

MODERN
DICTIONARY
of
ELECTRONICS

SEVENTH EDITION
REVISED AND UPDATED

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operator that, for a monthly fee, provides the viewer with typically 30 to 75 or more channels of programming. 3. A system for distributing television programming by a cable network rather than by electromagnetic radiation.

cable vault—A vault in which the outside plant cables are spliced to the tipping cables.

cabling—1. The assembly of wire bundles extended from one physical structure to another to interconnect the circuits within structures. Cabling differs from wire jumpers in that it is understood to be external to the physical structures and may include tubing sheaths, zipper tubing, or rubber jackets. 2. Twisting together two or more insulated conductors by machine to form a cable. This also is a term loosely applied to bundling wires together, such as in the forming of wire harnesses. 3. In fiber optics, a method by which a group of fibers or bundle of fibers is mechanically assembled.

cache—1. A small, fast memory built into a processor to give faster access to the data and instructions that a program uses repeatedly (also called cache memory, buffer storage). 2. A small, fast storage area interposed between the main memory and CPU to improve memory-transfer rates and processor efficiency. The name is derived from the fact that the memory is hidden from or transparent to the programmer. 3. A storage area for frequently accessed information. Retrieval of the information is faster from the cache than the original source. There are many types of cache, including RAM cache, secondary cache, disk cache, and cache memory, to name a few. 4. In a computer system, a small but very high-speed memory buffer situated between the processor and main memory. It operates on the principle that certain memory locations tend to be accessed very often (normally for reads). Thus, when a main memory location is read, it is stored in the cache at the same time.

cache memory—1. A high-speed, low-capacity computer memory similar to a scratch-pad memory except that it has a larger capacity. 2. The fastest portion of the overall memory, which stores only the data that the computer may need in the immediate future. 3. A high-speed buffer memory used between the central processor and main memory. The cache is filled at medium speed from the main memory. Instructions and programs can operate at higher speed if found in the cache. If not found, a new segment is loaded. The cache contains the instruction or sequence of instructions most likely to be executed next. 4. A special, extra-fast part of RAM in which frequently accessed information is stored. Same as memory cache and RAM cache. 5. *See* cache. 6. A fast random-access memory system designed to store the most frequently accessed data in RAM.

cactus needle—A phonograph needle made from the thorn of a cactus plant.

CAD—Abbreviation for computer-aided design. 1. Use of a computer to aid in the design of complex MSI or LSI circuit arrays. CAD is especially useful for custom IC fabrication. 2. Man/computer interactions for the design and testing of customer MSI/LSI arrays and other complex engineering designs in a reasonable time frame. 3. Any system or process using a computer to aid in the creation or modification of a design. 4. High-performance design workstations that enable designers to manipulate parts diagrams and simulate operations, among other things. Can be linked to computer-aided manufacturing systems.

CADAM—Computer-augmented design and manufacturing system for design and analysis functions, developed by Lockheed for the aerospace industry and licensed by IBM.

CAD/CAM—Computer-aided design/computer-aided manufacturing. Two highly specialized technical applications of a computer to improve the productivity of the engineer.

cadmium—A metallic element widely used for plating steel hardware or chassis to improve its appearance and solderability and to prevent corrosion. It is also used in the manufacture of photocells.

cadmium cell—A standard cell used as a voltage reference; at 20°C its voltage is 1.0186 volts.

cadmium selenide photoconductive cell—A photoconductive cell that uses cadmium selenide as the semiconductor material. It has a fast response time and high sensitivity to longer light wavelengths, such as those emitted by incandescent lamps and some infrared light sources.

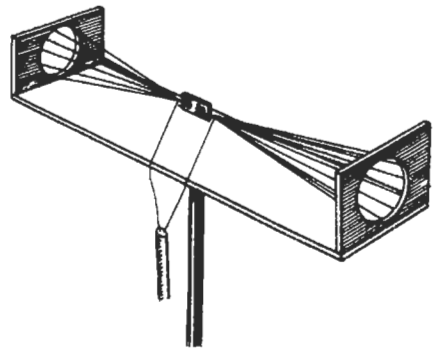
cadmium sulfide cell—*See* cadmium sulfide photoconductive cell.

cadmium sulfide photoconductive cell—A photoconductive cell in which a small wafer of cadmium sulfide is used to provide an extremely high dark-light resistance ratio. Some of the cells can be used directly as a light-controlled switch operated from the 120-volt ac power line.

CAE—Abbreviation for computer-aided engineering. The use of general-purpose computers and special application software to automate routine, iterative hardware engineering tasks.

cage—1. A completely shielded enclosure. 2. A screened room that is covered with a grounded fine-mesh conductive screen on all sides to allow measurements within the cage without any influence or interference from extraneous signals.

cage antenna—An antenna comprising a number of wires connected in parallel and arranged in the form of a cage. This arrangement reduces the copper losses and increases the effective capacity.



Cage antenna.

calculating—Computing a result by multiplication, division, addition, or subtraction or by a combination of these operations. A data-processing function.

calculating punch—A punched-card machine that reads data from a group of cards and punches new data in the same or other cards.

calculator—1. A device capable of performing arithmetic. 2. A calculator as in definition 1 that requires frequent manual intervention. 3. Generally and historically, a device for carrying out logical and arithmetical digital operations of any kind.

calculator mode—Also called fast answerback. An interactive computer system that has a mode which allows

radix complement—Also called true complement. A number obtained by subtracting each digit of the given number from one less than the radix, then adding to the least significant digit, executing all required carries. Examples are the tens complement in decimal notation and the two's complement in binary notation.

radix-minus-one complement—Also called diminished-radix complement. A number obtained by subtracting each digit of the given number from one less than the radix. Examples are the nine's complement in decimal notation and the one's complement in binary notation.

radix notation—A positional representation in which any two adjacent digit positions have significances in an integral ratio called the radix of the least significant of the two positions; the digit in any position may have a value from zero to one less than the radix of that position.

radix point—Also called base point, and binary point, decimal point, etc., depending on the numbering system. The index that separates the integral and fractional digits of the numbering system in which the quantity is represented.

radome—Also called radar dome. The housing that protects a radar antenna from the elements, but does not block radio frequencies.

radux—A long-distance, low-frequency navigational system that provides hyperbolic lines of position. It is of the continuous-wave, phase-comparison type.

railing—Radar pulse jamming at high recurrence rates (50 to 150 kHz). On a radar indicator, it results in an image resembling fence railing.

railings—The pattern produced on an A-scope by continuous waves modulated with a high-frequency signal. It appears as a series of vertical lines resembling target echoes along the baseline.

rain-barrel effect—The characteristic sound noted on an equalized line that is overcompensated.

rainbow—The technique that applies pulse-to-pulse frequency changing to identify and discriminate against decoys and chaff.

rainbow generator—A signal generator with which the entire color spectrum can be produced on the screen of a color television receiver. The colors merge together as in a rainbow. *See also* keyed rainbow generator.

rake angle—The angle that a stylus makes with a phonograph record when viewed from the side.

RAM—Abbreviation for random-access memory.

ram—The moving part of the head of a crimping tool.

ramark—Also called a radar marker. A fixed radar transmitter that emits a continuous signal that is used as a bearing indication on a radar display.

ramp—A voltage or current that varies at a constant rate; for example, that portion of the output waveform of a time/linear sweep generator used as a time base for scope display.

ramping—Control method used to vary the pulse rate from one value to another, to produce either acceleration or deceleration of a stepper motor.

ramp input—A change, in an input signal, that varies at a constant rate.

Ramsauer effect—The absorption of slow-moving electrons by intervening matter.

random—Irregular; having no set pattern.

random access—1. Access to a computer storage under conditions whereby there is no rule for predetermining the position from where the next item of information is to be obtained. 2. The process of obtaining information from the computer storage with the access time independent of the location of the information. 3. Access method in a computer in which each word can be retrieved directly

by its address. 4. The ability to gain access to any location of a memory unit in a time that is independent of the location itself. 5. A term used to describe computer files that do not have to be searched sequentially to find a particular record but can be addressed directly. 6. The ability of a computer to directly access random bits of memory without going through a predefined sequence of locations.

random-access device—Also called direct-access device. A data-storage device in which the access time is effectively independent of the location of the stored data.

random-access memory—Abbreviated RAM.

1. A storage arrangement from which information can be retrieved with a speed that is independent of the location of the information in the storage. For example, a core memory is a random-access memory, but a magnetic tape memory is not. 2. A device that permits individual interrogation of any memory cell in a completely random sequence. Any point in the total memory system can be accessed without looking at any other bit. 3. A memory that may be written to, or read from, any address location in any order. May refer specifically to the integrated circuit method of implementation. 4. A read/write memory, usually a permanent memory, that stores information in such a way that each bit of information may be retrieved within the same amount of time as any other bit. As opposed to serial memory. 5. A type of memory that offers access to storage location within it by means of X and Y coordinates. 6. The main memory of a computer. Instructions can be written into and read out of RAM, and its contents can be changed at any time. But its contents are wiped clean when power is shut off. *See* ROM. 7. A type of memory that is used to store and retrieve digital data that is constantly being changed, updated, or modified in some way. 8. A memory in which the central processor can access all locations with equal facility. Sometimes called read/write memory because data can be added to or removed from such memory as an ordinary procedure. RAM is used for both storage of a computer operation program and for data. 9. A memory that permits access to any of its address locations in any desired sequence with similar access time to each location. The term has come to mean only a read/write memory, not a ROM or EPROM, which, strictly speaking, are also random-access memories.

random-access programming—Programming a problem for a computer without regard to the access time to the information in the registers called for in the program.

random-access storage—A form of storage in which information can be recovered immediately, regardless of where it was stored. For example, magnetic-core memory devices will usually yield any bit of information with almost no time penalty regardless of where it is located, while magnetic tape must be run until the required information can be found.

random bundle—A fiber-optics bundle that scrambles an image but can convey light from a source to a relatively inaccessible point, and then again from that location to a photocell.

random error—The inherent imprecision of a given process of measurement; the unpredictable component of repeated independent measurements on the same object under sensible uniform conditions, usually of an approximately normal (Gaussian) frequency distribution, other than systematic or erratic errors and mistakes, sometimes called short-period errors.

random experiment—An experiment that can be repeated a large number of times but may yield different results each time, even when performed under similar circumstances.

signal. 11. A device that is designed to produce a signal or offer indication in response to an event or stimulus within its detection zone. 12. A component that provides an electrical signal in response to a specific physical or chemical stimulus such as heat, pressure, magnetic field, or a particular chemical vapor. Microsensors are fabricated using processes similar to those for manufacturing ICs, or extensions of such processes. Integrated microsensors incorporate an integrated circuit on the same die as that used for the sensor element.

sensory robot—A computerized robot with one or more artificial senses, usually sight or touch.

sentinel—1. A symbol marking the beginning or end of some piece of information in digital-computer programming. 2. *See* tag.

separate excitation—Excitation in which generator field current is provided by an independent source, or motor field current is provided from a source other than the one connected across the armature.

separately instructed carry—Executing the carry process in a computer by allowing carry information to propagate to succeeding places only when a specific signal is received.

separation—The degree to which two stereo signals are kept apart. Stereo realism is dependent on the successful prevention of their mixture before reaching the output terminals of the power amplifier. Tape systems have a separation capability inherently far superior to that of the disc systems.

separation circuit—A circuit that separates signals according to their amplitude, frequency, or some other selected characteristic.

separation filter—A combination of filters used to separate one band of frequencies from another—often, to separate carrier and voice frequencies for transmission over individual paths.

separation loss—The loss that occurs in output when the surface coating of a tape fails to make perfect contact with the surfaces of either the record or reproduce head.

separator—1. An insulating sheet or other device employed in a storage battery to prevent metallic contact between plates of opposite polarity within a cell. 2. An insulator used in the construction of convolutely wound capacitors. 3. *See* delimiter.

septate coaxial cavity—A coaxial cavity with a vane or septum added between the inner and outer conductors. The result is a cavity that acts as if it had a rectangular cross section bent transversely.

septate waveguide—A waveguide with one or more septa placed across it to control microwave power transmission.

septum—A thin metal vane that has been perforated with an appropriate wave pattern. It is inserted into a waveguide to reflect the wave. Plural: septa.

sequence—1. The order in which objects or items are arranged. 2. To place in order. 3. A succession of terms so related that each may be derived from one or more of the preceding terms in accordance with some fixed law.

sequence checking routine—A checking routine that examines every instruction executed and prints certain data concerning this check.

sequence control—Automatic control of a series of operations in a predetermined order.

sequencer—1. The component of a processor that controls the program flow by implementing branches for subroutine processing and handling interrupts. 2. A device or computer program that records, edits, and plays back MIDI data much like a word processor for music, such that you can fix wrong notes or lengthen or shorten notes.

3. A mechanical or electronic device that may be set to initiate a series of events and to make the events follow in sequence. 4. A circuit that pulls information from the control store memory, based on external conditions. 5. In a bit-slice system, the module in charge of providing the next microprogram address to the microprogram memory. Essentially a complex multiplexer, but may include stack facilities and a loop counter.

sequence relay—A relay that controls two or more sets of contacts in a predetermined sequence.

sequencer register—In a computer, a counter that is pulsed or reset following the execution of an instruction to form the new memory address that locates the next instruction.

sequence timer—A succession of time-delay circuits arranged so that completion of the delay in one circuit initiates the delay in the following circuit.

sequencing equipment—A special selecting device by means of which messages received from several teletypewriter circuits may be subsequently selected and retransmitted over a smaller number of trunks or circuit.

sequency of operation—A detailed written description of the order in which electrical devices and other parts of the equipment should function.

sequential access—1. An access mode in which records are retrieved in the same order in which they were written. Each successive access to a file refers to the next record in the file. 2. A term used to describe files such as magnetic tape that must be searched sequentially to find any desired record. 3. Computer access method in which a word is accessed by scanning sequential blocks or records. For example: a tape. 4. Data on storage, such as magnetic tape, that must be searched serially from the beginning to find any desired record.

sequential-access file—A type of file structure in which data may only be accessed sequentially, one record at a time. Data stored on magnetic tape is an example of a sequential file.

sequential-access memory—Abbreviated SAM. 1. A serial-type memory in which words are selected in a fixed order. The addressing circuit steps from word to word in a predetermined order, with the result that the access time for the stored information (words) is variable. 2. A method of information retrieval in which the complete memory is scanned and each word is, in its turn, read out, worked on, then rewritten.

sequential circuit—A digital circuit that changes state according to an input signal (normally under clock control); it must be tested with a sequence of signals.

sequential color television—A color television system in which the three primary colors are transmitted in succession and reproduced on the receiver screen in the same manner.

sequential color transmission—The transmission of television signals that originate from variously colored parts of an image in a particular sequential order.

sequential computer—A computer in which events occur in time sequence with little or no simultaneous occurrence or overlap of events.

sequential control—Digital-computer operation in which the instructions are set up in sequence and fed to the computer consecutively during the solution of a problem.

sequential element—A device having at least one output channel and one or more input channels, all characterized by discrete states, such that the state of each output channel is determined by the previous states of the input channels.

sequential interlace—A method of interlacing in which the lines of one field are placed directly under the corresponding lines of the preceding field.