

WILEY ELECTRICAL AND ELECTRONICS ENGINEERING DICTIONARY

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campus-wide information system A computer-based information retrieval system used in an educational institution, such as a university. Useful, for instance, in course selection, or for accessing required readings. Its abbreviation is CWIS.

can A metal container which serves to enclose a component. For example, the outer casing of an electrolytic capacitor.

CAN Abbreviation of **cancel character**.

cancel 1. To diminish, annul, or omit. 2. To match in force or effect, especially when diminishing, annulling, or omitting.

cancel character In data transmission, a control character indicating that the associated text should be canceled. Its abbreviation is CAN.

candela The fundamental SI unit of luminous intensity. Formerly, it was defined in various manners, ranging from the light of a certain type of candle under particular conditions, to more recently as a given proportion of the radiating power of a blackbody under specific conditions. It is currently defined as the luminous intensity of a light source emitting monochromatic radiation in a given direction at a frequency of 540 terahertz, with a power of 1/683 watt per steradian in the specified direction. Its symbol is **cd**. This term was formerly known as **candle**, **international candle**, **standard candle**, or **new candle**.

candle Former name of **candela**.

candle power Same as **candlepower**.

candlepower Luminous intensity expressed in **candelas**. Also spelled **candle power**. Its abbreviation is **cp**.

cannibalize To remove one or more components from equipment which is in working order, to use for repairing or operating other equipment.

cannot find server An error 404 resulting from the server not being available. Also called **server not found**.

CAP Abbreviation of **carrierless amplitude phase**.

capacimeter Abbreviation of **capacitance meter**.

capacitance The ability to store electric charge between conductors which are separated by a dielectric material, when a potential difference exists between said conductors. Its value is expressed as the ratio of stored electric charge to the potential difference, and is expressed in farads, although in practicality this unit is so large that it is more common to use microfarads or picofarads. Its symbol is **C**. Formerly, this concept was known as **capacity** (4).

capacitance box A device containing an assembly of capacitors and switches, enabling precise adjustment of the capacitance at the terminals.

capacitance bridge A bridge which enables measuring or comparing a capacitance against a known capacitance. An example is a Schering bridge.

capacitance filter A filter consisting solely of a capacitor. Such a filter tends to smooth voltage variations because a capacitor resists discharging instantaneously. Used, for instance, in audio applications.

capacitance meter A direct-reading meter for measuring capacitance of circuits or capacitors. Its abbreviation is **capacimeter**, or **C meter**.

capacitance relay A relay which responds to very small variations in capacitance, similar to those produced by a human body, or a part of it, such as a hand. Such a device may be used, for instance, as an intrusion alarm. Also called **proximity relay**.

capacitance standard A capacitor whose capacitance value is precisely known, and which serves to measure or compare unknown capacitances. May be used, for instance in a Schering bridge. Also called **standard capacitance**.

capacitance temperature coefficient A numerical value that indicates the relationship between a change in the capaci-

tance of a component, device, material, or area, as a function of temperature. Also called **temperature coefficient of capacitance**.

capacitive Pertaining to **capacitance**.

capacitive coupling The coupling of two or more circuits by means of a **capacitance**. Also called **electrostatic coupling**.

capacitive diaphragm A metal plate placed inside a waveguide to introduce capacitive reactance at the transmitted frequency.

capacitive-discharge ignition An automotive ignition system in which energy is stored in a capacitor, and is then discharged across the gap of a spark plug at the proper intervals.

capacitive feedback The return of part of the energy from the output of a circuit back to its input by means of a common capacitance.

capacitive load A load in which current leads voltage. The capacitive reactance exceeds the inductive reactance in such a load. Also called **leading load**.

capacitive loudspeaker Same as **capacitor speaker**.

capacitive post A post placed inside a waveguide to introduce capacitive reactance.

capacitive reactance The opposition to the flow of AC by the capacitance of a capacitor or circuit. Its symbol is X_C , it is measured in ohms, and its formula is: $X_C = 1/2\pi fC$, where π is pi, f is frequency in hertz, and C is capacitance in farads.

capacitive speaker Same as **capacitor speaker**.

capacitive transducer A transducer consisting of two capacitor plates, one fixed and the other flexible or movable, which converts changes in applied voltage into movement. Also called **electrostatic transducer**.

capacitive tuning The tuning of a circuit by adjusting a variable capacitor.

capacitive voltage divider A voltage divider formed by two or more capacitors.

capacitor A component which has **capacitance**. The conductors separated by the dielectric material are known as electrodes or plates. The value of the capacitance will vary depending on the size, shape, and composition of the conductors, the distance between them, and on the dielectric. In addition to storing charge, a capacitor blocks DC, and may be fixed or variable. There are various types, including mica, electrolytic, metallized paper, and MOS capacitors. Formerly known as **condenser** (3).

capacitor amplifier An amplifier circuit whose active component is a ferroelectric capacitor whose capacitance varies as a function of the applied voltage. Also called **dielectric amplifier**.

capacitor antenna An antenna which utilizes the capacitance between two conductors or systems of conductors. Also called **condenser antenna**.

capacitor bank A group of capacitors connected in series and/or parallel.

capacitor color code A system utilizing markings, such as color dots and bands, to indicate capacitor information such as values, multipliers, and tolerance.

capacitor filter A power-supply filter in which a capacitor is connected to the output of the rectifier. That is, the input component of the filter is a capacitor. Also called **capacitor-input filter**.

capacitor-input filter Same as **capacitor filter**.

capacitor loudspeaker Same as **capacitor speaker**.

capacitor microphone A microphone in which a flexible metal diaphragm and a rigid plate form a two-plate air capacitor. As the incident sound waves make the flexible plate

far field 1. Same as **far-field region**. 2. The electromagnetic field further than a given distance from a source of electromagnetic radiation. 3. The sound field further than a certain distance to a sound source. May be, for instance, that extending beyond two wavelengths.

far-field diffraction pattern The diffraction pattern of a light source which is observed at an effectively infinite distance from the object diffracting it. The light source may be, for instance, the output of an optical fiber, or that of an LED. Also called **Fraunhofer diffraction pattern**.

far-field region The region in which the transmitted energy from an antenna behaves as if it were emanating from a point source in the vicinity of said antenna. Such a region usually begins at a distance of $2D^2/\lambda$ from the antenna, where D is the maximum overall dimension of said antenna, and λ is the wavelength considered. The region of space closer to the antenna than the far field is the **near-field region**. Also called **far field (1)**, **far region**, **far zone**, **Fraunhofer region**, or **radiation zone**.

far infrared Its abbreviation is **far IR**. 1. Pertaining to **far-infrared radiation**. 2. Same as **far-infrared radiation**.

far-infrared radiation Electromagnetic radiation in the infrared region which is furthest from visible light. It corresponds to wavelengths of approximately 10 to 1000 micrometers, though the defined interval varies. Also called **far infrared (2)**, or **long-wave infrared**.

far IR Abbreviation of **far infrared**.

far region Same as **far-field region**.

far ultraviolet Its abbreviation is **far UV**. 1. Pertaining to **far-ultraviolet radiation**. 2. Same as **far-ultraviolet radiation**.

far-ultraviolet radiation Electromagnetic radiation which is between near ultraviolet and extreme ultraviolet. It corresponds to wavelengths of approximately 200 to 300 nm, though the defined interval varies. Also called **far ultraviolet (2)**, or **long-wave ultraviolet**.

far UV Abbreviation of **far ultraviolet**.

far zone Same as **far-field region**.

farad The SI unit of capacitance. It is equivalent to the capacitance of a capacitor in which a charge of 1 coulomb increases the potential difference between its plates by 1 volt. In practicality, this unit is so large that it is more common to use microfarads or picofarads. Its symbol is **F**.

faraday Same as **Faraday constant**.

Faraday cage An enclosure which blocks the effects of an electric field, while allowing free passage to magnetic fields. A Faraday cage usually consists of a network of parallel wires which provides a low-resistance path to ground. Such a network, for instance, may be incorporated into special plastic bags, providing safer storage and handling of circuit boards en route to being installed. Such a bag does not have to be grounded. Also called **Faraday shield**, **Faraday shielding (1)**, **Faraday screen**, **Faraday electrostatic shield**, or **shielded room**.

Faraday constant Its symbol is **F**. A physical constant equal to approximately 9.64853×10^4 coulombs per mole. Its formula is: $F = N_A \cdot e$, where N_A is Avogadro's number, and e is the electron charge. It is equal to the electric charge carried by a mole of electrons, or by a mole of singly-charged ions. Also called **faraday**.

Faraday dark space In a glow-discharge tube, a dark space between the negative glow and the positive column.

Faraday effect The rotation of the plane of polarization of an electromagnetic wave as it passes through certain materials, when under the influence of a magnetic field parallel to the direction of propagation of said wave. Also called **Kundt effect**, or **magnetic rotation**.

Faraday electrostatic shield Same as **Faraday cage**.

Faraday rotation The rotation of the plane of polarization of an electromagnetic wave as a result of the **Faraday effect**.

Faraday screen Same as **Faraday cage**.

Faraday shield Same as **Faraday cage**.

Faraday shielding 1. Same as **Faraday cage**. 2. The use of a **Faraday cage**.

Faraday's law 1. Either of **Faraday's laws of electrolysis**. 2. Same as **Faraday's law of electromagnetic induction**.

Faraday's law of electromagnetic induction A law which states that the electromotive force induced in a conductor is proportional to the rate of change of magnetic flux through it. Also called **Faraday's law of induction**, or **law of induction**.

Faraday's law of induction Same as **Faraday's law of electromagnetic induction**.

Faraday's laws of electrolysis 1. A law stating that during electrolysis, the amount of a substance deposited onto an electrode or dissolved into solution is directly proportional to the current passed. 2. A law stating that the amount of a substance deposited onto an electrode or dissolved into solution is proportional to the equivalent weight of said substance.

faradic current An intermittent and nonsymmetrical AC, such as that produced by the secondary winding of an induction coil.

Farnsworth dissector tube Same as **Farnsworth image dissector**.

Farnsworth image dissector A camera tube in which the picture to be transmitted is focused upon a photosensitive surface from which electrons are emitted proportionally to the light of each part of the picture. These electrons are focused, in sequence, onto a controller electrode, which produces the output video signal. Also called **Farnsworth dissector tube**, **image dissector**, or **dissector tube**.

fast-access storage For a given computer system, the storage from which data can be retrieved most rapidly.

Fast ATA An enhanced version of the IDE interface. It supports both the ATA-2 and ATAPI interfaces, providing for significantly faster transfer rates when using hard disks, optical discs, or tape drives. In addition, it supports hard disks with much larger capacities. Also called **Fast IDE**, **ATA-2**, or **EIDE**.

fast-blow fuse A fuse which opens a circuit at a lower amperage than a normal-blow fuse would. Used, for instance, to protect especially delicate components, circuits, stages, devices, units, equipment, or systems.

fast break The opening of an electric circuit without a delay. This contrasts with a **delayed break**, where there is a specified delay.

fast busy signal A busy signal that indicates that the central office either did not understand the dialed digits, or that a part of the network is too busy to process the call. This contrasts with a **slow busy signal**, which indicates that the dialed number is currently in use.

fast charge The accelerated charging of a rechargeable battery, such as a lithium-ion battery.

fast charger A battery charger used for **fast charges**. Such chargers usually maintain a trickle charge once the full charge is reached.

fast Ethernet An Ethernet standard supporting data transfer rates of up to 100 Mbps. Depending on the specific configuration, it may utilize two or four twisted-pair copper wires, or fiber-optic cables. Also called **100Base-T**.

fast-forward Its abbreviation is **FF**. 1. To advance a tape rapidly. For instance, than in a VHS cassette, to advance the tape to the end of a chapter. The term may also be used to refer to moving forward rapidly within the programming of an optical disc. 2. To advance a tape rapidly. For instance, than in a VHS cassette, to advance the tape to the end of a chapter. The term may also be used to refer to moving forward rapidly within the programming of an optical disc.

NCP 1. Abbreviation of **network control program**. 2. Abbreviation of **network control protocol**.

NCSA Abbreviation of National Center for Supercomputer Applications. A center for high-performance computing and networking that provides supercomputer resources, and which develops applications, such as Mosaic.

NCSA server Abbreviation of National Center for Supercomputer Applications **server**. An HTTP server developed by the NCSA. It was one of the first tailored to the World Wide Web.

NCSA Telnet Abbreviation of National Center for Supercomputer Applications **Telnet**. A Telenet application developed and distributed by the NCSA.

Nd Chemical symbol for **neodymium**.

NDB Abbreviation of **non-directional radio beacon**.

NDMP Abbreviation of **Network Data Management Protocol**.

NDR Same as **non-destructive readout**.

NDRO Same as **non-destructive readout**.

Ne Chemical symbol for **neon**.

near-end crosstalk Crosstalk which is propagated between circuits in which the interfering signal travels in the direction opposite that of the desired signal. The terminal where near-end crosstalk is observed is usually near or at its origination point. This contrasts with **far-end crosstalk**, where each signal travels in the same direction, and is usually observed at a point distant from the where it originates. Its abbreviation is **NEXT**.

near field 1. Same as **near-field region**. 2. The electromagnetic field closer than a given distance from a source of electromagnetic radiation. 3. The sound field close to a sound source. May be, for instance, that within two wavelengths.

near-field recording A data-storage method combining features of magneto-optical recording and magnetic hard disk technologies, to create and utilize extremely narrow bit cells, which in turn provide enhanced capacity and performance. Its abbreviation is **NFR**.

near-field region For a transmitting antenna, the electromagnetic field extending no further than a distance of $2D^2/\lambda$, where D is the maximum overall dimension of said antenna, and λ is the wavelength considered. Beyond this distance, the **far-field region** begins. Also called **near field** (1), **near region**, or **near zone**

near infrared Its abbreviation is **near IR**. 1. Pertaining to **near-infrared radiation**. 2. Same as **near-infrared radiation**.

near-infrared radiation Electromagnetic radiation in the infrared region which is nearest to visible light. It corresponds to wavelengths of approximately 0.75 to 3 micrometers, though the defined interval varies. Also called **near infrared** (2).

near-instantaneous companded audio multiplex Same as **NICAM**.

near-instantaneously companded audio multiplex Same as **NICAM**.

near IR Abbreviation of **near infrared**.

near-letter quality Printed characters which are dark, crisp, and well-defined, but not to the extent exhibited in **letter quality**. Also, a printing mode with such an output. Most laser printers can print in this mode. Its abbreviation is **NLQ**.

near online Same as **nearline**.

near region Same as **near-field region**.

near ultraviolet Its abbreviation is **near UV**. 1. Pertaining to **near-ultraviolet radiation**. 2. Same as **near-ultraviolet radiation**.

near-ultraviolet radiation Electromagnetic radiation in the ultraviolet region which is nearest to visible light. It corresponds to wavelengths of approximately 300 to 400 nm, though the defined interval varies. Also called **near ultraviolet**, or **soft ultraviolet**.

near UV Abbreviation of **near ultraviolet**.

Near Video on Demand Cable or satellite programming, especially movies, offered at staggered times. For example, there may be a selection of 30 feature films, each of which starts again every 10 or 15 minutes. Its abbreviation is **NVOD**.

near zone Same as **near-field region**.

nearline Abbreviation of **near online**. Not quite immediately available or accessible. Said, for instance, of data archived in CD-Rs.

NEC Acronym for **National Electrical Code**.

necessary bandwidth For a given type or class of emission, the minimum frequency interval necessary to provide a specified level of quality at a stated transmission speed. Signals outside of this band may be suppressed to help ensure adequate performance.

needle 1. A slender and pointed object, or that resembling such an object. For instance, the shape of the magnetizable particles on the surface a magnetic tape or disk is that of a needle. 2. A **needle** (1) which serves to convey information in a meter, gauge, or similar device or instrument. A specific example is that used in a D'Arsonval galvanometer. Also called **needle pointer**, **indicator needle**, or **pointer needle**. 3. A pointed object which extends from a phonographic pickup, and which serves to follow the undulations of the grooves of a phonographic disc and transmit them as vibrations to said pickup. Such an object is usually made of a metal needle with a diamond or sapphire tip. Also called **stylus** (3). 4. A needle in a magnetic compass. Also called **magnetic needle**.

needle electrode A slender and pointed electrode, such as that used in electrocautery.

needle pointer Same as **needle** (2).

needle probe A probe with a slender and pointed tip, such as that used in electrocautery.

Néel temperature For a material exhibiting ferrimagnetism, the temperature below which its magnetic properties are similar to ferromagnetic materials. Above this temperature, such a material becomes paramagnetic.

neg Abbreviation of **negative**.

negation Same as **NOT**.

negative Its abbreviation is **neg**, or **N**. Its symbol is $-$. 1. Of, or pertaining to, a quantity or value below zero. For instance, a temperature below 0 °C, or a negative number. 2. Of, pertaining to, or the same as the charge or a multiple of the charge of an electron. For example, the minus one charge of a chlorine ion. 3. Of, or pertaining to, a particle, material, or other entity which has an excess of electrons. For instance, an anion. 4. Of, or pertaining to, a quantity, value, entity, phenomenon, or concept which is considered the opposite of an equivalent which would be described as positive. For example, a negative electrode, negative image, negative peak, negative pole, and so on. 5. Same as **negative image**.

negative acceleration Slowing down, or the rate at which velocity decreases with respect to time. Also called **deceleration**.

negative acknowledge character In communications, a message indicating the inability to receive a transmission, or that a transmission has been received incorrectly. This message is sent from the receiving unit or station to the sending unit or station as a means of verification. Its abbreviation is **NAK**.