3. Operating gear, showing maximum dimensions; 4. High-voltage connection with series resistor; 5. Stress distributor, showing maximum dimensions; P Sparking point of high-voltage sphere; A Height of P above ground plane; B Radius of space free from external structures; X item 4 not to pass through this plane within a distance from B from P. Note: The figure is drawn to scale for a 100 cm sphere gap at radius spacing.*

**standard sphere gap (figure A)**




*Key: 1. Insulating support; 2. Sphere shank; 3. Operating gear, showing maximum dimensions; 4. High-voltage connection with series resistor; P Sparking point of high-voltage sphere; A Height of P above ground plane; B Radius of space free from external structures; X item 4 not to pass through this plane within a distance from B from P. Note: This figure is drawn to scale for a 25 cm sphere gap at radius spacing.*

**standard sphere gap (figure B)**

(PE/PSIM) 4-1978s

**standard structure** A particular C structure, defined in `std_stru.h`, that contains fields used to pass data over the procedural interface (PI) (thus avoiding large numbers of arguments). Most functions of the PI have a pointer to a *standard structure* as their first argument. (C/DA) 1481-1999

**standard switching impulse (power and distribution transformers)** A full impulse having a front time of 250 μs and a time to half value of 2500 μs. It is described as a 250/2500 impulse. *Note:* It is recognized that some apparatus standards may have to use a modified wave shape where practical test considerations or particular dielectric strength characteristics make some modification imperative. Transformers, for example, use a modified switching impulse wave with the following characteristics: 1) Time to crest greater than 100 μs; 2) Exceeds 90% of crest value for at least 200 μs; 3) Time to first voltage zero on tail not less than 1000 μs, except where core saturation causes the tail to become shorter.

(PE/TR) C57.12.80-1978r

**standard switching impulses** The wave shapes of standard impulse tests depend on equipment being tested:

a) For air insulation and switchgear: 250/2500 μs
b) For transformer products: 100/1000 μs
c) For arrester sparkover tests:
1) 30–60/90–180 μs
2) 50–300/400–900 μs
3) 1000–2000/3000–6000 μs (The tail duration is not critical)

(SPD/PE) C62.22-1997

**standard switching impulse voltage shape** A full impulse having a time-to-crest of 250 μs and a time to half value of 2500 μs. It is described as a 250/2500 impulse. *Note:* Some apparatus standards use a modified wave shape where practical test considerations or particular dielectric strength characteristics make some modification imperative.

(PE/C) 1313.1-1996

**standard systems (electric installations on shipboard)** The following systems of distribution are recognized as standard:

a) Two-wire with single-phase alternating current, or direct current.
b) Three-wire with single-phase alternating current, or direct current.
c) Three-phase three-wire, alternating current.
d) Three-phase, four-wire, alternating current.

(IA/MT) 45-1983s

**standard television signal** A signal that conforms to certain accepted specifications. *See also:* television.

(EEC/PE) [119]

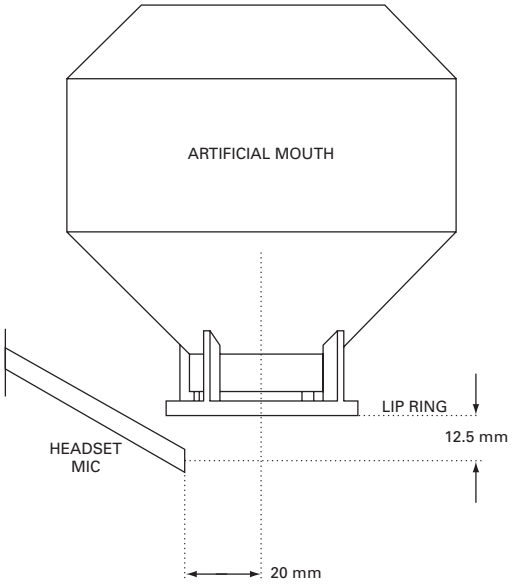
**standard test fiber** A silica graded index multi-mode optical fiber with a core diameter of 100 μm, an outside diameter of 140 μm, a numerical aperture of 0.29, a bandwidth of 400 MHz-km at 1300 nm and terminated in a standard subminiature assembly (SMA) connector. (C/BA) 1393-1999

**standard test frequencies in the broadcast band (amplitude-modulation broadcast receivers)** The standard group of seven carrier frequencies for testing is 540, 600, 800, 1 000, 1 200, 1 400, and 1 600 kilocycles. The standard group of three carrier frequencies for testing is 600, 1 000, and 1 400 kilocycles. (CE) 186-1948w

**standard test interface language (STIL)** A syntax for the description of device stimulus and expected response used for stimulus development, as well as input to automated test equipment (ATE). (C/TT) 1450-1999

**standard test modulation (frequency-modulated mobile communications receivers)** Sixty percent of the rated system deviation at a frequency of 1 kilohertz. (VT) 184-1969w

**standard test position (STP)** The default test position for a headset that does not have a fixed spatial relationship between the location of their transmitter and receiver sound ports. See the figure below.




**headset transmitter port in standard test position (STP)**

(COM/TA) 1206-1994

**standard test problem (test, measurement, and diagnostic equipment)** An evaluation of the performance of a system, or any part of it, conducted by setting parameters into the system; the parameters are operated on and the results obtained from system read outs. (MIL) [2]

**standard test tone (data transmission)** A 1mW (0 dBm) 1000 Hz signal applied to the 600 Ω audio portion of a circuit at a zero transmission level reference point. If referred to a point with a relative level other than 0, the absolute power of the tone shall be adjusted to suit the relative level at the point of application. (PE) 599-1985w

**standard track** *See:* single-track.

**standard transmitter test modulation (land-mobile communications transmitters)** The standard test modulation shall

be 60% of the maximum rated deviation at 1 kKz. (EMC) 377-1980r

**standard tuning frequency (standard musical pitch)** The frequency for the note A4, namely, 440 Hz. (SP) [32]

**standard voltages (electric installations on shipboard)** The following voltages are recognized as standard:

| | Alternating Current (volts) | Direct Current (volts) |
|---|---|---|
| Lighting | 115 | 115 |
| Power | 115–200–220–440 | 115 and 230 |
| Generators | 120–208–230–450 | 120 and 240 |

*Note:* Satisfactory to use 120 V lamps

**standard volume indicator (volume measurements of electrical speech and program waves)** A device for the indication of volume, and having the characteristic described in IEEE Std 152-1953w. *Note:* A standard volume indicator consists of at least two parts: 1) A meter; and 2) an attenuator (adjustable loss) or pad (fixed loss).

**standard watthour meter** *See:* portable standard watthour meter; reference standard watthour meter.

**standard-wave error (navigation aids) (direction finder measurements)** The bearing error produced by a wave whose vertically and horizontally polarized electric fields are equal and phased so as to give maximum error in the DF, and whose incidence direction is arranged to be 45°. (AES/GCS) 172-1983w

**standard working axis** (of a semiconductor x-ray energy spectrometer) A straight line drawn between the center of the entrance window on the detector and the specified location of the source of x rays. (NPS/NID) 759-1984r

**standBy** A lower-power operating mode of RamLink slaves, in which a change in the flag line is sufficient to quickly reactivate attached chips. (C/MM) 1596.4-1996

**standby** *See:* reserve; alternative.

**standby current** The current flowing in any specific conductor (including a conductive case) when the device is connected as intended to the energized power system at rated voltage with no connected load. (SPD/PE) C62.62-2000

**standby current, dc** *See:* direct-current standby current.

**standby equipment** Equipment not normally in operation that is available on demand to perform a specific function. (PE/NP) 933-1999

**standby failure rate (reliability data for pumps and drivers, valve actuators, and valves)** The probability (per hour) of failure for those components which are normally dormant or in a standby state until tested or required to operate to perform their function. (PE/NP) 500-1984w

**standby losses** The losses produced with the HVDC converter station energized, but with the valves blocked. (SUB/PE) 1158-1991r

**standby monitor** A station on the ring that is not in active monitor mode. The function of the standby monitor in normal ring operation is to assure that an active monitor is operating. (C/LM) 8802-5-1998

**standBy packet** An event packet that initiates the transition into the standBy state. (C/MM) 1596.4-1996

**standby power** The power consumption while the chip is not performing any read or write operation. (ED) 641-1987w

**standby power, ac** *See:* alternating-current standby power.

**standby power supply (nuclear power generating station) (diesel-generator unit)** The power supply that is selected to furnish electric energy when the preferred power supply is not available. (PE/NP) 387-1995, 308-1991

**standby power system (emergency and standby power)** An independent reserve source of electric energy that, upon failure or outage of the normal source, provides electric power of acceptable quality so that the user's facilities may continue in satisfactory operation. (IA/PSE) 446-1995

**standby redundancy (1) (software)** In fault tolerance, the use of redundant elements that are left inoperative until a failure occurs in a primary element. *Contrast:* active redundancy. (C) 610.12-1990

**(2)** That redundancy wherein the alternative means for performing a given function are inoperative until needed. (R) [29]

**standby service (electric power utilization)** Service through a permanent connection not normally used but available in lieu of, or as a supplement to, the usual source of supply. (PE/PSE) 346-1973w, 858-1993w

**standby time** *See:* idle time.

**ST and CBT** *See:* sharing transformer and current balancing transformer.

**standing-on-nines carry (mathematics of computing)** A carry process in which a carry digit transferred to a given digit place is further transferred to the next higher digit place if the current sum in the given digit place is nine. *See also:* carry. (C) [20], 1084-1986w, [85]

**standing wave (1) (overhead power-line corona and radio noise)** A wave in which, for any component of the field, the ratio of its instantaneous value at one point to that at any other point does not vary with time. *Notes:* 1. A standing wave is most frequently produced by reflection. The sum of the incident and reflected waves, if they are periodic, will produce a standing wave. 2. Commonly, a standing wave is a periodic wave in which the amplitude of the displacement in the medium is a periodic function of the distance in the direction of any line of propagation of the waves. (T&D/PE) 539-1990

**(2)** A wave formed by the interference of two oppositely traveling plane waves having the same frequency and polarization. (AP/PROP) 211-1997

**standing-wave antenna** An antenna whose excitation is essentially equiphase, as the result of two feeding waves that traverse its length from opposite directions, their combined effect being that of a standing wave. (AP/ANT) 145-1993

**standing-wave detector** *See:* standing-wave meter.

**standing wave dissipation factor (waveguide)** The ratio of the transmission loss in an unmatched waveguide to that in the same waveguide when matched. (MTT) 146-1980w

**standing-wave indicator** *See:* standing-wave meter.

**standing-wave loss factor** The ratio of the transmission loss in an unmatched waveguide to that in the same waveguide when matched. *See also:* waveguide. (MTT) 146-1980w

**standing-wave machine** *See:* standing-wave meter.

**standing-wave meter (standing-wave indicator) (standing-wave machine) (standing-wave detector)** An instrument for measuring the standing-wave ratio in a transmission line. In addition, a standing-wave meter may include means for finding the location of maximum and minimum amplitudes. See table on previous page. *See also:* instrument. (PE/EEC) [119]

**standing wave ratio (1) (data transmission)** The ratio of the amplitude of a standing wave at an antinode to the amplitude of a node. *Note:* The standing wave ratio in a uniform transmission line is

$$\frac{1 + p}{1 - p}$$

where $p$ = the reflection coefficient. (T&D/PE) 539-1990, 599-1985w

**(2) (waveguide)** At a given frequency in a uniform transmission line or waveguide, the ratio of the maximum to the minimum amplitudes of corresponding components of the field (or the voltage or current) along the waveguide in the direction of propagation. *Note:* The standing wave ratio is occasionally expressed as the reciprocal of the ratio defined above. (MTT) 148-1959w, 146-1980w

**standing-wave-ratio indicator (standing-wave-ratio meter)** A device or part thereof used to indicate the standing-wave ratio. *Note:* In common terminology, it is the combination of

amplifier and meter as a supplement to the slotted line or bridge, etc., when performing impedance or reflection measurements. (IM/WM&A) 181-1977w

**stand, reel** *See:* reel stand.

**standstill locking (rotating machinery)** The occurrence of zero or unusably small torque in an energized polyphase induction motor, at standstill, for certain rotor positions. *See also:* asynchronous machine. (PE) [9]

**Stanford Artificial Intelligence Language** A dialect of LISP that was developed at Stanford's Artificial Intelligence Laboratory. (C) 610.13-1993w

**STAP** *See:* space-time adaptive processing.

**star-bus topology** A topology where the stations are physically star-wired to a hub but which logically act like a bus. *Note:* This is a common wiring scheme when using traditional point-to-point media such as twisted pair and optical fiber in a bus network. *See also:* bus topology; star-ring topology; star topology; bus-ring topology; loop topology; ring topology; tree topology. (C) 610.7-1995

**star chain (navigation aids)** A radio navigation transmitting system comprising a master station about which three (or more) slave stations are symmetrically located. (AES/GCS) 172-1983w

**star-connected circuit** A polyphase circuit in which all the current paths of the circuit extend from a terminal of entry to a common terminal or conductor (which may be the neutral conductor). *Note:* In a three-phase system this is sometimes called a Y (or wye) connection. (IA/PSE) 1100-1999

**star connection** *See:* Y connection.

**star coupler (fiber optics)** A passive device in which power from one or several input waveguides is distributed amongst a larger number of output optical waveguides. *See also:* tee coupler; optical combiner. (Std100) 812-1984w

**star-delta starter** A switch for starting a three-phase motor by connecting its windings first in star and then in delta. *See also:* starter. (IA/ICTL/IAC) [60], [84]

**star-delta starting** The process of starting a three-phase motor by connecting it to the supply with the primary winding initially connected in star, then reconnected in delta for running operation. (PE) [9]

**star ground** *See:* radial ground.

**star network** A set of three or more branches with one-terminal of each connected at a common node. *See also:* network analysis. (Std100) 270-1966w

**star quad** A cable element that comprises four insulated conductors twisted together. Two diametrically facing conductors form a transmission pair. *Note:* Cables containing star quads can be used interchangeably with cables consisting of pairs, provided the electrical characteristics meet the same specifications. (C/LM) 802.3-1998

**star rectifier circuit** A circuit that employs six or more rectifying elements with a conducting period of 60 electrical degrees plus the commutating angle. *See also:* rectification. (EEC/PE) [119]

**star-ring topology** A topology having a logical arrangement of a ring with a physical implementation of a star. This results in a system with relatively short cables, as in a ring network, and allows maintenance to be performed from a single point, as in a star network. *Note:* This is accomplished by connecting each node over a cable to a wiring closet and connecting all cables in a ring topology within the wiring closet. This is the common way in which IEEE 802.5 token rings are built. *See also:* bus-ring topology; star topology; bus topology; star-bus topology; tree topology; loop topology; ring topology. (C) 610.7-1995

**start (1)** An electric controller for accelerating a motor from rest to normal speed and to stop the motor. (IA/ICTL/MT/PKG) 45-1983s, 333-1980w

**(2) (gas tube)** A control electrode, the principal function of which is to establish sufficient ionization to reduce the anode breakdown voltage. *Note:* This has sometimes been referred to as a "trigger electrode." (ED) 161-1971w

**start and stop characters** Distinct bar/space patterns used at the beginning and end of each bar code symbol that provide initial timing references and direction-of-read information to the coding logic. (PE/TR) C57.12.35-1996

**start bit (1)** In asynchronous transmission, a signal that lasts a single bit time, indicating the beginning of a character. *Contrast:* stop bit. (C) 610.7-1995

**(2)** For the low-speed version of the Physical layer, a bit that is encoded identically to a logic "0" data bit that is used to delineate the beginning of each individual octet transmission. (EMB/MIB) 1073.4.1-2000

**Start Current** The current taken from the line when the motor is producing rated start torque at rated voltage and frequency. (PE/NP) 1290-1996

**start cycle** A cycle that initiates a transaction. The address and transfer type are valid during this cycle. (C/MM) 1196-1987w

**start-dialing signal (semiautomatic or automatic working) (telecommunications)** A signal transmitted from the incoming end of a circuit, following the receipt of a seizing signal, to indicate that the necessary circuit conditions have been established for receiving the numerical routing information. (COM) [49]

**start-diesel signal** That input signal to the diesel-generator unit start logic that initiates a diesel-generator unit start sequence. (PE/NP) 387-1995

**start element (1) (data transmission)** In a character transmitted in a start-stop system, the first element in each character, which serves to prepare the receiving equipment for the reception and registration of the character. The start element is a spacing signal. (PE) 599-1985w

**(2)** *See also:* start signal. (C) 610.7-1995

**starter (1) (illuminating engineering)** A device used in conjunction with a ballast for the purpose of starting an electric-discharge lamp. (EEC/IE) [126]

**(2)** An electric controller that is used to accelerate a motor from rest to normal speed and to stop the motor. (A device designed for starting a motor in either direction of rotation includes the additional function of reversing and should be designated a controller.) (IA/MT) 45-1998

**starter gap (gas tube)** The conduction path between a starter and the other electrode to which starting voltage is applied. *Note:* Commonly used in the glow-discharge cold-cathode tube. (ED) 161-1971w

**starters (fluorescent lamps)** Devices that first connect a fluorescent or similar discharge lamp in a circuit to provide for cathode preheating and then open the circuit so that the starting voltage is applied across the lamp to establish an arc. Starters also include a capacitor for the purpose of assisting the starting operation and for the suppression of radio interference during lamp starting and lamp operation. They may also include a circuit-opening device arraned to disconnect the preheat circuit if the lamp fails to light normally. (NPS) 325-1972s

**starter voltage drop (glow-discharge cold-cathode tube)** The starter-gap voltage drop after conduction is established in the starter gap. (ED) 161-1971w

**starting (rotating machinery)** The process of bringing a motor up to speed from rest. *Note:* This includes breaking away, accelerating and if necessary, synchronizing with the supply. (PE) [9]

**starting address** The address of the first instruction of a computer program in main storage. *Note:* This address may or may not be the same as the program's origin, depending upon whether there are data preceding the first instruction. *Contrast:* origin. *See also:* loaded origin; assembled origin. (C) 610.12-1990

**starting amortisseur** An amortisseur, the primary function of which is the starting of the synchronous machine and its connected load. (EEC/PE) [119]

**starting anode** An electrode that is used in establishing the initial arc. *See also:* rectification. (EEC/PE) [119]

**starting attempt (electric generating unit reliability, availability, and productivity)** The action to bring a unit from shutdown to the in-service state. Repeated initiations of the starting sequence without accomplishing corrective repairs are counted as a single attempt. (PE/PSE) 762-1987w

**starting capacitance (capacitor motor)** The total effective capacitance in series with the auxiliary winding for starting operation. *See also:* asynchronous machine.

**starting circuit breaker (power system device function numbers)** A device whose principal function is to connect a machine to its source of starting voltage. (SUB/PE) C37.2-1979s

**starting current (1) (rotating machinery)** The current drawn by the motor during the starting period. (A function of speed or slip). *See also:* asynchronous machine. (PE) [9]
**(2) (oscillators)** The value of electron-stream current through an oscillator at which selfsustaining oscillations will start under specified conditions of loading. *See also:* magnetron. (ED) 161-1971w

**starting failure (electric generating unit reliability, availability, and productivity)** The inability to bring a unit from some unavailable state or reserve shutdown state to the in-service state within a specified period. The specified period may be different for individual units. Repeated failures within the specified starting period are counted as a single starting failure. (PE/PSE) 762-1987w

**starting motor** An auxiliary motor used to facilitate the starting and accelerating of a main machine to which it is mechanically connected. *See also:* asynchronous machine. (PE) [9]

**starting open-phase protection** The effect of a device operative to prevent connecting the load to the supply unless all conductors of a polyphase system are energized. (IA/IAC) [60]

**starting operation (A) (single-phase motor)** The range of operation between locked rotor and switching for a motor employing a starting-switch or relay. **(B) (single-phase motor)** The range of operation between locked rotor and a point just below but not including breakdown-torque speed for a motor not employing a starting switch or relay. *See also:* asynchronous machine. (PE) [9]

**starting point (A)** (for common channel signaling [CCS] incoming trunk). Receipt of the initial address message (IAM). **(B)** For non-centralized automatic message accounting (CAMA) p*er-trunk-signaling incoming trunk).* End of valid called-number digit reception. **(C)** (for CAMA per-trunk-signaling incoming trunk). End of reception of first automatic number identification (ANI) digit [exclusive of start of dialing or key pulse (KP) signal and information digit] or first operator number identification (ONI) digit. *See also:* ending point; cross-office delay. (COM/TA) 973-1990

**starting reactor (power and distribution transformers)** A current-limiting reactor for decreasing the starting current of a machine or device. *See also:* reactor. (PE/TR) C57.12.80-1978r, [57]

**starting resistor (rotating machinery)** A resistor connected in a secondary or field circuit to modify starting performance of an electric machine. *See also:* rotor; stator. (PE) [9]

**starting rheostat** A rheostat that controls the current taken by a motor during the period of starting and acceleration, but does not control the speed when the motor is running normally. (IA/ICTL/IAC) [60]

**starting sheet (electrorefining)** A thin sheet of refined metal introduced into an electrolytic cell to serve as a cathode surface for the deposition of the same refined metal. *See also:* electrorefining. (EEC/PE) [119]

**starting-sheet blank (electrorefining)** A rigid sheet of conducting material designed for introduction into an electrolytic cell as a cathode for the deposition of a thin temporarily adherent deposit to be stripped off as a starting sheet. *See also:* electrorefining. (EEC/PE) [119]

**starting success (electric generating unit reliability, availability, and productivity)** The occurrence of bringing a unit from some unavailable state or the reserve shutdown state to the in-service state within a specified period. The specified period may be different for individual units. (PE/PSE) 762-1987w

**starting-switch assembly** The make-and-break contacts, mechanical linkage, and mounting parts necessary for starting or running, or both starting and running, split-phase and capacitor motors. *Note:* The starting-switch assembly may consist of a stationary-contact assembly and a contact that moves with the rotor. (EEC/PE) [119]

**starting switch, centrifugal** *See:* centrifugal starting switch.

**starting switch, relay** *See:* relay starting switch.

**starting temperature (grounding device)** The winding temperature at the start of the flow of thermal current. (PE/SPD) 32-1972r

**starting test (rotating machinery)** A test taken on a machine while it is accelerating from standstill under specified conditions. *See also:* asynchronous machine. (PE) [9]

**starting torque (1) (electric coupling)** The minimum torque of an electric coupling developed with the output member stationary and the input member rotating, with excitation applied. *Note:* Starting torque is usually specified with rated speed of rotation and rated excitation applied. (EM/PE) 290-1980w
**(2) (synchronous motor)** The torque exerted by the motor during the starting period. (A function of speed or slip). (PE) [9]

**starting-to-running transition contactor (power system device function numbers)** A device that operates to initiate or cause the automatic transfer of a machine from the starting to the running power connection. (PE/SUB) C37.2-1979s

**starting voltage (radiation counters)** The voltage applied to a Geiger-Mueller tube at which pulses of 1 V amplitude appear across the tube when irradiated. *See also:* anticoincidence. (ED) [45]

**starting winding (rotating machinery)** A winding, the sole or main purpose of which is to set up or aid in setting up a magnetic field for producing the torque to start and accelerate a rotating electric machine. (PE) [9]

**startle shock** An electric shock from a steady-state or a discharge current that, if it occurred unexpectedly, would produce an unintentional muscular reflex. (T&D/PE) 539-1990

**Start_of_Packet Delimiter (SPD)** In 1000BASE-X, a single code-group 8B/10B ordered_set used to delineate the starting boundary of a data transmission sequence for a single packet. (C/LM) 802.3-1998

**start of packet byte** A single byte (hex A5, decimal 165) that is used by both the printer device and the host to quickly determine whether or not they are synchronized. (C/MM) 1284.1-1997

**start of stream delimiter (ssd) (1)** A pattern of defined code words used to delineate the boundary of a data transmission sequence on the Physical Layer stream. The SSD is unique in that it may be recognized independent of previously defined code-group boundaries and it defines subsequent code-group boundaries for the stream it delimits. For 100BASE-T4, SSD is a pattern of three predefined sosb code-groups (one per wire pair) indicating the positions of the first data code-group on each wire pair. For 100BASE-X, SSD consists of the code-group sequence /J/K/. For 100BASE-T2, the SSD is indicated by two consecutive pairs of predefined PAM5×5 symbols (±2, ±2) (±2, 0) which are generated using unique SSD/ESD coding rules. (C/LM) 802.3-1998
**(2) (local area networks)** Reserved code patterns that identify the beginning of the MII channel transmission frame. The ssd indicates the transmission priority of the packet. (C) 8802-12-1998

**star topology** A topology in which stations are connected to a single central switching facility. *See also:* bus topology; star-ring topology; ring topology; bus-ring topology; star-bus topology; tree topology; loop topology. (C) 610.7-1995

**start-pulsing signal (telephone switching systems)** A signal transmitted from the receiving end to the sending end of a trunk to indicate that the receiving end is in a condition to receive pulsing. (COM) 312-1977w

**star tracker** *See:* astrotracker.

**start-record signal** A signal used for starting the process of converting the electric signal to an image on the record sheet. *See also:* facsimile signal. (COM) 168-1956w

**start signal (1) (start-stop system)** Signal serving to prepare the receiving mechanism for the reception and registration of a character, or for the control of a function. (COM) [49]

**(2) (facsimile)** A signal that initiates the transfer of a facsimile equipment condition from standby to active. *See also:* facsimile signal. (COM) 168-1956w

**(3) (telephone switching systems)** In multifrequency and key pulsing, a signal used to indicate that all digits have been transmitted. (COM) 312-1977w

**(4) (data management)** A signal at the beginning of a start-stop character that prepares the receiving device for the reception of the code elements. *Note:* A start signal is limited to one signal element generally having the duration of unit interval. (C) 610.5-1990w

**(5)** In asynchronous transmission, a signal preceding a character that prepares the receiving device for the reception of code elements. *Synonym:* start element. *Contrast:* stop signal. (C) 610.7-1995

**start-stop character** A character including one start signal at the beginning and one or two stop signals at the end. (C) 610.5-1990w

**start-stop printing telegraphy** That form of printing telegraphy in which the signal-receiving mechanisms are started in operation at the beginning and stopped at the end of each character transmitted over the channel. *See also:* telegraphy. (EEC/PE) [119]

**start-stop signal** A signal composed of a sequence or group of signal elements, each group representing a character or block, having a duration equal to the duration of an integral number of unit intervals and which are separated by time intervals for which the duration is not fixed. (C) 610.7-1995

**start-stop system (data transmission)** A system in which each group of code elements corresponding to a character is preceded by a start element which serves to prepare the receiving equipment for the reception and registration of a character, and is followed by a stop element during which the receiving equipment comes to rest in preparation for the reception of the next character. (PE) 599-1985w

**start-stop tape drive** A tape drive capable of coming to a complete stop and restarting in the gap between two recorded data blocks. *Contrast:* streaming tape drive. (C) 610.10-1994w

**start-stop transmission (1) (data transmission)** A synchronous transmission in which a group of code elements corresponding to a character signal is preceded by a start signal which serves to prepare the receiving mechanism for the reception and registration of a character and is followed by a stop signal which serves to bring the receiving mechanism to rest in preparation for the reception of the next character. (PE) 599-1985w

**(2)** *See also:* asynchronous transmission. (C) 610.7-1995

**start time** *See:* acceleration time.

**start transition (data transmission)** In a character transmitted in a start-stop system, the mark-to-space transition at the beginning of the start element. (PE) 599-1985w

**startup** (of a relay) The action of a relay as it just departs from complete reset. Startup is also used as a qualifying term to identify the minimum value of the input quantity that will permit this condition. (SWG/PE) C37.100-1992

**startup current (1)** The transient current of a heating cable immediately following energization. (IA/PC) 515.1-1995

**(2)** The current response of a heating cable or surface heating device following energization. (IA) 515-1997

**startup testing** All testing of the generating unit from initial-powered rotation to verify suitability for operation. (PE/EDPG) 1248-1998

**starvation** A condition that occurs when one or more modules perform no useful work for an indefinite period of time due to lack of access to the bus or other system resources. (C/BA) 1014.1-1994w, 10857-1994, 896.3-1993w

**starved electrolyte cell** *See:* absorbed electrolyte cell.

**statcoulomb** The unit of charge in the centimeter-gram-second electrostatic system. It is that amount of charge that repels an equal charge with a force of one dyne when they are in a vacuum, stationary, and one centimeter apart. One statcoulomb is approximately $3.335 \times 10^{-10}$ C. (Std100) 270-1966w

**State** An unordered, finite datatype. Each state value is identified by an associated name. (C/PA) 1224.1-1993w

**state (1) (high-level microprocessor language)** The condition of the target microprocessor, given in terms of the contents of its registers, internal flags, local memory, etc. (C/MM) 755-1985w

**(2) (A) (modeling and simulation) (software)** A condition or mode of existence that a system, component, or simulation may be in; for example, the pre-flight state of an aircraft navigation program or the input state of given channel. **(B) (modeling and simulation) (software)** The values assumed at a given instant by the variables that define the characteristics of a system, component, or simulation. *Synonym:* system state. *See also:* steady state. (C) 610.3-1989, 610.12-1990

**(3) (power outages)** Component or unit state is a particular condition or status of a component or a unit which is important for outage reporting purposes. (PE/PSE) 859-1987w

**(4)** The language-independent syntax for a family on unordered, finite datatypes. Each state value is identified by an associated name. (C/PA) 1351-1994w

**(5)** The input to and information stored in a circuit or device. *Note:* A full description of the state of a device allows its future behavior to be predicted for any combination of inputs. (C) 610.10-1994w

**(6)** A condition that characterizes the behavior of a function/subfunction or element at a point in time. (C/SE) 1220-1998

**state class** A kind of class that represents a set of real or abstract objects (people, places, events, ideas, things, combinations of things, etc.) that have common knowledge or behavior. A state class represents instances with changeable state. The constituent instances of a state class can come and go and can change state over time, i.e., their property values can change. (C/SE) 1320.2-1998

**state data (software unit testing)** Data that defines an internal state of the test unit and is used to establish that state or compare with existing states. (SE/C) 1008-1987r, 610.12-1990

**state diagram (software)** A diagram that depicts the states that a system or component can assume, and shows the events or circumstances that cause or result from a change from one state to another. (C) 610.12-1990

**state element (high-level microprocessor language)** A microprocessor component containing a distinguishable part of the state information, such as a single register. (MM/C) 755-1985w

**state machine** A model of a system in which all values are discrete, as in a digital computer. (C) 610.3-1989w

**statement (1) (computer programming)** A meaningful expression or generalized instruction in a source language. (C) [20], [85]

**(2) (software)** In a programming language, a meaningful expression that defines data, specifies program actions, or directs the assembler or compiler. *See also:* control statement; assignment statement; declaration. (C) 610.12-1990

**statement of work** A document used by the acquirer as a means to identify, describe, and specify the tasks to be performed under the contract. (C/SE) 1062-1998

**statement testing (software)** Testing designed to execute each statement of a computer program. *Contrast:* path testing; branch testing. (C) 610.12-1990

**state-of-charge factor** Actual capacity of a battery expressed as a percentage of a fully-charged capacity. *Note:* This is based on experience, application (cycling/float service), and charging parameters. (VT) 1476-2000

**state of chromatic adaptation (illuminating engineering)** The condition of the chromatic properties of the visual system at a specified moment as a result of exposure to the totality of colors of the visual field currently and in the past. *See also:* chromatic adaptation. (EEC/IE) [126]

**state of polarization** (of a plane wave [field vector]) At a given point in space, the condition of the polarization of a plane wave [field vector] as described by the axial ratio, tilt angle, and sense of polarization. *Synonym:* polarization state. (AP/ANT) 145-1993

**state of statistical control (pulse measurement process)** That state wherein a degree of consistency among repeated measurements of a characteristic, property, or attribute is attained. (IM/WM&A) 181-1977w

**State Sequence Error (SSE) bit** A bit in the Bus Error register of all S-modules. An addressed S-module sets this bit to indicate that the S-module's Slave Link Layer Controller has entered the ERROR Slave Controller State. (TT/C) 1149.5-1995

**state space (1) (automatic control)** A space which contains the state vectors of a system. *Note:* The number of state variables in the system determines the dimension of the state space. *See also:* control system. (PE/EDPG) [3]
**(2)** Memory that is used to store the parameters, variables, workspace, etc., related to an I/O transaction that is currently being processed. (C/MM) 1212.1-1993

**state, system** *See:* system state.

**state trajectory (automatic control)** The vector function describing the dependence of the state on time and initial state. *Note:* If $\phi$ is the state trajectory, then

$$\phi(t_0,x_0) = x_0$$

$$\phi(t_2,x_0) = \phi[t_2,\phi(t_1,x_0)]$$

(PE/EDPG) [3]

**state transition** A change from one state to another in a system, component, or simulation. (C) 610.3-1989w

**state transition diagram** A graphical means of expressing the allowed states of an object and the allowed transitions from one state to another. (IM/ST) 1451.1-1999

**state variable** A variable that defines one of the characteristics of a system, component, or simulation. The values of all such variables define the state of the system, component, or simulation. (C) 610.3-1989w

**state variable formulation (excitation systems)** (eigenvalue, eigenvector, characteristic equation) A system may be mathematically modeled by assigning variables $x_1, x_2, \ldots, x_n$ to system parameters: when these $x$s comprise the minimum number of parameters which completely specify the system, they are termed "states" or "state variables." System states arranged in a $n$-vector form a state vector. The mathematical model of the system may be manipulated into the form

$$(dx)/(dt) = \dot{H} = AX + bu$$

$$Y = CX + bu$$

where X is the system state vector, u is the input vector, Y is the output vector, and A, b, C, d are matrices of appropriate dimension which specify the system. Such a model is known as a state variable or modern control formulation.

$$\det (A - \lambda I) = 0$$

is called the characteristic equation and has n roots which are called eigenvalues (det (·) denotes determinant). When eigenvalues are real, they are the negative inverses of closed loop system time constants. Eigenvalues are also the pole locations of the closed loop transfer function. Any vector $e_i$ such that

$$(A - \lambda_i I)e_i = 0$$

$$\|e_i\| \neq 0$$

is called an eigenvector of the eigenvalue $\lambda_i(\|\cdot\|)$ denotes the square root of the sum of the squares of all entries of a vector. All $n$ eigenvectors of a system form a modal matrix of matrix A when arranged side-by-side in a square matrix. The modal matrix is used in certain analytic procedures in modern control theory whereby large, complex systems are decoupled into many first order systems. (PE/EDPG) 421A-1978s

**state variables (automatic control)** Those whose values determine the state. (PE/EDPG) [3]

**state vector (automatic control)** One whose components are the state variables. (PE/EDPG) [3]

**static (1) (atmospherics)** Interference caused by natural electric disturbances in the atmosphere, or the electromagnetic phenomena capable of causing such interference. *See also:* radio transmitter. (PE/EEC) [119]
**(2) (adjective) (automatic control)** Referring to a state in which a quantity exhibits no appreciable change within an arbitrarily long time interval. (PE/EDPG) [3]
**(3) (software)** Pertaining to an event or process that occurs without computer program execution; for example, static analysis, static binding. *Contrast:* dynamic. (C) 610.12-1990

**static accuracy (analog computer)** Accuracy determined with a constant output. (C) 165-1977w

**static analysis (software)** The process of evaluating a system or component based on its form, structure, content, or documentation. *Contrast:* dynamic analysis. *See also:* walkthrough; inspection. (C) 610.12-1990

**static analyzer (software)** A software tool that aids in the evaluation of a computer program without executing the program. Examples include syntax checkers, compilers, cross-reference generators, standards enforcers, and flowcharters. *See also:* dynamic analyzer; computer program; syntax; compiler; program. (C/SE) 729-1983s

**static binding (software)** Binding performed prior to the execution of a computer program and not subject to change during program execution. *Contrast:* dynamic binding. (C) 610.12-1990

**static breakpoint** A breakpoint that can be set at compile time, such as entry into a given routine. *See also:* data breakpoint; epilog breakpoint; code breakpoint; prolog breakpoint; programmable breakpoint. (C) 610.12-1990

**static breeze** *See:* convective discharge.

**static characteristic (electron tube)** A relation, usually represented by a graph, between a pair of variables such as electrode voltage and electrode current, with all other voltages maintained constant. (ED) [45]

**static characteristic, relay** *See:* relay static characteristic.

**static charge** Any electric charge at rest, e.g., charge on capacitor. Static charge is often loosely used to describe discharge conditions resulting from electric field coupling. (T&D/PE) 524a-1993r, 1048-1990

**static check** *See:* problem check.

**static compensator (STATCOM)** A static synchronous generator operated as a shunt-connected static var compensator (SVC), whose capacitive or inductive output current can be controlled independently of the ac system voltage. (PE/SUB) 1031-2000

**static converter** A unit that employs solid state devices such as semiconductor rectifiers or controlled rectifiers (thyristors), gated power transistors, electron tubes, or magnetic amplifiers to change ac power to dc power, dc power to ac power, or fixed frequency ac power to variable frequency ac power. (IA/MT) 45-1998

**static decay (charge-storage tubes)** Decay that is a function only of the target properties, such as lateral and transverse leakage. *See also:* charge-storage tube. (ED) 158-1962w

**static dissipative** Having a level of resistivity that typically leads to charge dissipation. (SPD/PE) C62.47-1992r

**static dose rate test** Test of the permanent changes induced by radiation that are obtained by a comparison of characteristics before and after exposure at a given dose rate. (ED) 1005-1998

**static dump (1) (software)** A dump that is produced before or after the execution of a computer program. *Contrast:* dynamic dump. *See also:* selective dump; memory dump; snapshot dump; postmortem dump; change dump. (C) 610.12-1990 **(2) (computers)** A dump that is performed at a particular point in time with respect to a machine run, frequently at the end of a run. (C) [20], [85]

**static electrode potential** The electrode potential that exists when no current is flowing between the electrode and the electrolyte. *See also:* electrolytic cell. (EEC/PE) [119]

**static error (software)** An error that is independent of the time-varying nature of an input. *Contrast:* dynamic error. (C) 610.12-1990, 165-1977w

**static exciter** Nonrotating source of direct current for the synchronous generator field, utilizing controlled rectifiers. (PE/EDPG) 1020-1988r

**static friction** *See:* stiction.

**static induced current** The charging and discharging current of a pair of Leyden jars or other capacitors, which current is passed through a patient. *See also:* electrotherapy. (EMB) [47]

**staticize (A) (electronic digital computation)** To convert serial or time-dependent parallel data into static form. **(B) (electronic digital computation)** Occasionally, to retrieve an instruction and its operands from storage prior to its execution. (C) 162-1963

**staticizer (electronic computation)** A storage device for converting time-sequential information into static parallel information. (Std100) 270-1966w

**static Kraemer system (rotating machinery)** A system of speed control below synchronous speed for wound-rotor induction motors. Slip power is recovered through the medium of a static converter equipment electrically connected between the secondary winding of the induction motor and a power system. *See also:* asynchronous machine. (PE) [9]

**static load line** The locus of all simultaneous average values of output electrode current and voltage, for a fixed value of direct-current load resistance. (ED) [45]

**static magnetic cell** *See:* magnetic cell.

**static method** A method that can be executed without an instance of its package. (C/BA) 1275-1994

**static model (1)** A model of a system in which there is no change; for example, a scale model of a bridge, studied for its appearance rather than for its performance under varying loads. *Contrast:* dynamic model. (C) 610.3-1989w **(2)** A kind of model that describes an interrelated set of classes (and/or subject domains) along with their relationships and responsibilities. *Contrast:* dynamic model. (C/SE) 1320.2-1998

**static noise (atmospherics) (telephone practice)** Interference caused by natural electric disturbances in the atmosphere, or the electromagnetic phenomena capable of causing such interference. *See also:* static. (PE/PSR) C37.93-1976s

**static optical transmission (acousto-optic device)** The ratio of the transmitted zero order intensity, $I_0$, to the incident light intensity, $I_{in}$, when the acoustic drive power is off: thus $T = I_0/I_n$. (UFFC) [23]

**static overvoltage (surge arresters)** An overvoltage due to an electric charge on an isolated conductor or installation. (PE) [8]

**static patterns** A set of controlled, time-invariant patterns. (SCC20) 1445-1998

**static phase offset** The constant difference between the phase of the recovered clock and the optimal sampling position of the received data. (LM/C) 802.5-1989s

**static plow (cable plowing)** A plowing unit that depends upon drawbar pull only for its movement through the soil. (T&D/PE) 590-1977w

**static power converter** Any static power converter with control, protection, and filtering functions used to interface an electric energy source with an electric utility system. Sometimes referred to as power conditioning subsystems, power conversion systems, solid-state converters, or power conditioning units. (DESG) 1035-1989w

**static pressure (audio and electroacoustics)** (at a point in a medium) The pressure that would exist at that point in the absence of sound waves. (SP/ACO) [32]

**static radiation test (metal nitride oxide semiconducter arrays)** A test of the permanent changes induced by radiation obtained by a comparison of characteristics before and after exposure. (ED) 641-1987w, 581-1978w

**static random-access memory (SRAM)** A static form of random-access memory that does not require periodic refresh to retain data. *Contrast:* dynamic random-access memory. (C) 610.10-1994w

**static regulation** Expresses the change from one steady-state condition to another as a percentage of the final steady-state condition.

$$\text{Static Regulation} = \frac{E_{\text{initial}} - E_{\text{final}}}{E_{\text{final}}}$$

(AES) [41]

**static regulator** A transmission regulator in which the adjusting mechanism is in self-equilibrium at any setting and requires control power to change the setting. *See also:* transmission regulator. (EEC/PE) [119]

**static relay** (or relay unit) A relay or relay unit in which the designed response is developed by electronic, solid-state, magnetic or other components without mechanical motion. *Note:* A relay that is composed of both static and electromechanical units in which the designed response is accomplished by static units may be referred to as a static relay. (SWG/PE) C37.100-1992

**static resistance (semiconductor rectifier device)** (forward or reverse) The quotient of the voltage by the current at a stated point on the static characteristic curve. *See also:* rectification. (IA) [12]

**static routing** A routing strategy that determines the path to be followed by network traffic using the information and algorithms fixed at the time of network generation. (C) 610.7-1995

**static short-circuit ratio (arc-welding apparatus)** The ratio of the steady-state output short-circuit current of a welding power supply at any setting to the output current at rated load voltage for the same setting. (EEC/AWM) [91]

**static, solid-state converter** *See:* solid-state converter static.

**static storage** A type of storage that does not require periodic refreshment for retention of data. *Contrast:* dynamic storage. *See also:* static random-access memory. (C) 610.10-1994w

**static test (1) (A) (test, measurement, and diagnostic equipment)** A test of a non-signal property, such as voltage and current, of an equipment or of any of its constituent units, performed while the equipment is energized. **(B) (test, measurement, and diagnostic equipment)** A test of a device in a stationary of helddown position as a means of testing and measuring its dynamic reactions. (MIL) [2] **(2)** The computer-control state that applies a predetermined set of voltages and conditions to the analog computer, allowing a static check to be performed. (C) 610.10-1994w, 165-1977w

**static timing error** The constant part of the difference in time between the ideal sampling point for the received data and the actual sampling point. (C/LM) 8802-5-1998

**static torque (electric coupling)** The minimum torque an electric coupling will transmit or develop with no relative motion between the input and output members, with excitation applied. *Note:* Static torque is usually specified for rated excitation. (EM/PE) 290-1980w

**static value (light-emitting diodes)** A non-varying value or quantity of measurement at a specified fixed point, or the slope of the line from the origin to the operating point on the appropriate characteristic curve. (ED) [127]

**static var compensator (SVC)** A shunt-connected static var generator or absorber whose output is adjusted to exchange capacitive or inductive current to maintain or control specific parameters of the electrical power system (typically bus voltage). (PE/SUB) 1031-2000

**static var system (SVS)** A combination of different static and mechanically switched var compensators whose outputs are coordinated. (PE/SUB) 1031-2000

**static volt-ampere characteristic (arc-welding apparatus)** The curve or family of curves that gives the terminal voltage of a welding power supply as ordinate, plotted against output load current as abscissa, is the static volt-ampere characteristic of the power supply. (EEC/AWM) [91]

**static wave current (electrotherapy)** The current resulting from the sudden periodic discharging of a patient who has been raised to a high potential by means of an electrostatic generator. *See also:* electrotherapy. (EMB) [47]

**static wire** *See:* shield wire; overhead ground wire.

**static wire-coupling protector** A device for protecting carrier terminals that are used in conjunction with overhead, insulated ground wires (static wires) of a power transmission line. *Synonym:* sky wire-coupling protector. (PE/PSC) 487-1992

**station (1)** One of the input or output devices on a communications network. *Synonym:* data station. *See also:* secondary station; device; server; primary station. (C) 610.7-1995
**(2)** A facility where several components of a system are located. (PE/PSE) 858-1993w
**(3)** Any device that contains an IEEE 802.11 conformant medium access control (MAC) and physical layer (PHY) interface to the wireless medium (WM). (C/LM) 8802-11-1999
**(4)** A physical device that may be attached to a shared medium local area network (LAN) to transmit and receive information on that shared medium. A data station is identified by a destination address. *Synonym:* data station. (EMB/MIB) 1073.4.1-2000
**(5) (generating station grounding)** *See also:* generating station. (PE/EDPG) 665-1987s
**(6)** *See also:* semiautomatic station; automatic station; remote station; master station. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**Station** When capitalized, Station refers to DTR station or a C-Port in Station Emulation mode. (C/LM) 802.5t-2000

**stationarity (seismic qualification of Class 1E equipment for nuclear power generating stations)** A condition that exists when a waveform is stationary and when its amplitude distribution, frequency content, and other descriptive parameters are statistically constant with time. (PE/NP) 344-1987r

**stationary appliance (electric systems)** An appliance that is not easily moved from one place to another in normal use. *See also:* appliance. (NESC) [86]

**stationary battery** A storage battery designed for service in a permanent location. *See also:* battery. (EEC/PE) [119]

**stationary-contact assembly** The fixed part of the starting-switch assembly. *See also:* starting-switch assembly. (EEC/PE) [119]

**stationary contact member** A conducting part having a contact surface that remains substantially stationary. (SWG/PE) C37.100-1992

**stationary-mounted device** One that cannot be removed except by the unbolting of connections and mounting supports. *See also:* drawout-mounted device. (SWG/PE) C37.100-1992

**stationary phase approximation** A technique for evaluating or estimating integrals whose integrands have rapid variations in phase everywhere except near stationary phase points. (AP/PROP) 211-1997

**stationary phase point** Point in space near which the phase of a function is slowly varying. (AP/PROP) 211-1997

**stationary relay contact** The member of a contact pair that is not moved directly by the actuating system. (EEC/REE) [87]

**stationary satellite (communication satellite)** A synchronous satellite with an equatorial, circular and direct orbit. A stationary satellite remains fixed in relation to the surface of the primary body. *Note:* A geo-stationary satellite is a stationary earth satellite. (COM) [19]

**stationary system (excitation systems)** (time invarient) Let a system have zero input response Z(t), then the system is stationary (time invarient) if the response to input R(t) is C(t) + Z(t) and the response to input R(t + T) is C(t + T) + Z(t). Otherwise the system is nonstationary. *Note:* A stationary system is modelled mathematically by a stationary differential equation the coefficients of which are not functions of time. (PE/EDPG) 421A-1978s

**stationary wave** *See:* standing wave.

**station auxiliary (generating station) (generating stations electric power system)** An auxiliary at a generating station not assigned to a specific unit. (PE/EDPG) 505-1977r

**station auxiliary losses** The electric power required to feed the HVDC station auxiliary loads. (SUB/PE) 1158-1991r

**station basic rate** A data transfer rate belonging to the extended service set (ESS) basic rate set that is used by a station for specific transmissions. The station basic rate may change dynamically as frequently each medium access control (MAC) protocol data unit (MPDU) transmission attempt, based on local considerations at that station. (C/LM) 8802-11-1999

**station blackout** The complete loss of ac electric power to the essential and nonessential switchgear buses in a nuclear power plant (i.e., loss of offsite electric power system concurrent with turbine trip and unavailability of the onsite emergency ac power system). Station blackout does not include the loss of available ac power to buses fed by station batteries through inverters or by alternate ac sources. (PE/NP) 765-1995

**station changing (communication satellite)** The changeover of service from one earth station to another, especially in a system using satellites that are not stationary. (COM) [19]

**station check (supervisory control, data acquisition, and automatic control) (supervisory check, status update)** The automatic selection, in a definite order, of all the supervisory alarm and indication points associated with one remote station or all remote stations of a system, and the transmission of all the indications to the master station. (SWG/SUB/PE) C37.1-1987s, C37.100-1992

**station-control error (electric power system)** The actual station generation minus assigned station generation. (PE/PSE) 94-1991w

**station equipment (data transmission)** A broad term used to denote equipment located at the customer's premises. The equipment may be owned by the telephone company or the customer. If the equipment is owned by the customer it is referred to as the customer's equipment. (PE) 599-1985w

**station ground** A ground grid or any equivalent system of grounding electrodes buried beneath or adjacent to the gas-insulated substation that determines the rise of ground voltage level relative to remote earth and controls the distribution of voltage gradients within the gas-insulated substation area during a fault. (SWG/SUB/PE) C37.122-1983s, C37.122.1-1993, C37.100-1992

**station identification (supervisory control, data acquisition, and automatic control)** A sequence of signal elements used to identify a station. (SWG/PE/SUB) C37.1-1987s, C37.100-1992

**station line (telephone switching systems)** Conductors carrying direct current between a central office and a main station, private branch exchange, or other end equipment. (COM) 312-1977w

**station lobe** The wiring that connects a LAN station or other device to a hub, excluding equipment and station attachment cables. (C) 610.7-1995

**station-loop resistance (telephone switching systems)** The series resistance of the loop conductors, including the resistance of an off-hook station. (COM) 312-1977w

**station management (SMT)** The conceptual control element of a station that interfaces with all of the layers of the station and is responsible for the setting and resetting of control parameters, obtaining reports of error conditions, and determining if the station should be connected to or disconnected from the medium. (C/LM) 8802-5-1998

**station number (subroutines for CAMAC)** The number n represents an integer which is the station number component of a CAMAC address. (NPS) 758-1979r

**station, peaking** *See:* peaking station.

**station, pumped storage** *See:* pumped storage station.

**station ringer** *See:* telephone ringer.

**station, run-of-river** *See:* run-of-river station.

**station service (SS) (1) (power operations)** Facilities that provide power for station use in a generating, switching, converting, or transforming station. (PE/PSE) 858-1987s, 346-1973w

**(2)** The set of services that support transport of medium access control (MAC) service data units (MSDUs) between stations within a basic service set (BSS). (C/LM) 8802-11-1999

**station service power** The power used to operate a station. (PE/PSE) 94-1991w

**station service transformer (generating stations electric power system)** A transformer that supplies power from a station high-voltage bus to the station auxiliaries and also to the unit auxiliaries during unit startup and shutdown or when the unit auxiliaries transformer is not available, or both. (PE/TR/EDPG) C57.116-1989r, 505-1977r

**station, steam-electric** *See:* steam-electric station.

**station, storage** *See:* storage station.

**station-to-station call (telephone switching systems)** A call intended for a designated main station. (COM) 312-1977w

**station-type cubicle switchgear (SC)** Metal-enclosed power switchgear characterized by the following required features:

— The main switch and interrupting device is of the stationary mounted type, composed of a primary circuit compartment and a secondary or mechanism compartment; arranged with gang-operated isolating switches that are mechanically interlocked with the main switching and interrupting device.

— Each phase for the major parts of the primary circuit switching or interrupting devices, buses, and line-to-ground potential transformers is completely enclosed (or segregated) by grounded metal barriers that have no intentional openings between compartments. Specifically included are mechanically interlocked doors in front of or a part of the primary circuit compartment of the circuit switching and interrupting device so that when the group operated isolating switches are closed, no primary parts can be exposed by the attempted opening of the interlocked doors.

— All live parts are enclosed within grounded metal compartments.

— Primary bus conductor and connections are bare.

— Mechanical interlocks are provided for proper operating sequence under normal operating conditions.

— Secondary control devices and their wiring are isolated by grounded metal barriers from all primary circuit elements with the exception of short lengths of wire, such as at instrument transformer terminals.

— The doors to the secondary or mechanism compartment of the primary switching or interrupting device are to provide access to the secondary or control equipment within the housing without danger of exposure to the primary circuit parts.

*Note:* Auxiliary vertical sections may be required for mounting devices or for use as bus transition. (SWG/PE) C37.100-1992, C37.20.2-1993

**station-type regulator** A regulator designed for ground-type installations in stations or substations. (PE/TR) C57.15-1999

**station-type transformer (power and distribution transformers)** A transformer designed for installation in a station or substation. (PE/TR) C57.12.80-1978r

**Statistical Analysis System (SAS)** A programming language used for statistical analysis, data manipulation, and application development. (C) 610.13-1993w

**statistical BIL** The crest values of a standard lightning impulse for which the insulation exhibits a 90% probability of withstand (or a 10% probability of failure) under specified conditions, applicable specifically to self-restoring insulations. (SPD/PE/C) C62.22-1997, 1313.1-1996

**statistical BSL** The crest value of a standard switching impulse for which the insulation exhibits a 90% probability of withstand (or a 10% probability of failure), under specified conditions, applicable to self-restoring insulations. (PE/SPD/C) C62.22-1997, 1313.1-1996

**statistical delay (gas tube)** The time lag from the application of the specified voltage to initiate the discharge to the beginning of breakdown. *See also:* gas tube. (ED) [45]

**statistical descriptors** Many sounds have sound-pressure levels that are not constant in time and cannot, without qualification, be adequately characterized by a single value of sound level. One method for dealing with fluctuating or intermittent sounds is to examine the sound level statistically as a function of time. Statistical descriptors are often applied to A-weighted sound levels. They are called exceedance levels or *L*-levels. For example, the $L_{10}$ is the A-weighted sound level exceeded for 10% of the time over a specified time period. The other 90% of the time, the sound level is less than the $L_{10}$. Similarly, the $L_{50}$ is the sound level exceeded 50% of the time; the $L_{90}$ is the sound level exceeded 90% of the time; etc. (T&D/PE) 656-1992

**statistical indicators** Parameters based on past plant-specific or generic experience used to predict the failure of identical or similar equipment based on time or stress histories. (PE/NP) 933-1999

**statistically homogeneous** Having statistical characteristics that are independent of the specific locations at which those characteristics are measured. (AP/PROP) 211-1997

**statistically isotropic** Having statistical characteristics that are independent of the directions along which those characteristics are measured. (AP/PROP) 211-1997

**statistical multiplexer** A multiplexer that uses time division multiplexing technique by dynamically allocating telecommunication line time to each of the various attached terminals, according to whether a terminal is active or inactive at a particular moment. (C) 610.7-1995

**Statistical Package for Social Sciences (SPSS)** A nonprocedural language used for statistical analysis of research results, particularly data collected in polls and surveys. (C) 610.13-1993w

**statistical pattern recognition** An approach to pattern recognition that uses probability and statistical methods to assign patterns to pattern classes. (C) 610.4-1990w

**statistical sparkover voltage** A transient overvoltage level that produces a 97.72% probability of sparkover (i.e., two standard deviations above the 50% sparkover voltage value). *Note:* IEC uses 90%. (T&D/PE) 516-1995

**statistical terms related to corona effects** Terms applied to the procedures of data collection, classification, and presentation relating to corona effects. (T&D/PE) 539-1990

**statistical test model (software)** A model that relates program faults to the input data set (or sets) which cause them to be encountered. The model also gives the probability that these faults will cause the program to fail. *See also:* model; data. (C/SE) 729-1983s

**statistical withstand voltage (1)** A transient overvoltage level that produces a 0.14% probability of sparkover (i.e., three standard deviations below the 50% sparkover voltage value). *Note:* IEC uses 2%. (T&D/PE) 516-1995

**(2)** The voltage that an insulation is capable of withstanding with a given probability of failure, corresponding to a specified probability of failure (e.g., 10%, 0.1%). (PE/SPD/C) C62.22-1997, 1313.1-1996

**stat mux** *See:* statistical multiplexer.

**stator (1) (watthour meter)** An assmbly of an induction watthour meter, which consists of a voltage circuit, one or more current circuits, and a combined magnetic circuit so arranged that their joint effect, when energized, is to exert a driving torque on the rotor by the reaction with currents induced in an individual or common conducting disk. (ELM) C12.1-1982s

**(2) (rotating machinery)** The portion that includes and supports the stationary active parts. The stator includes the stationary portions of the magnetic circuit and the associated winding and leads. It may, depending on the design, include a frame or shell, winding supports, ventilation circuits, coolers, and temperature detectors. A base, if provided, is not ordinarily considered to be part of the stator. (PE) [9]

**stator bar** A unit of winding on the stator of a machine. *See also:* stator coil; bar. (PE/EM) 1129-1992r

**stator coil (rotating machinery)** A unit of a winding on the stator of a machine. *See also:* stator. (PE) [9]

**stator coil pin (rotating machinery)** A rod through an opening in the stator core, extending beyond the faces of the core, for the purpose of holding coils of the stator winding to a desired position. *See also:* stator. (PE) [9]

**stator core (rotating machinery)** The stationary magnetic-circuit of an electric machine. It is commonly an assembly of laminations of magnetic steel, ready for winding. *See also:* stator. (PE) [9]

**stator-core lamination (rotating machinery)** A sheet of material usually of magnetic steel, containing teeth and winding slots, or containing pole structures, that forms the stator core when assembled with other identical or similar laminations. *See also:* stator. (PE) [9]

**stator frame (rotating machinery)** The supporting structure holding the stator core or core assembly. *Note:* In certain types of machines, the stator frame may be made integral with one end shield. *See also:* stator. (PE) [9]

**stator iron (rotating machinery)** A term commonly used for the magnetic steel material or core of the stator of a machine. *See also:* stator. (PE) [9]

**stator mounting lug (rotating machinery)** A part attached to the outer surface of stator core or a stator shell to provide a means for the bolting or equivalent attachment to the appliance, machine, or other foundation. *See also:* stator. (PE) [9]

**stator resistance starting (rotating machinery)** The process of starting a motor at reduced voltage by connecting the primary winding initially in series with starting resistors that are short-circuited for the running condition. (PE) [9]

**stator shell (rotating machinery)** A cylinder in tight assembly around the wound stator core, all or a portion of which is machined or otherwise made to a specific outer dimension so that the stator may be mounted into an appliance, machine, or other end product. *See also:* stator. (PE) [9]

**stator winding (rotating machinery)** A winding on the stator of a machine. *See also:* stator. (PE) [9]

**stator winding copper (rotating machinery)** A term commonly used for the material or conductors of a stator winding. *See also:* stator. (PE) [9]

**stator winding terminal (rotating machinery)** The end of a lead cable or a stud or blade of a terminal board to which connections are normally made during installation. *See also:* stator. (PE) [9]

**status (1) (supervisory control, data acquisition, and automatic control)** Information describing a logical state of a point or equipment. (SWG/PE/SUB) C37.100-1992, C37.1-1994

**(2)** A term used generally to describe data generated by the peripheral that reflects the current operating state of the peripheral. (C/MM) 1284-1994

**(3) (A)** The condition at a particular time of a system or system component. **(B)** Pertaining to the condition as in (A), for example a status bit containing a bit that represents the status of a system. (C) 610.10-1994

**status bit** A bit used to indicate a non-error condition important to S-module operation. Status bits are located in an S-module's Slave Status register and Bus Error register (the BMR bit) and may be located in the optional Module Status register or an Additional Status register Status bits in the Module Status register or in an Additional Status register are permitted to affect the value of the EVO bit of the Slave Status register. (TT/C) 1149.5-1995

**status code** A code used to indicate the results of a computer program operation. For example, a code indicating a carry, an overflow, or a parity error. *Synonym:* condition code. (C) 610.12-1990

**status codes** Information used to indicate the state or condition of system components. (SUB/PE) 999-1992w

**status datatype** An abstract datatype whose values may be bound to "control" values as well as "data" values. (C/PA) 1328-1993w, 1327-1993w, 1224.1-1993w, 1224-1993w, 1351-1994w

**status flag (radix-independent floating-point arithmetic) (binary floating-point arithmetic)** A variable that may take two states, set and clear. A user may clear a flag, copy it, or restore it to a previous state. When set, a status flag may contain additional system-dependent information, possibly inaccessible to some users. The operations of IEEE Std 754-1985 and IEEE Std 854-1987 may as a side effect set some of the following flags: inexact result, underflow, overflow, divide by zero, and invalid operation. (C/MM) 854-1987r, 754-1985r

**status lines** Unidirectional signals from the peripheral to the host, defined in Compatibility Mode to handshake data and to report error conditions. In other IEEE 1284 interface modes defined in this standard, these lines are used for control, data, and/or status. (C/MM) 1284-1994

**status memory (sequential events recording systems)** The memory that contains the most recently scanned status of all inputs. (PE/EDPG) [5], [1]

**status point, supervisory control** *See:* status.

**status register** A register in an S-module by means of which current operating conditions of the S-module (e.g., interrupt enabled, module pass/fail status, multicast address of the S-module, etc.) and event occurrence (e.g., detection of an error condition during transmission of a message) can be recorded either for later interrogation by the M-module or to record the necessity of particular S-module activity at a later time. (TT/C) 1149.5-1995

**status transfer** The passing of information over the system control signal group, between the bus owner and the replying agent, during the reply phase of a transfer operation. *See also:* agent status. (C/MM) 1296-1987s

**status word** Together with the contents of the processor's registers, this defines the state or condition of the processor at any given moment. *Note:* If the processor is interrupted, it must save the status word so it can return to its former task. (C) 610.10-1994w

**STC** *See:* sensitivity time control.

**S/TD** *See:* signal-to-total-distortion ratio.

**STD** *See:* subscriber trunk dialing.

**STE** *See:* spanning tree explorer.

**steady current** A current that does not change with time. (Std100) 270-1966w

**steady state (1)** The condition of a specified variable at a time when no transients are present. *Note:* For the purpose of this definition, drift is not considered to be a transient. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**(2) (cable insulation materials)** Conditions of current in the material attained when the difference between the maximum and minimum current observed during four consecutive hourly readings is less than 5% of the minimum current. (PE) 402-1974w

**(3) (excitation systems)** That in which some specified characteristic of a condition, such as value, rate, periodicity, or amplitude, exhibits only negligible change over an arbitrarily long interval of time. *Note:* It may describe a condition in which some characteristics are static, others dynamic. (PE/EDPG) 421A-1978s, 421-1972s

**(4) (data management)** A situation in which a model, process, or device exhibits stable behavior independent of time. *Synonym:* equilibrium. (C) 610.3-1989w

**(5)** The operating condition of a system wherein the observed variable has reached an equilibrium condition in response to an input or other stimulus in accordance with the definition of the system transfer function. This may involve a system output being at some constant voltage or current values in the case of power supplies. Referring to a subsystem operating parameter such as a thermal base-plate, it may be refer to a temperature that has reached stability as a function of the system operating inputs, load, and ambient environment. (PEL) 1515-2000

**steady-state condition** *See:* equilibrium mode distribution.

**steady-state current perception threshold** The current at which stimulation is perceptible for 50% of the subject population. *Note:* The threshold is a function of the frequency and voltage and varies considerably for various contact areas and pressures. Individual responses vary greatly from the mean threshold, and different levels are obtained for men, women, and children. (T&D/PE) 539-1990

**steady-state deviation (control)** The system deviation after transients have expired. *Note:* For the purpose of this definition, drift is not considered to be a transient. *See also:* deviation. (IM/IA/IAC) [120], [60]

**steady-state governing load band (hydraulic turbines)** The magnitude of the envelope of cyclic load variations caused by the governing system, expressed as a percent of rated power output, when the generating unit is operating in parallel with other generators and under steady-state load demand. (PE/EDPG) 125-1977s

**steady-state governing speed band (hydraulic turbines)** The magnitude of the envelope of the cyclic speed variations caused by the governing system, expressed as a percent of rated speed when the generating unit is operating independently and under steady-state load demand. (PE/EDPG) 125-1977s

**steady-state incremental speed regulation (gas turbines)** (excluding the effects of deadband) At a given steady-state speed and power, the rate of change of the steady-state speed with respect to the power output. It is the slope of the tangent to the steady-state speed versus power curve at the point of power output under consideration. It is the difference in steady-state speed, expressed in percent of rated speed, for any two points on the tangent, divided by the corresponding difference in power output, expressed as a fraction of the rated power output. For the basis of comparison, the several points of power output at which the values of steady-state incremental speed regulation are derived are based upon rated speed being obtained at each point of power output. (PE/PSE/EDPG) 94-1970w, 282-1968w, [5]

**steady-state induced current** The rms power-frequency current in any circuit, as a result of induction. (PE/T&D) 539-1990

**steady-state oscillation** A condition in which some aspect of the oscillation is a continuing periodic function. (SP) [32]

**steady-state response (system or element)** The part of the time response remaining after transients have expired. *Note:* The term steady-state may also be applied to any of the forced-response terms: for example steady-state sinusoidal response. *See also:* feedback control system; sinusoidal response. (IM) [120]

**steady-state short-circuit current (synchronous machines)** The steady-state current in the armature winding when short-circuited. (PE) [9]

**steady-state speed regulation (A) (straight condensing and noncondensing steam turbines, nonautomatic extraction turbines, hydro turbines, and gas turbines)** The percent change in rated speed as the power output is gradually reduced from rated power to zero while all speed-governing system settings remain unchanged. **(B) (straight condensing and noncondensing steam turbines, nonautomatic extraction turbines, hydro-turbines, and gas turbines)** The change in steady-state speed, expressed in percent of rated speed, when the power output of the turbine operating isolated is gradually reduced from rated power output to zero power output with unchanged settings of all adjustments of the speed-governing system. *Note:* Speed regulation is considered positive when the speed increases with a decrease in power output. *See also:* asynchronous machine; speed-governing system. (PE/PE/PSE/PSE/EDPG) 94-1991, 94-1970, 282-1968, [5]

**steady-state stability** A condition that exists in a power system if it operates with stability when not subjected to an aperiodic disturbance. *Note:* In practical systems, a variety of relatively small aperiodic disturbances may be present without any appreciable effect upon the stability, as long as the resultant rate of change in load is relatively slow in comparison with the natural frequency of oscillation of the major parts of the system or with the rate of change in field flux of the rotating machines. (PE/T&D) [10]

**steady-state stability factor** (system or part of a system) The ratio of the steady-state stability limit to the nominal power flow at the point of the system to which the stability limit is referred. *See also:* stability factor. (T&D/PE) [10]

**steady-state stability limit (steady-state power limit)** The maximum power flow possible through some particular point in the system when the entire system or the part of the system to which the stability limit refers is operating with steady-state stability. (T&D/PE) [10]

**steady-state temperature rise (grounding device)** The maximum temperature rise above ambient which will be attained by the winding of a device as the result of the flow of rated continuous current under standard operating conditions. It may be expressed as an average or a hot-spot winding rise. (PE/SPD) 32-1972r

**steady state thermal rating** The constant electrical current that would yield the maximum allowable conductor temperature for specified weather conditions and conductor characteristics under the assumption that the conductor is in thermal equilibrium (steady state). (T&D/PE) 738-1993

**steady-state value** The value of a current or voltage after all transients have decayed to a negligible value. For an alternating quantity, the root-mean-square value in the steady state does not vary with time. *See also:* asynchronous machine. (PE) [9]

**steady voltage** *See:* steady current.

**steam capability (power operations)** The maximum net capability of steam generating units which can be obtained under normal operating practices for a given period of time as calculated based on design or test data or as demonstrated by total plant tests. The limitation on steam capability may be electrical or mechanical in nature. (PE/PSE) 858-1987s

**steam-electric station (power operations)** An electric generating station utilizing steam for the motive force of its prime movers. (PE/PSE) 858-1987s, 346-1973w

**steam turbine-electric drive** A self-contained system of power generation and application in which the power generated by a steam turbine is transmitted electrically by means of a generator and a motor (or multiples of these) for propulsion purposes. *Note:* The prefix steam turbine-electric is applied to ships, locomotives, cars, buses, etc., that are equipped with this drive. *See also:* electric propulsion system; electric locomotive. (EEC/PE) [119]

**steel container (storage cell)** The container for the element and electrolyte of a nickel-alkaline storage cell. This steel container is sometimes called a can. *See also:* battery. (PE/EEC) [119]

**steel supported aluminum conductor (SSAC)** ACSR with the aluminum wires annealed. (T&D/PE) 524-1992r

**steerable-beam antenna system** An antenna with a non-moving aperture for which the direction of the major lobe can be changed by electronically altering the aperture excitation or by mechanically moving a feed of the antenna. (AP/ANT) 145-1993

**steering compass** A compass located within view of a steering stand, by reference to which the helmsman holds a ship on the set course.

**Stefan-Boltzmann law (illuminating engineering)** The statement that the radiant exitance of a blackbody is proportional to the fourth power of its absolute temperature; that is,

$$M = \sigma T^4$$

*Note:* The currently recommended value of the Stefan-Boltzmann constant s is $5.67032 \times 10^{-8}\ W \times m^{-2} \times K^{-4}$. (EEC/IE) [126]

**stellar guidance (navigation aids)** Guidance by means of celestial bodies, particularly the stars. (AES/GCS) 172-1983w

**stellar-inertial navigation equipment** *See:* celestial-inertial navigation equipment.

**step (1) (pulse techniques)** A waveform that, from the observer's frame of reference, approximates a Heaviside (unit step) function. *See also:* unit-step signal. (IM/HFIM) [40]
**(2) (A) (computers)** One operation in a computer routine. **(B) (computers)** To cause a computer to execute one operation. *See also:* single step. (C/C) [20], [85]
**(3) (pulse terminology) (single transition)** A transition waveform that has a transition duration that is negligible relative to the duration of the waveform epoch or to the duration of its adjacent first and second nominal states. (IM/WM&A) 194-1977w

**step-back relay** A relay that operates to limit the current peaks of a motor when the armature or line current increases. A step-back relay may, in addition, operate to remove such limitations when the cause of the high current has been removed. (IA/MT) 45-1998

**step-by-step operation** *See:* single-step operation.

**step-by-step switch (1)** A bank-and-wiper switch in which the wipers are moved by electromagnet ratchet mechanisms individual to each switch. *Note:* This type of switch may have either one or two types of motion. (EEC/PE) [119]
**(2)** A switch that moves in synchronism with a pulse device such as a rotary telephone dial. *Synonym:* line switch. *See also:* crossbar switch. (C) 610.7-1995

**step-by-step system (1)** An automatic telephone switching system that is generally characterized by the following features:

a) The selecting mechanisms are step-by-step switches;
b) The switching pulses may either actuate the successive selecting mechanisms directly or may be received and stored by controlling mechanisms that, in turn, actuate the selecting mechanisms.

(EEC/PE) [119]
**(2)** A type of line-switching system which uses step-by-step switches. *Synonym:* line switching system. *See also:* crossbar system; electronic switching system. (C) 610.7-1995

**step change** (control) (step function) An essentially instantaneous change of an input variable from one value to another. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**step compensation** (correction) The effect of a control function or a device that will cause a step change in an other function when a predetermined operating condition is reached. (IA/ICTL/IAC) [60]

**step control system (automatic control)** A system in which the manipulated variable assumes discrete predetermined values. *Note:* The condition for change from one predetermined value to another is often a function of the value of the actuating signal. When the number of values of the manipulated variable is two, it is called a two-step control system; when more than two, a multi-step control system. (PE/EDPG) [3]

**step distance** A non-pilot distance relay scheme using multiple zones with time delay to differentiate between the zones. (PE/PSR) C37.113-1999

**step-down transformer (power and distribution transformers)** A transformer in which the power transfer is from a higher voltage source circuit to a lower voltage circuit. (PE/TR) C57.12.80-1978r

**step-forced response (automatic control)** The total (transient plus steady-state) time response resulting from a sudden change from one constant level of input to another. (PE/EDPG) [3]

**step index optical waveguide (fiber optics)** An optical waveguide having a step index profile. *See also:* step index profile. (Std100) 812-1984w

**step index profile (fiber optics)** A refractive index profile characterized by a uniform refractive index within the core and a sharp decrease in refractive index at the core-cladding interface. *Note:* This corresponds to a power-law profile with profile parameter, g, approaching infinity. *See also:* total internal reflection; multimode optical waveguide; normalized frequency; graded index profile; critical angle; dispersion; refractive index; mode volume; optical waveguide. (Std100) 812-1984w

**stepless (electrical heating applications to melting furnaces and forehearths in the glass industry)** Power modulation by means of a device, such as a saturable reactor or thyristor that provides essentially infinite resolution in output voltage, current, or power. (IA) 668-1987w

**step line-voltage change (power supplies)** An instantaneous change in line voltage (for example, 105−125 volts alternating current): for measuring line regulation and recovery time. (AES) [41]

**step load change (power supplies)** An instantaneous change in load current (for example, zero to full load) for measuring the load regulation and recovery time. (AES) [41]

**stepped (electrical heating applications to melting furnaces and forehearths in the glass industry)** Power modulation by means of discrete voltage steps, such as with a tapped transformer. (IA) 668-1987w

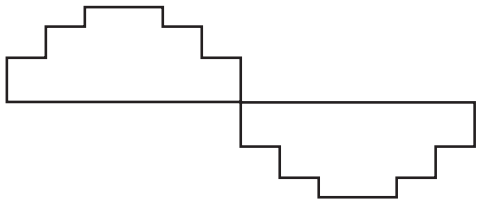
**stepped antenna** *See:* zoned antenna.

**stepped-gate structure (metal-nitride-oxide field-effect transistor)** Also source-drain protected structure: a variant of the metal-nitride-oxide semiconductor (MNOS) transistor whose gate dielectric along the channel is divided into two or three parts. One portion has the standard MNOS layer sequence of the memory device. On one or either side of the memory portion, particularly covering the lines where source and drain junction emerge at the silicon surface, is a gate dielectric that is used for the threshold insulated-gate field-effect transistor (IGFET) in a given technology. (ED) 581-1978w

**stepped leader (1) (lightning)** A series of discharges emanating from a region of charge concentration at short time intervals. Each discharge proceeds with a luminescent tip over a greater distance than the previous one. *See also:* direct-stroke protection. (T&D/PE) [10]
**(2)** Static discharge that propagates from a cloud into the air. Current magnitudes that are associated with stepped leaders

are small (on the order of 100 A) in comparison with the final stroke current. The stepped leaders progress in a random direction in discrete steps from 10 to 80 m in length. Their most frequent velocity of propagation is about 0.05% of the speed of light, or approximately 500 000 ft/s (150 000 m/s). It is not until the stepped leader is within the striking distance of the point to be struck that the stepped leader is positively directed toward this point. (SUB/PE) 998-1996

**stepped wave (converter characteristics) (self-commutated converters)** The waveform obtained from the summation of any number of square waves of the same frequency, each displaced in time from the others. The square waves are often uniformly displaced in time, but are not necessarily of equal amplitudes. An example is shown below.



**stepped wave**

(IA/SPC) 936-1987w

**stepping life** (for attenuator variable in fixed steps) Number of times to switch from any selected position to any other selected positions, after which the residual and incremental characteristic insertion loss remain within the specified repeatability. (IM/HFIM) 474-1973w

**stepping relay (1)** A multiposition relay in which moving wiper contacts mate with successive sets of fixed contacts in a series of steps, moving from one step to the next in successive operations of the relay. *See also:* relay. (EEC/REE) [87]

**(2) (rotary type)** A relay having many rotary positions, ratchet actuated, moving from one step to the next in successive operations, and usually operating its contacts by means of cams. There are two forms:

a) directly driven, where the forward motion occurs on energization; and
b) indirectly (spring) driven, where a spring produces the forward motion on pulse cessation.

*Note:* The term is also incorrectly used for stepping switch. (PE/EM) 43-1974s

**stepping relay, spring-actuated** *See:* spring-actuated stepping relay.

**step potential (1)** The potential difference between two points on the earth's surface separated by a distance of one pace (assumed to be one meter) in the direction of maximum potential gradient. This potential difference could be dangerous when current flows through the earth or material upon which a worker is standing, particularly under fault conditions. *Synonym:* step voltage. (T&D/PE) 1048-1990

**(2)** *See also:* step voltage. (T&D/PE) 524-1992r

**step response (1)** The recorded output response for an ideal input step with designated baseline and topline. (IM/WM&A) 1057-1994w

**(2) (high voltage testing)** $g(t)$ The normalized output as a function of time $t$ when the input is a voltage or current step. (PE/PSIM) 4-1995

**step-response time** The time required for the end device to come to rest in its new position after an abrupt change to a new constant value has occurred in the measured signal. *See also:* accuracy rating. (EEC/EMI) [112]

**step restoration** The restoration of service to blocks of customers in an area until the entire area or feeder is restored. (PE/T&D) 1366-1998

**step speed adjustment** The speed drive can be adjusted in rather large and definite steps between minimum and maximum speed. *See also:* electric drive. (IA/ICTL/IAC) [60]

**step-stress test** A test consisting of several stress levels applied sequentially, for periods of equal duration, to a (one) sample. During each period a stated stress-level is applied and the stress level is increased from one step to the next. *See also:* reliability. (R) [29]

**step twist, waveguide** *See:* waveguide step twist.

**step-up transformer (power and distribution transformers)** A transformer in which the power transfer is from a lower voltage source circuit to a higher voltage circuit. (PE/TR) C57.12.80-1978r

**step voltage (1) (conductor stringing equipment)** The potential difference between two points on the earth's surface separated by a distance of one pace (assumed to be 1 m) in the direction of maximum potential gradient. This potential difference could be dangerous when current flows through the earth or material upon which a worker is standing, particularly under fault conditions. *Synonym:* step potential. (T&D/PE/PSIM) 524a-1993r, 81-1983, 524-1992r

**(2)** The difference in surface potential experienced by a person not in contact with any grounded object and whose feet are spaced 1 m apart. (PE/SUB) 1268-1997

**(3)** The difference in surface potential experienced by a person bridging a distance of 1m with the feet without contacting any grounded object. (PE/SUB) 80-2000

**step-voltage regulator (1) (power and distribution transformers)** A regulating transformer in which the voltage of the regulated circuit is controlled in steps by means of taps and without interrupting the load. *Note:* Such units are generally 833 kVA (output) and below, single-phase; or 2500 kVA (output) and below, three-phase. (PE/TR) C57.12.80-1978r

**(2) (transformer type)** An induction device having one or more windings in shunt with, and excited from, the primary circuit, and having one or more windings in series between the primary circuit and the regulated circuit, all suitably adapted and arranged for the control of the voltage, or of the phase angle, or of both, of the regulated circuit in steps by means of taps without interrupting the load. (PE/TR) C57.15-1999

**step-voltage test (rotating machinery)** A controlled overvoltage test in which designated voltage increments are applied at designated times. Time increments may be constant or graded. *See also:* asynchronous machine; graded-time step-voltage test. (PE) [9]

**step wedge*** *See:* gray scale.

* Deprecated.

**stepwise refinement** A software development technique in which data and processing steps are defined broadly at first and then further defined with increasing detail. *See also:* transaction analysis; data structure-centered design; transform analysis; structured design; object-oriented design; modular decomposition; input-process-output. (C) 610.12-1990

**steradian (1) (metric practice)** The solid angle which, having its vertex in the center of a sphere, cuts off an area of the surface of the sphere equal to that of a square with sides of length equal to the radius of the sphere. (QUL) 268-1982s

**(2) (laser maser)** The unit of measure for a solid angle. There are $4\pi$ sr in a sphere. (LEO) 586-1980w

**stereophonic (frequency modulation)** (adjective) Pertains to audio information carried by a plurality of channels arranged to afford the listener a sense of the spatial distribution of the sound sources. *Note:* A stereophonic receiver responds to both the L + R main channel and the L − R subcarrier channel of a composite stereophonic signal, so that the one output contains substantially only L information, and the other only R. In addition to the main channel, stereophonic program modulation requires transmission of a 19 kHz pilot signal and the sidebands of a suppressed 38 kHz subcarrier carrying L − R information. This combination is called the composite signal, and it may be used alone or with other subcarrier (SCA) signals to frequency modulate the RF carrier. After pre-emphasis, the left and right channels are added for main

channel information. The right-channel program material is subtracted from the left to derive a difference signal that then amplitude modulates a 38 kHz subcarrier. The subcarrier is suppressed, divided by two, and transmitted as a 19 kHz pilot signal to facilitate demodulation of the suppressed carrier information at the receiver. (BT) 185-1975w

**stereopsis** The three-dimensional effect achieved by simultaneously viewing two two-dimensional images of the same object projected from slightly different viewpoints. *See also:* stereoscopic projection. (C) 610.6-1991w

**stereoscopic projection** The projection of two two-dimensional images onto a two-dimensional display by use of stereopsis. (C) 610.6-1991w

**ST-506 interface** A data-transfer interface used in many early personal computers with hard disk capacities less than 40MB; characterized by a 34-pin control cable, a 20-pin data cable and an modest data-transfer rate. (C) 610.10-1994w

**stick** A type of insulating tool used in various operations of live-line work *Synonyms:* work stick; hot stick; pole; work pole; live-line tool. (T&D/PE) 516-1995

**stick circuit** A circuit used to maintain a relay or similar unit energized through its own contact. (EEC/PE) [119]

**stickiness** The condition caused by physical interference with the rotation of the moving element. *See also:* moving element. (EEC/AII) [102]

**sticking voltage (luminescent screen)** The voltage applied to the electron beam below which the rate of secondary emission from the screen is less than unity. The screen then has a negative charge that repels the primary electrons. *See also:* cathode-ray tube. (ED) [45], [84]

**stick operation** Manual operation of a switching device by means of a switch stick. *Synonym:* hook operation. (SWG/PE) C37.100-1992

**stick printer** An element printer in which a stick moves from left to right, printing one character at a time. (C) 610.10-1994w

**stiction (1)** The force in excess of the coulomb friction required to start relative motion between two surfaces in contact. (IM) [120]

**(2)** (static friction) The total friction that opposes the start of relative motion between elements in contact. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**stiffness** The ability of a system or element to resist deviations resulting from loading at the output. *See also:* feedback control system. (PE/IA/ICTL/EDPG/IAC) [3], [60]

**stiffness coefficient** The factor $K$ (also called spring constant) in the differential equation for oscillatory motion $M\ddot{x} + B\dot{x} + Kx = 0$. (PE/EDPG) [3]

**stilb (illuminating engineering)** A centimeter-gram-second (CGS) unit of luminance. One stilb equals one candela per square centimeter. The use of this term is deprecated. (EEC/IE) [126]

**Stiles-Crawford effect (illuminating engineering)** The reduced luminous efficiency of rays entering the peripheral portion of the pupil of the eye. This effect applies only to cones and not to rod visual cells. Hence, there is no Stiles-Crawford effect in scotopic vision. (EEC/IE) [126]

**stimulate** To provide input to a system in order to observe or evaluate the system's response. (C) 610.3-1989w

**stimulated emission (1) (fiber optics)** Radiation emitted when the internal energy of a quantum mechanical system drops from an excited level to a lower level when induced by the presence of radiant energy at the same frequency. An example is the radiation from an injection laser diode above lasing threshold. *See also:* spontaneous emission. (Std100) 812-1984w

**(2) (laser maser)** The emission of radiation at a given frequency caused by an applied external radiation field of the same frequency. (LEO) 586-1980w

**stimulus (1)** Any change in signal that affects the controlled variable: for example, a disturbance or a change in reference input. (MIL/IA/ICTL/APP/IAC) [2], [69], [60]

**(2)** The logic states within a pattern that drives a circuit model in simulation, or a unit under test (UUT) on an automatic test equipment (ATE). (SCC20) 1445-1998

**stimulus data** The information associated with stimuli. (SCC20) 1226-1998

**stipple** To change the appearance of an object by covering it with a pattern or regularly spaced small dots, spaced sufficiently so that the underlying image or text is still recognizable to the user. Stippling is frequently used to denote an inaccessible, or busy, object. (C) 1295-1993w

**stirring effect** (induction heater usage) The circulation in a molten charge due to the combined forces of motor and pinch effects. *See also:* pinch effect; induction heating. (IA) 54-1955w, 169-1955w

**stochastic (1) (computer modeling and simulation)** Pertaining to a process, model, or variable whose outcome, result, or value depends on chance. *Contrast:* deterministic. (C) 610.3-1989w

**(2) (mathematics of computing)** Pertaining to variables that are probabilistic in nature. (C) 1084-1986w

**stochastic model** A model in which the results are determined by using one or more random variables to represent uncertainty about a process or in which a given input will produce an output according to some statistical distribution; for example, a model that estimates the total dollars spent at each of the checkout stations in a supermarket, based on probable number of customers and probable purchase amount of each customer. *Synonym:* probabilistic model. *Contrast:* deterministic model. *See also:* Markov chain model. (C) 610.3-1989w

**stochastic routing** A routing strategy in which the results of individual decisions vary according to the conditions in the network at decision time. (C) 610.7-1995

**Stokes matrix** *See:* Mueller matrix.

**Stokes parameters** Elements of the Stokes vector. *See also:* Stokes vector. (AP/PROP) 211-1997

**Stokes vector** A $4 \times 1$ vector of real numbers called the Stokes parameters, representing the polarization state of a propagating wave:

$$I = \begin{bmatrix} I_0 \\ Q \\ U \\ V \end{bmatrix} = \frac{1}{2\eta} \begin{bmatrix} |E_v|^2 + |E_h|^2 \\ |E_v|^2 - |E_h|^2 \\ 2\mathrm{Re}\{E_v E^*_h\} \\ 2\mathrm{Im}\{E_v E^*_h\} \end{bmatrix}$$

where
$E_v$ is the vertical electric field component of the wave
$E_h$ is the horizontal electric field component of the wave
$\eta$ is the intrinsic impedance of the medium
* indicates the complex conjugate

(AP/PROP) 211-1997

**stop (1)** (limit stop) A mechanical or electric device used to limit the excursion of electromechanical equipment. *See also:* limiter circuits. (C) 165-1977w

**(2) (software)** To terminate the execution of a computer program. *Synonym:* halt. *Contrast:* pause. (C) 610.12-1990

**stop band** A band of frequencies that pass through a filter with a substantial amount of loss (relative to other frequency bands such as a pass band). (CAS) [13]

**stop-band ripple** The difference between maxima and minima of loss in a filter stop band. (CAS) [13]

**stop bit (1)** In asynchronous transmission, a bit that signals the end of a character. *Contrast:* start bit. (C) 610.7-1995

**(2)** For the low-speed version of the Physical layer, a bit that is encoded identically to a logic "1" that is used to delineate the end of each individual octet transmission. (EMB/MIB) 1073.4.1-2000

**stop character** A word processing control character that interrupts the sequence of output processing to provide the ability to make changes in the text formatting parameters, the text itself, the character font on the output device, or other items. *Synonym:* stop code. (C) 610.2-1987

**stop code** *See:* stop character.

**stop dowel (rotating machinery)** A pin fitted into a hole to limit motion of a second part. (PE) [9]

**stop element (1) (data transmission)** In a character transmitted in a start-stop system, the last element in each character, to which is assigned a minimum duration, during which the receiving equipment is returned to its rest condition in preparation for the reception of the next character. The stop element is a marking signal. (PE) 599-1985w

**(2)** *See also:* stop signal. (C) 610.7-1995

**stop-go pulsing (telephone switching systems)** A method of pulsing control wherein the pulsing operation may take place in stages, and the sending end is arranged to pulse the digits continuously unless or until the stop-pulsing signal is received. *Note:* When this occurs, the pulsing of the remaining digits is suspended until the sending end receives a start-pulsing signal. (COM) 312-1977w

**stop instruction** A computer instruction that specifies the termination of the execution of a computer program. *See also:* pause instruction. (C) 610.10-1994w

**stop joint (power cable joints)** A joint that is designed to prevent any transfer of dielectric fluid between the cables being joined. (PE/IC) 404-1986s

**stop lamp (illuminating engineering)** A lighting device giving a steady warning light to the rear of a vehicle or train of vehicles, to indicate the intention of the operator to diminish speed or to stop. (EEC/IE) [126]

**stop list** In automatic indexing, a list of terms, words, or roots of words that are considered insignificant for purposes of information retrieval, and are excluded from being keywords in an index. *Synonym:* stopword list. *Contrast:* go list. (C) 610.2-1987

**stop-motion switch** *See:* machine final-terminal stopping device.

**stopping off** The application of a resist to any part of a cathode or plating rack. *See also:* electroplating. (EEC/PE) [119]

**stop-pulsing signal (telephone switching systems)** A signal transmitted from the receiving end to the sending end of a trunk to indicate that the receiving end is not in a condition to receive pulsing. (COM) 312-1977w

**stop-record signal (facsimile)** A signal used for stopping the process of converting the electrical signal to an image on the record sheet. *See also:* facsimile signal. (COM) 168-1956w

**stop signal (1) (facsimile)** A signal that initiates the transfer of a facsimile equipment condition from active to standby. *See also:* facsimile signal. (COM) 168-1956w

**(2) (data management)** A signal at the end of a start-stop character that prepares the receiving device for the reception of a subsequent character. *Note:* A stop signal is usually limited to one signal element having any duration equal to or greater than a specified minimum value. (C) 610.5-1990w

**(3)** In asynchronous transmission, a signal following a character that prepares the receiving device for the reception of a subsequent character or block. *Synonym:* stop element. *Contrast:* start signal. (C) 610.7-1995

**stop time** *See:* deceleration time.

**stop valve (1) (control systems for steam turbine-generator units)** [throttle valve(s)] Those valve(s) that normally provide fast interruption of the main energy input to the turbine. Throttle valves are sometimes used for turbine control during start-up. *Note:* The term stop valve is defined as an open or closed valve. A throttle valve has some portion of its opening through which it can modulate flow. (PE/EDPG) 122-1985s

**(2) (power system device function numbers)** A control device used primarily to shut down an equipment and hold it out of operation. This device may be manually or electrically actuated, but excludes the function of electrical lockout on abnormal conditions. *See also:* lockout relay. (SUB/PE) C37.2-1979s

**stopword list** *See:* stop list.

**storable swimming or wading pool** A pool with a maximum dimension of 15 ft and a maximum wall height of 3 ft and is so constructed that it may be readily disassembled for storage and reassembled to its original integrity. (NESC/NEC) [86]

**storage (1) (A) (electronic computation)** The act of storing information. **(B) (electronic computation)** Any device in which information can be stored, sometimes called a memory device. **(C) (electronic computation)** In a computer, a section used primarily for storing information. Such a section is sometimes called a memory or store (British). *Notes:* 1. The physical means of storing information may be electrostatic, ferroelectric, magnetic, acoustic, optical, chemical, electronic, electric, mechanical, etc., in nature. 2. Pertaining to a device in which data can be entered, in which it can be held, and from which it can be retrieved at a later time. *See also:* store. (MIL/C) [2], [85], [20]

**(2) (data management)** In a computer, one or more bytes that are used to store data. (C) 610.5-1990w

**(3) (A)** The retention of data in a storage device. **(B)** The action of placing data into a storage device. **(C)** A storage device. **(D)** Any medium in which data can be retained. (C) 610.10-1994

**storage access** *See:* access.

**storage allocation (1) (computers)** The assignment of sequences of data or instructions to specified blocks of storage. (C) [20], [85]

**(2) (software)** An element of computer resource allocation, consisting of assigning storage areas to specific jobs and performing related procedures, such as transfer of data between main and auxiliary storage, to support the assignments made. *See also:* paging; buffer; contiguous allocation; cyclic search; virtual storage; overlay; memory compaction. (C) 610.12-1990

**storage assembly (storage tubes)** An assembly of electrodes (including meshes) that contains the target together with electrodes used for control of the storage process, those that receive an output signal, and other members used for structural support. *See also:* storage tube. (ED) 158-1962w

**storage battery** A battery comprised of one or more rechargeable cells of the lead-acid, nickel-cadmium, or other rechargeable electrochemical types. (NESC/NEC) [86]

**storage breakpoint** *See:* data breakpoint.

**storage capacitor** A low leakage capacitor on which a data value can be stored. (C) 610.10-1994w

**storage capacity (1)** The amount of data that can be contained in a storage device. *Notes:* 1. The units of capacity are bits, characters, words, etc. For example, capacity might be "32 bits," "10 000 decimal digits," "16 384 words with 10 alphanumeric characters each." 2. When comparisons are made among devices using different character sets and word lengths, it may be convenient to express the capacity in equivalent bits, which is the number obtained by taking the logarithm to the base 2 of the number of usable distinguishable states in which the storage can exist. 3. The storage (or memory) capacity of a computer usually refers only to the internal storage section. (C) 162-1963w

**(2) (software)** The maximum number of items that can be held in a given storage device; usually measured in words or bytes. (C) 610.12-1990

**(3)** The amount of data that can be contained in a storage device measured in binary characters, bytes, words, or other units of data. (C) 610.10-1994w

**(4)** The amount of data that can be contained in a storage device. (ED) 1005-1998

**storage cell (1) (electric energy) (secondary cell or accumulator)** A galvanic cell for the generation of electric energy in which the cell, after being discharged, may be restored to a fully charged condition by an electric current flowing in a direction opposite to the flow of current when the cell discharges. (EEC/PE) [119]

**(2) (A)** One or more storage elements considered as a unit. **(B)** The smallest subdivision of storage into which a unit of data can be placed, retained, and with which the unit can be retrieved. *Synonym:* data cell. *See also:* binary cell; magnetic cell. (C) 610.10-1994
**(3)** An elementary unit of storage (e.g., a binary cell or a decimal cell). (ED/C) 1005-1998, [85], [20]

**storage channel** A channel that can be used to access a storage device. (C) 610.10-1994w

**storage device (1)** A device in which data can be stored and from which it can be copied at a later time. The means of storing data may be chemical, electrical, mechanical, etc. *See also:* storage. (C) 162-1963w
**(2)** A device into which data can be placed, in which they can be retained, and from which they can be retrieved. *See also:* store. (C) 610.10-1994w

**storage display** *See:* storage tube display device.

**storage efficiency** The degree to which a system or component performs its designated functions with minimum consumption of available storage. *See also:* execution efficiency. (C) 610.12-1990

**storage element (1) (storage tubes)** An area of a storage surface that retains information distinguishable from that of adjacent areas. *Note:* The storage element may be a portion of a continuous storage surface or a discrete area such as a dielectric island. *See also:* storage tube. (ED) 158-1962w, 161-1971w
**(2)** The basic unit of a storage device, such as a sector, or a track. (C) 610.10-1994w

**storage-element equilibrium voltage (storage tubes)** A limiting voltage toward which a storage element charges under the action of primary electron bombardment and secondary emission. At equilibrium voltage the escape ratio is unity. *Note:* Cathode equilibrium voltage, second-crossover equilibrium voltage, and gradient-established equilibrium voltage are typical examples. *See also:* charge-storage tube. (ED) 158-1962w

**storage-element equilibrium voltage, cathode (storage tubes)** The storage element equilibrium voltage near cathode voltage and below first-crossover voltage. *See also:* charge-storage tube. (ED) 158-1962w

**storage-element equilibrium voltage, collector** *See:* charge-storage tube.

**storage-element equilibrium voltage, gradient established (storage tubes)** The storage-element equilibrium voltage, between first- and second-crossover voltages, at which the escape ratio is unity. *See also:* charge-storage tube. (ED) 158-1962w

**storage-element equilibrium voltage, second-crossover (storage tubes)** The storage-element equilibrium voltage at the second-crossover voltage. *See also:* charge-storage tube. (ED) 158-1962w

**storage error** An error in which the data retrieved from storage is different from that which was originally stored in that location. *See also:* soft error; hard error; transient error. (C) 610.10-1994w

**storageid (microprocessor operating systems parameter types)** An identifier for a block of data. The identifier is not guaranteed to be valid outside the allocating process and should not be passed between processes. (C/MM) 855-1985s

**storage integrator** In an analog computer, a device used to store a voltage in the hold condition for future use. *See also:* electronic analog computer. (C) 610.10-1994w, 165-1977w

**storage life (accelerometer) (gyros) (inertial sensors)** The nonoperating time interval under specified conditions, after which a device will still exhibit a specified operating life and performance. *See also:* operating life. (AES/GYAC) 528-1994

**storage light** A light found on a storage device indicating that a parity check error has occurred on a character as it was read into storage. (C) 610.10-1994w

**storage light-amplifier** *See:* image-storage panel.

**storage location (1)** An area in a storage device that can be explicitly and uniquely specified by means of an address. (C) 610.5-1990w
**(2)** A location in a storage device that is uniquely specified by means of an address. (C) 610.10-1994w

**storage medium** Any device or recording medium into which data can be stored and held until some later time, and from which the entire original data can be obtained. (IA) [61]

**storage protection (computers)** An arrangement for preventing access to storage for either reading or writing, or both. (C) [20]

**storage rate** The frequency with which sampled signals are recorded in crashworthy nonvolatile memory. The event recorder may store any signal less often than it samples. (VT) 1482.1-1999

**storage, reservoir** *See:* reservoir storage.

**storage schema** In a CODASYL database, statements expressed in data storage definition language that describe storage areas, stored records, and any associated indices and access paths supporting the records and sets defined by a given schema. *See also:* CODASYL database. (C) 610.5-1990w

**storage stack** *See:* stack.

**storage station (power operations)** A hydroelectric generating station associated with a water storage reservoir. (PE/PSE) 858-1987s, 346-1973w

**storage structure (A)** The manner in which data structures are represented in storage. **(B)** The configuration of a database resident on computer storage devices after mapping the data elements of the logical structure of the database onto their respective physical counterparts. *Note:* The relationships and associations that provide the physical means for accessing the information stored in the database are preserved. (C) 610.5-1990

**storage surface (storage tubes)** The surface upon which information is stored. *See also:* storage tube. (ED) 158-1962w

**storage temperature (1) (power supply)** The range of environmental temperatures in which a power supply can be safely stored (for example, −40°C to +85°C). (AES/IA) [41], [12]
**(2) (light-emitting diodes)** The temperature at which the device, without any power applied, is stored. (ED) [127]

**storage temperature range** The range of temperatures over which the Hall generators may be stored without any voltage applied, or without exceeding a specified change in performance. (MAG) 296-1969w

**storage time** *See:* decay time; maximum retention time.

**storage tube** An electron tube into which information can be introduced and read at a later time. *Note:* The output may be an electric signal and.or a visible image corresponding to the stored information. (ED) 161-1971w, 158-1962w

**storage tube display device** A type of cathode ray tube display device that retains a display image on its surface in the form of a pattern of electric charges. *Synonyms:* storage display; display storage tube; direct-view storage tube. *Contrast:* refresh display device. (C) 610.10-1994w

**storage unit** The length of an addressable element of storage in the machine, measured in bits. (Every storage element has the same size.). *Note:* The storage unit is very likely to be one byte, but this is not a requirement. For example, it might be 32 or 64 bits. (C) 1003.5-1999

**store (A)** A device into which data can be placed, in which they can be retained, and from which they can be retrieved. *Note:* This term is the equivalent of the term storage in British (U.K.) usage. **(B)** To place data into a device as in definition (A). **(C)** To retain data in a device as in definition (A). (C) 162-1963, 610.10-1994
**(2) (A)** To place or retain data in a storage device. **(B) (software) (data management)** To copy computer instructions or data from a register to internal storage or from internal storage to external storage. *Contrast:* retrieve; load. *See also:* move; fetch. (C) 610.12-1990, 610.5-1990

**store-and-forward** Pertaining to communications where a message is received completely before beginning transmission onto the next node. (C) 610.7-1995

**store-and-forward buffer (local area networks)** A first-in-first-out (FIFO) buffer in the network repeater that can provide temporary storage for an entire message packet prior to retransmission. The buffer acts as a shift register and must hold an entire, full-length packet. *See also:* elasticity buffer. (C) 8802-12-1998

**store-and-forward switched network** A switched network in which the store-and-forward principle is used to handle transmissions between the sender and the recipient. (C) 610.7-1995

**store-and-forward switching** A method of switching whereby messages are transferred directly or with interim storage, each in accordance with its own address. *See also:* packet switching. (LM/COM) 168-1956w

**store-and-forward switching system (telephone switching systems)** A switching system for the transfer of messages, each with its own address or addresses, in which the message can be stored for subsequent transmission. (COM) 312-1977w

**stored-energy indicator** An indicator that visibly shows that the stored-energy mechanism is in the charged or discharged position. (SWG/PE) C37.100-1992

**stored-energy operation** Operation by means of energy stored in the mechanism itself prior to the completion of the operation and sufficient to complete it under predetermined conditions. *Note:* This kind of operation may be subdivided according to: (1) how the energy is stored (spring, weight, etc.), (2) how the energy originates (manual, electric, etc.), and (3) how the energy is released (manual, electric, etc.). (SWG/PE/IA/PSP) C37.100-1992, 1015-1997

**stored logic (telephone switching systems)** Instructions in memory arranged to direct the performance of predetermined functions in response to readout. (COM) 312-1977w

**stored paragraph** *See:* boilerplate text.

**stored program (telephone switching systems)** A program in memory that a processor can execute. (COM) 312-1977w

**stored-program computer (1)** A digital computer that, under control of internally stored instructions, can synthesize, alter, and store instructions as though they were data and can subsequently execute these new instructions. (C) [20], [85]
**(2)** A computer that is controlled by internally stored instructions that are treated as though they were data, and that can subsequently be executed. (C) 610.10-1994w

**stored program control (telephone switching systems)** A system control using stored logic. (COM) 312-1977w

**stored record** *See:* internal record.

**stored-program switching system (telephone switching systems)** An automatic switching system having stored program control. (COM) 312-1977w

**storm guys** Anchor guys, usually placed at right angles to direction of line, to provide strength to withstand transverse loading due to wind. *See also:* tower. (T&D/PE) [10]

**storm loading** The mechanical loading imposed upon the components of a pole line by the elements, that is, wind and/or ice, combined with the weight of the components of the line. *Note:* The United States has been divided into three loading districts, light, medium, and heavy, for which the amounts of wind and.or ice have been arbitrarily defined. *See also:* cable. (EEC/PE) [119]

**STP (local area networks)** A 150 Ω shielded balanced cable meeting the specifications in ISO/IEC 11801:1995. (C) 8802-12-1998

**STR** *See:* spanning tree route.

**straggling, energy** *See:* energy straggling.

**straight air brake** An arrangement of brakes whereby air is admitted from the main reservoir through a brake valve to the straight air pipe to the brake cylinders in the operating unit. *Note:* In most rail transit vehicle applications, an electropneumatic overlay is utilized to assist in the straight air brake command transmission. (VT) 1475-1999

**straight air pipe** A method of transmitting a pneumatic command from the active cab to the straight air brake equipment on each vehicle in the operating unit. (VT) 1475-1999

**straightaway** A one-way measurement requiring no path or connection in the opposite direction. (COM/TA) 743-1995

**straight binary** *See:* binary.

**straight condensing turbine (control systems for steam turbine-generator units)** All the steam enters the turbine at one pressure and all the steam leaves the turbine exhaust at a pressure below atmospheric pressure. (PE/EDPG) 122-1985s

**straight-cut control system (numerically controlled machines)** A system in which the controlled cutting action occurs only along a path parallel to linear, circular, or other machine ways. (IA) [61]

**straightforward trunking (manual telephone switchboard system)** That method of operation in which the A operator gives the order to the B operator over the trunk on which talking later takes place. (PE/EEC) [119]

**straight insertion sort** *See:* insertion sort.

**straight joint (power cable joints)** A cable joint used for connecting two lengths of cable, each of which consists of one or more conductors. (PE/IC) 404-1986s

**straight-line code** A sequence of computer instructions in which there are no loops. (C) 610.12-1990

**straight-line coding (1) (computers)** Coding in which loops are avoided by the repetition of parts of the coding when required. (C) [20], [85]
**(2) (software)** A programming technique in which loops are avoided by stating explicitly and in full all of the instructions that would be involved in the execution of each loop. *See also:* unwind. (C) 610.12-1990

**straight line sort** *See:* linear sort.

**straight noncondensing turbine (control systems for steam turbine-generator units)** All the steam enters the turbine at one pressure and all the steam leaves the turbine exhaust at a pressure equal to or greater than atmospheric pressure. (PE/EDPG) 122-1985s

**straight radix sort** A radix sort in which items are sorted repeatedly on successive digits within the numeric representation of the sort key, starting with the least significant digit. (C) 610.5-1990w

**straight-seated bearing (rotating machinery) (cylindrical bearing)** A journal bearing in which the bearing liner is constrained about a fixed axis determined by the supporting structure. *See also:* bearing. (PE) [9]

**straight selection sort** *See:* selection sort.

**straight storage system (electric power supply)** A system in which the electrical requirements of a car are supplied solely from a storage battery carried on the car. *See also:* axle-generator system. (PE/EEC) [119]

**straight two-way merge sort** A variation of the natural two-way merge sort in which the set to be sorted is repeatedly divided into two ordered subsets of length 2 to the power of $k$, where $k$ is the number of passes made so far. *Contrast:* natural two-way merge sort. (C) 610.5-1990w

**strain attachment** *See:* dead-end.

**strain-bus structure** A bus structure comprised of flexible conductors supported by strain insulators. (PE/SUB) 605-1998

**strain element** (of a fuse) That part of the current-responsive element that is connected in parallel with the fusible element in order to relieve it of tensile strain. *Note:* The fusible element melts and severs first, and then the strain element melts

during circuit interruption. *Synonym:* strain wire. (SWG/PE/SWG-OLD) C37.40-1993, C37.100-1992

**strain insulator** An insulator generally of elongated shape, with two transverse holes or slots. (EEC/IEPL) [89]

**strain stick** An insulating support tool used primarily to relieve mechanical loading at suspension and dead-end configurations so as to replace damaged insulators or hardware. (T&D/PE) 516-1995

**strain wire** *See:* strain element.

**STRAND** A concurrent logic programming language. (C) 610.13-1993w

**strand (A)** One of the wires, or groups of wires, of any stranded conductor. **(B)** One of a number of paralleled uninsulated conducting elements of a conductor which is stranded to provide flexibility in assembly or in operation. **(C)** One of a number of paralleled insulated conducting elements that constitute one turn of a coil in rotating machinery. The strands are usually separated electrically through all the turns of a multi-turn coil. Various types of transposition are commonly employed to reduce the circulation of current among the strands. A strand has a solid cross section, or it may be hollow to permit the flow of cooling fluid in intimate contact with the conductor (one form of "conductor cooling"). *See also:* rotor; conductor; stator. (PE) [9]

**stranded conductor** A conductor composed of a group of wires or of any combination of groups of wires. *Note:* The wires in a stranded conductor are usually twisted or braided together. *See also:* conductor. (T&D/PE) [10]

**stranded wire** *See:* stranded conductor.

**strand insulation (rotating machinery)** The insulation on a strand or lamination or between adjacent strands or laminations that comprise a conductor. (PE) [9]

**strand restraining clamp** An adjustable circular clamp commonly used to keep the individual strands of a conductor in place and to prevent them from spreading when the conductor is cut. *Synonyms:* plier clamp; vise grip; hose clamp. (T&D/PE) 524-1992r

**strand-to-strand test (rotating machinery)** A test that is designed to apply a voltage of specified amplitude and waveform between the strands of a coil for the purpose of determining the integrity of the strand insulation. (PE) [9]

**strap, anode** *See:* anode strap.

**strapdown (accelerometer) (gyros)** Direct-mounting of inertial sensors (without gimbals) to a vehicle to sense the linear and angular motion of the vehicle. (AES/GYAC) 528-1994

**strapdown inertial navigation equipment (navigation aid terms)** Inertial navigation equipment wherein the inertial sensors, (for example, gyros and accelerometers) are directly mounted to the vehicle, (eliminating the stable platform and gimbal system) to sense the linear and angular motion of the vehicle. *Notes:* 1. In this equipment, a computer utilizes gyro information to resolve the accelerations that are sensed along the carrier axes, and to refer these accelerations to an inertial frame of reference. Navigation is then accomplished in the same manner as in systems using a stable platform. 2. Also called strapped down. (AES/GCS) 172-1983w

**strap key** A pushbutton circuit controller that is biased by a spring metal strip and is used for opening or closing a circuit momentarily. (EEC/PE) [119]

**strapping** *See:* jumper; anode strap.

**stratified language** A language that cannot be used as its own metalanguage. Examples include FORTRAN, COBOL. *Contrast:* unstratified language. (C) 610.12-1990, 610.13-1993w

**stratopause** The upper boundary of the stratosphere. (AP/PROP) 211-1997

**stratosphere** That part of the Earth's atmosphere located above the troposphere in which the temperature remains constant or increases slightly with increasing height. The stratosphere extends to a height of around 50 km. (AP/PROP) 211-1997

**straw line** *See:* pilot line.

**stray** An element or occurrence usually not desired in a theoretical design, but unavoidable in a practical realization. For example, the relative proximity of wires can cause stray capacitance. *See also:* parasitic element. (CAS) [13]

**stray capacitance (electric circuits)** Capacitance arising from proximity of component parts, wires, and ground. *Note:* It is undesirable in most circuits, although in some high-frequency applications it is used as the tuning capacitance. In bridges and other measuring equipment, its effect must be eliminated by preliminary balancing out, or known and included in the results of any measurement performed. *See also:* measurement system. (IM/HFIM) [40]

**stray current** Currents or components that do not constitute information desired for measurement. Examples are currents due to the stray capacitance of an object to the ground plane, walls, etc. (T&D/PE) 516-1995

**stray-current corrosion** Corrosion caused by current through paths other than the intended circuit or by an extraneous current in the earth. *See also:* long-line current; noble potential; sacrificial protection; cathodic corrosion. (IA) [59]

**stray light (illuminating engineering)** (in the eye) Light from a source which is scattered onto parts of the retina lying outside the retinal image of the source. (EEC/IE) [126]

**stray load loss (synchronous machines)** The losses due to eddy currents in copper and additional core losses in the iron, produced by distortion of the magnetic flux by the load current, not including that portion of the core loss associated with the resistance drop. (PE) [9], [84]

**stray losses (electronic power transformer)** Those occurring in the core and case structure that result from the leakage flux of a transformer when supplying rated load current. (PEL/ET) 295-1969r

**strays**† Electromagnetic disturbances in radio reception other than those produced by radio transmitting systems. *See also:* radio transmitter. (EEC/PE) [119]

† Obsolete.

**stream (1)** An ordered sequence of characters, as described by the C Standard. (C/PA) 9945-2-1993
**(2)** The Physical Layer (PHY) encapsulation of a Media Access Control (MAC) frame. Depending on the particular PHY, the MAC frame may be modified or have information appended or prepended to it to facilitate transfer through the Physical Medium Attachment (PMA). Any conversion from a MAC frame to a PHY stream and back to a MAC frame is transparent to the MAC. (C/LM) 802.3-1998

**streamer** *See:* streamer mode.

**streamer mode** A repetitive corona discharge characterized by luminous filaments extending into the low electric field strength region near either a positive or a negative electrode, but not completely bridging the gap. (T&D/PE) 539-1990

**stream flow** The quantity rate of water passing a given point. *See also:* generating station. (T&D/PE) [10]

**streaming (audio and electroacoustics)** Unidirectional flow currents in a fluid that are due to the presence of acoustic waves. (SP) [32]

**streaming cassette** A magnetic tape cassette for a streaming tape drive. (C) 610.10-1994w

**streaming potential (electrobiology)** The electrokinetic potential gradient resulting from unit velocity of liquid forced to flow through a porous structure or past an interface. *See also:* electrobiology. (EMB) [47]

**streaming tape drive** A tape drive that does not come to a stop at each interrecord gap; rather the tape moves continuously past the read/write heads. *Note:* This type of tape drive is particularly appropriate for performing nonstop dumps or for restoring magnetic disks. *Synonym:* streamer. *Contrast:* start-stop tape drive. (C) 610.10-1994w

**streetlighting luminaire (illuminating engineering)** A complete lighting device consisting of a light source together with its direct appurtenances such as globe, reflector, refractor, housing, and such support as is integral with the housing. The pole, post, or bracket is not considered part of the luminaire. *Note:* Modern streetlighting luminaires contain the ballasts for high intensity discharge lamps where they are used. (EEC/IE) [126]

**streetlighting unit (illuminating engineering)** The assembly of a pole or lamp post with a bracket and a luminaire. (EEC/IE) [126]

**strength-duration curve (medical electronics)** (time-intensity) A graph of the intensity curve of applied electrical stimuli as a function of the duration just needed to elicit response in an excitable tissue. (EMB) [47]

**strength of a sound source** (strength of a simple source) The maximum instantaneous rate of volume displacement produced by the source when emitting a wave with sinusoidal time variation. *Note:* The term is properly applicable only to sources of dimension small with respect to the wavelength. (SP) [32]

**strength-reduction factor** *See:* resistance-reduction factor.

**strength test** A test to ensure that components of the fall protection system will not fail when subjected to a 22.2 kN (5000 pound) force per worker or to the design load of an engineered system. (T&D/PE) 1307-1996

**STRESS** *See:* STRuctural Engineering Systems Solver.

**stress** The nonspecific response of an organism to any demand upon it, whether pleasant or unpleasant, that results in certain biochemical changes. In popular usage, the harmful connotation is often assumed; i.e., excessive stress or distress. (T&D/PE) 539-1990

**stress-accelerated corrosion** Corrosion that is accelerated by stress. (IA) [59]

**stress analysis (Class 1E battery chargers and inverters)** An electrical and thermal design analysis of component applications in specific circuits under the specified range of service conditions. (PE/NP) 650-1979s

**stress control coating** The paint or tape on the outside of the groundwall insulation which extends several centimeters beyond the semiconductive slot coating in high voltage stator bars and coils. The stress control coating often contains silicon carbide particles which tend to linearize the electric field distribution along the coil or bar endturn. The stress control coating overlaps the semiconductive slot coating to provide electrical contact between them. (DEI) 1043-1996

**stress corrosion cracking** Spontaneous cracking produced by the combined action of corrosion and static stress (residual or applied). (IA) [59]

**stressor** An agent or stimulus that stems from fabrication or preservice and service conditions and can produce immediate degradation or aging degradation of a system, structure, or component. (PE/NP) 1205-1993

**stress relief** A predetermined amount of slack to relieve tension in component or lead wires. (EEC/AWM) [105]

**stress test (Class 1E battery chargers and inverters)** A type test performed on a sample equipment which "stresses" the equipment to the specified range of service conditions. (PE/NP) 650-1979s

**stress testing** Testing conducted to evaluate a system or component at or beyond the limits of its specified requirements. *See also:* boundary value. (C) 610.12-1990

**strike deposit (A) (electroplating)** A thin film of deposited metal to be followed by other coatings. *See also:* electroplating. **(B) (electroplating)** (bath) An electrolyte used to deposit a thin initial film of metal. *See also:* electroplating. (EEC/PE) [119]

**striking (1)** (arc) (spark) (gas) The process of establishing an arc or a spark. *See also:* discharge. (ED) [45], [84]

**(2) (electroplating)** The electrode position of a thin initial film of metal, usually at a high current density. *See also:* electroplating. (EEC/PE) [119]

**striking current (gas tube)** The starter-gap current required to initiate conduction across the main gap for a specified anode voltage. (ED) [45], [84]

**striking distance (1)** The shortest distance, measured through air, between parts of different polarities. (SWG/PE) C37.100-1992, [56]

**(2)** The shortest unobstructed distance measured through a dielectric medium such as liquid, gas, or vacuum between parts of different electric potential. (PE/TR) C57.12.80-1978r

**(3) (outdoor apparatus bushings)** The shortest tight string distance measured externally over the weather casing between the metal parts which have the operating line to ground voltage between them. (PE/TR) 21-1976

**(4)** The length of the final jump of the stepped leader as its potential exceeds the breakdown resistance of this last gap; found to be related to the amplitude of the first return stroke. (SUB/PE) 998-1996

**String** The IEEE 1451.1 representation of a sequence of human readable characters. (IM/ST) 1451.1-1999

**string (1) (microprocessor operating systems parameter types)** A sequence of characters. (C/MM) 855-1985s

**(2) (software)** A linear sequence of entities such as characters or physical elements. (C/SE) 729-1983s

**(3) (A) (data management)** A sequence of bits, characters, or other entities; for example, the bit string 0101010 or the character string XYZ. **(B) (data management)** Pertaining to data that contains a sequence as in definition (A). *Contrast:* arithmetic. *See also:* character string; bit string. (C) 610.5-1990

**(4)** An ordered sequence of zero or more bits, octets, or characters, accompanied by the length of the string. (C/PA) 1328-1993w, 1224-1993w, 1327-1993w

**(5)** (of capacitors) Capacitors connected in series between the line terminals.power systems relaying. (PE) C37.99-2000

**string device (1)** A logical input device used to provide a character string to a graphics system. (C) 610.6-1991w

**(2)** An input device that is used to specify or detect a character string. For example, an alphanumeric keyboard. (C) 610.10-1994w

**stringing (conductor stringing equipment)** The pulling of pilot lines, pulling lines, and conductors over travelers supported on structures of overhead transmission lines. Quite often, the entire job of stringing conductors is referred to as stringing operations, beginning with the planning phase and terminating after the conductors have been installed in the suspension clamps. (T&D/PE) 524a-1993r, 1048-1990, 524-1992r

**stringing block** *See:* traveler.

**stringing section** *See:* sag section.

**stringing sheave** *See:* traveler.

**stringing, slack** *See:* slack stringing.

**stringing traveler** *See:* traveler.

**stringing, tension** *See:* tension stringing.

**StriNg-Oriented symBOlic Language (SNOBOL)** A programming language designed for use in string manipulation tasks such as language translation, program compilation and combinatorial problems. (C) 610.13-1993w

**string-shadow instrument** An instrument in which the indicating means is the shadow (projected or viewed through an optical system) of a filamentary conductor, the position of which in a magnetic or an electric field depends upon the measured quantity. *See also:* instrument. (EEC/PE) [119]

**strip (1) (electroplating)** A solution used for the removal of a metal coating from the base metal. *See also:* electroplating. (EEC/PE) [119]

**(2)** To replace a received nonidle symbol by an idle symbol and hence to remove it from transmission on a ringlet. For example, a send packet is stripped by the receiving port of an agent or the target and replaced by idles (most of which may be consumed in the process of emptying the bypass FIFO) and an echo. Similarly an echo is stripped by the receiving port of an agent or the source and replaced by idles. (C/MM) 1596-1992

**strip-chart recorder (analog computer) (hybrid computer linkage components)** A recorder in which one or more records are made simultaneously as a function of time. *See also:* electronic analog computer. (C) 165-1977w, 166-1977w

**stripe-to-gap ratio** The ratio of the metallized surface to the free surface within the interdigital transducer. (UFFC) 1037-1992w

**stripline** A class of planar transmission line characterized by one or more thin conducting strips of finite width parallel to and approximately midway between two extended conducting ground planes. The space between the strips and the ground planes is filled by a homogeneous insulating medium. (MTT) 1004-1987w

**strip line (waveguide)** A transmission line consisting of a strip conductor above or between extended parallel conducting surfaces. Some common examples of such transmission lines are:

a) Partially-shielded strip transmission line: a strip conductor above a single ground plane;
b) Shielded strip transmission line: a strip conductor between two ground planes.

*See also:* slab line. (MTT) 146-1980w

**stripper tank (electrorefining)** An electrolytic cell in which the cathode deposit, for the production of starting sheets, is plated on starting-sheet blanks. *See also:* electrorefining. (EEC/PE) [119]

**stripping (1) (electroplating) (mechanical)** The removal of a metal coating by mechanical means. (PE/EEC) [119]
**(2) (chemical)** The removal of a metal coating by dissolving it. (EEC/PE) [119]
**(3) (electrolytic)** The removal of a metal coating by dissolving it or an underlying coating anodically with the aid of a current. *See also:* electroplating. (EEC/PE) [119]
**(4)** The action of a station removing the frames it has transmitted from the ring. (C/LM) 8802-5-1998

**stripping compound (electrometallurgy)** Any suitable material for coating a cathode surface so that the metal electro deposited on the surface can be conveniently stripped off in sheets. *See also:* electrowinning. (EEC/PE) [119]

**strip terminals (rotating machinery)** A form of terminal in which the ends of the machine winding are brought out to terminal strips mounted integral with the machine frame or assembly. (PE) [9]

**strip-type transmission line (waveguides)** A transmission line consisting of a conductor above or between extended conducting surfaces. *See also:* unshielded strip transmission line; shielded strip transmission line. (AP/ANT) [35]

**strobe (1) (A)** A pulse used to cause a register to assume and retain the state indicated by its data inputs. **(B)** A pulse used as an input to a trigger circuit. (C) 610.10-1994
**(2)** To record or measure the state of a particular node at an instant in time. Strobing will have a skew associated with it. (SCC20) 1445-1998

**strobing (pulse terminology)** A process in which a first pulse of relatively short duration interacts with a second pulse or other event of relatively longer duration to yield a signal which is indicative (typically, proportional to) the magnitude of the second pulse during the first pulse. (IM/WM&A) 194-1977w

**stroboscopic lamp (illuminating engineering)** A flashtube designed for repetitive flashing. (EEC/IE) [126]

**stroboscopic tube** A gas tube designed for the periodic production of short light flashes. *See also:* gas tube. (ED/C) [45], [85]

**stroke (1) (cable plowing)** Peak to peak displacement of the plow blade tip. (T&D/PE) 590-1977w
**(2)** In character recognition, a straight line or arc used as a segment of a graphic character. (C) 610.2-1987
**(3)** A straight line or arc that is a segment of a graphic character. *See also:* keystroke. (C) 610.10-1994w, 610.6-1991w

**stroke centerline** In character recognition, a line midway between two stroke edges. (C) 610.2-1987

**stroke character generator** A character generator that creates characters composed of line segments. *Contrast:* matrix character generator. (C) 610.6-1991w

**stroke device (1)** A logical input device used to provide a sequence of data points as the input data to a graphics system. (C) 610.6-1991w
**(2)** An input device that provides a set of coordinates that record the path of the device. (C) 610.10-1994w

**stroke edge** In character recognition, the line of discontinuity between a side of a stroke and the background, obtained by averaging, over the length of the stroke, the irregularities resulting from the printing and detecting process. (C) 610.2-1987

**stroke font** *See:* vector font.

**stroker display** *See:* random-scan display device.

**stroke speed (facsimile)** (scanning or recording line frequency) The number of times per minute, unless otherwise stated, that fixed line perpendicular to the direction of scanning is crossed in one direction by a scanning or recording spot. *Note:* In most conventional mechanical systems this is equivalent to drum speed. In systems in which the picture signal is used while scanning in both directions, the stroke speed is twice the above figure. *See also:* scanning; recording. (COM) 168-1956w

**stroke width (1)** The thickness of the lines that make up a character, usually expressed as a proportion of the character's height. (PE/NP) 1289-1998
**(2)** In character recognition, the distance between two stroke edges, measured perpendicular to the stroke centerline. (VT) 1477-1998

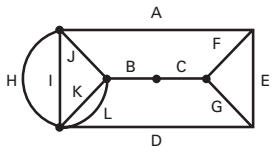
**strong sequential consistency** A state exhibited by a system when each participating cache in the system observes all modifications to lines within itself in the same order as all other participating caches in the system. *Note:* Futurebus+ allows modules to issue transactions that dynamically choose between following a weakly consistent behavior model (which implies greater concurrency and hence higher performance) and strongly consistent behavior models (which may be necessary to ensure correct operation of an algorithm written by a programmer not cognizant of the concurrency possible in different parts of a system). *See also:* weak sequential consistency. (C/BA) 10857-1994

**strong typing (software)** A feature of some programming languages that requires the type of each data item to be declared, precludes the application of operators to inappropriate data types, and prevents the interaction of data items of incompatible types. (C) 610.12-1990

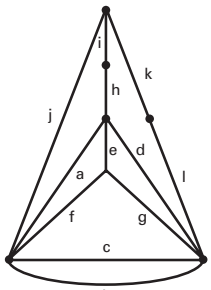
**STRUctural Design language** An extension of STRESS, used for analysis and design of structures. (C) 610.13-1993w

**STRuctural Engineering Systems Solver (STRESS)** A problem-oriented programming language used in structural engineering. *See also:* ICES. (C) 610.13-1993w

**structurally dual networks** A pair of networks such that their branches can be marked in one-to-one correspondence so that any mesh of one corresponds to a cut-set of the other. Each network of such a pair is said to be the dual of the other. *See also:* network analysis.




(A)




(B)

**structurally dual networks**

(Std100) 270-1966w

**structurally symmetrical network** A network that can be arranged so that a cut through the network produces two parts that are mirror images of each other. *See also:* network analysis. (Std100) 270-1966w

**structural model** A model of the physical or logical structure of a system; for example, a model that represents a computer network as a set of boxes connected by communication lines. *Contrast:* process model. (C) 610.3-1989w

**structural pattern recognition** An approach to pattern recognition in which patterns are represented in terms of primitives and relationships among those primitives in order to describe and classify pattern structure. *See also:* syntactic pattern recognition. (C) 610.4-1990w

**structural resolution (color picture tubes)** The resolution as limited by the size and shape of the screen elements. *See also:* television. (BT/AV) [34]

**structural return loss** A term used to describe the structural integrity of the coaxial cable. Structural return loss defines impedance variation due to deformed coaxial cable concentricity. (LM/C) 802.7-1989r

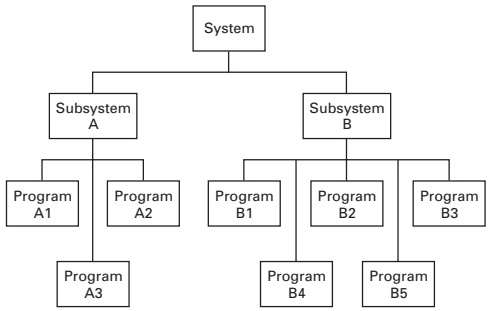
**structural testing** Testing that takes into account the internal mechanism of a system or component. Types include branch testing, path testing, statement testing. *Synonyms:* glass-box testing; white-box testing. *Contrast:* functional testing. (C) 610.12-1990

**structural vector** A pattern generated to exercise a device's structural elements (e.g., scan-based ATPG test generation). *Contrast:* functional vector. (C/TT) 1450-1999

**structure** Material assembled to support conductors or associated apparatus, or both, used for transmission and distribution of electricity (e.g., service pole, tower). (T&D/PE) 516-1995

**structure base ground (conductor stringing equipment)** A portable device designed to connect (bond) a metal structure to an electrical ground. Primarily used to provide safety for personnel during construction, reconstruction or maintenance operations. *Synonyms:* ground chain; butt ground. (PE/T&D) 524a-1993r, 524-1992r, 1048-1990

**structure chart** A diagram that identifies modules, activities, or other entities in a system or computer program and shows how larger or more general entities break down into smaller, more specific entities. *Note:* The result is not necessarily the same as that shown in a call graph. *Synonym:* hierarchy chart. *Contrast:* call graph.




**structure chart**

(C) 610.12-1990

**structure clash** In software design, a situation in which a module must deal with two or more data sets that have incompatible data structures. *See also:* order clash; data structure-centered design. (C) 610.12-1990

**structure conflict** A line so situated with respect to a second line that the overturning of the first line will result in contact between its supporting structures or conductors and the conductors of the second line, assuming that no conductors are broken in either line. (NESC/T&D) C2-1997, C2.2-1960

**structure constant ($C^2_n$)** A measure of the turbulent fluctuations of the refractive index of the atmosphere. (AP/PROP) 211-1997

**structure, crossing** *See:* crossing structure.

**structured** A postal O/R address that specifies the postal address of a user by means of several attributes. Its structure is prescribed in some detail. (C/PA) 1224.1-1993w

**structured design (A) (software)** Any disciplined approach to software design that adheres to specified rules based on principles such as modularity, top-down design, and stepwise refinement of data, system structures, and processing steps. *See also:* object-oriented design; input-process-output; transform analysis; modular decomposition; stepwise refinement; rapid prototyping; transaction analysis; data structure-centered design. **(B) (software)** The result of applying the approach in definition (A). (C) 610.12-1990

**structure designer** A party who designs the structure based on criteria given by a line designer. The structure designer could be an owner, an agent acting for the owner, or a manufacturer or fabricator. (T&D/PE) 1025-1993r, 951-1996

**structured program (software)** A computer program constructed of a basic set of control structures, each having one entry and one exit. The set of control structures typically includes: sequence of two or more instructions, conditional selection of one of two or more sequences of instructions, and repetition of a sequence of instructions. *See also:* structured design. (C) 610.12-1990

**structured programming (software)** Any software development technique that includes structured design and results in the development of structured programs. (C) 610.12-1990

**structured programming language** A programming language that provides structured program constructs such as single-entry-single-exit sequences, branches, and loops, and facilitates the development of structured programs. *See also:* block-structured language. (C) 610.13-1993w, 610.12-1990

**Structured Query Language (SQL)** A query language designed for accessing data and performing queries on relational databases, standardized by ASC ×3. (C) 610.13-1993w

**structure, snub** *See:* snub structure.

**structures, safety class** *See:* safety class structures.

**stub (1) (A) (software)** A skeletal or special-purpose implementation of a software module, used to develop or test a module that calls or is otherwise dependent on it. **(B) (software)** A computer program statement substituting for the body of a software module that is or will be defined elsewhere. (C) 610.12-1990

**(2)** The signal path on the module connecting the BTL transceiver to the Futurebus+ connector. (C/BA) 896.2-1991w

**stub antenna** A short, thick monopole. (AP/ANT) 145-1993

**stub card** A card that has a separable stub attached to a regular punch card. *Note:* May also be scored. (C) 610.10-1994w

**stub feeder** A feeder that connects a load to its only source of power. *Synonym:* radial feeder. (SWG/PE) C37.100-1992, [56]

**stub length** Stub length is measured from the point at which the connector assembly connects to the PC board to the pad where the transceiver lead is soldered to the PC board. (C/BA) 14536-1995

**stub-multiple feeder** A feeder that operates as either a stub or a multiple feeder. (SWG/PE) C37.100-1992

**stub shaft (rotating machinery)** A separate shaft not carried in its own bearings and connected to the shaft of a machine. *See also:* rotor. (PE) [9]

**stub-supported coaxial** A coaxial whose inner conductor is supported by means of short-circuited coaxial stubs. *See also:* waveguide. (EEC/PE) [119]

**stub tuner** A stub that is terminated by movable short-circuiting means and used for matching impedance in the line to which it is joined as a branch. *See also:* waveguide. (AP/ANT) [35]

**stub, waveguide** *See:* waveguide stub.

**stuck-at fault** A failure in a logic circuit that causes a signal connection to be fixed at 0 or 1 regardless of the operation of the circuitry that drives it. (TT/C) 1149.1-1990

**stud** (of a switching device) A rigid conductor between a terminal and a contact. (SWG/PE) C37.100-1992

**stuffing bits** Bits inserted into a frame to compensate for timing differences in constituent lower rate signals. (COM/TA) 1007-1991r

**stuffing box (watertight gland)** A device for use where a cable passes into a junction box or other piece of apparatus and is so designed as to render the joint watertight. (T&D/PE) [10]

**style** Set of editorial conventions covering grammar, terminology, punctuation, capitalization, etc, of a software user document. (C/SE) 1063-1987r

**stylus (1) (electroacoustics)** A mechanical element that provides the coupling between the recording or the reproducing transducer and the groove of a recording medium. *See also:* phonograph pickup. (SP) [32]

**(2) (computer graphics)** A pointing device, resembling a pencil, that is used with a data tablet to determine locations using an electrical sensing mechanism. (C) 610.6-1991w

**(3)** A pointing device used with a data tablet as a locator. Examples include light pens, sonic pens, and voltage pencils. *See also:* twinkle box. (C) 610.10-1994w

**stylus drag (electroacoustics)** An expression used to denote the force resulting from friction between the surface of the recording medium and the reproducing stylus. *See also:* phonograph pickup.

**stylus force (electroacoustics)** The vertical force exerted on a stationary recording medium by the stylus when in its operating position. *See also:* phonograph pickup. (SP) [32]

**SU** *See:* shared unmodified; system unit.

**SUB** *See:* substitute character.

**subaction (1)** A component of a transaction; a request or a response. (C/MM) 1596-1992

**(2)** One of the two components in a transaction; a transaction consists of request and response subactions. (C/MM) 1212-1991s

**(3)** A complete link layer operation: arbitration, packet transmission and acknowledgment. The arbitration may be missing when a node already controls the bus, and the acknowledge is not present for subactions with broadcast addresses or for isochronous subactions. (C/MM) 1394-1995

**(4)** A complete link layer operation: optional arbitration, packet transmission, and optional acknowledgment. (C/MM) 1394a-2000

**subaction gap (1)** The period of idle bus between subactions. There is no gap between the request and response subaction of a concatenated split transaction. (C/MM) 1394-1995

**(2)** For an asynchronous subaction, the period of idle bus that precedes arbitration. (C/MM) 1394a-2000

**subaddress (subroutines for CAMAC)** The symbol a represents an integer which is the subaddress component of a CAMAC address. (NPS) 758-1979r

**subassembly (1) (A)** One or more compartments that comprise the gas-insulated substation assembly. **(B) (electric and electronics parts and equipment)** Two or more basic parts which form a portion of an assembly or a unit, replaceable as a whole, but having a part or parts which are individually replaceable. *Notes:* 1. The application, size, and construction of an item may be factors in determining whether an item is regarded as a unit, an assembly, a subassembly, or a basic part. A small electric motor might be considered as a part if it is not normally subject to disassembly. 2. The distinction between an assembly and a subassembly is not always exact: an assembly in one instance may be a subassembly in another where it forms a portion of an assembly. Typical examples: filter network, terminal board with mounted parts. (SWG/SUB/PE/GSD) C37.122-1983, C37.100-1992, 200-1975

**(2)** An element of the physical or system architecture, specification tree, and system breakdown structure that is subordinate to a complex component, and is comprised of two or more subcomponents. (C/SE) 1220-1994s

**(3)** Items that have an identifiable function. Subassemblies are not completed equipment or individual components. (SPD/PE) C62.38-1994r

**subcarrier (facsimile)** A carrier that is applied as a modulating wave to modulate another carrier. (COM) 168-1956w

**subclass (1)** A class that is defined by specializing another class. The subclass typically adds features to the other class, called the superclass, or uses the facilities of the superclass to implement a more specific set of interfaces. (C) 1295-1993w

**(2)** One of the classes, designated as such, whose attribute types are a superset of those of another class. (C/PA) 1328-1993w, 1327-1993w, 1224-1993w

**(3)** A specialization of one or more superclasses. Each instance of a subclass is an instance of each superclass. A subclass typically specifies additional, different responsibilities to those of its superclasses or overrides superclass responsibilities to provide a different realization. (C/SE) 1320.2-1998

**subclass cluster (A)** A set of one or more generalization structures in which the subclasses share the same superclass and in which an instance of the superclass is an instance of no more than one subclass. A cluster exists when an instance of the superclass can be an instance of only one of the subclasses in the set, and each instance of a subclass is an instance of the superclass. **(B)** A set of one or more mutually exclusive specializations of the same generic entity. (C/SE) 1320.2-1998

**subclass responsibility** A designation that a property of a class must be overridden in its subclasses, i.e., the designation given to a property whose implementation is not specified in this class. A property that is a subclass responsibility is a specification in the superclass of an *interface* that each of its subclasses must provide. A property that is designated as a subclass responsibility has its *realization* deferred to the subclass(es) of the class. (C/SE) 1320.2-1998

**subclutter visibility** The ratio by which the target echo power may be weaker than the coincident clutter echo power and still be detected with specified detection and false-alarm probabilities. *Note:* Target and clutter powers are measured on a single pulse return and all target radial velocities are assumed equally likely. (AES) 686-1997

**subcomponent (1)** A part or portion of a component which is relevant for quantifying exposure to outage occurrences, or failures, or both, or for identifying the cause of an outage occurrence or failure. (PE/PSE) 859-1987w
**(2)** An element of the physical or system architecture, specification tree, and system breakdown structure that is subordinate to a noncomplex component, or a subassembly, and is comprised of two or more parts. (C/SE) 1220-1994s

**subcontractor** A party having a direct contract with the constructor for performing work covered by the Contract Documents, when the constructor is not the owner. (T&D/PE) 951-1996

**subdatabase** A subset of the data contained in a database as used for a specific type of application or system. (C) 610.5-1990w

**subdirectory entry** A read-only memory (ROM) entry that specifies the address of another ROM subdirectory. (C/BA) 896.10-1997, 896.2-1991w

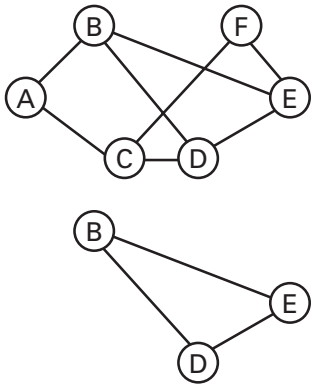
**subdivided capacitor (condenser box)** A capacitor in which several capacitors known as sections are so mounted that they may be used individually or in combination. (Std100) 270-1966w

**subfactor** *See:* quality subfactor.

**subfeeder** A feeder originating at a distribution center other than the main distribution center and supplying one or more branch-circuit distribution centers. *See also:* feeder. (EEC/PE) [119]

**subframe overhead (OH)** 12-byte SFODB Overhead structure used to transfer configuration and status information between the control fiber-optic bus interface unit (CFBIU) and fiber-optic bus interface units (FBIUs) on the network. (C/BA) 1393-1999

**subgraph (data management)** A graph consisting of a subset of nodes from a larger graph. See the figure below.




**subgraph**

(C) 610.5-1990w

**Subgroup** *See:* Remote Bridge Subgroup.

**Subgroup Port** A Virtual Port by which a Remote Bridge attaches to a Group consisting of two or more Subgroups. *Note:* Every Virtual Port is either a Virtual LAN Port or a Subgroup Port. In a Group that is not a Virtual LAN, every Bridge attaches to the Group by at least two Subgroup Ports. (C/LM) 802.1G-1996

**subharmonic (data transmission)** A sinusoidal quantity having a frequency which is an integral submultiple of the fundamental frequency of a periodic quantity to which it is related. For example, a wave the frequency of which is half the fundamental frequency of another wave is called the second subharmonic of that wave. (PE) 599-1985w

**subharmonic detector** A device that detects subharmonic current of specified frequency and duration and initiates an alarm signal or corrective action. (T&D/PE) 824-1994

**subharmonic protector (series capacitor)** A device to detect subharmonic current of a specified frequency and duration to initiate closing of the capacitor bypass switches. (T&D/PE) [26]

**subject** An active entity in a system that causes information to flow between objects or otherwise affects the system state. Typically, subjects include users, processes, and processing elements. (C/BA) 896.3-1993w

**subject copy (facsimile)** The material in graphic form that is to be transmitted for facsimile reproduction. *See also:* facsimile. (COM) 168-1956w

**subject domain (1)** The MD that contains the MTA embodied by the client and service of the MT interface. (C/PA) 1224.1-1993w
**(2)** An area of interest or expertise. The responsibilities of a subject domain are an aggregation of the responsibilities of a set of current or potential named classes. A subject domain may also contain other subject domains. A subject domain encapsulates the detail of a view. (C/SE) 1320.2-1998

**subject domain responsibility** A generalized concept that the analyst discovers by asking "in general, what do instances in this subject domain need to be able to do or to know?" The classes and subject domains in a subject domain together supply the knowledge, behavior, and rules that make up the subject. These notions are collectively referred to as the subject domain's responsibilities. Subject domain responsibilities are not distinguished as sub-domains or classes during the early stages of analysis. (C/SE) 1320.2-1998

**subjective brightness (illuminating engineering)** The subjective attribute of any light sensation giving rise to the percept of luminous magnitude, including the whole scale of qualities of being bright, light, brilliant, dim, or dark. *Note:* The term brightness often is used when referring to the measurable luminance. While the context usually makes it clear as to which meaning is intended, the preferable term for the photometric quality is luminance, thus reserving brightness for the subjective sensation. *See also:* luminance; saturation. (EEC/IE) [126]

**subject matter expert (SME)** An individual knowledgeable in the subject area being trained or tested. (DIS/C) 1278.3-1996

**subject message** When used in reference to a communique, the communique, if it is a message; or any of the messages denoted by the communique, if it is a probe. (C/PA) 1224.1-1993w

**sublayer** A subdivision of a layer in the OSI reference model. *See also:* physical layer; presentation layer; data link layer; session layer; entity layer; logical link control sublayer; application layer; client layer; network layer; transport layer; medium access control sublayer. (LM/C) 610.7-1995, 8802-6-1994

**submarine cable** A cable designed for service under water. *Note:* Submarine cable is usually a lead-covered cable with a steel armor applied between layers of jute. (T&D/PE) [10]

**submaster** *See:* master remote unit.

**submaster station** A station that can perform as a master station on one message transaction and as a remote station on another message transaction. *Note:* Examples of station equipments include

- *Hardwired.* Station supervisory equipment that is comprised entirely of wired-logic elements.
- *Firmware.* Station supervisory equipment that uses hardware logic programmed routines in a manner similar to a computer. the routines can only be modified by physically exchanging logic memory elements.
- *Programmable.* Station supervisory equipment that uses software routines.

(SWG/PE/SUB) C37.100-1992, C37.1-1994

**submerged-resistor induction furnace** A device for melting metal comprising a melting hearth, a depending melting channel closed through the hearth, a primary induction winding, and a magnetic core which links the melting channel and the primary winding. *See also:* induction heating. (IA) 54-1955w

**submersible (rotating machinery)** So constructed as to be successfully operable when submerged in water under specified conditions of pressure and time. (SWG/IA/PE/ICTL/MT/TR) 45-1983s, [9], C37.100-1992, C57.12.80-1978r

**submersible enclosure** An enclosure constructed so that the equipment within it will operate successfully when submerged in water under specified conditions of submergence depth and time. (IA/MT) 45-1998

**submersible entrance terminals (cable-heads)** (of distribution oil cutouts) A hermetically sealable entrance terminal for the connection of cable having a submersible sheathing or jacket. (SWG/PE) C37.100-1992, C37.40-1993

**submersible fuse (1) (subway oil cutout) (high-voltage switchgear)** A fuse that is so constructed that it will operate successfully when submerged in water under specified conditions of pressure and time. (SWG/PE) C37.40-1993 **(2)** *See also:* submersible; fuse. (SWG/PE) C37.100-1992

**submersible transformer (power and distribution transformers)** A transformer so constructed as to be successfully operable when submerged in water under predetermined conditions of pressure and time. (PE/TR) C57.12.80-1978r

**submillimeter** 300 GHz to 3 THz. *See also:* radio spectrum. (AP/PROP) 211-1997

**submission** The process by which a client requests that a batch server create a job via a Queue Job Request to perform a specified computational task. (C/PA) 1003.2d-1994

**submission queue** The database that the client of the MA interface uses to convey objects to the service. (C/PA) 1224.1-1993w

**submodel** *See:* subschema.

**subnetwork (1)** A functional unit comprised of a single dual bus pair and those access units (AUs) attached to it. Subnetworks are physically formed by connecting adjacent nodes with transmission links. (LM/EMB/C/MIB) 1073.3.1-1994, 8802-6-1994 **(2)** A set of one or more intermediate open systems that provide relaying and through which end systems may communicate. It is a representation within the OSI model of a real network such as a carrier network, a provider network, or a LAN. It can also be defined as a collection of equipment and physical media that forms an autonomous whole and that can be used to interconnect real systems for the purpose of communication. (C/LM) 802.9a-1995w

**subnetwork configuration** The topological arrangement of nodes to form a subnetwork. In normal operation a DQDB subnetwork can have one of two configurations, open Dual Bus or looped Dual Bus. (LM/C) 8802-6-1994

**subnetwork service** The service supported by the subnetwork access protocol. (C/LM/COM) 802.9a-1995w, 8802-9-1996

**subnormality (electrical depression) (electrobiology)** The state of reduced electrical sensitivity after a response or succession of responses. *See also:* excitability. (EMB) [47]

**subnormal number (mathematics of computing)** A non-zero floating-point number whose exponent is the precision's minimum and whose leading significant digit is zero. (C) 1084-1986w

**subobject** An immediate subobject of an object or of one of its subobjects applied recursively. (C/PA) 1328-1993w, 1327-1993w, 1224-1993w

**subordinate** The converse of superior. (C/PA) 1328.2-1993w, 1224.2-1993w, 1326.2-1993w, 1327.2-1993w

**subpanel (1) (photoelectric converter)** Combination of photoelectric converters in parallel mounted on a flat supporting structure. *See also:* semiconductor. (AES) [41] **(2) (solar cells)** A combination of solar cells in series.parallel matrix to provide current at array (bus) voltage. (AES/SS) 307-1969w

**subpost car frame (elevators)** A car frame all of whose members are located below the car platform. *See also:* hoistway. (PE/EEC) [119]

**subproduct** A software object that is a grouping of software filesets and other subproducts within a product. (C/PA) 1387.2-1995

**subprogram (1) (software)** A separately compilable, executable component of a computer program. *Note:* The terms "routine," "sub-program," and "subroutine" are defined and used differently in different programming languages; the preceding definition is advanced as a proposed standard. *See also:* coroutine; main program; routine; subroutine. (C) 610.12-1990 **(2) (test, measurement, and diagnostic equipment)** A part of a larger program which can be converted into machine language independently. (MIL) [2]

**subrack (VSB)** A rigid framework that provides mechanical support for boards inserted into the backplane, ensuring that the connectors mate properly and that adjacent boards do not contact each other. It also guides the cooling airflow through the system, and ensures that inserted boards are not disengaged from the backplane due to vibration. (C/MM/BA) 1096-1988w, 1014-1987

**subreflector** A reflector other than the main reflector of a multiple-reflector antenna. (AP/ANT) 145-1993

**subrefraction** Refraction for which the vertical gradient of refractivity is greater (less negative) than the standard gradient of refractivity. (AP/PROP) 211-1990s

**subrefractive atmosphere** *See:* refractive index gradient.

**subremote unit (SRU)** A physical device (for example, peripheral boards, RTUs, meters, or other intelligent electronic devices) that collects data, processes it in some way, and communicates it to an MRU. SRUs are able to respond to commands from MRUs. (PE/SUB) 1379-1997

**subroutine (1) (A) (electronic computation)** In a routine, a portion that causes a computer to carry out a well-defined mathematical or logic operation. **(B) (electronic computation)** A routine that is arranged so that control may be transferred to it from a master routine and so that at the conclusion of the subroutine, control reverts to the master routine. *Note:* Such a subroutine is usually called a closed subroutine. A single routine may simultaneously be both a subroutine with respect to another routine and a master routine with respect to a third. Usually control is transferred to a single subroutine from more than one place in the master routine and the reason for using the subroutine is to avoid having to repeat the same sequence of instructions in different places in the master routine. (MIL) [2], 270-1966 **(2) (software)** A routine that returns control to the program or subprogram that called it. *Note:* The terms "routine," "subprogram," and "subroutine" are defined and used differently in different programming languages; the preceding definition is advanced as a proposed standard. *Contrast:* coroutine. *See also:* open subroutine; closed subroutine. (C) 610.12-1990 **(3)** *See also:* procedure. (C/MM) 1178-1990r

**subroutine, open** *See:* open subroutine.

**subroutine trace** A record of all or selected subroutines or function calls performed during the execution of a computer program and, optionally, the values of parameters passed to and returned by each subroutine or function. *See also:* subroutine trace; retrospective trace; symbolic trace; variable trace; execution trace. (C) 610.12-1990

**subschema (A)** A subset of a schema that defines a view of the database that is needed by one or more application programs. *Synonym:* submodel. **(B)** A description of the logical structure of a record in a database. (C) 610.5-1990

**subscriber carrier (telephone loop performance)** A system that multiplexes customer signals to achieve pair gain in the loop plant. Usually, it consists of (1) An end office terminal (EOT); it interfaces with the end office (EO) through analog line appearances, one per each integrated loop. If the carrier is a digital system integrated in a digital end office, this ter-

minal and its interfaces are replaced by much simpler all-digital equipment that may be integrated into the switching system. (2) A remote terminal (RT); it interfaces with the cable pairs to the customers' premises through analog interfaces, one per each implemented loop. (3) A transmission medium between the EOT (or EO in a digital integrated system) and the RT; it provides a control channel for internal EOT/EO-to-RT communication and communciation channels for customer traffic. A nonconcentrated system has as many customer channels as implemented loops, with fixed loop-channel assignments. A concentrated system has fewer channels than implemented loops, and changes loop-channel assignments to accomodate changing traffic patterns. (COM/TA) 820-1984r

**subscriber equipment (protective signaling)** That portion of a system installed in the protected premises or otherwise supervised. *See also:* protective signaling. (EEC/PE) [119]

**subscriber line (data transmission)** A telephone line between a central office and a telephone station, private branch exchange, or other end equipment. (PE) 599-1985w

**subscriber loop** *See:* subscriber's line.

**subscriber multiple** A bank of jacks in a manual switchboard providing outgoing access to subscriber lines, and usually having more than one appearance across the face of the switchboard. (EEC/PE) [119]

**Subscriber object** Any object that receives publications from the network via an Object of class `IEEE1451_SubscriberPort`. (IM/ST) 1451.1-1999

**Subscriber Port** An instance of the class `IEEE1451_SubscriberPort` or of a subclass thereof. (IM/ST) 1451.1-1999

**subscriber's drop** A wire that runs from a cable terminal or distribution point to the subscriber's premises. (C) 610.7-1995

**subscriber set (customer set)** An assembly of apparatus for use in originating or receiving calls on the premises of a subscriber to a communication or signaling service. *See also:* voice-frequency telephony. (EEC/PE) [119]

**subscriber's line (telephony)** A link between a local exchange and a telephone set, a private telephone system, or another terminal using signals compatible with the telephone network. According to evolving practice in North America, the subscriber loop may be referred to as a local exchange access line. *Note:* Most subscriber loops are physical pairs. Subscriber loops may also be provided by means of a radio link, associated "go" and "return" channels in a multiplex system, or line sections allocated by a line concentrator. For purposes of this standard, only that part of the line connecting the telephone set and the feeding bridge is considered to be part of the local sending or local receiving system. (COM/TA) 823-1989w

**subscriber's loop** *See:* local loop.

**subscriber's telephone line** *See:* subscriber's line.

**subscriber trunk dialing** *See:* direct distance dialing.

**subscript** A symbol that is associated with the name of a set to identify a particular subset or element of the set. (C) 610.5-1990w

**Subscription Domain** A Domain identified by a subscriber for a specific publication. *See also:* Domain. (IM/ST) 1451.1-1999

**Subscription Qualifier** A configurable identifier used to help define the selection of received publications on the basis of publication's Publication Topic in a publish-subscribe communication. Specifically, a value having datatype `SubscriptionQualifier`. For a Subscriber Port, the operation `GetSubscriptionQualifier` returns a value, `subscription_qualifier`, that has the same value as Port's Subscription Qualifier. (IM/ST) 1451.1-1999

**subset** A dialect of a particular language that varies from its referenced standard language such that its capabilities include some, but not all, the capabilities of the referenced language. For example, TINT is a subset of JOVIAL. *Contrast:* extension. (C) 610.13-1993w

**subset entity** Entities that are related to and dependent on other primary entity sets called parent entity sets. (PE/EDPG) 1150-1991w

**subshell** A shell execution environment, distinguished from the main or current shell execution environment by the attributes described in 3.12. (C/PA) 9945-2-1993

**subsidence** *See:* attenuation; damping.

**subsidence ratio (automatic control)** A measure of the damping of a second-order linear oscillation, resulting from step or ramp forcing, expressed as the greater divided by the lesser of two successive excursions in the same direction from an ultimate steady-state value. *Note:* The term is also used loosely to describe the ratio of the first two consecutive peaks of any damped oscillation. (PE/EDPG) [3]

**subsidiary communications authorization subcarrier modulation** The FCC permits broadcasters to transmit privileged information and control signals on subcarriers as specified under the SCA but only when transmitted in conjunction with broadcast programming. *Notes:* 1. With monophonic broadcasting, the SCA service may use from 20 to 75 kHz with no restriction on the number of subcarriers, but the total SCA modulation of the RF (radio frequency) carrier must not exceed 30 percent and the crosstalk into the main channel must be at least 60 dB down. 2. With stereophonic broadcasting, the SCA service is limited to 53−75 kHz, 10 percent modulation of the carrier, and must still comply with the 60 dB crosstalk ratio. A 67 kHz subcarrier with ±6 kHz modulation is often used. (BT) 185-1975w

**subsidiary conduit (lateral)** A terminating branch of an underground conduit run, extending from a manhole or handhole to a nearby building, handhole, or pole. *See also:* cable. (EEC/PE) [119]

**subsplit** A frequency division scheme that allows two-way traffic on a single cable. Inbound path signals come to the headend from 5 to 30 MHz. Outbound path signals go from the headend from 54 to the upper frequency limit. The guardband is located from 30 to 54 MHz. (LM/C) 802.7-1989r

**substantial** So constructed and arranged as to be of adequate strength and durability for the service to be performed under the prevailing conditions. (T&D) C2.2-1960

**substation (1) (generating stations electric power system)** An area or group of equipment containing switches, circuit breakers, buses, and transformers for switching power circuits and to transform power from one voltage to another or from one system to another. (PE/EDPG) 505-1977r

**(2)** An assemblage of equipment for purposes other than generation or utilization, through which electric energy in bulk is passed for the purpose of switching or modifying its characteristics. Service equipment, distribution transformer installations, or other minor distribution or transmission equipment are not classified as substations. *Note:* A substation is of such size or complexity that it incorporates one or more buses, a multiplicity of circuit breakers, and usually is either the sole receiving point of commonly more than one supply circuit, or it sectionalizes the transmission circuits passing through it by means of circuit breakers. *See also:* alternating-current distribution; direct-current distribution. (T&D/PE) [10]

**(3)** An enclosed assemblage of equipment (e.g., switches, circuit breakers, buses, and transformers) under the control of qualified persons, through which electric energy is passed for the purposes of switching or modifying its characteristics. (PE/EDPG) 665-1995

**(4)** An enclosed assemblage of equipment, e.g., switches, circuit breakers, buses, and transformers, under the control of qualified persons, through which electric energy is passed for the purpose of switching or modifying its characteristics. (NESC) C2-1997

**substitutability** A principle stating that, since each instance of a subclass is an instance of the superclass, an instance of the

subclass should be acceptable in any context where an instance of the superclass is acceptable. Any request sent to an instance receives an acceptable response, regardless of whether the receiver is an instance of the subclass or the superclass. (C/SE) 1320.2-1998

**substitute character (SUB)** A control character used in the place of a character that is recognized to be invalid or in error, or that cannot be represented on a given device. (C) 610.5-1990w

**substitution** The introduction unauthorized, potentially malicious components to intercept communications, generate incorrect or misleading information, masquerade as a legitimate component, or perform other undesirable functions. Substitution may be perpetrated throughout a system (e.g., hardware and software components), and could result in unauthorized disclosure or modification of information, unauthorized receipt of services, or denial of service to legitimate users or critical functions. (C/BA) 896.3-1993w

**substitution error, direct-current-radio-frequency (bolometers)** The error arising in the bolometric measurement technique when a quantity of direct-current or audio-frequency power is replaced by a quantity of radio-frequency power with the result that the different current distributions generate different temperature fields that give the bolometer element different values of resistance for the same amonts of power. This error is expressed as where e is the effective efficiency of the bolometer units and h is the efficiency of the bolometer unit. *See also:* bolometric power meter. (IM/HFIM) [40]

**substitution error, dual-element** A substitution error peculiar to dual-element bolometer units that results from a different division of direct-current (or audio-frequency) and radio-frequency powers between the two elements. (IM/HFIM) [40]

**substitution power (bolometers)** The difference in bias power required to maintain the resistance of a bolometer at the same value before and after radio-frequency power is applied. Commonly, a bolometer is placed in one arm of a Wheatstone bridge that is balanced when the bias current (direct current and.or audio frequency) holds the bolometer at its nominal operating resistance. Following the application of the radio-frequency signal, the reduction in bias power is taken as a measure of the radio-frequency power. This reduction in the bias power is the substitution power and is given by

$$P = I_1^2R - I_2^2R$$

where $I_1$ and $I_2$ are the bias currents before and after radio-frequency power is applied and R is the nominal operating resistance of the bolometer. *See also:* bolometric power meter. (IM) 470-1972w

**substrate (1) (integrated circuit)** The supporting material upon or within which an integrated circuit is fabricated or to which an integrated circuit is attached. (ED) 274-1966w
**(2) (photovoltaic power system)** Supporting material or structure for solar cells in a panel assembly. Solar cells are attached to the substrate. (AES) [41]
**(3) (planar transmission lines)** The supporting material upon or within which a planar transmission line is fabricated or to which it is attached. A substrate can be composed of one or more nonconducting layers. (MTT) 1004-1987w
**(4)** The base material upon which or in which a transistor or integrated circuit is fabricated; for example, materials such as glass-ceramic or silicon oxide. (C) 610.10-1994w

**subsurface corrosion** Formation of isolated particles of corrosion product(s) beneath the metal surface. This results from the preferential reaction of certain alloy constituents by inward diffusion of oxygen, nitrogen, sulfur, etc. (internal oxidation). (IA) [59]

**subsurface switch** A submersible switching assembly suitable for application in a below-grade enclosure that does not allow space for personnel access. (SWG/PE) C37.71-1984r, C37.100-1992

**subsurface transformer (power and distribution transformers)** A transformer utilized as part of an underground distribution system, connected below ground to high-voltage and low-voltage cables, and located below the surface of the ground. (PE/TR) C57.12.80-1978r

**subsynchronous reluctance motor** A form of reluctance motor that has the number of salient poles greater than the number of electrical poles of the primary winding, thus causing the motor to operate at a constant average speed that is a submultiple of its apparent synchronous speed. *See also:* asynchronous machine. (PE) [9]

**subsynchronous satellite (communication satellite)** A satellite, for which the sidereal period of rotation of the primary body about its own axis is an integral multiple of the mean sidereal period of revolution of the satellite about the primary body. (COM) [19]

**subsystem (1) (unique identification in power plants)** A portion of a system containing two or more integrated components which, while not completely performing the specific function of a system, may be isolated for design, test, or maintenance. (PE/EDPG) 804-1983r, 803-1983r
**(2) (nuclear power generating station protective systems)** That part of the system which effects a particular protective function. These subsystems may include, but are not limited to those actuating: reactor shutdown: safety injection: containment isolation: emergency core cooling: containment pressure and temperature reduction: containment air cleaning. (PE/NP) 380-1975w
**(3) (software)** A secondary or subordinate system with a larger system. (C) 610.12-1990
**(4)** An element of the physical or system architecture, specification tree, or system breakdown structure that is a subordinate element to a product and is comprised of one or more assemblies and their associated life-cycle processes. (C/SE) 1220-1994s
**(5)** An interconnected, interrelated group of equipment intended to serve a single basic purpose within a larger installation or facility. (SUB/PE) 1303-1994
**(6)** An element in a hierarchical division of an open system that interacts directly only with elements in the next higher division or the next lower division of that open system (ISO 7498). (LM/C) 8802-6-1994

**subsystem identification** An eight-character label further describing the system. Leading spaces are not interpreted as leading zeros. This is used with the system identification to uniquely describe the data. (NPS/NID) 1214-1992r

**subsystem verification** Testing to verify that all of the systems required for a main generating unit startup have been tested and are operational. (PE/EDPG) 1248-1998

**subtracter** A device whose output data is the arithmetic difference of the two or more quantities presented as input data. *Contrast:* adder. *See also:* half subtracter; full subtracter; adder-subtracter. (C) 610.10-1994w

**subtract time** The elapsed time required to perform one subtraction operation, not including the time required to obtain the operands or to return the result to storage. *Contrast:* multiply time; add time. (C) 610.10-1994w

**subtrahend** A number to be subtracted from another number (the minuend) to produce a result (the difference). (C) 1084-1986w

**subtransient current (rotating machinery)** The initial alternating component of armature current following a sudden short circuit. *See also:* armature. (PE) [9]

**subtransient internal voltage (synchronous machines) (specified operating condition)** The fundamental-frequency component of the voltage of each armature phase that would appear at the terminals immediately following the sudden removal of the load. *Note:* The subtransient internal voltage, as shown in the phasor diagram, is related to the terminal-voltage and phase-current phasors by the equation:

$$E''_1 = E_a + RI_a + jX''_dI_{ad} + jX''_qI_{aq}$$

For a machine subject to saturation, the reactances should be determined for the degree of saturation applicable to the specified operating conditions. (PE) [9]

**subtransient reactance (1) (electrical power systems in commercial buildings)** The apparent reactance of the stator winding at the instant the short circuit occurs. (IA/PSE) 241-1990r

**(2)** Reactance of a generator at the initiation of a fault. This reactance is used in calculations of the initial symmetrical fault current. The current continuously decreases, but it is assumed to be steady at this value as a first step, lasting approximately 0.05 s after an applied fault. (PE/SUB/PSC) 80-2000, 367-1996

**subtrate (metal-nitride-oxide field-effect transistor)** This insulated-gate field-effect transistor (IGFET) region separates source from drain and is of opposite conductivity type. The potential on the substrate terminal can only be equally, or less attractive to the carriers in the channel than the source terminal. (ED) 581-1978w

**subtree** A tree whose root node is part of a larger tree. *Note:* A subtree is made up of a node and all of its hierarchical descendants. *Synonym:* branch. (C) 610.5-1990w

**subtype (1)** A subset of a data type, obtained by constraining the set of possible values of the data type. *Note:* The operations applicable to the subtype are the same as those of the original data type. *See also:* derived type. (C) 610.12-1990

**(2)** *See also:* subclass. (C/SE) 1320.2-1998

**subunit** A logical subcomponent of a unit that is accessed by a largely independent subcomponent of I/O driver software. For example, a terminal multiplexer unit could have multiple subunits (two for each full-duplex connection). (C/MM) 1212-1991s

**subvoice-band channel** A channel with a bandwidth narrower than that of a voice-band channel. *Note:* It is generally used in telegraphy. (C) 610.7-1995

**subway transformer (power and distribution transformers)** A submersible-type distribution transformer suitable for installation in an underground vault. (PE/TR) C57.12.80-1978r

**successfully transferred** For a write operation to a regular file, when the system ensures that all data written is readable on any subsequent open of the file (even one that follows a system or power failure) in the absence of a failure of the physical storage medium. For a read operation, when an image of the data on the physical storage medium is available to the requesting process. (C/PA) 9945-1-1996, 1003.5-1999

**successful test** A completed test that is invoked by a write to the TEST_START register, in which no errors are detected. (C/MM) 1212-1991s

**sudden failure** *See:* failure.

**sudden ionospheric disturbance (SID)** An ionospheric disturbance with a duration of from a few minutes to a few hours, characterized by the sudden increase in the ionization of the D region in the daylight hemisphere as a result of electromagnetic radiation from a solar flare. *Note:* This effect is sometimes called the Mägel-Delinger effect. (AP/PROP) 211-1997

**sudden-pressure relay** A relay that operates by the rate of rise in pressure of a liquid or gas. (SWG/PE) C37.100-1992

**sudden short-circuit test (synchronous machines)** A test in which a short-circuit is suddenly applied to the armature winding of the machine under specified operating conditions. (PE) [9]

**Suez Canal searchlight** A searchlight constructed to the specifications of the Canal Administration that by regulation of the Administration, must be carried by every ship traversing the canal, so located as to illuminate the banks. (EEC/PE) [119]

**suffix notation** *See:* postfix notation.

**suicide control (adjustable-speed drive)** A control function that reduces and automatically maintains the generator voltage at approximately zero by negative feedback. *See also:* feedback control system. (IA/IAC) [60]

**suitable test (faulted circuit indicators)** Where a condition or a set of conditions are so variable from one utility to another or even within the utility itself that no test can be properly specified for all conditions, it is left to the user to determine their individual test needs. A suitable test and anticipated service life are mutually agreed to between manufacturer and user. (T&D/PE) 495-1986w

**suitcase** *See:* conductor grip.

**sulfur hexafluoride ($SF_6$)** A gaseous dielectric for high-voltage power applications having characteristics as specified in ASTM D2472-92. (SWG/SUB/PE) C37.122-1983s, C37.122.1-1993, C37.100-1992

**sum (mathematics of computing)** The result of an addition operation. (C) 1084-1986w

**sum check** *See:* summation check.

**sum frequency (parametric device)** The sum of a harmonic ($nf_p$) of the pump frequency ($f_p$) and the signal frequency ($f_s$), where $n$ is a positive integer. *Note:* Usually $n$ is equal to one. *See also:* parametric device. (ED) [46]

**sum-frequency parametric amplifier** *See:* parametric device; noninverting parametric device.

**summary punch (1) (test, measurement, and diagnostic equipment)** A tape or card punch operating in conjunction with another machine to punch data which have been summarized or calculated by the other machine. (MIL) [2]

**(2)** A card punch used to record data that were calculated or summarized by another device. (C) 610.10-1994w

**summation check (1) (computers)** A check based on the formation of the sum of the digits of a numeral. The sum of the individual digits is usually compared with a previously computed value. (C) [20], [85]

**(2) (mathematics of computing)** A check in which a group of digits is summed, usually without regard to overflow, and that sum is checked against a previously computed value to verify that no digits have been changed. *Synonym:* sum check. (C) 1084-1986w

**summer** *See:* summing amplifier.

**summer outage rate** The number of outage occurrences per unit of service time during the summer. Summer outage rate = number of outages during the summer/service time during summer. *See also:* outage rate. (PE/PSE) 859-1987w

**summing amplifier** An operational amplifier whose output analog variable is the integral of a weighted sum of the input analog variables with respect to time or with respect to another input analog variable. (C) 610.10-1994w, 165-1977w

**summing junction** In an analog computer, the junction common to the input and feedback impedances used with an operational amplifier. (C) 610.10-1994w, 165-1977w

**summing point (1)** Any point at which signals are added algebraically. *Note:* For example the null junction of a power supply is a summing point because, as the input to a high-gain direct-current amplifier, operational summing can be performed at this point. As a virtual ground, the summing point decouples all inputs so that they add linearly in the output, without other interaction. *See also:* operational programming; null junction. (PE/EDPG) [3]

**(2)** The point in a feedback control system at which the algebraic sum of two or more signals is obtained. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**sum pattern** A radiation pattern characterized by a single main lobe whose cross section is essentially elliptical, and a family of side lobes, the latter usually at a relatively low level. *Note:* Antennas that produce sum patterns are often designed to produce a difference pattern and have application in acquisition and tracking radar systems. *Contrast:* difference pattern. (AP/ANT) 145-1993

**sun bearing (illuminating engineering)** The angle measured in the plane of the horizon between a vertical plane at a right

angle to the window wall and the position of this plane after it has been rotated to contain the sun. (EEC/IE) [126]

**sun light (illuminating engineering)** Direct visible radiation from the sun. (EEC/IE) [126]

**superclass (1)** A class that is the ancestor of another class in the class hierarchy. (C) 1295-1993w

**(2)** One of the classes, designated as such, whose attribute types are a subset of those of another class. (C/PA) 1328-1993w, 1224-1993w, 1327-1993w

**(3)** A class whose instances are specialized into one or more subclasses. *See also:* partial cluster; total cluster. (C/SE) 1320.2-1998

**supercomputer** Any of the group of computers that have the fastest processing speeds available at a given time. (C) 610.10-1994w

**superconducting** The state of a superconductor in which it exhibits superconductivity. Example: Lead is superconducting below a critical temperature and at sufficiently low operating frequencies. *See also:* normal; superconductivity. (ED) [46]

**superconductive** Pertaining to a material or device that is capable of exhibiting superconductivity. Example: Lead is a superconductive metal regardless of temperature. The cryotron is a superconductive computer component. *See also:* superconductivity. (ED) [46]

**superconductivity** A property of a material that is characterized by zero electric resistivity and, ideally, zero permeability. (ED) [46]

**superconductor** Any material that is capable of exhibiting superconductivity. Example: Lead is a superconductor. *See also:* superconductivity. (ED) [46]

**superdirectivity** The condition that occurs when the antenna illumination efficiency significantly exceeds 100%. *Note:* Superdirectivity is only obtained at a cost of a large increase in the ratio of average stored energy to energy radiated per cycle. (AP/ANT) 145-1993

**superframe** A structure that consists of 12 DS1 frames (2316 bits). The DS1 frame comprises 193 bit positions, the first of which is the frame overhead bit position. Frame overhead bit positions are used for terminal frame ($F_t$) and signaling frame ($F_s$) alignment only. (COM/TA) 1007-1991r

**supergroup** *See:* channel supergroup.

**superheterodyne reception** A method of receiving radio waves in which the process of heterodyne reception is used to convert the voltage of the received wave into a voltage of an intermediate, but usually superaudible, frequency, that is then detected. *See also:* radio receiver. (EEC/PE) [119]

**super high frequency (SHF)** 3–30 GHz. *See also:* radio spectrum. (AP/PROP) 211-1997

**superimposed ringing (telephone switching systems)** Selective ringing that utilizes direct current polarity to obtain selectivity. (COM) 312-1977w

**superior** (applying to entry or directory object) Immediately superior, or superior to one that is immediately superior (recursively). (C/PA) 1326.2-1993w, 1224.2-1993w, 1327.2-1993w, 1328.2-1993w

**super-large scale integration** *See:* ultra-large scale integration; very large scale integration.

**superluminescent LED** *See:* superluminescent light-emitting diode.

**superluminescent light-emitting diode (SLED, SLD) (1) (fiber optics)** An emitter based on stimulated emission with amplification but insufficient feedback for oscillation to build up. *Synonym:* superluminescent LED. *See also:* spontaneous emission; stimulated emission. (Std100) 812-1984w

**(2)** A p-n junction semiconductor emitter based on stimulated emission with amplification, but insufficient for feedback oscillation to build up. (AES/GYAC) 528-1994

**superobject** The immediate superobject of an object, or one of its superobjects applied recursively. (C/PA) 1328-1993w, 1224-1993w, 1327-1993w

**superposed circuit** An additional channel obtained from one or more circuits, normally provided for other channels, in such a manner that all the channels can be used simultaneously without mutual interference. *See also:* transmission line. (EEC/PE) [119]

**superposition theorem** States that the current that flows in a linear network, or the potential difference that exists between any two points in such a network, resulting from the simultaneous application of a number of voltages distributed in any manner whatsoever throughout the network is the sum of the component currents at the first point, or the component potential differences between the two points, that would be caused by the individual voltages acting separately. (EEC/PE) [119]

**superradiance (fiber optics)** Amplification of spontaneously emitted radiation in a gain medium, characterized by moderate line narrowing and moderate directionality. *Note:* This process is generally distinguished from lasing action by the absence of positive feedback and hence the absence of well-defined modes of oscillation. *See also:* stimulated emission; spontaneous emission; laser. (Std100) 812-1984w

**super-refraction (1)** Refraction for which the vertical gradient of refractivity is less (more negative) than the standard gradient of refractivity. (AP/PROP) 211-1990s

**(2)** *See also:* ducting. (AES) 686-1997

**super-refractive atmosphere** *See:* refractive index gradient.

**superregeneration** A form of regenerative amplification, frequently used in radio receiver detecting circuits, in which oscillations are alternately allowed to build up and are quenched at a superaudible rate. *See also:* radio receiver. (EEC/PE) [119]

**supersonic frequency** *See:* ultrasonic frequency.

**supersynchronous satellite (communication satellite)** A satellite with mean sidereal period of revolution about the primary body which is an integral multiple of the sidereal period of rotation of the primary body about its axis. (COM) [19]

**supertype** *See:* superclass.

**supervised circuit (protective signaling)** A closed circuit having a current-responsive device to indicate a break in the circuit, and, in some cases, to indicate an accidental ground. *See also:* protective signaling. (EEC/PE) [119]

**supervision (telephone switching systems)** The function of indicating and controlling the status of a call. (COM) 312-1977w

**supervisor** *See:* supervisory program.

**supervisor mode** A processor state that is active when the S bit of the PSR is set (PSR.S = 1). *See also:* privileged. (C/MM) 1754-1994

**supervisor software** Software that executes when the processor is in **supervisor mode.** (C/MM) 1754-1994

**supervisor state** In the operation of a computer system, a state in which the supervisory program is executing. This state usually has higher priority than, and precludes the execution of, application programs. *Synonyms:* executive state; master state; privileged state. *Contrast:* problem state. (C) 610.12-1990

**supervisory control (1) (supervisory control, data acquisition, and automatic control)** An arrangement for operator control and supervision of remotely located apparatus using multiplexing techniques over a relatively small number of interconnecting channels. (PE/SUB) 999-1992w, C37.1-1994

**(2)** A form of remote control comprising an arrangement for the selective control of remotely located units by electrical means over one or more common interconnecting channels. (SWG/PE) C37.100-1992

**supervisory control data acquisition system (supervisory control, data acquisition, and automatic control)** A system

operating with coded signals over communication channels so as to provide control of remote equipment (using typically one communication channel per remote station). The supervisory system may be combined with a data acquisition system, by adding the use of coded signals over communication channels to acquire information about the status of the remote equipment for display or for recording functions.
(SWG/PE/SUB) C37.100-1992, C37.1-1994

**supervisory control functions** Equipment governed by this standard that comprises one or more of the following functions:

1) **alarm function.** The capability of a supervisory system to accomplish a predefined action in response to an alarm condition.
2) **analog function.** The capability of a supervisory system to accept, record, or display, or do all of these, an analog quantity as presented by a transducer or external device. The transducer may or may not be a part of the supervisory control system.
3) **control function.** The capability of a supervisory system to selectively perform manual operation, automatic operation, or both (singularly or in selected groups), of external devices. Control may be either analog (magnitude or duration) or digital.
4) **indication (status) function.** The capability of a supervisory system to accept, record, or display, or do all of these, the status of a device. The status of a device may be derived from one or more inputs giving two or more states of indication.
   a) **two-state indication.** Only one of the two possible positions of the supervised device is displayed at a time. Such display may be derived from a single set of contacts.
   b) **three-station indication.** Indication in which the transitional state or security indication as well as the terminal positions of the supervised device is displayed. Such a display is derived from at least two sets of initiating contacts.
   c) **multistate indication.** Only one of the predefined states (transitional or discrete, or both) is indicated at a time. Such a display is derived from multiple inputs.
   d) **indication with memory.** An indication function with the additional capability of storing single or multiple changes of status that occur between scans.
   e) **accumulator function.** The capability of a supervisory system to accept and totalize digital pulses and make them available for display or recording or both.
5) **sequence of events function.** The capability of a supervisory system to recognize each predefined event, associate a time of occurrence with each event, and present the event data in order of occurrence of the events.

*See also:* alarm condition.
(SWG/PE/SUB) C37.100-1992, C37.1-1987s

**supervisory format** The format used to perform data link supervisory control such as acknowledging I frames, requesting retransmission of I frames, and requesting a temporary suspension of transmission of I frames.
(EMB/MIB) 1073.3.1-1994

**supervisory indication** A form of remote indication comprising an arrangement for the automatic indication of the position or condition of remotely located units by electrical means over one or more common interconnecting channels.
(SWG/PE) C37.100-1992

**supervisory program (software)** A computer program, usually part of an operating system, that controls the execution of other computer programs and regulates the flow of work in a computer system. *Synonyms:* executive; control program; executive program; supervisor. *See also:* supervisor state.
(C) 610.12-1990

**supervisory relay** A relay that, during a call, is generally controlled by the transmitter current supplied to a subscriber line in order to receive, from the associated station, directing signals that control the actions of operators or switching mechanisms with regard to the connection. (EEC/PE) [119]

**supervisory routine** *See:* executive routine.

**supervisory scanning cycle (station control and data acquisition)** The time interval to start and complete a supervisory scan. (SUB/PE) C37.1-1979s

**supervisory sequence** In data communications, a sequence of communication control characters, and possibly other characters, that define control function. (C) 610.7-1995

**supervisory signal (telephone switching systems)** Any signal used to indicate or control the states of the circuits involved in a particular connection. (COM) 312-1977w

**supervisory station check** The automatic selection in a definite order, by means of a single initiation of the master station, of all of the supervisory points associated with one remote station of a system; and the transmission to the master station of indications of positions or conditions of the individual equipment or device associated with each point.
(SWG/PE) C37.100-1992

**supervisory system (supervisory control, data acquisition, and automatic control)** All control indicating and associated with telemetering equipment at the master station and all of the complementary devices at the remote station, or stations. *See also:* scanning supervisory system; continuous update supervisory system; quiescent supervisory system; polling supervisory system.
(SWG/PE/SUB) C37.100-1992, C37.1-1994

**supervisory system check** The automatic selection in a definite order, by means of a single initiation at the master station, of all supervisory points associated with all of the remote stations in a system; and the transmission to the master station of indications of positions or conditions of the individual equipment or device associated with each point.
(SWG/PE) C37.100-1992

**supervisory telemeter selection** A form of remote telemeter selection comprising an arrangement for the selective connection of telemeter transmitting equipment to an appropriate telemeter receiving equipment over one or more common interconnecting channels. (SWG/PE) C37.100-1992

**supervisory tone (telephone switching systems)** A tone that indicates to equipment, an operator or a customer that a particular state in the call has been reached, and which may signify the need for action to be taken. The terms used for the various supervisory tones are usually self-explanatory.
(COM) 312-1977w

**supplementary control** Any control action that is superimposed upon normal governor action. (PE/PSE) 94-1991w

**supplementary equipment ground (generating station grounding)** A grounding conductor used to connect the equipment frame to local grounding system to minimize potential difference. (PE/EDPG) 665-1987s

**supplementary group ID (1)** An attribute of a process used in determining file access permissions. A process has up to {NGROUPS_MAX} supplementary group IDs in addition to the effective group ID. The supplementary group IDs of a process are set to the supplementary group IDs of the parent process when the process is created. Whether the effective group ID of the process is included in or omitted from its list of supplementary group IDs is unspecified.
(C/PA) 9945-1-1996, 1003.2-1992s

**(2)** An attribute of a process, used in determining file access permissions. A process has group IDs in addition to the effective group ID. The size of this list of supplementary group IDs is specified at compile time by `Groups_Maxima` in package `POSIX_Limits`, or at run time by the value of the function `Groups_Maximum` in package `POSIX_Configurable_System_Limits`. The supplementary group IDs of a process are set to the supplementary group IDs of the parent process when the process is created. Whether the effective group ID of a process is included in or omitted from its list of supplementary group IDs is unspecified. (C) 1003.5-1999

**supplementary insulation** Independent insulation applied in addition to basic insulation to protect against electric shock if the basic insulation fails. (EMB/MIB) 1073.4.1-2000

**supplementary lighting (illuminating engineering)** Lighting used to provide an additional quantity and quality of illuminance which cannot readily be obtained by a general lighting system and which supplements the general lighting level, usually for specific work requirements. (EEC/IE) [126]

**supplementary standard illuminant $D_{55}$ (illuminating engineering)** A representation of a phase of daylight at a correlated color temperature of approximately 5500 K. (EEC/IE) [126]

**supplementary standard illuminant $D_{75}$ (illuminating engineering)** A representation of a phase of daylight at a correlated color temperature of approximately 7500 K. (EEC/IE) [126]

**supplier (1) (nuclear power quality assurance)** Any individual or organization who furnishes items or services to a procurement document. An all inclusive term used in place of any of the following: vendor, seller, contractor, subcontractor, fabricator, consultant, and subtier levels. (PE/NP) [124]
**(2)** An organization that develops some or all of the project deliverables for an acquirer. Suppliers may include organizations that have primary responsibility for project deliverables and subcontractors that deliver some part of the project deliverables to a primary supplier. In the latter case, the primary supplier is also an acquirer. (C/SE) 1058-1998
**(3)** The person, or persons, who produce a product for a customer. In the context of this recommended practice, the customer and the supplier may be members of the same organization. (C/SE) 830-1998
**(4)** The entity that contractually acts as the source of a product. *Note:* The supplier may or may not be the actual builder. (VT) 1475-1999, 1476-2000
**(5)** A person or organization that enters into a contract with the acquirer for the supply of a software product (which may be part of a system) under the terms of the contract. (C/SE) 1062-1998
**(6)** *See also:* developer. (C/SE) 1362-1998

**suppliers** Those who build and/or sell the CASE tools, or intermediate distributors of the CASE tools. (C/SE) 1209-1992w

**supply circuit (household electric ranges)** The circuit that is the immediate source of the electric energy used by the range. *See also:* appliance outlet. (IA/APP) [90]

**supply equipment** *See:* electric-supply equipment.

**supply impedance (1) (converters having dc input) (self-commutated converters)** The impedance appearing in the input lines to the converter. (IA/SPC) 936-1987w
**(2) (inverters)** The impedance appearing across the input lines to the power inverter with the power inverter disconnected. *See also:* self-commutated inverters. (IA) [62]

**supply line, motor** *See:* motor supply line.

**supply lines** *See:* electric supply lines.

**supply short-circuit current (self-commutated converters) (converters having dc input)** The steady-state current that the dc (direct current) supply system can deliver into a short-circuit across the terminals to which the converter is to be connected. (IA/SPC) 936-1987w

**supply station** *See:* electric supply station.

**supply transient energy (converters having dc input) (self-commutated converters)** The energy that the dc (direct current) supply system, due to a transient, is capable of delivering at the terminals to which the terminal is to be connected. (IA/SPC) 936-1987w

**supply transient overvoltage (self-commutated converters) (converters having dc input)** The peak instantaneous voltage that may appear between the input lines to the converter with the converter disconnected. (IA/SPC) 936-1987w

**supply transient voltage (inverters)** The peak instantaneous voltage appearing across the input lines to the power inverter with the inverter disconnected. *See also:* self-commutated inverters. (IA) [62]

**supply voltage (electron tube) (electrode)** The voltage, usually direct, applied by an external source to the circuit of an electrode. *See also:* electrode voltage. (ED) [45], [84]

**support (1) (raceway systems for Class 1E circuits for nuclear power generating stations) (raceway)** An assembly of structural members whose function is to restrain and provide structural stability for raceways. (PE/NP) 628-1987r
**(2) (software)** The set of activities necessary to ensure that an operational system or component fulfills its original requirements and any subsequent modifications to those requirements. For example, software or hardware maintenance, user training. *See also:* system life cycle; software life cycle. (C) 610.12-1990

**support components** The components that give additional strength and rigidity or both to the bus enclosure and are basic subassemblies of the enclosure. (SWG/PE) C37.100-1992, C37.23-1987r

**supported** A condition regarding optional functionality. (C/PA) 1326.2-1993w, 1003.1-1988s, 1003.5-1999

**supported transaction** A transaction whose returned data value and side effects are defined by the hardware architecture that is addressed. For example, a write 4 transactions to the 4-byte STATE_CLEAR register is supported. (C/MM) 1212-1991s

**support equipment (test, measurement, and diagnostic equipment)** Equipment required to make an item, system or facility operational in its environment. This includes all equipment required to maintain and operate the item, system or facility and the computer programs related thereto. (MIL) [2]

**supporting data item** Data used to describe an anomaly and the environment in which it was encountered. (C/SE) 1044-1993, 1044.1-1995

**supporting operations area(s) (nuclear power generating station)** Functional area(s) allocated for controls and displays that support plant operation. (PE/NP) 566-1977w

**supporting structure** The main supporting unit (usually a pole or tower). (NESC/T&D) C2-1997, C2.2-1960

**supporting process** A collection of work activities that span the entire duration of a software project. Examples of supporting processes include software documentation, quality assurance, configuration management, software reviews, audit processes, and problem resolution activities. (C/SE) 1058-1998

**support manual** A document that provides the information necessary to service and maintain an operational system or component throughout its life cycle. Typically described are the hardware and software that make up the system or component and procedures for servicing, repairing, or reprogramming it. *Synonym:* maintenance manual. *See also:* installation manual; operator manual; programmer manual; user manual; diagnostic manual. (C) 610.12-1990

**support package** A package, residing in the `/packages` node, that provides a service to assist in the implementation of a particular device type. (C/BA) 1275-1994

**support ring (rotating machinery)** A structure for the support of a winding overhang: either constructed of insulating material, carrying support-ring insulation, or separately insulated before assembly. *See also:* stator. (PE) [9]

**support-ring insulation (rotating machinery)** Insulation between the winding overhang or end winding and the winding support rings. *See also:* rotor; stator. (PE) [9]

**support software** Software that aids in the development or maintenance of other software, for example, compilers, loaders, and other utilities. *Contrast:* application software. *See also:* system software. (C) 610.12-1990

**support staff-hour** An hour of effort expended by a member of the staff who does not directly define or create the software

product, but acts to assist those who do. (C/SE) 1045-1992

**support test system (test, measurement, and diagnostic equipment)** A measurement system used to assess the quality of operational equipments and may include: test equipment; ancillary equipment; supporting documentation; operating personnel. (MIL) [2]

**suppressed-carrier modulation** Modulation in which the carrier is suppressed. *Note:* By carrier is meant that part of the modulated wave that corresponds in a specified manner to the unmodulated wave. (Std100) 270-1964w

**suppressed-carrier operation (data transmission)** That form of amplitude-modulation carrier transmission in which the carrier wave is suppressed. (PE) 599-1985w

**suppressed carrier transmission** A method of transmission in which the carrier frequency is suppressed partially or fully. (C) 610.7-1995

**suppressed time delay (navigation aids)** A deliberate displacement of the zero of the time scale with respect to the time of emission of a pulse. (AES/GCS) 172-1983w

**suppressed-zero instrument** An indicating or recording instrument in which the zero position is below the end of the scale markings. *See also:* instrument. (EEC/PE) [119]

**suppressed-zero range** A range where the zero value of the measured variable, measured signal, etc., is less than the lower range value. Zero does not appear on the scale. *Note:* For example: 20 to 100. (EEC/EMI) [112]

**suppression** *See:* zero suppression.

**suppression characteristic (thyristor)** Predicated on a device's ability to block voltage at higher than rated junction temperatures (Ts) when either the voltage or the rate of application of the principal blocking voltage, or both, are below the rated voltage of the silicon controlled rectifier (SCR). (IA/IPC) 428-1981w

**suppression corrugation** Grooves or surface roughness intentionally placed in the nonactive side of the substrate for reflected bulk-wave signals. (UFFC) 1037-1992w

**suppression distributor rotor** Rotor of an ignition distributor with a built-in suppressor. *See also:* electromagnetic compatibility. (INT) [53], [70]

**suppression rating (thyristor)** Repetitive surge ON-state current. A specified ON-state current of short time duration resulting in a specified junction temperature, above rated, immediately prior to supporting a specified principal voltage without turning on (gate signal removed, gate impedance specified). *Note:* Proper coordination with this rating permits a thyristor power controller to limit fault currents without fuse blowing or circuit breaker action. For a given silicon controlled rectifier (SCR) its suppression characteristic may be defined in one of two ways: (1) $T_L$ and $I_f$ together with shape of fault I waveform may be specified together with time $t_2 - t_1$. This then determines maximum $V_{line}$ and shape of reapplied V at time $t_2$, that is, dv/dt. Alternately, ac frequency and peak V may be given for sinusoidal waveforms. (2) $T_s$ may be specified together with shape and magnitude of reapplied voltage at time $t_2$. Criteria (2) serves as well as (1) since the magnitude and shape of the fault current determine $T_2$ together with the time $(t_2 - t_1)$. (IA/IPC) 428-1981w

**suppression ratio (suppressed-zero range)** The ratio of the lower range-value to the span. *Note:* For example: Range 20 to 100

$$\text{suppression ratio} = \frac{20}{80} = 0.25$$

(EEC/EMI) [112]

**suppressive wiring techniques (coupling in control systems)** Those wiring techniques which result in the reduction of electric or magnetic fields in the vicinity of the wires which carry current without altering the value of the current. Wires which are candidates for suppressive techniques are generally connected to a noise source, may couple noise into a susceptible circuit by induction. Example: twisting or transposing of alternating-current power lines to reduce the intensity of magnetic field produced by current in these lines. *See also:* compensatory wiring techniques; barrier wiring techniques. (IA/ICTL) 518-1982r

**suppressor grid** A grid that is interposed between two positive electrodes (usually the screen grid and the plate), primarily to reduce the flow of secondary electrons from one electrode to the other. *See also:* grid; electrode. (ED) 161-1971w

**suppressor spark plug** A spark plug with a built-in interference suppressor. *See also:* electromagnetic compatibility. [53]

**supra-aural receiver** A receiver that rests upon the pinna of the ear. (For example, conventional telephone handsets use receivers of the supra-aural type.) (COM/TA) 1206-1994

**supra-concha receiver** A receiver that rests upon the ridges of the concha cavity. (COM/TA) 1206-1994

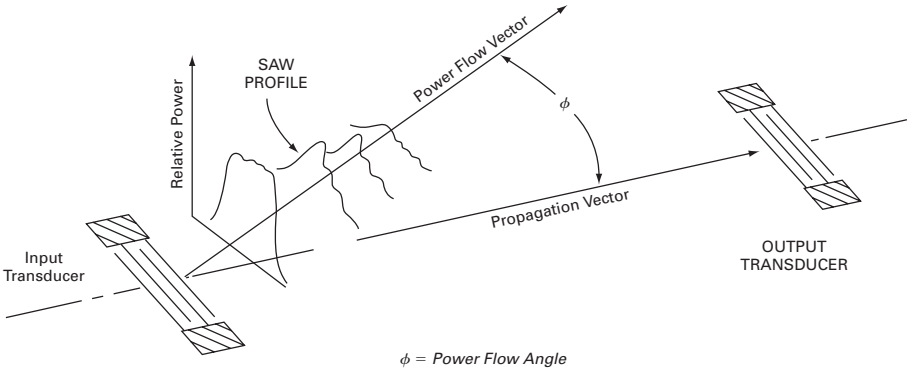
**surface acoustic wave (SAW)** An acoustic or Rayleigh wave, propagating along a surface of an elastic substrate whose amplitude decays exponentially with substrate depth. See the corresponding figure. (UFFC) 1037-1992w

**surface acoustic wave diffraction** A phenomenon (analogous to optical diffraction due to the finite aperture of the source) that causes surface acoustic wave beam spreading and wavefront distortion. (UFFC) 1037-1992w

**surface active agent** *See:* wetting agent.

**surface-barrier contact (1) (x-ray energy spectrometers) (semiconductor radiation detectors)** A rectifying contact that is characterized by a potential barrier associated with an inversion or accumulation layer; said inversion or accumulation layer being caused by surface charge resulting from the presence of surface states and work function differences, or both. (NPS/NID) 759-1984r, 301-1976s

**(2) (charged-particle detectors)** A metal-insulator-semiconductor contact structure in which the rectification properties are dominated or heavily influenced by charge trapped at the




*ϕ = Power Flow Angle*

**illustration of wave-related term**

interfaces and in the insulator.
(NPS) 300-1988r, 325-1996

**surface barrier detector** A radiation detector in which the principal rectifying junction is a surface barrier contact.
(NPS) 325-1996

**surface barrier radiation detector (1) (charged-particle detectors)** A radiation detector for which the blocking contact is a surface barrier contact. (NPS) 300-1988r
**(2) (germanium gamma-ray detectors) (x-ray energy spectrometers) (semiconductor radiation detectors)** A radiation detector for which the principal rectifying junction is a surface barrier contact.
(NPS/NID) 325-1986s, 759-1984r, 301-1976s

**surface channel (semiconductor radiation detectors)** A thin region at a semiconductor surface of *p* or *n*-type conductivity created by the action of an electric field; for example, that due to trapped surface charge.
(NPS) 300-1988r, 325-1996

**surface connecting cable (electric submersible pump cable)** Power cable connecting the ESP (electric submersible pump) cable to surface equipment. (IA/PC) 1017-1985s

**surface contamination (plutonium monitoring)** Radioactive material deposited on the surface of facilities (floor surfaces, workbench tops, machines, etc.), equipment, or personnel.
(NI) N317-1980r

**surface density** *See:* recording density.

**surface duct** An atmospheric radio duct for which the lower boundary is the Earth's surface. (AP/PROP) 211-1997

**surface flame spread** The propagation of a flame away from the source of ignition across the surface of a liquid or a solid.
(DEI) 1221-1993w

**surface heating device** A heater comprising series or parallel connected elements having sufficient flexibility to conform to the shape of the surface to be heated. (IA) 515-1997

**surface impedance** For a monochromatic electromagnetic wave incident on a locally planar boundary, the complex ratio of the total orthogonal electric to magnetic field components tangent to the surface. The surface impedance is taken as having a positive real part. (AP/PROP) 211-1997

**surface leakage** The passage of current over the surface of a material rather than through its volume.
(Std100) 270-1966w

**surface leakage current ($I_L$)** A current that is constant with time, and which usually exists over the surface of the end-turns of the stator winding or between exposed conductors and the rotor body in insulated rotor windings. The magnitude of the surface leakage current is dependent upon temperature and the amount of conductive material, i.e., moisture or contamination on the surface of the insulation.
(PE/EM) 43-2000

**surface material** A material installed over the soil consisting of, but not limited to, rock or crushed stone, asphalt, or man-made materials. The surfacing material, depending on the resistivity of the material, may significantly impact the body current for touch and step voltages involving the person's feet. (PE/SUB) 80-2000

**surface metal raceway (metal molding)** A raceway consisting of an assembly of backing and capping. *See also:* raceway.
(EEC/PE) [119]

**surface-mounted (illuminating engineering)** A luminaire that is mounted directly on the ceiling. (EEC/IE) [126]

**surface-mounted device** A device, the entire body of which projects in front of the mounting surface.
(SWG/PE) C37.100-1992

**surface navigation (navigation aids)** Navigation of a vehicle on the surface of the earth. (AES/GCS) 172-1983w

**surface noise (mechanical recording)** The noise component in the electric output of a pickup due to irregularities in the contact surface of the groove. *See also:* phonograph pickup.
(SP) [32]

**surface of position (navigation aids)** Any surface defined by a constant value of some navigation quantity.
(AES/GCS) 172-1983w

**surface operable (1)** A term indicating that the switch and its accessories are operable from above grade.
(SWG/PE) C37.71-1984r
**(2)** A term indicating that an underground switch and its accessories are operable from above grade.
(SWG/PE) C37.100-1992

**surface-potential gradient** The slope of a potential profile, the path of which intersects equipotential lines at right angles.
(PE/PSIM) 81-1983

**surface, prescribed** *See:* prescribed surface.

**surface search radar** *See:* navigational radar.

**surface-skimming (shallow-bulk) acoustic wave** A predominantly horizontally polarized bulk shear wave that propagates in a direction almost parallel to and at a depth just below the substrate surface. (UFFC) 1037-1992w

**surface, specular** *See:* specular surface.

**surface state coefficient (m) (overhead-power-line corona and radio noise)** A coefficient ($0 < m < 1$) by which the nominal corona inception gradient must be multiplied to obtain the actual corona inception gradient on overhead power lines. *Note:* Examples of conditions that affect the surface state are given in the definition of corona, overhead power lines. *See also:* corona, overhead power lines.
(T&D/PE) 539-1990

**surface wave (1) (planar transmission lines)** A mode of propagation where the energy is concentrated near the interface of two media having different electric or magnetic properties, or both, and whose field amplitude decays in a direction normal to the interface. (MTT) 1004-1987w
**(2) (fiber optics)** A wave that is guided by the interface between two different media or by a refractive index gradient in the medium. The field components of the wave may exist (in principle) throughout space (even to infinity) but become negligibly small within a finite distance from the interface. *Note:* All guided modes, but not radiation modes, in an optical waveguide belong to a class known in electromagnetic theory as surface waves. (Std100) 812-1984w
**(3)** A wave guided by a boundary with a surface impedance whose reactive part exceeds the resistive part. A surface wave is generally characterized as a slow wave having a magnitude that exponentially decreases with distance from the interface but may be modified by curvature. (AP/PROP) 211-1997

**surface wave antenna** An antenna that radiates power from discontinuities in the structure that interrupt a bound wave on the antenna surface. (AP/ANT) 145-1993

**surface-wave transmission line (waveguide)** A transmission line in which propagation in other than a TEM mode is constrained to follow the external face of a guiding structure.
(MTT) 146-1980w

**surge (1)** A transient voltage or current, which usually rises rapidly to a peak value and then falls more slowly to zero, occurring in electrical equipment or networks in service.
(PE/PSIM) 4-1995
**(2)** A transient wave of voltage or current. (The duration of a surge is not tightly specified, but it is usually less than a few milliseconds.)
(T&D/PE/SPD) 1250-1995, C62.34-1996, C62.48-1995
**(3)** A transient wave of current, potential, or power in an electric circuit.
(SPD/PE) C62.22-1997, C62.11-1999, C62.62-2000
**(4)** *See also:* transient. (IA/PSE) 1100-1999

**surge arrester (1) (electrical heating applications to melting furnaces and forehearths in the glass industry)** A protective device for limiting surge voltages on equipment by discharging or bypassing surge current. It prevents continued flow of current to ground and is capable of repeating these functions, as specified. As surge protective devices, arresters are connected from sensitive circuit points to ground, thus

limiting dangerous surge voltage below damaging levels. (IA) 668-1987w

**(2) (ac power circuits)** A protective device for limiting surge voltages on equipment by discharging or bypassing surge current; it prevents continued flow of follow current to ground, and is capable of repeating these functions as specified. *Notes:* 1. The term "arrester" as used in IEEE Stds 28-1974 and C62.1-1981 shall be understood to mean "surge arrester." 2. Use of the term "lightning arrester" is deprecated. (SPD/PE) 28-1974, C62.1-1981s

**(3) (broadband local area networks)** A device that protects electronic equipment against surge voltage and transient signals on trunk and distribution lines. (LM/C) 802.7-1989r

**(4)** A device that guards against dielectric failure of protection apparatus due to lightning or surge voltages in excess of their dielectric capabilities and serves to interrupt power follow current. (PE/PSC) 487-1992

**(5)** A protective device for limiting surge voltages on equipment by discharging or bypassing surge current; it limits the flow of power follow current to ground, and is capable of repeating these functions as specified. (SPD/PE) C62.22-1997

**(6)** A protective device for limiting surge voltages on equipment by diverting surge current and returning the device to its original status. It is capable of repeating these functions as specified. (SPD/PE) C62.11-1999

**surge breakdown voltage** *See:* impulse sparkover voltage.

**surge capacitor (electrical heating applications to melting furnaces and forehearths in the glass industry)** Capacitors used to decrease the slope of the surge voltage wave fronts. They help to reduce the voltage stresses on protected apparatus by spreading the impressed voltage over a greater time span. (IA) 668-1987w

**surge-crest ammeter** A special form of magnetometer intended to be used with magnetizable links to measure the crest value of transient electric currents. *See also:* instrument. (EEC/PE) [119]

**surge diverter** *See:* surge arrester.

**surge electrode current** *See:* fault electrode current.

**surge energy** The energy (in joules) contained in a surge. It can be calculated if the current and voltage wave shape are known:

$$E = \int_{dt} V I \, dt$$

where
E is the energy
t is the time
I is the instantaneous current
V is the instantaneous voltage
T is the time duration of the pulse
$\int_{dt}$ is the time integral

(RL) C136.10-1996

**surge generator (impulse generator)** An electric apparatus suitable for the production of surges. *Notes:* 1. Surge generator types common in the art are: transformer-capacitor; transformer-rectifier; transformer-rectifier-capacitor; parallel charging; series discharging. 2. Use of the term lightning generator is deprecated. (T&D/PE) [10], [8]

**surge ground** The point of external connection to the relay system reference or common bus for surge protection. (PE/PSR) C37.90.1-1989r

**surge impedance (1) (self-surge impedance)** The ratio between voltage and current of a wave that travels on a line of infinite length and of the same characteristics as the relevant line. *See also:* characteristic impedance. (PE) [8], [84]

**(2)** The impedance of an electrical circuit under surge conditions (which may differ significantly from the impedance of a circuit under steady state conditions). (PE/IC) 1143-1994r

**(3)** The ratio between voltage and current of a wave that travels on a conductor. (SUB/PE) 998-1996

**surge let-through** That part of the surge that passes by a surge-protective device with little or no alteration. *See also:* surge remnant. (SPD/PE) C62.45-1992r, C62.62-2000

**surge life** The number of surges of specified voltage and current amplitudes and waveshapes that may be applied to a device without causing degradation beyond specified limits. The pulse life applies to a device connected to an ac line of specified characteristics and to surges sufficiently spaced in time to preclude the effects of cumulative heating. (SPD/PE) C62.62-2000

**surge protection** *See:* rate-of-change protection.

**surge-protective device (1)** The generic term used to describe a device by its protective function, regardless of technology used, ratings, packaging, point of application, etc. (SPD/PE) C62.45-1992r

**(2)** A device intended to limit transient overvoltages, divert surge currents, or both. It contains at least one nonlinear component. (T&D/PE/IA/PSE) 1250-1995, C62.34-1996, 1100-1999

**(3)** An assembly of one or more components intended to limit or divert surges. The device contains at least one nonlinear component. (SPD/PE) C62.48-1995

**(4)** The generic term used to describe a device by its protective function, regardless of technology used, ratings, packaging, point of application, etc. It contains at least one nonlinear component. (SPD/PE) C62.62-2000

**surge protective level (surge arresters)** The highest value of surge voltage that may appear across the terminals under the prescribed conditions. (PE) [8]

**surge protector (1) (gas-tube surge protective devices)** A protective device, consisting of one or more surge arresters, a mounting assembly, optional fuses and short-circuiting devices, etc, which is used for limiting surge voltages on low-voltage ($\leq$1000 V rms or 1200 V dc) electrical and electronic equipment or circuits. (SPD/PE) C62.31-1987r

**(2)** An assembly of protective devices consisting of one or more series, parallel, or any combination of elements used to limit surge voltages, currents, or both to a specified level. (SPD/PE) C62.36-1994

**(3)** The term used to refer to a specific complete device [generally the equipment under test (EUT) in the context of the present guide], as opposed to a component of the surge protector or a generic surge-protective device. (SPD/PE) C62.45-1992r

**surge rating (thyristor)** Rated values for surge forward current is given for two time regions:

a) For times smaller than one-half cycle (at 50 hertz (Hz) or 60 Hz) down to approximately one millisecond (ms), the value is given in terms of maximum rated $\int dt i_t^2$. They may be given by means of a curve or by single values. No immediate subsequent application of reverse blocking voltage is assumed.

b) Maximum values of surge forward current versus time up to at least 10 cycles. The frequency, the conducting period length, the current waveshape and the reverse blocking voltage capability including the rate-of-rise of voltage for the intervals after and between the surges are specified. In either case, a previous application of rate maximum junction temperature is assumed if not otherwise specifically mentioned.

(IA/IPC) 428-1981w

**surge reference equalizer** A surge protective device used for connecting equipment to external systems whereby all conductors connected to the protected load are routed, physically and electrically, through a single enclosure with a shared reference point between the input and output ports of each system. (IA/PSE) 1100-1999

**surge remnant (surge testing for equipment connected to low-voltage ac power circuits)** That part of an applied surge that remains downstream of one or several protective devices. *See also:* surge let-through. (SPD/PE) C62.45-1992r, C62.62-2000

**surge-response current** The current flowing in a surge-protective device during its diverting function upon occurrence of an impinging surge. (SPD/PE) C62.62-2000

**surge-response voltage (1)** The voltage profile appearing at the output terminals of a surge-protective device and applied to downstream loads, during and after a specified impinging surge, until normal, stable conditions are reached. (SPD/PE) C62.48-1995, C62.45-1992r

**(2)** The voltage that appears at the output terminals of a surge-protective device during and after a specified impinging surge, until normal stable conditions are reached. (SPD/PE) C62.62-2000

**surge suppressor** A device operative in conformance with the rate of change of current, voltage, power, etc., to prevent the rise of such quantity above a predetermined value. (IA/ICTL/IAC) [60]

**surge, switching** *See:* switching surge.

**surge voltage recorder** *See:* Lichtenberg figure camera.

**surveillance (1) (diesel-generator unit)** The determination of the state or condition of a system or subsystem. (PE/NP) 387-1995, 338-1987r

**(2) (nuclear power quality assurance)** The act of monitoring or observing to verify whether an item or activity conforms to specified requirements. (PE/NP) [124]

**(3)** The act of monitoring or observing whether an item or activity conforms to specific requirements. A surveillance is less extensive than an audit and concentrates on a single activity or item. It is usually conducted more frequently than an audit. Reports are issued to cognizant personnel or groups with a request for corrective action if required. (NI) N42.23-1995

**surveillance radar (1) (navigation aid terms)** A search radar used to maintain cognizance of selected traffic within a selected area, such as an airport terminal area or air route. (AES/GCS) 172-1983w

**(2)** A radar used to detect, locate, and track targets over a large volume of space. (AES) 686-1997

**surveillance test** The test that can determine the state or condition of a system or subsystem. (PE/NP) 933-1999

**surveillance testing** Periodic testing to verify that safety systems continue to function or are in a state of readiness to perform their safety function. (PE/NP) 338-1987r

**survey (plutonium monitoring)** The examination of an area for the purpose of detecting the presence of radioactive materials and determining the quantity of that radioactivity. (NI) N317-1980r

**survey contamination control (plutonium monitoring)** A survey conducted to determine the presence of unwanted contaminants, normally conducted with alpha or gamma, or both, sensitive instruments. (NI) N317-1980r

**survey dose rate (plutonium monitoring)** A survey conducted to determine the dose rate at some specified location or area and usually conducted with gamma exposure rate survey instruments. Neutron surveys may also be required frequently. (NI) N317-1980r

**survey meter** A lightweight battery operated meter that can be held conveniently by hand in order to conduct survey type measurements. (T&D/PE) 1308-1994

**susceptance** The imaginary part of admittance. (IM/HFIM) 270-1966w, [40]

**susceptance relay** A mho type of distance relay for which the center of the operating characteristic on the *R-X* diagram is on the *X* axis. *Note:* The equation that describes such a characteristic is $Z = K\sin\theta$, where $K$ is a constant and $\theta$ is the phase angle by which the input voltage leads the input current. (SWG/PE) C37.100-1992

**susceptibility (1) (grounding in generating stations)** The property of an equipment that describes its capability to function acceptably when subjected to unwanted electromagnetic energy. (PE/EDPG) 1050-1996

**(2)** The inability of a device, equipment, or system to resist an electromagnetic disturbance. *Note:* Susceptibility is the lack of immunity. (SPD/PE) C62.45-1992r

**(3)** The property of equipment that describes its capability to function acceptably when subjected to unwanted interfering energy. (PE/PSC) 367-1996

**(4) (electromagnetic)** The characteristic of any equipment that results in an undesired response to an electromagnetic field. (SWG/PE) C37.100-1992

**susceptiveness** The characteristics of a communication circuit, including its connected apparatus, that determine the extent to which it is adversely affected by inductive fields. (NESC/T&D) C2-1997, C2.2-1960

**susceptor** Energy absorbing device generally used to transfer heat to another load. (IA) 54-1955w

**suspended (illuminating engineering)** (pendant) A luminaire which is hung from a ceiling by supports. (EEC/IE) [126]

**suspended domain** One or more suspended nodes linked by suspended connection(s). Two nodes are part of the same suspended domain if there is a physical connection between them and all ports on the path are suspended. A boundary node is adjacent to one or more suspended domain(s) but not part of the suspended domain(s). (C/MM) 1394a-2000

**suspend initiator** An active port that transmits the TX_SUSPEND signal and engages in a protocol with its connected peer physical layer (PHY) to suspend the connection. (C/MM) 1394a-2000

**suspended job** A job that has received a SIGSTOP, SIGTSTP, SIGTTIN, or SIGTTOU signal that caused the process group to stop. A suspended job is a background job, but a background job is not necessarily a suspended job. (C/PA) 9945-2-1993

**suspended node** An isolated node with at least one port that is suspended. (C/MM) 1394a-2000

**suspended port** A connected port not operational for normal Serial Bus arbitration, but otherwise capable of detecting both a physical cable disconnection and received bias. (C/MM) 1394a-2000

**suspended stripline** A type of stripline in which the major dielectric is empty space. The strip conductor is located on a thin dielectric substrate supported between two ground planes. The conductor can be either a single strip or two strips in double registration acting electrically as a single conductor. (MTT) 1004-1987w

**suspended substrate microstrip** A compound planar transmission line consisting of one or more thin conducting strips of finite width affixed to an insulating substrate of finite thickness and suspended above a single extended conducting ground plane with the strips facing the ground plane and separated from it by free space. The semi-infinite space above the substrate is also free space. (MTT) 1004-1987w

**suspended-type handset telephone** *See:* hang-up hand telephone set.

**suspend target** An active port that observes the RX_SUSPEND signal. A suspend target requests all of the physical layer's (PHY's) other active ports to become suspend initiators while the suspend target engages in a protocol with its connected peer PHY to suspend the connection. (C/MM) 1394a-2000

**suspension (accelerometer) (inertial sensors) (gyros)** A means of supporting and positioning a float (floated gyro), rotor (dynamically tuned gyro, electrically suspended gyro), or proof mass (accelerometer) with respect to the case. (AES/GYAC) 528-1994

**suspension insulator (1)** One or a string of suspension-type insulators assembled with the necessary attaching members and designed to support in a generally vertical direction the weight of the conductor and to afford adequate insulation from tower or other structure. *See also:* tower; insulator. (T&D/PE) [10]

**(2) (composite insulators)** As used in IEEE Std 987-1985, any insulator intended primarily to carry tension loads. It includes tangent, deadend, and vee-string installations. (T&D/PE) 987-1985w

**suspension-insulator unit** An assembly of a shell and hardware, having means for nonrigid coupling to other units or terminal hardware. (EEC/IEPL) [89]

**suspension-insulator weights** Devices, usually cast iron, hung below the conductor on a special spindle supported by the conductor clamp. *Note:* Suspension insulator weights will limit the swing of the insulator string, thus maintaining adequate clearances. In practice, weights of several hundreds of pounds are sometimes used. *See also:* tower. (T&D/PE) [10]

**suspension of reclosing** To make inoperative automatic reclosing equipment *Synonyms:* live-line permit; hold order; hold out; hold off. (T&D/PE) 516-1995

**suspension strand (messenger)** A stranded group of wires supported above the ground at intervals by poles or other structures and employed to furnish within these intervals frequent points of support for conductors or cables. *See also:* cable. (EEC/PE) [119]

**sustained** When used to quantify the duration of a voltage interruption, refers to the time frame associated with a long duration variation (i.e., greater than 1 min). (SCC22) 1346-1998

**sustained bypass current detection (series capacitor)** A means to detect prolonged current flow through the protective device and to initiate closing of the bypass device. (T&D/PE) 824-1985s

**sustained gap-arc protection (series capacitor)** A means to detect prolonged arcing of the protective power gap or arcing of the backup gap if included to initiate closing of the capacitor bypass switch. (T&D/PE) [26]

**sustained interruption (1) (electric power system)** Any interruption not classified as a momentary interruption. *See also:* outage. (PE/PSE) [54], 346-1973w
**(2)** Any interruption not classified as a momentary event. Any interruption longer than 5 min. (PE/T&D) 1366-1998
**(3)** A type of long duration variation. The complete loss of voltage ($<0.1$ pu) on one or more phase conductors for a time greater than 1 min. (SCC22) 1346-1998
**(4) (power quality monitoring)** The complete loss of voltage for a time period greater than 1 min. (IA/PSE) 1100-1999

**sustained-operation influence** The change in the recorded value, including zero shift, caused solely by energizing the instrument over extended periods of time, as compared to the indication obtained at the end of the first 15 min of the application of energy. It is to be expressed as a percentage of the full-scale value. *Note:* The coil used in the standard method shall be approximately 80 in in diameter, not over 5 in long, and shall carry sufficient current to produce the required field. The current to produce a field to an accuracy of $\pm 1\%$ in air shall be calculated without the instrument in terms of specific dimensions and turns of the coil. In this coil, 800 ampere-turns will produce a field of approximately 5 oersteds. The instrument under test shall be placed in the center of the coil. (EEC/ERI) [111]

**sustained oscillation (1) (system) (sustained vibration)** The oscillation when forces controlled by the system maintain a periodic oscillation of the system. Example: Pendulum actuated by a clock mechanism. (Std100) 270-1966w
**(2) (gas turbines)** Those oscillations in which the amplitude does not decrease to zero, or to a negligibly small, final value. (PE/EDPG) 282-1968w, [5]

**sustained overvoltage detection device (series capacitor)** A device that detects capacitor voltage above rating but below the operation level of the protective device and initiates an alarm signal or corrective action. (T&D/PE) 824-1985s

**sustained overvoltage protection device (series capacitor)** A device to detect capacitor voltage that is above rating or predetermined value but is below the sparkover of the protective power gaps, and to initiate the closing of the capacitor bypass switch according to a predetermined voltage-time characteristic. (T&D/PE) [26]

**sustained short-circuit test (synchronous machines)** A test in which the machine is run as a generator with its terminals short-circuited. (PE) [9]

**SVC** *See:* switched virtual circuit.

**SVV** *See:* Segment Variability Value.

**swamp buggy** *See:* off-road vehicle.

**swap (A)** An exchange of the contents of two storage areas, usually an area of main storage with an area of auxiliary storage. *See also:* roll in; roll out. **(B)** To perform an exchange as in definition (A). (C) 610.12-1990

**sweep** A traversing of a range of values of a quantity for the purpose of delineating, sampling, or controlling another quantity. *Notes:* 1. Examples of swept quantities are: the displacement of a scanning spot on the screen of a cathode-ray tube; and the frequency of a wave. 2. Unless otherwise specified, a linear time function is implies; but the sweep may also vary in some other controlled and desirable manner. (BT/IM/AV/HFIM) [34], [40]

**sweep accuracy (oscilloscopes)** Accuracy of the horizontal (vertical) displacement of the trace compared with the reference independent variable, usually expressed in terms of average rate error as a percent of full scale. *See also:* oscillograph. (IM) 311-1970w

**sweep-delay accuracy (oscilloscopes)** Accuracy of indicated sweep delay, usually specified in error terms. (IM) 311-1970w

**sweep, delayed** *See:* delayed sweep.

**sweep duration (sawtooth sweep)** The time required for the sweep ramp. *See also:* oscillograph. (IM/HFIM) [40]

**sweep duty factor** For repetitive sweeps, the ratio of the sweep duration to the interval between the start of one sweep and the start of the next. *See also:* oscillograph. (IM/HFIM) [40]

**sweep, expanded** *See:* magnified sweep.

**sweep, external (oscilloscopes)** A sweep generated external to the instrument. (IM) 311-1970w

**sweep, free-running** *See:* free-running sweep.

**sweep frequency (oscilloscopes)** The sweep repetition rate. *See also:* oscillograph. (IM/HFIM) [40]

**sweep gate (oscilloscopes)** Rectangular waveform used to control the duration of the sweep; usually also used to unblank the cathode-ray tube for the duration of the sweep. *See also:* oscillograph. (IM/HFIM) [40]

**sweep, gated** *See:* gated sweep.

**sweep generator (oscilloscopes)** A circuit that generates a signal used as an independent variable; the signal is usually a ramp, changing value at a constant rate. (IM) 311-1970w

**sweep holdoff interval (oscilloscopes)** The interval between sweeps during which the sweep and/or trigger circuits are inhibited. (IM) 311-1970w

**sweep linearity (oscilloscopes)** Maximum displacement error of the independent variable between specified points on the display area. (IM) 311-1970w

**sweep mode control (oscilloscopes)** The control used on some oscilloscopes to set the sweep for triggered, free-running, or synchronized operation. (IM) 311-1970w

**sweep oscillator** An oscillator in which the output frequency varies continuously and periodically between two frequency limits. *See also:* telephone station. (COM) [50]

**sweep-out time, charge** *See:* charge collection time.

**sweep range (oscilloscopes)** The set of sweep-time/division settings provided. *See also:* oscillograph. (IM/HFIM) [40]

**sweep recovery time (oscilloscopes)** The minimum possible time between the completion of one sweep and the initiation of the next, usually the sweep holdoff interval. *See also:* oscillograph. (IM/HFIM) [40]

**sweep, recurrent** *See:* recurrent sweep.

**sweep reset (oscilloscopes)** In oscilloscopes with single-sweep operation, the arming of the sweep generator to allow it to cycle once. *See also:* oscillograph. (IM/HFIM) [40]

**sweep, sine-wave** *See:* sine-wave sweep.

**sweep, stairstep** *See:* stairstep sweep.

**sweep switching (automatic)** Alternate display of two or more time bases or other sweeps using a single-beam cathode-ray tube: comparable to dual- or multiple-trace operation of the deflection amplifier. (IM) 311-1970w

**sweep time** (acoustically tunable optical filter) The time to continuously tune the filter over its spectral range. (UFFC) [17]

**sweep time division (spectrum analyzer)** The nominal time required for the spot in the reference coordinate to move from one graticule division to the next. Also the name of the control used to select this time. (IM) 748-1979w

**swell (1)** A momentary increase in the power frequency voltage delivered by the mains, outside of the normal tolerances, with a duration of more than one cycle and less than a few seconds. *See also:* surge. (SPD/PE) C62.48-1995, C62.41-1991r

**(2)** An rms increase in the ac voltage, at the power frequency, for durations from a half-cycle to a few seconds. *See also:* overvoltage; surge. (PE/T&D) 1250-1995

**(3)** An increase in rms voltage or current at the power frequency for durations from 0.5 cycles to 1 min. Typical values are 1.1 to 1.8 pu. See the figure below. (SCC22/IA/PSE) 1346-1998, 1100-1999

**swellable powder** A powder that swells upon contact with moisture. A jelly like material is formed to block the longitudinal transmission of moisture. (PE/IC) 1142-1995

**swim** The visual misrepresentation that occurs when images on a display surface appear to move about their normal positions. (C) 610.6-1991w

**swing** A transient power flow due to change in relative angles of generation on the system caused by a change in transmission or generation configuration. (PE/PSR) C37.113-1999

**swinging compass (navigation aid terms)** An accurate, portable magnetic compass used to indicate magnetic headings during aircraft magnetic compass calibration. (AES/GCS) 172-1983w

**swingout panel (packaging machinery)** A panel that is hinge-mounted in such a manner that the back of the panel may be made accessible from the front of the enclosure. (IA/PKG) 333-1980w

**swing rack cabinet** An assembly enclosed at the top, side, and rear with front hinged door for front access having a swing open frame for equipment mounting (e. g., nominal 19-inch wide chassis and subpanel assemblies). (SWG/PE) C37.100-1992, C37.21-1985r

**switch (1) (telephone loop performance) (switching system)** A system that establishes communication channels among two or more of its interfaces at customers' demand. (COM/TA) 820-1984r

**(2) (high-voltage switchgear)** A device designed to close or open, or both, one or more electric circuits. *See also:* switching device. (SWG/PE) C37.40-1993

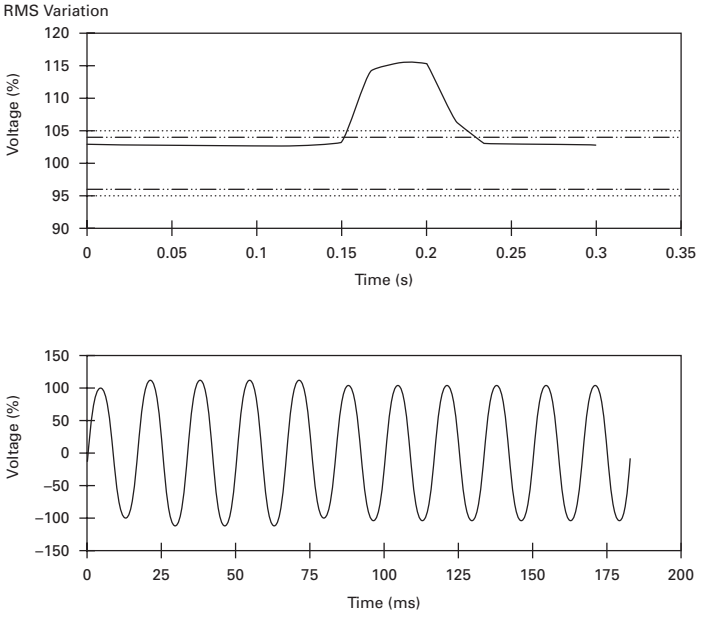
**(3) (computers)** A device or programming technique for making a selection, for example, a toggle, a conditional jump. (C) [20], [85]

**(4) (electric and electronics parts and equipment)** A device for making, breaking, or changing the connections in an electric circuit. *Note:* a switch may be operated by manual, mechanical, hydraulic, thermal, barometric, or gravitational means, or by electromechanical means not falling within the definition of "relay." (GSD) 200-1975w

**(5)** A device that connects ringlets and has queues. It can behave as a consumer (when accepting remote subactions) and as a producer (when forwarding the subaction to another ringlet). It may be visible as a node, with a nodeId, or be transparent, with no nodeId. A switch differs from a bridge in that a switch may connect more than two ringlets, but a bridge connects only two. A switch is generally assumed to connect multiple instances of the same bus standard, while a bridge may connect different bus standards. (C/MM) 1596-1992

**(6)** A routing device (for example, a box or board) providing a set of numbered node interfaces, constructed from one or more switch chips (or by other methods). *See also:* switch chip; fabric; node interface. (C/BA) 1355-1995

**(7) (A)** An electrical or mechanical device used for opening, closing, or changing the connection of a circuit. *Synonym:*




*Swells occurring upon recovery from a remote system fault*

**swell**

switchpoint. *See also:* DIP switch; display switch; sense switch; function switch; relay. **(B)** To open, close, or change the connection of a circuit as in definition (A). **(C)** A device used for making a selection, as in a toggle. (C) 610.10-1994

**(8)** A device for opening and closing or for changing the connection of a circuit. In these rules, a switch is understood to be manually operable, unless otherwise stated. (NESC/T&D) C2-1997, C2.2-1960

**(9)** In a propulsion system, the historic name for the lowest level of positive tractive effort and power; so called because it is typically utilized for slow-speed switching movements, such as yard moves, train makeup, etc. (VT) 1475-1999

**(10)** A layer 2 interconnection device that conforms to the ISO/IEC 10038 [ANSI/IEEE 802.1D-1990] International Standard. *Synonym:* bridge. (C/LM) 802.3-1998

**(11)** An electronic device connected between two data lines. A switch can exist in one of two states, referred to as "open" and "closed." The state at any time depends on a digital control variable. When the switch is open, the pathway between the two data lines has a very high impedance (ideally infinite) so that signals appearing on the data lines should be completely independent. When the switch is closed, the pathway between the two data lines has a very low impedance (ideally zero) so that signals on the two data lines should be identical. *Notes:* 1. Practical electronic switches implemented in silicon depart from the ideal in at least three ways.

a) In the "on" state, the pathway between the two data lines may have significant impedance, or the relationship between voltage and current may be nonlinear (e.g., a voltage-dependent "impedance").
b) In the "off" state, there may be significant interaction between the signals on the two data lines due to, for example, stray capacitance.
c) In either state there may be significant leakage pathways through which current can pass from the data lines to the surrounding circuitry or vice versa.

The effects of all these characteristics will need to be considered as part of the detailed implementation, especially in a system containing multiple-switch networks. 2. A switching action effectively in series with the function signal pathway can sometimes be obtained without a physically separate device by incorporating a high-Z or enable facility into the functional circuitry. 3. Data transmission through a switch is normally assumed to be bidirectional (as with electromechanical devices such as relays or semiconductor switches such as transmission gates). Some forms of switch can implement only unidirectional voltage or current dependence. *See also:* conceptual switch; high-Z. (C/TT) 1149.4-1999

**switch base** The main members to which the insulator units are attached. (SWG/PE) C37.30-1992s

**switchboard (1) (electric power system)** A large single panel, frame, or assembly of panels, on which are mounted, on the face or back or both, switches, overcurrent and other protective devices, buses, and usually instruments. *Note:* Switchboards are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets. *See also:* panelboard; center of distribution; distribution center. (NESC) [86]

**(2)** A type of switchgear assembly that consists of one or more panels with electric devices mounted thereon, and associated framework. *Note:* Switchboards may be classified by function, that is, power switchboards or control switchboards. Both power and control switchboards may be further classified by construction as defined. (SWG/PE/NESC) C37.100-1992, C2-1997

**(3)** When referred to in connection with supply of electricity, a large single panel, frame, or assembly of panels, on which are mounted (on the face, or back, or both) switches, fuses, buses, and usually instruments. (T&D) C2.2-1960

**switchboard cord** A cord that is used in conjunction with switchboard apparatus to complete or build up a telephone connection. (EEC/PE) [119]

**switchboard lamp (switchboard)** A small electric lamp associated with the wiring in such a way as to give a visual indication of the status of a call or to give information concerning the condition of trunks, subscriber lines, and apparatus. (EEC/PE) [119]

**switchboard position (telephone switching systems)** That portion of a manual switchboard normally provided for the use of one operator. (COM) 312-1977w

**switchboards and panels (electric installations on shipboard)** A generator and distribution switchboard receives energy from the generating plant and distributes directly or indirectly to all equipment supplied by the generating plant. A subdistribution switchboard is essentially a section of the generator and distribution switchboard (connected thereto by a bus-feeder and remotely located for reasons of convenience or economy) that distributes energy for lighting, heating, and power circuits in a certain section of the vessel. A distribution panel receives energy from a distribution or subdistribution switchboard and distributes energy to energy-consuming devices or other distribution panels or panelboards. A panelboard is a distribution panel enclosed in a metal cabinet. (IA/MT) 45-1983s

**switchboard section (telephone switching systems)** A structural unit providing for one or more operator positions. A complete switchboard may consist of one or more sections. (COM) 312-1977w

**switchboard supervisory lamp** (cord circuit or trunk circuit) A lamp that is controlled by one or other of the users to attract the attention of the operator. (EEC/PE) [119]

**switchboard supervisory relay** A relay that controls a switchboard supervisory lamp. (EEC/PE) [119]

**switch chip** A VLSI integrated circuit with two or more link interfaces, between which it provides packet routing. *See also:* link; switch. (C/BA) 1355-1995

**switch compartment (metal-enclosed interrupter switchgear)** That portion of the switchgear assembly that contains one switching device, such as an interrupter switch, power fuse interrupter switch combination, etc., and the associated primary conductors. (SWG/PE) C37.20.3-1996

**switch core** A magnetic core in which the core material generally has a high residual flux density and a high ratio of residual to saturated flux density; Switching does not occur when the magnetic force imposed on the core is below a threshold value. (C) 610.10-1994w

**switched bank** A capacitor bank designed for controlled operation.power systems relaying. (T&D/PE) 1036-1992, C37.99-2000

**switched current** The prospective current to be broken during a switching operation by each set of main switching or transition contacts (resistance-type LTC) or transfer contacts (reactance-type LTC) incorporated in the arcing switch or arcing tap switch. (PE/TR) C57.131-1995

**switched network (1)** A computer interconnect that uses switches to allow intermodule communications. (C/BA) 14536-1995

**(2)** A network, using a switching technique, to direct messages from the sender to the ultimate recipient. *See also:* circuit-switched network; store-and-forward switched network. (C) 610.7-1995

**switched-service network (telephone switching systems)** An arrangement of dedicated switching facilities to provide telecommunications services for a specific customer. (COM) 312-1977w

**switched virtual circuit** A virtual circuit that is established on an as-needed basis to interconnect any two end users attached to a network. *Note:* SVC service requires the definition of some call control procedures for the establishment, maintenance, and termination of the virtual circuit. An SVC may not be available when the user wants if too many SVCs are open at once. *See also:* permanent virtual circuit. (C) 610.7-1995

**switched way (1)** A way connected to the bus through a three-pole, group operated switch. (SWG/PE) C37.71-1984r

**(2)** A way connected to the bus through a switch. (SWG/PE) C37.100-1992

**(3)** A way connected to the bus through a three-phase group-operated switch or single-phase switch. (SWG/PE) C37.73-1998

**switchgear (1)** A general term covering switching and interrupting devices and their combination with associated control, instrumentation, metering, protective and regulating devices, also assemblies of these devices with associated interconnections, accessories and supporting structures used primarily in connection with the generation, transmission, distribution, and conversion of electric power. (SWG/PE/IA/PSP) C37.20.3-1996, 1015-1997, C37.20.2-1993, C37.20.1-1993r, C37.100-1992

**(2) (hydroelectric power plants)** An assembly of equipment used to switch and control electrical power. (PE/EDPG) 1020-1988r

**switchgear assembly** An assembled equipment (indoor or outdoor) including, but not limited to, one or more of the following categories: switching, interrupting, control, instrumentation, metering, protective, and regulating devices; together with their supporting structures, enclosures, conductors, electrical interconnections, and accessories. (SWG/PE) C37.20.1-1993r, C37.20.2-1993, C37.20.3-1996, C37.100-1992

**switchgear pothead** A pothead intended for use in a switchgear where the inside ambient air temperature may exceed 40°C. It may be an indoor or outdoor pothead that has been suitably modified by silver surfacing (or the equivalent) the current-carrying parts and incorporates sealing materials suitable for the higher operating temperatures. *See also:* pothead. (PE) 48-1975s

**switchgear, protective** *See:* protective switchgear.

**switch hook (hookswitch)** A switch on a telephone set, associated with the structure supporting the receiver or handset. It is operated by the removal or replacement of the receiver or handset on the support. *See also:* telephone station; switch stick. (EEC/PE) [119]

**switch indicator (1)** A device used at a noninterlocked switch to indicate the presence of a train in a block. (EEC/PE) [119]

**(2)** An indicator that shows the setting of a switch. *See also:* flag. (C) 610.10-1994w

**switching (1)** The process by which the remanent polarization is reversed (or reoriented) to a new value of $P_r$ (generally equal and opposite). Switching can be produced by electric fields or mechanical stresses. (UFFC) 180-1986w

**(2) (single-phase motor)** The point in the starting operation at which the stator-winding circuits are switched from one connection arrangement to another. *See also:* asynchronous machine. (PE) [9]

**(3) (test, measurement, and diagnostic equipment)** The act of manually, mechanically or electrically actuating a device for opening or closing an electrical circuit. (MIL) [2]

**(4)** In networking, pertaining to a connection that is established by closing switches. *See also:* packet switching; message switching; digital switching; circuit switching. (C) 610.7-1995

**(5)** The process of using a switch. (C) 610.10-1994w

**switching amplifier** An amplifier that is designed to be applied so that its output is sustained at one of two specified states dependent upon the presence of specified inputs. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**switching array (telephone switching systems)** An assemblage of multipled crosspoints. (COM) 312-1977w

**switching branch (synchronous motor drives)** A part of the circuit, including at least one switching element, bounded by two principal terminals. *Note:* A switching branch may include one or more simultaneously conducting converter switching elements connected together, commutating reactor windings, and other devices intended to protect the semiconductor devices or to ensure their proper function, such as voltage and current dividers, and snubbers. In the simplest case, a switching branch may consist of only the switching element, which may be a single semiconductor device. The adjective "switching" may be omitted when the context of converter circuits is clear. (IA/ID/SPC) 995-1987w, 936-1987w

**switching card (test, measurement, and diagnostic equipment)** A plug-in device that provides the necessary interconnection to the unit under test. (MIL) [2]

**switching circuit (data transmission)** Term applied to the method of handling traffic through a switching center, either from a local user or from other switching centers, whereby additional electrical connection is established between the calling and the called station. (PE) 599-1985w

**switching coefficient** The derivative of applied magnetizing force with respect to the reciprocal of the resultant switching time. It is usually determined as the reciprocal of the slope of a curve of reciprocals of switching times versus values of applied magnetizing forces. The magnetizing forces are applied as step functions. (C) [20]

**switching computer** A communications computer designed to handle switching messages or packets in a network. *See also:* gate. (C) 610.7-1995, 610.10-1994w

**switching control center (telephone switching systems)** A place where maintenance analysis and control activities are centralized for switching entities situated in different locations. (COM) 312-1977w

**switching current** The value of current expressed in rms symmetrical amperes that the power circuit breaker element of the circuit protector interrupts at the rated maximum voltage and rated frequency under the prescribed test conditions. (SWG/PE) C37.100-1992, C37.29-1981r

**switching current rating** The designated rms current that a load-break connector can connect and disconnect for a specified number of times under specified conditions. (T&D/PE) 386-1995

**switching device (switch)** A device designed to close or open, or both, one or more electric circuits. *Note:* The term *switch* in international (IEC) practice refers to a mechanical switching device capable of opening and closing rated continuous load current. *See also:* nonmechanical switching device; mechanical switching device. (SWG/PE) C37.100-1992

**switching entity (telephone switching systems)** A switching network and its control. (COM) 312-1977w

**switching function** A function that has only a finite number of possible values and whose independent variables each have only a finite number of possible values. (C) 1084-1986w

**switching impulse (1)** Ideally, an aperiodic transient impulse voltage that rises rapidly to a maximum value and falls, usually less rapidly, to zero. Switching impulses generally have front times of the order of tens to thousands of microseconds, in contrast to lightning impulses, which have front times from fractions of a microsecond to tens of microseconds. 332-1972w

**(2)** An impulse with a front duration of some tens to thousands of microseconds. (PE/PSIM) 4-1995

**switching impulse insulation level (power and distribution transformers)** An insulation level expressed in kilovolts of the crest value of a switching impulse withstand voltage. (PE/TR) C57.12.80-1978r

**switching impulse protective level** (of a surge protective device) The maximum switching impulse expected at the terminals of a surge protective device under specified conditions of operation. *Note:* The switching impulse protective levels given by the higher of either: a) the switching impulse discharge voltage for a specified current magnitude and wave shape, or b) the switching impulse sparkover voltage for a specified voltage wave shape. (C/PE/TR) 1313.1-1996, C57.12.80-1978r

**switching-impulse sparkover voltage (arresters)** The impulse sparkover voltage with an impulse having a virtual duration of wavefront greater than 30 μs. (PE) [8]

**switching impulse test (power and distribution transformers)** Application of the "standard switching impulse," a full wave having a front time of 250 μ and a time to half value of 2500 μ, described as a 250/2500 impulse. *Note:* It is recognized that some apparatus standards may have to use a modified wave shape where practical test considerations or particular dielectric strength characteristics make some modification imperative. Transformers, for example, use a modified switching impulse wave with the following characteristics:

— Time to crest greater than 100 μ.
— Exceeds 90% of crest value for at least 200 μ.
— Time to first voltage zero on tail not less than 1000 μ, except where core saturation causes the tail to become shorter.

(PE/TR) C57.12.80-1978r

**switching impulse withstand voltage** The crest value of a voltage impulse with a front duration from tens to thousands of microseconds that, under specified conditions, can be applied without causing flashover or puncture.

(SWG/PE) C37.34-1994

**switching network (telephone switching systems)** Switching stages and their interconnections. Within a switching system there may be more than one switching network.

(COM) 312-1977w

**switching-network plan (telephone switching systems)** The switching stages and their interconnections within a specific switching system. (COM) 312-1977w

**switching node** The intelligent interface point where the customer's equipment is connected to a public packet switching network. (C) 610.7-1995

**switching overvoltage (1)** A transient overvoltage in which a slow front, short duration, unidirectional or oscillatory, highly damped voltage is generated (usually by switching or faults).

(PE/C) 1313.1-1996

**(2)** Any combination of switching surge(s) and temporary overvoltage(s) associated with a single switching episode.

(SPD/PE) C62.22-1997

**switching plan (telephone switching systems)** A plan for the interconnection of switching entities. (COM) 312-1977w

**switching, slave-sweep** *See:* slave-sweep switching.

**switching stage (telephone switching systems)** An assemblage of switching arrays within each inlet that can be connected through a single crosspoint to its associated outlet.

(COM) 312-1977w

**switching station (power operations)** A station where transmission lines are connected without power transformers.

(PE/PSE) 858-1987s

**switching structure** An open framework supporting the main switching and associated equipment, such as instrument transformers, buses, fuses, and connections. It may be designed for indoor or outdoor use and may be assembled with or without switchboard panels carrying the control equipment.

(SWG/PE) C37.100-1992

**switching surge (1) (conductor stringing equipment)** A transient wave of overvoltage in an electrical circuit caused by a switching operation. When this occurs, a momentary voltage surge could be induced in a circuit adjacent and parallel to the switched circuit in excess of the voltage induced normally during steady-state conditions. If the adjacent circuit is under construction, switching operations should be minimized to reduce the possibility of hazards to the workers.

(T&D/PE) 524a-1993r, 524-1992r, 1048-1990

**(2)** A heavily damped transient electrical disturbance associated with switching. System insulation flashover may precede or follow the switching in some cases but not all.

(SPD/PE) C62.22-1997

**switching-surge protective level (arresters)** The highest value of switching-surge voltage that may appear across the terminals under the prescribed conditions. *Note:* The switching-surge protective levels are given numerically by the maximums of the following quantities: (1) discharge voltage at a given discharge current, and (2) switching-impulse sparkover voltage. (PE) [8]

**switching system (telephone switching systems)** A system in which connections are established between inlets and outlets either directly or with intermediate storage.

(COM) 312-1977w

**switching-system processor (telephone switching systems)** Circuitry to perform a series of switching system operations under control of a program. (COM) 312-1977w

**switching time ($T_S$) (1) (A) (magnetic storage cells)** $T_s$, the time interval between the reference time and the last instant at which the instantaneous voltage response of a magnetic cell reaches a stated fraction of its peak value. **(B) (magnetic storage cells)** $T_x$, the time interval between the reference time and the first instant at which the instantaneous integrated voltage response reaches a stated fraction of its peak value.

(C) [20]

**(2) (hybrid computer linkage components) (settling time)** That time required from the time at which a channel is addressed until the selected analog signal is available at the output within a given accuracy. (C) 166-1977w

**(3)** The time required for a device to change from one state to another. (C) 610.10-1994w

**(4) (reliable industrial and commercial power systems planning and design)** The period from the time a switching operation is required due to a component failure until that switching operation is completed. Switching operations include such operations as throwover to an alternate circuit, opening or closing a sectionalizing switch or circuit breaker, reclosing a circuit breaker following a trip-out due to a temporary fault, etc. (PE/IA/PSE) [54], 493-1997, 399-1997

**(5)** Time taken to switch from one transmission direction to the other in alternating single talk conversation on a handsfree telephone (HFT). (COM/TA) 1329-1999

**switching torque (1)** (motor having an automatic connection change during the starting period). The minimum external torque developed by the motor as it accelerates through switch operating speed. *Note:* It should be noted that if the torque on the starting connection is never less than the switching torque, the pull-up torque is identical with the switching torque; however, if the torque on the starting connection falls below the switching torque at some speed below switch operating speed, the pull-up and switching torques are not identical. *See also:* asynchronous machine. (EEC/PE) [119]

**(2) (single-phase motor)** The minimum torque which a motor will provide at switching at normal operating temperature, with rated voltage applied at rated frequency. *See also:* asynchronous machine. (PE) [9]

**switching transients (radiation survey instruments)** Sudden excursions of the meter which occur when the range switch is changed from one position to the next.

(NI) N13.4-1971w

**switching variable** A variable that may take only a finite number of possible values or states. *Synonym:* logical variable.

(C) 1084-1986w

**switch inrush current capability for single capacitance** (as applied to interrupter switches) This capability is a function of the rated switching current, for single capacitance, the rated differential capacitance voltage (minimum) and the maximum design voltage of the switch. *Note:* This can be calculated from the equation:

$$\text{Capability, in Peak Amperes} = \sqrt{2} I_C \sqrt{1 + \frac{0.816 E_m}{\Delta V_{min}}}$$

where

$I_C$ = Rated switching current for single capacitance
$\Delta V_{min}$ = Rated differential capacitance voltage, minimum
$E_m$ = Switch rated maximum voltage, in volts, rms

(SWG/PE) C37.100-1992

**switch, load matching** *See:* load-matching switch.

**switch, load transfer** *See:* load transfer switch.

**switch machine** A quick-acting mechanism, electrically controlled, for positioning track switch points, and so arranged that the accidental trailing of the switch points does not cause damage. A switch machine may be electrically or pneumatically operated. *See also:* car retarder. (EEC/PE) [119]

**switch machine lever lights** A group of lights indicating the position of the switch machine. (EEC/PE) [119]

**switch-machine point detector** *See:* point detector.

**switch mode (thyristor)** The starting instant of the controller ON-state interval is nonperiodic. This instant may be random (analogous to contactor operation), or it may be selected, for example, at voltage zero. (IA/IPC) 428-1981w

**switch onto fault protection** This provides tripping in the event that the breaker is closed into a zero voltage bolted fault, such as occurs if the grounding chains were left on the line following maintenance. (PE/PSR) C37.113-1999

**switch, optical** *See:* optical switch.

**switch or contactor, load** *See:* load switch or contactor.

**switch part class designation** A code which identifies the curve that relates the loadability factor (LF) of a switch part material and function to the ambient temperature $\theta_A$. (SWG/PE) C37.30-1992s, C37.37-1996

**switch point (watthour meters)** The transition from one time-of-use period to another. (ELM) C12.13-1985s

**switchpoint** *See:* switch.

**switch register** A register made up of a number of manual switches, typically equal to the number of bits in the computer, and generally located on the computer control panel. *Note:* Used to manually enter addresses and data into main storage and to manually intervene in program execution. (C) 610.10-1994w

**switchroom (telephone switching systems)** That part of a building that houses an assemblage of switching equipment. (COM) 312-1977w

**switch signal** A low two-indication horizontal color light signal with electric lamps for indicating position of switch or derail. (EEC/PE) [119]

**switch sleeve** A component of the linkage between the centrifugal mechanism and the starting-switch assembly. *See also:* starting-switch assembly. (EEC/PE) [119]

**switch starting** *See:* preheat-starting.

**switch stick** A device with an insulated handle and a hook or other means for performing stick operation of a switching device. *Synonym:* switch hook. (SWG/PE) C37.100-1992

**switch train** A series of switches in tandem. (EEC/PE) [119]

**switch-type function generator** A function generator using a multitap switch rotated in accordance with the input and having its taps connected to suitable voltage sources. *See also:* electronic analog computer. (C) 165-1977w

**swivel link (conductor stringing equipment)** A swivel device designed to connect pulling lines and conductors together in series or connect one pulling line to the drawbar of a pulling vehicle. The device will spin and help relieve the torsional forces which build up in the line or conductor under tension. (T&D/PE) 524-1992r

**SWR** *See:* residual standing-wave ratio; standing-wave-ratio indicator.

**syllabic companding (modulation systems)** Companding in which the gain variations occur at a rate comparable to the syllabic rate of speech; but do not respond to individual cycles of the audio-frequency signal wave. (IT) [7]

**syllable articulation** (percent syllable articulation) The percent articulation obtained when the speech units considered are syllables (usually meaningless and usually of the consonant-vowel-consonant type). *See also:* volume equivalent; articulation (percent articulation) and intelligibility (percent intelligibility). (EEC/PE) [119]

**syllable hyphen** *See:* discretionary hyphen.

**symbol (1)** A representation of something by reason of relationship, association, or convention. *See also:* logic symbol. (C) [20], [85]

**(2) (packaging machinery)** A sign, mark, or drawing agreed upon to represent an electrical device of component part thereof. (IA/PKG) 333-1980w

**(3) (computer graphics)** A conventional representation of an object, composed of one or more display elements that is expressed as a unit. (C) 610.6-1991w

**(4)** A 16 bit unit of data accompanied by flag information. The flag information may be explicitly present as a 17th bit, or implied by the context. Symbols are transmitted one after another to form SCI packets or idles. The particular physical layer used to transmit these symbols is not visible to the logical layer. (C/MM) 1596-1992

**(5)** Refers to data within an SCI packet. A 16-bit unit of data accompanied by flag information. The flag information may be explicitly present as a 17th bit, or implied by the context. Symbols are transmitted one after another to form SCI packets or idles. The particular physical layer used to transmit these symbols is not visible to the logical layer. (C/MM) 1596.3-1996

**(6)** A 10-bit, 8B/10B encoded byte. (C/BA) 1393-1999

**(7)** Two signal elements. Four symbols are defined: data_zero, data_one, non-data_J, and non-data_K. (C/LM) 8802-5-1998

**(8)** The smallest unit of data transmission on the medium. Symbols are unique to the coding system employed. 100BASE-T4 uses ternary symbols; 10BASE-T and 100BASE-X use binary symbols or code bits; 100BASE-T2 uses quinary symbols. (C/LM) 802.3-1998

**(9)** The radio-frequency (RF) energy and/or the RF current advisory symbols. (NIR/SCC28) C95.2-1999

**(10) (data management)** *See also:* code. (C) 610.5-1990w

**symbol for a quantity (abbreviation) (quantity symbol)** A letter (which may have letters or numbers, or both, as subscripts or superscripts, or both), used to represent a physical quantity or a relationship between quantities. *Compare with:* abbreviation; functional designation; mathematical symbol; reference designation; symbol for a unit. *See also:* abbreviation. (GSD) 267-1966

**symbol for a unit** (unit symbol) (abbreviation) A letter, a character, or combinations thereof, that may be used in place of the name of the unit. With few exceptions, the letter is taken from the name of the unit. *Compare with:* abbreviation; mathematical symbol; symbol for a quantity. *See also:* abbreviation. (GSD) 267-1966

**symbolic address (1) (computers)** An address expressed in symbols convenient to the programmer. (C) [20], [85]

**(2) (software)** An address expressed as a name or label that must be translated to the absolute address of the device or storage location to be accessed. *Contrast:* absolute address. (C) 610.12-1990

**(3)** An address, expressed in symbols convenient to the computer programmer, that will be translated to an absolute or virtual address before it can be interpreted by the computer. (C) 610.10-1994w

**symbolic addressing** An addressing mode in which the address field of an instruction contains a symbolic address. (C) 610.10-1994w

**symbolic coding (computers)** Coding that uses machine instructions with symbolic addresses. (C) [20], [85]

**symbolic execution (software)** A software analysis technique in which program execution is simulated using symbols, such as variable names, rather than actual values for input data, and program outputs are expressed as logical or mathematical expressions involving these symbols. (C) 610.12-1990

**symbolic image** A digital image in which the value associated with each pixel is a symbol, rather than a gray level. (C) 610.4-1990w

**symbolic language** A programming language that expresses operations and addresses in symbols convenient to humans rather than in machine language. Examples are assembly language, high-order language. *Contrast:* machine language. *See also:* list processing language. (C) 610.12-1990, 610.13-1993w

**symbolic link** A type of file that contains a pathname. Rather than containing data itself, this type of file will resolve to another, as defined by the contained pathname. The way in which this type of file is handled by implementations of this standard is undefined. (C/PA) 1387.2-1995

**symbolic logic** The discipline that treats formal logic by means of a formalized artificial language or symbolic calculus whose purpose is to avoid the ambiguities and logical inadequacies of natural languages. (C) [20], [85]

**symbolic model** A model whose properties are expressed in symbols. Examples include graphical models, mathematical models, narrative models, software models, and tabular models. *Contrast:* physical model. (C) 610.3-1989w

**symbolic processor (A)** A computer which manipulates data at the algorithm level, typically not reducing computed equation values to a numerical resultant value. **(B)** A processor optimized to manipulate character strings and other symbolic data. *Note:* This is often done in the LISP or Prolog programming languages. (C) 610.10-1994

**Symbolic Programming Systems (SPS)** A programming language in which terms may represent quantities and locations. (C) 610.13-1993w

**symbolic quantity** *See:* mathematico-physical quantity.

**symbolic trace** A record of the source statements and branch outcomes that are encountered when a computer program is executed using symbolic, rather than actual, values for input data. *See also:* subroutine trace; variable trace; retrospective trace; execution trace. (C) 610.12-1990

**symbol manipulation language** *See:* list processing language.

**symbol rank** *See:* digit place.

**symbol rate (1)** The total number of symbols per second transferred to or from the Medium Dependent Interface (MDI) on a single wire pair. For 100BASE-T4, the symbol rate is 25 MBd; for 100BASE-X, the symbol rate is 125 MBd; for 100BASE-T2, the symbol rate is 25 MBd. (C/LM) 802.3-1998

**(2) (local area networks)** The number of symbols transmitted per second and expressed in baud (e.g., 1 Mbd = 1 000 000 symbols per second). (C) 8802-12-1998

**symbol table** A table that presents program symbols and their corresponding addresses, values, and other attributes. (C) 610.12-1990

**symbol time (ST)** The duration of one symbol as transferred to and from the Medium Dependent Interface (MDI) via a single wire pair. The symbol time is the reciprocal of the symbol rate. (C/LM) 802.3-1998

**symmetrical** The shape of the ac current waves about the zero axis (when both sides have equal value and configuration). (IA/PSE) 241-1990r

**symmetrical alternating current** A periodic alternating current in which points one-half a period apart are equal and have opposite signs. *See also:* network analysis; alternating function. (Std100) 270-1966w

**symmetrical channel** One of a pair of channels in which the transmit and receive directions of transmission have the same data signaling rate. (C) 610.10-1994w

**symmetrical component (ac component)** (of a total current) That portion of the total current that constitutes the symmetry. (SWG/PE) C37.100-1992

**symmetrical components (A) (set of polyphase alternating voltages)** The symmetrical components of an unsymmetrical set of sinusoidal polyphase alternating voltages of $m$ phases are the $m$ symmetrical sets of polyphase voltages into which the unsymmetrical set can be uniquely resolved, each component set having an angular phase lag between successive members of the set that is a different integral multiple of the characteristic angular phase difference for the number of phases. The successive component sets will have phase differences that increase from zero for the first set to $(m - 1)$ times the characteristic angular phase difference for the last set. The phase sequence of each component set is identified by the integer that denotes the number of times the angle of lag between successive members of the component set contains the characteristic angular phase difference. If the members of an unsymmetrical set of alternating polyphase voltages are not sinusoidal, each voltage is first resolved into its harmonic components, then the harmonic components of the same period are grouped to form unsymmetrical sets of sinusoidal voltages, and finally each harmonic set of sinusoidal voltages is uniquely resolved into its symmetrical components. Because the resolution of a set of polyphase voltages into its harmonic components is also unique, it follows that the resolution of an unsymmetrical set of polyphase voltages into its symmetrical components is unique. There may be a symmetrical-component set of voltages for each of the possible phase sequences from zero to $(m - 1)$ and for each of the harmonics present from 1 to $r$, where $r$ may approach infinity in particular cases. Each member of a set of symmetrical component voltages of $k$th phase sequence and $r$th harmonic may be denoted by

$$e_{ski} = (2)^{1/2} E_{akr} \cos\left(r\omega t + \alpha_{akr} - (s - 1)\, K \frac{2\pi}{m}\right)$$

where $e_{skr}$ is the instantaneous voltage component of phase sequence $k$ and harmonic $r$ in phase $s$. $E_{akr}$ is the root-mean-square amplitude of the voltage component of phase sequence $k$ and harmonic $r$, using phase $a$ as reference, $a_{akr}$ is the phase angle of the first member of the set, selected as phase $a$, with respect to a common reference. The letter $s$ as the first subscript denotes the phase identification of the individual member, $a$, $b$, $c$, etc., for successive members, and $a$ denotes that the first phase, $a$, has been used as a reference from which other members are specified. The second subscript, $k$, denotes the phase sequence of the component, and may run from 0 to $m - 1$. The third subscript denotes the order of the harmonic, and may run from 1 to $\infty$. The letter $s$ as an algebraic quantity denotes the member of the set and runs from 1 for phase $a$ to $m$ for the last phase. Of the $m$ symmetrical component sets for each harmonic, one will be of zero phase sequence, one of positive phase sequence, and one of negative phase sequence. If the number of phases $m$ ($m > 2$) is even, one of the symmetrical component sets for $k = m/2$ will be a single-phase symmetrical set (polyphase voltages). The zero-phase-sequence component set will constitute a zero-phase symmetrical set (polyphase voltages), and the remaining sequence components will constitute polyphase symmetrical sets (polyphase voltages). *See also:* network analysis. **(B) (set of polyphase alternating currents)** Obtained from the corresponding definition for symmetrical components (set of polyphase alternating voltages) by substituting the word current for voltage wherever it appears. *See also:* network analysis. (Std100/OLD TERMS) 270-1966

**symmetrical fractional-slot winding (rotating machinery)** A distributed winding in which the average number of slots per pole per phase is not integral, but in which the winding pattern repeats after every pair of poles, for example, $3\frac{1}{2}$ slots per pole per phase. *See also:* rotor; stator. (PE) [9]

**symmetrical grid current** That portion of the symmetrical ground fault current that flows between the grounding grid and surrounding earth. It may be expressed as

$$I_g = S_f \times I_f$$

where
$I_g$ = the rms symmetrical grid current in A
$I_f$ = the rms symmetrical ground fault current in A
$S_f$ = the fault current division factor

(PE/SUB) 80-2000

**symmetrical ground fault current** The maximum rms value of symmetrical fault current after the instant of a ground fault initiation. As such, it represents the rms value of the symmetrical component in the first half-cycle of a current wave that develops after the instant of fault at time zero. For phase-to-ground faults

$$I_{f(0+)} = 3I_0''$$

where

$I_{f(0+)}$ = the initial rms symmetrical ground fault current

$I_0''$ = the rms value of zero-sequence symmetrical current that develops immediately after the instant of fault initiation, reflecting the subtransient reactances of rotating machines contributing to the fault

This rms symmetrical fault current is shown in an abbreviated notation as $I_f$, or is referred to only as $3I_0$. The underlying reason for the latter notation is that, for purposes of this guide, the initial symmetrical fault current is assumed to remain constant for the entire duration of the fault. (PE/SUB) 80-2000

**symmetrically cyclically magnetized condition** A condition of a magnetic material when it is in a cyclically magnetized condition and the limits of the applied magnetizing forces are equal and of opposite sign, so that the limits of flux density are equal and of opposite sign. (Std100) 270-1966w

**symmetrical network** *See:* structurally symmetrical network.

**symmetrical periodic function** A function having the period $2\pi$ is symmetrical if it satisfies one or more of the following identities.

(1) $f(x) = -f(-x)$

(2) $f(x) = -f(\pi + x)$

(3) $f(x) = -f(\pi - x)$

(4) $f(x) = f(-x)$

(5) $f(x) = f(\pi + x)$

(6) $f(x) = f(\pi - x)$

*See also:* network analysis. (Std100) 270-1966w

**symmetrical set (A) (polyphase voltages)** A symmetrical set of polyphase voltages of m phases is a set of polyphase voltages in which each voltage is sinusoidal and has the same amplitude, and the set is arranged in such a sequence that the angular phase difference between each member of the set and the one following it, and between the last member and the first, can be expressed as the same multiple of the characteristic angular phase difference $2\pi/m$ radians. A symmetrical set of polyphase voltages may be expressed by the equations

$$e_a = (2)^{1/2}E_{ar}\cos(r\omega t + \alpha_{ar})$$

$$e_b = (2)^{1/2}E_{ar}\cos\left(r\omega t + \alpha_{ar} - k\frac{2\pi}{m}\right)$$

$$e_c = (2)^{1/2}E_{ar}\cos\left(r\omega t + \alpha_{ar} - 2k\frac{2\pi}{m}\right)$$

$$e_m = (2)^{1/2}E_{ar}\cos\left(r\omega t + \alpha_{ar} - (m-1)\,k\frac{2\pi}{m}\right)$$

where $E_{ar}$ is the root-mean-square amplitude of each member of the set, $r$ is the order of the harmonic of each member, with respect to a specified period. $a_{ar}$ is the phase angle of the first member of the set with respect to a selected reference. $k$ is an integer that denotes the phase sequence. *Notes:* 1. Although sets of polyphase voltages that have the same amplitude and waveform but that are not sinusoidal possess some of the characteristics of a symmetrical set, only in special cases do the several harmonics have the same phase sequence. Since phase sequence is an important feature in the use of symmetrical sets, the definition is limited to sinusoidal quantities. This represents a change from the corresponding definition in the 1941 edition of the American Standard Definitions of Electrical Terms. 2. This definition may be applied to a two-phase four-wire or five-wire circuit if $m$ is considered to be 4 instead of 2. The concept of symmetrical sets is not directly applicable to a two-phase three-wire circuit. **(B) (polyphase currents)** This definition is obtained from the corresponding definitions for voltage by substituting the word current for voltage, and the symbol $I$ for $E$ and b for a wherever they appear. The subscripts are unaltered. *See also:* network analysis. (Std100) 270-1966

**symmetrical terminal voltage** Terminal voltage measured in a delta network across the mains lead. *See also:* electromagnetic compatibility. (EMC) [53]

**symmetrical transducer (specified terminations in general)** A transducer in which all possible pairs of specified terminations may be interchanged without affecting transmission. *See also:* transducer. (Std100) 270-1966w

**symmetric channel** *See:* binary symmetric channel; symmetrical channel.

**Symmetric List Processing Language (SLIP)** A high-order list processing language using a structure reader, a parser that can traverse a data structure. (C) 610.13-1993w

**symmetric multiprocessor** A multiprocessor system in which each processor is equal to all others. *Contrast:* asymmetric multiprocessor. (C) 610.10-1994w

**symmetric system** Tunnel lighting system or luminaires having a symmetric light distribution with respect to the direction of travel. (RL) C136.27-1996

**symmetric traversal** *See:* inorder traversal.

**synapse** The junction between two neural elements, which has the property of one-way propagation. (EMB) [47]

**sync (1) (television)** Abbreviation for synchronizing signal extensively used in speech and writing. *Note:* This abbreviation is so commonly used that it has achieved the status of a word. (BT/AV) 201-1979w

**(2)** A function in which a bedside communications controller (BCC) may precisely synchronize a common fiduciary (now) maintained by multiple device communications controllers (DCCs) to the value of its own real-time clock, to an accuracy of approximately 1 ms. The BCC implements this function by transmitting a 3 μs pulse to one or more DCCs. A sync pulse may also be transmitted by a BCC or a DCC for reasons other than time synchronization. (EMB/MIB) 1073.4.1-2000

**synchro control transformer (synchro or selsyn devices)** A transformer with relatively rotatable primary and secondary windings. The primary inputs is a set of two or more voltages from a synchro transmitter that define an angular position relative to that of the transmitter. The secondary output voltage varies with the relative angular alignment of primary and secondary windings, of the control transformer and the position of the transmitter. The output voltage is substantially zero in value at a position known as correspondence. *See also:* synchro system. (PE) [9]

**synchro differential receiver (synchro or selsyn devices)** (motor) A transformer identical in construction to a synchro differential transmitter but used to develop a torque increasing with the difference in the relative angular displacement (up to about 90 electrical degrees) between the two sets of voltage input signals to its primary and secondary windings, the torque being in a direction to reduce this difference to zero. *See also:* synchro system. (PE) [9]

**synchro differential transmitter (rotating machinery)** (generator) A transformer with relatively rotatable primary and secondary windings. The primary input is a set of two or more voltages that define an angular position. The secondary output is a set of two or more voltages that represent the sum or difference, depending upon connections, of the position defined by the primary input and the relative angular displacement between primary and secondary windings. *See also:* synchro system. (PE) [9]

**synchronism** The state where connected alternating-current systems, machines, or a combination operate at the same frequency and where the phase angle displacement between voltages in them are constant, or vary about a steady and stable

average value. *See also:* asynchronous machine. (PE/PSR) 1344-1995, [9]

**synchronism-check relay** A verification relay whose function is to operate when two input voltage phasors are within predetermined limits. (SWG/PE) C37.100-1992

**synchronization (data transmission)** A means of ensuring that both transmitting and receiving stations are operating together (equal scanning line frequencies) in a fixed phase relationship. (PE) 599-1985w

**synchronization bit** One or more bits that are added to a string of data to allow a receiving circuit to align its clocks with the data. *See also:* clock track. (C) 610.10-1994w

**synchronization error (navigation) (navigation aids)** The error due to imperfect timing of two operations; this may or may not include signal transmission time. (AES/GCS) 172-1983w

**synchronization internal** The time period between clock synchronization cycles. (C/BA) 896.2-1991w

**synchronization time (gyros)** The time interval required for the gyro rotor to reach synchronous speed from standstill. (AES/GYAC) 528-1994

**synchronized I/O completion** The state of an I/O operation that has either been successfully transferred or diagnosed as unsuccessful. (C/PA) 1003.5-1999, 9945-1-1996

**synchronized I/O data integrity completion** A degree of completion for an I/O operation that occurs when:

1) For read, the operation has been completed or diagnosed as unsuccessful. The read is complete only when an image of the data has been successfully transferred to the requesting task. If there were any pending write requests affecting the data to be read at the time that the synchronized read operation was requested, these write requests shall be successfully transferred prior to reading the data.
2) For write, the operation has been completed or diagnosed as unsuccessful. The write is complete only when the data specified in the write request is successfully transferred, and all file system information required to retrieve the data is successfully transferred.

File attributes that are not necessary for data retrieval (***Last Access Time***, ***Last Modification Time***, ***Last Status Change Time***) need not be successfully transferred prior to returning to the calling task. (C/PA) 1003.5-1999, 9945-1-1996

**synchronized I/O file integrity completion (1)** Identical to a synchronized I/O data integrity completion with the addition that all file attributes relative to the I/O operation (including ***Last Access Time***, ***Last Modification Time***, ***Last Status Change Time***) shall be successfully transferred prior to returning to the calling task. (C) 1003.5-1999
**(2)** Identical to a synchronized I/O data integrity completion with the addition that all file attributes relative to the I/O operation (including access time, modification time, status change time) shall be successfully transferred prior to returning to the calling process. (C/PA) 9945-1-1996

**synchronized I/O operation** An I/O operation performed on a file that provides the application assurance of the integrity of its data and files. *See also:* synchronized I/O file integrity completion; synchronized I/O data integrity completion. (C/PA) 1003.5-1999, 9945-1-1996

**synchronous I/O operation (1)** An I/O operation that causes the task requesting the I/O to be blocked from further use of the processor until that I/O operation completes. *Note:* A synchronous I/O operation does not imply synchronized I/O data integrity completion or synchronized I/O file integrity completion. (C) 1003.5-1999
**(2)** An I/O operation that causes the process requesting the I/O to be blocked from further use of the processor until that I/O operation completes. *Note:* A synchronous I/O operation does not perforce imply synchronized I/O data integrity completion or synchronized I/O file integrity completion. (C/PA) 9945-1-1996

**synchronized operation (1)** An operating mode where system facilities are connected and controlled to operate at the same frequency. (PE/PSE) 858-1993w
**(2) (power operations)** An operation wherein power facilities are electrically connected and controlled to operate at the same frequency. (PE/PSE) 346-1973w

**synchronized phasor** A phasor calculated from data samples using a standard time signal as the reference for the sampling process. In this case, the phasors from remote sites have a defined common phase relationship. (PE/PSR) 1344-1995

**synchronized sweep (spectrum analyzer) (non-real time spectrum analyzer) (oscilloscopes)** A sweep that would free run in the absence of an applied signal but in the presence of the signal is synchronized by it. *See also:* oscillograph. (IM) 748-1979w

**synchronizing (1) (rotating machinery)** The process whereby a synchronous machine, with its voltage and phase suitably adjusted, is paralleled with another synchronous machine or system. *See also:* asynchronous machine. (PE) [9]
**(2) (facsimile)** The maintenance of predetermined speed relations between the scanning spot and the recording spot within each scanning line. *See also:* facsimile. (COM) 168-1956w
**(3) (television)** Maintaining two or more scanning processes in phase. (BT/AV) [34]
**(4) (pulse terminology)** The process of rendering a first pulse train or other sequence of events synchronous with a second pulse train. (IM/WM&A) 194-1977w
**(5) (hydroelectric power plants)** Process of paralleling and connecting a synchronous generator to another source. (PE/EDPG) 1020-1988r

**synchronizing coefficient (rotating machinery)** The quotient of the shaft power and the angular displacement of the rotor. *Note:* It is expressed in kilowatts per electrical radian. Unless otherwise stated, the value will be for rated voltage, load, power-factor, and frequency. *See also:* asynchronous machine. (PE) [9]

**synchronizing or synchronism-check device (power system device function numbers)** A device that operates when two ac circuits are within the desired limits of frequency, phase angle, and voltage, to permit or to cause the paralleling of these two circuits. (PE/SUB) C37.2-1979s

**synchronizing reactor (power and distribution transformers)** A current-limiting reactor for connecting momentarily across the open contacts of a circuit-interrupting device for synchronizing purposes. *See also:* reactor. (PE/TR) C57.12.80-1978r, [57]

**synchronizing relay** A programming relay whose function is to initiate the closing of a circuit breaker between two ac sources when the voltages of these two sources have a predetermined relationship of magnitude, phase angle, and frequency. (SWG/PE) C37.100-1992

**synchronizing signal (1) (television)** The signal employed for the synchronizing of scanning. *Note:* In television, this signal is composed of pulses at rates related to the line and field frequencies. The signal usually originates in a central synchronizing generator and is added to the combination of picture signal and blanking signal, comprising the output signal from the pickup equipment, to form the composite picture signal. In a television receiver, this signal is normally separated from the picture signal and is used to synchronize the deflection generators. (BT/AV) [34]
**(2) (facsimile)** A signal used for maintenance of predetermined speed relations between the scanning spot and recording spot within each scanning line. *See also:* facsimile signal. (COM) 168-1956w
**(3) (oscillograph)** A signal used to synchronize repetitive functions. *See also:* oscillograph. (IM/HFIM) [40]
**(4) (telecommunications)** A special signal which may be sent to establish or maintain a fixed relationship in synchronous systems. (COM) [49]

**synchronizing signal compression (television)** The reduction in gain applied to the synchronizing signal over any part of its amplitude range with respect to the gain at a specified reference level. *Notes:* 1. The gain referred to in the definition is for a signal amplitude small in comparison with the total peak-to-peak composite picture signal involved. A quantitative evaluation of this effect can be obtained by a measurement of differential gain. 2. Frequently the gain at the level of the peaks of synchronizing pulses is reduced with respect to the gain at the levels near the bases of the synchronizing pulses. Under some conditions, the gain over the entire synchronizing signal region of the composite picture signal may be reduced with respect to the gain in the region of the picture signal. *See also:* television. (BT/AV) [34]

**synchronizing signal level (television)** The level of the peaks of the synchronizing signal. *See also:* television. (BT/AV) [34]

**synchronizing torque (synchronous machines)** The torque produced, primarily through interaction between the armature currents and the flux produced by the field winding, tending to pull the machine into synchronism with a connected power system or with another synchronous machine. (PE) [9]

**synchronous (1)** A mode of transmission in which the sending and receiving terminal equipment are operating continuously at the same rate and are maintained in a desired phase relationship by an appropriate means. (COM/TA) 1007-1991r
**(2)** Protocol operation in which only one exchange between a given pair of entities can be handled at any moment in time. The current exchange must complete before the next can be initiated. (LM/C) 15802-2-1995
**(3)** Describes an activity specified by a function that is expected to be complete when the function returns. (C/MM) 855-1990

**synchronous assignment** An assignment that takes place when a signal or variable value is updated as a direct result of a clock edge expression evaluating as true. (C/DA) 1076.6-1999

**synchronous booster converter** A synchronous converter having a mechanically connected alternating-current reversible booster connected in series with the alternating-current supply circuit for the purpose of adjusting the output voltage. *See also:* converter. (EEC/PE) [119]

**synchronous booster inverter** An inverter having a mechanically connected reversible synchronous booster connected in series for the purpose of adjusting the output voltage. *See also:* converter. (EEC/PE) [119]

**synchronous capacitor (rotating machinery)** A synchronous machine running without mechanical load and supplying or absorbing reactive power to or from a power system. *See also:* converter; synchronous condenser. (PE) [9]

**synchronous circuit** A circuit in which clock pulses synchronize the operations of the elements. *Contrast:* asynchronous circuit. (C) 610.10-1994w

**synchronous communication** In the IEEE 1451.1 client-server model, refers to a stateless communication in which the client blocks until the return is received from the server. That is, the client can perform no activities until unblocked by the return of the result. (IM/ST) 1451.1-1999

**synchronous computer (1)** A computer in which each event, or the performance of each operation, starts as a result of a signal generated by a clock. *Contrast:* asynchronous computer. (C) [20], [85], 610.10-1994w
**(2)** A computer in which each event or operation is performed upon receipt of a signal generated by the completion of a previous event or operation, or upon availability of the system resources required by the event or operation. (C) 610.10-1994w

**synchronous condenser* (1) (electric installations on shipboard)** A synchronous phase modifier running without mechanical load, the field excitation of which may be varied so as to modify the power factor of the system: or through such modification, to influence the load voltage. (IA/MT) 45-1983s
**(2)** A synchronous machine running without mechanical load and supplying or absorbing reactive power. *See also:* synchronous capacitor. (PE) [9]
* Deprecated.

**synchronous converter** A converter that combines both motor and generator action in one armature winding and is excited by one magnetic field. It is normally used to change ac power to dc power, or to create an isolated ac power source. (IA/MT) 45-1998

**synchronous coupling (1) (electric coupling)** An electric coupling in which torque is transmitted by attraction between magnetic poles on both rotating members which revolve at the same speed. The magnetic poles may be produced by direct current excitation, permanent magnet excitation, or alternating current excitation, and those on one rotating member may be salient reluctance poles. (EM/PE) 290-1980w
**(2) (rotating machinery)** A type of electric coupling in which torque is transmitted at zero slip, either between two electromagnetic members or like number of poles, or between one electromagnetic member and a reluctance member containing a number of saliencies equal to the number of poles. *Note:* Synchronous couplings may have induction members or other means for providing torque during nonsynchronous operation such as starting. *See also:* electric coupling. (PE) [9]

**synchronous detector** A device whose output is proportional to the amplitude of a vector component of an input radio frequency (RF) or intermediate frequency (IF) signal measured with respect to an externally supplied reference signal. (AES) 686-1997

**synchronous device (data transmission)** A device whose speed of operation is related to the rest of the system to which the device is connected. (PE) 599-1985w

**synchronous errored second** A one-second interval during which one or more errors are received, which is measured by triggering the one-second time period on a detected error. (COM/TA) 1007-1991r

**synchronous gate** A time gate wherein the output intervals are synchronized with an incoming signal. (AP/ANT) 145-1983s

**synchronous generator (1) (hydroelectric power plants)** A generator that produces power with rotor speed exactly proportional to the frequency of the system. The generator has field poles excited by direct current. (PE/EDPG) 1020-1988r
**(2)** A synchronous ac machine that transforms mechanical power into electric power. (A synchronous machine is one in which the average speed of normal operation is exactly proportional to the frequency of the system to which it is connected.) (IA/MT) 45-1998

**synchronous impedance (1) (per unit direct-axis)** The ratio of the field current at rated armature current on sustained symmetrical short-circuit to the field current at normal open-circuit voltage on the air-gap line. *Note:* This definition of synchronous impedance is used to a great extent in electrical literature and corresponds to the definition of direct-axis synchronous reactance as determined from open-circuit and sustained short-circuit tests. *See also:* positive-phase-sequence reactance. (EEC/PE) [119]
**(2) (rotating machinery)** The ratio of the value of the phasor difference between the synchronous internal voltage and the terminal voltage of a synchronous machine to the armature current under a balanced steady-state condition. *Note:* This definition is of rigorous application to turbine type machines only, but it gives a good degree of approximation for salient pole machines. *See also:* synchronous reactance. (PE) [9]

**synchronous induction motor (rotating machinery)** A cylindrical rotor synchronous motor having a secondary coil winding similar to that of a wound rotor induction motor. *Note:* This winding is used for both starting and excitation purposes. (PE) [9]

**synchronous (interdigital) transducer** An interdigital transducer that has uniform electrode center-to-center spacing. (UFFC) 1037-1992w

**synchronous internal voltage (synchronous machine for any specified operating conditions)** The fundamental-frequency component of the voltage of each armature phase that would be produced by the steady (or very slowly varying) component of the current in the main field winding (or field windings) acting alone provided the permeance of all parts of the magnetic circuit remained the same as for the specified operating condition. *Note:* The synchronous internal voltage, as shown in the phasor diagram, is related to the terminal-voltage and phase-current phasors by the equation. For a machine subject to saturation, the reactances should be determined for the degree of saturation applicable to the specified operating condition. (PE) [9]

**synchronous inverter** An inverter that combines both motor and generator action in one armature winding. It is excited by one magnetic field and changes direct-current power to alternating-current power. *Note:* Usually it has no amortisseur winding. *See also:* converter. (EEC/PE) [119]

**synchronously generated signal** A signal that is attributable to a specific thread. For example, a thread executing an illegal instruction or touching invalid memory causes a synchronously generated signal. Being synchronous is a property of how the signal was generated and not a property of the signal number. (C/PA) 9945-1-1996

**synchronous machine** A machine in which the average speed of normal operation is exactly proportional to the frequency of the system to which it is connected. (IA/MT) 45-1998

**synchronous-machine regulating-system stability** The property of a synchronous-machine-regulating system in which a change in the controlled variable, resulting from a stimulus, decays with time if the stimulus is removed. (PE) [9]

**synchronous machine, ideal** *See:* ideal synchronous machine.

**synchronous-machine regulating system** An electric-machine regulating system consisting of one or more principal synchronous electric machines and the associated excitation system. (PE) [9]

**synchronous machine regulator (1) (excitation systems for synchronous machines)** A regulator that couples the output variables of the synchronous machine to the output of the exciter through feedback and forward controlling elements for the purpose of regulating the synchronous machine output variables. (PE/EDPG) 421.4-1990, 421.1-1986r

**(2) (excitation systems)** One that couples the output variables of the synchronous machine to the input of the exciter through feedback and forward controlling elements for the purpose of regulating the synchronous machine output variables. *Note:* In general, the regulator is assumed to consist of an error detector, preamplifier, power amplifier, stabilizers, auxiliary inputs, and limiters. (PE/EDPG) 421-1972s

**(3) (rotating machinery)** An electric-machine regulator that controls the excitation of a synchronous machine. (PE) [9]

**synchronous motor** A polyphase ac motor with separately supplied dc field and an auxiliary (amortisseur) winding for starting purposes. The operating speed is fixed by the frequency ($f$) of the system and the number of poles ($p$) of the motor. (Synchronous speed (r/min) = $120\,f/p$). Thus the speed of the motor can be varied by varying the frequency of the power source. The synchronous motor generally operates at unity power factor and can be used to improve the system power factor. It is generally the motor of choice for ac propulsion systems. (IA/MT) 45-1998

**synchronous operation (1)** An operation that causes the process requesting the operation to be blocked until it is complete. (C/PA) 1327.2-1993w, 1224.2-1993w

**(2) (opening or closing)** Operation of a switching device in such a manner that the contacts are closed or opened at a predetermined point on a reference voltage or current wave. *Note:* Synchronous operation applied on multiphase circuits may require that closing or opening of the contacts of each pole be responsive to a different reference. (SWG/PE) C37.100-1992

**synchronous reactance (1) (rotating machinery)** (effective) An assumed value of synchronous reactance used to represent a machine in a system study calculation for a particular operating condition. *Note:* The synchronous internal voltage, as shown in the phasor diagram, is related to the terminal-voltage and phase-current phasors by the equation

$$E'_i = E_a + RI_a + jX_{eff}I_a$$

*See also:* synchronous internal voltage; synchronous impedance. (PE) [9]

**(2) (power fault effects)** The steady-state reactance of a generator during fault conditions used to calculate the steady-state fault current. The current so calculated excludes the effect of the automatic voltage regulator or governor. (PE/PSC) 367-1996

**(3) (electric power systems in commercial buildings)** The reactance that determines the current flow when a steady-state condition is reached. (IA/PSE) 241-1990r

**synchronous satellite (navigation aids)** An equatorial satellite orbiting the earth in a west-to-east direction at an altitude of approximately 35 900 km. At this altitude the satellite makes one revolution in 24 h, synchronous with the earth's rotation. (AES/GCS) 172-1983w

**synchronous speed (rotating machinery)** The speed of rotation of the magnetic flux, produced by or linking the primary winding. (PE) [9]

**synchronous-speed device (power system device function numbers)** A device such as a centrifugal-speed switch, a slip-frequency relay, a voltage relay, an undercurrent relay, or any type of device that operates at approximately the synchronous speed of a machine. (SUB/PE) C37.2-1979s

**synchronous system (data transmission)** A system in which the sending and receiving instruments are operating continuously at substantially the same rate and are maintained by means of correction if necessary, in a fixed relationship. (PE) 599-1985w

**synchronous time division multiplexing** A method of time division multiplexing in which time slots on a shared communication channel are assigned to devices on a fixed, predetermined basis. (C) 610.7-1995

**synchronous transmission (1) (data transmission)** A mode of data transmission in which the sending and receiving data processing terminal equipments are operating continuously at substantially the same frequency and are maintained in a desired phase relationship by an appropriate means. (PE) 599-1985w

**(2)** A transmission in which information and control characters are sent at regular clocked intervals so that sending and receiving stations are operating continuously in step with each other. *Synonym:* synchronous communication. *Contrast:* asynchronous transmission. (C) 610.7-1995

**synchronous-vibration sensitivity (dynamically tuned gyro)** The functions that relate drift rates to linear or angular vibrations that are phase coherent with spin frequency or its harmonics. *See also:* two-N (2N) translational sensitivity; one-N (1N) translational sensitivity; two-N (2N) angular sensitivity. (AES/GYAC) 528-1994

**synchronous voltage (traveling-wave tubes)** The voltage required to accelerate electrons from rest to a velocity equal to the phase velocity of a wave in the absence of electron flow. *See also:* magnetron. (ED) [45]

**synchro receiver (rotating machinery)** (or motor) A transformer electrically similar to a synchro transmitter and that, when the secondary windings of the two devices are interconnected, develops a torque increasing with the difference in angular alignment of the transmitter and receiver rotors and in a direction to reduce the difference toward zero. *See also:* synchro system. (PE) [9]

**synchroscope** An instrument for indicating whether two periodic quantities are synchronous. It usually embodies a continuously rotatable element the position of which at any time

is a measure of the instantaneous phase difference between the quantities: while its speed of rotation indicates the frequency difference between the quantities: and its direction of rotation indicates which of the quantities is of higher frequency. *Note:* This term is also used to designate a cathode-ray oscilloscope providing either: 1) a rotating pattern giving indications similar to that of the conventional synchroscope; or 2) a triggered sweep, giving an indication of synchronism. *See also:* instrument. (EEC/PE) [119]

**synchro system (alternating current)** An electric system for transmitting angular position or motion. It consists of one or more synchro transmitters, one or more synchro receivers or synchro control transformers and may include differential synchro machines. (PE) [9]

**synchro transmitter (rotating machinery)** (or generator) A transformer with relatively rotatable primary and secondary windings, the output of the secondary winding being two or more voltages that vary with and completely define the relative angular position of the primary and secondary windings. *See also:* synchro system. (PE) [9]

**synchrotron** A device for accelerating charged particles (for example, electrons) to high energies in a vacuum. The particles are guided by a changing magnetic field while they are accelerated many times in a closed path by a radio-frequency electric field. (ED) [45]

**SyncLink** A physical interconnect model, consisting of shared input and output links, that supports the RamLink logical protocols. SyncLink is optimized for short-distance single-board communications using a bused connection. The signal-levels for this interconnect model have been left for a future extension to this standard. (C/MM) 1596.4-1996

**sync packet (1)** A special packet that is used heavily during initialization and occasionally during normal operation for the purpose of checking and adjusting receiver circuit timing. (C/MM) 1596.3-1996, 1596-1992

**(2)** A packet consisting of four high and four low flags, as well as four data bytes whose bits are the complement of the flag values, typically generated when leaving shutdown (to synchronize the device and controller receiver circuits). (C/MM) 1596.4-1996

**sync signal** *See:* synchronizing signal.

**sync slip** An error condition in serial communication channels in which the receiving terminal incorrectly recognizes the start of a new message. (SUB/PE) 999-1992w

**syndrome** A particular group of symptoms that occur together and that define a particular disease or abnormality. (T&D/PE) 539-1990

**synergism** The presence of a performance or aging effect, produced by a combination of aging factors, that is different from the effect predicted by the simple summations of the effects of these factors acting separately. (DEI/RE) 775-1993w

**synonym** In hashing, an item whose hash value is identical to that of another item. *See also:* collision resolution. (C) 610.5-1990w

**syntactic error** A violation of the structural or grammatical rules defined for a language; for example, using the statement $B + C = A$ in Fortran, rather than the correct $A = B + C$. *Synonym:* syntax error. *Contrast:* semantic error. (C) 610.12-1990

**syntactic pattern recognition** A type of structural pattern recognition that identifies primitives and relationships in natural or artificial language patterns. (C) 610.4-1990w

**syntax (1) (A) (computers)** The structure of expressions in a language. **(B) (computers)** The rules governing the structure of a language. (C/C) [20], [85]

**(2) (software)** The structural or grammatical rules that define how the symbols in a language are to be combined to form words, phrases, expressions, and other allowable constructs. (C) 610.12-1990

**(3)** A category into which an attribute value is placed on the basis of its form. (C/PA) 1328-1993w, 1327-1993w, 1224-1993w

**(4)** The structural components or features of a language and rules that define the ways in which the language constructs may be assembled together to form sentences. (C/SE) 1320.2-1998

**(5)** The grammatical rules pertaining to the structure of an ATLAS statement. (SCC20) 771-1998

**(6)** The structure of expressions in a language and the rules governing the structure of a language. (SCC32) 1489-1999

**(7)** *See also:* attribute syntax. (C/PA) 1328.2-1993w

**syntax error** *See:* syntactic error.

**syntax template** A lexical construct containing an asterisk from which several attribute syntaxes can be derived by substituting text for the asterisk. (C/PA) 1328-1993w, 1224-1993w, 1327-1993w

**synthetic address** *See:* generated address.

**synthetic-aperture radar (SAR) (1)** A radar system that generates the effect of a long antenna by signal processing means rather than by the actual use of a long physical antenna. (AES/GCS) 172-1983w

**(2)** A coherent radar system that generates a narrow cross range impulse response by signal processing (integrating) the amplitude and phase of the received signal over an angular rotation of the radar line of sight with respect to the object (target) illuminated. *Note:* Due to the change in line-of-sight direction, a synthetic aperture is produced by the signal processing that has the effect of an antenna with a much larger aperture (and hence a much greater angular resolution). (AES) 686-1997

**synthetic-aperture radar-moving-target indication (SAR-MTI)** A synthetic-aperture imaging radar that also detects moving targets (especially slow-moving ground vehicles) and displays them on the SAR image. (AES) 686-1997

**synthetic benchmark program** A benchmark program that consists of a small program constructed especially for benchmarking purposes, but does not necessarily perform any useful function. (C) 610.10-1994w

**synthetic environment** The integrated set of data elements that define the environment within which a given simulation application operates. The data elements include information about the initial and subsequent states of the terrain including cultural features, and atmospheric and oceanographic environments throughout a DIS exercise. The data elements include databases of externally observable information about instantiable DIS entities, and are adequately correlated for the type of exercise to be performed. (DIS/C) 1278.1-1995, 1278.2-1995

**synthetic test (1)** A test in which the major part of, or the total current, is obtained from one source (current circuit), and the major part of, or all of the transient recovery voltage from a separate source or sources (voltage circuit). (SWG/PE) C37.100-1992, C37.081-1981r

**(2)** A test in which the major part of, or the total current, is obtained from a source or sources (current circuit), and the major part of, or all of the transient recovery voltage from a separate source or sources (voltage circuit). (SWG/PE) C37.083-1999

**synthesis tool** Any system, process, or tool that interprets RTL VHDL source code as a description of an electronic circuit and derives a netlist description of that circuit. (C/DA) 1076.6-1999, 1076.3-1997

**SyRS** *See:* System Requirements Specification.

**sysgen** *See:* system generation.

**system (1) (microcomputer system bus) (general system)** A set of interconnected elements that achieve a given objective through the performance of a specified function. (C/MM/IM/AIN) 796-1983r, 488.1-1987r, 696-1983w

**(2) (monitoring radioactivity in effluents)** The entire assembled equipment excluding only the sample collecting pipe. (NI) N42.18-1980r

**(3) (reliability data for pumps and drivers, valve actuators, and valves)** A collection of components arranged to provide a desired function (for example, containment spray system, residual heat removal system, high pressure coolant injection system). (PE/NP) 500-1984w
**(4) (seismic design of substations)** A group of components operating together to perform a function (for example, disconnect switch, support structure and foundation, relay protection system, and telemetering system). (PE/SUB) 693-1984s
**(5) (unique identification in power plants and related facilities)** A combination of two or more interrelated components that perform a specific function related to plant operation and safety. A system may peform a function such as control, monitoring, electrical, mechanical, or structural. (PE/EDPG) 804-1983r
**(6)** An integrated whole even though composed of diverse, interacting, specialized structures and subjunctions. *Notes:* 1. Any system has a number of objectives and the weights placed on them may differ widely from system to system. 2. A system performs a function not possible with any of the individual parts. Complexity of the combination is implied. (SMC) [63]
**(7) (computers)** A collection of components organized to accomplish a specific function or set of functions. (C) 610.3-1989w, 610.5-1990w, 610.12-1990
**(8) (electric and electronics parts and equipment)** A combination of two or more sets, generally physically separated when in operation, and such other units, assemblies, and basic parts necessary to perform an operational function or functions. Typical examples: telephone carrier system, ground-controlled approach (GCA) electronic system, telemetering system, facsimile transmission system. (GSD) 200-1975w
**(9) (test access port and boundary-scan architecture)** Pertaining to the nontest function of the circuit. (TT/C) 1149.1-1990
**(10) (measurement of radio-noise emissions)** An arrangement of interconnected devices and their cables designed to perform a particular function or functions. (EMC) C63.4-1991
**(11)** A group of devices and a controller interconnected with a system interface. (IM/AIN) 488.2-1992r
**(12)** Hardware and software collectively organized to achieve an operational objective. (SUB/PE) 999-1992w
**(13)** A set of interconnected boards that achieve a specified objective by performing designated functions. (C/BA/MM) 896.9-1994w, 1000-1987r
**(14)** One or more mainframes that are connected, having a common resource manager. Each device in a system has a unique logical address. (C/MM) 1155-1992
**(15) (A)** A collection of entities to be processed by applying a top-down, hierarchical approach. **(B)** A collection of interacting, interrelated, or interdependent elements forming a collective, functioning entity. **(C)** A set of objects or phenomena grouped together for classification or analysis. **(D)** A collection of hardware or software components necessary for performing a high-level function. (ATLAS) 1232-1995
**(16) (power operations)** A group of components connected or associated in a fixed configuration to perform a specified function of distributing power. (PE/IA/PSE) 858-1987s, 493-1997, 399-1997
**(17)** An integration of parts or constituents, their relationships, their mutual behavior or possible states, and the laws or rules that determine their behavior. (PE/NP) 1082-1997
**(18)** A set or arrangement of elements [people, products (hardware and software) and processes (facilities, equipment, material, and procedures)] that are related and whose behavior satisfies customer/operational needs, and provides for the life cycle sustainment of the products. (C/SE) 1220-1998
**(19) (A)** A collection of interacting components organized to accomplish a specific function or set of functions within a specific environment. **(B)** A group of people, objects, and procedures constituted to achieve defined objectives of some operational role by performing specified functions. A complete system includes all of the associated equipment, facilities, material, computer programs, firmware, technical documentation, services, and personnel required for operations and support to the degree necessary for self-sufficient use in its intended environment. (C/SE) 1362-1998
**(20)** A set of interlinked units organized to accomplish one or several specific functions. (C/SE) 1219-1998
**(21)** An interdependent group of people, objects, and procedures constituted to achieve defined objectives or some operational role by performing specified functions. A complete system includes all of the associated equipment, facilities, material, computer programs, firmware, technical documentation, services, and personnel required for operations and support to the degree necessary for self-sufficient use in its intended environment. (C/SE) 1233-1998
**(22)** An integrated composite that consists of one or more of the processes, hardware, software, facilities, and people, that provides a capability to satisfy a stated need or objective. (C/SE) 1517-1999
**(23) (controlling)** *See also:* controlling system. (SPD/PE) 32-1972r
**(24)** *See also:* batch system.
**(25)** *See also:* insulation system. (PE/TR) 1276-1997

**system acceptance** The formal approval of system operation parameters. (LM/C) 802.7-1989r

**system access** Attacks on computer system resources (e.g., files, directories, devices) from an intruder having access to the application software or operating system. This threat area assumes that anintruder has access to some form of man-machine interface in the system (e.g., terminal, operator console, workstation). (C/BA) 896.3-1993w

**system architecture (1) (software)** The structure and relationship among the components of a system. The system architecture may also include the system's interface with its operational environment. (C/SE) 729-1983s
**(2)** The composite of the design architectures for products and their life cycle processes. (C/SE) 1220-1998

**system assured capability (power operations)** The dependable capability of all power sources available to a system under short range conditions, including firm power contracts, less that reserve assigned to provide for planned outages, equipment and operating limitations, and unplanned outages of power sources. (PE/PSE) 858-1987s

**systematic drift rate (gyros)** That component of drift rate that is correlated with specific operating conditions. It is composed of acceleration-sensitive drift rate and acceleration-insensitive drift rate. It is expressed as angular displacement per unit time. (AES/GYAC) 528-1994

**systematic error (1) (electrothermic power meters)** The inherent bias (off-set) of a measurement process or of one of its components. (IM/HFIM) 544-1975w, 314-1971w
**(2) (electronic navigation)** Error capable of identification due to its orderly character. *See also:* navigation. (AES/RS) 686-1982s, [42]
**(3)** Errors where the magnitudes and directions are constant throughout the calibration process. (PE/PSIM) 4-1995

**systematic reuse** The practice of reuse according to a well-defined, repeatable process. (C/SE) 1517-1999

**system breakdown structure (SBS)** A hierarchy of elements, related life cycle processes, and personnel used to assign development teams, conduct technical reviews, and to partition out the assigned work and associated resource allocations to each of the tasks necessary to accomplish the objectives of the project. It also provides the basis for cost tracking and control. (C/SE) 1220-1998

**system bus** The IEEE 488.1 bus and protocols that interconnect the **devices** and **controllers** in a **system.** The content of this standard applies to device-dependent traffic over this bus. (IM/AIN) 488.2-1992r

**system bus bridge** The interface between a Profile B Futurebus+ and the system CPU/main memory which uses Fu-

turebus+ to communicate to I/O subsystems. Typically, the bridge couples the Profile B I/O bus to an internal system bus, which links CPU and main memory. A distinction should be made between the two types of bus bridges defined in this clause: the *bus bridge* must comply with Profile B requirements in all respects, while the *system bus bridge* may be exempt from certain Profile requirements, such as accessibility of its CSRs from the Futurebus+, and mechanical requirements. Where different or reduced constraints apply to system bus bridges, they are called out in the appropriate section of the profile. (C/BA) 896.2-1991w

**system clock driver** A functional module that provides a 16 MHz timing signal on the utility bus. (C/BA) 1014-1987

**system configuration process** The software that intializes the system. The monarch processor executes the system configuration process. (C/BA) 896.2-1991w, 896.10-1997

**system control (telephone switching systems)** The means for collecting and processing pulsing and supervisory signals in a switching system. (COM) 312-1977w

**system controller board** A board that resides in slot I of the backplane and has a system clock driver, an arbiter, an lack daisy-chain driver, and a bus timer. Some also have a serial clock driver, a power monitor, or both. (C/BA) 1014-1987

**system control signal group** A set of ten (10) signals, including two parity bits, which supply command and status information between the bus owner and the replying agent. (C/MM) 1296-1987s

**system crash (1)** An interval initiated by an unspecified circumstance that causes all processes (possibly other than special system processes) to be terminated in an undefined manner, after which any changes to the state and contents of files created or written to by a Conforming POSIX.1 Application prior to the interval are undefined, except as required elsewhere in this standard. (C/PA) 9945-1-1996
**(2)** An event initiated by an unspecified circumstance that causes all processes (possibly other than special system processes) to be terminated in an undefined manner, after which any changes to the state and contents of files created or written to by a conforming POSIX.5 application prior to the interval are undefined. (C) 1003.5-1999

**system delay time (mobile communication)** The time required for the transmitter associated with the system to provide rated radio-frequency output after activation of the local control (push to talk) plus the time required for the system receiver to provide useful output. *See also:* mobile communication system. (VT) [37]

**system demand factor** *See:* demand factor.

**system design (A) (software)** The process of defining the hardware and software architectures, components, modules, interfaces, and data for a system to satisfy specified system requirements. **(B) (software)** The result of the system design process. *See also:* system; data; component; software; hardware; requirement; module. (C/SE) 729-1983

**system design review** A review conducted to evaluate the manner in which the requirements for a system have been allocated to configuration items, the system engineering process that produced the allocation, the engineering planning for the next phase of the effort, manufacturing considerations, and the planning for production engineering. *See also:* critical design review; preliminary design review. (C) 610.12-1990

**system development cycle (1)** The period of time that begins with the decision to develop a system and ends when the system is delivered to its end user. *Note:* This term is sometimes used to mean a longer period of time, either the period that ends when the system is no longer being enhanced, or the entire system life cycle. *Contrast:* system life cycle. *See also:* software development cycle. (C) 610.12-1990
**(2)** The life cycle through which a system is developed, which consists of the following:

a) Concept development
b) Design
c) Test and construction
d) Operation
e) Maintenance

(PE/NP) 845-1999

**system, directly controlled** *See:* directly controlled system.

**system, discrete** *See:* discrete system.

**system, discrete-state** *See:* discrete-state system.

**system diversity factor** *See:* diversity factor.

**system documentation (1) (software)** Documentation conveying the requirements, design philosophy, design details, capabilities, limitations, and other characteristics of a system. *See also:* documentation; user documentation; requirement; system; design. (C/SE) 729-1983s
**(2)** All documentation provided with an implementation, except the conformance document. Electronically distributed documents for an implementation are considered part of the system documentation. (C/PA) 1326.2-1993w, 2003.2-1996, 1003.5-1999

**system effectiveness** A measurement of the ability of a system to satisfy its intended operational uses as a function of how the system performs under anticipated environmental conditions, and the ability to produce, test, distribute, operate, support, train, and dispose of the system throughout its life cycle. (C/SE) 1220-1998

**system element (1)** One or more basic elements with other components and necessary parts to form all or a significant part of one of the general functional groups into which a measurement system can be classified. While a system element must be functionally distinct from other such elements it is not necessarily a separate measurement device. Typical examples of system elements are: a thermocouple, a measurement amplifier, a millivoltmeter. *See also:* measurement system. (EEC/PE) [119]
**(2)** A product, subsystem, assembly, component, subcomponent, subassembly, or part of the system breakdown structure that includes the specifications, configuration baseline, budget, schedule, and work tasks. (C/SE) 1220-1994s
**(3)** One or more software, hardware, or firmware components that perform a specified task. *Note:* A system element may be a composed of a combination of system elements. A system element may be a system. (C/PA) 2000.1-1999

**system failure** Malfunctions in the hardware and software that could compromise the security of the system (for example, non-security-related failures and design flaws are not considered). The malfunctions include both intentional and inadvertent design or implementation flaws (including malicious hardware and software) and component failures. For intentional attacks, this threat area assumes that an intruder has access to the design or implementation processes of the system or to the operational system in such a way as to be able to cause a failure in a component. For inadvertent attacks, there may not be a specific intruder. (C/BA) 896.9-1994w, 896.3-1993w

**system, finite-state** *See:* discrete-state system.

**system flowchart** *See:* flowchart.

**system frequency (electric power system)** The prevailing frequency in hertz (Hz) of the alternating current and voltage throughout a power system. (PE/PSE) 94-1991w

**system frequency stability (mobile communication) (radio system)** The measure of the ability of all stations, including all transmitters and receivers, to remain on an assigned frequency-channel as determined on both a short-term and long-term basis. *See also:* mobile communication system. (VT) [37]

**system generation** The process of using an operating system to assemble and link together all the parts that constitute another operating system. (C) 610.10-1994w

**system ground (surge arresters)** The connection between a grounding system and a point of an electric circuit (for example, a neutral point). (PE/EDPG) 665-1995, [84], [8]

**system grounding conductor** An auxiliary solidly grounded conductor that connects together the individual grounding

conductors in a given area. *Note:* This conductor is not normally a part of any current-carrying circuit including the system neutral. *See also:* ground. (T&D/PE) [10]

**system handshake** A handshake in a broadcast operation where the handshake signal is from the last segment of the addressed system rather than from individual devices. (NID) 960-1993

**system hazard** A system condition that is a prerequisite to an accident. (C/SE) 1228-1994

**system high** The highest security level supported by a system. (C/BA) 896.3-1993w

**system, idealized** *See:* idealized system.

**system identification** An eight-character label describing the system. Leading spaces are not interpreted as leading zeros. This is intended to be used to identify the laboratory or experimental apparatus where the data were collected. This, along with the subsystem identification, can be used to uniquely describe the source of the data. (NPS/NID) 1214-1992r

**system incremental cost** The additional cost of delivering another megawatt of power to the load center. This cost is commonly called lambda (λ). (PE/PSE) 94-1991w

**system interconnection** The connecting together of two or more power systems. *See also:* direct-current distribution; alternating-current distribution. (T&D/PE) [10]

**system interface** An interface that connects a **device** or **controller** to the **system bus.** A "non-IEEE 488.2 system interface" is any interface other than **the system interface** that may happen to be connected to a **device** or **controller.** (IM/AIN) 488.2-1992r

**system integrator** A person who combines software and hardware into a working ATE. (SCC20) 993-1997

**system library (software)** A software library containing system-resident software that can be accessed for use or incorporated into other programs by reference; for example, a macro library. *Contrast:* master library; production library; software repository; software development library. (C) 610.12-1990

**system life cycle** The period of time that begins when a system is conceived and ends when the system is no longer available for use. *See also:* software life cycle; system development cycle. (C) 610.12-1990

**system load (1) (power operations)** Equal to internal load plus pumping load plus firm sales for resale. (PE/PSE) 858-1987s

**(2) (electric power system)** Total loads within the system including transmission and distribution losses. (PE/PSE) 346-1973w

**system logic (1) (test access port and boundary-scan architecture)** Any item of logic that is dedicated to realizing the nontest function of the component or is at the time of interest configured to achieve some aspect of the nontest function. (TT/C) 1149.1-1990

**(2)** That equipment that monitors the output of two or more channels and supplies output signals in accordance with a prescribed combination rule (for example, two of three, two of four, etc.). (PE/NP) 379-1994, 308-1980s

**system loss ($L_s$)** (of a radio system) The ratio of the input power to the terminals of the transmitting antenna to the available output power at the terminals of the receiving antenna. Usually expressed in decibels as a positive number. (AP/PROP) 211-1997

**system low** The lowest security level supported by a system. (C/BA) 896.3-1993w

**system management stack** The protocols residing above SDE that request services via an SDE SAP that is supported by the use of a bootstrap SAID with either of the two values reserved for system management. (C/LM) 802.10-1998

**system margin capability (power operations)** The difference between system capability and system load. (PE/PSE) 858-1987s

**system matrix** A matrix of transfer functions that relate the Laplace transforms of the system outputs and of the system inputs. *See also:* control system. (CS/IM/PE/EDPG) [120], [3]

**system maximum hourly load (power operations) (electric power system)** The maximum hourly integrated system load. This is an energy quantity usually expressed in kilowatt-hours per hour (kWh/h). (PE/PSE) 858-1987s, 346-1973w

**system memory** Read/write memory accessible by both the Processor and I/O Unit in the system address space. It is usually thought of as being in one or more third-party nodes, but it could alternatively be wholly or partially located in the communicating Processor or I/O nodes. (C/MM) 1212.1-1993

**system model** In computer performance evaluation, a representation of a system depicting the relationships between workloads and performance measures in the system. *See also:* workload model. (C) 610.12-1990

**system monitor and control subsystem (terrestrial photovoltaic power systems)** Logic and control circuitry that supervises the overall operation of the system by controlling the interaction between all subsystems. *See also:* array control. (PV) 928-1986r

**system, multidimensional** *See:* multidimensional system.

**system, multivariable** *See:* multivariable system.

**system noise (sound recording and reproducing system)** The noise output that arises within or is generated by the system or any of its components, including the medium. *See also:* noise.

**system nominal response** The rate of increase of the excitation system output voltage determined from the excitation system voltage response curve, divided by the rated field voltage. This rate, if maintained constant, would develop the same voltage-time area as obtained from the actual curve over the first half-second interval (unless a different time interval is specified). (PE/EDPG) 421.2-1990

**system of units** A set of interrelated units for expressing the magnitudes of a number of different quantities. (Std100) 270-1966w

**system operator (1)** A person designated to operate the system or parts thereof. (NESC) C2-1977s

**(2)** Electric utility personnel in charge of system-wide coordination of generation, interchange, and transmission security. (PE/PSE) 858-1993w

**system overshoot (control)** The largest value of system deviation following the first dynamic crossing of the ideal value in the direction of correction, after the application of a specified stimulus. *See also:* feedback control system. (IA/ICTL/IAC) [60]

**system performance testing (nuclear power generating station)** Tests performed on completed systems, including all their electric, instrumentation, controls, fluid, and mechanical subsystems under normal or simulated normal process conditions of temperature, flow, level, pressure, etc. 336-1980s

**system pin** A component pin that feeds, or is fed from, the on-chip system logic. (TT/C) 1149.1-1990

**system process (1)** An object, other than a process executing an application, that is defined by the system and has a process ID. (C/PA) 9945-1-1996

**(2)** An object, other than a process executing an application, that is defined by the system and has a process ID. An implementation shall reserve at least one process ID for system processes. (C) 1003.5-1999

**system production time** The part of operating time that is actually used by a user. *Contrast:* system test time. (C) 610.10-1994w

**system profile** A set of measurements used in computer performance evaluation, describing the proportion of time each of the major resources in a computer system is busy, divided by the time that resource is available. (C) 610.12-1990

**system, quantized** *See:* quantized system.

**system reboot** An implementation defined sequence of events that may result in the loss of transitory data, i.e., data that is not saved in permanent storage. This includes message queues, shared memory, semaphores, and processes. (C/PA) 9945-1-1996, 1003.5-1999

**system recovery time (mobile communication)** The elapsed time from deactivation of the local transmitter control until the local receiver is capable of producing useful output. *See also:* mobile communication system. (VT) [37]

**system-related outage** A forced outage that results from system effects or conditions and is not caused by an event directly associated with the component or unit being reported. *Note:* line outage occurrences due to cascading, out-of-step conditions, and so forth, are all examples of system-related outages. (PE/PSE) 859-1987w

**system reliability (software)** The probability that a system, including all hardware and software subsystems, will perform a required task or mission for a specified time in a specified environment. *See also:* system; operational reliability; software reliability; hardware. (C/SE) 729-1983s

**system reliability service (SRS)** A United Kingdom reliability information and database service. (PE/NP) 933-1999

**system requirements review** A review conducted to evaluate the completeness and adequacy of the requirements defined for a system; to evaluate the system engineering process that produced those requirements; to assess the results of system engineering studies; and to evaluate system engineering plans. *See also:* software requirements review. (C) 610.12-1990

**System Requirements Specification (SyRS)** A structured collection of information that embodies the requirements of the system. (C/SE) 1233-1998

**system reserve** The capacity, in equipment and conductors, installed on the system in excess of that required to carry the peak load. *See also:* generating station. (T&D/PE) [10]

**system reset** An initialization event intiated when any module asserts the re* signal for 100 to 200 ms. (C/BA) 896.2-1991w, 896.10-1997

**system resources chart** *See:* block diagram.

**system routing code (telephone switching systems)** In World Zone 1, a three-digit code consisting of a country code and two additional numerals that uniquely identifies an international switching center. *See also:* world-zone number. (COM) 312-1977w

**system safety (1)** Freedom from system hazards. (C/SE) 1228-1994

**(2)** The application of engineering and management principles, criteria, and techniques to optimize all aspects of safety within the constraints of operational effectiveness, time, and cost throughout all phases of the system life cycle. (VT/RT) 1474.1-1999, 1483-2000

**system safety goals—quantitative** A quantitative limit of the probability and/or frequency with which any vital function fails to be implemented safely. (VT/RT) 1483-2000

**system safety program** The combined tasks and activities of system safety management and system safety engineering that enhance operational effectiveness by satisfying the system safety requirements in a timely, cost-effective manner throughout the system life cycle. (VT/RT) 1483-2000, 1474.1-1999

**system safety program plan** A formal document that fully describes the planned safety tasks required to meet the system requirements, including organizational responsibilities, methods of accomplishment, milestones, depth of effort, and integration with other program engineering and management functions. (VT/RT) 1483-2000

**system, sampled-data** *See:* sampled-data system.

**system scheduling priority** A number used as advice to the system to alter process scheduling priorities. Raising the value of the system scheduling priority should give a process additional preference when scheduling a process to run. Lowering the value should reduce the preference and make a process less likely to run. Typically, a process with higher system scheduling priority will run to completion more quickly than an equivalent process with lower system scheduling priority. A scheduling priority of zero specifies the default policy of the system. (C/PA) 9945-2-1993

**system science** The branch of organized knowledge dealing with systems and their properties, the systematized knowledge of systems. *See also:* system; cybernetics; learning system; systems engineering; adaptive system; tradeoff. (SMC) [63]

**systems engineering (1)** The application of the mathematical and physical sciences to develop systems that utilize economically the materials and forces of nature for the benefit of mankind. *See also:* system science. (SMC) [63]

**(2)** An interdisciplinary collaborative approach to derive, evolve, and verify a life-cycle balanced system solution that satisfies customer expectations and meets public acceptability. (C/SE) 1220-1994s

**systems management** In networking, functions in the application layer related to the management of various OSI resources and their status across all layers of the OSI architecture. (LM/C) 610.7-1995, 8802-6-1994, 802.10-1992

**systems management entity** An entity that carries out communications to perform systems management functions such as monitoring, controlling and coordination in the OSI environment. (C) 610.7-1995

**systems network architecture** A network architecture used widely by IBM and its compatible products for transmitting information units through and controlling the configuration and operation of a network. (C) 610.10-1994w

**system software (software)** Software designed to facilitate the operation and maintenance of a computer system and its associated programs; for example, operating systems, assemblers, utilities. *Contrast:* application software. *See also:* support software. (C) 610.12-1990

**system-source short-circuit current** The short-circuit current when the source of the short-circuit current is from the power system through at least one transformation. (SWG/PE) C37.013-1997

**system specification** Agreed description of the requirements of the system. (C/BA) 896.9-1994w

**system state (modeling and simulation) (software)** The values assumed at a given instant by the variables that define the characteristics of a system, component, or simulation. *Synonym:* system state. *See also:* steady state; final state. (C/BA) 896.9-1994w

**system structure** (unique identification in power plants) A combination of two or more integrated components, generally physically remote or occupying a large area, interacting to perform a specific function important to plant operation or safety, or both. A system may be civil/structural, that is, a building or structure, mechanical/fluid, or electrical/control. A system, for the purpose of IEEE Std 803-1983, will not be considered a subsystem of another system. (PE/EDPG) 803-1983r

**systemtag (microprocessor operating systems parameter types)** A "tag" returned by one function for use by another. Its contents may not be examined or changed. Its form is system dependent. A systemtag is valid system-wide (that is, global) and may be passed between processes. (C/MM) 855-1985s

**system test** A test, or collection of tests, that may use an external memory buffer and may require cooperation of other nodes. For example, identical unit architectures may collaborate to test cache coherence or to generate background "noise" traffic for other nodes being tested. A system test is invoked by writing to the TEST_START register. (C/MM) 1212-1991s

**system testing (1) (software)** Testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. *See also:* interface testing; integra-

tion testing; component testing; unit testing. (C/PE/NP) 610.12-1990, 7-4.3.2-1993

**(2)** The activities of testing an integrated hardware and software system to verify and validate whether the system meets its original objectives. (C/SE) 1012-1998

**(3)** Preoperational testing to verify components of the system, and operational testing to verify the coordination of the system components for proper design operation of the system functions. (PE/EDPG) 1248-1998

**system test time** The part of operating time during which the computer is tested for proper system operation. *Contrast:* system production time. (C) 610.10-1994w

**system time (1) (supervisory control, data acquisition, and automatic control)** A coordinated value of time maintained at stations throughout the power system. (SWG/PE) C37.100-1992

**(2)** A coordinated value of time maintained throughout the control and data acquisition equipment. (SUB/PE) C37.1-1994

**(3)** The state of any system element that is used to synchronize system events with real-world events based on a date, time, or combination of the two. (C/PA) 2000.2-1999, 2000.1-1999

**system transaction** A complete operation, such as a memory read or write, as viewed from the initiating unit. A system transaction can be translated into one or more bus transactions by the Futurebus+ interface to complete the operation. (C/BA) 10857-1994

**system-transfer function (automatic control)** The transfer function obtained by taking the ratio of the Laplace transform of the signal corresponding to the ultimately controlled variable to the Laplace transform of the signal corresponding to the command. *See also:* feedback control system. (IM/PE/EDPG) [120], [3]

**system under test (SUT)** The computer system hardware and software on which the implementation under test operates. (C/PA) 2003-1997

**system unit (SU) (1)** The equipment reference increment mounting pitch equal to 25 mm. (C/BA) 1101.3-1993

**(2)** The equipment reference increment mounting pitch, 1 SU = 25.0 mm, for height, width, and depth. (C/MM) 1301.3-1992r, 1301.1-1991

**(3)** The equipment reference increment or mounting pitch ($mp_1$), used for length and width (1 SU = 25 mm = $mp_1$). (C/BA) 1301.4-1996

**system utilization factor** *See:* utilization factor.

**system validation** *See:* validation.

**system verification** *See:* verification.

**system voltage (1) (electric power systems in commercial buildings)** The root-mean square phase-to-phase voltage of a portion of an ac electric system. Each system voltage pertains to a portion of the system that is bounded by transformers or utilization equipment. (IA/PSE) 241-1990r

**(2)** Phase-to-phase voltage of the circuit(s). When phase-to-ground voltage is the intention, it should be so noted. (PE/T&D) 957-1995

**(3) (power and distribution transformers)** The root-mean-square (rms) phase-to-phase power frequency voltage on a three-phase alternating-current electric system. (PE/SPD/TR) C57.12.80-1978r, C62.22-1997

**(4)** The rms power-frequency voltage from line-to-line, as distinguished from the voltage from line-to-neutral. (SPD/PE) C62.11-1999, C62.62-2000