T

T Letter symbol for the duration of a half-period of the nominal upper cut-off frequency of a transmission system. Therefore

$$T = \frac{1}{2f_c}$$

Note: for the TV system M

$$T = \frac{1}{2 \times 4\ (\text{MHz})} = 125''\ (\text{ns})$$

The duration T is commonly referred to as the Nyquist interval. The concept of T is employed not only when the frequency cut-off is a physical property of a given system but also when the system is flat and there is no interest in the performance of the system beyond a given frequency. (BT) 511-1979w

TA *See:* watthour meter—test current; terminal adapter; technical advisory; test amperes.

⟨tab⟩ The horizontal tab character. (C/PA) 9945-2-1993

table (1) (A) (software) An array of data, each item of which may be unambiguously identified by means of one or more arguments. **(B) (software)** A collection of data in which each item is uniquely identified by a label, by its position relative to the other items, or by some other means. *See also:* label; data. (SE/C) 729-1983

(2) (data management) A two-dimensional array. (See below for an example.)

Table

State	Abbreviation	Zone
Alabama	AL	2
Alaska	AK	9
. . .		
West Virginia	WV	3
Wisconsin	WI	4
Wyoming	WY	3

See also: code-decode table. (C) 610.5-1990w

(3) Functionally related utility application data elements, grouped together into a single data structure for transport. (AMR/SCC31) 1377-1997

table ESD test An indirect test in which ESD is applied to the HCP. (EMC) C63.16-1993

table lamp (illuminating engineering) A portable luminaire with a short stand suitable for standing on furniture. (EEC/IE) [126]

table lookup (TLU) (1) (mathematics of computing) A procedure for obtaining the value of a function corresponding to a given argument from a table of function values. *See also:* look-up table. (C) 1084-1986w

(2) (data management) The process of obtaining the value y corresponding to an argument x from a two-dimensional table of (x,y) pairs. *See also:* direct lookup; associative lookup. (C) 610.5-1990w

tablet *See:* graphic tablet; acoustic tablet; data tablet.

table-top device A device designed for and normally placed on the raised surface of a table; e.g., most personal computers are considered to be table-top devices. (EMC) C63.4-1991

tab sequential format (numerically controlled machines) A means of identifying a word by the number of tab characters preceding the word in the block. The first character in each word is a tab character. Words must be presented in a specific order but all characters in a word, except the tab character, may be omitted when the command represented by that word is not desired. (IA) [61]

tabular model A symbolic model whose properties are expressed in tabular form; for example, a truth table that represents the logic of an OR gate. *Contrast:* narrative model; software model; mathematical model; graphical model. (C) 610.3-1989w

tabulate (A) To form data into a table. **(B)** To print totals. (C) [20], [85]

tabulation character A format effector character that causes the print or display position to move to the next corresponding horizontal or vertical position in a series of predetermined positions. *See also:* horizontal tabulation character; vertical tabulation character. (C) 610.5-1990w

tabulator A device that reads data from some medium such as punch cards or punched tape, and which produces lists, totals, or calculations. (C) 610.10-1994w

tacan (tactical air navigation) (navigation aids) A complete ultra-high frequency (uhf), polar coordinate (rho theta) navigation system using pulse techniques. The distance (rho) function operates as DME (distance measuring equipment) and the bearing function is derived by rotating the ground transponder antenna so as to obtain a rotating multilobe pattern for coarse and fine bearing information. (AES/GCS) 172-1983w

TACCAR *See:* time-averaged-clutter coherent airborne radar.

tachometer A device to measure speed or rotation. *See also:* rotor. (PE) [9]

tachometer electric indicator A device that provides an indication of the speed of an aircraft engine, of a helicopter rotor, of a jet engine, and of similar rotating apparatus used in aircraft. Such tachometer indicators may be calibrated directly in revolutions per minute or in percent of some particular speed in revolutions per minute. (EEC/PE) [119]

tachometer generator (rotating machinery) A generator, mechanically coupled to an engine, whose main function is to generate a voltage, the magnitude or frequency of which is used either to determine the speed of rotation of the common shaft or to supply a signal to a control circuit to provide speed regulation. (PE) [9]

tachometric relay A relay in which actuation of the contacts is effected at a predetermined speed of a moving part. *See also:* relay. (IA/ICTL/IAC) [60]

taffrail log A device that indicates distance traveled based on the rotation of a screw-type rotor towed behind a ship which drives, through the towing line, a counter mounted on the taffrail. *Note:* An electric contact made (usually) each tenth of a mile causes an audible signal to permit ready calculation of speed. (EEC/PE) [119]

tag (1) (supervisory control, data acquisition, and automatic control) A visual indication, usually at the master station, to indicate that a device has been cleared for field maintenance/construction purposes and is not available for control or data acquisition. (SWG/PE/SUB) C37.100-1992, C37.1-1994

(2) (A) Same as flag. **(B)** Same as label. (MIL/C) [2], [20]

(3) (data management) One or more characters associated with a set of data, containing information about the set. (C) 610.5-1990w

(4) (computer graphics) A unique textual identifier associated with a display element. (C) 610.6-1991w

(5) Accident prevention tag (DANGER, PEOPLE AT WORK, etc.) of a distinctive appearance used for the purpose of personnel protection to indicate that the operation of the device to which it is attached is restricted. (NESC) C2-1997

tag address *See:* symbolic address.

tagged architecture A computer architecture in which each word is "tagged" as either an instruction or a unit of data. *Contrast:* Von Neumann architecture. (C) 610.10-1994w

tagged frame A frame that contains a tag header immediately following the Source MAC Address field of the frame or, if the frame contained a Routing Information field, immediately following the Routing Information field. There are two types

of tagged frames: *VLAN-tagged frames* and *priority-tagged frames*. (C/LM) 802.1Q-1998

tag header Allows user priority information, and optionally, VLAN identification information, to be associated with a frame. (C/LM) 802.1Q-1998

tag line A control line, normally manila or synthetic fiber rope, attached to a suspended load to enable a worker to control its movement. *Synonym:* tag rope. (T&D/PE) 524-1992r

tag rope *See:* tag line.

tags Men-at-work tags of distinctive appearance, indicating that the equipment or lines so marked are being worked on. (T&D) C2.2-1960

Tag Set Name A numeric identifier associated with a set of security tags. (C/LM) 802.10g-1995

tag sort A sort that uses the address table sorting technique. (C) 610.5-1990w

tail (x-ray energy spectrometers) (on a monoenergetic peak) Any peak shape distortion that does not comply with the limits defining the full energy peak intensity and that does not come from a source of radiation other than the monoenergetic source in question. (NPS/NID) 759-1984r

tailing (1) (hangover) (facsimile) The excessive prolongation of the decay of the signal. *See also:* facsimile signal. (COM) 168-1956w

(2) (hydrometallurgy and ore concentration) (electrometallurgy) The discarded residue after treatment of an ore to remove desirable minerals. *See also:* electrowinning. (PE/EEC) [119]

tailing time (charged-particle detectors) (of an amplifier output pulse) The time interval between the top centerline of a unipolar pulse and the one percent level on the last transition. (NPS) 300-1988r

tail lamp (illuminating engineering) A lighting device used to designate the rear of a vehicle by a warning light. (EEC/IE) [126]

tail-of-wave (chopped wave) impulse test voltage (insulation strength) The crest voltage of a standard impulse wave that is chopped by flashover at or after crest. (PE/TR) 21-1976

tailrace The exit channel of water from the powerhouse. (PE/EDPG) 1020-1988r

tail recursive A property of the implementation of a programming language. In a tail-recursive implementation, iterative processes can be expressed by means of procedure calls. (The process described by a program is iterative if and only if the order of its space growth is constant, aside from that used for the values of the program's variables.) (C/MM) 1178-1990r

tailwater The water in the tailrace. (PE/EDPG) 1020-1988r

take-over time (T_T) Time taken to switch from one transmission direction to the other in double talk conversation on a handsfree telephone (HFT). The signal in the first direction is continuously applied while the interrupting signal is applied in the opposite direction. T_T is measured from the application of the interrupting signal until the output level due to the interrupting signal reaches 3 dB below its final value. (COM/TA) 1329-1999

takeup reel *See:* reel winder.

talker A node that sends an isochronous subaction for an isochronous channel. (C/MM) 1394-1995

talker echo Echo that reaches the ear of the talker. (EEC/PE) [119]

talker sidetone The sidetone acoustic output of the telephone caused by an input from the artificial mouth. (COM/TA) 269-1992

talking key A key whose operation permits conversation over the circuit to which the key is connected. (EEC/PE) [119]

talk-ringing key (listening and ringing key) A combined talking key and ringing key operated by one handle. (EEC/PE) [119]

tamper To interfere with the performance of a security sensor or the electrical connections within an alarm communications system. (PE/NP) 692-1997

tampering Attacks to physical and logical system components (i.e., hardware, software, media), including substituting rogue components in place of legitimate components, physical theft of components, damage to components, and electrical probing within the system. This threat area assumes that an intruder has physical or electrical access to the system components and their internal structure (e.g., processor and memory boards, software modules). (C/BA) 896.3-1993w

tamper protection The aspect of physical security concerned with the protection of system resources from unauthorized modification, especially where modifying or altering a component degrades system security. *See also:* quadrant. (C/BA) 896.3-1993w

tamper-resistant enclosure A metal-enclosure for a power switchgear assembly that is designed to resist damage to or improper operation of the switchgear from willful acts of destruction and which is designed to provide reasonably safe protection against tampering by unauthorized persons who may attempt to gain entry by forcible means, to insert foreign substances into, or otherwise tamper with the assembly. (SWG/PE) C37.20-1968w

tandem (cascade) (networks) Networks are in tandem when the output terminals of one network are directly connected to the input terminals of the other network. *See also:* network analysis. (CAS) [13]

tandem blocking The first and final failure matching loss for trunk-to-trunk connections. *See also:* matching loss. (COM/TA) 973-1990w

tandem central office (tandem office) A central office used primarily as a switching point for traffic between other central offices. (SWG/PE) C37.20-1968w

tandem-completing trunk A trunk, extending from a tandem office to a central office, used as part of a telephone connection between stations. (EEC/PE) [119]

tandem control (electric power system) A means of control whereby the area control error of an area or areas A, connected to the interconnected system B only through the facilities of another area C, is included in control of area C generation. (PE/PSE) 94-1970w

tandem drive Two or more drives that are mechanically coupled together. *See also:* electric drive. (IA/ICTL/APP/IAC) [69], [60]

tandem office (telephone switching systems) An intermediate office used primarily for interconnecting end offices with each other and with toll connecting trunks. (COM) 312-1977w

tandem trunk (data transmission) A trunk extending from a central office or a tandem office to a tandem office and used as part of a telephone connection between stations. (PE) 599-1985w

tangential plane The plane that is tangential to the surface of the VDT screen at the center-center point. (EMC) 1140-1994r

tangential wave path (data transmission) In radio wave propagation over the earth, a path of propagation of a direct wave, which is tangential to the surface of the earth. The tangential wave path is curved by atmospheric refraction. (PE) 599-1985w

tangent-plane approximation *See:* Kirchhoff approximation.

tank (storage cell) A lead container, supported by wood, for the element and electrolyte of a storage cell. *Note:* This is restricted to some relatively large types of lead-acid cells. *See also:* battery. (EEC/PE) [119]

tank circuit (signal-transmission system) A circuit consisting of inductance and capacitance, capable of storing electric energy over a band of frequencies continuously distributed about a single frequency at which the circuit is said to be resonant, or tuned. *Note:* The selectivity of the circuit is proportional to the ratio of the energy stored in the circuit to the

energy dissipated. The ratio is often called the Q of the circuit. *See also:* oscillatory circuit; signal. (AP/ANT) 145-1983s

tank, single-anode *See:* single-anode tank.

tank vessel A vessel that carries liquid or gaseous cargo in bulk. (IA/MT) 45-1998

tank voltage The total potential drop between the anode and cathode bus bars during electrodeposition. *See also:* electroplating. (EEC/PE) [119]

TAP *See:* test access port.

tap (1) (fiber optics) A device for extracting a portion of the optical signal from a fiber. (Std100) 812-1984w

(2) (power and distribution transformers) (in a transformer) A connection brought out of a winding at some point between its extremities, to permit changing the voltage, or current, ratio. (PE/TR) C57.12.80-1978r

(3) (power and distribution transformers) An available connection that permits changing the active portion of the device in the circuit. *See also:* grounding device. (SPD/PE) 32-1972r

(4) (reactor) A connection brought out of a winding at some point between its extremities, to permit changing the impedance. *See also:* reactor. C57.16-1958w

(5) (rotating machinery) A connection made at some intermediate point in a winding. *See also:* stator; voltage regulator; rotor. (PE) [9]

(6) (broadband local area networks) A passive device in the feeder system that provides a connection between the drop cable and the feeder. The tap is the principal means of access to the cable system by the user. It removes a portion of the signal power from the distribution line and delivers it to the drop line. The amount of power tapped off the main line depends on the input power to the tap and the attenuation value of the tap. Only the information signal (and not 60 Hz power) goes to the outlet ports. *See also:* multi-tap. (LM/C) 802.7-1989r

(7) (A) In a baseband system, a component or connector that attaches a transceiver to a cable. **(B)** In a broadband system, a passive device used to remove a portion of the signal power from the distribution line and deliver it onto the drop line. *See also:* fan-out box. **(C)** In the security environment, the term is used for a breach of security on a telecommunication line or channel. (C) 610.7-1995

(8) A connection brought out of a winding at some point between its extremities to permit the changing of the voltage ratio. (PE/TR) C57.15-1999

tap change operation A complete sequence of events from the initiation to the completion of the transition of the through current from one tap position to an adjacent one. (PE/TR) C57.131-1995

tap-changer, for deenergized operation (power and distribution transformers) A selector switch device used to change transformer taps with the transformer de-energized. (PE/TR) C57.12.80-1978r

tape (1) (rotating machinery) A relatively narrow, long, thin, flexible fabric, mat, or film, or a combination of them with or without binder, not over 20 cm in width. *See also:* rotor; stator. (PE) [9]

(2) (electronic computation) *See also:* magnetic tape. (PE) [9]

(3) *See also:* punch tape; magnetic tape; chadless tape; carriage control tape; perforated tape. (C) 610.10-1994w

tape block (test, measurement, and diagnostic equipment) A group of frames or tape lines. (MIL) [2]

taped A joint that is constructed in the field with the use of one or more tapes that are applied over the cable in layers. Heat may or may not be applied as part of the installation procedure. (PE/IC) 404-1993

tape deck *See:* tape drive.

taped insulation Insulation of helically wound tapes applied over a conductor or over an assembled group of insulated conductors. A) When successive convolutions of a tape overlie each other for a fraction of the tape width, the taped insulation is lap wound. This is also called positive lap wound. B) When a tape is applied so that there is an open space between successive convolutions, this construction is known as open butt or negative lap wound. C) When a tape is applied so that the space between successive convolutions is too small to measure with the unaided eye, it is a closed butt taping. (T&D/PE) [10]

taped joint (power cable joints) A joint with hand-applied tape insulation. (PE/IC) 404-1986s

tape drive A device that moves tape past a head. (C) [20], [85]

(2) (A) An input device that reads magnetic tape. *Contrast:* disk drive. **(B)** A mechanism for moving magnetic tape and controlling its movement. *Note:* This mechanism is used to move magnetic tape past a read head or write head, or used to allow automatic rewinding. *Synonym:* transport; magnetic tape drive. *See also:* incremental tape drive; hypertape drive. (C) 610.10-1994

tape frame *See:* tape row; tape drive.

tape line *See:* frame.

tape merge sort An external merge sort in which the auxiliary storage used is a magnetic tape. *See also:* direct-access merge sort. (C) 610.5-1990w

tape preparation The act of translating command information into punched or magnetic tape. (IA) [61]

tape punch *See:* perforator.

taper (communication practice) A continuous or gradual change in electrical properties with length, as obtained, for example, by a continuous change of cross-section of a waveguide. *See also:* transmission line. (Std100) 270-1966w

tape recorder *See:* magnetic recorder.

tapered fiber waveguide (fiber optics) An optical waveguide whose transverse dimensions vary monotonically with length. *Synonym:* tapered transmission line. (Std100) 812-1984w

tapered hose *See:* leader cone.

tapered key (rotating machinery) A wedge-shaped key to be driven into place, in a matching hole or recess. (PE) [9]

tapered potentiometer A function potentiometer that achieves a prescribed functional relationship by means of a nonuniform winding. *See also:* electronic analog computer. (C) 165-1977w

tapered transmission line *See:* tapered waveguide; tapered fiber waveguide.

tapered waveguide (waveguide terms) A waveguide in which a physical or electrical characteristic increases or decreases continuously with distance along the axis of the guide. (MTT) 147-1979w, 146-1980w

tape reproducer A device that prepares one tape from another tape by copying all or part of the data from the tape that is read. (C) 610.10-1994w

tape row A group of binary characters recorded or sensed in parallel on a line perpendicular to the reference edge of a tape. *Synonym:* tape frame. *See also:* skew; row pitch. (C) 610.10-1994w

taper, waveguide *See:* waveguide taper.

tape station *See:* tape unit; tape drive.

tape thickness The lesser of the cross-sectional dimensions of a length of ferromagnetic tape. *See also:* tape-wound core. (Std100) 163-1959w

tape to card Pertaining to equipment or methods that transmit data from either magnetic tape or punched tape to punched cards. (C) [20], [85]

tape transmitter (telegraphy) A machine for keying telegraph code signals previously recorded on tape. *See also:* telegraphy. (COM) [49]

tape transport (1) (test, measurement, and diagnostic equipment) A device which moves magnetic or punched tape past the tape reader. Reels for storage of the tape are usually provided. *See also:* tape drive. (MIL) [2]

(2) *See also:* tape drive. (C) 610.10-1994w

tape unit **(1)** A device containing a tape drive, together with reading and writing heads and associated controls. (C) [20], [85]

(2) *See also:* tape drive. (C) 610.10-1994w

tape width The greater of the cross-sectional dimensions of a length of ferromagnetic tape. *See also:* tape-wound core. (Std100) 163-1959w

tape-wound core A length of ferromagnetic tape coiled about an axis in such a way that one convolution falls directly upon the preceding convolution. *See also:* wrap thickness. (Std100) 163-1959w

tap outlet An F-type connector port on a tap used to attach a drop cable to an outlet. (LM/C) 802.7-1989r

tapped field *See:* short field.

tapped field control A system of regulating the tractive force of an electrically driven vehicle by changing the number of effective turns of the traction motor series-field windings by means of an intermediate tap or taps in those windings. *See also:* multiple-unit control. (EEC/PE) [119]

tapped potentiometer A potentiometer, usually a servo potentiometer, that has a number of fixed contacts (or taps) to the resistance element in addition to the end and movable contacts. *See also:* electronic analog computer. (C) 165-1977w

tapped-secondary current or voltage transformer One with two ratios obtained by use of a tap on the secondary winding. (PE/TR) C57.13-1993, [57]

tapped way A way solidly connected to the bus. (SWG/PE) C37.71-1984r, C37.100-1992

tapper bell A single-stroke bell having a gong designed to produce a sound of low intensity and relatively high pitch. *See also:* protective signaling. (EEC/PE) [119]

tap selector A device designed to carry, but not to make or break current, used in conjunction with an arcing switch to select tap connections. (PE/TR) C57.131-1995

target **(1)** **(camera tubes)** A structure employing a storage surface that is scanned by an electron beam to generate a signal output current corresponding to a charge-density pattern stored thereon. *Note:* The structure may include the storage surface that is scanned by an electron beam, the backplate, and the intervening dielectric. *See also:* radar; television. (ED/BT/AV) 161-1971w, [34], [45]

(2) **(storage tubes)** The storage surface and its immediate supporting electrodes. *See also:* radar; storage tube. (ED) 158-1962w, [45]

(3) In micrographics, any document or chart containing identification information or a resolution test chart. *See also:* flash card. (C) 610.2-1987

(4) The node addressed by the first symbol of a packet; i.e., the final destination of the packet. (C/MM) 1596-1992

(5) The specification of a target distribution object, or installed software object, for a software administration utility. The target host provides a means to locate the target role and the target path is a path accessible to the target host. (C/PA) 1387.2-1995

(6) **(operation indicator)** (of a relay) A supplementary device operated either mechanically or electrically, to indicate visibly that the relay has operated or completed its function. *Notes:* 1. A mechanically operated target indicates the physical operation of the relay. 2. An electrically operated target, when not further described, is actuated by the current in the control circuit associated with the relay and hence indicates not only that the relay has operated but also that it has completed its function by causing current to flow in the associated control circuit. 3. A shunt-energized target only indicates operation of the relay contact and does not necessarily show that current has actually flowed in the associated control circuit. (SWG/PE) C37.100-1992

(7) Broadly, any discrete object that scatters energy back to the radar. (AES/RS) 686-1990

(8) *See also:* target sag. (T&D/PE) 524-1992r

(9) **(A)** Specifically, an object of radar search or tracking. **(B)** Broadly, any discrete object that scatters energy back to the radar. (AES/GCS) 686-1997, 172-1983

target capacitance (camera tubes) The capacitance between the scanned area of the target and the backplate. *See also:* television. (ED/BT/AV) 161-1971w, [45], [34]

target classification *See:* target recognition.

target cutoff voltage (camera tubes) The lowest target voltage at which any detectable electric signal corresponding to a light image on the sensitive surface of the tube can be obtained. *See also:* television. (ED) 161-1971w

target fluctuation Variation in the amplitude of the echo from a complex target caused by changes in target aspect angle, motion of target-scattering sources, or changes in radar wavelength (i.e., the amplitude component of target noise). *Note:* Rapid fluctuation is usually modeled as independent from pulse to pulse within a scan and independent from scan to scan. The terms *scintillation* and *amplitude noise* have been used in the past as synonyms for target fluctuation and also to denote location errors caused by target fluctuation, and should be avoided because of this ambiguity. (AES) 686-1997

target glint *See:* glint.

target host The host portion of a target specification. (C/PA) 1387.2-1995

target identification Target identification means identifying a particular target such as the name painted on the side of a ship, an aircraft's side-number, or the flight number of a commercial aircraft. *Note:* Primary radar cannot usually provide the identity of a target, but secondary radar systems including transponders can be used for such cooperative target identification. *See also:* target recognition. (AES) 686-1997

target language (software) The language in which the output from a machine-aided translation process is represented. For example, the language output by an assembler or compiler. *Synonym:* object language. *Contrast:* source language. (C) 610.2-1987, [85], [20], 610.12-1990

target machine (A) (software) The computer on which a program is intended to execute. **(B) (software)** A computer being emulated by another computer. *Contrast:* host machine. (C) 610.12-1990

target noise Random variations in observed amplitude, location, and/or Doppler of a target, caused by changes in target aspect angle, rotation or vibration of target-scattering sources, or by changes in wavelength. *See also:* glint; scintillation error; target fluctuation. (AES) 686-1997

target path The pathname portion of a target specification. (C/PA) 1387.2-1995

target program A program written in a target language. *See also:* object program. (C) [20], [85]

target recognition The use of a radar to recognize one class of target from another. Also known as noncooperative target recognition (NCTR) or target classification. *See also:* target identification. (AES) 686-1997

target role Where software is installed, removed, listed, and otherwise operated on by the utilities. For example, when installing software, the target is where software is installed after having been delivered from a source. As another example, the target for a copy operation command refers to the distribution to which products are added. For management operations like removing software, the target refers to either the installed_software objects or the distributions from which software is being removed. (C/PA) 1387.2-1995

target sag 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 a reference to determine the proper conductor sag. *Synonyms:* target; sag board. (T&D/PE) 524-1992r

target system The combination of the computer system on which the PCTS is executed and the parts of the development system that are used to generate the executable code of a PCTS. (C/PA) 13210-1994, 2003.1-1992

target transmitter (electronic navigation) (navigation aids) A source of radio-frequency energy suitable for providing test signals at a test site. *See also:* navigation. (AES/GCS/RS) 173-1959w, [42], 686-1982s, 172-1983w

target user The name of a user on the destination batch server. The *target user* is the *user_name* under whose account the job is to execute on the destination batch server. (C/PA) 1003.2d-1994

target voltage (camera tube with low-velocity scanning) The potential difference between the thermionic cathode and the backplate. *See also:* television. (ED/BT/AV) 161-1971w, [34], [45]

tariff (1) (data transmission) The published rate for a particular approved commercial service of a common carrier. (PE) 599-1985w

(2) (electric power utilization) (power operations) A published volume of rate schedules and general terms and conditions. (PE/PSE) 858-1987s, 346-1973w

(3) A published list of rate schedules and terms and conditions. (AMR/SCC31) 1377-1997

tarnish Surface discoloration of a metal caused by formation of a thin film of corrosion product. (IA) [59]

TASI *See:* time assigned speech interpolation.

task (1) (A) (software) A sequence of instructions treated as a basic unit of work by the supervisory program of an operating system. **(B) (software)** In software design, a software component that can operate in parallel with other software components. (C) 610.12-1990

(2) The smallest unit of work subject to management accountability. A task is a well-defined work assignment for one or more project members. Related tasks are usually grouped to form activities. (C/SE) 1074-1995s

(3) An Ada object with a thread of control. The execution of an Ada program consists of the execution of one or more tasks. Each task represents a separate thread of control that proceeds independently and concurrently between the points where it interacts with other tasks. (C) 1003.5-1999

task-ambient lighting A concept involving a component of light directed toward tasks from appropriate locations by luminaires located close to the task for energy efficiency. (IA/PSE) 241-1990r

task illumination (health care facilities) Provision for the minimum lighting required to carry out necessary tasks in the described areas, including safe access to supplies and equipment, and access to exits. (NESC/NEC) [86]

tasking activity The person(s) or organization that directs a performing activity to accomplish the work specified in this standard. (C/SE) 1220-1994s

taut-band suspension (electric instruments) A mechanical arrangement whereby the moving element of an instrument is suspended by means of ligaments, usually in the form of a thin flat conducting ribbon, at each of its ends. The ligaments normally are in tension sufficient to restrict the lateral motion of the moving element to within limits that permit freedom of useful motion when the instrument is mounted in any position. A restoring torque is produced within the ligaments with rotation of the moving element. *See also:* moving element. (EEC/AII) [102]

taxi-channel lights (illuminating engineering) Aeronautical ground lights arranged along a taxi-channel of a water aerodrome to indicate the route to be followed by taxiing aircraft. (EEC/IE) [126]

taxi light (illuminating engineering) An aircraft aeronautical light designed to provide necessary illumination for taxiing. (EEC/IE) [126]

taxiway-centerline lights (illuminating engineering) Taxiway lights placed along the centerline of a taxiway except that on curves or corners having fillets, these lights are placed a distance equal to half the normal width of the taxiway from the outside edge of the curve or corner. (EEC/IE) [126]

taxiway-edge lights (illuminating engineering) Taxiway lights placed along or near the edges of a taxiway. (EEC/IE) [126]

taxiway holding-post light (illuminating engineering) A light or group of lights installed at the edge of a taxiway near an entrance to a runway, or to another taxiway, to indicate the position at which the aircraft should stop and obtain clearance to proceed. (EEC/IE) [126]

taxiway lights (illuminating engineering) Aeronautical ground lights provided to indicate the route to be followed by taxiing aircraft. (EEC/IE) [126]

taxonomy (1) A scheme that partitions a body of knowledge and defines the relationships among the pieces. It is used for classifying and understanding the body of knowledge. (C) 610.12-1990, 610.10-1994w

(2) A classification scheme, or its results. (PE/NP) 1082-1997

Taylor distribution, circular A continuous distribution of a circular planar aperture that is equiphase, with the amplitude distribution dependent only on distance from the center of the aperture and such as to produce a pattern with a main beam plus side lobes. The side lobe structure is rotationally symmetric, with a specified number of inner side lobes at a quasi-uniform height, the remainder of the side lobes decaying in height with their angular separation from the main beam. *Note:* Taylor distributions are often sampled to obtain the excitation for a planar array. (AP/ANT) 145-1993

Taylor distribution, linear A continuous distribution of a line source that is symmetric in amplitude, has a uniform progressive phase, and yields a pattern with a main beam plus side lobes. The side lobe structure is symmetrical, with a specified number of inner side lobes at a quasi-uniform height, the remainder of the side lobes decaying in height with their angular separation from the main beam. *Note:* Taylor distributions are often sampled to obtain the excitation for a planar array. (AP/ANT) 145-1993

TB cell *See:* transmitter-blocker cell.

Tbyte Terabyte. Indicates 2^{40} bytes. (MM/C) 1212-1991s

T-carrier system A hierarchy of high-speed digital transmission facility designed to carry speech and other signals in digital form according to their transmission capacity. *See also:* T1; T2; T3; T1C; T4. (C) 610.7-1995

TCB *See:* trusted computing base.

TCBH *See also:* traffic engineering limits; time-consistent busy hour. (COM/TA) 973-1990w

TCF *See:* transformer correction factor.

TCM *See:* time compression multiplexing.

T-connected transformer (power and distribution transformers) (or tee-connected) A three-phase to three-phase transformer, similar to a Scott-connected transformer. *See also:* Scott or T-connected transformer. (PE/TR) C57.12.80-1978r

TC traffic measures *See:* time-consistent traffic measures.

TCR *See:* thyristor-controlled reactor.

TCU *See:* trunk coupling unit.

TDD *See:* total demand distortion.

TDM *See:* time-division multiplexing.

TDMA *See:* time division multiple access.

TDR *See:* time domain reflectometer.

TE *See:* transverse electric mode.

tearing (television) An erratic lateral displacement of some scanning lines of a raster caused by disturbance of synchronization. *See also:* television. (BT/AV) [34]

teaser transformer (power and distribution transformers) As applied to two single-phase Scott-connected units for the three-phase to two-phase or two-phase to three-phase operation, designates the transformer that is connected between the midpoint of the main transformer and the third-phase wire of the three-phase system. (PE/TR) C57.12.80-1978r

technical advisory (TA) A telephone company publication intended to disclose information and request comments regard-

ing network services.
(AMR/SCC31) 1390-1995, 1390.2-1999, 1390.3-1999

technical effort The total engineering, testing, manufacturing, and specialty engineering effort associated with the development of a product that encompasses all of the system, equipment, facilities, etc., necessary for the enterprise to develop, produce, distribute, operate, test, support, train, and dispose of the product. (C/SE) 1220-1994s

technical management The application of technical and administrative resources to plan, organize, and control engineering functions. (C) 610.12-1990

technical requirements (TR) A telephone company publication intended to disclose information and operation regarding network services.
(AMR/SCC31) 1390-1995, 1390.2-1999, 1390.3-1999

technical review A systematic evaluation of a software product by a team of qualified personnel that examines the suitability of the software product for its intended use and identifies discrepancies from specifications and standards. Technical reviews may also provide recommendations of alternatives and examination of various alternatives. (C/SE) 1028-1997

technical standard A standard that describes the characteristics of applying accumulated technical or management skills and methods in the creation of a product or performing a service. (C) 610.12-1990

techniques (1) (software) Technical and managerial procedures that aid in the evaluation and improvement of the software development process. (C/SE) 610.12-1990, 983-1986w
(2) Technical and managerial procedures used to achieve a given objective. (C/SE) 730.1-1995

technology Scientific knowledge used to achieve a practical purpose. (C/PA) 1003.23-1998

Technology Ability Field An eight-bit field in the Auto-Negotiation base page that is used to indicate the abilities of a local station, such as support for 10BASE-T, 100BASE-T4, 100BASE-TX, and 100BASE-T2, as well as full duplex capabilities. (C/LM) 802.3-1998

technology component model The assembled IT services required to deliver one or more IS services to support the BSRs. (C/PA) 1003.23-1998

technology data Data used to calculate the timing properties of a cell instance based on its context in the design. This term includes information that is not cell type specific or data specific for each cell type in the library. The kind of data used varies with the timing calculation methodology. General data and cell data may be contained in the same file or in separate files. Cell data also may be merged with the timing models of each cell, for example, when a tool performs its own timing calculation. (C/DA) 1481-1999

technology library A technology library is a program written in delay calculation language (DCL) consisting of one or more subrules, each of which may contain references to other subrules (yet to be loaded). There is no hierarchical limit to the nesting of subrules within the scope of a technology library. Subrules can also be segmented into technology families, which alters the way they are made available to the application. (C/DA) 1481-1999

TEDL *See:* Test Equipment Description Language.

tee connection Connection of heater in series or parallel to accommodate a branch on a pipe or equipment.
(IA) 515-1997

tee coupler (fiber optics) A passive coupler that connects three ports. *See also:* star coupler. (Std100) 812-1984w

teed feeder A feeder that supplies two or more feeding points. *See also:* center of distribution. (PE/TR) [57]

tee junction (waveguide components) A junction of waveguides or transmission lines in which the longitudinal guide axes form a tee. (MTT) 147-1979w

teleautograph A telegraphic writing instrument, in which movement of a pen at the transmitting end causes corresponding movement of a pen at the remote receiving instrument. *Synonym:* telewriter. *See also:* telegraphy.
(C/PE/EEC) 610.2-1987, [119]

telecommunication (1) The transmission of signals over long distance, such as by telegraph, radio, or television. *See also:* computer conferencing; office automation.
(SWG/C/PE) 610.2-1987, C37.20.1-1987s
(2) (data transmission) The transmission of information from one point to another. (PE) 599-1985w
(3) The transmission of signals by electrical, electromagnetic, optical acoustic, or mechanical means. (C) 610.7-1995

telecommunication access program A software program located in a front-end communications processor that handles tasks associated with the routing, scheduling, and movement of messages between remote terminals and the host computer. (C) 610.7-1995

telecommunication circuit A circuit that is designed to handle remote transmission of information. *See also:* wideband circuit. (C) 610.7-1995, 610.10-1994w

telecommunication line A medium, such as wire or circuit, that connects equipment which enables data to be sent and received. (C) 610.7-1995

telecommunication loop (telephone switching systems) A channel between a telecommunications station and a switching entity. (COM) 312-1977w

telecommunication monitor *See:* teleprocessing monitor.

telecommunications Any transmission, emission, and reception of signs, signals, writings, images, and sounds, i.e., information of any nature, by cable, radio, optical, or other electromagnetic systems. (IA/PSE) 1100-1999

telecommunications customer (telephone switching systems) One for whom telecommunications service is provided (formerly referred to as a "subscriber"). (COM) 312-1977w

telecommunications equipment room (TER) A centralized space for telecommunications equipment that serves the occupants of the building. (IA/PSE) 1100-1999

telecommunications exchange (telephone switching systems) A means of providing telecommunications services to a group of users within a specified geographical area.
(COM) 312-1977w

Telecommunications Industries Association A sister organization of EIA that establishes and maintains standards for the telecommunications industries in the United States.
(C) 610.7-1995

telecommunications interface equipment A portion of a relay system that transmits or receives information from a telecommunications system; eg, audio tone equipment or carrier transmitter-receiver included as an integral part of the relay system. (PE/PSR) C37.90.1-1989r

telecommunications switchboard (telephone switching systems) A manual means of interconnecting telecommunications lines, trunks, and associated circuits, and including signaling facilities. (COM) 312-1977w

telecommunications switching (telephone switching systems) The function of selectively establishing and releasing connections among telecommunication transmission paths.
(COM) 312-1977w

telecommunications system (1) (telephone switching systems) An assemblage of telecommunications stations, lines, and channels, and switching arrangements for their interconnection, together with all the accessories for providing telecommunications services. (COM) 312-1977w
(2) (surge withstand capability tests for protective relays and relay systems) Any of the telecommunication media; eg, microwave, power-line carrier, wire line.
(PE/PSR) C37.90.1-1989r

telecommuting An employment alternative involving working at home using a computer and telecommunication system instead of commuting between home and workplace.
(SWG/C/PE) 610.2-1987, C37.20.1-1987s

teleconferencing A form of communication that uses telephones, computer networks, and television to allow participants at different geographical locations to confer. (SWG/C/PE) 610.2-1987, C37.20.1-1987s

telecopier A device used for facsimile transmission. (C) 610.2-1987, 610.10-1994w

telefax *See:* facsimile transmission.

telegraph A mechanized or electric device for the transmission of stereotyped orders or information from one fixed point to another. *Note:* The usual form of telegraph is a transmitter and a receiver, each having a circular dial in sectors upon which are printed standard orders. When the index of the transmitter is placed at any order, the pointer of the receiver designates that order. dual mechanism is generally provided to permit repeat back or acknowledgment of orders. (EEC/PE/MT) [119]

telegraph channel (data transmission) A channel suitable for the transmission of telegraph signals. *Note:* Three basically different kinds of telegraph channels used in multichannel telegraph transmission are

- One of a number of paths for simultaneous transmission in the same frequency range as in bridge duplex, differential duplex, and quadruplex telegraphy.
- One of a number of paths for simultaneous transmission in the same frequency range as in bridge duplex, differential duplex, and quadruplex telegraphy.
- One of a number of paths for successive transmission as in multiplex printing telegraphy.

Combinations of these three types may be used on the same circuit. (PE) 599-1985w

telegraph concentrator A switching arrangement by means of which a number of branch or subscriber lines or station sets may be connected to a lesser number of trunk lines or operating positions or instruments through the medium of manual or automatic switching devices in order to obtain more efficient use of facilities. *See also:* telegraphy. (COM) [49]

telegraph distortion (data transmission) The condition in which the significant intervals have not all exactly their theoretical durations. The reference point used when measuring telegraph distortion is the initial space-to-mark transition of each character which occurs at the beginning of each "start" element. The slicing level for all measurements is at the 50% point on the rising or falling current waveforms. Percent distortion is expressed by

$$\text{percent distortion} = \frac{\Delta t}{t_e} \times 100$$

where

t = time difference between the actual slicing point and the ideal crossover point

t_e = time interval of one signal element.

(PE) 599-1985w

telegraph distributor A device that effectively associates one direct-current or carrier telegraph channel in rapid succession with the elements of one or more signal sending or receiving devices. *See also:* telegraphy. (EEC/PE) [119]

telegraph key A hand-operated telegraph transmitter used primarily in Morse telegraphy. *See also:* telegraphy. (EEC/PE) [119]

telegraph repeater An arrangement of apparatus and circuits for receiving telegraph signals from one line and retransmitting corresponding signals into another line. *See also:* telegraphy. (EEC/PE) [119]

telegraph selector A device that performs a switching operation in response to a definite signal or group of successive signals received over a controlling circuit. *See also:* telegraphy. (EEC/PE) [119]

telegraph sender A transmitting device for forming telegraph signals. Examples are a manually operated telegraph key and a printer keyboard. *See also:* telegraphy. (EEC/PE) [119]

telegraph signal (telecommunications) The set of conventional elements established by the code to enable the transmission of a written character (letter, figure, punctuation sign, arithmetic sign, etc.) or the control of a particular function (spacing, shift, line-feed, carriage return, phase correction, etc.): this set of elements being characterized by the variety, the duration and the relative position of the component elements or by some of these features. (COM) [49]

telegraph signal distortion Time displacement of transitions between conditions, such as marking and spacing, with respect to their proper relative positions in perfectly timed signals. *Note:* The total distortion is the algebraic sum of the bias and the characteristic and fortuitous distortions. *See also:* telegraphy. (EEC/PE) [119]

telegraph sounder A telegraph receiving instrument by means of which Morse signals are interpreted aurally (or read) by noting the intervals of time between two diverse sounds. *See also:* telegraphy. (EEC/PE) [119]

telegraph transmission speed The rate at which signals are transmitted, and may be measured by the equivalent number of dot cycles per second or by the average number of letters or words transmitted, and received per minute. *Note:* A given speed in dot cycles per second (often abbreviated to dots per second) may be converted to bauds by multiplying by two. The baud is the unit of signaling transmission speed recommended by the International Consultative Committee on Telegraph Communication. Where words per minute are used as a measure of transmission speed, five letters and a space per word are assumed. *See also:* telegraphy. (EEC/PE) [119]

telegraph transmitter A device for controlling a source of electric power so as to form telegraph signals. *See also:* telegraphy. (EEC/PE) [119]

telegraph word (conventional) A word comprising five letters together with one letter-space, used in computing telegraph speed in words per minute or traffic capacity. *See also:* telegraphy. (COM) [49]

telegraphy (1) (data transmission) A system of telecommunication for the transmission of graphic symbols, usually letters or numerals, by the use of a signal code. It is used primarily for record communication. The term may be extended to include any system of telecommunication for the transmission of graphic symbols or images for reception in record form, usually without gradation of shade values. (PE) 599-1985w

(2) The communication of textual messages through a telecommunication medium at speeds of 150 baud or less. (C) 610.7-1995

teleinformatics Data transfer via telecommunication systems. (C) 610.2-1987

telemetering (1) (A) (supervisory control, data acquisition, and automatic control) Transmission of measurable quantities using telecommunication techniques. *See also:* pulse-type telemeter; current-type telemeter; frequency-type telemeter; ratio-type telemeter. **(B) (supervisory control, data acquisition, and automatic control)** (Analog) Telemetering in which some characteristic of the transmitter signal is proportional to the quantity being measured. **(C) (supervisory control, data acquisition, and automatic control)** (Digital) Telemetering in which a numerical representation is generated and transmitted, the number being representative of the quantity being measured. (SWG/PE/SUB) C37.1-1987, C37.100-1992

(2) (data transmission) Measurement with the aid of intermediate means that permit the measurement to be interpreted at a distance from the primary detector. *Note:* The distinctive feature of telemetering is the nature of the translating means, which includes provision for converting the measure into a representative quantity of another kind that can be transmitted conveniently for measurement at a distance. The actual distance is irrelevant. (SWG/PE) 599-1985w

telemetering selection point interface Master station or RTU (or both) element(s) for the selective connection of tele-

metering 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. (SUB/PE) C37.1-1994

telemeter service Metered telegraph transmission between paired telegraph instruments over an intervening circuit adapted to serve a number of such pairs on a shared-time basis. *See also:* telegraphy. (EEC/PE) [119]

telemetry interface unit (TIU) A customer premise equipment (CPE) device that provides a network gateway function and an interface to one or more meters (water, gas, and electric) or other telemetry/control devices or to a local area network. The TIU may be placed in series with or bridged onto the local loop assigned to the end user. Because the TIUs are not network elements but CPE, they are connected to the end user's line (tip/ring) of the local loop at the network interface. In existing systems, these units are also known as meter interface units (MIUs). (AMR/SCC31) 1390-1995, 1390.2-1999, 1390.3-1999

teleordering Use of a telecommunication system to accept orders from customers at remote locations. *Synonyms:* online ordering; teleshopping. (C) 610.2-1987

telephone air-to-air input-output characteristic The acoustical output level of a telephone set as a function of the acoustical input level of another telephone set to which it is connected. The output is measured in an artificial ear, and the input is measured free-field at a specified location relative to the reference point of an artificial mouth. *See also:* telephone station. (COM) [50]

telephone booth A booth, closet, or stall for housing a telephone station. *See also:* telephone station. (EEC/PE) [119]

telephone central office (data transmission) A telephone switching unit, installed in a telephone system providing service to the general public, having the necessary equipment and operating arrangements for terminating and interconnecting lines and trunks. *Note:* There may be more than one central office in the same building. (PE) 599-1985w

telephone channel (data transmission) A channel suitable for the transmission of telephone signals. (PE) 599-1985w

telephone connection A two-way telephone channel completed between two points by means of suitable switching apparatus and arranged for the transmission of telephone currents, together with the associated arrangements for its functioning with the other parts of a telephone system in switching and signaling operations. *Note:* The term is also sometimes used to mean a two-way telephone channel permanently established between two telephone stations. (EEC/PE) [119]

telephone electrical impedance The complex ratio of the voltage to the current at the line terminals at any given single frequency. *See also:* telephone station. (COM) [50]

telephone equalization A property of a telephone circuit that ideally causes both transmit and receive responses to be inverse functions of current, thus tending to equalize variations in loop loss. (COM) [50]

telephone exchange (1) (data transmission) A unit of a telephone communication system for the provision of communication service in a specified area which usually embraces a city, town, or village, and its environs. Incoming lines are connected to outgoing lines as required by the individual caller dial code. (PE) 599-1985w

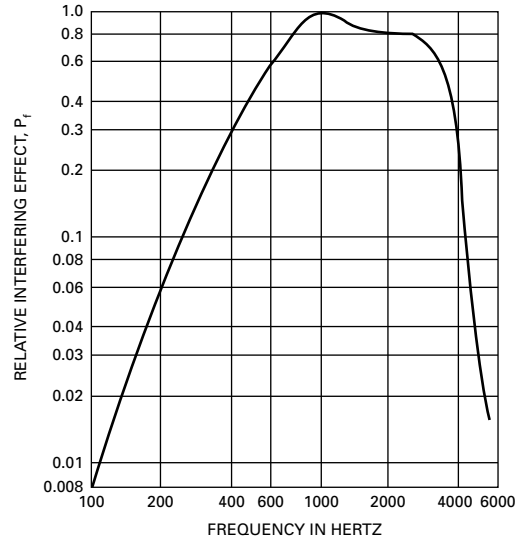
(2) *See also:* central office. (C) 610.7-1995

telephone feed circuit An arrangement for supplying direct-current power to a telephone set and an alternating-current path between the telephone set and a terminating circuit. (COM) [50]

telephone frequency characteristics Electrical and acoustical properties as functions of frequency. (COM) [50]

telephone handset A telephone transmitter and receiver combined in a unit with a handle. *See also:* telephone station. (COM) [50]

telephone influence factor (TIF) (1) (high-voltage direct-current systems) A dimensionless quantity which includes C-message weighting and is used to express the effect of the deviation of a voltage or current wave shape from a pure sinusoidal wave on a voice-frequency communication network caused by electromagnetic or electrostatic induction, or both. The frequencies and amplitudes of harmonics present on the power circuit, among other factors, determine a power circuit's inductive influence on a voice communications circuit. TIF expressed in terms of $I \cdot T$ product current and voltage TIF (that is, kV $\cdot$ T product per kilovolt) is a measure of this influence. TIF of a voltage or current wave is the ratio of the square root of the sum of the squares (rss) of the weighted root-mean-square (rms) values of all the sine-wave components (including in ac waves both fundamental and harmonics to the root-mean-square value (unweighted) of the entire wave. C-message weighting is derived from listening tests to indicate the relative annoyance of speech impairment by an interfering signal of frequency f as heard through a modern (since 1960) telephone set. The result, called C-message weighting, is shown in graphical and tubular form in the figure on the next page in terms of relative interfering effect P_f at frequency f.



C-message weighting

telephone influence factor

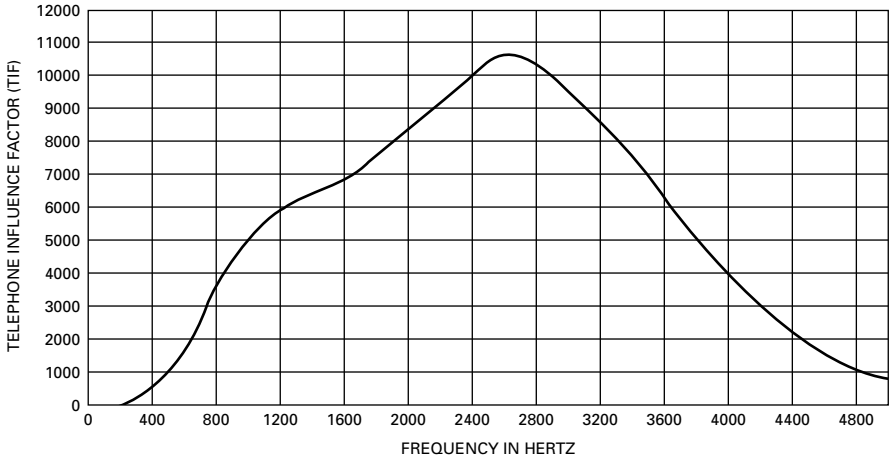
(COM/TA) 368-1977w

(2) (thyristor) Of a voltage or current wave in an electric supply circuit, the ratio of the square root of the sum of the square of the weighted root-mean-square (rms) values of all sine-wave components (including in alternating waves both the fundamental and harmonics) to the rms (unweighted) values of the entire wave. (The weightings are applied to the individual components of different frequencies according to a prescribed curve). (IA/IPC) 428-1981w

(3) (voice-frequency electrical-noise test) The ratio of the square root of the sum of the squares of the weighted root-mean-square values of all the sine-wave components (including, in alternating-current waves, both fundamental and harmonics) to the root-mean-square value (unweighted) of the entire wave. The TIF represents the relative interfering effect of voltages and currents at the various harmonic frequencies that appear in power supply circuits. It is a dimensionless quantity indicative of waveform and not of amplitude. TIF takes into consideration the characteristics of the telephone receiver and the ear (all represented by *c*-message weighting) and the assumption that the coupling between the electric supply circuit and the telephone circuit is directly proportional to the interfering frequency. TIF is also shown as T for convenience and is expressed as

1960 SINGLE FREQUENCY TIF VALUES							
FREQ	TIF	FREQ	TIF	FREQ	TIF	FREQ	TIF
60	0.5	1020	5100	1860	7820	3000	9670
180	30	1080	5400	1980	8330	3180	8740
300	225	1140	5630	2100	8830	3300	8090
360	400	1260	6050	2160	9080	3540	6730
420	650	1380	6370	2220	9330	3660	6130
540	1320	1440	6650	2340	9840	3900	4400

1960 SINGLE FREQUENCY TIF VALUES							
FREQ	TIF	FREQ	TIF	FREQ	TIF	FREQ	TIF
660	2260	1500	6680	2460	10340	4020	3700
720	2760	1620	6970	2580	10600	4260	2750
780	3360	1740	7320	2820	10210	4380	2190
900	4350	1800	7570	2940	9820	5000	840
1000	5000						



TIF weighting characteristic

telephone influence factor

$$T = \frac{\sqrt{\Sigma(X_f \cdot W_f)^2}}{X_t}$$

or

$$T = \sqrt{\Sigma\left(\frac{X_t \cdot W_f}{X_t}\right)^2}$$

where

X_t = The total effective or rms current (I) or voltage (kV)
X_f = The single-frequency effective current (I) or voltage (kV) at frequency f, including the fundamental
W_f = The single-frequency TIF weighting at frequency f. The TIF contribution of power-circuit voltage or current at frequency f may be expressed as follows:

$$T = \frac{X_f \cdot W_f}{X_t}$$

The 1960 TIF weighting characteristic represents the relative interfering effect of a voltage or current in a supply circuit at frequency f. The weighting takes into account the relative subjective effect of frequency f as heard through a telephone set (that is, the c-message weighting) and the coupling between the power and telephone circuit, assumed to be directly proportional to frequency. It is defined as

$$W_f = 5P_f f$$

where

5 = A constant
P_f = The c-message weighting at frequency f
f = The frequency under consideration.

The 1960 TIF weighting characteristic is shown in the corresponding figure.

(COM/TA) 469-1988w

(4) (power and distribution transformers) Of a voltage or current wave in an electric supply circuit, the ratio of the square root of the sum of the squares of the weighted root-mean-square values of all the sine-wave components (including in alternating-current waves both fundamental and harmonics) to the root-mean-square value (unweighted) of the entire wave. *Note:* This factor was formerly known as telephone interference factor, which term is still used occasionally when referring to values based on the original (1919) weighting curve. (PE/TR) C57.12.80-1978r

(5) For a voltage or current wave in an electric supply circuit, the ratio of the square root of the sum of the squares of the weighted root-mean-square values of all the sine-wave components (including alternating current waves both fundamental and harmonic) to the root-mean-square value (unweighted) of the entire wave. (IA/SPC) 519-1992

telephone line (data transmission) A general term used in communication practice in several different senses, the more important of which are:

— The conductor or conductors and supporting or containing structures extending between telephone stations and central offices or between central offices whether they be in the same or in different communities.
— The conductors and circuit apparatus associated with a particular communication channel.

(PE) 599-1985w

telephone modal distance The distance between the center of the grid of a telephone handset transmitter 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. *See also:* telephone station. (COM/TA) 269-1971w, [50]

telephone modal position The position a telephone handset assumes when the receiver of the handset is held in close contact with the ear of a person with head dimensions that are modal for a population. *See also:* telephone station. (COM) [50]

telephone network A telecommunication network primarily intended for telephony. (COM/TA) 823-1989w

telephone operator A person who handles switching and signaling operations needed to establish telephone connections between stations or who performs various auxiliary functions associated therewith. (COM) [48]

telephone receive input-output characteristic The acoustical output level of a telephone set as a function of the electric input level. The output is measured in an artificial ear, and the input is measured across a specified termination connected to the telephone feed circuit. *See also:* telephone station. (COM) [50]

telephone receiver An earphone for use in a telephone system. (SP) [32]

telephone repeater A repeater for use in a telephone circuit. *See also:* repeater. (EEC/PE) [119]

telephone ringer (ringer) (station ringer) An electric bell designed to operate on low-frequency alternating or pulsating current and associated with a telephone station for indicating a telephone call to the station. *See also:* telephone station. (EEC/PE) [119]

telephone set (1) (telephone) An assemblage of apparatus including a telephone transmitter, a telephone receiver, and usually a switch, and the immediately associated wiring and signaling arrangements. *See also:* telephone station. (PE/EEC) [119]

(2) (speech telephony) An assembly of apparatus for speech telephony, including at least a telephone transmitter and a telephone receiver in a handset, and the wiring and components immediately associated with these transducers. A telephone set usually includes other components such as a switchhook; it may also include a telephone bell and a dial. (COM/TA) 823-1989w

(3) A device that, when connected to a telephone network, allows two-way voice communication. (COM/TA) 269-1992

telephone sidetone The ratio of the acoustical output of the receiver of a given telephone set to the acoustical input of the transmitter of the same telephone set. *See also:* telephone station; telephone air-to-air input-output characteristic. (COM) [50]

telephone speech network An electric circuit that connects the transmitter and the receiver to a telephone line or telephone test loop and to each other. *See also:* telephone station. (COM) [50]

telephone station An installed telephone set and associated wiring and apparatus, in service for telephone communication. *Note:* As generally applied, this term does not include the telephone sets employed by central-office operators and by certain other personnel in the operation and maintenance of a telephone system. (EEC/PE) [119]

telephone subscriber A customer of a telephone system who is served by the system under a specific agreement or contract. (COM) [48]

telephone switchboard A switchboard for interconnecting telephone lines and associated circuits. (COM) [48]

telephone system An assemblage of telephone stations, lines, channels, and switching arrangements for their interconnection, together with all the accessories for providing telephone communication. (COM) [48]

telephone test circuit An assembly consisting of a telephone set(s) and interface(s) as may be required to realize simulated partial and overall telephone connections. (COM/TA) 269-1992

telephone test connection Two telephone sets connected together by means of telephone test loops and a telephone feed circuit. (COM) [50]

telephone test loop A circuit that is interposed between a telephone set and a telephone feed circuit to simulate a real telephone line. (COM) [50]

telephone transmit input-output characteristic The electric output level of a telephone set as a function of the acoustical input level. The output is measured across a specified impedance connected to the telephone feed circuit, and the input is measured free-field at a specified location relative to the reference point of an artificial mouth. *See also:* telephone station. (COM) [50]

telephone transmitter A microphone for use in a telephone system. *See also:* telephone station. (SP) [32]

telephone-type relay A type of electromechanical relay in which the significant structural feature is a hinged armature mechanically separate from the contact assembly. This assembly usually consists of a multiplicity of stacked leaf-spring contacts. (SWG/PE) C37.100-1992

telephony (1) (speech telephony) A form of telecommunication primarily intended for the exchange of information in the form of speech. (COM/TA) 823-1989w

(2) (speech telephony) *See also:* sleeve wire; sleeve conductor.

telephotography *See:* facsimile telegraphy; picture transmission.

teleprinter *See:* printer.

teleprocessing *See:* remote-access data processing; distributed data processing.

teleprocessing monitor The software program, usually located in the host computer, that handles various tasks required for incoming and outgoing messages. *Synonym:* telecommunication monitor. (C) 610.7-1995

teleran (navigation aids) A navigation system which employs ground-based search radar equipment along an airway to locate aircraft flying near that airway. (AES/GCS) 172-1983w

telereference The use of a telecommunication system to reference data at some remote location. (C) 610.2-1987

teleshopping *See:* teleordering.

teletext A form of videotex that allows users to receive textual or pictorial material via broadcast signals interpreted by a special decoder attached to a television set. *Contrast:* viewdata. (C) 610.2-1987

teletype exchange A service that permits the transmission of data using commercial telecommunication facilities. *Synonym:* telex. (C) 610.2-1987

teletypesetting (TTS) Use of a telecommunication system to allow typesetting to be done at remote locations. (C) 610.2-1987

teletypewriter *See:* printer.

television (TV) The electric transmission and reception of transient visual images. (EEC/PE) [119]

television broadcast station A radio station for transmitting visual signals, and usually simultaneous aural signals, for general reception. *See also:* television. (EEC/PE) [119]

television camera A pickup unit used in a television system to convert into electric signals the optical image formed by a lens. *See also:* television. (EEC/PE) [119]

television channel A channel suitable for the transmission of television signals. The channel for associated sound signals may or may not be considered a part of the television channel. *See also:* channel. (EEC/PE) [119]

television interference (overhead-power-line corona and radio noise) A radio interference occurring in the frequency range of television signals. (T&D/PE) 539-1990

television line number The ratio of the raster height to the half period of a periodic test pattern. Example: In a test pattern composed of alternate equal-width black and white bars, the television line number is the ratio of the raster height to the width of each bar. *Note:* Both quantities are measured at the camera-tube sensitive surface. *See also:* television. (ED) 158-1962w

television lines (TVL) The number of television lines for the measurement of camera resolution is defined as the total number of alternate, equal width, black and white, horizontally oriented lines that can be drawn between the top edge and bottom edge of the picture and that will fill the complete height of the resolution chart. Specification and measurement of the number of television lines always refers to *lines per picture height*. *Note:* Total Lines per Picture Width = (Picture Width ÷ Picture Height) × (TVL). For a given value of television lines (TVL), the total number of alternate, equal width,

vertically oriented black or white lines that can be drawn between the left edge and right edge of the picture, and that will fill the complete width of the resolution chart, can be determined by multiplying the number of horizontally oriented lines *N,* by the aspect ratio of the resolution chart, which is the ratio of the chart width to the chart height. (BT/AV) 208-1995

television lines per raster height (diode-type camera tube) The number of half-cycles of a uniform periodic array referred to a unit length equal to the raster height. The array may be sinusoidal or comprised of equal width alternating light and dark bars (lines). For a given array, the TVL/RH value is numerically twice the spatial frequency in line pairs per raster height (LP/RH) units. *Note:* While the unit TVL/RH has had wide usage throughout the television industry, it is recommended that the more accurately descriptive unit LP/RH be adopted. (ED) 503-1978w

television picture tube *See:* picture tube.

television receiver A radio receiver for converting incoming electric signals into television pictures and customarily associated sound. *See also:* television. (EEC/PE) [119]

television repeater A repeater for use in a television circuit. *See also:* television; repeater. (EEC/PE) [119]

television transmitter The aggregate of such radio-frequency and modulating equipment as is necessary to supply to an antenna system modulated radio-frequency power by means of which all the component parts of a complete television signal (including audio, video, and synchronizing signals) are concurrently transmitted. *See also:* television. (AP/ANT) 145-1983s

telewriter *See:* teleautograph.

telex *See:* teletype exchange.

Tell-a-graf A computer language used to develop presentation and business graphics. (C) 610.13-1993w

telltale *See:* running-light-indicator panel.

telluric (power fault effects) Currents circulating in the earth or in conductors connecting two grounded points due to voltages in the earth. (PE/PSC) 367-1979, 367-1996

telluric currents (power fault effects) Currents circulating in the earth or in conductors connecting two grounded points due to voltages in the earth. (PE/PSC) 367-1979, 367-1996

telluric effects Currents circulating in the earth or in conductors connecting two grounded points due to voltages in the earth. (PE/PSC) 367-1987s

TEM *See:* transverse-electromagnetic wave.

TEM mode (1) (waveguide terms) A waveguide mode in which the longitudinal components of the electric and magnetic fields are everywhere zero. (MTT) 146-1980w

(2) (transverse electromagnetic) A mode of propagation characterized by frequency-independent electric and magnetic-field patterns that are purely transverse with respect to the axis of the transmission line; that is, patterns that possess no field component in the direction of propagation. A transmission line cannot possess TEM modes unless there are at least two disjoint conductors in its cross section, and unless the medium filling the cross section is homogeneous and normally isotropic. (MTT) 1004-1987w

(3) (fiber optics) *See also:* transverse-electromagnetic mode 812-1984w

TE_{mn} mode (A) (waveguide) (H_{mn} mode) In a rectangular waveguide, the subscripts $_m$ and $_n$ denote the number of half-period variations in the electric field parallel to the broad and narrow sides, respectively, of the guide. *Note:* In the United Kingdom, the reverse order is preferred. **(B) (waveguide)** (H_{mn} mode) In a circular waveguide, a mode that has $_m$ diametral planes in which the longitudinal component of the magnetic field is zero, and $_n$ cylindrical surfaces of nonzero radius (including the wall of the guide) at which the tangential component of the electric field is zero. **(C) (waveguide)** (H_{mn} mode) In a resonant cavity consisting of a length of rectangular or circular waveguide, a third subscript is used to indicate the number of half-period variations of the field along the waveguide axis. (MTT) 146-1980

TE mode (1) (waveguide) (H mode) A waveguide mode in which the longitudinal component of the electrical field is everywhere zero and the longitudinal component of the magnetic field is not. (MTT) 146-1980w

(2) (fiber optics) *See also:* transverse electric mode. 812-1984w

temperature, ambient air *See:* ambient air temperature.

temperature class (1) (evaluation of thermal capability) (thermal classification of electric equipment and electrical insulation) A standardization designation of the temperature capability of the insulation in electric equipment, as defined by the appropriate technical committee. It may be determined by experience or test and expressed by letters or numbers. (EI) 1-1986r

(2) One of the values of temperature allocated to electrical heating devices derived from a system of classification according to the maximum surface temperature of the heater. Also referred to as T-class, identification number, T-rating, and temperature code. (IA) 515-1997

temperature classification (solid electrical insulating materials) The term is reserved for insulation systems as used in specific equipment and is no longer recognized as a description of the temperature capability of individual insulating materials. Historically, the term has been used in reference to insulation systems and to electrical equipment. In the future the term may be reserved for use in rating electrical equipment, while thermal identification may be used in the specification of insulation systems for particular applications. (EI) 98-1984r

temperature 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. 1) 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. 2) 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. *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. *Notes:* 1. 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 105°C. *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 Class 105 insulation materials. 2. 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. *class 150 insulation system.* Materials or combinations of materials such as mica, glass fiber, asbestos, etc., with suitable bonding substances. 3. 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 life at 150 degrees Celsius. *class 185 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. 4. 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 185°C. *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. 5. Other materials or combinations of materials may be included in this class if by experience or accepted tests, the system can be shown to have comparable thermal life at 220°C. *class over-220 insulation system.* Materials consisting entirely of mica, porcelain, glass quartz, and similar inorganic materials. 6. 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. *class O insulation.* (nonpreferred term). *class A insulation.* (nonpreferred term). *See also:* Class 105 insulation system.

(PE/TR) C57.12.80-1978r

temperature coefficient (1) (power supplies) (ferroresonant voltage regulators) The percent change in the output voltage or current as a result of a 1°C change in the ambient operating temperature (percent per degree Celsius). *See also:* environmental coefficient; overall regulation.

(AES/PEL/ET) [41], 449-1990s

(2) (rotating machinery) The variation of the quantity considered, divided by the difference in temperature producing it. Temperature coefficient may be defined as an average over a temperature range or an incremental value applying to a specified temperature. *See also:* asynchronous machine.

(PE) [9]

(3) (variable or fixed attenuator) Maximum temporary and reversible change of insertion loss in decibels per degree Celsius over operating temperature range.

(IM/HFIM) 474-1973w

temperature coefficient of capacity (storage cell or battery) The change in delivered capacity (ampere-hour or watt hour capacity) per degree Celsius relative to the capacity of the cell or battery at a specified temperature. (EEC/PE) [119]

temperature coefficient of electromotive force (storage cell or battery) The change in open-circuit voltage per degree Celsius relative to the electromotive force of the cell or battery at a specified temperature. (EEC/PE) [119]

temperature coefficient of resistance (rotating machinery) The temperature coefficient relating a change in electric resistance to the difference in temperature producing it. *See also:* asynchronous machine. (PE) [9]

temperature coefficient of sensitivity (electrothermic power meters) The change in rf sensitivity (microvolts/milliwatts) resulting from a specified temperature change of the electrothermic unit at a specified power level. Expressed in percent per degree celsius. (IM) 544-1975w

temperature coefficient of voltage drop (glow-discharge tubes) The quotient of the change of tube voltage drop (excluding any voltage jumps) by the change of ambient (or envelope) temperature. *Note:* It must be indicated whether the quotient is taken with respect to ambient or envelope temperature. *See also:* gas tube. (ED) 161-1971w

temperature compensated overload relay A device that functions at any current in excess of a predetermined value essentially independent of the ambient temperature.

(IA/MT) 45-1998

temperature control (packaging machinery) A control device responsive to temperature. (IA/PKG) 333-1980w

temperature control device (power system device function numbers) A device that functions to raise or lower the temperature of a machine or other apparatus, or of any medium, when its temperature falls below, or rises above, a predetermined value. *Note:* An example is a thermostat that switches on a space heater in a switchgear assembly when the temperature falls to a desired value as distinguished from a device that is used to provide automatic temperature regulation between close limits and would be designated as device function 90T [regulating device T]. (SUB/PE) C37.2-1979s

temperature control system (gas turbines) The devices and elements, including the necessary temperature detectors, relays, or other signal-amplifying devices and control elements, required to actuate directly or indirectly the fuel-control valve, speed of the air compressor, or stator blades of the compressor so as to limit or control the rate of fuel input or air flow inlet to the gas turbine. By this means, the temperature in the combustion system or the temperatures in the turbine stages or turbine exhaust may be limited or controlled.

(PE/EDPG) [5]

temperature conversion (tolerance requirements) (International System of Units (SI)) Standard practice for converting tolerances from degrees Fahrenheit to kelvins or degrees Celsius is:

Conversion of Temperature Tolerance Requirements

Tolerance °F	Tolerance °K or °C
±1	±0.5
±2	±1
±5	±3
±10	±5.5
±15	±8.5
±20	±11
±25	±14

Normally, temperatures expressed in a whole number of degrees Fahrenheit should be converted to the nearest 0.5 kelvin (or degrees Celcius). As with other quantities, the number of significant digits to retain will depend upon implied accruacy of the original dimension; for example:

100 ± 5°F implied accuracy estimated total 2°F

37.7777 ± 2.7777°C rounds to 38 ± 3°C

1000 ± 50°F implied accuracy estimated total 20°F

537.7777 ± 27.7777°C rounds to 540 ± 30°C

See also: units and letter symbols. (QUL) 268-1982s

temperature derating (semiconductor devices) The reduction in reverse-voltage or forward-current rating, or both, assigned by the manufacturer under stated conditions of higher ambient temperatures. *See also:* average forward current rating; semiconductor rectifier stack. (IA) [62]

temperature detectors (gas turbines and rotating electric machinery) The primary temperature-sensing elements that are directly responsive to temperature. *See also:* asynchronous machine; electric thermometer. (PE) [9]

temperature, dew point *See:* dew point temperature.

temperature, dry bulb *See:* dry bulb temperature.

temperature, effective *See:* effective temperature.

temperature, equilibrium *See:* equilibrium temperature.

temperature index (1) (power and distribution transformers) An index that allows relative comparisons of the temperature capability of insulating materials or insulation systems based on specified controlled test conditions. Preferred values of temperature index numbers are shown in the table below. (PE/TR) C57.12.80-1978r

(2) (thermal classification of electric equipment and electrical insulation) (evaluation of thermal capability) The number that corresponds to the temperature in °C, derived mathematically or graphically from the thermal endurance relationship at a specified time (often 20 000 h). The temperature index (TI) may be reported for materials and insulation systems. However, for insulation systems it may be preferable to make comparisons at a particular temperature, for example, 130°C, 155°C, or over a range of temperatures. (The TI is not used for equipment). *See also:* thermal endurance graph. (EI) 1-1986r

(3) (solid electrical insulating materials) This is the number corresponding to the temperature in degrees Celsius derived from the thermal endurance graph at a given time.

Number Range	Preferred Temperature Index
90–104	90
105–129	105
130–154	130
155–179	155
180–199	180
200–219	200

For 220 and above, no preferred indices established.

See also: thermal endurance graph. (EI) 98-1984r

temperature inversion (in the troposphere) An increase of temperature with height in the troposphere. (AP/PROP) 211-1997

temperature meter *See:* electric thermometer.

temperature, operating *See:* operating temperature.

temperature radiator (illuminating engineering) An ideal radiator whose radiant flux density (radiant exitance) is determined by its temperature and the material and character of its surface, and is independent of its previous history. (EEC/IE) [126]

temperature-regulating equipment (rectifier) Any equipment used for heating and cooling a rectifier, together with the devices for controlling and indicating its temperature. *See also:* rectification. (IA) [62]

temperature relay A relay whose operation is caused by specified external temperature. *See also:* thermal relay. (SWG/PE) C37.100-1992

temperature relays (gas turbines) Devices by means of which the output signals of the temperature detectors are enabled to control directly or indirectly the rate of fuel energy input, the air flow input, or both, to the combustion system. *Note:* Operation of a temperature relay is caused by a specified external temperature: whereas operation of a thermal relay is caused by the heating of a part of the relay. *See also:* thermal relay. (SWG/PE/PSR) C37.90-1978s, C37.100-1981s

temperature rise (1) The difference between the temperature of the part under consideration [commonly the *average winding rise* or the *maximum (hottest-spot) winding temperature rise*] and the ambient temperature. (PE/TR) C57.134-2000 **(2)** The difference between the temperature of the part under consideration and the ambient temperature. (PE/EM/TR) 67-1990r, C57.12.80-1978r

temperature-rise tests (1) Tests to determine the temperature rise, above ambient, of various parts of the tested device when subjected to specified test quantities. *Note:* The test quantities may be current, load, etc. *See also:* allowable continuous current. (SWG/PE) C37.40-1981s, C37.100-1992 **(2)** A test in which rated current at rated frequency is applied to equipment to determine its temperature rise. (SWG/PE/SWG-OLD) [9], C37.34-1971s, [56]

temperature sensor (sensing element) A device that responds to temperature and provides an electrical signal or mechanical operation. (IA/BT/AV/PC) 515-1997, 152-1953s, 515.1-1995

temperature stability (electrical conversion) Static regulation caused by a shift or change in output that was caused by temperature variation. This effect may be produced by a change in the ambient or by self-heating. (AES) [41]

temperature, wet bulb *See:* wet bulb temperature.

tempest The investigation, study, and control of spurious electromagnetic signals emitted by electronic equipment. *See also:* emanations security. (C/BA) 896.3-1993w

template An asset with parameters or slots that can be used to construct an instantiated asset. *See also:* construction. (C/SE) 1517-1999

template matching (A) An image processing technique in which patterns or shapes are detected by comparison with prespecified patterns or shapes called templates. *See also:* image matching. **(B)** A pattern recognition technique using the principle described in definition (A). (C) 610.4-1990

temporal coherence (1) (laser maser) (electromagnetic) The correlation in time of electromagnetic fields at a point in space. (LEO) 586-1980w **(2) (fiber optics)** *See also:* coherent. 812-1984w

temporal cohesion A type of cohesion in which the tasks performed by a software module are all required at a particular phase of program execution; for example, a module containing all of a program's initialization tasks. *Contrast:* coincidental cohesion; logical cohesion; sequential cohesion; procedural cohesion; functional cohesion; communicational cohesion. (C) 610.12-1990

temporal locality The tendency for a program to reference the same memory locations over short time intervals. (C/BA) 10857-1994

temporally coherent radiation *See:* coherent.

temporally weighted terminal coupling loss (TCL_T) The terminal coupling loss, weighted in both time and frequency domains to account for subjective perception. (COM/TA) 1329-1999

temporal noise (diode-type camera tube) The varying amplitude portion of what should be a fixed amplitude video signal. It is statistical in nature, being random in both time and amplitude. (ED) 503-1978w

temporary Intermittent or transient. (C/BA) 896.3-1993w

temporary emergency circuits Circuits arranged for instantaneous automatic transfer to a storage-battery supply upon failure of a ship's service supply. *See also:* emergency electric system. (EEC/PE/MT) [119]

temporary emergency lighting The lighting of exits and passages to permit passengers and crew, upon failure of a ship's service lighting, readily to find their way to the lifeboat embarkation deck. *See also:* emergency electric system. (EEC/PE/MT) [119]

temporary fault One that may be self-clearing, or may be cleared if the faulted circuit is rapidly de-energized by opening of a protective device, such as a circuit breaker or recloser. (T&D/PE) 1250-1995

temporary forced outage A forced outage where the unit or component is undamaged and is restored to service by manual switching operations without repair but possibly with on-site inspection. (PE/PSE) 859-1987w

temporary ground A connection between a grounding system and parts of an installation that are normally alive, applied temporarily so that work may be safely carried out in them. (PE) [8]

temporary interruption (1) A short-duration outage that interferes with call processing but does not affect established connections. SPCSs may have frequent outages of short duration due to system reinitialization. Although established calls may remain connected during these outages, new calls may be delayed and calls in the dialing state may be lost. Most customers do not perceive these short outages because they are not likely to be using their telephones when they occur. However, an excessive number of short outages can lead to degradation of service and can cause delay in dial tone or ineffective attempts. (COM/TA) 973-1990w **(2)** 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 3 s and 1 min. (SCC22) 1346-1998

(3) (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 3 s and 1 min. (IA/PSE) 1100-1999

temporary master *See:* master.

temporary overvoltage (1) An oscillatory phase-to-ground or phase-to-phase overvoltage that is at a given location of relatively long duration (seconds, even minutes) and that is undamped or only weakly damped. Temporary overvoltages usually originate from switching operations or faults (for example, load rejection, single-phase fault, fault on a high-resistance grounded or ungrounded system) or from nonlinearities (ferroresonance effects, harmonics), or both. They are characterized by the amplitude, the oscillation frequencies, the total duration, or the decrement. (C/PE/TR) 1313.1-1996, C57.12.80-1978r

(2) An oscillatory overvoltage, associated with switching or faults (for example, load rejection, single-phase faults) and/or nonlinearities (ferroresonance effects, harmonics), of relatively long duration, which is undamped or slightly damped. (SPD/PE) C62.22-1997

temporary storage (programming) Storage locations reserved for intermediate results. *See also:* working storage. (MIL/C) [2], 610.10-1994w, [85], [20]

temporary structure *See:* crossing structure.

TEM wave *See:* transverse-electromagnetic wave.

10BASE-T (1) ISO/IEC 8802-3 Physical Layer specification for Ethernet over two pairs of unshielded twisted pair (UTP) media at 10 Mbit/s. (C/LM) 802.9a-1995w

(2) IEEE 802.3 Physical Layer specification for a 10 Mb/s CSMA/CD local area network over two pairs of twisted-pair telephone wire. (C/LM) 802.3-1998

10BASE2 IEEE 802.3 Physical Layer specification for a 10 Mb/s CSMA/CD local area network over RG 58 coaxial cable. (C/LM) 802.3-1998

10BASE-F IEEE 802.3 Physical Layer specification for a 10 Mb/s CSMA/CD local area network over fiber optic cable. (C/LM) 802.3-1998

10BASE-FB port A port on a repeater that contains an internal 10BASE-FB Medium Attachment Unit (MAU) that can connect to a similar port on another repeater. (C/LM) 802.3-1998

10BASE-FB segment A fiber optic link segment providing a point-to-point connection between two 10BASE-FB ports on repeaters. (C/LM) 802.3-1998

10BASE5 IEEE 802.3 Physical Layer specification for a 10 Mb/s CSMA/CD local area network over coaxial cable (i.e., thicknet). (C/LM) 802.3-1998

10BASE-FL segment A fiber optic link segment providing point-to-point connection between two 10BASE-FL Medium Attachment Units (MAUs). (C/LM) 802.3-1998

10BASE-FP segment A fiber optic mixing segment, including one 10BASE-FP Star and all of the attached fiber pairs. (C/LM) 802.3-1998

10BASE-FP Star A passive device that is used to couple fiber pairs together to form a 10BASE-FP segment. Optical signals received at any input port of the 10BASE-FP Star are distributed to all of its output ports (including the output port of the optical interface from which it was received). A 10BASE-FP Star is typically comprised of a passive-star coupler, fiber optic connectors, and a suitable mechanical housing. (C/LM) 802.3-1998

10BROAD36 IEEE 802.3 Physical Layer specification for a 10 Mb/s CSMA/CD local area network over single broadband cable. (C/LM) 802.3-1998

ten high day *See:* ten high day busy-hour load; time-consistent traffic measures.

ten high day busy-hour load To calculate the THDBH load, traffic data for the time-consistent busy hour is processed all year to identify the 10 highest traffic days of the year. The 10-day average traffic level for this time-consistent busy hour is the THDBH load. *Synonym:* THDBH load. *See also:* time-consistent traffic measures. (COM/TA) 973-1990w

ten-minute reserve An additional amount of operating reserve sufficient to reduce area control error to zero within ten minutes following the loss of generating capacity that would result from the most severe single contingency. (PE/PSE) 858-1993w

tens complement (mathematics of computing) The radix complement of a decimal numeral, which may be formed by subtracting each digit from 9, then adding 1 to the least significant digit and executing any required carries. For example, the tens complement of 4830 is 5170. *Synonym:* complement on ten. (C) 1084-1986w

tension *See:* final unloaded conductor tension; conductor.

tensioner *See:* bullwheel tensioner.

tensioner, bullwheel *See:* bullwheel tensioner.

tension site (conductor stringing equipment) The location on the line where the tensioner, reel stands, and anchors (snubs) are located. This site may also serve as the pull or tension site for the next sag section. *Synonyms:* payout site; conductor payout station; payout site; reel setup; conductor payout station; reel setup. (T&D/PE) 524a-1993r, 524-1992r

tension stringing The use of pullers and tensioners to keep the conductor under tension and positive control during the stringing phase, thus keeping it clear of the earth and other obstacles that could cause damage. (T&D/PE) 524-1992r

tension, unloaded *See:* unloaded tension.

tenth-power width (in a plane containing the direction of the maximum of a lobe) The full angle between the two directions in that plane about the maximum in which the radiation intensity is one-tenth the maximum value of the lobe. *See also:* antenna. (AP/ANT) 145-1983s

tenuous medium A medium in which the spatial variations of constitutive parameters, either continuous or discrete, are small relative to their mean values. (AP/PROP) 211-1997

tenure (1) (STEbus) The time during which a master has control of the bus. (C/MM) 1000-1987r

(2) (NuBus) Time period of unbroken ownership of the bus by a particular module. May consist of one or more transactions or attention cycles. (C/MM) 1196-1987w

teratology The study of developmental abnormalities in the fetus. (T&D/PE) 539-1990

terdenary (A) Pertaining to a selection in which there are 13 possible outcomes. **(B)** Pertaining to the numeration system with a radix of 13. (C) 1084-1986

terminal (1) (A) (supervisory control, data acquisition, and automatic control) A point in a system or communication network at which data can either enter or leave. *See also:* virtual terminal. **(B) (supervisory control, data acquisition, and automatic control)** An input/output device capable of transmitting entries to and obtaining output from the system of which it is a part, for example cathode-ray tube (crt) terminal. **(C) (power and distribution transformers)** A conducting element of an equipment or a circuit intended for connection to an external conductor. **(D) (power and distribution transformers)** A device attached to a conductor to facilitate connection with another conductor. **(E)** An input-output peripheral device capable of transmitting entries to and obtaining output from a system. *See also:* link-attached terminal; intelligent terminal; logical terminal; master terminal; smart terminal; output terminal; input terminal; video display terminal; graphic user terminal; facsimile terminal; dumb terminal; channel-attached terminal; job-oriented terminal; remote terminal; local terminal. (SWG/SUB/PE/C/TR) C37.1-1987, C37.100-1992, 610.7-1995, 610.10-1994, C57.12.80-1978

(2) (packaging machinery) A point of connection in an electric circuit. (IA/PKG) 333-1980w

(3) (terminal connector) A connector for attaching a conductor to electrical apparatus. (SWG/PE) C37.40-1993, C37.100-1992

(4) (networks) A point at which any element may be directly connected to one or more other elements. *See also:* network analysis. (BT) 153-1950w

(5) (light-emitting diodes) (semiconductor devices) An externally available point of connection to one or more electrodes or elements within the device. *See also:* semiconductor rectifier cell; semiconductor; anode. (ED/ICTL) 216-1960w

(6) (telegraph circuits) A general term referring to the equipment at the end of a telegraph circuit, modems, input-output and associated equipment. *See also:* telegraph. (COM) [49]

(7) (rotating machinery) A conducting element of a winding intended for connection to an external electrical conductor. *See also:* stator. (PE) [9]

(8) (power outages) A functional facility (substation, generating station, or load center) that includes components such as bus sections, circuit breakers, and protection systems where transmission units terminate. (PE/PSE) 859-1987w

(9) A master or remote terminal connected to a communication channel. (SUB/PE) 999-1992w

(10) A character special file that obeys the specifications of the POSIX.1 General Terminal Interface. *Synonym:* terminal device. (C/PA/C/PA) 9945-2-1993, 9945-1-1996

(11) (terminal device) A character special file that obeys the specifications of IEEE Std 1003.5b-1995. (PA/C) 1003.5b-1995

terminal adapter (TA) An adapter required to map one specified interface to another. An example is the adapting of the R interface in the ITU-T ISDN to the S/T interface. The TA may be an integral functional entity as part of the terminal or may be a separate physical unit connected between an R interface and the S/T interface. (C/LM/COM) 802.9a-1995w, 8802-9-1996

terminal block An insulating base equipped with terminals for connecting secondary and control wiring. *Synonym:* terminal board. (SWG/PE) C37.100-1992

terminal board (power and distribution transformers) A plate of insulating material that is used to support terminations of winding leads. *Notes:* 1. The terminations, which may be mounted studs or blade connectors, are used for making connections to the supply line, the load, other external circuits, or among the windings of the machine. 2. Small terminal boards may also be termed terminal blocks, or terminal strips. (PE/TR) C57.12.80-1978r

terminal board cover (rotating machinery) A closure for the opening which permits access to the terminal board and prevents accidental contact with the terminals. (PE) [8]

terminal box (rotating machinery) A form of termination in which the ends of the machine winding are connected to the incoming supply leads inside a box that virtually encloses the connections, and is of minimum size consistent with adequate access and with clearance and creepage-distance requirements. The box is provided with a removable cover plate for access. *See also:* stator. (PE) [9]

terminal chamber A metal-enclosed container that includes all necessary mechanical and electrical items to complete the connections to other equipment. (SWG/PE) C37.100-1992, C37.23-1969s

terminal charge *See:* apparent charge.

terminal conformity *See:* conformity.

terminal connection (battery) Connections made between cells or rows of cells or at the positive and negative terminals of the battery, which may include terminal plates, cables with lugs, and connectors. (SB) 1188-1996

terminal connection detail (1) (nickle-cadmium storage batteries for generating stations and substation) Connections made between cells, rows of cells, and at positive and negative terminals of the battery, which may include nickel- or cadmium-plated terminal plates, cables with nickel- or cadmium-plated lugs, and nickel- or cadmium-plated solid copper or steel connectors. (PE/EDPG) 1106-1987s

(2) Connections made between rows of cells or at the positive and negative terminals of the battery, which may include terminal plates, cables with lugs, and connectors. (PE/EDPG) 450-1995

terminal connector (1) (power and distribution transformers) A connector for attaching a conductor to a lead, terminal block, or stud of electric apparatus. (PE/TR) C57.12.80-1978r

(2) *See also:* terminal. (SWG/PE) C37.100-1981s

terminal corona charge (corona measurement) A charge equal to the product of the capacitance of the insulation system and the terminal corona-pulse voltage. (MAG/ET) 436-1977s

terminal corona-pulse voltage (corona measurement) The pulse voltage resulting from a corona discharge that is represented as a voltage source suddenly applied in series with the capacitance of the insulation system under test, and which would appear at the terminals of the system under open-circuit conditions. (MAG/ET) 436-1977s

terminal coupling loss (TCL) The loss in the echo path from the receive electrical test point to the send electrical test point. TCL can be weighted in time, frequency, or both. *Synonym:* echo return loss. (COM/TA) 1329-1999

terminal device *See:* terminal.

terminal emulator Software that makes a frame-buffer appear to have the characteristics of a cursor-addressable text terminal. (C/BA) 1275-1994

terminal guidance (navigation aids) Guidance from an arbitrary point, at which midcourse guidance ends, to the destination. (AES/GCS) 172-1983w

terminal interface processor (TIP) A computer that connects terminals directly to a network, eliminating the need for a host computer. (C) 610.7-1995

terminal interference voltage *See:* terminal voltage.

terminal linearity *See:* conformity.

terminal, master *See:* master terminal.

terminal node (1) In a tree, a node that has no subtrees. *Synonym:* external node. *See also:* root node; leaf. (C) 610.5-1990w

(2) A node with one or more link interfaces which are used to originate or consume data across an interconnect complying with this standard. *See also:* source; sink. (C/BA) 1355-1995

terminal of entry (for a conductor entering a delimited region) That cross section of the conductor that coincides with the boundary surface of the region and that is perpendicular to the direction of the electric field intensity at its every point within the conductor. In a conventional circuit, in which the conductors have a cross section that is uniform and small by comparison of the largest dimension with the length, the terminal of entry is a cross section perpendicular to the axis of the conductor. If the cross section of the conductor is infinitesimal, the terminal of entry becomes the point at which the conductor cuts the surface. *Notes:* 1. It follows from this definition and delimited region that the algebraic sum of the currents directed into a delimited region through all the terminals of entry is zero at every instant. 2. The term terminal of entry has been introduced because of the need in precise definitions of indicating definitely the terminations of the paths along which voltages are determined. The terms phase conductor and neutral conductor refer to a portion of a conductor rather than to a particular cross section although they may be considered by a practical engineer as representing a portion along which the integral of the electric intensity is negligibly small. Hence he may treat these terms as synonymous with terminal of entry in particular cases. *See also:* network analysis. (Std100) 270-1966w

terminal pad A usually flat conducting part of a device to which a terminal connector is fastened. (SWG/PE) C37.40-1993, C37.100-1992

terminal pair (networks) An associated pair of accessible terminals, such as input pair, output pair, and the like. *See also:* network analysis. (IA/PSE) 141-1976s, 270-1966w

terminal-per-line system (telephone switching systems) A switching entity having an outlet corresponding to each line. (COM) 312-1977w

terminal-per-station system (telephone switching systems) A switching entity having an outlet corresponding to each main-station code. (COM) 312-1977w

terminal, remote *See:* remote terminal.

terminal repeater (data transmission) A repeater for use at the end of a trunk or line. (PE) 599-1985w

terminal room (telephone switching systems) That part of a building that contains distributing frames, relays and similar apparatus associated with switching equipment. (COM) 312-1977w

terminals (1) (storage battery) (storage cell) The parts to which the external circuit is connected. *See also:* battery. (PE/EEC) [119]

(2) The conducting parts provided for connecting the arrester across the insulation to be protected. (SPD/PE) C62.11-1999

(3) The conducting parts provided for connecting the surge-protective device across the circuit to be protected. Terminal designations could be phase(s), neutral or ground with line and/or load designations. (SPD/PE) C62.62-2000

terminal server On a network, a server that provides access to a central computer from one or more terminals. *See also:* disk server; file server; mail server; database server; print server; network server. (C) 610.7-1995

terminal set A set of three primary terminals with primary disconnecting devices typically called "upper" or "lower," "front" or "back," or "bus" or "line," depending upon design configuration. (SWG/PE) C37.20.6-1997

terminal screw *See:* binding screw.

terminal, stator winding *See:* stator winding terminal.

terminal strip *See:* terminal board.

terminal trunk (data transmission) A trunk circuit connecting switching centers used in conjunction with local switching only in these centers. (PE) 599-1985w

terminal unit (programmable instrumentation) An apparatus that terminates the considered interface system and by means which a connection (and translation, if required) is made between the considered interface system and another external interface system. (IM/AIN) 488.1-1987r

terminal voltage (terminal interference voltage) Interference voltage measured between two terminals of an artificial mains network. *See also:* electromagnetic compatibility. (EMC/INT) [53], [70]

terminate (a connection) To dissolve an association established between two or more endpoints for the transfer of data. (C) 1003.5-1999

terminating (line or transducer) The closing of the circuit at either end by the connection of some device thereto. Terminating does not imply any special condition, such as the elimination of reflection. (PE/EEC) [119]

terminating power meter or measuring system A device which terminates a waveguide or transmission line in a prescribed manner and contains provisions for measuring the incident of absorbed power. (IM) 470-1972w, 544-1975w

terminating test circuit (measuring longitudinal balance of telephone equipment operating in the voice band) A network connected to a transmission port of a circuit to terminate it in a suitable balanced termination for longitudinal balance testing. This circuit is used when a driving test circuit is connected to one such port and the test specimen has additional transmission ports. (COM/TA) 455-1985w

terminating toll center code (telephone switching systems) In operator distance dialing, the three digits used for identifying the toll center within the area to which a call is routed. (COM) 312-1977w

terminating traffic (telephone switching systems) Traffic delivered directly to lines. (COM) 312-1977w

termination (1) (A) (power outages) A facility where a transmission line ends within a terminal, typically at a circuit breaker. **(B) (metal-enclosed bus and calculating losses in isolated-phase bus) (terminal chamber)** A metal enclosure that contains all necessary and mechanical and electrical items to complete the connections to other equipment. *See also:* dead-end; cable terminal. (SWG/PE/PSE) 859-1987

(2) A one-port load that terminates a section of a transmission system in a specified manner. *See also:* transmission line. (NESC/IM/HFIM) [40]

(3) (rotating machinery) The arrangement for making the connections between the machine terminals and the external conductors. *See also:* stator. (PE) [9]

(4) (waveguide components) A one port load in a waveguide or transmission line. (MTT) 147-1979w

(5) A constant impedance and digital logic state that a signal is held at during some or all of a test. (C/TT) 1450-1999

termination capacity (lines and trunks) The number of lines and trunks that can be terminated and maintained on a switching system. (COM/TA) 973-1990w

termination charge (electric power utilization) The amount paid by a customer when service is terminated at the customer's request. (PE/PSE) 346-1973w

termination, conjugate *See:* conjugate termination.

termination construct A program construct that results in a halt or exit. (C) 610.12-1990

termination failure A failure in the portion of the cable, which does not have a metallic shield covering. (PE/IC) 1407-1998

termination insulator (cable terminations) An insulator used to protect each cable conductor passing through the device and provide complete external leakage insulation between the cable conductor(s) and ground. (PE/IC) 48-1996

termination, matched *See:* matched termination.

termination proof (software) In proof of correctness, the demonstration that a program will terminate under all specified input conditions. *See also:* proof of correctness; program. (C/SE) 729-1983s

termination, reflectionless *See:* reflectionless termination.

terminations charge (power operations) The amount paid by a customer when service is terminated at the customer's request. (PE/PSE) 858-1987s

termination sequence The process by which the AS/AK lock is broken. (NID) 960-1993

terminator A single-port, 75-Ω device that is used to absorb energy from a transmission line or RF device. Terminators prevent energy from reflecting back into a cable plant by absorbing the RF signals. A terminator is usually shielded, which also prevents ingress and egress from an unused port. (LM/C) 802.7-1989r

terminology bank *See:* automated glossary.

ternary (A) (mathematics of computing) Pertaining to the numeration system with a radix of 3. *See also:* base; positional notation; radix. **(B) (mathematics of computing)** Pertaining to a selection in which there are three possible outcomes. (C) 1084-1986

ternary code A code whose alphabet consists of three symbols. *See also:* ternary. (IT) [7]

ternary incremental representation Representation of changes in variables in which the value of an increment is plus one, zero, or minus one. *Synonym:* incremental ternary representation. (C) 1084-1986w

ternary relation A relation with three attributes. (C) 610.5-1990w

ternary symbol In 100BASE-T4, a ternary data element. A ternary symbol can have one of three values: −1, 0, or +1. (C/LM) 802.3-1998

ternary torquing (1) (digital accelerometer) System with three stable torquing states (for example, positive, negative, and off). (AES/GYAC) 530-1978r

(2) (accelerometer) (gyros) A torquing mechanization that utilizes three levels of torquer current, usually positive and negative of the same magnitude, and a zero current or off condition. The positive and negative torque conditions can be either discrete pulses or pulse-duration-modulated current periods. In both implementations, the case of zero input (acceleration or angular rate) will result in zero torquer current. Ternary torquer power is proportional to the input (acceleration or angular rate), resulting in minimum power as compared to binary torquing. (AES/GYAC) 528-1994

terrain-avoidance radar (1) A radar that provides assistance to a pilot for flight around obstacles by sensing obstacles at or above his or her altitude. (AES/GCS) 172-1983w

(2) A radar that provides information about the ground environment so that an aircraft can fly around high ground or obstacles. (AES) 686-1997

terrain-clearance indicator (navigation aids) An absolute altimeter using the measurement of height above terrain to alert the pilot of danger. (AES/GCS) 172-1983w

terrain echoes *See:* ground clutter.

terrain error (navigation aids) The error resulting from the use of a wave which has become distorted by the terrain over which it has propagated. (AES/GCS) 172-1983w

terrain-following radar (1) (navigation aids) A radar that works with the aircraft flight control system to provide low-level flight following the contour of the earth's surface at some given altitude. (AES/GCS) 172-1983w

(2) An airborne radar that works with the aircraft flight control system to achieve flight that follows the contour of the earth's surface at some given altitude. (AES) 686-1997

terrestrial-reference flight (navigation aids) That type of stabilized flight which obtains control information from terrestrial phenomena, such as earth's magnetic field, atmospheric pressure, etc. (AES/GCS) 172-1983w

tertiary winding (power and distribution transformers) An additional winding in a transformer which can be connected to a synchronous condenser, a reactor, an auxiliary circuit, etc. For transformers with Y-connected primary and secondary windings, it may also help to: stabilize voltages to the neutral, when delta connected; reduce the magnitude of third harmonics when delta connected; control the value of the zero-sequence impedance; serve load. (PE/TR) C57.12.80-1978r

tesla The unit of magnetic induction in the International System of Units (SI). The tesla is a unit of magnetic induction equal to 1 weber per square meter. (Std100) 270-1966w

Tesla current (coagulating current) (electrotherapy) A spark discharge having a drop of 5–10 kV in air, from monopolar or bipolar electrodes, generated by a special arrangement of transformers, spark gaps, and capacitors, delivered to a tissue surface, and dense enough to precipitate and oxidize (char) tissue proteins. *Note:* The term Tesla current is appropriate if the emphasis is on the method of generation: a coagulating current, if the emphasis is on the physiological effects. *See also:* electrotherapy. (EMB) [47]

test (1) An action or group of actions performed on a particular unit under test (UUT) to evaluate a parameter or characteristic. (ATLAS) 771-1989s

(2) (A) (electronic digital computation) To ascertain the state or condition of an element, device, program, etc. **(B) (electronic digital computation)** Sometimes used as a general term to include both check and diagnostic procedures. **(C) (electronic digital computation)** Loosely, same as check. *See also:* check problem; check. **(D) (supervisory control, data acquisition, and automatic control)** *See also:* data test; point test; certified design test. (SWG/C/Std100) 162-1963

(3) (instrument or meter) To ascertain its performance characteristics while functioning under controlled conditions. (MIL) [2]

(4) (A) (software) An activity in which a system or component is executed under specified conditions, the results are observed or recorded, and an evaluation is made of some aspect of the system or component. **(B) (software)** To conduct an activity as in definition (A). (C/Std100) 610.12-1990

(5) (airborne radioactivity monitoring) A procedure whereby the instrument, component, or circuit is evaluated for performance or satisfactory operation. (NI) N42.17B-1989r, N323-1978r

(6) (physical interpretation) Zero or more actions or groups of actions performed on a particular system to evaluate a parameter or characteristic. (Abstract interpretation) A source of information about the behavior of a system. In the abstract sense, an observation (symptom) can be interpreted as a test. (ATLAS) 1232-1995

(7) A set of stimuli, either applied or known, combined with a set of observed responses and criteria for comparing these responses to a known standard. (SCC20) 1232.1-1997

(8) An observed activity that may be caused to occur (e.g., stimulus-response) in order to obtain information about the behavior of a test subject. (SCC20) 1226-1998

(9) (A) A set of one or more test cases. **(B)** A set of one or more test procedures. **(C)** A set of one or more test cases and procedures. (C/SE) 829-1998

testability (1) (software) The degree to which a system or component facilitates the establishment of test criteria and the performance of tests to determine whether those criteria have been met. (C/Std100) 610.12-1990

(2) The degree to which a requirement is stated in terms that permit establishment of test criteria and performance of tests to determine whether those criteria have been met. (C/SE) 1233-1998

test—acceptance A test to demonstrate the degree of compliance of a device with the purchaser's requirement. (ELM) C12.1-1988

test access port (TAP) A general-purpose port that can provide access to many support functions built into a component, including the test logic defined by IEEE Std 1149.1-1990. It is composed as a minimum of the three input connections and one output connection required by the test logic in IEEE Std 1149.1-1990. An optional fourth input connection provides for asynchronous initialization of the test logic defined by IEEE Std 1149.1-1990. (TT/C) 1149.1-1990

test adapter *See:* adapter.

test amperes *See:* watthour meter—test current.

test analysis (test, measurement, and diagnostic equipment) The examination of the test results to determine whether the device is in a go or no-go state or to determine the reasons for or location of a malfunction. (MIL) [2]

test application framework (TAF) A structure for organizing the test objects related to a specific testing requirement. (SCC20) 1226-1998

test—approval A test of one or more meters or other items under various controlled conditions to ascertain the performance characteristics of the type of which they are a sample. (ELM) C12.1-1988

test asset An assemblage of instruments, interconnect devices, supporting software, and manual procedures that enable one or more test objectives to be achieved. *See also:* automatic test system. (SCC20) 1226-1998

test bed (software) An environment containing the hardware, instrumentation, simulators, software tools, and other support elements needed to conduct a test. (C) 610.12-1990

test bench (test, measurement, and diagnostic equipment) An equipment specifically designed to provide a suitable work surface for testing a unit in a particular test setup under controlled conditions. (MIL) [2]

test block *See:* test switch.

test block cabinet (watthour meter) An enclosure to house a test block and wiring for a bottom-connected watthour meter. (ELM) C12.8-1981r

test board A switchboard equipped with testing apparatus so arranged that connections can be made from it to telephone lines or central-office equipment for testing purposes. (COM) [48]

test bus interface circuit (TBIC) A circuit module that allows an internal analog test bus in an integrated circuit to be isolated from or connected to the pins in the analog test access port (ATAP). *See also:* analog test access port. (C/TT) 1149.4-1999

test bypass A mode of testing whereby the safety group under test is designed to permit any one channel or load group to be maintained, tested or calibrated during power operation, without initiating a protective action of the safety group. (PE/NP) 338-1987r

test cabinet (for a switchgear assembly) An assembly of a cabinet containing permanent electric connections, with cable connections to a contact box arranged to make connection to the secondary contacts on an electrically operated removable element, permitting operation and testing of the removable element when removed from the housing. It includes the necessary control switch and closing relay, if required. (SWG/PE) C37.100-1992

test call (telephone switching systems) A call made to determine if circuits or equipment are performing properly. (COM) 312-1977w

test cap A protective structure that is placed over the exposed end of the cable to seal the sheath or other covering completely against the entrance of dirt, moisture, air, or other foreign substances. *Note:* Test caps are often provided with facilities for vacuum treatment, oil filling, or other special field operations. *See also:* live cable test cap. (T&D/PE) [10]

test case (1) (software) A set of test inputs, execution conditions, and expected results developed for a particular objective, such as to exercise a particular program path or to verify compliance with a specific requirement. (C/Std100) 610.12-1990

(2) Documentation that specifies inputs, predicted results, and a set of execution conditions for a test item. (C/SE) 1012-1998, 610.12-1990

test case generator (software) A software tool that accepts as input source code, test criteria, specifications, or data structure definitions; uses these inputs to generate test input data; and, sometimes, determines expected results. *Synonyms:* test generator; test data generator. *See also:* automated test generator. (C) 610.12-1990

test case specification (1) (software) A document that specifies the test inputs, execution conditions, and predicted results for an item to be tested. *Synonyms:* test specification; test description. *See also:* test procedure; test report; test plan; test item transmittal report; test incident report; test log. (C) 610.12-1990

(2) A document specifying inputs, predicted results, and a set of execution conditions for a test item. (C/SE) 829-1998

test circuit breaker (ac high-voltage circuit breakers) The circuit breaker under test. (SWG/PE) C37.081-1981r, C37.083-19992, C37.100-1992

test connection (telephony) Two telephone sets connected together by means of test loops and a feed circuit. (COM/TA) 269-1971w

test control The functionality that directs and facilitates the execution of tests and the collection of data. (SCC20) 1226-1998

test coordinator A person typically responsible for organizing and scheduling tests; deciding how, when, and where the system and its components will be tested; and determining the test equipment that is needed. (SUB/PE) 1303-1994

test coverage The degree to which a given test or set of tests addresses all specified requirements for a given system or component. (C) 610.12-1990

test criteria The criteria that a system or component must meet in order to pass a given test. *See also:* acceptance criteria; pass/fail criteria. (C) 610.12-1990

test current *See:* watthour meter—test current.

test current, continuous *See:* continuous test current.

test current in alternating-current circuits (insulation tests) The normal current flowing in the test circuit as the result of insulation leakage and, in alternating-current circuits, is the vector sum of the inphase leakage currents and quadrature capacitive currents. (AES/ENSY) 135-1969w

test current, long-time *See:* long-time test current.

test current, short-time *See:* short-time test current.

test data (1) Data from observations during tests. *Note:* All conditions should be stated in detail, for example, time, stress conditions and failure or success criteria. (R) [29]

(2) (software) Data developed to test a system or system component. *See also:* test case; component; data; system. (C/SE) 729-1983s

(3) (A) (station control and data acquisition) The recorded results of test. **(B) (station control and data acquisition)** A set of data developed specifically to test the adequacy of a computer run or system. They may be actual data taken from previous operations or artificial data created for this purpose. (SWG/PE/SUB) C37.100-1992, C37.1-1994, C37.1-1979

(4) Data that are entered into an electronic system of any kind (component, printed circuit assembly, subsystem, system) to verify the integrity of part or all of the system. Test data may be entered through function pins or test pins or both. (C/TT) 1149.4-1999

test data generator *See:* automated test generator; test case generator.

test description *See:* test case specification.

test design Documentation that specifies the details of the test approach for a software feature or combination of software features and identifying the associated tests. (C/SE) 1012-1998

test design specification A document specifying the details of the test approach for a software feature or combination of software features and identifying the associated tests. (C/SE) 829-1998

test desk (telephone switching systems) A position equipped with testing apparatus so arranged that connections can be made from it to telephone lines or central office equipment for testing purposes. (COM) 312-1977w

test documentation Documentation describing plans for, or results of, the testing of a system or component. Types include test case specification, test incident report, test log, test plan, test procedure, test report. (C) 610.12-1990

test driver (software) A software module used to invoke a module under test and, often, provide test inputs, control and monitor execution, and report test results. *Synonym:* test harness. (C) 610.12-1990

test duration (nuclear power generating station) The elapsed time between the test initiation and the test termination. (PE/NP) 338-1987r

test enclosure (for low-voltage ac power circuit breakers) A single-unit enclosure used for test purposes for a specific frame-size circuit breaker, which conforms to the manufacturer's recommendation for minimum volume, minimum electrical clearances, effective areas and locations of ventilation openings, and configuration of connections to terminals. (SWG/PE) C37.100-1992

Test Equipment Description Language (TEDL) A standardized computer language used to describe the configuration of ATE systems. (ATLAS) 1226-1993s

tester cycle *See:* vector.

test event An action or group of actions performed on a particular unit under test (UUT) to evaluate a parameter or characteristic. It is the process of initialization, stimulus, and measurement of the UUT. It includes one or more tests and occurs during a continuous period of time. Test events are

defined by the test procedure or test software requirements. A Parametric Data Log (PDL) file corresponds to a single event and would be a test of a single device or unit. (SCC20) 1545-1999

test event data The necessary and sufficient set of information that allows the parametric data to be understood in the context within which it was obtained. It includes the identification of the unit under test (UUT), test set hardware and procedure, the start time and stop time when the data was taken, and any other information needed to interpret the parametric data. (SCC20) 1545-1999

test executive The part of the test system within the AI-ESTATE architectural concept that controls the test resources. (ATLAS) 1232-1995

test foundation framework (TFF) A comprehensive set of object classes that supports the use of product data, the development of test programs, and the utilization of diagnostic data elements. The classes defined in the TFF are based wholly on the fundamental functionality required for test. (SCC20) 1226-1998

test frequency (reliability analysis of nuclear power generating station safety systems) The number of tests of the same type per unit time interval; the reciprocal of the test interval. (PE/NP) 352-1987r

test gas phase (fly ash resistivity) The gaseous environment to which the ash layer being tested is exposed in a test cell used for the laboratory measurement of electrical resistivity of fly ash.

test generator *See:* test case generator.

test handset (telephone) A handset used for test purposes in a central office or in the outside plant. It may contain in the handle other components in addition to the transducer, as for example a dial, keys, capacitors, and resistors. *See also:* telephone station. (EEC/PE) [119]

test harness *See:* test driver.

test incident report (1) (software) A document that describes an event that occurred during testing that requires further investigation. *See also:* test log; test plan; test case specification; test item transmittal report; test report; test procedure. (C) 610.12-1990

(2) A document reporting on any event that occurs during the testing process which requires investigation. (C/SE) 829-1998

testing (1) (nuclear power quality assurance) An element of verification for the determination of the capability of an item to meet specified requirements by subjecting the item to a set of physical, chemical, environmental, or operating conditions. (PE/NP) [124]

(2) Dynamic verification performed with valued inputs. (C/BA) 896.9-1994w

(3) The process of analyzing a software item to detect the differences between existing and required conditions (that is, bugs) and to evaluate the features of the software item. (C/SE) 829-1998

testing agency The organization that actually performs the tests and records the data. (EMC/STCOORD) 299-1997

testing constant A constant that is not specified in the standard being tested but is required by an assertion test to test an assertion. (C/PA) 2003-1997

testing state A node state that is reflected by the value of 2 in the STATE_CLEAR.state field. The testing state is an optional transient state that is entered immediately after a write to the TEST_START register. The node remains in the testing state until the active test completes. (C/MM) 1212-1991s

testing unavailability *See:* unavailability.

test initiation (nuclear power generating station) The application of a test input or removal of equipment train from service to perform a test. (PE/NP) 338-1987r

test input (nuclear power generating station) A real or simulated, but deliberate action that is imposed upon a sensor, channel, train, load group, or other system or device for the purpose of testing. (PE/NP) 338-1987r

test—in-service A test made during the period that the meter is in service. It may be made on the customer's premises without removing the meter from its mounting, or by removing the meter for test either on the premises or in a laboratory or meter shop. (ELM) C12.1-1988

test instruction A computer instruction that checks the condition of data and sets status or overflow flag bits for a subsequent branch instruction. For example:

test x (sets flag to zero, negative or

overflow, depending on value of x

)

branch p (if flag is TRUE, then branch to p)

n: . . . .

p:

(C) 610.10-1994w

test interval (nuclear power generating station) The elapsed time between the initiation (or successful completion) of tests on the same sensor, channel, load group, safety group, safety system, or other specified system or device. (PE/NP) 338-1987r, 352-1987r

test item A software item which is an object of testing. (C/SE) 829-1998

test item transmittal report A document identifying test items. It contains current status and location information. (C/SE) 829-1998

test jack A spring-jaw receptacle in the current element of a test switch that provides a bipolar test connection in the metering current circuit without interruption of the current circuit. (ELM) C12.9-1993

test jack switch A single-pole single-throw disconnect switch used in conjunction with a test jack to provide a parallel current path during normal operating conditions. (ELM) C12.9-1993

test language A computer language used in testing components of hardware or of software. Examples include ATLAS, ATOLL, DETOL, and DMAD. (C) 610.13-1993w

test log A chronological record of relevant details about the execution of tests. (C/SE) 829-1998

test logic (1) (test access port and boundary-scan architecture) Any item of logic that is a dedicated part of the test logic architecture defined by this standard or is at the time of interest configured as a part of the test logic architecture defined by 1149.1-1990. (TT/C) 1149.1-1990

(2) (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 for determining related maintenance or maintainability design requirements. (MIL) [2]

test loop (transmission performance of telephone sets) A circuit that is interposed between a telephone set and a telephone feed circuit to simulate a telephone line. (COM/TA) 269-1983s

test, measurement, and diagnostic equipment Any system or device used to evaluate the operational condition of a system or equipment to identify and isolate or both any actual or potential malfunction. (MIL) [2]

test method (1) The software, procedures, or other means specified by a standard to measure conformance. (C/PA) 1003.10-1995, 2003.1-1992

(2) The software, procedures, or other means specified by a POSIX standard to measure conformance. Test methods may include a PCTS, PCTP, or an audit of a PCD. (C/PA) 13210-1994

(3) A testing approach, philosophy, or strategy. (SCC20) 771-1998

(4) A specification that defines the algorithm, procedures, and required controllable inputs and potential behavior (nominal or anomalous) of a test object. (SCC20) 1226-1998

(5) The software, procedures, or other means specified to measure conformance to a specification. (C/PA) 1328.2-1993w, 1224-1993w, 1224.1-1993w, 1327-1993w, 1326.1-1993w, 1328-1993w, 1326.2-1993w

test method implementation The software, procedures, or other means used to measure conformance. For PASC, test method implementations may include a CTS, a CTP, or an audit of a CD. (C/PA) 2003-1997

test method specification A document that expresses the required functionality and behavior of a base standard as assertions and provides the complete set of conforming test result codes. (C/PA) 2003-1997

test method standard A test method specification that has been adopted as a standard. (C/PA) 2003-1997

test model (thermal classification of electric equipment and electrical insulation) (evaluation of thermal capability) A representation of equipment, a component or part of equipment, or the equipment itself, that is suitable for use in a functional test. (EI) 1-1986r

test mode select input pin (TMS) The test mode select input pin contained in the test access port (TAP) defined by IEEE Std 1149.1-1990. *See also:* test access port. (TT/C) 1149.1-1990

test node Any physical location(s) of relevance to a test. (ATLAS) 1232-1995

test object (1) An encapsulated stand-alone, executable test procedure. (ATLAS) 1226.2-1993w

(2) Any object defined for use within the domain of test representing an encapsulated view of a test method with interfaces to a test system. (SCC20) 1226-1998

test objective (software unit testing) (software) An identified set of software features to be measured under specified conditions by comparing actual behavior with the required behavior described in the software documentation. (C/SE) 610.12-1990, 1008-1987r

test operating cycle (valve actuators) The movement of an actuator through its required operations travel under specified loading conditions, terminating with a return to the starting position. (PE/NP) 382-1985

test-oriented language (test, measurement, and diagnostic equipment) A computer language utilizing English mnemonics that are commonly used in testing. Examples are measure, apply, connect, disconnect, and so forth. (MIL) [2]

test outcome A mapping from an observation to one of a set of discrete possibilities. (SCC20) 1226-1998

test phase (software verification and validation plans) (software) The period of time in the software life cycle during which the components of a software product are evaluated and integrated, and the software product is evaluated to determine whether or not requirements have been satisfied. (C/SE) 1012-1986s, 610.12-1990

test pin A pin on a component or a printed circuit assembly that is provided solely or primarily for use during test or maintenance operations. (C/TT) 1149.4-1999

test plan (1) (safety systems equipment in nuclear power generating stations) A document that identifies the equipment to be qualified, defines the acceptance criteria and the total scope of the testing activities required for qualification to a specified set of conditions. (PE/NP) 600-1983w

(2) Documentation that specifies the scope, approach, resources, and schedule of intended testing activities. (C/SE) 1012-1998

(3) A document describing the scope, approach, resources, and schedule of intended testing activities. It identifies test items, the features to be tested, the testing tasks, who will do each task, and any risks requiring contingency planning. (C/SE) 829-1998

test plug A bipolar mating plug to a **test jack** for inserting instrumentation into the metering current circuit. (ELM) C12.9-1993

test point (1) (separable insulated connectors) A capacitively coupled terminal for use with voltage sensing devices. (T&D/PE) 386-1995

(2) (station control and data acquisition) A predefined location within equipments or routines at which known result should be present if the equipment or routine is operating properly. (SUB/PE) C37.1-1979s

(3) (test, measurement, and diagnostic equipment) A convenient, safe access to a circuit or system so that a significant quantity can be measured or introduced to facilitate maintenance, repair, calibration, alignment, and checkout. (MIL) [2]

(4) A geographic location which has been selected for the measurement of field strength. (T&D/PE) 1260-1996

test point selector (test, measurement, and diagnostic equipment) A device capable of selecting test points on an item being tested in accordance with instructions from the programmer. (MIL) [2]

test position (of a switchgear assembly removable element) That position in which the primary disconnecting devices of the removable element are separated by a safe distance from these in the housing, and some or all of the secondary disconnecting devices are in operating contact. *Notes:* 1. A set of test jumpers or mechanical movement of secondary disconnecting devices may be used to complete all secondary connections for test in the test position. This may correspond with the disconnected position. 2. Safe distance, as used here, is a distance at which the equipment will meet its withstand ratings, both power frequency and impulse, between line and load stationary terminals and phase-to-phase and phase-to-ground on both line and load stationary terminals with the switching device in the closed position. (SWG/PE) C37.100-1992

test procedure (1) (safety systems equipment in nuclear power generating stations) A document that defines the implementation of the test plan and describes the methodology for performing the specific test. (PE/NP) 600-1983w

(2) (test, measurement, and diagnostic equipment) A document that describes step by step the operation required to test a specific unit with a specific test system. (MIL) [2]

(3) A description of the tests, test methods, and test sequences to be performed on a unit under test (UUT) to verify conformance with its test specification with or without fault diagnosis and without reference to specific test equipment. (SCC20) 771-1998

(4) Documentation that specifies a sequence of actions for the execution of a test. (C/SE) 1012-1998

(5) The implementation of a test method. (SCC20) 1226-1998

test procedure specification (1) A document specifying a sequence of actions for the execution of a test. (C/SE) 829-1998

(2) (software) *See also:* test procedure. (C) 610.12-1990

test program (TP) (1) (test, measurement, and diagnostic equipment) A program specifically intended for the testing of a unit under test (UUT). (MIL) [2]

(2) An implementation of the tests, test methods, and test sequences to be performed on a unit under test (UUT) to verify conformance with its test specification with or without fault diagnosis and designed for execution on a specific test system. (SCC20) 771-1998

(3) A test program implements the tests, test methods, and test sequences to be performed on a unit under test (UUT) to verify conformance with its test specification with or without fault diagnosis and designed for execution on a specific test system. (SCC20) 993-1997

(4) A program specifically intended for the testing of a test subject. (SCC20) 1226-1998

test program documentation *See:* test programming procedures.

test programming procedures (test, measurement, and diagnostic equipment) Documents which explain in detail the

composition of test programs including definitions and logic used to compose the program. Provides instructions to implement changes in the program. (MIL) [2]

test program set (TPS) (1) The complete set of hardware, software, and documentation needed to evaluate a unit under test (UUT) on a given test system. (ATLAS) 1232-1995

(2) The complete set of hardware, software, and documentation needed to evaluate a unit under test (UUT) on a given test system. The test program set includes the test program, adapter devices, ancillary hardware and software, operator initiated procedures, and supporting documentation (source data, adapter device schematics, parts lists, etc.). (SCC20) 993-1997

(3) An assembly of items necessary to test a test subject on a piece of automatic test equipment (ATE). This includes the electrical, mechanical, instructional, and logical decision elements. The individual elements of the TPS are the TP, the adapter, and the TPS documentation (TPSD). (SCC20) 1226-1998

test provisions (test, measurement, and diagnostic equipment) The capability included in the design for conveniently evaluating the performance of a prime equipment, module, assembly, or part. (MIL) [2]

test radius A circle, with the center of the antenna array as its origin, on which the test points for field strength measurements ideally should be located. (T&D/PE) 1260-1996

test readiness review (TRR) (A) A review conducted to evaluate preliminary test results for one or more configuration items; to verify that the test procedures for each configuration item are complete, comply with test plans and descriptions, and satisfy test requirements; and to verify that a project is prepared to proceed to formal testing of the configuration items. **(B)** A review as in definition (A) for any hardware or software component. *Contrast:* formal qualification review; requirements review; design review; code review. (C) 610.12-1990

test—referee A test made by or in the presence of one or more representatives of a regulatory body or other impartial agency. (ELM) C12.1-1988

test reliability The assessed reliability of an item based on a particular test with stated stress and stated failure criteria. *See also:* reliability. (R) [29]

test repeatability (software) An attribute of a test, indicating that the same results are produced each time the test is conducted. (C) 610.12-1990

test report (software) A document that describes the conduct and results of the testing carried out for a system or component. *Synonym:* test summary report. *See also:* test log; test incident report; test case specification; test item transmittal report; test plan; test procedure. (C) 610.12-1990

test—request A test made at the request of a customer. (ELM) C12.1-1988

test requirement (1) A definition of the tests and test conditions required to be performed on a unit under test (UUT) to verify conformance with its performance specification. (SCC20) 771-1998

(2) A specification of a particular test action giving the necessary power input conditioning, the stimulus and load applications, the measurements to be taken, and any special operator actions. The complete collection of all test requirements defines the actions necessary to validate proper operation of a unit under test (UUT) in accordance with a predetermined design or product specification. (SCC20) 993-1997

(3) A specification of the test methods and test conditions needed to evaluate and diagnose a test subject. (SCC20) 1226-1998

test requirement analysis (test, measurement, and diagnostic equipment) The examination of documents such as schematics, assembly drawings and specifications for the purpose of deriving test requirements for a unit. (MIL) [2]

test requirement document (test, measurement, and diagnostic equipment) The document that specifies the tests and test conditions required to test and fault isolate a unit under test. (MIL) [2]

Test Requirement Specification Language (TRSL) A standardized computer language used to specify test requirements. (ATLAS) 1226-1993s

test response spectrum (TRS) (1) (nuclear power generating station) (seismic qualification of Class 1E equipment) The response spectrum that is constructed using analysis or derived using spectrum analysis equipment based on the actual motion of the shake table. (SWG/PE) C37.100-1992

(2) (seismic qualification of Class 1E metal-enclosed power switchgear assemblies) The response spectrum that is developed from the actual time history of the actual motion of the shake table. *Note:* When qualifying equipment bu utilizing response spectra, the TRS is to be compared with the RRS (required response spectrum) using the methods described in 7.6.2 and 7.6.3 of IEEE Std 344-1987. (SWG/PE/NP) C37.81-1989r, 344-1987r

(3) (valve actuators) The response spectrum that is constructed using analysis or derived using spectrum analysis equipment based on the actual input test table motion to the device. (PE/NP) 382-1985

(4) (seismic testing of relays) (as applied to relays) The acceleration response spectrum that is constructed using analysis or derived using spectrum analysis equipment based on the actual motion of the shake table. (PE/PSR) C37.98-1977s

(5) The calculated response spectrum that is developed from the actual time history of the motion of the shake table (not any point on the equipment or equipment structure) for a particular damping value. (PE/SUB) 693-1997

test result code A value that describes the result of an assertion test. (C/PA) 13210-1994, 2003-1997, 2003.1-1992

test routine (A) Usually a synonym for check routine. **(B)** Sometimes used as a general term to include both check routine and diagnostic routine. (Std100) 270-1966

tests after delivery Those tests made by the purchaser after delivery of the circuit breaker, which supplement inspection, to determine whether the circuit breaker has arrived in good condition. These tests may consist of timing tests on closing, opening, close-open no-load operations, and power frequency voltage withstand tests at 75% of the rated power frequency withstand voltage. (SWG/PE) C37.013-1997

test schedule (reliability analysis of nuclear power generating station safety systems) The pattern of testing applied to systems or the parts of a system. In general, there are two patterns of interest:

a) (simultaneous) Redundant items or systems are tested at the beginning of each test interval, one immediately following the other.

b) (perfectly staggered) Redundant items or systems are tested such that the test interval is divided into equal subintervals. (PE/NP) 352-1987r

test script *See:* test procedure.

test sequence (1) (A) (test, measurement, and diagnostic equipment) A unique setup of measurements, and. **(B) (test, measurement, and diagnostic equipment)** A specific order of related tests. (MIL) [2]

(2) A specified order of related tests. (SCC20) 771-1998

test sequence number (test, measurement, and diagnostic equipment) Identification of a test sequence. (MIL) [2]

test set architecture (software) The nested relationships between sets of test cases that directly reflect the hierarchic decomposition of the test objectives. (C/SE) 610.12-1990, 1008-1987r

test site A site meeting specified requirements suitable for measuring radio interference fields radiated by an appliance under test. *See also:* electromagnetic compatibility. (EMC/INT) [53], [70]

test software (test, measurement, and diagnostic equipment) Maintenance instructions which control the testing operations and procedures of the automatic test equipment. This software is used to control the unique stimuli and measurement parameters used in testing the unit under test. (MIL) [2]

test specification (1) (safety systems equipment in nuclear power generating stations) A document that defines the test requirements including test levels and performance requirements. (PE/NP) 600-1983w

(2) (software) *See also:* test case specification. (C) 610.12-1990

(3) Describes the test criteria and the methods to be used in a specific test to assure that the performance and design specifications have been satisfied. The test specification identifies the capabilities or program functions to be tested, and identifies the test environment. (C/SE) 1298-1992w

(4) A definition of the tests to be performed on a unit under test (UUT) to verify conformance with its performance specification and without reference to any specific test equipment or test method. (SCC20) 771-1998

(5) A document that defines the tests to be performed on a test subject to verify conformance with its performance specification, without reference to any specific test equipment or test method. (SCC20) 1226-1998

test specimen (insulators) An insulator that is representative of the product being tested: it is a specimen that is undamaged in any way that would influence the result of the test. (EEC/IEPL) [89]

test spectrum (test, measurement, and diagnostic equipment) A range of test stimuli and measurements based on analysis of prime equipment test requirements. (MIL) [2]

test stand (test, measurement, and diagnostic equipment) An equipment specifically designed to provide suitable mountings, connections, and controls for testing electrical, mechanical, or hydraulic equipment as an entire system. (MIL) [2]

test stimulus (electrical) A single shock or succession of shocks, used to characterize or determine the state of excitability or the threshold of a tissue. (EMB) [47]

test strategy (A) The arrangement of specific tester types to achieve optimum throughput and diagnostic capability at the least possible cost given the fault spectrum, process yield, production rate, and product mix for a particular environment. (Adapted from MIL-STD-1309D). **(B)** A selection of test methods to achieve some diagnostic test within execution time and test resource constraints. (SCC20) 1226-1998

(2) (A) An approach taken to combine factors including constraints, goals, and other considerations to be applied to the testing of a unit under test (UUT). **(B)** The approach taken to the evaluation of a UUT by which a result is obtained. **(C)** The requirements and constraints to be reflected in test and diagnostic strategies. (ATLAS) 1232-1995

test subject (1) The entity to be tested. It may range from a simple to a complex system, e.g., a unit under test or a human patient. (SCC20) 1232.1-1997

(2) The specific product design that is the focus of attention or target for the development of tests and diagnostics. (SCC20) 1226-1998

test summary report A document summarizing testing activities and results. It also contains an evaluation of the corresponding test items. (C/SE) 829-1998

test support Those facilities not specified by the standard(s) being tested, or specified but not required, that need to be provided by the SUT in order to perform an assertion test. (C/PA) 2003-1997

test support software (test, measurement, and diagnostic equipment) Computer programs used to prepare, analyze, and maintain test software. Test software includes automatic test equipment (ATE) compilers, translation/analysis programs and punch/print programs. (MIL) [2]

test switch A combination of connection studs, jacks, plugs, or switch parts arranged conveniently to connect the necessary devices for testing instruments, meters, relays, etc. *Synonym:* test block. (SWG/PE) C37.100-1992

test system One system within the AI-ESTATE architecture. This system handles the execution of tests. (ATLAS) 1232-1995

test temperature The temperature of the heater plates mounted on the stator coil or bar, as measured by a temperature sensor embedded within the heater plate. (DEI) 1043-1996

test termination The removal of a test input with results of the test being known, or the committal of the equipment for repair based on the results of the test. (PE/NP) 380-1975w

test testboard (telephone switching systems) A position equipped with testing apparatus so arranged that connections can be made from it to trunks for testing purposes. (COM) 312-1977w

test unit (software unit testing) A set of one or more computer program modules together with associated control data, (for example, tables), usage procedures, and operating procedures that satisfy the following conditions:

a) All modules are from a single computer program
b) At least one of the new or changed modules in the set has not completed the unit test.
c) The set of modules together with its associated data and procedures are the sole object of a testing process.

Notes: 1. A test unit may occur at any level of the design hierarchy from a single module to a complete program. Therefore, a test unit may be a module, a few modules, or a complete computer program along with associated data and procedures. 2. A test unit may contain one or more modules that have already been unit tested. (C/SE) 1008-1987r, 610.12-1990

test validity (software) The degree to which a test accomplishes its specified goal. (C/SE) 729-1983s

test voltage (electrical insulation tests) The voltage applied across the specimen during a test. (AES/ENSY) 135-1969w

test voltage, partial discharge-free A specified voltage applied in a specified test procedure, at which the test object is free from partial discharges exceeding a specified level. This voltage is expressed as a peak value divided by the square root of two. *Note:* The term corona-free test voltage has frequently been used with this connotation. It is recommended that such usage be discontinued in favor of the term partial discharge-free test voltage. (PE/PSIM) 454-1973w

test voltage related to partial discharges The phase-to-ground alternating voltage whose value is expressed by its peak value divided by $\sqrt{2}$. (SWG/PE) 1291-1993r

test withstand voltage The maximum value of a test voltage at which a new valve, with unimpaired integrity, does not show any disruptive discharge, nor suffer component failures above permissible levels, when subjected to a specified number of applications of the test voltage, under specified conditions. (SUB/PE) 857-1996

tetanizing current (electrotherapy) The current that, when applied to a muscle or to a motor nerve connected with a muscle stimulates the muscle with sufficient intensity and frequency to produce a smoothly sustained contraction as distinguished from a succession of twitches. *See also:* electrotherapy. (EMB) [47]

tetrad A group of four closely related items or digits. (C) 1084-1986w

tetrode A four-electrode electron tube containing an anode, a cathode, a control electrode, and one additional electrode that is ordinarily a grid. (ED) [45]

TEX A public-domain word processing language. *See also:* teletype exchange. (C) 610.2-1987

TeX A page description language used widely for formatting text containing mathematical symbols. (C) 610.13-1993w

text (1) In word processing, information that is intended for presentation for human comprehension in a two-dimensional form. Text may consist of symbols, phrases, sentences in natural or artificial language, pictures, diagrams, and tables. (C) 610.2-1987

(2) (computer graphics) A display element that consists of a character string. (C) 610.6-1991w

text attribute A characteristic of text. For example, color index, font, path, precision. (C) 610.6-1991w

text-based user interface *See:* character-based user interface.

text column A roughly rectangular block of characters capable of being laid out side-by-side next to other text columns on an output page or terminal screen. The widths of text columns are measured in column positions. (C/PA) 9945-2-1993

text cursor A screen object that indicates the insertion point for text input. (C) 1295-1993w

text editing The process of entering, altering, and viewing text. (C) 610.2-1987

text editor A computer program, often part of a word processing system, that allows a user to enter, alter, and view text. *Synonym:* editor. *See also:* program editor; document editor; full-screen editor; line editor. (C) 610.2-1987, 610.12-1990

text end adjustment The ability of a text formatter to automatically reformat text to comply with specified line lengths and page sizes. *See also:* adjust line mode. (C) 610.2-1987

text field A visual user interface control into which a user types or places alphanumeric text on one line. Its boundaries are usually indicated. (C) 1295-1993w

text file A file that contains characters organized into one or more lines. The lines shall not contain NUL characters and none shall exceed {LINE_MAX} bytes in length, including the ⟨newline⟩. Although POSIX.1 does not distinguish between text files and binary files (see the C Standard), many utilities only produce predictable or meaningful output when operating on text files. The standard utilities that have such restrictions always specify *text files* in their Standard Input or Input Files subclauses. (C/PA) 9945-2-1993

text formatter A computer program, often part of a word processing system, that interprets formatting commands embedded in text and performs the indentation, pagination, tabulation, underscoring, and other formatting procedures indicated by the commands. *Synonym:* print formatter. (C) 610.2-1987

text formatting In word processing, the process of interpreting formatting commands embedded in text and performing the indentation, pagination, tabulation, underscoring, and other formatting procedures indicated by the formatting commands. *Synonym:* print formatter. (C) 610.2-1987

text-formatting language A computer language used to format text documents. Examples include Bookmaster, Cyphertext, DCF, SCRIPT, PAGE, and SCRIBE. *See also:* page description language. (C) 610.13-1993w

text page A model page that contains textual material related to a specific diagram. (C/SE) 1320.1-1998

text processing *See:* word processing.

texture (image processing and pattern recognition) An attribute representing the spatial arrangement of the gray levels of the pixels in a region. (C) 610.4-1990w

text window That portion of a display screen that is being used to display text (human-readable characters and words). (C/BA) 1275-1994

T4 A carrier facility that transmits digital signal level four. The data rate is 274.176 Mb/s, the equivalent of 4032 voice-band channels. (C) 610.7-1995

THD *See:* total harmonic distortion.

THDBH load *See:* ten high day busy-hour load.

theft Unauthorized removal of system components (i.e., hardware, software, media). Theft could result in unauthorized disclosure of information or sensitive technology and denial of service conditions. (C/BA) 896.3-1993w

theoretical cutoff frequency (theoretical cutoff) (electric structure) A frequency at which, disregarding the effects of dissipation, the attenuation constant changes from zero to a positive value or vice versa. *See also:* cutoff frequency. (PE/EEC) [119]

theory *See:* information theory.

therapeutic high-frequency diathermy equipment (health care facilities) Therapeutic high-frequency diathermy equipment is therapeutic induction and dielectric heating equipment. (NESC/NEC) [86]

therm A quantity of heat that is equal to 100 000 Btu. (IA/PSE) 241-1990r

thermal aging (1) (rotating machinery) Normal load/temperature deteriorating influence on insulation. (PE/EM) 432-1976s

(2) (thermal classification of electric equipment and electrical insulation) The aging that takes place at an elevated temperature. (EI) 1-1986r

thermal burden rating of a voltage transformer The voltampere output that the voltage transformer will provide continuously at rated secondary voltage without exceeding the specified temperature limits. (PE/TR) C57.13-1993, C57.12.80-1978r

thermal capability (solid electrical insulating materials) Includes the ability to withstand without failure the maximum short time operating temperatures and the long time integrated degradative effect of temperature and time. It constitutes a design limitation on the use of insulating materials in electrical and electronic equipment to the extent that both thermal softening (or other short term effects) and long term aging affect functional properties. (EI) 98-1984r

thermal cell A reserve cell that is activated by the application of heat. *See also:* electrochemistry. (EEC/PE) [119]

thermal conduction The transport of thermal energy by processes having rates proportional to the temperature gradient and excluding those processes involving a net mass flow. *See also:* thermoelectric device. (ED) [46]

thermal conductivity (1) (electric power systems in commercial buildings) The time rate of heat flow through a unit area of a homogeneous substance under steady conditions when a unit temperature gradient is maintained in the direction that is normal to the area. (IA/PSE) 241-1990r

(2) The quotient of the conducted heat through unit area per unit time by the component of the temperature gradient normal to that area. *See also:* thermoelectric device. (ED) [46]

thermal conductivity, electronic *See:* electronic thermal conductivity.

thermal converter (thermoelement) (electric instruments) (thermocouple converter) A device that consists of one or more thermojunctions in thermal contact with an electric heater or integral therewith, so that the electromotive force developed at its output terminals by thermoelectric action gives a measure of the input current in its heater. *Note:* The combination of two or more thermal converters when connected with appropriate auxiliary equipment so that its combined direct-current output gives a measure of the active power in the circuit is called a thermal watt converter. (EEC/PE) [119]

thermal current converter (electric instruments) A type of thermal converter in which the electromotive force developed at the output terminals gives a measure of the current through the input terminals. *See also:* thermal converter. (EEC/AII) [102]

thermal current rating (A) (neutral grounding devices) (electric power) The root-mean-square neutral current in amperes that it will carry under standard conditions for its rated time without exceeding standard temperature limitations, unless otherwise specified. *See also:* grounding device.

(B) (resistors) The initial root-mean-square symmetrical value of the current that will flow when rated voltage is applied. (SPD/PE) 32-1972

thermal cutout An overcurrent protective device that contains a heater element in addition to and affecting a renewable fusible member which opens the circuit. It is not designed to interrupt short-circuit currents. (NESC/NEC) [86]

thermal diffusivity Thermal conductivity divided by the product of density and specific heat. (IA/PSE) 241-1990r

thermal duty cycle (nuclear power generating station) The percentage of time that heat producing electrical current flows in equipment over a specific period of time. (PE/NP) 649-1980s

thermal electromotive force Alternative term for Seebeck electromotive force. *See also:* thermoelectric device. (ED) [46], 221-1962w

thermal endurance (1) (rotating machinery) The relationship, between temperature and time spent at that temperature, required to produce such degradation of an electrical insulation that it fails under specified conditions of stress, electric or mechanical, in service or under test. For most of the chemical reactions encountered, this relationship is a straight line when plotted with ordinates of logarithm of time against abscissae of reciprocal of absolute temperature (Arrhenius plot). *See also:* asynchronous machine. (PE/EI) [9]

(2) (solid electrical insulating materials) Related to the rate at which important properties deteriorate as a function of temperature and time. It is determined by accelerated testing. (EI) 98-1984r

thermal endurance graph (thermal classification of electric equipment and electrical insulation) (evaluation of thermal capability) The graphical expression of the thermal endurance relationship in which time to failure is plotted against the reciprocal of the absolute test temperature. (EI) 1-1986r

thermal endurance relationship (thermal classification of electric equipment and electrical insulation) (evaluation of thermal capability) The expression of aging time to failure as a function of test temperature in an aging test. (EI) 1-1986r

thermal equilibrium (rotating machinery) The state reached when the observed temperature rise of the several parts of the machine does not vary by more than 2°C over a period of one hour. *See also:* asynchronous machine. (PE) [9]

thermal fire hazard A hazard resulting from the generation of heat in a fire. (DEI) 1221-1993w

thermal flow switch *See:* flow relay.

thermal insulation (1) (electrical heating systems) Material having air- or gas-filled pockets, void spaces, or heat-reflective surfaces that, when properly applied, will reduce the transfer of heat with reasonable effectiveness under ordinary conditions. (BT/IA/AV/PC) 152-1953s, 515.1-1995, 844-1991, 515-1997

(2) (electric power systems in commercial buildings) A material having a high resistance to heat flow and used to retard the flow of heat to the outside. (IA/PE/PSE/EDPG) 241-1990r, 622-1979s

thermal limit curves for large squirrel-cage motors Plots of maximum permissible time versus percent of rated current flowing in the motor winding under specified emergency conditions. These curves can be used in conjunction with the motor time-current curve for a normal start to set protective relays and breakers for motor thermal protection during starting and running conditions. (EM/PE) 620-1987w

thermally delayed overcurrent trip *See:* thermally delayed release; overcurrent release.

thermally delayed release A release delayed by a thermal device. *Synonym:* thermally delayed trip. (SWG/PE) C37.100-1992

thermally delayed trip *See:* thermally delayed release.

thermally protected (as applied to motors) The words "Thermally Protected" appearing on the nameplate of a motor or motor-compressor indicate that the motor is provided with a thermal protector. (NESC/NEC) [86]

thermal-mechanical cycling (rotating machinery) The experience undergone by rotating-machine windings, and particularly their insulation, as a result of differential movement between copper and iron on heating and cooling. Also denotes a test in which such actions are simulated for study of the resulting behavior of an insulation system, particularly for machines having a long core length. *See also:* asynchronous machine. (PE) [9]

thermal noise (1) (telephone practice) Noise occurring in electric conductors and resistors and resulting from the random movement of free electrons contained in the conducting material. The name derives from the fact that such random motion depends on the temperature of the material. Thermal noise has a flat power spectrum out to extremely high frequencies. (PE/PSR) C37.93-1976s

(2) (electron tube) The noise caused by thermal agitation in a dissipative body. *Note:* The available thermal noise power N, from a resistor at temperature T, is $N = kT\Delta f$, where k is Boltzmann's constant and Δf is the frequency increment. (ED) 161-1971w

(3) (resistance noise) (data transmission) Random noise in a circuit associated with the thermodynamic interchange of energy necessary to maintain thermal equilibrium between the circuit and its surroundings. *Note:* The average square of the open-circuit voltage across the terminals of a passive two-terminal network of uniform temperature, due to thermal agitation, is given by:

$$V_T^2 = 4kT \int R\,(f)\,\mathrm{d}f$$

where T is the absolute temperature in degrees Celsius, R is the resistance component Ω in ohms of the network impedance at the frequency f measured in hertz, and k is the Boltzmann constant, 1.38×10^{-23}. (PE) 599-1985w

(4) *See also:* noise. (LM/C) 802.7-1989r

thermal-overload detection (series capacitor) A means to detect excessive heating of series capacitor bank components and to initiate an alarm signal, or the closing of the associated bypass device, or both. (T&D/PE) 824-1985s

thermal-overload protection (series capacitor) A means to detect excessive heating of capacitor units as a result of a combination of current, ambient temperature, and solar radiations, and to initiate an alarm signal or the closing of the associated capacitor bypass switch, or both. (T&D/PE) [26]

thermal power converter (thermal watt converter) (electric instruments) A complex type of thermal converter having both potential and current input terminals. It usually contains both current and potential transformers or other isolating elements, resistors, and a multiplicity of thermoelements. The electromotive force developed at the output terminals gives a measure of the power at the input terminals. *See also:* thermal converter. (EEC/AII) [102]

thermal printer A nonimpact printer in which the characters are produced by applying heated elements to heat-sensitive paper directly or by melting ink from a ribbon onto normal paper. *Synonym:* thermal transfer printer. (C) 610.10-1994w

thermal protection (motors) The words thermal protection appearing on the nameplate of a motor indicate that the motor is provided with a thermal protector. *See also:* contactor. (NESC) [86]

thermal protector (1) (as applied to motors) A protective device for assembly as an integral part of a motor or motor-compressor and which, when properly applied, protects the motor against dangerous overheating due to overload and failure to start. The thermal protector may consist of one or more sensing elements integral with the motor or motor-compressor and an external control device. (NESC/NEC) [86]

(2) (rotating machinery) A protective device, for assembly as an integral part of a machine, that protects the machine against dangerous overheating due to overload or any other

reason. *Notes:* 1. It may consist of one or more temperature-sensing elements integral with the machine and a control device external to the machine. 2. When a thermal protector is designed to perform its function by opening the circuit to the machine and then automatically closing the circuit after the machine cools to a satisfactory operating temperature, it is an automatic-reset thermal protector. 3. When a thermal protector is designed to perform its function by opening the circuit to the machine but must be reset manually to close the circuit, it is a manual-reset thermal protector. *See also:* contactor. (PE) [9]

thermal relay (1) A relay in which the displacement of the moving contact member is produced by the heating of a part of the relay under the action of electric currents. *See also:* relay. (SWG/PE/IA/ICTL/IAC) C37.100-1992, [60], [84]
(2) A relay whose operation is caused by heat developed within the relay as a result of specified external conditions. *See also:* temperature relay. (SWG/PE) C37.100-1992

thermal residual voltage (Hall effect devices) That component of the zero field residual voltage caused by a temperature gradient in the Hall plate. (MAG) 296-1969w

thermal resistance (1) (cable) The resistance offered by the insulation and other coverings to the flow of heat from the conductor or conductors to the outer surface. *Note:* The thermal resistance of the cable is equal to the difference of temperature between the conductor or conductors and the outside surface of the cable divided by rate of flow of heat produced thereby. It is preferably expressed by the number of degrees Celsius per watt per foot of cable. (T&D/PE) [10]
(2) (Hall generator) The difference between the mean Hall plate temperature and the temperature of an external reference point, divided by the power dissipation in the Hall plate. (MAG) 296-1969w

thermal resistance case-to-ambien (light-emitting diodes) The thermal resistance (steady-state) from the device case to the ambient. (ED) [127]

thermal resistance, effective *See:* effective thermal resistance.

thermal resistance junction-to-ambient ($R\theta CA$) (light-emitting diodes) (formerly $\theta_{J\text{-}C}$) The thermal resistance (steady-state) from the semiconductor junction(s) to the ambient. (ED) [127]

thermal resistance junction-to-case ($R\theta CA$) (light-emitting diodes) (formerly $\theta_{J\text{-}C}$) The thermal resistance (steady-state) from the semiconductor junction(s) to a stated location on the case. (ED) [127]

thermal runaway A condition that is caused by a battery charging current that produces more internal heat than the battery can dissipate. This condition ultimately causes cell venting and premature failure. (PE/EDPG) 1184-1994

thermal short-circuit rating The maximum steady-state short-circuit rms current that can be carried for a specified time, the reactor being approximately at rated temperature rise and maximum ambient at the time the load is applied, without exceeding the specified temperature limits, and within the limitations of established standards. (PE/TR) C57.16-1996

thermal short-time current rating (current transformer) The root-mean-square symmetrical primary current that may be carried for a stated period (five seconds or less) with the secondary winding short-circuited, without exceeding a specified maximum temperature in any winding. *See also:* instrument transformer. (PE/TR) [57]

thermal subsystem (terrestrial photovoltaic power systems) The subsystem that receives thermal energy from the array subsystem. The thermal energy may be utilized for a thermal load application or dissipated. *See also:* array control. (PV) 928-1986r

thermal telephone receiver (thermophone) A telephone receiver in which the temperature of a conductor is caused to vary in response to the current input, thereby producing sound waves as a result of the expansion and contraction of the adjacent air. (EEC/PE) [119]

thermal time constant The time required for the conductor temperature to accomplish 63.2% of a change in initial temperature to the final temperature when the electrical current going through a conductor undergoes a step change. (T&D/PE) 738-1993

thermal transfer printer *See:* thermal printer.

thermal transmittance (U factor) The time rate of heat flow per unit temperature difference. (IA/PSE) 241-1990r

thermal tuning The process of changing the operating frequency of a system by using a controlled thermal expansion to alter the geometry of the system. *See also:* oscillatory circuit. (ED) 161-1971w

thermal tuning rate The initial time rate of change in frequency that occurs when the input power to the tuner is instantaneously changed by a specified amount. *Note:* This rate is a function of the power input to the tuner as well as the sign and magnitude of the power change. *See also:* oscillatory circuit. (ED) 161-1971w

thermal tuning sensitivity The rate of change of resonator equilibrium frequency with respect to applied thermal tuner power. (ED) 161-1971w

thermal tuning time constant The time required for the frequency to change by a fraction $(1 - 1/e)$ of the change in equilibrium frequency after an incremental change of the applied thermal tuner power. *Notes:* 1. If the behavior is not exponential, the initial conditions must be stated. 2. Here e is the base of natural logarithms. *See also:* oscillatory circuit. (ED) 161-1971w

thermal voltage converter (electric instruments) A thermoelement of low-current input rating with an associated series impedance or transformer, such that the electromotive force developed at the output terminals gives a measure of the voltage applied to the input terminals. *See also:* thermal converter. (EEC/AII) [102]

thermal watt converter *See:* thermal converter; thermal power converter.

thermionic arc (gas) An electric arc characterized by the fact that the thermionic cathode is heated by the arc current itself. *See also:* discharge. (ED) [45], [84]

thermionic emission (Edison effect) (Richardson effect) The liberation of electrons or ions from a solid or liquid as a result of its thermal energy. *See also:* electron emission. (ED) 161-1971w, 160-1957w

thermionic generator A thermoelectric generator in which a part of the circuit, across which a temperature difference is maintained, is a vacuum or a gas. *See also:* thermoelectric device. (ED) [46]

thermionic grid emission Current produced by electrons thermionically emitted from a grid. *See also:* electron emission. (ED) 161-1971w, 160-1957w

thermionic tube An electron tube in which the heating of one or more of the electrodes is for the purpose of causing electron or ion emission. *See also:* hot-cathode tube. (ED) 161-1971w

thermistor (1) (general) An electron device that makes use of the change of resistivity of semiconductor with change in temperature. *See also:* bolometric detector; semiconductor. (PE/ED/PSIM) 119-1974w, 216-1960w
(2) (power semiconductor) A semiconductor device whose electric resistance is dependent upon temperature. (IA) [12]
(3) (waveguide components) A form of bolometer element having a negative temperature coefficient of resistivity which typically employs a semiconductor bead. (MTT) 147-1979w

thermistor mount (waveguide) (bolometer mount) A waveguide termination in which a thermistor (bolometer) can be incorporated for the purpose of measuring electromagnetic power. *See also:* waveguide. (AP/ANT) [35], [84]

thermochromeric Pertaining to heat-sensitive materials that change color when heated to different temperatures. (C) 610.10-1994w

thermochromeric display device A display device that uses thermochromeric materials to form images on the display surface. (C) 610.10-1994w

thermocouple A pair of dissimilar conductors so joined at two points that an electromotive force is developed by the thermoelectric effects when the junctions are at different temperatures. *See also:* electric thermometer; thermoelectric effect. (IM/PE/PSIM) 544-1975w, 119-1974w

thermocouple converter *See:* thermal converter.

thermocouple extension wire A pair of wires having such electromotive-force-temperature characteristics relative to the thermocouple with which the wires are intended to be used that, when properly connected to the thermocouple, the reference junction is in effect transferred to the other end of the wires. (PE/PSIM) 119-1974w

thermocouple instrument An electrothermic instrument in which one or more thermojunctions are heated directly or indirectly by an electric current or currents and supply a direct current that flows through the coil of a suitable direct-current mechanism, such as one of the permanent-magnet moving-coil type. *See also:* instrument. (EEC/PE) [119]

thermocouple leads A pair of electrical conductors that connect the thermocouple to the electromotive force measuring device. One or both leads may be simply extensions of the thermoelements themselves or both may be of copper, dependent on the thermoelements in use and upon the physical location of the reference junction or junctions relative to the measuring device. (PE/PSIM) 119-1974w

thermocouple thermometer A temperature-measuring instrument comprising a device for measuring electromotive force, a sensing element called a thermocouple that produces an electromotive force of magnitude directly related to the temperature difference between its junctions, and electrical conductors for operatively connecting the two. (PE/PSIM) 119-1974w

thermocouple vacuum gauge A vacuum gauge that depends for its operation on the thermal conduction of the gas present, pressure being measured as a function of the electromotive force of a thermocouple the measuring junction of which is in thermal contact with a heater that carries a constant current. It is ordinarily used over a pressure range of 10^{-1} to 10^{-3} conventional millimeter of mercury. *See also:* instrument. (EEC/PE) [119]

thermodynamic equilibrium A situation in which the net thermal radiation exchanged by members of a system is zero. (AP/PROP) 211-1997

thermoelectric arm The part of a thermoelectric device in which the electric-current density and temperature gradient are approximately parallel or antiparallel and that is electrically connected only at its extremities to a part having the opposite relation between the direction of the temperature gradient and the electric-current density. *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], 221-1962w

thermoelectric cooling device A thermoelectric heat pump that is used to remove thermal energy from a body. *See also:* thermoelectric device. (ED) [46], 221-1962w

thermoelectric device A generic term for thermoelectric heat pumps and thermoelectric generators. (ED) [46]

thermoelectric effect *See:* Seebeck effect.

thermoelectric effect error (bolometric power meters) An error arising in bolometric power meters that employ thermistor elements in which the majority of the bias power is alternating current and the remainder direct current. The error is caused by thermocouples at the contacts of the thermistor leads to the metal oxides of the thermistors. *See also:* bolometric power meter. (IM/HFIM) [40]

thermoelectric generator A device that converts thermal energy into electric energy by direct interaction of a heat flow and the charge carriers in an electric circuit, and that requires for this process the existence of a temperature difference in the electric circuit. *See also:* thermoelectric device. (ED) [46]

thermoelectric, graded arm A thermoelectric arm whose composition changes continuously along the direction of the current density. *See also:* thermoelectric device. (ED) [46], 221-1962w

thermoelectric heating device A thermoelectric heat pump that is used to add thermal energy to a body. *See also:* thermoelectric device. (ED) [46]

thermoelectric heat pump A device that transfers thermal energy from one body to another by the direct interaction of an electric current and the heat flow. *See also:* thermoelectric device. (ED) [46]

thermoelectric power *See:* thermoelectric device; Seebeck coefficient.

thermoelectric thermometer (thermocouple thermometer) An electric thermometer that employs one or more thermocouples of which the set of measuring junctions is in thermal contact with the body, the temperature of which is to be measured, while the temperature of the reference junctions is either known or otherwise taken into account. *See also:* electric thermometer. (EEC/PE) [119]

thermoelement (electric instruments) The simplest type of thermal converter. It consists of a thermocouple, the measuring junction of which is in thermal contact with an electric heater or integral therewith. *See also:* thermal converter. (EEC/AII) [102]

thermogalvanic corrosion Corrosion resulting from a galvanic cell caused primarily by a thermal gradient. *See also:* electrolytic cell. (IA) [59]

thermographic printer A nonimpact printer that creates images on paper through heat impressions. (C) 610.10-1994w

thermojunction One of the surfaces of contact between the two conductors of a thermocouple. The thermojunction that is in thermal contact with the body under measurement is called the measuring junction, and the other thermojunction is called the reference junction. *See also:* electric thermometer. (EEC/PE) [119]

thermometer An instrument for determining the temperature of a body or space. (SWG/PE) C37.30-1971s

thermometer method of temperature determination (1) (power and distribution transformers) The determination of the temperature by mercury, alcohol, resistance, or thermocouple thermometer, any of these instruments being applied to the hottest accessible part of the device. (PE/TR) C57.12.80-1978r

(2) This method consists of the determination of the temperature by thermocouple or suitable thermometer, with either being applied to the hottest accessible part of the equipment. (PE/TR) C57.15-1999

thermophone An electroacoustic transducer in which sound waves of calculable magnitude result from the expansion and contraction of the air adjacent to a conductor whose temperature varies in response to a current input. *Note:* When used for the calibration of pressure microphones, a thermophone is generally used in a cavity the dimensions of which are small compared to a wavelength. *See also:* microphone. (SP) [32]

thermopile A group of thermocouples connected in series aiding. This term is usually applied to a device used either to measure radiant power or energy or as a source of electric energy. *See also:* electric thermometer. (IM/PE/PSIM) 544-1975w, 119-1974w

thermoplastic (A) A plastic that is thermoplastic in behavior. **(B)** Having the quality of softening when heated above a certain temperature range and of returning to its original state when cooling below that range. (PE) [9]

thermoplastic insulating tape A tape composed of a thermoplastic compound that provides insulation for joints. (EEC/PE) [119]

thermoplastic insulations and jackets (power distribution, underground cables) Insulations and jackets made of materials that are softened by heat for application to the cable and then become firm, tough and resilient upon cooling. Subsequent heating and cooling will reproduce similar changes in the physical properties of the material. (PE) [4]

thermosphere That part of the Earth's atmosphere located above the mesosphere in which temperature increases and then remains constant with increasing height and from which there is virtually no further escape of particles to free space. The thermosphere extends to an altitude of 500–600 km. (AP/PROP) 211-1997

thermostat A device that responds to temperature and, directly or indirectly, controls temperature in a building. (IA/PSE) 241-1990r

thermostatic switch (thermostat) A form of temperature-operated switch that receives its operating energy by thermal conduction or convection from the device being controlled or operated. *See also:* switch. (IA/IAC) [60]

theta polarization (θ polarization) The state of the wave in which the *E* vector is tangential to the meridian lines 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 (θ) polarization and the horizontal loop will radiate only phi (ϕ) polarization. *See also:* antenna. (AP) 149-1979r, [84]

Thevenin's theorem States that the current that will flow through an impedance Z', when connected to any two terminals of a linear network between which there previously existed a voltage *E* and an impedance *Z*, is equal to the voltage *E* divided by the sum of *Z* and Z'. (EEC/PE) [119]

thickener (hydrometallurgy) (electrometallurgy) A tank in which suspension of solid material can settle so that the solid material emerges from a suitable opening with only a portion of the liquid while the remainder of the liquid overflows in clear condition at another part of the thickener. *See also:* electrowinning. (EEC/PE) [119]

thick film technology A technology in which a thick film (about 1 mil) is screen-printed onto an insulating substrate and then fused to the substrate by firing. *Note:* Resistors, capacitors, and conductors are commonly made by this technology. (CAS) [13]

thimble A print element shaped like a sewing thimble, used for letter quality printing, with type slugs arranged around its perimeter. (C) 610.10-1994w

thin film (1) Loosely, magnetic thin film. (C) [20], [85]
(2) *See also:* magnetic thin film. (C) 610.10-1994w

thin film storage *See:* magnetic thin film storage.

thin film technology A technology in which a thin film (a few hundred to a few thousand angstroms in thickness) is applied by vacuum deposition to an insulating substrate. Resistors, capacitors, and conductors are commonly made by this technology. (CAS) [13]

thin film waveguide (fiber optics) A transparent dielectric film, bounded by lower index materials, capable of guiding light. *See also:* optical waveguide. (Std100) 812-1984w

think time The elapsed time between the end of a prompt or message generated by an interactive system and the beginning of a human user's response. *See also:* response time; turnaround time; port-to-port time. (C) 610.12-1990

thinned array antenna An array antenna that contains substantially fewer driven radiating elements than a conventional uniformly spaced array with the same beamwidth having identical elements. Interelement spacings in the thinned array are chosen such that no large grating lobes are formed and side lobes are minimized. (AP/ANT) 145-1993

thinning An image processing technique in which regions are reduced to sets of thin curves. (C) 610.4-1990w

thin phase screen approximation An approximation in which the cumulative effects of phase distortion take place in an equivalent thin layer and amplitude effects are neglected. (AP/PROP) 211-1997

thin stack A less than fully featured protocol stack. *See also:* short stack. (C) 610.7-1995

thin-wall counter (radiation counters) A counter tube in which part of the envelope is made thin enough to permit the entry of radiation of low penetrating power. *See also:* anticoincidence. (ED) [45]

third generation A period during the evolution of electronic computers in which integrated circuits, core memory technology and miniaturized components replaced transistors and discrete passive components. *Note:* Introduced in 1964, thought to have been the state of the art until the introduction of large scale integration, as is found in many microcomputers. *See also:* second generation; first generation; fourth generation; fifth generation. (C) 610.10-1994w

third generation language *See:* high-order language.

third-level address *See:* n-level address.

third normal form One of the forms used to characterize relations; a relation is said to in third normal form if it is in second normal form and if no nonprime attribute is transitively dependent on the primary key. See the table below.

Third Normal Form

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

THIRD NORMAL FORM
ORDER3 = ORDER-NO + DATE + CUSTOMER-NO
+TOTAL-ORDER-AMOUNT
CUSTOMER3 = CUSTOMER-NO
+CUSTOMER-NAME
+CUSTOMER-ADDRESS
ORDER-ITEM3 = ORDER-NO + ITEM-NO
+QUANTITY-ORDERED + EXTENDED-PRICE
ITEM3 = ITEM-NO + ITEM-DESCRIPTION
+UNIT-PRICE

In second normal form, nonprime attributes CUSTOMER-NAME and CUSTOMER-ADDRESS are transitively dependent on CUSTOMER-NO. Keys shown in brackets.

See also: Boyce/Codd Normal form. (C) 610.5-1990w

third-order distortion *See:* intermodulation distortion.

third-order nonlinearity coefficient (accelerometer) The proportionality constant that relates a variation of the output to the cube of the input, applied parallel to the input reference axis. (AES/GYAC) 528-1994

third-rail clearance line (railroads) The contour that embraces all cross sections of third rail and its insulators, supports, and guards located at an elevation higher than the top of the running rail. *See also:* electric locomotive. (PE/EEC) [119]

third-rail electric car An electric car that collects propulsion power through a third-rail system. *See also:* electric motor car. (EEC/PE) [119]

third-rail electric locomotive An electric locomotive that collects propulsion power from a third-rail system. *See also:* electric locomotive. (EEC/PE) [119]

third voltage range *See:* voltage range.

32-bit supportive Uses 32-bit addresses when accessing System Memory. (C/MM) 1212.1-1993

Thomson bridge *See:* Kelvin bridge.

Thomson coefficient The quotient of the rate of Thomson heat absorption per unit volume of conductor by the scalar product of the electric current density and the temperature gradient. The Thomson coefficient is positive if Thomson heat is absorbed by the conductor when the component of the electric

current density in the direction of the temperature gradient is positive. *See also:* thermoelectric device. (ED) [46]

Thomson effect The absorption or evolution of thermal energy produced by the interaction of an electric current and a temperature gradient in a homogeneous electric conductor. *Notes:* 1. An electromotive force exists between two points in a single conductor that are at different temperatures. The magnitude and direction of the electromotive force depend on the material of the conductor. A consequence of this effect is that if a current exists in a conductor between two points at different temperatures, heat will be absorbed or liberated depending on the material and on the sense of the current. 2. In a nonhomogeneous conductor, the Peltier effect and the Thomson effect cannot be separated. *See also:* thermoelectric device. (ED) [46]

Thomson heat The thermal energy absorbed or evolved as a result of the Thomson effect. *See also:* thermoelectric device. (ED) [46]

thrashing A state in which a computer sys-tem is expending most or all of its resources on overhead operations, such as swapping data between main and auxiliary storage, rather than on intended computing functions. (C) 610.12-1990

thread (1) (control) A control function that provides for maintained operation of a drive at a preset reduced speed such as for setup purposes. *See also:* electric drive. (IA/ICTL/IAC) [60]

(2) (data management) In a tree, a set of link fields, one in each node, each of which points to the successor or predecessor of that node with respect to a particular traversal order. (C) 610.5-1990w

(3) A single sequential flow of control within a process. (C/PA) 1328.2-1993w, 1326.2-1993w, 1224.2-1993w, 1327.2-1993w, 14252-1996

(4) A single flow of control within a process. Each thread has its own thread ID, scheduling priority and policy, *errno* value, thread-specific key/value bindings, and the required system resources to support a flow of control. Anything whose address may be determined by a thread, including but not limited to static variables, storage obtained via *malloc*(), directly addressable storage obtained through implementation-supplied functions, and automatic variables shall be accessible to all threads in the same process. (C/PA) 9945-1-1996

threaded coupling (rigid steel conduit) An internally threaded steel cylinder for connecting two sections of rigid steel conduit. (EEC/CON) [28]

threaded tree A tree whose nodes contain link fields for one or more threads, allowing nonrecursive traversal of the tree. *See also:* left-threaded tree; triply-threaded tree; doubly-threaded tree; right-threaded tree. (C) 610.5-1990w

thread ID A unique value of type *pthread_t* that identifies each thread during its lifetime in a process. (C/PA) 9945-1-1996

threading line (conductor stringing equipment) A lightweight flexible line, normally manila or synthetic fiber rope, used to lead a conductor through the bullwheels of a tensioner or pulling line through a bull wheel puller. *Synonyms:* threading rope; bull line. (T&D/PE) 524-1992r

threading rope *See:* threading line.

thread list An ordered set of runnable threads that all have the same ordinal value for their priority. The ordering of threads on the list is determined by a scheduling policy or policies. The set of thread lists includes all runnable threads in the system. (C/PA) 9945-1-1996

thread of control A sequence of instructions executed by a conceptual sequential subprogram, independent of any programming language. More than one thread of control may execute concurrently, interleaved on a single processor, or on separate processors. The conceptual threads of control in an Ada application are Ada tasks. They may, but need not, correspond to the POSIX threads defined in POSIX.1. (C) 1003.5-1999

thread-safe A function that may be safely invoked concurrently by multiple threads. Each function defined by this standard is thread-safe unless explicitly stated otherwise. An example is any "pure" function (a function that holds a mutex locked while it is accessing static storage or objects shared among threads). (C/PA) 9945-1-1996

thread-specific data key A process global handle of type *pthread_key_t* that is used for naming thread-specific data. Although the same key value may be used by different threads, the values bound to the key by *pthread_setspecific*() and accessed by *pthread_getspecific*() are maintained on a per-thread basis and persist for the life of the calling thread. (C/PA) 9945-1-1996

threat (1) A potential violation of security. (LM/C) 802.10g-1995, 802.10-1992

(2) Means by which a system may be adversely affected. Threats include both inadvertent and malicious actions. (C/BA) 896.3-1993w

three-address Pertaining to an instruction code in which each instruction has three address parts. Also called triple-address. In a typical three-address instruction the addresses specify the location of two operands and the destination of the result, and the instructions are taken from storage in a preassigned order. *See also:* two-plus-one address. (C) 162-1963w

three-address instruction (1) A computer instruction that contains three address fields. For example, an instruction to add the contents of locations A and B, and place the results in location C. *Contrast:* four-address instruction; one-address instruction; zero-address instruction; two-address instruction. (C) 610.12-1990

(2) An instruction containing three addresses. *Synonym:* triple-address instruction. *See also:* address format. (C) 610.10-1994w

three-bit byte *See:* triplet.

three-conductor bundle *See:* bundle.

three-dimensional graphics The presentation of data on a two-dimensional display surface so that it appears to represent a three-dimensional model, and can be viewed from any position. *Note:* Each coordinate of the model contains a triplet of information; for example, *x*, *y*, and *z* in the Cartesian coordinate system. (C) 610.6-1991w

three-dimensional hardware A graphical display processor that accepts three-dimensional information as input and generates an image directly rather than using a projection transformation. (C) 610.6-1991w

three-dimensional priority The property possessed by a line or surface that is in front of another line or surface from the viewer's perspective. (C) 610.6-1991w

three-dimensional radar (navigation aid terms) A radar capable of producing three-dimensional position data on a multiplicity of targets. (AES/GCS) 686-1997, 172-1983w

3GL *See:* high-order language.

three-input adder *See:* full adder.

three-level address *See:* n-level address.

3-of-9 bar code A variable length, bidirectional, discrete, self-checking, alpha-numeric bar code. Its basic data character set contains 43 characters: 0 to 9, A to Z, −, ., /, +, $, %, and space. Each character is composed of 9 elements: 5 bars and 4 spaces. Three of the nine elements are wide (binary value 1) and six are narrow (binary value 0). A common character (*) is used exclusively for both a start and stop character. (PE/TR) C57.12.35-1996

three-phase ac fields (electric and magnetic fields from ac power lines) Three-phase transmission lines generate a three-phase field whose space components are not in phase. The field at any point can be described by the field ellipse, that is, by the magnitude and direction of the semi-major axis and the magnitude and direction of its semi-major axis. In a three-phase field, the electric field at large distances ≥ 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 (less than 10%) of the major axis when measured at a height of 1 m. Similar remarks apply for the magnetic field. *See also:* electric field strength.
(T&D/PE) 644-1979s

three-phase circuit A combination of circuits energized by alternating electromotive forces that differ in phase by one-third of a cycle (120°). *Note:* In practice, the phases may vary several degrees from the specified angle.
(IA/MT) 45-1998

three-phase dry-type air-core reactor Dry-type air core rectors are single phase devices. In a three-phase reactor the single phase reactors are stacked and magnetically coupled. Depending on the application the self inductance may be modified to compensate for mutual coupling effects.
(PE/TR) C57.16-1996

three-phase electric locomotive An electric locomotive that collects propulsion power from three phases of an alternating-current distribution system. *See also:* electric locomotive.
(EEC/PE) [119]

three-phase enclosure A metallic enclosure containing the buses and/or devices of all phases of a three-phase system.
(SUB/PE) C37.122.1-1993

three-phase four-wire system A system of alternating-current supply comprising four conductors, three of which are connected as in a three-phase three-wire system, the fourth being connected to the neutral point of the supply, which may be grounded. *See also:* alternating-current distribution.
(T&D/PE) [10]

three-phase seven-wire system A system of alternating-current supply from groups of three single-phase transformers connected in Y so as to obtain a three-phase four-wire grounded-neutral system for lighting and a three-phase three-wire grounded-neutral system of a higher voltage for power, the neutral wire being common to both systems. *See also:* alternating-current distribution. (T&D/PE) [10]

three-phase three-wire system A system of alternating-current supply comprising three conductors between successive pairs of which are maintained alternating differences of potential successively displaced in phase by one-third of a period. *See also:* alternating-current distribution. (T&D/PE) [10]

three-plus-one address Pertaining to a four-address code in which one address part always specifies the location of the next instruction to be interpreted. (C) 162-1963w

three-plus-one address instruction A computer instruction that contains four address fields, the fourth containing the address of the instruction to be executed next. For example, an instruction to add the contents of locations A and B, place the results in location C, then execute the instruction at location D. *Contrast:* four-plus-one address instruction; two-plus-one address instruction; one-plus-one address instruction.
(C) 610.12-1990

three-position relay A relay that may be operated to three distinct positions. (EEC/PE) [119]

three-state A type of bus driver. Either drives high, low, or not at all. (C/MM) 1196-1987w

three-state circuit A digital circuit which has three output states: logical one (false), logical zero (true) and a high impedance output to isolate itself from the circuit.
(C) 610.10-1994w

three-state indication *See:* supervisory control functions.

3-state pin A component output pin where the drive may be either active or inactive (for example, at high impedance).
(TT/C) 1149.1-1990

three-terminal capacitor Two conductors (the active electrodes) insulated from each other and from a surrounding third conductor that constitutes the shield. When the capacitor is provided with properly designed terminals and used with shielded leads, the direct capacitance between the active electrodes is independent of the presence of other conductors. (Specialized usage.) (Std100) 270-1966w

three-tone slope A measure of attenuation distortion at 404 Hz and 2804 Hz relative to loss at 1020Hz (or 1004 Hz). Three-tone slope is specified for many telecommunication services.
(COM/TA) 743-1995

three-wire control A control function that utilizes a momentary-contact pilot device and a holding-circuit contact to provide undervoltage protection. *See also:* undervoltage protection; relay. (IA/ICTL/IAC) [60]

three-wire system (direct current or single-phase alternating current) A system of electric supply comprising three conductors, one of which (known as the neutral wire) is maintained at a potential midway between the potential of the other two (referred to as the outer conductors). *Note:* Part of the load may be connected directly between the outer conductors, the remainder being divided as evenly as possible into two parts each of which is connected between the neutral and one outer conductor. There are thus two distinct voltages of supply, the one being twice the other. *See also:* alternating-current distribution; direct-current distribution.
(T&D/PE) [10]

three-wire type current transformer (1) (power and distribution transformers) One which has two primary windings each completely insulated for the rated insulation level of the transformer. This type of current transformer is for use on a three-wire single-phase service. *Note:* The primary windings and secondary windings are permanently assembled on the core as an integral structure. The secondary current is proportional to the phasor sum of the primary currents.
(PE/TR) C57.12.80-1978r

(2) One that has two insulated primary windings and one secondary winding and is for use on a three-wire, single-phase service. *Note:* The primary windings and the secondary winding are permanently assembled on the core as an integral structure. The secondary current is proportional to the phasor sum of the primary currents. (PE/TR) C57.13-1993

threshold (1) (A) (mathematics of computing) A logic operator having the property that if P is a statement, Q is a statement, R is a statement, . . ., then the threshold of P, Q, R, . . . is true if at least *N* statements are true, false if less than *N* statements are true, where *N* is a specified non-negative integer called the threshold condition. **(B) (mathematics of computing)** The threshold condition as in definition (A).
(C) 1084-1986

(2) (image processing) A specified gray level used for producing a binary image. *See also:* thresholding.
(C) 610.4-1990w

(3) (illuminating engineering) The value of a variable of a physical stimulus (such as size, luminance, contrast or time) which permits the stimulus to be seen a specific percentage of the time or at a specific accuracy level. In many psychophysical experiments, thresholds are presented in terms of 50% accuracy or accurately 50% of the time. However, the threshold also is expressed as the value of the physical variable which permits the object to be just barely seen. The threshold may be determined by merely detecting the presence of an object or it may be determined by discriminating certain details of the object. (EEC/IE) [126]

(4) (of a maser or laser) The condition of a maser or laser wherein the gain of its medium is just sufficient to permit the start of oscillation. (LEO) 586-1980w

(5) (accelerometer) (gyros) The largest absolute value of the minimum input that produces an output equal to at least 50% of the output expected using the nominal scale factor.
(AES/GYAC) 528-1994

(6) A value of voltage or other measure that a signal must exceed in order to be detected or retained for further processing. (AES) 686-1997

threshold audiogram *See:* audiogram.

threshold center voltage The algebraic average of the (HC) and (LC) threshold voltages; that is, $(V_{LC} + V_{HC})/2$.

threshold current (1) (protection and coordination of industrial and commercial power systems) The magnitude of

current at which a fuse becomes current limiting, specifically the symmetrical root-mean-square (rms) available current at the threshold of the current-limiting range, where the fuse total clearing time is less than half-cycle at rated voltage and rated frequency, for symmetrical closing, and a power factor of less than 20%. Refer to various peak let-through current curves for each type of fuse. The threshold ratio is the relationship of the threshold current to the fuse's continuous-current rating. (IA/PSP) 242-1986r

(2) (fiber optics) The driving current corresponding to lasing threshold. *See also:* lasing threshold. (Std100) 812-1984w

(3) (of a current-limiting fuse) A current magnitude of specified wave shape at which the melting of the current-responsive element occurs at the first instantaneous peak current for that wave shape. *Note:* The current magnitude is usually expressed in rms amperes. (SWG/PE) C37.100-1992

threshold element (1) (A) A combinational logic element such that the output channel is in its one state if and only if at least n input channels are in their one states, where n is a specified fixed nonnegative integer, called the threshold of the element. **(B)** By extension, a similar element whose output channel is in its one state if and only if at least n input channels are in states specified for them, not necessarily the one state but a fixed state for each input channel. (C) 162-1963

(2) A device that performs the logic threshold operation but in which the truth of each input statement contributes to the output determination a weight associated with that statement. (C) [20], [85]

(3) *See also:* threshold gate. (C) 610.10-1994w

threshold field The least magnetizing force in a direction that tends to decrease the remanence, that, when applied either as a steady field of long duration or as a pulsed field appearing many times, will cause a stated fractional change of remanence. (C) [20]

threshold frequency (photoelectric tubes) (photoelectric device) The frequency of incident radiant energy below which there is no photoemissive effect. *See also:* photoelectric effect. (ED) [45], [84]

threshold function A two-value switching function of one or more not necessarily Boolean arguments that take the value 1 if a specified mathematical function of the arguments exceeds a given threshold value, and zero otherwise. *See also:* threshold operation. (C) 610.10-1994w

threshold gate A combinational circuit that performs a threshold operation. *Synonym:* threshold element. (C) 610.10-1994w

thresholding The process of producing a binary image from a gray scale image by assigning each output pixel the value 1 if its corresponding input pixel is at or above a specified gray level (the threshold) and the value 0 if the input pixel is below that threshold. (C) 610.4-1990w

threshold level (L_{TH}) The minimum signal level necessary for removing insertion loss on a handsfree telephone (HFT). (COM/TA) 1329-1999

threshold lights (illuminating engineering) Runway lights so placed as to indicate the longitudinal limits of that portion of a runway, channel, or landing path usable for landing. (EEC/IE) [126]

threshold limit value—short term exposure limit (TLV-STEL) as defined by the American Conference of Governmental Industrial Hygienists: The maximum concentration to which workers can be exposed for a period of up to 15 min continuously without suffering adverse effects, or materially reduced work efficiency, provided that no more than four 15 min excursions per day are permitted with at least 60 min between exposure periods, and provided that the TLV-TWA is not exceeded. (In most jurisdictions in North America, the TLVs are legislated limits to exposure.) (SUB/PE) C37.122.1-1993

threshold limit value—time weighted average (TLV-TWA) as defined by the American Conference of Governmental Industrial Hygienists: The time-weighted average concentration for a normal 8h work day and 40 h work week to which nearly all workers may be exposed repeatedly, day after day, without adverse effect. (SUB/PE) C37.122.1-1993

threshold of audibility (specified signal) (threshold of detectability) The minimum effective sound pressure level of the signal that is capable of evoking an auditory sensation in a specified fraction of the trials. The characteristics of the signal, the manner in which it is presented to the listener, and the point at which the sound pressure is measured must be specified. *Notes:* 1. Unless otherwise specified, the ambient noise reaching the ears is assumed to be negligible. 2. The threshold is usually given as a sound pressure level in decibels relative to 20 micronewtons per square meter. 3. Instead of the method of constant stimuli, which is implied by the phrase in a specified fraction of the trials, another psychophysical method (which should be specified) may be employed. (SP) [32]

threshold of discomfort (audio and electroacoustics) (for a specified signal) The minimum effective sound pressure level at the entrance to the external auditory canal that, in a specified fraction of the trials, will stimulate the ear to a point at which the sensation of feeling becomes uncomfortable. (SP) [32]

threshold of feeling (audio and electroacoustics) (tickle) (for a specified signal) The minimum effective sound pressure level at the entrance to the external auditory canal that, in a specified fraction of the trials, will stimulate the ear to a point at which there is a sensation of feeling that is different from the sensation of hearing. (SP) [32]

threshold of pain (audio and electroacoustics) (for a specified signal) The minimum effective sound pressure level at the entrance to the external auditory canal that, in a specified fraction of the trials, will stimulate the ear to a point at which the discomfort gives way to definite pain that is distinct from the mere nonnoxious feeling of discomfort. (SP) [32]

threshold of perception The level of stimulation at which 50% of the population is just able to consciously detect the presence of the stimulus. (T&D/PE) 539-1990

threshold operation An operation that evaluates the threshold function of the operands. *See also:* majority operation. (C) 610.10-1994w

threshold ratio (of a current-limiting fuse) The ratio of the threshold current to the fuse current rating. (SWG/PE) C37.100-1992

threshold sensitivity (test, measurement, and diagnostic equipment) The smallest quantity that can be detected by a measuring instrument or automatic control system. (MIL) [2]

threshold signal (navigation aid terms) (navigation) The smallest signal capable of effecting a recognizable change in navigational information. (AES/GCS) 172-1983w

threshold signal-to-interference ratio (TSI) The minimum signal to interference power, described in a prescribed way, required to provide a specified performance level. *See also:* electromagnetic compatibility. (EMC) [53]

threshold voltage (1) (metal-nitride-oxide field-effect transistor) Minimum gate voltage necessary for onset of current flow between source and drain of an insulated-gate field-effect transistor (IGFET). This is a serviceable general definition. There are three more specific definitions possible.

(1) $V_T = V_{GS}$ at $I_{DS} = 10\ \mu A$, when $V_{GS} = V_{DS}$

that is, V_T is the gate voltage necessary to result in a defined low current level;

(2) $V_T = V_{GS} - \left[\frac{I_{DS}\ell}{k'W}\right]^{1/2}$

that is, V_T is that value that gives the best fit to the I–V relationship of the IGFET;

(3) $V_T = \phi_{ms} + \phi_s - \frac{Q_B}{C_G} - \frac{Q_I}{C_G}$

that is, V_T is derived from inherent structural parameters only. *Note:* Equation (1) is commonly used in practice. While normally I_{DS} is set at 10 μA, a value of I_{DS} independent of lateral geometry is I_{DS} 0.5 (W/l) μA. Equation (3) suffers from the fact that in packaged devices, none of the terms can be varified by independent measurement. *See also:* insulated-gate field-effect transistor symbols. (ED) 581-1978w

(2) (semiconductor rectifiers) The zero-current−voltage intercept of a straight-line approximation of the forward current-voltage characteristic over the normal operating range. (IA) [62]

(3) The minimum voltage considered to be a high state or the maximum voltage considered to be a low state. (SCC20) 1445-1998

threshold voltage saturation (metal-nitride-oxide field-effect transistor) For a given gate-to-source voltage, the transistor metal-nitride-oxide semiconductor (MNOS) threshold voltage achieved in either of the two written states for which an order of magnitude increase in pulse width causes less than a 100-mV change in threshold voltage. Thus pulse width can also be achieved by sequence of shorter pulses of the same polarity. (ED) 581-1978w

threshold voltage window (metal-nitride-oxide field-effect transistor) The algebraic difference between the two threshold voltages (the threshold voltage after a write-high operation minus the threshold voltage after a write-low operation). (ED) 581-1978w

threshold wavelength (photoelectric tubes) (photoelectric device) The wavelength of the incident radiant energy above which there is no photoemission effect. *See also:* photoelectric effect. (ED) [45], [84]

throat microphone A microphone normally actuated by mechanical contact with the throat. *See also:* microphone. (EEC/PE) [119]

through-board This refers to the implementation of dual-in-line packages, axial-leaded devices, etc., into plated through-holes in a PWB. *Synonym:* through-hole. (C/BA) 1101.3-1993

through bolt (rotating machinery) A bolt passing axially through a laminated core, that is used to apply pressure to the end plates. (PE) [9]

through-hole *See:* through-board.

through loss *See:* insertion loss.

throughput (1) (data transmission) The total capability of equipment to process or transmit data during a specified time period. (PE) 599-1985w

(2) (software) The amount of work that can be performed by a computer system or component in a given period of time; for example, number of jobs per day. *See also:* turnaround time; workload model. (C) 610.12-1990

(3) (automatic control) *See also:* capacity.

through supervision (1) (communication switching) The automatic transfer of supervisory signals through one or more trunks in a manual telephone switchboard. (COM) [48]

(2) (telephone switching systems) The capability of apparatus within a switched connection to pass or repeat signaling. (COM) 312-1977w

throwing power (electroplating) (of a solution) A measure of its adaptability to deposit metal uniformly upon a cathode of irregular shape. In a given solution under specified conditions it is equal to the improvement (in percent) of the metal distribution ratio above the primary-current distribution ratio. *See also:* electroplating. (EEC/PE) [119]

throw-over equipment *See:* automatic transfer equipment.

thrust bearing (rotating machinery) A bearing designed to carry an axial load so as to prevent or to limit axial movement of a shaft, or to carry the weight of a vertical rotor system. *See also:* bearing. (PE) [9]

thrust block (rotating machinery) A support for a thrust-bearing runner. *See also:* bearing. (PE) [9]

thrust collar (rotating machinery) The part of a shaft or rotor that contacts the thrust bearing and transmits the axial load. *See also:* rotor. (PE) [9]

thumbwheel An input device consisting of a dial or wheel, inset into a surface so that only a portion of its rim protrudes, that can be moved with one degree of freedom to provide coordinate input data. *Note:* It is usually used in pairs to control the display of crosshairs on a display surface. (C) 610.6-1991w, 610.10-1994w

thump A low-frequency transient disturbance in a system or transducer characterized audibly by the onomatopoeic connotation of the word. *Note:* In telephony, thump is the noise in a receiver connected to a telephone circuit on which a direct-current telegraph channel is superposed caused by the telegraph currents. *See also:* signal-to-noise ratio. (SP) 151-1965w

thunder The sound that follows a flash of lightning and is caused by the sudden expansion of the air in the path of electrical discharge. (SUB/PE) 998-1996

thunderstorm day (1) A day during which thunder is heard at least once at a specified observation point. (PE/PSC) 487-1992

(2) A day on which thunder can be heard, and hence when lightning occurs. (SUB/PE) 998-1996

thunderstorm hour An hour during which thunder can be heard, and hence when lightning occurs. (SUB/PE) 998-1996

Thury transmission system A system of direct-current transmission with constant current and a variable high voltage. *Note:* High voltage used on this system is obtained by connecting series direct-current generators in series at the generating station: and is utilized by connecting series direct-current motors in series at the substations. *See also:* direct-current distribution. (T&D/PE) [10]

thyratron A hot-cathode gas tube in which one or more control electrodes initiate but do not limit the anode current except under certain operating conditions. (ED) [45]

thyristor (1) (thyristor ac power controllers) A bistable semiconductor device comprising three or more junctions that can be switched from the OFF state to the ON state or vice versa, such switching occurring within at least one quadrant of the principal voltage-current characteristic. (IA/IPC) 428-1981w

(2) (electrical heating applications to melting furnaces and forehearths in the glass industry) A bistable semiconductor device comprising three or more junctions that can be switched from an off (nonconducting) to an on (conducting) condition, or vice versa, by the application of a small electric signal. Such switching occurs within at least one quadrant of the principal voltage-current characteristic. (IA) 668-1987w

thyristor ac power controller A power electronic equipment for the control or switching of ac power where switching, multicycle control and phase control are included. The only power controlling element is the thyristor, although other power elements may be included. (IA/IPC) 428-1981w

thyristor assembly An electrical and mechanical functional assembly of thyristors in combination with diodes, if any, or thyristor stacks, complete with all its connections and auxiliary components, including trigger equipment, together with means for cooling, if any, in its own mechanical structure, but without the controller transformers and other switching devices. *Note:* A thyristor assembly may be combined of several subassemblies, which are made and traded as mechanically combined units, for example, thyristor stacks or other combinations or one or more thyristors with control devices, protective devices, etc. (IA/IPC) 428-1981w

thyristor-controlled reactor (TCR) (1) A series connection thyristor controller, typically connected between two halves of a reactor, that forms one leg of the connected circuit. The thyristor controller consists of antiparallel phase angle con-

trolled thyristors for vernier control of the reactor susceptance (current). (SUB/PE) 1303-1994

(2) A shunt-connected thyristor-controlled inductor whose effective reactance is varied in a continuous manner by partial conduction of the thyristor valve. (SUB/PE) 1031-2000

(3) The effective value of the reactor is changed by using thyristors to control the flow of current by phase-controlling the turn-on signal to the thyristors.power systems relaying. (PE) C37.99-2000

thyristor converter (thyristor converter unit, thyristor converter equipment) An operative unit comprising one or more thyristor sections together with converter transformers, essential switching devices, and other auxiliaries, if any of these items exist. System control equipments are optionally included. (IA/IPC) 444-1973w

thyristor converter, bridge *See:* bridge thyristor converter.

thyristor converter, cascade *See:* cascade thyristor converter.

thyristor converter circuit element A group of one or more thyristors, connected in series or parallel or any combination of both, bounded by no more than two circuit terminals and conducting forward current in the same direction between these terminals. *Note:* A circuit element is also referred to as a leg or arm, and in the case of paralleled thyristors each path is referred to as a branch. (IA/IPC) 444-1973w

thyristor converter, multiple *See:* multiple thyristor converter.

thyristor converter, parallel *See:* parallel thyristor converter.

thyristor converter, series *See:* series thyristor converter.

thyristor converter, simple *See:* simple thyristor converter.

thyristor converter, single-way *See:* single-way thyristor converter.

thyristor converter transformer A transformer that operates at the fundamental frequency of the ac system and is designed to have one or more output windings conductively connected to the thyristor converter elements. (IA/IPC) 444-1973w

thyristor converter unit, double *See:* double thyristor converter unit.

thyristor converter unit, single *See:* single thyristor converter unit.

thyristor fuses Fuses of special characteristics connected in series with one or more thyristors to protect the thyristor or other circuit components, or both. (IA/IPC) 444-1973w

thyristor-level A single thyristor, or thyristors if the valve has parallel connected thyristors, and associated components for control, voltage grading, protection, and monitoring that constitute a single voltage level within the valve. (SUB/PE) 857-1996

thyristor, reverse-blocking triode *See:* reverse-blocking triode thyristor.

thyristor stack A single structure of one or more thyristors with its (their) associated mounting(s), cooling attachments, if any, connections whether electrical or mechanical, and auxiliary components, if any. A thyristor stack may consist of thyristors and semiconductor rectifier diodes in combination and in this case it may be referred to as a non-uniform thyristor stack. Trigger equipments are not included in this definition. (IA/IPC) 428-1981w

thyristor-switched capacitor (TSC) (1) A series connection thyristor switch, typically connected between a capacitor bank and a current limiting reactor, that forms one leg of the connected circuit. The thyristor switch consists of antiparallel thyristors that are blocked or fired for full conduction (on/off control). (SUB/PE) 1303-1994

(2) A shunt-connected thyristor-switched capacitor whose effective reactance is varied in a stepwise manner by full- or zero-conduction operation of the thyristor valve. (PE/SUB) 1031-2000

(3) (power systems relaying) A capacitor switched on and off by thyristor control action. (PE) C37.99-2000

thyristor-switched reactor (TSR) (1) A series connection thyristor switch, typically connected between two halves of a reactor, that forms one leg of the connected circuit. The thyristor switch consists of antiparallel thyristors that are blocked or fired for full conduction (on/off control). (SUB/PE) 1303-1994

(2) A shunt-connected thyristor-switched inductor whose effective reactance is varied in a stepwise manner by full- or zero-conduction operation of the thyristor valve. (PE/SUB) 1031-2000

thyristor trigger circuit A circuit for the conversion of a control signal to suitable trigger signals for the thyristors in a thyristor ac power controller including phase shifting circuits, pulse generating circuits, and power supply circuits. (IA/IPC) 428-1981w

TIA *See:* Telecommunications Industries Association.

tick A time interval that is equal to the transmission of one RamLink data byte. (C/MM) 1596.4-1996

ticker A form of receiving-only printer used in the dissemination of information such as stock quotations and news. *See also:* telegraphy. (COM) [49]

tick-pair A time interval that is equal to the transmission time of two RamLink data bytes. (C/MM) 1596.4-1996

tie (rotating machinery) A binding of the end turns used to hold a winding in place or to hold leads to windings for purpose of anchoring. *See also:* stator; rotor. (PE) [9]

tie feeder A feeder that connects together two or more independent sources of power and has no tapped load between the terminals. *Note:* If a feeder has any tapped load between the two sources, it is designated as a multiple feeder. (SWG/PE) C37.100-1992

tie line (electric power system) A transmission line connecting two power systems. (PE/PSE) 94-1991w

tie-line bias control A mode of load-frequency control in which the area control error is a function of the net interchange error and frequency-related biases. (PE/PSE) 858-1993w, 94-1991nw

tie point (electric power system) The location of the switching facilities of a tie line. (PE/PSE) 94-1991w

tier (rotating machinery) A concentric winding is said to have one, two or more tiers according to whether the peripheral extremities of the end windings of groups of coils at each end of the machine form one, two or more solids of revolution around the axis of the machine. (PE) [9]

tier chart *See:* call graph.

tie trunk (data transmission) A telephone line or channel directly connecting two private branch exchanges. (COM/PE) 312-1977w, 599-1985w

tie wire A short piece of wire used to bind an overhead conductor to an insulator or other support. *See also:* conductor; tower. (T&D/PE) [10]

TIF *See:* telephone influence factor.

tight (1) (packaging machinery) Used as a suffix, indicating that apparatus is so constructed that the enclosing case will exclude the specified material. (IA/PKG) 333-1980w

(2) (power and distribution transformers) (used as a suffix) Apparatus is designed as watertight, dusttight, etc, when so constructed that the enclosing case will exclude the specified material under specified conditions. (PE/TR) C57.12.80-1978r

(3) (used as a suffix) So constructed that the specific material is excluded under specified conditions. (SWG/PE) C37.100-1992, C37.40-1993

tight coupling *See:* close coupling.

tightly coupled A condition that exists when simulation entities are involved in very close interaction such that every action of an entity must be immediately accounted for by the other entities. Several tanks in close formation involving rapid, complicated maneuvers over the terrain is an example of a tightly coupled situation. (DIS/C) 1278.2-1995

tile The pixmap used repetitively to pattern an area on the screen. (C) 1295-1993w

tilde (1) The character "~". (C/PA) 9945-2-1993

(2) Negation. (C/BA) 14536-1995

tilt (1) (navigation aids) (directional antenna) The angle that the antenna axis forms with the horizontal. (AES/GCS) 172-1983w

(2) (pulse transformers) (A_D) (droop) The difference between A_M and A_T. It is expressed in amplitude units or in percentage of A_M. *See also:* input pulse shape. (PEL/ET) 390-1987r

(3) (pulse terminology) A distortion of a pulse top or pulse base wherein the overall slope over the extent of the pulse top or the pulse base is essentially constant and other than zero. Tilt may be of either polarity. *See also:* preshoot. (IM/WM&A) 194-1977w

(4) (broadband local area networks) The relative level of multiplexed carriers with respect to a designated reference carrier. The gross difference in level between signals at the upper and lower frequency of the bandwidth of interest. *See also:* cable tilt. (LM/C) 802.7-1989r

tilt angle (1) (navigation aids) The vertical angle between the axis of measurement and a reference axis; the reference is normally horizontal. (AES/GCS) 172-1983w

(2) (of a polarization ellipse) When the plane of polarization is viewed from a specified side, the angle measured clockwise from a reference line to the major axis of the ellipse. *Notes:* 1. For a plane wave, the plane of polarization shall be viewed looking in the direction of propagation. 2. The tilt angle is only defined up to a multiple of π radians and is usually taken in the range $(-\pi/2, +\pi/2)$ or $(0, \pi)$. (AP/ANT) 145-1993

(3) (of polarization) Angle of major axis of the polarization ellipse relative to horizontal. (AP/PROP) 211-1997

tilted bushing A bushing intended to be mounted at an angle of 20° to 70° from the vertical. (PE/TR) C57.19.03-1996

tilt error *See:* ionospheric tilt error.

tilting-insulator switch One in which the opening and closing travel of the blade is accomplished by a tilting movement of one or more of the insulators supporting the conducting parts of the switch. (SWG/PE) C37.100-1992

tilting-pad bearing (rotating machinery) (kingsbury bearing) A pad-type bearing in which the pads are capable of moving in such a manner as to improve the flow of lubricating fluid between the bearing and the shaft journal or collar (runner). *See also:* bearing. (PE) [9]

timbering machine An electrically driven machine to raise and hold timbers in place while supporting posts are being set after being cut to length by the machine's power-driven saw. (EEC/PE) [119]

timbre The attribute of auditory sensation in terms of which a listener can judge that two sounds similarly presented and having the same loudness and pitch are dissimilar. *Note:* Timbre depends primarily upon the spectrum of the stimulus, but it also depends upon the waveform, the sound pressure, the frequency location of the spectrum, and the temporal characteristics of the stimulus. (SP) [32]

time (1) Any duration of observations of the considered items either in actual operation or in storage, readiness, etc., but excluding down time due to a failure. *Note:* In definitions where time is used, this parameter may be replaced by distance, cycles, or other measures of life as may be appropriate. This refers to terms such as acceleration factor, wear-out failure, failure rate, mean life, mean time between failures, mean time to failure, reliability, and useful life. *See also:* reliability. (R) [29]

(2) (International System of Units (SI)) The SI unit of time is the second. This unit is preferred and should be used if practical, particularly when technical calculations are involved. In cases where time relates to life customs or calendar cycles, the minute, hour, day, and other calendar units may be necessary. For example, vehicle velocity will normally be expressed in kilometers per hour. *See also:* units and letter symbols. (QUL) 268-1982s

(3) (A) The measured or measurable period during which an action, process, or condition exists or continues. **(B)** The instant at which an event occurs. (C) 610.10-1994

(4) (electronic computation) *See also:* reference time; access time; switching time; word time; real time. (QUL) 268-1982s

time above 90 percent (switching impulse testing) The time interval T_d during which the switching impulse exceeds 90% of its crest value. 332-1972w

time-and-charge-request call (telephone switching systems) A call for which a request is made to be informed of its duration and cost upon its completion. (COM) 312-1977w

time assigned speech interpolation (TASI) The sending of two or more voice calls on the same telephone circuit simultaneously by interleaving the active signals of one conversation with the periods of silence of other conversations. (C) 610.7-1995

time-averaged-clutter coherent airborne radar (TACCAR) An airborne moving-target indication (MTI) radar that uses a technique to compensate for the changing Doppler frequency from fixed clutter due to the motion of the aircraft (or other vehicle) carrying the radar or as the moving radar antenna scans in angle. The clutter is sampled over some range interval, the average Doppler frequency of the clutter in the range interval is used to set the frequency of a voltage-controlled oscillator (VCO) in a phase-lock loop to cause the mean Doppler frequency of the clutter echo to coincide with a null of the MTI Doppler frequency response over the range of observation. *Note:* Also known as clutter-locked MTI. (AES) 686-1997

time-averaged Poynting vector ($\vec{S}$) Of a periodic electromagnetic wave, the time average of the instantaneous Poynting vector over the wave period. For time harmonic waves, it is equal to:

$(1/2)\mathrm{Re}(\vec{E} \times \vec{H}^*)$

where
Re indicates the real part
$\vec{E}$ = the electric field vector in phasor notation
$\vec{H}$ = the magnetic field vector in phasor notation
* indicates the complex conjugate

(AP/PROP) 211-1997

time-bandwidth product The product of the device time delay and the chirp bandwidth. (UFFC) 1037-1992w

time base (1) (oscilloscopes) The sweep generator in an oscilloscope. *See also:* oscillograph. (IM/HFIM) [40]

(2) A stable, periodic signal, usually a square wave, used to synchronize and to provide power to circuits. (C) 610.10-1994w

time base primary The principal means of establishing timing relationships. (ELM) C12.15-1990

time base—primary (watthour meters) A timing system established from the power line-source. (ELM) C12.13-1985s

time base—secondary (watthour meters) A timing system established from an alternate source when the line source is not available or not used. (ELM) C12.13-1985s

time bias (electric power system) An offset in the scheduled net interchange power of a control area that varies in proportion to the time deviation. This offset is in a direction to assist in restoring the time deviation to zero. *See also:* power system. (PE/PSE) 94-1970w, [54]

time bias setting (electric power system) A coefficient that, when multiplied by time error, yields time error bias. (PE/PSE) [54], 94-1991w

time, build-up *See:* build-up time.

time characteristic *See:* demand meter—time characteristic.

time coherence *See:* coherent.

time compression multiplexing (TCM) A multiplexing technique that provides full-duplex digital data transmission over a single twisted pair. *Synonym:* ping-pong transmission technique. (C) 610.7-1995

time-consistent busy hour (TCBH) The hour having the highest average traffic for the three highest traffic months. A "busy hour" determination study uses only about two weeks worth

of hour-by-hour data collected just in advance of the expected high-traffic months. *Synonym:* busy hour. *See also:* traffic engineering limits; time-consistent traffic measures. (COM/TA) 973-1990w

time-consistent traffic measures Three time frames in common use for PTS today are termed as follows: average busy season, 10 high day, and high day, each with busy hour appended (but sometimes omitted as understood). These will be defined in terms of load volumes and, implicitly, there is always a corresponding service criterion. In the definitions of average busy season busy-hour (ABSBH) load, ten high day busy-hour (THDBH) load, and high day busy-hour (HDBH) load, "hour" refers to 60 contiguous minutes starting at a clock hour or half-hour, and "month" refers to a service observing month, which is not generally a calendar month. Traffic intensity or event data, typically expressed for local switching systems as CCS or calls or call attempts per hour, is collected and processed to determine the candidate busy hours for each of the switching system components to be engineered. The hour having the highest average traffic for the three highest traffic months is defined as the "busy hour" or "time consistent busy hour." However, a "busy hour" determination study uses only about two weeks worth of hour-by-hour data collected just in advance of the expected high-traffic months. *Synonym:* TC traffic measures. *See also:* average busy season busy-hour load; high day busy-hour load; ten high day busy-hour load. (COM/TA) 973-1990w

time constant (1) (electrothermic unit) The time required for the dc electrothermic output voltage to reach $1 - (1/e)$, or 63% of its final value after a fixed amount of power is applied to the electrothermic unit. (IM) 544-1975w

(2) (excitation systems) The value T in an exponential response term $A^{-t/T}$ or in one of the transform factors $1 + sT$, $1 + j\omega T$, $1/(1 + sT)$, $1/(1 + j\omega T)$. *Note:* For the output of a first-order (lag or lead) system forced by a step or an impulse, T is the time required to complete 63.2% of the total rise or decay; at any instant during the process, T is the quotient of the instantaneous rate of change divided into the change still to be completed. In higher order systems, there is a time constant for each of the first-order components of the process. In a Bode diagram, breakpoints occur at $\omega = 1/T$. (PE/EDPG) 421A-1978s

(3) The time required for a field probe output to reach a stable, repeatable reading. The measurement includes test set up, metering unit, cables, etc., thus is a worst case. The measurements assume an exponential response of the field probe. The time constant is used specifically for burst peak field strength measurements. (EMC) 1309-1996

time constant, derivative action (automatic control) A parameter whose value is equal to $1/2\pi f_a$ where f_a is the frequency (cycles.unit time) on a Bode diagram of the lowest frequency gain corner resulting from derivative control action. (PE/EDPG) [3]

time constant of an exponential function $1/b$, if t represents time and b is real. (Std100) 270-1966w

time constant of fall (data transmission) (pulse) The time required for the pulse to fall from 70.7% to 26.0% of its maximum amplitude excluding spike. (PE) 599-1985w

time constant of integrator (for each input) The ratio of the input to the corresponding time rate of change of the output. *See also:* electronic analog computer. (C) 165-1977w

time constant of rise (data transmission) (pulse) The time required for the pulse to rise from 26.0% to 70.7% and of its maximum amplitude excluding spike. (PE) 599-1985w

time constant of the damping device (hydraulic turbines) A time constant which describes the decay of the output signal from the damping device. (PE/EDPG) 125-1977s

time correction (A) (manual) A change made to the system frequency in order to correct for system time error. **(B) (automatic)** A component of the area control error formula that adds a bias to correct interconnection time error. (PE/PSE) 858-1993

time critical Applications where the communication delay is bound to a fixed upper limit, independent of the load conditions. (VT) 1473-1999

time-current characteristic *See:* fuse time-current characteristic.

time-current tests *See:* fuse time-current tests.

timed acceleration A control function that accelerates the drive by automatically controlling the speed change as a function of time. *See also:* electric drive. (IA/ICTL/APP/IAC) [69], [60]

timed deceleration A control function that decelerates the drive by automatically controlling the speed change as a function time. *See also:* feedback control system. (IA/ICTL/APP/IAC) [69], [60]

time delay (1) (analog computer) The time interval between the manifestation of a signal at one point and the manifestation or detection of the same signal at another point. *Notes:* 1. Generally, the term time delay is used to describe a process whereby an output signal has the same form as an input signal causing it, but is delayed in time; that is, the amplification of all frequency components of the output are related by a single constant to those of corresponding input frequency components but each output component lags behind the corresponding input component by a phase angle proportional to the frequency of the component. 2. Transport delay is synonymous with time delay but usually is reserved for applications that involve the flow of material. (C) 165-1977w

(2) (protection and coordination of industrial and commercial power systems) Meaningless unless defined. This term is now used by National Electrical Manufacturers Association (NEMA), American National Standards Institute (ANSI), and Underwriters Laboratories (UL) to mean, in Classes H, K, J, and R cartridge fuses, a minimum opening time of 10 s on an overload current five times the ampere rating of the fuse. Such a delay is particularly useful in allowing the fuse to pass the momentary starting current of a motor, yet not hindering the opening of the fuse should the overload persist. In Class G, CC, and plug fuses, the phrase "time delay" is required by UL to be a minimum opening time of 12 s on an overload of twice the fuse's ampere rating. The time-delay characteristic does not affect the fuse's short-circuit current clearing ability. (IA/PSP) 242-1986r

(3) The time interval between the manifestation of a signal at one point and the manifestation or detection of the same signal at another point. *Synonym:* transport delay. *See also:* propagation delay. (C) 610.7-1995, 610.10-1994w

(4) A time interval purposely introduced in the performance of a function. *See also:* feedback control system. (C/IA/IAC) 610.10-1994w, [60]

time delay register *See:* delay-line storage.

time-delay relay *See:* delay relay; relay.

time delay spread ($\sigma\tau$) A measure of the differential propagation times due to multipath propagation. Specifically, time delay spread is the rms width of the signal received when a very narrow pulse has been transmitted. *Note:* The time delay spread is inversely proportional to the frequency selective bandwidth (f_τ):

$$\sigma_\tau = (2\pi f_\tau)^{-1}$$

(AP/PROP) 211-1997

time-delay starting or closing relay (power system device function numbers) A device that functions to give a desired amount of time delay before or after any point of operation in a switching sequence or protective relay system, except as specifically provided by incomplete sequence relay, time-delay stopping or opening relay, and alternating current (ac) reclosing relay, device functions 48, 62, and 79. (PE/SUB) C37.2-1979s

time-delay stopping or opening relay (power system device function numbers) A time-delay relay that serves in conjunction with the device that initiates the shutdown, stopping, or opening operating in an automatic sequence or protective relay system. (SUB/PE) C37.2-1979s

time-dependent event An event that occurs at a predetermined point in time or after a predetermined period of time has elapsed. *See also:* conditional event. (C) 610.3-1989w

time derived channel A channel that is obtained from multiplexing a channel by time division. (C) 610.7-1995

time deviation ($x(t)$) (1) (power system) The integrated or accumulated difference in cycles between system frequency and rated frequency. This is usually expressed in seconds by dividing the deviation in cycles by the rated frequency. (PE/PSE) 94-1970w

(2) Instantaneous time departure from a nominal time. (SCC27) 1139-1999

time dial (1) The control that determines the value of the integral at which the trip output is actuated and hence controls the time scale of the time-current characteristic produced by the relay. In the induction type relay, the time dial sets the distance the disk must travel which is the integral of the velocity with respect to time. (PE/PSR) C37.112-1996

(2) (time lever) (of a relay) An adjustable, graduated element of a relay by which, under fixed input conditions, the prescribed relay operating time can be varied. (SWG/PE) C37.100-1992

time difference (navigation aids) (loran) The difference in the time of reception of the two signals of a loran rate. (AES/GCS) 172-1983w

time-difference-of-arrival *See:* time-of-arrival location.

time discriminator (electronic navigation) A circuit in which the sense and magnitude of the output is a function of the time difference of the occurrence, and relative time sequence, of two pulses. *See also:* navigation. (AES/RS) 686-1982s, [42]

time distortion (broadband local area networks) Time distortion (group delay) is the difference in transmission time between frequencies of a service. The broadband service usually resides in a single channel, but the delay distortion may be specified over a bandwidth that is different than the bandwidth of the channel. Video specifies the time delay distortion to be less than a channel bandwidth. Video channels (6 MHz) normally specify the group delay between the video and color carriers (3.58 MHz). The delay distortion in video services may influence color rendition. In data services, group delay may influence the bit error rate. The specification for group delay must always be applied across a referenced bandwidth to be valid. This distortion is most prominent at the frequency band-edges of a diplex filter, but may also be observed in band-pass, band-stop, and equalizing filters. (LM/C) 802.7-1989r

time distribution analyzer (nuclear techniques) An instrument capable of indicating the number or rate of occurrence of time intervals falling within one or more specified time interval ranges. The time interval is delineated by the separation between pulses of a pulse pair. *See also:* ionizing radiation. (NPS) 175-1960w

time-division analog switching (telephone switching systems) Analog switching with common time-divided paths for simultaneous calls. (COM) 312-1977w

time-division digital switching (telephone switching systems) Digital switching with common time-divided paths for simultaneous calls. (COM) 312-1977w

time division multiple access (TDMA) (1) (communication satellite) A technique whereby earth stations communicate with each other on the basis of non-overlapping time sequenced bursts of transmissions through a common satellite repeater. (COM) [19]

(2) A multiplexing technique in which a channel is divided among different users allocating to each of them a time slot in a repeating cycle. (C) 610.7-1995

time-division multiplex (data transmission) The process or device in which each modulating wave modulates a separate pulse subcarrier, the pulse subcarriers being spaced in time so that no two pulses occupy the same time interval. *Note:* Time division permits the transmission of two or more signals over a common path by using different time intervals for the transmission of the intelligence of each message signal. (AP/PE/ANT) 145-1983s, 599-1985w

time-division multiplexing (TDM) (1) Sharing a communication channel among several users by allowing each to use the channel for a given period of time in a defined, repeated sequence. (LM/C) 802.7-1989r

(2) A method by which two or more channels of information are transmitted over the same link by allocating a different time interval for the transmission of each channel. *See also:* synchronous time division multiplexing; wave-division multiplexing. (C) 610.7-1995

time division multiplexing bus switching A method of time division switching in which time slots are used to transfer data over a shared bus between transmitter and receiver. (C) 610.7-1995

time division switching (1) The switching of inputs to outputs using time-division multiplexing techniques. *See also:* time division multiplexing bus switching. (C) 610.7-1995

(2) A method of switching that provides a common path with separate time intervals assigned to each of the simultaneous calls. (COM) 312-1977w

time domain A function in which the signals are represented as a function of time. (EMC) 1128-1998

time domain calibration A result which is the impulse response function of the sensor or probe in the time domain. (EMC) 1309-1996

time domain reflectometer (TDR) (1) Test equipment that verifies proper functioning of the physical components of the network with a sequence of time-delayed electrical pulses. (C) 610.7-1995

(2) An instrument designed to indicate and to measure reflection characteristics of a transmission system connected to the instrument by monitoring the step-formed signals entering the test object and the superimposed reflected transient signals on an oscilloscope that is equipped with a suitable time-based sweep. The measuring system basically consists of a fast-rise function generator, a tee coupler, and an oscilloscope connected to the probing branch of the coupler. *See also:* instrument. (EMC/IM/HFIM) 1128-1998, [40]

timed release (telephone switching systems) Release accomplished after a specified delay. (COM) 312-1977w

time, electrification *See:* electrification time.

time error Power system time minus a reference time. This quantity is derived by integrating frequency error over time and dividing it by rated frequency. (PE/PSE) 858-1993w, 94-1991w

time error bias An offset of the scheduled net interchange of a control area that varies in proportion to time error and that assists in restoring time error to zero. (PE/PSE) 858-1993w, 94-1991w

time gain control *See:* differential gain-control circuit.

time gate A transducer that gives output only during chosen time intervals. (AP/ANT) 145-1983s

time history (1) (gas-insulated substations) The trace of acceleration, velocity, or displacement as a function of time that the ground, the floor of a building, or a point of support experiences due to an earthquake. (SWG/SUB/PE) C37.122-1983s, C37.100-1992

(2) A record of motion, usually in terms of acceleration, as a function of time. (PE/SUB) 693-1997

time-insensitivity A type of year-insensitivity in which year, date, day indicator, and time-of-day are not maintained or represented. (C/PA) 2000.1-1999

time instability ($S_x(f)$) One-sided spectral density of the time deviation. (SCC27) 1139-1999

time-interval error (TIE) The variation of the time difference between a real clock and an ideal uniform time scale following a time period t after perfect synchronization. (SCC27) 1139-1999

time-interval selector (nuclear techniques) A circuit that produces a specified output pulse when and only when the time

interval between two pulses lies between specified limits. *See also:* scintillation counter. (NPS) 175-1960w

time-interval simulation *See:* time-slice simulation.

time-invariant filtering (germanium gamma-ray detectors) Pulse shaping in which the filter response does not change with respect to time. [CR-(RC)n shaping is an example of time-invariant filtering.] (NPS) 325-1986s

time lag *See:* lag.

time lag of impulse flashover (surge arresters) The time between the instant when the voltage of the impulse wave first exceeds the power-frequency flashover crest voltage and the instant when the impulse flashover causes the abrupt drop in the testing wave. (T&D/PE) [10], [8]

time-load withstand strength (of an insulator) The mechanical load that, under specified conditions, can be continuously applied without mechanical or electrical failure. *See also:* insulator. (EEC/IEPL) [89]

time locking A method of locking, either mechanical or electric, that, after a signal has been caused to display an aspect to proceed, prevents, until after the expiration of a predetermined time interval after such signal has been caused to display its most restrictive aspect, the operation of any interlocked or electrically locked switch, movable-point frog, or derail in the route governed by that signal, and that prevents an aspect to proceed from being displayed for any conflicting route. *See also:* interlocking. (EEC/PE) [119]

time meridian (navigation aids) Any meridian used as a reference for reckoning time, particularly a zone. (AES/GCS) 172-1983w

time-multiplexed bus A bus which uses time-division multiplexing techniques to share its data paths between a number of devices. (C) 610.10-1994w

time multiplexed switching (TMS) A form of space-division switching in which each input line is a time division multiplexing strea. At the receiving end, the different signals are divided out and merged back into single streams. *See also:* message switching; circuit switching; space-division switching. (C) 610.7-1995

time-of-arrival location (TOA) A process whereby the position of a radiating transmitter can be located by means of the relative time delay between its signals as received in multiple receivers of known relative position. *Synonym:* time-difference-of-arrival. (AES) 686-1997

time-of-day clock A clock that indicates the actual time of the day. *Synonym:* real-time clock. *See also:* wall clock. (C) 610.10-1994w

time of death The term used to describe a field within a send packet that is used to determine when a send packet is stale and should be discarded. (C/MM) 1596-1992

time of decay of video pulses The duration of the decaying portion of a pulse measured between specified levels. *See also:* pulse timing of video pulses. (BT) 207-1950w

time-of-flight The time delay between a signal leaving a driving pin or primary input port and reaching a receiving pin or primary output. Time-of-flight is generally dominated by the time taken to charge the distributed capacitance of the interconnect and the capacitance of the driven pins through the distributed impedance of the interconnect. The internal impedance of the driving port affects the load-dependent delay but *not* (directly) the time-of-flight. (C/DA) 1481-1999

time of response *See:* response time.

time of rise of video pulses (television) (decay) The duration of the rising (decaying) portion of a pulse measured between specified levels. *See also:* pulse timing of video pulses. (BT) 207-1950w

time-of-use metering Metering equipment that separately records metered or measured quantities according to a time schedule. (AMR/SCC31) 1377-1997

time-of-use period (watthour meters) A selected period of time during which a specified rate will apply to the energy usage or demand. (ELM) C12.13-1985s

time-of-use register (watthour meters) That portion of a watthour meter that, for selected periods of time, accumulates and may display amounts of electric energy, demand, or other quantities measured or calculated. (ELM) C12.13-1985s

time origin line (pulse terminology) A line of constant and specified time which, unless otherwise specified, has a time equal to zero and passes through the first datum time, t_0, of a waveform epoch. *See also:* waveform epoch. (IM/WM&A) 194-1977w

timeout (1) A mechanism for terminating requested activity that, at least from the requester's perspective, does not complete within the time specified by the timeout's "value." (IM/ST) 1451.1-1999

(2) A method of error checking whereby an expected event is tested to occur within a specified period of time. (C) 1003.5-1999

time-out (1) (A) A condition that occurs when a predetermined amount of time elapses without the occurrence of an expected event. For example, the condition that causes termination of an on-line process if no user input is received within a specified period of time. **(B)** To experience the condition in definition (A). (C/Std100) 610.12-1990, 610.10-1994

(2) A time-out occurs when a protective timer completes its assigned time without the expected event occurring. Time-outs prevent the system from waiting indefinitely in case of error or failure. (NID) 960-1993

time-out of tone If the calling party reaches a call progress tone or announcement and does not abandon the call within a specified length of time, called the timeout of ringing interval, the switch may release the call. (COM/TA) 973-1990w

time-overcurrent relay An overcurrent relay in which the input current and operating time are inversely related throughout a substantial portion of the performance range. (SWG/PE) C37.100-1992

Time Parameter An instance of the class `IEEE1451_Time-Parameter` or of a subclass thereof. (IM/ST) 1451.1-1999

time parameters and references *See:* time reference lines; pulse start time; transition duration; pulse duration.

time pattern (television) A picture-tube presentation of horizontal and vertical lines or dot rows generated by two stable frequency sources operating at multiples of the line and field frequencies. (BT) 202-1954w

time per point (multiple-point recorders) The time interval between successive points on printed records. *Note:* For some instruments this interval is variable and depends on the magnitude of change in measured signal. For such instruments, time per point is specified as the minimum and maximum time intervals. (EEC/EMI) [112]

time proportioning (electrical heating applications to melting furnaces and forehearths in the glass industry) An operation in which variable length bursts of full cycles of output voltage are alternated with variable length off periods to produce modulation of output. (IA) 668-1987w

timer (1) A register or storage location whose value is changed at regular intervals in such a manner as to measure time. *Synonyms:* clock register; time register. *See also:* watchdog timer; interval timer. (C) 610.10-1994w

(2) An object that can notify a process when the time as measured by a particular clock has reached or passed a specified value, or when a specified amount of time, as measured by a particular clock, has passed. (C/PA) 9945-1-1996

(3) An object that can notify a process when the time as measured by a particular clock has reached or passed a specified value or when a specified amount of time as measured by a particular clock has passed. Timers are per process; that is, they cannot be shared between processes. (C) 1003.5-1999

time rate (storage cell) The current in amperes at which a storage battery will be discharged in a specified time, under specified conditions of temperature and final voltage. *See also:* battery. (PE/EEC) [119]

time rating (of a VAM) The maximum amount of time the motor can be operated at rated running load without exceed-

ing the allowable temperature rise for the insulation class being used. (PE/NP) 1290-1996

time, real *See:* real time.

timer EEPROM Typically a byte-alterable electrically erasable programmable read-only memory (EEPROM) with on-chip latches for all address, data, and control lines to internally control the duration of a write cycle. (ED) 1005-1998

time referenced point (pulse terminology) A point at the intersection of a time reference line and a waveform. (IM/WM&A) 194-1977w

time reference line (pulse terminology) A line parallel to the time origin line at a specified instant. (IM/WM&A) 194-1977w

time reference lines (A) (pulse terminology) (pulse start [stop]) line. The time reference line at pulse start (stop) time. *See also:* waveform epoch. **(B) (pulse terminology)** (top center line) The time reference line at the average of pulse start time and pulse stop time. *See also:* waveform epoch. (IM/WM&A) 194-1977

time register *See:* timer.

time-related adjectives (A) (pulse terminology) (periodic [aperiodic]) Of or pertaining to a series of specified waveforms or features which repeat or recur regularly (irregularly in time. **(B) (pulse terminology)** (coherent [incoherent]) Of or pertaining to two or more repetitive waveforms whose constituent features have (lack) time correlation. **(C) (pulse terminology)** (synchronous [asynchronous]) Of or pertaining to two or more repetitive waveforms whose sequential constituent features have (lack) time correlation. (IM/WM&A) 194-1977

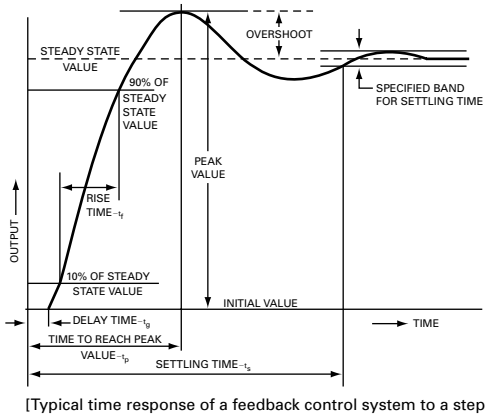
time-related definitions *See:* cycle; frequency; duration; interval; period.

time release A device used to prevent the operation of an operative unit until after the expiration of a predetermined time interval after the device has been actuated. (EEC/PE) [119]

time resolution The minimum time interval that a clock can measure or whose passage a timer can detect. (PA/C/C/PA) 1003.5b-1995, 9945-1-1996

time response (1) (control system feedback) An output, expressed as a function of time, resulting from the application of a specified input under specified operating conditions. *Note:* It consists of a transient component that depends on the initial conditions of the system, and a steady-state component that depends on the time pattern of the input. *Synonym:* dynamic response. (IA/IAC) [60]

(2) (excitation systems) An output expressed as a function of time, resulting from the application of a specified input under specified operating conditions. See the corresponding figure for a typical time response of a system to step increase of input and for identification of the principle characteristics of interest.



[Typical time response of a feedback control system to a step change in input.]

time response (PE/EDPG) 421A-1978s

(3) (synchronous-machine regulator) The output of the synchronous-machine regulator (that is, voltage, current, impedance, or position) expressed as a function of time following the application of prescribed inputs under specfied conditions. (PE/EDPG) 421A-1978s

time, response *See:* response time.

time rise tone (measuring the performance of tone address signaling systems) The time interval between the end of the tone off condition and the beginning of the tone present condition at the beginning of the tone under consideration. (COM/TA) 752-1986w

timer overrun (1) A condition that occurs each time a timer, for which there is already an expiration signal queued to the process, expires. (C/PA) 9945-1-1996

(2) A condition that occurs each time a timer for which there is already an expiration signal queued to the process expires. (C) 1003.5-1999

time scale *See:* time.

time schedule controller (process control) A controller in which the command (or reference input signal) automatically adheres to a pre-determined time schedule. *Note:* The time schedule mechanism may be programmed to switch motors or other devices. (PE/EDPG) [3]

time sharing (software) A mode of operation that permits two or more users to execute computer programs concurrently on the same computer system by interleaving the execution of their program. *Note:* Time sharing may be implemented by time slicing, priority-based interrupts, or other scheduling methods. (C) 610.12-1990, 610.10-1994w

time signal (navigation aids) An accurate signal marking a specified time or time interval. (AES/GCS) 172-1983w

time skew (analog-to-digital converter) In an analog to digital conversion process, the time difference between the conversion of one analog channel and any other analog channel, such that the converted (digital) representations of the analog signals do not correspond to values of the analog variables that existed at the same instant of time. Time skew is eliminated, where necessary, by the use of a multiplexor with a sample/hold feature, allowing all input channels to be simultaneously sampled and stored for later conversion. *See also:* switching time; analog-to-digital converter. (C) 165-1977w, 166-1977w

(2) (A) In a conversion from analog to digital, the time difference between the conversion of one analog channel and any other analog channel, such that the converted (digital) representations of the analog signals do not correspond to values of the analog variables that existed at the same instant of time. **(B)** The time interval between two events which are intended to be simultaneous. (C) 610.10-1994

time-slice simulation (A) A discrete simulation that is terminated after a specific amount of time has elapsed; for example, a model depicting the year-by-year forces affecting a volcanic eruption over a period of 100 000 years. *Synonym:* time-interval simulation. *See also:* critical event simulation. **(B)** A discrete simulation of continuous events in which time advances by intervals chosen independent of the simulated events; for example, a model of a time multiplexed communication system with multiple channels transmitting signals over a single transmission line in very rapid succession. (C) 610.3-1989

time slicing A mode of operation in which two or more processes are each assigned a small, fixed amount of continuous processing time on the same processor, and the processes execute in a round-robin manner, each for its allotted time, until all are completed. (C) 610.12-1990

time slot (1) In time division multiplexing, when time is divided into slots to route data from input to output. (C) 610.7-1995

(2) Any cyclic time interval that can be recognized and defined uniquely. (COM/TA) 1007-1991r

time sorter *See:* time distribution analyzer.

time-to-amplitude converter (scintillation counting) An instrument producing an output pulse whose amplitude is proportional to the time difference between start and stop pulses. (NPS) 398-1972r

time to chopping (switching impulse testing) The time interval T_c between actual zero and the instant when the chopping occurs. 332-1972w

time to crest The time interval T_{cr} between actual zero and the instant when the voltage has reached its crest value. 332-1972w

time-to-crest value (T_r) The time that an impulse rises to crest value. (PE/C) 1313.1-1996

time to failure The amount of time remaining until the event horizon. (C/PA) 2000.1-1999

time to first voltage zero on the tail of the wave The time interval from the start of the transient to the time when the first voltage zero occurs on the tail of the wave. (PE/TR) C57.12.90-1999

time to half value (1) The time interval T_h between actual zero and the instant on the tail when the impulse has decreased to half its crest value. (Std100) 332-1972w

(2) The time that an impulse drops to 0.5 crest value. (PE/C) 1313.1-1996

time to half-value on the wavetail *See:* virtual time to half-value.

time to impulse flashover The time between the initial point of the voltage impulse causing flashover and the point at which the abrupt drop in the voltage impulse takes place. (T&D/PE) [10]

time to impulse sparkover (1) The time between virtual zero of the voltage impulse that causes sparkover and the point on the voltage wave at which sparkover occurs. The voltage across the terminals of the surge-protective-device during the flow of discharge current and contributes to the limitation of follow current at normal power-frequency voltage. (SPD/PE) C62.62-2000

(2) The time between virtual zero of the voltage impulse causing sparkover and the point on the voltage wave at which sparkover occurs. (SPD/PE) C62.11-1999

time to repair (TTR) Time required to accomplish corrective maintenance or repair successfully. It includes all of the time required for diagnosis, set-up, replacement, reassembly, and test, but does not include logistics scheduling and approval. (PE/NP) 933-1999

time-to-saturation The time during which the secondary current is a faithful replica of the primary current. *Note:* The core does not saturate suddenly. Beyond the saturation flux level, the exciting current increases more rapidly than the secondary current, causing distortion in the secondary waveform. (PE/PSR) C37.110-1996

time, turnaround *See:* turnaround time.

time-undervoltage protection A form of undervoltage protection that disconnects the protected equipment upon a deficiency of voltage after a predetermined time interval. (SWG/PE) C37.100-1992

time unit (TU) A measurement of time equal to 1024 μs. (C/LM) 8802-11-1999

time update (sequential events recording systems) The correction or resetting of a real time clock to match a time standard. *See also:* real time. (PE/EDPG) [5], [1]

time variable A variable whose value represents simulated time or the state of the simulation clock. (C) 610.3-1989w

time-variant filtering Pulse shaping in which the filter response varies with time. (NPS) 325-1996

time zone diversity Load diversity between two or more electric systems that occurs when their peak loads are in different time zones. (PE/PSE) 858-1993w, 346-1973w

timing accuracy The maximum timing error allowable in message accounting records. Different tolerances may be required for recording time of day and for call duration. Time of day would reflect the time zone of the originating station and affects billing rates. Tolerances on call duration are usually chosen to avoid charging a customer for time that a call is not connected. (COM/TA) 973-1990w

timing ambiguity The period of time in a nodal transition during which the state of the node cannot be guaranteed. (SCC20) 1445-1998

timing analyzer (software) A software tool that estimates or measures the execution time of a computer program or portion of a computer program, either by summing the execution times of the instructions along specified paths or by inserting probes at specified points in the program and measuring the execution time between probes. (C) 610.12-1990

timing annotation The annotation of a design in one tool with timing data computed by another tool. If timing calculation is performed as an off-line process (separately from the application using the timing data), the process of reading the timing data into the tool is known as timing annotation. A timing annotation file stores the data written by the timing calculator and is later read by an application. *Synonym:* back-annotation. (C/DA) 1481-1999

timing arc A pair of ports, pins, or nodes possess some timing relationship, such as the propagation delay of a signal from one to the other or a timing check between them. Delay arcs may be between two distinct ports or nodes of a cell or over the interconnect from driver pins to receiver pins. (C/DA) 1481-1999

timing calculation The process of calculating values for the delays and timing checks associated with the physical primitives (cells) of an integrated circuit design, or part of an integrated circuit design, and their interconnections. (C/DA) 1481-1999

timing check A timing property of a circuit (frequently a cell) that describes a relationship in time between two input signal events. This relationship needs to be satisfied for the circuit to function correctly. (C/DA) 1481-1999

timing deviation demand meter (metering) The difference between the elapsed time indicated by the timing element and the true elapsed time, expressed as a percentage of the true elapsed time. (ELM) C12.1-1982s

timing discriminator A class of discriminators in which the initiation of the output signal is keyed to the instant when the input signal crosses the discriminator threshold. *See also:* constant-fraction discriminator; discriminator. (NPS) 325-1996

timing generator The function in the automatic test equipment (ATE) that stores and produces timing sets, or its analogous construct in the simulation process. (SCC20) 1445-1998

timing jitter Short-term deviations of the significant instants of a digital signal from their ideal positions in time. 1007-1991r

timing mechanism (1) (demand meter) That mechanism through which the time factor is introduced into the result. The principal function of the timing mechanism of a demand meter is to measure the demand interval, but it has a subsidiary function, in the case of certain types of demand meters, to provide also a record of the time of day at which any demand has occurred. A timing mechanism consists either of a clock or its equivalent, or of a lagging device that delays the indications of the electric mechanism. In thermally lagged meters the time factor is introduced by the thermal time lag of the temperature responsive elements. In the case of curve-drawing meters, the timing element merely provides a continuous record of time on a chart or graph. *See also:* demand meter. (EEC/PE) [119]

(2) (recording instrument) The time-regulating device usually includes the motive power unit necessary to propel the chart at a controlled rate (linear or angular). *See also:* moving element. (EEC/ERI) [111]

timing model The timing behavior of a cell for applications, such as simulation and timing analysis. For black-box timing behavior, it represents the definition of pin-to-pin delays between any pair of pins as well as internal nodes. In addition,

for sequential cells it provides the definition of timing checks and constraints on any pair of pins and/or internal nodes. (C/DA) 1481-1999

timing offset The difference between two physical units' fundamental clock sources; those sources being the timing basis from which signals and sampling are derived and analyzed (usually expressed proportionally in parts per million). Timing offset will cause a uniform percentage change in signal frequencies. (COM/TA) 743-1995

timing phase noise *See:* aperture uncertainty.

timing pulse *See:* clock signal.

timing relay An auxiliary relay or relay unit whose function is to introduce one or more time delays in the completion of an associated function. *Synonym:* relay unit. (SWG/PE) C37.100-1992

timing sequence Sequence of enable, coding, and data pulses to permit writing or reading of information. (ED) 1005-1998

timing set (TSET) An automatic test equipment (ATE) timing-cycle during which stimuli are applied and unit under test (UUT) responses are measured. A timing set includes the specification of the pattern period, UUT input pin groupings that will transition at a specific time within a pattern, and UUT output pin groupings that share the same window. (SCC20) 1445-1998

timing table That portion of central-station equipment at which means are provided for operators' supervision of signal reception. *See also:* protective signaling. (EEC/PE) [119]

timing track *See:* clock track.

tinning (electrotyping) The melting of lead-tin foil or tin plating upon the back of shells. (PE/EEC) [119]

tinsel cord A flexible cord in which the conducting elements are thin metal ribbons wound helically around a thread core. *See also:* transmission line.

TINT A subset of JOVIAL designed for simplified time-sharing programming. (C) 610.13-1993w

TIP *See:* terminal interface processor.

tip (1) (plug) The contacting part at the end of the plug. (EEC/PE) [119]

(2) (electron tube) (pip) A small protuberance on the envelope resulting from the sealing of the envelope after evacuation. (ED) [45], [84]

tip and ring wires (1) (telephone switching systems) A pair of conductors associated with the transmission portions of circuits and apparatus. Tip or ring designation of the individual conductors is arbitrary except when applied to cord-type switchboard wiring in which case the conductors are designated according to their association with tip or ring contacts of the jacks and plugs. (COM) 312-1977w

(2) (communication and control cables) The pair of conductors associated with the transmission portions of telephone cables, circuits, and apparatus. (PE/PSC) 789-1988w

tip switch A button on the end of a light pen or stylus that is depressed as the pen is touched to a data tablet, determining the position of a display element. (C) 610.6-1991w

TIU *See:* telemetry interface unit.

T junction (waveguide) A junction of waveguides in which the longitudinal guide axes form a T. *Note:* The guide that continues through the junction is the main guide: the guide that terminates at a junction is the branch guide. *See also:* waveguide. (AP/ANT) [35]

TLP *See:* transmission level point.

TLU *See:* table lookup.

TLV-STEL *See:* threshold limit value—short term exposure limit.

TLV-TWA *See:* threshold limit value—time weighted average.

T matrix Relates the scattered field to the exciting field. (AP/PROP) 211-1997

TM_{mn}mode (A) (E_{mn}mode) In a rectangular waveguide, the subscripts $_m$ and $_n$ denote the number of half-period variation in the magnetic field parallel to the broad and narrow sides, respectively, of the guide. *Note:* In the United Kingdom, the reverse order is preferred. **(B) (E_{mn}mode)** In a circular waveguide, a mode that has $_m$ diametral planes and $_n$ cylindrical surfaces of nonzero radius (including the wall of the guide) at which the longitudinal component of the electric field is zero. **(C) (E_{mn}mode)** In a resonant cavity consisting of a length of rectangular or circular waveguide, a third subscript is used to indicate the number of half-period variations of the field along the waveguide axis. (MTT) 146-1980

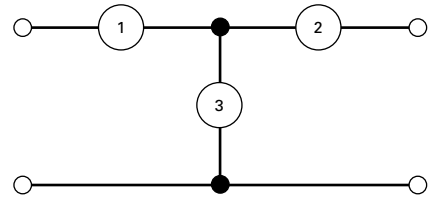
TM mode (1) (E mode) A waveguide mode in which the longitudinal component of the magnetic field is everywhere zero and the longitudinal component of the electric field is not. (MTT) 146-1980w

(2) (fiber optics) *See also:* transverse magnetic mode. 812-1984w

TMS *See:* time multiplexed switching; test mode select input pin.

TNA *See:* transient network analyzer.

T network A network composed of three branches with one end of each branch connected to a common junction point, and with the three remaining ends connected to an input terminal, an output terminal, and a common input and output terminal, respectively. *See also:* network analysis.



One end of each of the branches 1, 2, and 3 is connected to a common point. The other ends of branches 1 and 2 form, respectively, an input and an output terminal, and the other end of branch 3 forms a common input and output terminal.

T network

(BT) 153-1950w, 270-1966w

TOA location *See:* time-of-arrival location.

toe and shoulder (photographic techniques) [of a Hurter and Driffield (H and D) curve] The terms applied to the nonlinear portions of the H and D curve that lie, respectively, below and above the straight portion of this curve. (SP) [32]

to-from indicator (navigation aids) (omnirange receiver) A supplementary device used with an omnibearing selector to resolve the ambiguity of measured omnibearings. (AES/GCS) 172-1983w

toggle (1) Pertaining to any device having two stable states. *See also:* flip-flop. (C) [20], [85]

(2) A switching action performed on an object with two states. (C) 1295-1993w

(3) The action of changing state in a sequential circuit. *See also:* flip-flop. (C) 610.10-1994w

toggle bit An end-of-write indicator. (ED) 1005-1998

token (1) In a local area network, a control mechanism that is passed among stations to indicate which station is currently in control. *See also:* token passing; token ring; token bus; token access. (C) 610.7-1995

(2) In the shell command language, a sequence of characters that the shell considers as a single unit when reading input. A token is either an operator or a word. (C/PA) 9945-2-1993

(3) The 3-bit field of authority that is passed between data hosts using a token access method to indicate which data host is currently in control of the medium. (C/BA) 1393-1999

(4) A signal sequence passed from station to station that is used to control access to the medium. (C/LM) 8802-5-1998

token access (1) A means of transmitting data over a local area network that employs a token, a special bit pattern, to which a station attaches its data. (C) 610.7-1995

(2) The asynchronous data transmission process utilizing tokens to indicate which fiber-optic bus interface unit (FBIU) is currently in control of a token group. (C/BA) 1393-1999

token bus A network with a physical bus and logical ring topology where token passing is used to determine which node is allowed to transmit next. *See also:* bus-ring topology. (C) 610.7-1995

token group There are four token groups. Each fiber-optic bus interface unit (FBIU) can be a member of up to four token groups. Members of each token group share access to the same Tx Data Slots defined by the Token Arbitrated Transmit Slot Masks of FBIU configuration and status registers 16 through 19 [FCSR-(16–19)]. That is, FCSR-(16–19) for each member of a token group must be identical. This shared access is controlled using a simple token passing protocol. (C/BA) 1393-1999

tokenizer A development tool that converts FCode source code into a (binary) FCode program. (C/BA) 1275-1994

token passing A local area network access method in which a terminal can transmit only after it has acquired the network's token. (C) 610.7-1995

token ring A network in a logical ring configuration around which a token is periodically passed. The node which has the token at any time is the only node allowed to transmit on the network. (C) 610.7-1995

tokens The content of a document as characterized by words, ideograms, and graphics. (C/SE) 1045-1992

tolerable out-of-service time (nuclear power generating station) The time an information display channel is allowed to be unavailable for use as a post accident monitoring display. (PE/NP) 497-1981w

tolerable voltage difference (generating station grounding) The maximum potential difference that would cause a body current to flow of such value as not to cause ventricular fibrillation. (PE/EDPG) 665-1987s

tolerance (1) (nuclear power generating station) The allowable deviation from a specified or true value. 41-1982

(2) (software) The ability of a system to provide continuity of operation under various abnormal conditions. *See also:* system. (C/SE) 729-1983s

(3) (test, measurement, and diagnostic equipment) The total permissible variation of a quantity from a designated value. (MIL) [2]

(4) (metric practice) The amount by which the value of a quantity is allowed to vary; thus, the tolerance is the algebraic difference between the maximum and minimum limits. (SCC14/QUL) SI 10-1997, 268-1982s

tolerance band (1) (self-commutated converters) (converter characteristics) The range of steady-state values of a stabilized output quantity lying between the limits of operating error. *Notes:* 1. Tolerance band describes the permissible deviation of a stabilized output quantity from a rated or preset value. 2. A statement of tolerance band is useful when a subdivision into output effects and intrinsic errors is not of interest. (IA/SPC) 936-1987w

(2) (thyristor) The range of values specified in terms of permissible deviations of the steady state value of a parameter from a specified nominal value. (IA/IPC) 428-1981w

tolerance chart *See:* instrument tolerance chart.

tolerance, fault *See:* fault tolerance.

tolerance field (A) (fiber optics) In general, the region between two curves (frequently two circles) used to specify the tolerance on component size. **(B) (fiber optics)** When used to specify fiber cladding size, the annular region between the two concentric circles of diameter $D + \Delta D$ and $D - \Delta D$. The first circumscribes the outer surface of the homogeneous cladding; the second (smaller) circle is the largest circle that fits within the outer surface of the homogeneous cladding. **(C) (fiber optics)** When used to specify the core size, the annular region between the two concentric circles of diameter $d + \Delta d$ and $d - \Delta d$. The first circumscribes the core area; the second (smaller) circle is the largest circle that fits within the core area. *Note:* The circles of definition B need not be concentric with the circles of definition C. *See also:* core; cladding; homogeneous cladding; concentricity error. (Std100) 812-1984

toll board A switchboard used primarily for establishing connections over toll lines. (EEC/PE) [119]

toll call (telephone switching systems) A call for a destination outside the local-service area of the calling station. (COM) 312-1977w

toll center (1) (telephone switching systems) A toll office where trunks from end offices are connected to intertoll trunks and where operator's assistance is provided in completing incoming calls and where other traffic operating functions are performed. Toll centers are classified as Class 4C offices. *See also:* office class. (COM) 312-1977w

(2) Class 4 office in the North American hierarchical routing plan; a control center connecting end offices of the telephone system together. *See also:* primary center; end office; regional center; sectional center. (C) 610.7-1995

toll circuit *See:* trunk circuit.

toll connecting trunk (telephone switching systems) A trunk between a local office and a toll office or switchboard. (COM) 312-1977w

toll line A telephone line or channel between two central offices in different telephone exchanges. (EEC/PE) [119]

toll office (telephone switching systems) An intermediate office serving toll calls. (COM) 312-1977w

toll point (telephone switching systems) A toll office where trunks from end offices are connected to the distance dialing network and where operators handle only outward calls or where there are no operators present. Toll points are classified as Class 4P offices. (COM) 312-1977w

toll restriction (telephone switching systems) A method that prevents private automatic branch exchange stations from completing certain or any toll calls or reaching a toll operator, except through the attendant. (COM) 312-1977w

toll station A public telephone station connected directly to a toll telephone switchboard. *See also:* telephone station. (EEC/PE) [119]

toll switching trunk (telephone switching systems) A trunk for completing calls from a toll office or switchboard to a local office. (COM) 312-1977w

toll switch train A switch train that carries a connection from a toll board to a subscriber line. *Synonym:* toll train. *See also:* switching system. (EEC/PE) [119]

toll terminal loss (toll connection) That part of the over-all transmission loss that is attributable to the facilities from the toll center through the tributary office to and including the subscriber's equipment. *Note:* The toll terminal loss at each end of the circuit is ordinarily taken as the average of the transmitting loss and the receiving loss between the subscriber and the toll center. *See also:* transmission loss. (PE/EEC) [119]

toll train *See:* toll switch train.

toll transmission selector A selector in a toll switch train that furnishes toll-grade transmission to the subscriber and controls the ringing. (EEC/PE) [119]

T1 A carrier facility that transmits digital signal level one. The data rate is 1.544 Mb/s, the equivalent of 24 voice-band channels. *Note:* T1 is used to provide long-distance telephone service and also to provide voice and data communications to individual subscribers. (C) 610.7-1995

tone (1) (A) (general) A sound wave capable of exciting an auditory sensation having pitch. **(B) (general)** A sound sensation having pitch. (SP) [32]

(2) (telephone switching systems) An audible signal transmitted over the telecommunications network. (COM) 312-1977w

T1C A carrier facility that transmits digital signal level 1C. The data rate is 3.152 Mb/s, the equivalent of 48 voice-band channels. (C) 610.7-1995

tone, call *See:* call tone.

tone control A means for altering the frequency response at the audio-frequency output of a circuit, particularly of a radio receiver or hearing aid, for the purpose of obtaining a quality more pleasing to the listener. *See also:* radio receiver; amplifier. (EEC/PE) [119]

tone decay time (measuring the performance of tone address signaling systems) The time interval between the end of the tone present condition and the beginning of the tone off condition at the end of the tone under consideration. (COM/TA) 752-1986w

tone duration (measuring the performance of tone address signaling systems) The time interval during which a tone present condition exists continuously. (COM/TA) 752-1986w

tone leak (measuring the performance of tone address signaling systems) The occurrence of any address signaling tone during the signal present or signal off intervals when such tone is not intended. (COM/TA) 752-1986w

tone localizer *See:* equisignal localizer.

tone-modulated waves Waves obtained from continuous waves by amplitude modulating them at audio frequency in a substantially periodic manner. *See also:* telegraphy. (EEC/PE) [119]

tone off (measuring the performance of tone address signaling systems) Any condition where the tone under consideration is below a specified OFF level. (COM/TA) 752-1986w

tone-operated net-loss adjuster *See:* tonlar.

tone present (measuring the performance of tone address signaling systems) Any condition where the tone under consideration is equal to or greater than a specified threshold value. (COM/TA) 752-1986w

toner (electrostatography) The image-forming material in a developer that, deposited by the field of an electrostatic-charge pattern, becomes the visible record. *See also:* electrostatography. (ED) [46]

tone-to-C-Notched noise ratio The ratio in dB of the incoming holding tone power to the C-Notched noise power at the point of measurement. The incoming holding tone power is reduced in power by at least 50 dB by the 1010 Hz Notch. (COM/TA) 743-1995

tone-to-D-Notched noise ratio The ratio in dB of the incoming holding tone power to the D-Notched noise power at the point of measurement. The incoming holding tone power is reduced in power by at least 50 dB by the 1010 Hz Notch. (COM/TA) 743-1995

tongs, fuse *See:* fuse tongs.

tonlar A system for stabilizing the net loss of a telephone circuit by means of a tone transmitted between conversations. The name is derived from the initial letters of the expression tone-operated net-loss adjuster. (EEC/PE) [119]

ton of refrigeration Is equal to 12 000 Btu/hour. (IA/PSE) 241-1990r

tool (software) A hardware device used to analyze software or its performance. *See also:* performance; hardware. (C/SE) 729-1983s

tool function (numerically controlled machines) A command identifying a tool and calling for its selection either automatically or manually. The actual changing of the tool may be initiated by a separate tool-change command. (IA) [61]

toolkit An implementation of IEEE Std 1003.5b-1995. (C/PA) 1295-1993w, 1387.2-1995, 1003.5b-1995, 9945-1-1996, 1003.5-1992r, 9945-2-1993

tool offset (numerically controlled machines) A correction for tool position parallel to a controlled axis. (IA) [61]

tool or equipment current The total current delivered to the tool or equipment. (T&D/PE) 516-1995

tools, access *See:* access tools.

tooth (1) (rotating machinery) A projection from a core, separating two adjacent slots, the tip of which forms part of one surface of the air gap. *See also:* stator; rotor. (PE) [9]

(2) (cable plowing) *See also:* wear point. (T&D/PE) 590-1977w

tooth pitch *See:* slot pitch.

tooth tip (rotating machinery) That portion of a tooth that forms part of the inner or outer periphery of the air gap. It is frequently considered to be the section of a tooth between the radial location of the wedge and the air gap. *See also:* stator; rotor. (PE) [9]

top (1) (pulse terminology) The portion of a pulse waveform which represents the second nominal state of a pulse. (IM/WM&A) 194-1977w

(2) (data management) In a queue or a stack, the position of the next item to be retrieved. *Contrast:* bottom. (C) 610.5-1990w

(3) By convention, the edge of the module seen clockwise from the faceplate when viewing the component side. In IEEE 1101.1 systems, the P1 connector is closer to the top than the bottom edge. (C/MM) 1101.2-1992

top box The box in the A-0 context diagram that models the top-level function of an IDEF0 model. (C/SE) 1320.1-1998

top cap (electron tube) (side contact) A small metal shell on the envelope of an electron tube or valve used to connect one electrode to an external circuit. *See also:* electron tube. (ED) [45]

top car clearance (elevators) The shortest vertical distance between the top of the car crosshead, or between the top of the car where no car crosshead is provided, and the nearest part of the overhead structure or any other obstruction when the car floor is level with the top terminal landing. *See also:* hoistway. (PE/EEC) [119]

top center line (of a pulse) In a peaked pulse, the ordinate that passes through the peak; in a flat-topped pulse, the ordinate that bisects the nominally flat-topped region. (NPS) 325-1996

top centerline (of a pulse) In a peaked pulse, the ordinate that passes through the peak. In a flat-topped pulse, the ordinate that bisects the nominally flat-topped region. (NPS) 300-1988r

top coil side (rotating machinery) (radially inner coil side) The coil side of a stator slot nearest the bore of the stator or nearest the slot wedge. *See also:* stator. (PE) [9]

top counterweight clearance (elevators) (elevator counterweight) The shortest vertical distance between any part of the counterweight structure and the nearest part of the overhead structure or any other obstruction when the car floor is level with the bottom terminal landing. *See also:* hoistway. (EEC/PE) [119]

top-down Pertaining to an activity that starts with the highest level component of a hierarchy and proceeds through progressively lower levels; for example, top-down design; top-down testing. *Contrast:* bottom-up. *See also:* critical piece first. (C) 610.12-1990

top-down design (software) The process of designing a system by identifying its major components, decomposing them into their lower level components, and iterating until the desired level of detail is achieved. *See also:* system; bottom-up design; level; component. (C/SE) 729-1983s

top-down testing (software) The process of checking out hierarchically organized programs, progressively, from top to bottom, using simulation of lower level components. *See also:* simulation; component; program. (C/SE) 729-1983s

top half bearing (rotating machinery) The upper half of a split sleeve bearing. *See also:* bearing. (PE) [9]

top-level environment The environment used to resolve free variable references in a Scheme program. (C/MM) 1178-1990r

top-level function The function modeled by the single box in the A-0 context diagram of an IDEF0 model. (C/SE) 1320.1-1998

top-loaded vertical antenna A vertical monopole with an additional metallic structure at the top intended to increase the effective height of the antenna and to change its input impedance. (AP/ANT) 145-1993

top magnitude (pulse terminology) The magnitude of the top as obtained by a specified procedure or algorithm. *See also:* waveform epoch. (IM/WM&A) 194-1977w

topology (1) (A) The interconnection pattern of nodes on a network. **(B)** The logical and/or physical arrangement of stations on a network. *See also:* bus-ring topology; star topology; star-bus topology; tree topology; loop topology; ring topology; bus topology; star-ring topology. (C) 610.7-1995 **(2)** The geometric pattern or configuration of intelligent devices and how they are linked together for communications. (VT) 1473-1999

topside ionospheric sounding Vertical incidence ionospheric sounding made from an artificial Earth satellite above the height of the maximum electron density of the F region. (AP/PROP) 211-1997

top side sounding (communication satellite) Ionospheric sounding from medium altitude satellites for measuring ionospheric densities at high altitudes. (COM) [25]

top terminal landing (elevators) The highest landing served by the elevator that is equipped with a hoistway door and hoisting-door locking device that permits egress from the hoistway side. *See also:* elevator landing. (EEC/PE) [119]

torchere (illuminating engineering) An indirect floor lamp which sends all or nearly all of its light upward. (EEC/IE) [126]

toroid (doughnut) A toroidal-shaped vacuum envelope in which electrons are accelerated. *See also:* electron device. (ED) [45]

toroidal coil A coil wound in the form of a toroidal helix. (IM) [120]

toroidal reflector A reflector formed by rotating a segment of plane curve about a nonintersecting co-planar line. *Note:* The plane curve segment is called the torus cross section and the co-planar line is called the toroidal axis. (AP/ANT) 145-1993

torque (instrument) The turning moment on the moving element produced by the quantity to be measured or some quantity dependent thereon acting through the mechanism. This is also termed the deflecting torque and in many instruments is opposed by the controlling torque, which is the turning moment produced by the mechanism of the instrument tending to return it to a fixed position. *Note:* Full-scale torque is the particular value of the torque for the condition of full-scale deflection and as an index of performance should be accompanied by a statement of the angle corresponding to this deflection. *See also:* accuracy rating; energy and torque. (PE/EEC) [119]

torque (force) balance accelerometer A device that measures acceleration by applying a torquer (force) rebalance. (AES/GYAC) 528-1994

torque buildup time constant (electric coupling) The time constant applicable when excitation voltage is changed from zero to full value. (EM/PE) 290-1980w

torque-coil magnetometer A magnetometer that depends for its operation on the torque developed by a known current in a coil that can turn in the field to be measured. *See also:* magnetometer. (EEC/PE) [119]

torque-command storage (gyros) The transient deviation of the output of a rate-integrating gyro from that of an ideal integrator when the gyro is subjected to a torquer command signal. It is a function of the gyro's characteristic time and the torquer time constant. *See also:* float storage; attitude storage. (AES/GYAC) 528-1994

torque control (1) (protective relaying of utility-consumer interconnections) A means of supervising the operation of one relay element with another. For example, an overcurrent relay cannot operate unless the lag coil circuit is closed. It may be closed by the contact of an undervoltage element. (PE/PSR) C37.95-1973s **(2)** (of a relay) A method of constraining the pickup of a relay by preventing the torque-producing element from developing operating torque until another associated relay unit operates. (SWG/PE) C37.100-1992

torque decay time constant (electric coupling) The time constant applicable when the excitation voltage is changed from full value to zero. (EM/PE) 290-1980w

torque-generator reaction torque *See:* torquer reaction torque.

torque margin The increase in torque above rated torque to which a motor may be subjected without the motor pulling out of step. This is of particular concern with electric propulsion systems. (IA/MT) 45-1998

torque motor A motor designed primarily to exert torque through a limited travel or in a stalled position. *Note:* Such a motor may be capable of being stalled continuously or only for a limited time. *See also:* asynchronous machine. (PE) [9]

torquer (accelerometer) (or forcer) (gyros) A device that exerts a torque (or force) on a gimbal, a gyro rotor, or a proof mass, in response to a command signal. (AES/GYAC) 528-1994

torquer axis (accelerometer) (inertial sensors) (gyros) The axis about which a force couple is produced by a torquer. (AES/GYAC) 528-1994

torquer-current rectification (accelerometer) (gyros) (inertial sensors) An apparent drift rate (or bias) in an inertial sensor resulting from effects such as torquer nonlinearity or capture loop asymmetry. (AES/GYAC) 528-1994

torquer reaction torque (accelerometer) (gyros) The usually undesired reaction torque that is a function of the frequency and amplitude of the command torque signal. (AES/GYAC) 528-1994

torque seating A control scheme that uses the torque switch as the primary control for operation of the VAM. The torque switch controls the VAM by interrupting power to the motor contactor when the valve actuator output torque exceeds a predetermined value. (PE/NP) 1290-1996

torque time constants (electric coupling) Torque time constants define the time required for the coupling torque to reach 63.2% of its total excursion, whenever the magnitude of excitation voltage is instantly changed between specified values. This does not imply that the torque time constant of a given coupling under certain conditions of slip, speed, temperature, and environmental conditions will be the same under other conditions. (EM/PE) 290-1980w

torquing (accelerometer) (gyros) The application of torque to a gimbal or a gyro rotor about an axis-of-freedom for the purpose of precessing, capturing, slaving, or slewing. (AES/GYAC) 528-1994

torquing rate (navigation aids) (inertial navigation) The angular rate at which the orientation of a gyro, with respect to inertial space, is changed in response to a command. (AES/GCS) 172-1983w

torsional critical speed (rotating machinery) The speed at which the amplitudes of the angular vibrations of a machine rotor due to shaft torsional vibration reach a maximum. *See also:* rotor. (PE) [9]

torsional mechanism An operating mechanism that transfers rotary motion by torsion through a pipe or shaft from the operating means to open or close the switching device. (SWG/PE) C37.100-1992, C37.30-1971s

torsionmeter A device to indicate the torque transmitted by a propeller shaft based on measurement of the twist of a calibrated length of the shaft. *See also:* electric propulsion system. (EEC/PE) [119]

total A complete mapping. The mapping `M` from a set `D` to a set `R` is *total* if for every `X` in `D`, there is at least one `Y` in `R` and pair [`X`, `Y`] in `M`. A property of a class is total, meaning that

it will have a value for every instance of the class, unless it is explicitly declared partial. *Contrast:* partial. *See also:* mandatory; mapping completeness. (C/SE) 1320.2-1998

total cluster A subclass cluster in which each instance of a superclass must be an instance of at least one of the subclasses of the cluster. *Contrast:* partial cluster. *See also:* superclass. (C/SE) 1320.2-1998

total current The combination of the symmetrical component and the dc component of the current. (SWG/PE) C37.100-1992

total average power dissipation (semiconductor) The sum of the full cycle average forward and full cycle average reverse power dissipation. (IA) [12]

total break time *See:* interrupting time.

total capability for load (electric power supply) The capability available to a system from all sources including purchases. *See also:* generating station. (PE/PSE) [54]

total capacitance *See:* self-capacitance.

total charge One-half of the charge that flows as the condition of the device is changed from that of full applied positive voltage to that of full negative voltage (or vice versa). *Note:* Total charge is dependent on the amplitude of the applied voltage which should be stated when measurements of total charge are reported. *See also:* ferroelectric domain. (UFFC) 180w

total clearing time (1) (protection and coordination of industrial and commercial power systems) The total time between the beginning of the specified overcurrent and the final interruption of the circuit, at rated voltage. It is the sum of the minimum melting time plus tolerance and the arcing time. For clearing times in excess of half-cycle, the clearing time is substantially the maximum melting time for low-voltage fuses. *See also:* clearing time. (IA/PSP) 242-1986r

(2) *See also:* clearing time; fuse tube; melting-speed ratio. (SWG/PE) C37.100-1992

total correctness In proof of correctness, a designation indicating that a program's output assertions follow logically from its input assertions and processing steps, and that, in addition, the program terminates under all specified input conditions. *Contrast:* partial correctness. *See also:* input assertion; output assertion; proof of correctness; assertion. (C) 610.12-1990

total-current regulation (axle generator) That type of automatic regulation in which the generator regulator controls the total current output of the generator. *See also:* axle-generator system.

total cyanide (electroplating) (in a solution for metal deposition) The total content of the cyanide radical (CN), whether present as the simple or complex cyanide of an alkali or other metal. *See also:* electroplating. (PE/EEC) [119]

total detection efficiency (germanium detectors) The ratio of the total (peak plus Compton) counting rate to the gamma-ray emission rate. *Note:* The terms standard source and radioactivity standard are general terms used to refer to the sources and standards of National Radioactivity Standard Source and Certified Radioactivity Standard Source. (PE/EDPG) 485-1983s

total demand distortion (TDD) (1) The total root-sum-square harmonic current distortion, in percent of the maximum demand load current (15 or 30 min demand). (IA/SPC) 519-1992

(2) The total rms current distortion in percent of maximum demand current. (T&D/PE) 1250-1995

total distortion (1) A measure of the difference between a pure sine waveform of a specified frequency and a test voltage waveform. Usually measured by an audio distortion analyzer. (DESG) 1035-1989w

(2) The ratio in dB of the energy of a fundamental test signal, to all the other energy appearing in the band of interest. (COM/TA) 1007-1991r

(3) The summation of noise and distortion resulting from the application of a test signal (quantizing noise, phase jitter, intermodulation distortion, etc.), and the noise not related to the application of a test signal (background noise). (COM/TA) 743-1995

total dose (1) (metal-nitride-oxide field-effect transistor) The total amount of ionizing radiation deposited in the active area of a device over a given period of time. The unit of measure for total dose most commonly used in the present context is rads (SI). (ED) 581-1978w, 1005-1998

(2) The total amount of ionizing radiation that is deposited in the active area of a device over a given period of time. The unit of measure for total dose that is most commonly used in the present context is rads(Si).

total efficiency The ratio of the number of pulses in the entire energy spectrum due to an X or gamma ray of a given energy to the number of X- or gamma-ray photons emitted by the source for a specified source-to-detector distance. (NI) N42.14-1991

total electric current density At any point, the vector sum of the conduction-current density vector, the convection-current density vector, and the displacement-current density vector at that point. (Std100) 270-1966w

total electrode capacitance (electron tube) The capacitance of one electrode to all other electrodes connected together. (ED) [45]

total electron content (TEC) The total number of free electrons in a tube (generally with a vertical axis) of unit transverse cross-section passing through the ionosphere. *Note:* The units for TEC are 10^{16} electrons/m^2 (or 10^{12} electrons/cm^2). (AP/PROP) 211-1997

total emissivity (element of surface of a temperature radiator) The ratio of its radiant-flux density (radiant exitance) to that of a blackbody at the same temperature. (EEC/IE) [126]

total fall distance The maximum vertical distance between the person's fall arrest attachment point at the onset of a fall and after the fall is arrested, including free fall distance and maximum deceleration distance. Total fall distance excludes dynamic elongation. (T&D/PE) 1307-1996

total for load capability (power operations) The dependable capability available to a system from all sources including purchases. (PE/PSE) 858-1987s

total harmonic distortion (1) The root sum square of all harmonic distortion components including their aliases. (IM/WM&A) 1057-1994w

(2) The ratio of the rms value of the sum of the squared individual harmonic amplitudes to the rms value of the fundamental frequency of a complex waveform. *Synonym:* distortion factor. (T&D/PE/DESG) 1250-1995, 1035-1989w

(3) The ratio in dB of the energy of a fundamental test frequency to the energy of its harmonics appearing in the band of interest. (COM/TA) 1007-1991r

(4) The ratio, expressed as a percent, of the rms value of the ac signal after the fundamental component is removed and inter-harmonic components are ignored, to the rms value of the fundamental. The formula defining total harmonic distortion (THD) is provided below. The variables 'X1' and xn may represent either voltage or current, and may be expressed either as rms or peak values, so long as all are expressed in the same fashion.

$$D_x = \frac{\sqrt{\sum_{n=2} x_n^2}}{X_1} \cdot 100\%$$

where

X_1 = fundamental value of current or voltage;

x_n = n^{th} harmonic value of current or voltage.

(PEL) 1515-2000

(5) *See also:* distortion factor. (IA/SPC) 519-1992

(6) *See also:* distortion factor. (IA/PSE) 1100-1999

total hazard current (health care facilities) The hazard current of a given isolated system with all devices, including the line isolation monitor, connected. *See also:* hazard current. (EMB) [47]

total internal reflection (fiber optics) The total reflection that occurs when light strikes an interface at angles of incidence (with respect to the normal) greater than the critical angle. *See also:* step index optical waveguide; critical angle. (Std100) 812-1984w

total ionizing dose (TID) The radiation dose accumulated in a component, device, or module. (C/BA) 1156.4-1997

totalizing pulse relay (metering) 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) C12.1-1982s

totalizing relay A device used to receive and totalize pulses from two or more sources for proportional transmission to another totalizing relay or to a receiver. *See also:* auxiliary device to an instrument. (ELM) C12.1-1982s

total loss (rotating machinery) The difference between the active electrical power (mechanical power) input and the active electrical power (mechanical power) output. (PE) [9]

total losses (1) (transformer or regulator) The sum of the no-load and load losses, excluding losses due to accessories. (PE/TR) C57.12.80-1978r

(2) (shunt reactors over 500 kVA) (of a shunt reactor) The sum of the conductor loss, magnetic circuit loss, cooling loss, shielding loss, and any other stray losses in the shunt reactor. (PE/TR) C57.21-1981s

(3) The sum of the no-load losses and the load losses. (PE/TR) C57.12.90-1999

(4) Those losses that are the sum of the no-load losses and the load losses. Power required for cooling fans, oil pumps, space heaters, and other ancillary equipment is not included in the total loss. When specified, loss data on such ancillary equipment shall be furnished. (PE/TR) C57.15-1999

totally-depleted detector (charged-particle detectors) (germanium gamma-ray detectors) (semiconductor radiation detectors) (x-ray energy spectrometers) A detector in which the thickness of the depletion region is essentially equal to the thickness of the semiconductor material. (NPS/AES/NID/GCS) 759-1984r, 325-1996, 172-1983w, 301-1976s, 300-1988r

totally enclosed (rotating machinery) A term applied to apparatus with an integral enclosure that is constructed so that while it is not necessarily airtight, the enclosed air has no deliberate connection with the external air except for the provision for draining and breathing. (PE) [9]

totally enclosed fan-cooled A term applied to a totally enclosed apparatus equipped for exterior cooling by means of a fan or fans, integral with the apparatus but external to the enclosing parts. *Synonym:* totally enclosed fan-ventilated. *See also:* asynchronous machine. (IA/PE/MT) 45-1983s, [9]

totally enclosed fan-cooled machine (TEFC) A totally enclosed machine equipped for exterior cooling by means of a fan or fans integral with the machine but external to the enclosing parts. (IA/MT) 45-1998

totally enclosed fan-ventilated *See:* totally enclosed fan-cooled.

totally-enclosed fan-ventilated air-cooled (rotating machinery) Applied to a totally-enclosed machine having an air-to-air heat exchanger in the internal air circuit, the external air being blown through the heat exchanger by a fan mechanically driven by the machine shaft. (PE) [9]

totally enclosed machine (electric installations on shipboard) A machine so enclosed as to prevent the exchange of air between the inside and outside of the case, but not sufficiently enclosed to be termed airtight. (IA/MT) 45-1983s

totally enclosed nonventilated (rotating machinery) A term applied to a totally enclosed apparatus that is not equipped for cooling by means external to the enclosing parts. *See also:* asynchronous machine. (PE) [9]

totally enclosed nonventilated machine (TENV) A machine enclosed to prevent the free exchange of air between the inside and outside of the case, but not sufficiently enclosed to be airtight. (IA/MT) 45-1998

totally enclosed pipe-ventilated machine A totally enclosed machine except for openings so arranged that inlet and outlet ducts or pipes may be connected to them for the admission and discharge of the ventilating air. This air may be circulated by means integral with the machine or by means external to and not a part of the machine. In the latter case, these machines shall be known as separately ventilated or forced ventilated machines. *See also:* closed air circuit; asynchronous machine. (EEC/PE) [119]

totally enclosed ventilated apparatus Apparatus totally enclosed in which the cooling air is carried through the case and apparatus by means of ventilating tubes and the air does not come in direct contact with the windings of the apparatus. (EEC/PE) [119]

totally enclosed water/air cooled machine (TEWAC) A totally enclosed machine with integral water-to-air heat exchanger and internal fan to provide closed-loop air cooling of the windings. (IA/MT) 45-1998

totally unbalanced currents (balanced line) Push-push currents. *See also:* waveguide. (MTT) 146-1980w

total motor temperature The motor temperature rise plus the ambient temperature. (PE/NP) 1290-1996

total number of customers served The total number of customers served on the last day of the reporting period. If a different customer total is used, it must be clearly defined within the report. (PE/T&D) 1366-1998

total operating losses The total station losses produced with the converter station energized and the valves operating. (SUB/PE) 1158-1991r

total power The total (or apparent) power (S) is the product of rms voltage and current (VA). (PEL) 1515-2000

total power factor The ratio of the total power input, in watts, to the total volt-ampere input. *Note:* This definition includes the effect of harmonic components of current and voltage and the effect of phase displacement between current and voltage. (IA/PSE/SPC) 1100-1999, 519-1992

total power loss (semiconductor rectifiers) The sum of the forward and reverse power losses. *See also:* rectification. (IA) [12]

total propagated uncertainty An estimate or approximation of the accuracy of a measured value by propagation of individual uncertainties in accordance with NIST recommendations. (NI) N42.22-1995

total range (instrument) The region between the limits within which the quantity measured is to be indicated or recorded and is expressed by stating the two end-scale values. *Notes:* 1. If the span passes through zero, the range is stated by inserting zero or 0 between the end-scale values. 2. In specifying the range of multiple-range instruments, it is preferable to list the ranges in descending order, for example, 750/300/150. *See also:* instrument. (EEC/ERI) [111]

total sag The distance measured vertically from the conductor to the straight line joining its two points of support, under conditions of ice loading equivalent to the total resultant loading for the district in which it is located. (NESC/T&D) C2-1997, C2.2-1960

total scattering cross-section The average over 4π steradians of the bistatic scattering cross-section for a specific illumination, given by

$$\sigma_\tau = \frac{1}{4\pi}\int_\Omega \sigma d\Omega$$

(AP/PROP) 211-1997

total stability (solution, $\phi = \phi(x(t_0);t)$ of the system $x = f(x,t)$) Implies that for every given $\varepsilon > 0$ there exist a $\delta_1 > 0$ and a $\delta_2 > 0$ (both of which, in general, may depend on ε and t_0) such that $\|\Delta x(t_0)\| \leq \delta_1$ and $\|g(x,t)\| \leq \delta_2$ imply $\|\phi - \Psi\| \leq \varepsilon$ for $t \geq t_0$, where $\Psi = \Psi(x(t_0) + \Delta x(t_0);t)$ is a solution of the system $x = f(x,t) + g(x,t)$. *See also:* control system. (CS/IM) [120]

total start-stop telegraph distortion Refers to the time displacement of selecting-pulse transitions from the beginning of the start pulse expressed in percent of unit pulse. (AP/ANT) 145-1983s

total switching time The time required to reverse the signal charge. *Note:* Total switching time is measured from the time of application of the voltage pulse, which must have a rise time much less than and a duration greater than the total switching time. The magnitude of the applied voltage pulse should be specified as part of the description of this characteristic. *See also:* ferroelectric domain. (UFFC) 180w

total system downtime (switching system) The time interval over which the entire switching system is down and cannot process any calls. It is the long-term mean time out of service in minutes per year for all outages greater than 30 s. (COM/TA) 973-1990w

total telegraph distortion Telegraph transmisson impairment, expressed in terms of time displacement of mark-space and space-mark transitions from their proper positions relative to one another, in percent of the shortest perfect pulses called the unit pulse. (Time lag affecting all transitions alike does not cause distortion). Telegraph distortion is specified in terms of its effect on code and terminal equipment. Total Morse telegraph distortion for a particular mark or space pulse is expressed as the algebraic sum of time displacements of space-mark and mark-space transitions determining the beginning and end of the pulses, measured in percent of unit pulse. Lengthening of mark is positive, and shortening, negative. *See also:* distortion. (AP/ANT) 145-1983s

total varactor capacitance The capacitance between the varactor terminals under specified conditions. (ED) 318-1971w

total voltage regulation (rectifier) The change in output voltage, expressed in volts, that occurs when the load current is reduced from its rated value to zero or light transition load with rated sinusoidal alternating voltage applied to the alternating-current line terminals, but including the effect of the specified alternating-current system impedance as if it were inserted between the line terminals and the transformer, with the rectifier transformer on the rated tap. *Note:* The measurement shall be made with zero phase control and shall exclude the corrective action of any automatic voltage-regulating means, but not impedance. *See also:* rectification; power rectifier. (IA) [62]

touchdown zone lights (illuminating engineering) Barettes of runway lights installed in the surface of the runway between the runway edge lights and the runway centerline lights to provide additional guidance during the touchdown phase of a landing in conditions of very poor visibility. (EEC/IE) [126]

touch panel A touch-sensitive input device that allows users to interact with a computer system by touching an area on the panel. *See also:* touch screen. (C) 610.6-1991w, 610.10-1994w

touch potential (1) The potential difference between a grounded metallic structure and a point on the earth's surface separated by a distance equal to the normal maximum horizontal reach, approximately one meter. This potential difference could be dangerous and could result from induction or fault conditions, or both. *Synonym:* touch voltage. (T&D/PE) 1048-1990

(2) *See also:* touch voltage. (T&D/PE) 524-1992r

touch screen A display screen equipped with a touch panel in front of it such that users may interact with a computer system by touching an area on the panel. *See also:* touch panel. (C) 610.10-1994w

touch-sensitive Pertaining to an input device that can detect when a user touches its surface with a finger, pencil or other object. *See also:* light-sensitive. (C) 610.10-1994w

touch symbol Refers to the overall design and shape shown in the figure below. This symbol is normally shown under a red circle with bar to show the action (touching) is prohibited.

Touch symbol

touch symbol

(NIR/SCC28) C95.2-1999

touch voltage (1) The potential difference between a grounded metallic structure and a point on the earth's surface separated by a distance equal to the normal maximum horizontal reach, approximately 1 m (3 ft). *Note:* This potential difference could be dangerous and could result from induction or fault conditions, or both. *Synonym:* touch potential. (PE/T&D/PSIM) 81-1983, 524a-1993r, 524-1992r

(2) The potential difference between the ground potential rise (GPR) and the surface potential at the point where a person is standing while at the same time having a hand in contact with a grounded structure. (PE/SUB) 80-2000, 1268-1997

tournament sort A repeated selection sort in which each of the subsets that make up the set to be sorted consists of no more than two items. (C) 610.5-1990w

tower (1) A broad-base latticed steel support for line conductors. (T&D/PE) [10]

(2) (mainenance of energized power lines) *See also:* structure. (T&D/PE) 516-1987s

tower footing resistance (lightning protection) The resistance between the tower grounding system and true ground. *See also:* direct-stroke protection. (T&D/PE) [10]

tower ladder A ladder complete with hooks and safety chains attached to one end of the side rails. These units are normally fabricated from fiberglass, wood, or metal. The ladder is suspended from the arm or bridge of a structure to enable workers to work at the conductor level, to hang travelers, perform clipping-in operations, etc. In some cases, these ladders are also used as lineperson's platforms. *Synonym:* hook ladder. (T&D/PE) 524-1992r

tower loading The load placed on a tower by its own weight, the weight of the wires with or without ice covering, the insulators, the wind pressure normal to the line acting both on the tower and the wires and the pull from the wires in the direction of the line. *See also:* tower. (T&D/PE) [10]

towing light A lantern or lanterns fixed to the mast or hung in the rigging to indicate that a ship is towing another vessel or other objects. (EEC/PE) [119]

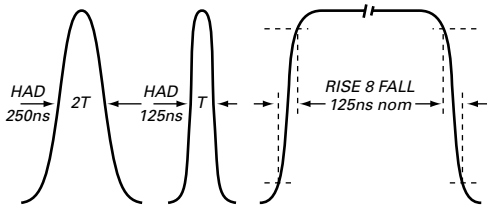
Townsend coefficient (gas) The number of ionizing collisions per centimeter of path in the direction of the applied electric field. *See also:* discharge. (ED) [45]

TPC *See:* trigger pulse converter.

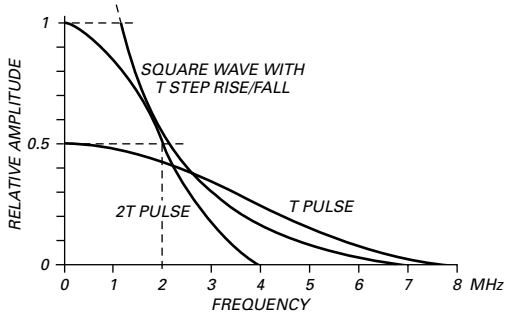
T-pin broadcast A method of using the pattern of ones on the A/D lines to select devices on a segment that should participate in a broadcast. (NID) 960-1993

TPS *See:* test program set.

T pulse (linear waveform distortion) A $\sin^2$ pulse with a half-amplitude duration (HAD) of 125 ns. The amplitude of the envelope of the frequency spectrum at 4 MHz is 0.5 of the amplitude at zero frequency and effectively zero at and beyond 8 MHz. (See the corresponding figures.)



2*T* pulse, *T* pulse, and *T* step



Envelope of frequency spectrum of 2*T* pulse, *T* pulse and square wave with *T* step rise and fall

T pulse

(BT) 511-1979w

TRSL *See:* Test Requirement Specification Language.

TRV *See:* transient recovery voltage; actual transient recovery voltage.

trace (1) The cathode-ray-tube display produced by a moving spot. (IM/HFIM) [40]

(2) (A) (software) A record of the execution of a computer program, showing the sequence of instructions executed, the names and values of variables, or both. Types include execution trace, retrospective trace, subroutine trace, symbolic trace, variable trace. **(B) (software)** To produce a record as in definition (A). **(C) (software)** To establish a relationship between two or more products of the development process; for example, to establish the relationship between a given requirement and the design element that implements that requirement. (C) 610.10-1994, 610.12-1990

(3) To execute the component steps of a computer program, displaying the state of selected system resources after each step. (C/BA) 1275-1994

(4) A diagnostic fault isolation program that uses a probe on a tester. (SCC20) 1445-1998

traceable reference material or standard A NIST prepared standard reference material or a sample of known activity concentration prepared from a NIST traceable reference material (derived standard material). Analogous to certified reference material. (NI) N42.23-1995

traceability (1) (nuclear power quality assurance) The ability to trace the history, application, or location of an item and like items or activities by means of recorded identification. (PE/NP) [124]

(2) (test, measurement, and diagnostic equipment) Process by which the assigned value of a measurement is compared, directly or indirectly, through a series of calibrations to the value established by the U.S. national standard. (MIL) [2]

(3) (software) The degree to which each element in a software development product establishes its reason for existing; for example, the degree to which each element in a bubble chart references the requirement that it satisfies. (C) 610.12-1990

(4) Demonstrated lineage of measurement process quality to the national physical standards. (NI) N42.23-1995

(5) The identification and documentation of derivation paths (upward) and allocation or flowdown paths (downward) of work products in the work product hierarchy. Important kinds of traceability include: to or from external sources to or from system requirements; to or from system requirements to or from lowest level requirements; to or from requirements to or from design; to or from design to or from implementation; to or from implementation to test; and to or from requirements to test. (C/SE) 1362-1998

(6) The degree to which a relationship can be established between two or more products of the development process, especially products having a predecessor-successor or master-subordinate relationship to one another; e.g., the degree to which the requirements and design of a given system element match. (C/SE) 1233-1998

traceability matrix A matrix that records the relationship between two or more products of the development process; for example, a matrix that records the relationship between the requirements and the design of a given software component. (C) 610.12-1990

traced tube bundle Pretraced and thermally insulated instrument tubing that is used for fluid transport, containment, or conditioning system. The bundle is factory fabricated and consists of tubing, heating cable, thermal insulation, and weatherproof jacket. (IA) 515-1997

trace finder *See:* beam finder.

trace interval (television) The interval corresponding to the direction of sweep used for delineation. (BT/AV) 201-1979w

tracer (software) A software tool used to trace. *See also:* trace. (C/SE) 729-1983s

trace, return *See:* return trace.

trace width (oscilloscopes) The distance between two points on opposite sides of a trace perpendicular to the direction of motion of the spot, at which luminance is 50% of maximum. With one setting of the beam controls, the width of both horizontally and vertically going traces within the quality area should be stated. *See also:* oscillograph. (IM/HFIM) [40]

tracing distortion The nonlinear distortion introduced in the reproduction of mechanical recording because the curve traced by the motion of the reproducing stylus is not an exact replica of the modulated groove. For example, in the case of a sine-wave modulation in vertical recording the curve traced by the center of the tip of a stylus is a poid. *See also:* phonograph pickup. (SP) [32]

tracing domain The MD that produces an external trace entry. (C/PA) 1224.1-1993w

tracing MTA The MTA that produces an internal trace entry. (C/PA) 1224.1-1993w

tracing routine (computers) A routine that provides a historical record of specified events in the execution of a program. (C) [20], [85]

track (1) (A) (navigation) (navigation aids) The resultant direction of actual travel projected in the horizontal plane and expressed as a bearing. **(B) (navigation) (navigation aids)** The component of motion that is in the horizontal plane and represents the history of accomplished travel. (AES/GCS) 172-1983

(2) (in electronic computers) The portion of a moving-type storage medium that is accessible to a given reading station: for example, as on film, drum, tapes, or discs. *See also:* band. (C) [85], 338

(3) (test, measurement, and diagnostic equipment) *See also:* channel. (MIL) [2]

(4) (A) A path that is to be followed. For example, the track followed by the read or write head in a storage device during access to a storage medium. *See also:* band; address track; feed track; recording density; card track; storage element; clock track; alternate track; regenerative track. **(B)** One consecutive stream of recorded data on a storage medium. (C) 610.10-1994

track and hold unit A device whose input analog variable is equal to either the input analog variable or a sample of this variable selected by the action of an external Boolean signal. *Synonyms:* track store; track and store unit. (C) 610.10-1994w

track and store unit *See:* track and hold unit.

track angle (navigation aid terms) Track measured from 0° at the reference direction. (AES/GCS) 172-1983w

track ball *See:* control ball.

track brake A magnetic friction brake that compresses against the running rail and is activated by an electrical signal. (VT) 1475-1999

track circuit An electric circuit that includes the rails of a track relay as essential parts. (EEC/PE) [119]

track density The number of tracks per unit length of a data medium, measured in a direction perpendicular to the tracks. (C) 610.10-1994w

tracked munition A munition for which tracking data is required. By necessity, a tracked munition becomes a simulation entity during its flight; its flight path is represented, therefore, by Entity State PDUs. (DIS/C) 1278.1-1995

track element *See:* roadway element.

track homing (navigation aids) The process of following a line of position known to pass through an objective. (AES/GCS) 172-1983w

track indicator chart A maplike reproduction of railway tracks controlled by track circuits so arranged as to indicate automatically for defined sections of track whether such sections are or are not occupied. (EEC/PE) [119]

tracking (1) A motion given to the major lobe of an antenna with the intent that a selected moving target be contained within the major lobe. *Synonym:* angle tracking. (AP/ANT) 145-1993

(2) (A) (data transmission) (radar) The process of following a moving object or a variable input quantity using a servomechanism. *Note:* In radar, tracking is carried out by keeping a narror beam or angle cursor centered on the target angle, a range mark or gate on the delayed echo, or a narrowband filter of the signal frequency. **(B) (data transmission)** (electric) The maintenance of proper frequency relations in circuits designed to be simultaneously varied by gang operation. **(C) (data transmission)** (phonographic technique). The accuracy with which the stylus of a phonograph pickup follows a prescribed path. **(D) (data transmission)** (instrument) The ability of an instrument to indicate, at the division line being checked, when energized by corresponding proportional value of actual end-scale excitation, expressed as a percentage of actual end-scale value. **(E) (data transmission)** (communication satellite) (1) The determination of the orbit and the ephemeris to a satellite or spacecraft. (2) Maintaining the point of a high gain antenna at a moving spacecraft. **(F) (data transmission)** (antenna) A motion given to the major lobe of an antenna so that a selected moving target is contained within the major lobe. (PE/AES/GCS) 599-1985, 172-1983

(3) (image processing and pattern recognition) An image segmentation technique in which arcs are detected by searching sequentially from one arc pixel to the next. (C) 610.4-1990w

(4) (computer graphics) The process of moving a tracking symbol across a display surface in response to coordinate data from an input device. (C) 610.6-1991w

(5) Irreversible degradation of surface material from the formation of conductive carbonized paths. (SPD/PE) C62.11-1999

(6) The process of following a moving object or a variable input quantity. In radar, target tracking in angle, range, or Doppler frequency is accomplished by keeping a beam or angle cursor on the target angle, a range mark or gate on the delayed echo, or a narrowband filter on the signal frequency, respectively. *Note:* This process may be carried out manually or automatically for one or more of the above input quantities. The beam, range gate, or filter can be either centered on the input quantity or can be coarsely placed, with interpolation measurements providing accurate data to a computer that does the fine tracking. *See also:* automatic tracking; tracking radar; track-while-scan. (AES) 686-1997

(7) (computer graphics) *See also:* tracking level. (COM/TA) 1007-1991r

tracking error (1) The deviation of a dependent variable with respect to a reference function. *Note:* As applied to power inverters, tracking error may be the deviation of the output volts per hertz from a prescribed profile or the deviation of the output frequency from a given input synchronizing signal or others. *See also:* self-commutated inverters. (IA) [62]

(2) (lateral mechanical recording) (phonographic techniques) The angle between the vibration axis of the mechanical system of the pickup and a plane containing the tangent to the unmodulated record groove that is perpendicular to the surface of the recording medium at the point of needle contact. *See also:* phonograph pickup. (SP) [32]

(3) The portion of alignment error due to failure to track receiver jitter. (C/LM) 8802-5-1998

tracking level Deviation of the gain or loss as the input level to a codec is varied. Usually the reference level is 0 dBm0 at 1004 Hz. (COM/TA) 1007-1991r

tracking radar (navigation aids) A radar whose primary function is the automatic tracking of targets. *See also:* automatic tracking; tracking. (AES/GCS) 686-1997, 172-1983w

tracking servo (A) A servomechanism that allows a device to follow the path of a target; for example, a telescope or a radar device. **(B)** A mechanism in a rotating storage device that keeps the head centered on a track by following recorded signals on the medium. (C) 610.10-1994

tracking symbol A cross or other predefined symbol, appearing on a display surface, that represents the position of an object being tracked by a computer system. (C) 610.6-1991w

track instrument A device in which the vertical movement of the rail or the blow of a passing wheel operates a contact to open or close an electric circuit. (EEC/PE) [119]

trackless trolley coach *See:* trolley coach.

track pitch The distance between adjacent tracks, measured in a direction perpendicular to the tracks. *See also:* track density; row pitch. (C) 610.10-1994w

track relay A relay receiving all or part of its operating energy through conductors of which the track rails are an essential part and that responds to the presence of a train on the track. (EEC/PE) [119]

track store (1) (analog computer) A component, controlled by digital logic signals, whose output equals the input, when in the "track" mode, and whose output becomes constant and is held (stored) at the value it possessed at the instant its mode was switched to the "store" mode. (C) 165-1977w

(2) *See also:* track and hold unit. (C) 610.10-1994w

track-while-scan (TWS) An automatic target tracking process in which the radar antenna and receiver provide periodic video data from a search scan, together with interpolation measurements, as inputs to computer channels that follow individual targets. *See also:* tracking. (AES) 686-1997

traction machine (elevators) A direct-drive machine in which the motion of a car is obtained through friction between the suspension ropes and a traction sheave. *See also:* driving machine. (EEC/PE) [119]

traction motor An electric propulsion motor used for exerting tractive force through the wheels of a vehicle. (EEC/PE) [119]

traction system *See:* propulsion system.

tractive effort The force generated at the wheel-rail interface as a result of the action of the propulsion system. It may be either positive, indicating motoring/powering, or negative, indicating brake. (VT) 1475-1999

tractive force (electrically propelled vehicle) The total propelling force measured at the rims of the driving wheels, or at the pitch line of the gear rack in the case of a rack vehicle. *Note:* Tractive force of an electrically propelled vehicle is commonly qualified by such terms as: maximum starting tractive force; short-time-rating tractive force; continuous-rating tractive force. *See also:* electric locomotive. (PE/EEC) [119]

tractor *See:* crawler tractor; wheel tractor.

tractor, crawler *See:* crawler tractor.

tractor feed A method for feeding paper or preprinted forms into a printer using an attachment that guides the paper using advancing sprockets that fit into specially prepared guide holes in the paper. *Synonyms:* sprocket feed; form feed; pin feed. *Contrast:* friction feed. (C) 610.10-1994w

tractor, wheel *See:* wheel tractor.

trademark A symbol, word, or phrase used to denote a particular source of goods or services. (C/SE) 1420.1b-1999

tradeoff Parametric analysis of concepts or components for the purpose of optimizing the system or some trait of the system. *See also:* system science. (SMC) [63]

tradeoff analysis An analytical evaluation of design options/alternatives against performance, design-to-cost objectives, and life cycle quality factors. (C/SE) 1220-1998

trade secret Any formula, process, design, or intellectual property interest that is protected by secrecy. (C/SE) 1420.1b-1999

traffic (A) Messages that are transmitted and received over a communication channel. **(B)** A quantitative measure of network load. *Note:* Generally refers to the packet transmission rate, frames/second or frames/hour. (C) 610.7-1995, 610.10-1994

traffic analysis The collection, analysis, and interpretation of communication patterns to inferoperational and logistics-related information. Traffic analysis may be perpetrated using the same techniques as wiretapping, and could result in the unauthorized disclosure of sensitive operations or logisticsinformation. (C/BA) 896.3-1993w

traffic beam *See:* lower beams.

traffic-control system A block signal system under which train movements are authorized by block signals whose indications supersede the superiority of trains for both opposing and following movements on the same track. *See also:* centralized traffic-control system. (EEC/PE) [119]

traffic engineering limits Two engineering methodologies are in common use for PTS. These are time-consistent busy hour (TCBH) and extreme value engineering (EVE). In each methodology, two or three capacities are stated. The lowest capacity is meant to correspond to peak or busy-hour daily loads and is designed to protect the network as several switching systems interact under moderate-to-heavy load. The highest capacity corresponds to peak yearly loads and defines the boundary between normal load and overload. The switching system should maintain throughput at peak capacity, but some of its interactions with other systems may be slightly degraded. Greater loads than peak load may require network management actions. (COM/TA) 973-1990w

traffic flow security (A) The concealment of valid messages on a communication circuit, usually by causing the circuit to appear busy at all times or by encrypting the source and destination addresses of valid messages. **(B)** The state of protection that results from (A). (C) 610.7-1995

traffic intensity A measure of load volume, typically expressed for local switching systems as CCS or calls or call attempts per hour. *Synonym:* event data. *See also:* time-consistent traffic measures. (COM/TA) 973-1990w

traffic locking Electric locking adapted to prevent the manipulation of levers or other devices for changing the direction of traffic on a section of track while that section is occupied or while a signal is displayed for a train to proceed into that section. *See also:* interlocking. (EEC/PE) [119]

traffic peg count A measure of the number of occurrences of particular events; for example, recognition of a call by the system. Accuracy of peg counts is usually not an issue, since under normal load it is relatively easier to get good peg count data than usage data. Accuracy of peg count data should be expressed in percentages at peak system load. *Note:* It is very important to collect accurate data exactly when it may become most difficult—when the switching system is in overload. (COM/TA) 973-1990w

traffic service (telephone switching systems) The services rendered to customers by telephone company operators. (COM) 312-1977w

traffic usage capacity The capacity of the switching network of a switching system depends on the customer usage that can be supported while meeting the network service requirements. The usage of a customer line is composed of originating and terminating usage. (COM/TA) 973-1990w

traffic usage count A measure of server occupancy, usually expressed in Erlangs or hundreds of call seconds per hour (CCS). Measurements may be required for individual servers or for a set of servers performing the same function. Usage may be measured directly, (e.g., by measuring the server holding time of each call) and then summing for all calls. The direct method can be made to be as accurate as the precision of the data register (e.g., tenths of a second). It is usually simpler to measure usage by the scan method. In the scan method, servers are scanned periodically and the number of busy servers is added to a usage register. The scan period is typically every second, 10 s, or 100 s, depending on the desired accuracy. Accuracy will also depend on the service holding time, the number of servers, and the total load being measured. Accuracy of the scan method was the subject of much early statistical analysis in telephony. Accuracy of usage data collected by the scan method should be expressed as the probability that error exceeds a certain percentage of the total usage. *See also:* server. (COM/TA) 973-1990w

traffic usage recorder (telephone switching systems) A device or system for sampling and recording the occupancy of equipment. (COM) 312-1977w

trailer (1) Identification or control information placed at the end of a file or message. *Contrast:* header. (C) 610.12-1990
(2) The contiguous control bits following a transmission that contain information used for such purposes as bit error detection and end-of-transmission indication. *Contrast:* header. (C) 610.7-1995
(3) The portion of tape that follows the end-of-tape marker. *Contrast:* leader. (C) 610.10-1994w

trailer card A punch card that contains information identifying data on the preceding cards. *Note:* Usually the last card in a deck of cards *Contrast:* header card. (C) 610.10-1994w

trailer label *See:* end-of-file label.

trailer plow (cable plowing) (static or vibratory plows) A unit that is self-contained except for drawbar pull that is furnished by a prime mover. (T&D/PE) 590-1977w

trailing decision A loop control that is executed after the loop body. *Contrast:* leading decision. *See also:* UNTIL. (C) 610.12-1990

trailing edge (pulse transformers) That portion of the pulse occurring between the time of intersection of straight-line segments used to determine A_T and the time at which the instantaneous value reduces to zero. *Synonym:* last transition. (PEL/ET) 390-1987r

trailing edge amplitude (pulse transformers) That quantity determined by the intersection of a line passing through the points on the trailing edge where the instantaneous value reaches 90% and 10% of A_T, and the straight-line segment fitted to the top of the pulse in determining A_M. (PEL/ET) 390-1987r

trailing edge, pulse *See:* pulse trailing edge.

trailing-edge pulse time The time at which the instantaneous amplitude last reaches a stated fraction of the peak pulse amplitude. (IM/WM&A) 194-1977w

trailing-type antenna (aircraft) A flexible conductor usually wound on a reel within the aircraft passing through a fairlead to the outside of the aircraft, terminated in a streamlined weight or wind sock and fed out to the proper length for the desired radio frequency of operation. It has taken other forms such as a capsule that when exploded releases the antenna. (EEC/PE) [119]

trailing zero A zero that comes after the last digit in a numeric representation that is non-zero, and that is to the right of the decimal point; for example, the two zeros in "324.600." *Contrast:* leading zero. (C) 610.5-1990w

train (1) (illuminating engineering) The angle between the vertical plane through the axis of the searchlight drum and the plane in which this plane lies when the searchlight is in a position designated as having zero train. (EEC/IE) [126]

(2) A consist of one or more basic operating units. (VT/RT) 1477-1998, 1473-1999, 1475-1999, 1474.1-1999

train control system The system for controlling train movement, enforcing train safety, and directing train operations. (VT) 1477-1998

train-control territory That portion of a division or district equipped with an automatic train-control system. *See also:* automatic train control. (EEC/PE) [119]

train describer An instrument used to give information regarding the origin, destination, class, or character of trains, engines, or cars moving or to be moved between given points. (EEC/PE) [119]

trained listening group (speech-quality measurements) Six to ten listeners who understand thoroughly the purpose of the speech quality test and respond properly throughout the test. All persons of the group shall meet the requirements on auditory acuity as described by USAS S3.2-1960 (Monosyllabic Word Intelligibility). The training of the listeners will depend on the special type of tests to be conducted. 297-1969w

training (1) The process of synchronizing the receiver circuit of a linc to the incoming data stream during initialization. (C/MM) 1596-1992

(2) (local area networks) (Training_Up, Training_Down) A link control signal indicating that the sending entity is either requesting or giving permission to train (initialize) the link. (C) 8802-12-1998

trainline interoperability The ability of the basic operating units that constitute a train to communicate successfully with each other through coupler interface(s), without limitation as to the sequence or orientation of the basic operating units within the train, and without requirement for manual configuration other than optional manual confirmation of basic operating unit sequence within the train. (VT) 1473-1999

trainlines Wires routed through and/or between vehicles or units by means of couplers, jumpers, or other means so that power or signals may be transmitted to all vehicles of the train. (VT) 1475-1999

train printer An impact printer in which the type slugs are moved around on a circular track, known as a print train. (C) 610.10-1994w

trajectory stability Orbital stability where the solution curve is not closed. *See also:* control system. (CS/IM) [120]

trajectory, state *See:* state trajectory.

trans-μ-factor (multibeam electron tubes) The ratio of the magnitude of an infinitesimal change in the voltage at the control grid of any one beam to the magnitude of an infinitesimal change in the voltage at the control grid of a second beam. The current in the second beam and the voltage of all other electrodes are maintained constant. (ED) 161-1971w

transaction (1) An event that requires data contained in a master file to be processed. *See also:* change transaction; null transaction; update transaction; delete transaction; add transaction. (C) 610.2-1987

(2) A data element, control element, signal, event, or change of state that causes, triggers, or initiates an action or sequence of actions. (SE/C) 610.12-1990

(3) (supervisory control, data acquisition, and automatic control) That sequence of messages between master and remote stations required to perform a specific function (for example, acquire specific data or control a selected device). (SUB/PE) C37.1-1994

(4) (STEbus) The combination of data transfer sequences controlled by a master during a single bus tenure. (MM/C) 1000-1987r

(5) (NuBus) A sequence of cycles beginning with a start cycle and ending with an ack cycle that is used to convey data between a master and a slave. (C/MM) 1196-1987w

(6) A sequence of messages between cooperating terminals to perform a specific function. Usually a minimum of one message in each direction that is comprised of a command followed by a response. (SUB/PE) 999-1992w

(7) A unit of work consisting of an arbitrary number of individual operations, all of which will either complete successfully or abort with no effect on the intended resources. A transaction has well-defined boundaries. A transaction starts with a request from the application program and either completes successfully (commits) or has no effect (abort). Both the commit and abort signify completion of a transaction. (C/PA) 14252-1996

(8) An information exchange between two nodes. A transaction consists of a request subaction and a response subaction. The request subaction transfers commands (and possibly data) between a requester and a responder. The response subaction returns status (and possibly data) from the responder to the requester. (C/MM) 1596.5-1993, 1596-1992

(9) A transfer between requester and responder consisting of a request and response subaction. The request subaction transfers a command (and sometimes data) between a requester and responder. The response subaction returns status (and sometimes data) from the responder to the requester. A transaction may be either unified or split. (C/MM) 1212-1991s

(10) A single use of a service. (ATLAS) 1232-1995

(11) A transaction is a sequence of packets sent between two or more terminal nodes to perform some function. *See also:* transaction layer. (C/BA) 1355-1995

(12) A request and the corresponding response. The response may be null for transactions with broadcast destination addresses. This is the PDU for the transaction layer. (C/MM) 1394-1995

(13) An event initiated with a connection phase and terminated with a disconnection phase. Data may or may not be transferred during a transaction. Often used instead of the more precise phrase "bus transaction" for the sake of brevity. *See also:* bus transaction; system transaction. (C/BA) 10857-1994

(14) A functionally continuous and complete exchange of information between the roadside equipment (RSE) and the vehicle transponder. (SCC32) 1455-1999

transaction analysis A software development technique in which the structure of a system is derived from analyzing the transactions that the system is required to process. *Synonym:* transaction-centered design. *See also:* transform analysis; structured design; object-oriented design; modular decomposition; input-process-output; rapid prototyping; data structure-centered design; stepwise refinement. (C) 610.12-1990

transaction bystander A module that is not participating in the current transaction. A transaction bystander monitors, asserts, and releases the synchronization signals, even though it is not the initiator of a transaction or the target of it. (C/BA) 896.4-1993w

transaction-centered design *See:* transaction analysis.

transaction code An identifier associated with a transaction and representing the operation to be carried out by that transaction. For example, "A" for an add transaction, "D" for a delete transaction. (C) 610.2-1987

transaction completion (reply) A reply generated by a function in response to one or more I/O transaction initiations. The completion returns status and sometimes data. In a disk read I/O transaction, for example, the completion returns the data and status from the disk and the function in the I/O Unit to the Processor. (C/MM) 1212.1-1993

transaction file An organized collection of transaction records. *Synonym:* detail file. *Contrast:* master file. (C) 610.2-1987

transaction_ID A value selected by an initiator to designate a given I/O transaction. It is included either explicitly or im-

plicitly in a transaction-initiation message and returned in a transaction-completion message. (C/MM) 1212.1-1993

transaction initiation (request) A request generated by the initiator to start an action by the responder. An initiation message usually transfers a command and sometimes data. For a disk read I/O transaction, for example, the initiation transfers the address and command. (C/MM) 1212.1-1993

transaction, I/O *See:* I/O transaction.

transaction layer (1) The layer above the packet layer for use by applications. It is unspecified in this standard. *See also:* transaction. (C/BA) 1355-1995

(2) The layer, in a stack of three protocol layers defined for the Serial Bus, that defines a request-response protocol to perform bus operations of type read, write, and lock. (C/MM) 1394-1995

transaction matrix A matrix that identifies possible requests for database access and relates each request to information categories or elements in the database. (C) 610.12-1990

transaction record A record, representing one transaction, used to process data stored in a master file. *See also:* update transaction; null transaction; change transaction; delete transaction; add transaction. (C) 610.2-1987

transactor A magnetic device with an air-gapped core having an input winding which is energized with an alternating current and having an output winding which produces a voltage that is a function of the input current. *Note:* The term "transactor" is a contraction of the words "transformer" and "reactor." (SWG/PE/PSR) C37.110-1996, C37.100-1992

transadmittance For harmonically varying quantities at a given frequency, the ratio of the complex amplitude of the current at one pair of terminals of a network to the complex amplitude of the voltage across a different pair of terminals. *See also:* interelectrode transadmittance. (IM/HFIM) [40]

transadmittance compression ratio (electron tube) The ratio of the magnitude of the small-signal forward transadmittance of the tube to the magnitude of the forward transadmittance at a given input signal level. (ED) 161-1971w

transadmittance, forward *See:* forward transadmittance.

transceiver (1) (data transmission) The combination of radio transmitting and receiving equipment in a common housing, usually for portable or mobile use, and employing common circuit components for both transmitting and receiving. (PE) 599-1985w

(2) (navigation aids) A combination transmitter and receiver in a single housing, with some components being used by both parts. *See also:* transponder. (AES/GCS) 172-1983w

(3) (A) A device that both transmits and receives data. **(B)** A device that connects a host interface to a network. **(C)** A device that applies electronic signals to the cable and may sense collisions. *Note:* Definition (C) is contextually specific to IEEE Std 802.3. (C) 610.7-1995

transceiver cable A four-pair, shielded cable which interconnects a workstation to a transceiver or fan-out box. *Note:* This term is contextually specific to IEEE Std 802.3. *See also:* coaxial cable; trunk cable; drop cable; attachment unit interface cable. (C) 610.7-1995

transceiver chatter *See:* chatter.

transconductance The real part of the transadmittance. *Note:* Transconductance is, as most commonly used, the interelectrode transconductance between the control grid and the plate. At low frequencies, transconductance is the slope of the control-grid-to-plate transfer characteristic. *See also:* interelectrode transconductance; electron-tube admittances. (ED) 161-1971w

transconductance meter (mutual-conductance meter) An instrument for indicating the transconductance of a grid-controlled electron tube. *See also:* instrument. (EEC/PE) [119]

transcribe (electronic computation) To convert data recorded in a given medium to the medium used by a digital computing machine or vice versa. (C) 162-1963w

transcriber (electronic computation) Equipment associated with a computing machine for the purpose of transferring input (or output) data from a record of information in a given language to the medium and the language used by a digital computing machine (or from a computing machine to a record of information). (Std100) 270-1966w

transducer (1) (electrical heating applications to melting furnaces and forehearths in the glass industry) A device that is actuated by power from one system and supplies power in any other form to a second system. (IA) 668-1987w

(2) (communication and power transmission) A device by means of which energy can flow from one or more transmission systems or media to one or more other transmission systems or media. *Note:* The energy transmitted by these systems or media may be of any form (for example, it may be electric, mechanical, or acoustical), and it may be of the same form or different forms in the various input and output systems or media. (MIL/C/AP/ANT) [2], [85], 145-1983s

(3) (metering) A device to receive energy from one system and supply energy (of either the same or of a difference kind) to another system, in such a manner that the desired characteristics of the energy input appear at the output. (ELM) C12.1-1988

(4) (thyristor) A device which under the influence of a change in energy level of one form or in one system, produces a specified change in energy level of another form or in another system. (IA/IPC) 428-1981w

(5) A device for converting energy from one form to another. (C) 610.10-1994w

(6) A device converting energy from one domain into another. The device may either be a sensor or an actuator. (IM/ST) 1451.2-1997

(7) A device converting energy from one domain into another, calibrated to minimize the errors in the conversion process. A sensor or an actuator. (IM/ST) 1451.1-1999

transducer, active *See:* active transducer.

Transducer Block An instance of a subclass of `IEEE1451_TransducerBlock`. (IM/ST) 1451.1-1999

transducer conversion loss The ratio of the SAW power generated in the substrate at the transducer output to the power available in the circuit at the transducer input in decibels. (UFFC) 1037-1992w

Transducer Electronic Data Sheet (TEDS) (1) A data sheet describing a transducer stored in some form of electronically readable memory. (IM/ST) 1451.2-1997

(2) Several of the IEEE 1451.X standards use TEDS to provide a machine-readable specification of the characteristics of the transducer interface. (IM/ST) 1451.1-1999

transducer gain (1) The ratio of the power that the transducer delivers to the specified load under specified operating conditions to the available power of the specified source. *Notes:* 1. If the input and/or output power consist of more than one component, such as multifrequency signals or noise, then the particular components used and their weighting must be specified. 2. This gain is usually expressed in decibels. *See also:* transducer. (Std100) 270-1966w

(2) (two-port linear transducer) At a specified frequency, the ratio of the actual signal power transferred from the output port of the transducer to its load, to the available signal power from the source driving the transducer. (ED) 161-1971w

transducer, ideal *See:* ideal transducer.

Transducer Independent Interface The digital interface used to connect a Smart Transducer Interface Module to a Network Capable Application Processor. (IM/ST) 1451.2-1997

transducer interface The physical connection by which a transducer communicates with the control or data systems that it is a member of, including the physical connector, the signal wires used and the rules by which information is passed across the connection. (IM/ST) 1451.2-1997

transducer, line *See:* line transducer.

transducer loss The ratio of the available power of the specified source to the power that the transducer delivers to the speci-

fied load under specified operating conditions. *Notes:* 1. If the input and/or output power consist of more than one component, such as multifrequency signals or noise, then the particular components used and their weighting must be specified. 2. This loss is usually expressed in decibels. *See also:* transducer. (Std100) 270-1966w

transducer, passive *See:* passive transducer.

transfer (1) (telephone switching systems) A feature that allows a customer to instruct the switching equipment or operator to transfer his call to another station. (COM) 312-1977w

(2) (A) (electronic computation) To transmit, or copy, information from one device to another. **(B) (electronic computation)** To jump. **(C) (electronic computation)** The act of transferring. *See also:* transmit; jump. (C) 162-1963

(3) (electrostatography) The act of moving a developed image, or a portion thereof, from one surface to another, as by electrostatic or adhesive forces, without altering the geometric configuration of the image. *See also:* electrostatography. (ED) [46]

(4) (data management) (software) To send data from one place and receive it at another. *See also:* transmit. (C) 610.5-1990w, 610.12-1990

(5) (software) To relinquish control by one process and assume it at another, either with expectation of return (call) or without such expectation (jump). *See also:* call; jump. (C) 610.12-1990

(6) (STEbus) The movement of a single byte of data from the current master to the addressed slave(s) or from the addressed slave to the master. (C/MM) 1000-1987r

(7) The successful movement of a bit or bits between an MTM-Bus Master module and one or more modules co-connected by the MTM-Bus. (TT/C) 1149.5-1995

(8) To transmit, or copy, information from one device to another. (IM/ST) 1451.2-1997

transfer admittance (1) (linear passive networks) A transmittance for which the excitation is a voltage and the response is a current. (CAS) 156-1960w

(2) (from the ith terminal to the jth terminal of an n-terminal network) The (complex) current flowing to the ith terminal divided by the (complex) voltage applied between the jth terminal with respect to the reference point when all other terminals have arbitrary terminations. For example, for a 3-terminal network terminated in short circuits,

$$y_{12} = \left.\frac{I}{v}\right|_{v_1} = 0$$

transfer alignment (navigation aids) A method of transfer of reference coordinates to an inertial navigation system for initial alignment. Accomplished by way of: structure to structure mating, simultaneous measurement of acceleration patterns, or by optical measurement techniques. (AES/GCS) 172-1983w

transfer capability The capacity and ability of a transmission network to allow for the reliable movement of electric power from an area of supply to an area of need. (PE/PSE) 858-1993w

transfer characteristic (1) (electron tube) A relation, usually shown by a graph, between the voltage of one electrode and the current to another electrode, all other electrode voltages being maintained constant. *See also:* electrode. (ED) 161-1971w

(2) (camera tubes) A relation between the illumination on the tube and the corresponding signal output current, under specified conditions of illumination. *Note:* The relation is usually shown by a graph of the logarithm of the signal output current as a function of the logarithm of the illumination. *See also:* illumination; television; sensitivity. (ED) 161-1971w

transfer check (electronic computation) A check (usually an automatic check) on the accuracy of a data transfer. *Note:* In particular, a check on the accuracy of the transfer of a word. (C) 162-1963w

transfer constant *See:* image transfer constant.

transfer contacts For reactance-type LTCs, a set of contacts that makes and breaks current. *Note:* In cases where no bypass contacts are provided, the transfer contact is a continuous current carrying contact. (PE/TR) C57.131-1995

transfer control *See:* jump.

transfer current (gas tube) The current to one electrode required to initiate breakdown to another electrode. *Note:* The transfer current is a function of the voltage of the second electrode. (ED) 161-1971w

transfer-current ratio (linear passive networks) A transmittance for which the variables are currents. *Note:* The word transfer is frequently dropped in present usage. (CAS) 156-1960w

transfer function (1) (seismic qualification of Class 1E equipment for nuclear power generating stations) A complex frequency response function that defines the dynamic characteristics of a constant parameter linear system. For an ideal system, the transfer function is the ratio of the Fourier transform of the output to that of a given input. (PE/NP) 344-1987r

(2) (control system feedback) A mathematical, graphic, or tabular statement of the influence that a system or element has on a signal or action compared at input and at output terminals. *Note:* For a linear system, general usage limits the transfer function to mean the ratio of the Laplace transform of the output to the Laplace transform of the input in the absence of all other signals, and with all initial conditions zero. *See also:* transfer function; feedback control system. (IM/PE/EDPG) [120], [3]

(3) (low-power wide-band transformers) The complex ratio of the output of the device to its input. It is also the combined phase and frequency responses. (MAG/PEL/ET) 264-1977w, 111-1984w

(4) (nuclear power generating station) A mathematical, graphical, or tabular statement of the influence which a module has on a signal or action compared at input and at output terminals. This should be specified as to whether it is transient or steady state. (PE/NP) 381-1977w

(5) (excitation systems) A mathematical, graphical, or tabular statement of the influence which a system or element has on a signal or action compared at input and output terminals. *Note:* For a linear system, general usage limits the transfer function to mean the ratio of the Laplace transform of the output to the Laplace transform of the input in the absence of all other signals, and with all initial conditions zero. (PE/EDPG) 421A-1978s

(6) The relationship between the input and output signals of a circuit, especially when expressed as a continuous mathematical function. (C) 610.10-1994w

(7) The ratio of the device output signal (voltage, current, frequency, meter reading, etc.) to the incident field or field vector of interest in the Frequency Domain. The transfer function is the Laplace (or Fourier) transform of the impulse response function. (EMC) 1309-1996

(8) [$H(f)$] The quantity $Y(f)$ divided by $X(f)$, where $Y(f)$ and $X(f)$ are the frequency domain representations of the output and input signals respectively. (PE/PSIM) 4-1995

(9) (fiber optics) (of a device) The complex function, $H(f)$, equal to the ratio of the output to input of the device as a function of frequency. The amplitude and phase responses are, respectively, the magnitude of $H(f)$ and the phase of $H(f)$. *Notes:* 1. For an optical fiber, $H(f)$ is taken to be the ratio of output optical power to input optical power as a function of modulation frequency. 2. For a linear system, the transfer function and the impulse response $h(t)$ are related through the Fourier transform pair, a common form of which is given by

$$H(f) = \int_{-\infty}^{\infty} h(t)^{(i2\pi ft)}\mathrm{d}t$$

$$h(t) = \int_{-\infty}^{\infty} H(f)^{(-2\pi ft)}\mathrm{d}f$$

where f is frequency. Often $H(f)$ is normalized to $H(0)$ and $h(t)$ to

$$\int_{-\infty}^{\infty} h(t)\mathrm{d}t,$$

which by definition is $H(0)$. *Synonyms:* baseband response function; frequency response. *See also:* impulse response. (Std100) 812-1984w

transfer immittance *See:* transmittance.

transfer impedance (linear passive networks) A transmittance for which the excitation is a current and the response is a voltage. *Note:* It is therefore the impedance obtained when the response is determined at a point other than that at which the driving force is applied, all terminals being terminated in any specified manner. In the case of an electric circuit, the response would be determined in any branch except that in which the driving force is. *See also:* network analysis; self-impedance. (CAS) 156-1960w

(2) (A) (linear passive networks) (general). A transmittance for which the excitation is a current and the response is a voltage. **(B)** (from the ith terminal to the jth terminal of an n- terminal network). The (complex) voltage measured between the ith terminal and the reference point divided by the (complex) current applied to the jth terminal when all other terminals have arbitrary terminations. For example, for a 3-terminal network terminated in open circuits

$$Z_{12} = \left.\frac{V_1}{I_2}\right|_{I_1} = 0$$

(CAS/PE/EM) 95-1977

transfer instruction *See:* branch instruction.

transfer instrument (radiation protection) Instrument or dosimeter exhibiting high precision which has been standardized against a national or derived standardized source. (NI) N323-1978r

transfer interpreter A device that prints on a punch card the characters corresponding to hole patterns punched in another card. *See also:* interpreter. (C) 610.10-1994w

transfer lag *See:* first-order lag; multiorder lag.

transfer line size The size of the block of data transferred to or from main memory in a caching environment. (C/BA) 896.4-1993w

transfer locus (linear system or element) A plot of the transfer function as a function of frequency in any convenient coordinate system. *Note:* A plot of the reciprocal of the transfer function is called the inverse transfer locus. *See also:* phase locus; feedback control system. (IM) [120]

transfer of control *See:* jump.

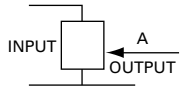
transfer operation The bus operation in which a bus owner transfers data on the parallel system bus. *See also:* bus operation; bus owner. (C/MM) 1296-1987s

transfer rate The average number of bits, characters, or blocks per unit time passing between corresponding devices in a data transmission system. It is expressed in terms of bits, characters, or blocks per second, minute, or hour. *Synonym:* data rate. (C) 610.7-1995

transfer ratio A dimensionless transfer function. (Std100) 270-1966w

transfer ratio correction (correction to setting) The deviation of the output phasor from nominal, in proportional parts of the input phasor.

$$\frac{\text{Output}}{\text{Input}} = A + \alpha + j\beta$$



A = setting
α = in-phase transfer ratio correction
β = quadrature transfer ratio correction

transferred charge The net electric charge transferred from one terminal of a capacitor to another via an external circuit. *See also:* nonlinear capacitor. (ED) [46]

transferred-charge characteristic (nonlinear capacitor) The function relating transferred charge to capacitor voltage. *See also:* nonlinear capacitor. (ED) [46]

transferred information *See:* transinformation.

transferred jitter The amount of jitter in the recovered clock of the upstream PHY which is subsequently transferred to the downstream PHY which in turn is transferred to the next downstream PHY. Transferred jitter is important because each PHY must both limit the amount of jitter it generates and track the jitter delivered by the upstream PHY. (C/LM) 8802-5-1998

transferred voltage (1) That voltage between points of contact, hand to foot or feet, where the grounded surface touched is intentionally grounded at a remote point (or unintentionally touching at a remote point a conductor connected to the station ground system). Here the voltage rise encountered due to ground fault conditions may equal or exceed the ground potential rise of the ground grid discharging the fault current (and not a fraction of this total as is encountered in the usual touch contact). (PE/EDPG) 665-1995

(2) A special case of the touch voltage where a voltage is transferred into or out of the substation from or to a remote point external to the substation site. (PE/SUB) 1268-1997, 80-2000

transferring (as applied to fall protection) The act of moving from one distinct object to another (e.g., between an aerial device and a structure). (NESC/T&D/PE) C2-1997, 1307-1996

transfer standard A term that refers to an electrically small field probe or field sensor. This can be a short dipole for sensing E-fields or a small loop for H-fields, which has a known response over a given range of frequency and amplitude. This known response can be either accurately calculable quasi-static response parameters or a calibration performed to some specified accuracy and precision by an accredited calibration facility. (EMC) 1309-1996

transfer standards, alternating-current–direct-current Devices used to establish the equality of a root-mean-square current or voltage (or the average value of alternating power) with the corresponding steady-state direct-current quantity that can be referred to the basic standards through potentiometric techniques. *See also:* auxiliary device to an instrument. (ELM) C12.1-1982s

transfer state A state of a Link Layer Controller the name of which begins with the letters "XFER". Such states in the MTM-Bus Master Link Layer Controller are called M-transfer states and in the MTM-Bus Slave Link Layer Controller are called S-transfer states. (TT/C) 1149.5-1995

transfer switch (1) (emergency and standby power) A device for transferring one or more load conductor connections from one power source to another. (IA) [18]

(2) (a high-voltage switch) A switch arranged to permit transferring a conductor connection from one circuit to another without interrupting the current.

1) A tandem transfer switch is a switch with two blades, each of which can be moved into or out of only one contact.
2) A double-blade double-throw transfer switch is a switch with two blades, each of which can be moved into or out of either of two contacts.

Note: In contrast to high-voltage switches, many low-voltage, control and instrument transfer switches interrupt current during transfer. *See also:* automatic transfer equipment; selector switch. (SWG/PE) C37.100-1992

transfer switch, load *See:* load transfer switch.

transfer time (1) (A) (gas tube surge arresters) The time required for the voltage across a conducting gap to drop into the arc region after the gap initially begins to conduct. **(B)** The time duration of the transverse voltage. (PE/SPD) [8], C62.31-1987

(2) The part of access time attributed to the time between the beginning of a transfer of data to or from storage and its completion. (C) 610.10-1994w

(3) (uninterruptible power supply) The time that it takes an uninterruptible power supply to transfer the critical load from the output of the inverter to the alternate source, or back again. (IA/PSE) 1100-1999

transfer time, relay *See:* relay transfer time.

transfer trip (1) A form of remote trip in which a communication channel is used to transmit a trip signal from the relay location to a remote location. (SWG/PE) C37.100-1992

(2) The sending of a TRIP signal via a communication channel to a remote line terminal. (PE/PSR) C37.113-1999

transform analysis A software development technique in which the structure of a system is derived from analyzing the flow of data through the system and the transformations that must be performed on the data. *Synonyms:* transformation analysis; transform-centered design. *See also:* rapid prototyping; transaction analysis; data structure-centered design; structured design; stepwise refinement; modular decomposition; input-process-output; object-oriented design. (C) 610.12-1990

transformation A segment attribute that determines the translation, scaling, and rotation applied to a segment when it is displayed on a display surface. (C) 610.6-1991w

transformation analysis *See:* transform analysis.

transformation function A mapping function that performs graphical coordinate transformations such as scaling, rotation, and translation. (C) 610.6-1991w

transform-centered design *See:* transform analysis.

transformer (1) A device, which when used, will raise or lower the voltage of alternating current of the original source. (NESC/NEC) [86]

(2) (power and distribution transformers) A static electric device consisting of a winding, or two or more coupled windings, with or without a magnetic core, for introducing mutual coupling between electric circuits. Transformers are extensively used in electric power systems to transfer power by electromagnetic induction between circuits at the same frequency, usually with changed values of voltage and current. (PE/TR) C57.12.80-1978r

(3) (failure data for power transformers and shunt reactors) A static electric device consisting of a winding, or two or more coupled windings, with or without a magnetic core, for introducing mutual coupling between electric circuits. *Note:* The transformer includes all transformer-related components, such as bushings, LTCs, fans, temperature gauges, etc, and excludes all system-related components, such as surge arresters, grounding resistors, high voltage switches, low-voltage switches, and house service equipment. (PE/TR) C57.117-1986r

(4) An inductive electrical device which uses electromagnetic energy to transform voltage and current levels within a circuit. (C) 610.10-1994w

(5) *See also:* transformer coupled; dry-type encapsulated water-cooled transformer; liquid-filled, or liquid-cooled transformer; dry-type transformer. (IA) 668-1987w

transformer, alternating-current arc welder *See:* alternating-current arc welder transformer.

transformerboard Pressboard specifically manufactured for use as transformer dielectric insulation. (PE/TR) 1276-1997

transformer category definitions (distribution, power and regulating transformers) n/a. *Note:* All kVA ratings are minimum nameplate kVA for the principal windings. Category I includes distribution transformers manufactured in accordance with ANSI C57.12.20-1974, Requirements for Overhead-Type Distribution Transformers 67 000 Volts and Below; 500 kVA and Smaller, up through 500 kVA, single phase or three phase. In addition, autotransformers of 500 equivalent two-winding kVA or less that are manufactured as distribution transformers in accordance with ANSI C57.12.20-1974 are included in Category I, even through their nameplate kVAs may exceed 500. (PE/TR) C57.12.00-1987s

transformer class designations *See:* oil-immersed transformer.

transformer, constant-voltage *See:* constant-voltage transformer.

transformer correction factor (TCF) The ratio of the true watts or watthours to the measured secondary watts or watthours, divided by the marked ratio. *Note:* The transformer correction factor for a current or voltage transformer is the ratio correction factor multiplied by the phase angle correction factor for a specified primary circuit power factor. The true primary watts or watthours are equal to the watts or watthours measured, multiplied by the transformer correction factor and the marked ratio. The true primary watts or watthours, when measured using both current and voltage transformers, are equal to the current transformer ratio correction factor multiplied by the voltage transformer ratio correction factor multiplied by the marked ratios of the current and voltage transformers multiplied by the observed watts or watthours. It is usually sufficiently accurate to calculate true watts or watthours as equal to the product of the two transformer correction factors multiplied by the marked ratios multiplied by the observed watts or watthours. (PE/TR) C57.13-1993, C57.12.80-1978r, [57]

transformer coupled (electrical heating applications to melting furnaces and forehearths in the glass industry) The power modulation device is connected in the primary circuit of a transformer whose secondary circuit is connected to the glass. (IA) 668-1987w

transformer, dry-type *See:* dry-type transformer.

transformer, energy-limiting *See:* energy-limiting transformer.

transformer equipment rating A volt-ampere output together with any other characteristics, such as voltage, current, frequency, and power factor, assigned to it by the manufacturer. *Note:* It is regarded as a test rating that defines an output that can be taken from the item of transformer equipment without exceeding established temperature-rise limitations, under prescribed conditions of test and within the limitations of established standards. *See also:* duty. (PE/TR) [57]

transformer, grounding *See:* grounding transformer.

transformer grounding switch and gap (capacitance potential devices) Consists of a protective gap connected across the capacitance potential device and transformer unit to limit the voltage impressed on the transformer and the auxiliary or shunt capacitor, when used; and a switch that when closed removes voltage from the potential device to permit adjustment of the potential device without interrupting high-voltage line operation and carrier-current operation when used. *See also:* outdoor coupling capacitor. (PE/EM) 43-1974s

transformer, group-series loop insulating *See:* group-series loop insulating transformer.

transformer, high-power-factor *See:* high-power−factor transformer.

transformer, high-reactance *See:* high-reactance transformer.

transformer, ideal *See:* ideal transformer.

transformer, individual-lamp insulating *See:* individual-lamp insulating transformer.

transformer, insulating *See:* insulating transformer.

transformer insulation life For a given temperature of the transformer insulation, the total time between the initial state for which the insulation is considered new and the final state for which dielectric stress, short circuit stress, or mechanical movement, which could occur in normal service, and would cause an electrical failure. (PE/TR) C57.91-1995

transformer integrally mounted cable terminating box A weatherproof air-filled compartment suitable for enclosing the sidewall bushings of a transformer and equipped with any one of the following entrance devices:

a) Single or multiple-conductor potheads with couplings or wiping sleeves;
b) Wiping sleeves;

c) Couplings with or without stuffing boxes for conduit-enclosed cable, metallic-sheathed cable, or rubber-covered cable.

(PE/TR) [108]

transformer, interphase *See:* interphase transformer.

transformer, isolating *See:* isolating transformer.

transformer, line *See:* line transformer.

transformer loss The ratio of the signal power that an ideal transformer would deliver to a load, to the power delivered to the same load by the actual transformer, both transformers having the same impedance ratio. *Note:* Transformer loss is usually expressed in decibels. *See also:* transmission loss. (COM/SP) 151-1965w

transformer-loss compensator (metering) A passive electric network that adds to or subtracts from the meter registration to compensate for predetermined iron and copper losses of transformers and transmission lines. (ELM) C12.1-1988

transformer, low-power factor *See:* low-power factor transformer.

transformer, matching *See:* matching transformer.

transformer, network *See:* network transformer.

transformer, nonenergy-limiting *See:* nonenergy-limiting transformer.

transformer, oil-immersed *See:* oil-immersed transformer.

transformer, outdoor *See:* outdoor transformer.

transformer overcurrent tripping *See:* overcurrent release; indirect release.

transformer, phase-shifting *See:* phase-shifting transformer.

transformer, pole-type *See:* pole-type transformer.

transformer, protected outdoor *See:* protected outdoor transformer.

transformer-rated electromechanical watthour meter A transformer-rated electromechanical watthour meter is one in which the terminals are arranged for connection to the secondary windings of external instrument transformers. (ELM) C12.10-1987

transformer-rectifier, alternating-current–direct-current arc welder A combination of static rectifier and the associated isolating transformer, reactors, regulators, control, and indicating devices required to produce either direct or alternating current suitable for arc-welding purposes. (EEC/AWM) [91]

transformer-rectifier, direct-current arc welder A combination of static rectifiers and the associated isolating transformer, reactors, regulators, control, and indicating devices required to produce direct current suitable for arc welding. (EEC/AWM) [91]

transformer relay A relay in which the coils act as a transformer. (EEC/PE) [119]

transformer removable cable-terminating box A weatherproof air-filled compartment suitable for enclosing the sidewall bushings of a transformer and equipped with mounting flange(s) (one or two) to accommodate either single-conductor or multiconductor potheads or entrance fittings, depending upon the type of cable termination to be used and the number of three-phase cable circuits (one or two) to be terminated. (PE/TR) [107]

transformer secondary current rating *See:* secondary current rating.

transformer, series *See:* series transformer.

transformer, series street-lighting *See:* series street-lighting transformer.

transformer, series street-lighting, rating The lumen rating of the series lamp, or the wattage rating of the multiple lamps, that the transformer is designed to operate. *See also:* specialty transformer. (PE/TR) [57]

transformer short-circuit impedance (A) For Category I and Category II transformers, the transformer impedance, expressed in percent on the transformer's rated voltage and rated base kilovoltamperes. **(B)** For Category III and Category IV transformers, the sum of transformer impedance and system short-circuit impedance at the transformer location, expressed in percent on the transformer's rated voltage and rated base kilovoltamperes. (PE/TR) C57.109-1993

transformer, shunt *See:* shunt transformer.

transformer, specialty *See:* specialty transformer.

transformer, station-type *See:* station-type transformer.

transformer undercurrent tripping *See:* undercurrent release; indirect release.

transformer vault An isolated enclosure either above or below ground with fire-resistant walls, ceiling, and floor, in which transformers and related equipment are installed, and which is not continuously attended during operation. *See also:* vault. (NESC) C2-1997

transformer, vault-type *See:* vault-type transformer.

transformer voltage (of a network protector) The voltage between phases or between phase and neutral on the transformer side of a network protector. (SWG/PE) C37.100-1992

transforming station (power operations) A station where power is transformed from one voltage level to another. (PE/PSE) 858-1987s

transhorizon tropospheric propagation Tropospheric propagation between two points, the reception point being beyond the radio horizon of the transmission point. Transhorizon propagation includes a variety of possible propagation mechanisms such as diffraction, scattering, ducting, refraction and reflection. *See also:* tropospheric scatter propagation. (AP/PROP) 211-1997

transient (1) (cable systems in substations) A change in the steady-state condition of voltage or current, or both. As used in this guide, transients occurring in control circuits are a result of rapid changes in the power circuits to which they are coupled. The frequency, damping factor, and magnitude of the transients are determined by resistance, inductance, and capacitance of the power and control circuits and the degree of coupling. Voltages as high as 10 kV in the frequency range of 0.3–3.0 MHz have been observed where little or no protection was provided. Transients may be caused by a lightning stroke, a fault, or by switching operation, such as the opening of a disconnect, and may readily be transferred from one conductor to another by means of electrostatic or electromagnetic coupling. 382-1987

(2) (industrial power and control) That part of the change in a variable that disappears during transition from one steady-state operating condition to another. *Note:* Using the term to mean the total variation during the transition between two steady states is deprecated. (IA) [18]

(3) (excitation systems) In a variable observed during transition from one steady-state operating condition to another, that part of the variation which ultimately disappears. *Note:* ANSI C85 deprecates using the term to mean the total variable during the transition between two steady-states. (PE/EDPG) 421A-1978s

(4) Any disturbance with a duration of less than a few cycles. *See also:* swell; notch; sag; surge. (T&D/PE) 1250-1995

(5) A fault or error resulting from temporary environmental conditions. (C/BA) 896.9-1994w

(6) That part of the change in a variable, such as voltage, current, or speed, which may be initiated by a change in steady-state conditions or an outside influence, that decays and/or disappears following its appearance. (IA/PSE) 446-1995

(7) Pertaining to or designating a phenomenon or a quantity which varies between two consecutive steady states during a time interval that is short compared to the time scale of interest. A transient can be a unidirectional impulse of either polarity or a damped oscillatory wave with the first peak occurring in either polarity. (SCC22) 1346-1998

(8) A subcycle disturbance in the ac waveform that is evidenced by a sharp, brief discontinuity of the waveform. May be of either polarity and may be additive to, or subtractive

from, the nominal waveform. *See also:* notch; overvoltage; swell. (IA/PSE) 1100-1999

(9) A momentary departure of a characteristic from steady-state conditions and back to steady state conditions as a result of a system disturbance. Normal transients occur as a result of normal disturbances such as load or line changes. Abnormal transients result from abnormal disturbances such as a power interruption or wire fault. (PEL) 1515-2000

transient adaptation factor (illuminating engineering) A factor which reduces the equivalent contrast due to readaptation from one luminous background to another. (EEC/IE) [126]

transient analyzer An electronic device for repeatedly producing in a test circuit a succession of equal electric surges of small amplitude and of adjustable waveform, and for presenting this waveform on the screen of an oscilloscope. *See also:* oscillograph. (EEC/PE) [119]

transient blanking *See:* chopping transient blanking.

transient blocking A circuit function that blocks tripping during the interval in which an external fault is being cleared. (SWG/PE) C37.100-1992

transient-cause forced outage (electric power system) A component outage whose cause is immediately self-clearing so that the affected component can be restored to service either automatically or as soon as a switch or circuit breaker can be reclosed or a fuse replaced. *Note:* An example of a transient-cause forced outage is lightning flashover that does not permanently disable the flashed component. *See also:* outage. (PE/PSE) [54]

transient-cause forced outage duration (electric power system) The period from the initiation of the outage until the affected component is restored to service by switching or fuse replacement. *See also:* outage. (PE/PSE) [54]

transient critical component temperatures The temperature that a semiconductor critical component may reach for a short (transient) period of time. (C/BA) 14536-1995

transient current (A) (rotating machinery) The current under nonsteady conditions. **(B) (rotating machinery)** The alternating component of armature current immediately following a sudden short-circuit, neglecting the rapidly decaying component present during the first few cycles. (PE) [9]

transient-decay current (photoelectric device) The decreasing current flowing in the device after the irradiation has been abruptly cut off. *See also:* phototube. (ED) [45]

transient deviation (control) The instantaneous value of the ultimately controlled variable minus its steady-state value. *Synonym:* transient overshoot. *See also:* deviation. (PE/IA/EDPG/IAC) 421-1972s, [60]

transient discharge An electric discharge of momentary nature, resulting from a sudden change in the electric-circuit voltage or current. The discharge may be energized via electric, magnetic, or electromagnetic field induction. *Note:* In many cases, the sudden change in the electric circuit is the result of an insulation breakdown of a small gap, such as between an energized object and a person attempting to grasp it. When the open-circuit voltage is high, the transient discharge may be initiated by a spark. For low open-circuit voltage, physical contact may produce the transient discharge without any associated spark. (T&D/PE) 539-1990

transient discharge perception threshold The level of transient discharge that is perceptible for 50% of the subject population. *Note:* The threshold varies considerably for various contact areas and transient discharge characteristics. Individual responses vary greatly from the mean thresholds, and different levels are obtained for men, women, and children. (T&D/PE) 539-1990

transient electrical noise An electrical disturbance that occurs in a time interval separated from other interferences. Transient electrical noise may be superimposed on other transients or on continuous waves. Transient electrical noise may be of several types, such as pulse, step, or oscillatory. It may occur as a response to a network to one of these types. Sources of transients affecting low voltage circuits are impulse noise, power switching, or lightning. (PE/IC) 1143-1994r

transient enclosure voltage (TEV) Very fast transient phenomena, which are found on the grounded enclosure of GIS systems. Typically, ground leads are too long (inductive) at the frequencies of interest to effectively prevent the occurrence of TEV. The phenomenon is also known as transient ground rise (TGR) or transient ground potential rise (TGPR). (PE/SUB) 80-2000

transient error (1) An error that occurs once, or at unpredictable intervals. *See also:* intermittent fault; random failure. (C) 610.12-1990

(2) A storage error in which data is retrieved incorrectly by the first read operation, but a second read operation is successful. *Contrast:* soft error; hard error. (C) 610.10-1994w

transient fault (1) (surge arresters) A fault that disappears of its own accord. (PE) [9], [84]

(2) A nonrecurring temporary error caused by temporary environmental conditions. (C/BA) 896.3-1993w

transient forced outage (1) A forced outage where the unit or component is undamaged and is restored to service automatically. (PE/PSE) 859-1987w

(2) (electric power system) An outage whose cause is immediately self-clearing so that the affected component can be restored to service either automatically or as soon as a switch or circuit breaker can be reclosed or a fuse replaced. *Notes:* 1. An example of a transient forced outage is a lightning flashover which does not permanently disable the flashed component. 2. This definition derives from transmission and distribution applications and does not necessarily apply to generation outages. (PE/PSE) 346-1973w

transient forced outage duration (electric power system) The period from the initiation of the outage until the component is restored to service by switching or fuse replacement. *Note:* Thus transient forced outage duration is really switching time. (PE/PSE) 346-1973w

transient inrush current Current that results when a switching device is closed to energize a capacitance or an inductive circuit. *Note:* Current is expressed by the highest peak value in amperes and frequency in hertz. (SWG/PE) C37.100-1992

transient insulation level (power and distribution transformers) An insulation level expressed in kilovolts of the crest value of the withstand voltage for a specified transient wave shape; that is, lightning or switching impulse. (PE/TR) C57.12.80-1978r

transient internal voltage (synchronous machines) (for any specified operating condition) The fundamental-frequency component of the voltage of each armature phase that would be determined by suddenly removing the load, without changing the excitation voltage applied to the field, and extrapolating the envelope of the voltage back to the instant of load removal, neglecting the voltage components of rapid decrement that may be present during the first few cycles after removal of the load. *Note:* The transient internal voltage, as shown in the phasor diagram, is related to the terminal-voltage and phase-current phasors by the equation

$$\mathrm{E}_i' = \mathrm{E}_a + R\mathrm{I}_a + jX_d'\mathrm{I}_{ad} + jX_q'\mathrm{I}_{aq}$$

For a machine subject to saturation, the reactances should be determined for the degree of saturation applicable to the specified operating condition. *See also:* phasor diagram; direct-axis synchronous reactance. (PE) [9]

transient motion (audio and electroacoustics) Any motion that has not reached or that has ceased to be a steady state. (SP) [32]

transient network analyzer (TNA) An analog test circuit representing a scaled down version of the pertinent power circuit components, used mainly for control response and performance testing. (SUB/PE) 1303-1994

transient overshoot An excursion beyond the final steady-state value of output as the result of a step-input change. *Note:* It is usually referred to as the first such excursion; expressed as

a percent of the steady-state output step. *See also:* accuracy rating; feedback control system. (EEC/EMI) [112]

transient overvoltage (1) A short-duration highly damped, oscillatory or nonoscillatory overvoltage, having a duration of few milliseconds or less. Transient overvoltage is classified as one of the following types: lightning, switching and very fast front, short duration. (PE/C) 1313.1-1996

(2) The peak voltage during the transient conditions resulting from the operation of a switching device. *Note:* The location and units of measurement are specified in apparatus standards. *See also:* transient overvoltage ratio. (SWG/PE) C37.100-1992

transient overvoltage ratio (factor) The ratio of the transient overvoltage to the closed-switching device operating line-to-neutral peak voltage with the load connected. *Note:* The location of measurement is specified in the apparatus standards. (SWG/PE) C37.100-1992

transient overvoltages Momentary excursions of voltage outside of the normal 60 Hz voltage wave. *Synonym:* spikes. (IA/PSE) 241-1990r

transient performance (synchronous-machine regulating system) The performance under a specified stimulus, before the transient expires. (PE) [9]

transient phenomena (rotating machinery) Phenomena appearing during the transition from one operating condition to another. (PE) [9], [84]

transient reactance (1) (electric power systems in commercial buildings) Determines the current flowing during the period when the subtransient reactance is the controlling value. (IA/PSE) 241-1990r

(2) (power fault effects) The reactance of a generator between the subtransient and synchronous states. This reactance is used for the calculation of the symmetrical fault current during the period between the subtransient and steady states. The current decreases continuously during this period but is assumed to be steady at this value for approximately 0.25 s. (PE/PSC) 367-1996

transient read *See:* dirty read.

transient recovery voltage (TRV) (1) The voltage transient that occurs across the terminals of a pole of a switching device upon interruption of the current flowing through the pole. *Note:* It is the difference between and in some cases the sum of the transient voltages to ground occurring on the terminals. The term "transient recovery voltage" is usually designated as TRV, and may refer to inherent TRV, modified inherent TRV, or actual TRV, as defined elsewhere. In a multipole switching device, the term is usually applied to the voltage across the first pole to interrupt in a three-phase ungrounded test, but not necessarily the first phase to interrupt when tested with a three-phase or multigrounded fault. For switching devices having several interrupting units in series, the term may be applied to the voltage across units or groups of units. (SWG) C37.04E-1985w, C37.4D-1985w, C37.100B-1981w

(2) The voltage transient that occurs across the terminals of a pole of a circuit switching device upon interruption of the current. *Note:* TRV is the difference between the transient voltages to ground occurring on the terminals. The term may refer to a circuit TRV, a modified circuit TRV, or an actual TRV. (SWG/PE) C37.40-1993

(3) The voltage transient that occurs across the terminals of a pole of a switching device upon interruption of the current. *Note:* TRV is the difference between transient voltages to ground occurring on the terminals. The term *transient recovery voltage* is usually designated as TRV, and may refer to inherent TRV, modified inherent TRV, or actual TRV as defined elsewhere. In a multiple switching device, the term is usually applied to the voltage across the first pole to interrupt. For switching devices having several interrupting units in series, the term may be applied to the voltage across units or groups of units. (SWG/PE/IA/PSP) C37.100-1992, 1015-1997

transient recovery voltage rate The rate at which the voltage rises across the terminals of a pole of a circuit-switching device upon interruption of the current. *Note:* The transient recovery voltage rate is usually determined by dividing the voltage at one of the crests of the TRV by the time from current zero to that crest. In case no definite crest exists, the rate may be taken to some stated value usually arbitrarily selected as a certain percentage of the crest value of the normal-frequency recovery voltage. In case the transient is an exponential function, the rate may also be taken at the point of zero voltage. It is the rate of rise of the algebraic difference between the transient voltages occurring on the terminals of the switching device upon interruption of the current. The transient recovery voltage rate may be a circuit transient recovery voltage rate or a modified circuit transient recovery voltage rate, or an actual transient recovery voltage rate according to the type of transient from which it is obtained. When giving actual transient recovery voltage rates, the points between which the rate is measured should be definitely stated. (SWG/PE) C37.100-1992

transient response (1) (excitation systems) A typical transient response of a feedback control system is shown below. The principal characteristics of interest are the rise time, overshoot, and settling time as indicated. *Note:* In some applications, the time to attain 10% of steady-state value is of interest. This time may be appreciable even though the delay time may be very small or even zero. (PE/EDPG) 421A-1978s

(2) (oscilloscopes) Time-domain reactions to abruptly varying inputs. (IM) 311-1970w

(3) (of a relay) The manner in which a relay, relay unit, or relay system responds to a sudden change in the input. (SWG/PE) C37.100-1992

transient speed deviation (A) (gas turbines) *load decrease.* The maximum instantaneous speed above the steady-state speed occurring after the sudden decrease from one specified steady-state electric load to another specified steady-state electric load having values within limits of the rated output of the gas-turbine-generator unit. It is expressed in percent of rated speed. **(B) (gas turbines)** *load increase.* The minimum instantaneous speed below the steady-state speed occurring after the sudden increase from one specified steady-state electric load having values within the limits of rated output of the gas-turbine-generator unit. It is expressed in percent of rated speed. (PE/EDPG) 282-1968, [5]

transient stability A condition that exists in a power system if, after an aperiodic disturbance, the system regains steady-state stability. *See also:* alternating-current distribution. (T&D/PE) [10]

transient stability factor (system or part of a system) The ratio of the transient stability limit to the nominal power flow at the point of the system to which the stability limit is referred. *See also:* stability factor; alternating-current distribution. (T&D/PE) [10]

transient stability limit (transient 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 transient stability. *See also:* alternating-current distribution. (T&D/PE) [10]

transient suppression networks Capacitors, resistors, or inductors so placed as to control the discharge of stored energy banks. They are commonly used to suppress transients caused by switching. (PEL/ET) 295-1969r

transient thermal impedance (semiconductor devices) The change in the difference between the virtual junction temperature and the temperature of a specified reference point or region at the end of a time interval divided by the step function change in power dissipation at the beginning of the same time interval which causes the change of temperature-difference. *Note:* It is the thermal impedance of the junction under conditions of change and is generally given in the form of a curve as a function of the duration of an applied pulse. *See also:* semiconductor rectifier stack; principal voltage-current characteristic. (ED) [46]

transient thermal rating The transient thermal rating is that final current (I_f) that yields the maximum allowable conductor temperature (T_{max}) in a specified time after a step change in electrical current from some initial current, I_i. (T&D/PE) 738-1993

transient voltage capability (thyristor) Rated nonrepetitive peak reverse voltage. The maximum instantaneous value of any nonrepetitive transient reverse voltage that may occur across a thyristor without damage. (IA/IPC) 428-1981w

transient voltage surge suppressor (TVSS) A device that functions as a surge protective device (SPD) or surge suppressor. (IA/PSE) 1100-1999

transimpedance (of a magnetic amplifier) The ratio of differential output voltage to differential control current. (MAG) 107-1964w

transinformation (of an output symbol about an input symbol) The difference between the information content of the input symbol and the conditional information content of the input symbol given the output symbol. *Notes:* 1. If x_i is an input symbol and y_j is an output symbol, the transinformation is equal to

$$[-\log p(x_i)] - [-\log p(x_i|y_j)]$$

$$= \log \frac{p(x_i|y_j)}{p(x_i)} = \log \frac{p(x_i,y_j)}{p(x_i)p(y_j)}$$

where $p(x_i|y_j)$ is the conditional probability that x_i was transmitted when y_j is received, and $p(x_i,y_j)$ is the joint probability of x_i and y_j. 2. This quantity has been called transferred information, transmitted information, and mutual information. *See also:* information theory. (IT) [123]

transistor (1) An active semiconductor device with three or more terminals. It is an analog device. (ED) 216-1960w **(2)** A semiconducting device for controlling the flow of current between two terminals, the emitter and the collector, by means of variations in the current flow between a third terminal, the base, and one of the other two. *See also:* logic gate. (C) 610.10-1994w

transistor, conductivity-modulation *See:* conductivity-modulation transistor.

transistor equivalent (A) A model approximating the behavior of an electronic component using only transistors, resistors, capacitors and inductors. **(B)** An approximation of the size of an integrated circuit, counting all circuit elements as transistors or portions thereof. (C) 610.10-1994

transistor, filamentary *See:* filamentary transistor.

transistor, junction *See:* junction transistor.

transistor, point-contact *See:* point-contact transistor.

transistor, point-junction *See:* point-junction transistor.

transistor reset preamplifier An integrating preamplifier in which the charge that accumulates on the feedback capacitor is drained off through a transistor when the charge exceeds a predetermined value. (NPS) 325-1996

transistor-transistor logic (TTL) A family of bipolar integrated circuit logic in which the multiple inputs on gates are provided by multiple transistors. (C) 610.10-1994w

transistor, unipolar *See:* unipolar transistor.

transit (1) (navigation aids) A radio navigation system using low orbit satellites to provide world-wide coverage, with transmissions from the satellites at vhf (very high frequency) and uhf (ultra high frequency), in which fixes are determined from measurements of the Doppler shift of the continuous wave signal received from the moving satellite. (AES/GCS) 172-1983w

(2) An instrument primarily used during construction of a line to survey the route, to set hubs and point on tangent (POT) locations, to plumb structures, to determine downstrain angles for locations of anchors at the pull and tension sites, and to sag conductors. *Synonyms:* site marker; level; scope. (T&D/PE) 524-1992r

transit angle The product of angular frequency and the time taken for an electron to traverse a given path. *See also:* electron emission. (ED) 161-1971w, [45]

transition (1) (A) (data transmission) (signal transmission) The change from one circuit condition to the other, that is, to change from mark to space or from space to mark. **(B) (data transmission)** (waveform) (pulse techniques) A change of the instantaneous amplitude from one amplitude to another amplitude level. **(C) (data transmission)** (transition frequency) (disk recording system) (crossover frequency) (turnover frequency) The frequency corresponding to the point of intersection of the asymptotes to the constant-amplitude and the constant-velocity portions of its frequency response curve. This curve is plotted with output voltage ratio in decibels as the ordinate and the logarithm of the frequency as the abscissa. (PE) 599-1985

(2) (A) (pulse) A portion of a wave or pulse between a first nominal state and a second nominal state. Throughout the remainder of this document the term transition is included in the term pulse and wave. **(B) (pulse)** The region of a pulse in which a major change in amplitude occurs, such as the leading edge (first transition) or final trailing edge (last transition). (NPS) 300-1988

(3) A joint that connects two cable types. A joint on extruded cable rated 46–138 kV connecting an ethylene propylene rubber (EPR) insulated cable to a crosslinked polyethylene (XLPE) or high-molecular-weight polyethylene (HMWPE) insulated cable should be considered a transition joint. (PE/IC) 404-1993

(4) (of a pulse) The region of a pulse in which a major change in amplitude occurs, such as at the leading edge (first transition) or final trailing edge (last transition). (NPS) 325-1996

(5) The change of a logic signal from one state to another (as in ". . .a transition at the input shall cause. . ." or the pair of logic states between which a transition may occur (as in ". . .the delay for a low-to- high transition. . ."). (C/DA) 1481-1999

(6) *See also:* software transition. (C/SE) J-STD-016-1995

transitional mode The change from the nonoperating to the operating mode, caused by switching the input to the relay from the nonoperating to the operating input, or vice versa. (SWG/PE/PSR) C37.100-1992, C37.98-1977s

transition compartment The compartment specifically designed for joining gas-insulated substation equipment of different design or manufacture. This compartment provides the necessary transition for the current-carrying conductor and the gas enclosure. (SWG/PE/SUB) C37.100-1992, C37.122.1-1993, C37.122-1993

transition contacts For resistance-type LTCs, a set of contacts that is connected in series with a transition impedance and makes and breaks current. (PE/TR) C57.131-1995

transition current The current required at a given temperature and duration to cause a current-protective device to change state. (SPD/PE) C62.36-1994

transition density The number of times the stream of bits within an 8B/10B code-group changes its value. (C/LM) 802.3-1998

transition duration (1) (pulse terminology) The duration between the proximal point and the distal point on a transition waveform. (IM/WM&A) 194-1977w

(2) (of a step response) The duration between the proximal point (10%) and the distal point (90%) on the recorded output response transition, for an ideal input step with designated baseline and topline. (IM/WM&A) 1057-1994w

transition frequency (disk recording) The frequency corresponding to the point of intersection of the asymptotes to the constant-amplitude and the constant-velocity portions of its frequency response curve. This curve is plotted with output voltage ratio in decibels as the ordinate and the logarithm of the frequency as the abscissa. *Synonyms:* turnover frequency;

crossover frequency. *See also:* phonograph pickup. (SP) [32]

transition impedance A resistor or reactor consisting of one or more units that bridge adjacent taps for the purpose of transferring load from one tap to the other without interruption or appreciable change in the load current, at the same time limiting the circulating current for the period that both taps are used. Normally, reactance-type LTCs use the bridging position as a service position and, therefore, the reactor is designed for continuous loading. (PE/TR) C57.131-1995

transitioning (as applied to fall protection) The act of moving from one location to another on equipment or a structure. (NESC/T&D/PE) C2-1997, 1307-1996

transition joint (power cable joints) A cable joint which connects two different types of cable. (PE/IC) 404-1986s

transition load (1) (rectifier circuits) The load at which a rectifier unit changes from one mode of operation to another. *Note:* The load current corresponding to a transition load is determined by the intersection of extensions of successive portions of the direct-current voltage-regulation curve where the curve changes shape or slope. *See also:* rectifier circuit element; rectification. (IA) [12]

(2) The load at which a thyristor converter changes from one mode of operation to another. *Note:* The load current corresponding to a transition load is determined by the intersection of extensions of successive portions of the direct-voltage regulation curve where the curve changes shape or slope. (IA/IPC) 444-1973w

transition loss (1) (A) (wave propagation) At a transition or discontinuity between two transmission media, the difference between the power incident upon the discontinuity and the power transmitted beyond the discontinuity that would be observed if the medium beyond the discontinuity were match-terminated. **(B) (wave propagation)** The ratio in decibels of the power incident upon the discontinuity to the power transmitted beyond the discontinuity that would be observed if the medium beyond the discontinuity were match terminated. *See also:* waveguide. (MTT) 146-1980

(2) (junction between a source and a load) The ratio of the available power to the power delivered to the load. Transition loss is usually expressed in decibels. *See also:* waveguide; transmission loss. (MTT) 146-1980w

transition matrix A matrix which maps the state of a linear system at one instant of time into another state at a later instant of time, provided that the system inputs are zero over the closed time interval between the two instants of time. *Note:* This is also the matrix of solutions of the homogeneous equations. *Synonym:* fundamental matrix. (CS/PE/EDPG) [3]

transition point (1) A point in a transmission system at which there is change in the surge impedance. (CAS/PE) [8], [84]

(2) 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. (IM/WM&A) 1057-1994w

transition pulse (pulse waveform) That segment comprising a change from one amplitude level to another amplitude level. *See also:* pulse. (IM/HFIM) [40]

transition region (semiconductor) The region, between two homogeneous semiconductor regions, in which the impurity concentration changes. *See also:* semiconductor; transistor. (AES/SS) 307-1969w

transition shape (A) (pulse terminology) For descriptive purposes a transition waveform may be imprecisely described by any of the adjectives, or combinations thereof, in descriptive adjectives, major (minor); polarity related adjectives; geometrical adjectives, round; and functional adjectives. When so used, these adjectives describe general shape only, and no precise distinctions are defined. **(B) (pulse terminology)** For tutorial purposes, a hypothetical transition waveform may be precisely defined by the further addition of the adjective ideal.

(C) (pulse terminology) For measurement or comparison purposes a transition waveform may be precisely defined by the further addition of the adjective reference. (IM/WM&A) 194-1977

transition time (gas-tube surge protective devices) The time required for the voltage across a conducting gap to drop into the arc region after the gap initially begins to conduct. (SPD/PE) C62.31-1987r

transitive dependency A type of dependency among attributes in a relation, in which a nonprime attribute A is said to be transitively dependent on another attribute B if and only if there is another attribute C that is functionally dependent on B and functionally determining A but not B. *Contrast:* nontransitive dependency. (C) 610.5-1990w

transitron oscillator A negative-transconductance oscillator employing a screen-grid tube with negative transconductance produced by a retarding field between the negative screen grid and the control grid that serves as the anode. *See also:* oscillatory circuit. (AP/ANT) 145-1983s

transit time (1) (electron tube) The time taken for a charge carrier to traverse a given path. *See also:* electron emission. (ED) [45]

(2) (multiplier-phototube) The time interval between the arrival of a delta-function light pulse at the entrance window of the tube and the time at which the output pulse at the anode terminal reaches peak amplitude. *See also:* electron emission; phototube. (ED) 158-1962w

transit-time mode (electron tube) A condition of operation of an oscillator corresponding to a limited range of drift-space transit angle for which the electron stream introduces a negative conductance into the coupled circuit. (ED) 161-1971w

transit-time spread (1) (electron tube) The time interval between the half-amplitude points of the output pulse at the anode terminal, arising from a delta function of light incident on the entrance window of the tube. *See also:* phototube. (ED) 158-1962w

(2) (scintillation counting) The FWHM (full-width-at-half-maximum) of the time distribution of a set of pulses each of which corresponds to the photomultiplier transit time for that individual event. (NPS) 398-1972r

translate (1) (A) To convert expressions in one language to synonymous expressions in another language. **(B)** To encode or decode. *See also:* matrix; translator. (C) 162-1963

(2) (data management) To transform data from one language to another. (C) 610.5-1990w

translation (1) (telecommunications) The process of converting information from one system of representation into equivalent information in another system of representation. (COM) [49]

(2) (computer graphics) The displacement of one or more display elements without rotation, maintaining its orientation. (C) 610.6-1991w

(3) In a single-cable 10BROAD36 system, the process by which incoming transmissions at one frequency are converted into another frequency for outgoing transmission. The translation takes place at the headend. (C/LM) 802.3-1998

translation buffer A set of registers in a memory management unit in which virtual addresses are converted to physical addresses. *Note:* Typically the complete map of translations will not fit into the memory management unit at one time so only a portion are buffered there while the entire map is in main storage. (C) 610.10-1994w

translation loss (playback loss) (reproduction of a mechanical recording) The loss whereby the amplitude of motion of the reproducing stylus differs from the recorded amplitude in the medium. *See also:* phonograph pickup. (SP) [32]

translation manager A facility that maps X event sequences (such as keyboard actions) into widget-supplied functionality (action procedures). (C) 1295-1993w

translator (1) (software) A computer program that transforms a sequence of statements expressed in one language into an

equivalent sequence of statements expressed in another language. *See also:* assembler; compiler. (C) 610.12-1990

(2) (telephone switching systems) Equipment capable of interpreting and converting information from one form to another form. (COM) 312-1977w

(3) (test, measurement, and diagnostic equipment) An automatic means, usually a program, to translate machine language mnemonic symbols for computer operations into true machine language. Memory locations and input-output lines must be written in numerical code, not symbolically. (MIL) [2]

(4) (broadband local area networks) A frequency conversion device located at the headend. Its sole purpose is to provide gain and convert inbound signal frequencies to the outbound frequency range. (LM/C) 802.7-1989r

transliterate (1) (data management) To convert data character-by-character from one character set to another. (C) 610.5-1990w

(2) (data management) To convert the characters of one alphabet to the corresponding characters of another alphabet. (C) [20], [85]

transmissibility Ratio of the response at any one point in the equipment to the input of the equipment at a single frequency. (SWG/PE) C37.100-1992, C37.81-1989r

transmission (1) (data transmission) The electrical transfer of a signal, message, or other form of intelligence from one location to another. (PE) 599-1985w

(2) (laser maser) Passage of radiation through a medium. (LEO) 586-1980w

(3) (illuminating engineering) A general term for the process by which incident flux leaves a surface or medium on a side other than the incident side, without change in frequency. *Note:* Transmission through a medium is often a combination of regular and diffuse transmission. *See also:* regular transmission; diffuse transmission. (EEC/IE) [126]

(4) The propagation of a signal, message, or other form of intelligence by any means, such as optical fiber, wire, or visual means. (C) 610.7-1995, 610.10-1994w

transmission band (uniconductor waveguide) The frequency range above the cutoff frequency. *See also:* waveguide. (MTT) 146-1980w

transmission block character *See:* end of transmission block character.

transmission coefficient (1) (waveguide) (of a network) At a given frequency and for a given mode, the ratio of some quantity associated with the transmitted wave at a specified reference plane to the corresponding quantity in the incident wave at a specified reference plane. *Notes:* 1. The transmission coefficient may be different for different associated quantities, and the chosen quantity must be specified. The voltage transmission coefficient is commonly used and is defined as the complex ratio of the resultant electric field strength (or voltage) to that of the incident wave. Examples of other quantities are power or current. 2. An interface is a special case of a network where the reference planes associated with the incident and transmitted waves become coincident; in this case the voltage transmission coefficient is equal to one plus the voltage reflection coefficient. (MTT) 146-1980w

(2) (multiport) Ratio of the complex amplitude of the wave emerging from a port of a multiport terminated by reflectionless terminations to the complex amplitude of the wave incident upon another port. *See also:* reflection coefficient; scattering coefficient. (IM/HFIM) [40]

(3) *See also:* Fresnel coefficients. (AP/PROP) 211-1997

transmission control character (1) (A) Any control character used to control or facilitate transmission of data. **(B)** Any character transmitted that is not part of the message being transferred, but that is used to control or to facilitate the transfer. *Synonym:* communication control character. (C) 610.5-1990

(2) A control character used to control or facilitate transmission of data between DTEs. (C) 610.7-1995

transmission delay or propagation delay *See:* absolute delay.

transmission detector (1) (charged-particle detectors) (semiconductor radiation detectors) (x-ray energy spectrometers) A totally depleted detector whose thickness including its entrance and exit windows is sufficiently small to permit radiation to pass completely through the detector. (PE/NID/NP) 301-1976s, [124]

(2) (charged-particle detectors) A totally depleted detector in which the thickness, including entrance and exit windows, is sufficiently thin to permit radiation to pass completely through it. (NPS) 300-1988r

transmission error control The process that ensures no errors are introduced while transmitting data between sender and receiver. (C) 610.7-1995

transmission facility (data transmission) The transmission medium and all the associated equipment required to transmit a message. (PE) 599-1985w

transmission factor *See:* Fresnel coefficients.

transmission feeder A feeder forming part of a transmission circuit. *See also:* center of distribution. (T&D/PE) [10]

transmission frequency meter (waveguide) A cavity frequency meter that, when tuned, couples energy from a waveguide into a detector. *See also:* waveguide. (AP/ANT) [35], [84]

transmission format The specified arrangement of delimiter symbols or start and stop symbols and of data bit symbols that constitute a complete transmitted signal frame (PhPDU). Data bit symbols are always arranged in octets (8 b groupings). The definition of the transmission format also includes the selected encoding scheme, which is binary for low-speed operation and Manchester biphase-L for high-speed operation. (EMB/MIB) 1073.4.1-2000

transmission gain (data transmission) General term used to denote an increase in signal power in transmission from one point to another. Gain is usually expressed in decibels and is widely used to denote transducer gain. (PE) 599-1985w

transmission level (data transmission) The ratio of the signal power at any point in a transmission system to the power at some point in the system chosen as a reference point. This ratio is usually expressed in decibels. The transmission level at the transmitting switchboard is frequently taken as the zero level reference point. (PE) 599-1985w

transmission level point (TLP) (1) For a particular point in a transmission system, the design signal level in dB relative to the level at the zero TLP reference point. (COM/TA) 1007-1991r

(2) a point in a transmission system at which the ratio is specified in dB of the power of a test signal at that point to the power of a signal at a reference point. The reference level point, called the zero transmission level point (0 TLP), is an arbitrary established point relative to which transmission levels at all other points are specified. A signal level of X dBm at the 0 TLP is designated X dBm0. (COM/TA) 743-1995

transmission line (1) (A) (data transmission) (signal-transmission system) The conductive connections between system elements which carry signal power; A waveguide consisting of two or more conductors. **(B) (data transmission)** (electric power) A line used for electric power transmission. **(C) (data transmission)** (electromagnetic wave guidance) A system of material boundaries or structures for guiding electromagnetic waves, in the TEM (transverse electromagnetic) mode. Commonly a two-wire or coaxial system of conductors. (PE) 599-1985

(2) (planar transmission lines) A structure designed to guide the propagation of electromagnetic energy in a well-defined direction. For purposes of definition and description relating to wave propagation, planar transmission lines are usually assumed to be of invariant cross section along the direction of propagation. *See also:* load leads. (MTT) 1004-1987w

(3) (waveguide) A system of material boundaries or structures for guiding electromagnetic waves. Frequently, such a system is used for guiding electromagnetic waves, in the TEM mode. Commonly, a two-wire or coaxial system of conductors. *See also:* waveguide. (MTT) 146-1980w

(4) Any overhead line used for electric power transmission with a phase-to-phase voltage exceeding 69 kV and an average conductor height of more than 10 m. (PE/T&D) 1243-1997

transmission-line capacity (electric power supply) The maximum continuous rating of a transmission line. The rating may be limited by thermal considerations, capacity of associated equipment, voltage regulation, system stability, or other factors. *See also:* generating station. (PE/PSE) [54]

transmission line, coaxial *See:* coaxial transmission line.

transmission link The physical unit of a DQDB subnetwork that provides the transmission connection between adjacent nodes. Each transmission link accommodates both buses of the dual bus pair between the adjacent nodes. (LM/C) 8802-6-1994

transmission loss (*L*) (1) (data transmission) In communication, a general term used to denote a decrease in power in transmission from one point to another. Transmission loss is usually expressed in decibels. *Synonym:* loss. (PE) 599-1985w

(2) (A) (electric power system) The power lost in transmission between one point and another. It is measured as the difference between the net power passing the first point and the net power passing the second. **(B) (electric power system)** The ratio in decibels of the net power passing the first point to the net power passing the second. (MTT) 146-1980

(3) (fiber optics) Total loss encountered in transmission through a system. *See also:* attenuation; reflection; transmittance. (Std100) 812-1984w

(4) (of a radio system) The ratio of the power radiated from the transmitting antenna to the resultant power that would be available from a loss-free (but otherwise identical) receiving antenna. (AP/PROP) 211-1997

transmission-loss coefficients (electric power system) Mathematically derived constants to be combined with source powers to provide incremental transmission losses from each source to the composite system load. These coefficients may also be used to calculate total system transmission losses. (PE/PSE) 94-1991w

transmission measuring set (data transmission) A measuring instrument comprising a signal source and a signal receiver having known impedances, that is designed to measure the insertion loss or gain of a network or transmission path connected between those impedances. (PE) 599-1985w

transmission media The physical facility utilized for the interconnection and transmission of messanges between a user station and network device; for example, twisted pair wire, coaxial cable, optical fiber, microwave, and infrared light beams. (C) 610.10-1994w

transmission medium (1) A means of transporting electrical or optical signals. *See also:* signal. (C/BA) 1355-1995

(2) The material on which information signals may be carried; e.g., optical fiber, coaxial cable, and twisted-wire pairs. (LM/C) 8802-6-1994

(3) The physical facility utilized for the interconnection and transmission of messages between a user station and network device. For example: coaxial cable; optical fiber. (C) 610.7-1995

transmission mode A form of propagation along a transmission line characterized by the presence of any one of the elemental types of TE (transverse electric), TM (transverse magnetic), or TEM (transverse electromagnetic) waves. *Note:* Waveguide transmission modes are designated by integers (modal numbers) associated with the orthogonal functions used to describe the waveform. These integers are known as waveguide mode subscripts. They may be assigned from observations of the transverse field components of the wave and without reference to mathematics. A waveguide transmission mode is commonly described as a $TE_{m,n}$ or $TM_{m,n}$ mode, $_{m,n}$ being numerics according to the following system:

a) (waves in rectangular waveguides). If a single wave is transmitted in a rectangular waveguide, the field that is everywhere transverse may be resolved into two components, parallel to the wide and narrow walls respectively. In any transverse section, these components vary periodically with distance along a path parallel to one of the walls. m = the total number of half-period variations of either component of field along a path parallel to the wide walls. n = the total number of half-period variations of either component of field along a path parallel to the narrow walls.

b) (waves in circular waveguides). If a single wave is transmitted in a circular waveguide, the transverse field may be resolved into two components, radial and angular, respectively. These components vary periodically along a circular path concentric with the wall and vary in a manner related to the Bessel function of order m along a radius, where m the total number of full-period variations of either component of field along a circular path concentric with the wall. n = one more than the total number of reversals of sign of either component of field along a radial path. This system can be used only if the observed waveform is known to correspond to a single mode.

See also: waveguide. (EEC/PE) [119]

transmission-mode photocathode A photocathode in which radiant flux incident on one side produces photoelectric emission from the opposite side. (NPS) 398-1972r

transmission modulation (storage tubes) Amplitude modulation of the reading-beam current as it passes through apertures in the storage surface, the degree of modulation being controlled by the charge pattern stored on that surface. *See also:* storage tube. (ED) 158-1962w

transmission network A group of interconnected transmission lines or feeders. *See also:* transmission line. (T&D/PE) [10]

transmission performance (in telephony) The effectiveness of a complete telephone connection for transmitting and reproducing speech under actual conditions. *Note:* The specification of transmission generally requires the consideration of more than one attribute or test method. (COM/TA) 823-1989w

transmission primaries (color television) The set of three colorimetric primaries that, if used in a display and controlled linearly and individually by a corresponding set of three channel signals generated in the color television camera, would result in exact colorimetric rendition (over the gamut defined by the primaries) of the scene viewed by the camera. *Note:* Ideally the primaries used at the receiver display would be identical with the transmission primaries, but this is not usually possible since developments in display phosphors occurring since the setting of transmission standards, for example, may result in the use of receiver display primaries that differ from the transmission primaries. Within a linear part of the overall system, it is always possible to compensate for differences existing between transmission and display primaries by means of matrixing. Because of the capability afforded by matrixing, the transmission primaries need not be real. There exists a unique relationship between the chromaticity coordinates of the transmission primaries and the spectral taking characteristics used at the camera to generate the three respective channel signals. (BT/AV) 201-1979w

transmission quality (mobile communication) The measure of the minimum usable speech-to-noise ratio, with reference to the number of correctly received words in a specified speech sequence. *See also:* mobile communication system. (VT) [37]

transmission regulator (electric communication) A device that functions to maintain substantially constant transmission over a transmission system. (PE/EEC) [119]

transmission route The route followed by a transmission circuit. *See also:* transmission line. (T&D/PE) [10]

transmission service charge The amount paid to a system for the use of its transmission facilities. (PE/PSE) 858-1993w

transmission system (1) (power operations) An interconnected group of electric transmission lines and associated equipment for the movement or transfer of electric energy in bulk between points of supply and points for delivery. (PE/PSE) 858-1987s

(2) (data transmission) In communication practice, an assembly of elements capable of functioning together to transmit signal waves. (PE) 599-1985w

(3) The interface and *transmission medium* through which peer *Physical Layer* entities transfer bits. (LM/C) 8802-6-1994

transmission test *See:* end-to-end test.

transmission throughput *See:* effective speed of transmission.

transmission time (data transmission) The absolute time interval from transmission to reception of a signal. (PE) 599-1985w

transmission window *See:* spectral window.

transmissivity (fiber optics) The transmittance of a unit length of material, at a given wavelength, excluding the reflectance of the surfaces of the material; the intrinsic transmittance of the material, irrespective of other parameters such as the reflectances of the surfaces. No longer in common use. *See also:* transmittance. (Std100) 812-1984w

(2) (A) (of a boundary) The ratio of the normal component of the power density transmitted across the boundary between two media to the normal component of the incident power density. **(B)** (of a layer) The ratio of the normal component of the power density transmitted through the layer to the normal component of the incident power density. (AP/PROP) 211-1997

transmissivity matrix A 4×4 matrix of dimensionless real numbers which, when multiplied by the Stokes vector incident upon a boundary or through a medium, yields the Stokes vector that is propagated across that boundary or medium. (AP/PROP) 211-1997

transmissometer (illuminating engineering) A photometer for measuring transmittance. *Note:* Transmissometers may be visual or physical instruments. (EEC/IE) [126]

transmit (1) (computers) To move data from one location to another location. *See also:* transfer. (C) [20], [85]

(2) (data management) To send data from one place for reception elsewhere. *See also:* transfer. (C) 610.5-1990w

(3) The electrical output of a telephone set or connecting test circuit due to an acoustic input to the telephone set. (COM/TA) 269-1992

(4) The electrical output of a handset, headset, or connecting test circuit, due to an acoustic input to the device. (COM/TA) 1206-1994

(5) The action of a station generating a frame, token, abort sequence, or fill and placing it on the medium. *Contrast:* repeat. (LM/C/LM) 8802-5-1998

transmit channel A channel used within a data circuit to transmit data. *Synonym:* send channel. *Contrast:* receive channel. (C) 610.10-1994w

transmit characteristic (telephony) The electrical output level of a telephone set as a function of the acoustic input level. The output is measured across a specified impedance connected to the telephone feed circuit, and the input is measured in free field at a specified location relative to the reference point of an artificial mouth. (COM/TA) 269-1971w

transmit-receive box *See:* transmit-receive switch.

transmit-receive cavity The resonant portion of a transmit-receive switch. (AES/RS) 686-1990

transmit-receive cell (waveguide) (tube) A gas-filled waveguide cavity that acts as a short circuit when ionized but is transparent to low-power energy when un-ionized. It is used in a transmit-receive switch for protecting the receiver from the high power of the transmitter but is transparent to low-power signals received from the antenna. *See also:* waveguide. (AP/ANT) [35]

transmit-receive module An active TR electronic module, usually with integrated circuits, consisting of an antenna (or direct connection thereto), transmitter, receiver, duplexer, phase shifters, and power conditioner employed at the radiating elements of a phased array radar. (AES) 686-1997

transmit-receive switch (TR switch) (1) An automatic device employed in a radar for substantially preventing the transmitted energy from reaching the receiver but allowing the received energy to reach the receiver without appreciable loss. *See also:* radar. (EEC/PE) [119]

(2) An RF switch, frequently of the gas discharge type, which automatically decouples the receiver from the antenna during the transmitting period. *Note:* Employed when a common antenna is used for transmission and reception. *Synonym:* transmit-receive box. (AES) 686-1997

transmit-receive switch, duplexer A switch, frequently of the gas discharge type, employed when a common transmitting and receiving antenna is used, that automatically decouples the receiver from the antenna during the transmitting period. *See also:* navigation. (AES/RS) 686-1982s, [42]

transmit-receive tube A gas-filled radio-frequency switching tube used to protect the receiver in pulsed radio-frequency systems. *See also:* gas tube. (ED) 161-1971w

transmittal of a CCS message *See:* transmittal of a CCS signal.

transmittal of a CCS signal Occurs when the signal or complete message becomes available for transmission (that is, stored in the output buffer). *Synonym:* transmittal of a CCS message. (COM/TA) 973-1990w

transmittal of a per-trunk-signaling supervisory signal Occurs when the state transition that begins the signal occurs at the M lead (or M-lead equivalent). (COM/TA) 973-1990w

transmittance (1) (fiber optics) The ratio of transmitted power to incident power. *Note:* In optics, frequently expressed as optical density or percent; in communications applications, generally expressed in decibels (dB). Formerly called "transmission." *See also:* transmission loss; antireflection coating. (Std100) 812-1984w

(2) (photovoltaic power system) The fraction of radiation incident on an object that is transmitted through the object. *See also:* photovoltaic power system. (AES) [41]

(3) (linear passive networks) (transfer function) A response function for which the variables are measured at different ports (terminal pairs). (CAS) 156-1960w

(4) (laser maser) (τ) The ratio of total transmitted radiant power to total incident radiant power. (LEO) 586-1980w

(5) (illuminating engineering) ($\tau = \Phi_t/\Phi_i$) (of a medium) The ratio of the transmitted flux to the incident flux. *Notes:* 1. It should be noted that transmittance refers to the ratio of flux emerging to flux incident; therefore; reflections at the surface as well as absorption within the material operate to reduce the transmittance. Transmittance is a function of:

a) geometry (i) of the incident flux (ii) of collection for the transmitted flux;
b) spectral distribution (i) characteristic of the incident flux (ii) weighting function for the collected flux; and
c) polarization (i) of the incident flux (ii) component defined for the collected flux.

2. Unless the state of polarization for the incident flux and the polarized component of the transmitted flux are stated, it shall be considered that the incident flux is unpolarized and that the total transmitted flux is evaluated. 3. Unless qualified by the term "spectral" (see "spectral reflectance") or other modifying adjectives, luminous transmittance (see "luminous transmittance") is meant. 4. If no qualifying geometric adjec-

tive is used, transmittance for hemispherical collection is meant. For other modifying adjectives see listing in reflectance factor entry. 5. In each case of conical incidence or collection, the solid angle is not restricted to a right circular cone, but may be of any cross section including rectangular, a ring, or a combination of two or more solid angles. 6. These concepts must be applied with care, if the area of the transmitting element is not large compared to its thickness, due to internal transmission across the boundary of the area. 7. The following breakdown of transmittance quantities is applicable only to the transmittance of thin films with negligible internal scattering so that the transmitted radiation emerges from a point that is not significantly separated from the point of incidence of the incident ray that produces the transmitted ray(s). The governing considerations are similar to those for application of the bidirectional reflectance-distribution function (BRDF), rather than the bidirectional scattering-surface reflectance-distribution function (BSSRDF). *See also:* luminous transmittance; spectral reflectance. (EEC/IE) [126]

transmittance, thermal *See:* thermal transmittance.

transmitted-carrier operation That form of amplitude-modulation carrier transmission in which the carrier wave is transmitted. *See also:* amplitude modulation. (EEC/PE) [119]

transmitted harmonics (electrical conversion) (induced harmonics) Harmonics that are transformed or pass through the conversion device from the input to the output. (AES) [41]

transmitted information *See:* transinformation.

transmitted light scanning The scanning of changes in the magnitude of light transmitted through a web. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

transmitted wave (1) (waveguide) At a transverse plane in a transmission line or waveguide, a wave transmitted past a discontinuity in the same direction as the incident wave. *See also:* reflected wave. (MTT) 146-1980w

(2) A wave (or waves) produced by an incident wave that continue(s) beyond the transition point. (CAS) [84]

(3) (A) The wave launched by a transmitting antenna. **(B)** *See also:* refracted wave. (AP/PROP) 211-1997

transmitter (1) (protective signaling) A device for transmitting a coded signal when operated by any one of a group of actuating devices. *See also:* protective signaling. (EEC/PE) [119]

(2) (radio) A device or circuit that generates high-frequency electric energy, controlled or modulated, which can be radiated by an antenna. (SWG/PE/PSR) C37.90.2-1995, C37.100-1992

transmitter-blocker cell (antitransmit-receive tube) (with reference to a waveguide). A gas-filled waveguide cavity that acts as a short circuit when ionized but as an open circuit when un-ionized. It is used in a transmit-receive switch for directing the energy received from the aerial to the receiver, no matter what the transmitter impedance may be. *See also:* waveguide. (AP/ANT) [35]

transmitter, facsimile *See:* facsimile transmitter.

transmitter on/transmitter off An asynchronous protocol that synchronizes the receiving terminal with the sending terminal. (C) 610.7-1995

transmitter performance *See:* audio input signal; audio input power.

transmitter, telephone *See:* telephone transmitter.

transmitting (transmission performance of telephone sets) The electric output level of a telephone set or connecting test circuit due to an acoustic input to the telephone set. The acoustic input may be varied either in frequency or level. The output is measured across a specified impedance and the input is measured at the calibration point of an artificial mouth. (COM/TA) 269-1983s

transmitting converter (facsimile) (amplitude-modulation to frequency-shift-modulation converter) A device which changes the type of modulation from amplitude to frequency shift. *See also:* facsimile transmission. (COM) 168-1956w

transmitting current response (electroacoustic transducer used for sound emission) The ratio of the sound pressure apparent at a distance of one meter in a specified direction from the effective acoustic center of the transducer to the current flowing at the electric input terminals. *Note:* The sound pressure apparent at a distance of one meter can be found by multiplying the sound pressure observed at a remote point (where the sound field is spherically divergent) by the number of meters from the effective acoustic center of the transducer to that point. (SP) [32]

transmitting efficiency (electroacoustic transducer) (projector efficiency). The ratio of the total acoustic power output to the electric power input. *Note:* In computing the electric power input, it is customary to omit any electric power supplied for polarization or bias. (SP) [32]

transmitting loop loss That part of the repetition equivalent assignable to the station set, subscriber line, and battery supply circuit that are on the transmitting end. *See also:* transmission loss. (EEC/PE) [119]

transmitting objective loudness rating (loudness ratings of telephone connections)

$$\mathrm{TOLR} = -20 \log_{10} \frac{V_T}{S_M}$$

where

S_M = sound pressure at the mouth reference point (in pascals)

V_T = output voltage of the transmitting component (in millivolts).

Note: Normally occurring TOLRs will be in the −30 to −55 (dB) range. These numbers are a result of the units chosen and have no physical significance. (COM/TA) 661-1979r

transmitting power response (electroacoustic transducer used for sound emission) (projector power response) The ratio of the mean-square sound pressure apparent at a distance of one meter in a specified direction from the effective acoustic center of the transducer to the electric power input. *Note:* The sound pressure apparent at a distance of one meter can be found by multiplying the sound pressure observed at a remote point (where the sound field is spherically divergent) by the number of meters from the effective acoustic center of the transducer to that point. (SP) [32]

transmitting voltage response (electroacoustic transducer used for sound emission) The ratio of the sound pressure apparent at a distance of one meter in a specified direction from the effective acoustic center of the transducer to the signal voltage applied at the electric input terminals. *Note:* The sound pressure apparent at a distance of one meter can be found by multiplying the sound pressure observed at a remote point (where the sound field is spherically divergent) by the number of meters from the effective acoustic center of the transducer to that point. (SP) [32]

transobuoy (navigation aids) A free floating or moored automatic weather station providing weather reports from the open ocean. (AES/GCS) 172-1983w

transparency A capability of a communications medium to pass within specified limits a range of signals having one or more defined properties, for example, a channel may be code transparent, or an equipment may be bit pattern transparent. (LM/COM) 168-1956w

transparent (1) (A) In data transmission, pertaining to information that does not contain transmission control characters. **(B)** To perform in a manner that is invisible to, and of no concern to a user. For example, a computer program may perform file allocation, database operations, and housekeeping operations transparent to its user. (C) 610.5-1990

(2) The state of a protocol when all of the following conditions are met:

a) Previously existing protocol implementations are able to recover when receiving packets formed by this new protocol.

b) The implementations of this protocol are able to process packets formed by previously existing protocols without problems.
c) The protocol does not affect the operations of the (N+1) and (N-1)-layer implementations.
(C/LM) 802.10-1998

transparent bridging A bridging mechanism in a bridged LAN that is transparent to the end stations. (C/LM) 8802-5-1998

transparent latch A latch that has a level sensitive trigger input such that when the trigger signal is in the 'enable' state the outputs follow the inputs, and when the trigger signal goes to the 'latch' state the outputs retain the data then at the inputs. (C) 610.10-1994w

transponder (1) (navigation aid terms) A transmitter-receiver facility, the function of which is to transmit signals automatically when the proper interrogation is received. (AES/GCS) 172-1983w
(2) (communication satellite) A receiver-transmitter combination, often aboard a satellite, or spacecraft, which receives a signal and retransmits it at a different carrier frequency. Transponders are used in communication satellites for reradiating signals to earth stations or in spacecraft for returning ranging signals. *See also:* repeater. (COM) [24]
(3) (broadband local area networks) A device that responds to a physical or electrical stimulus and emits an electrical signal in response to the stimulus. (LM/C) 802.7-1989r
(4) The onboard component of a dedicated short-range communications (DSRC) system. (SCC32) 1455-1999
(5) Receiver-transmitter equipment, the function of which is to transmit signals automatically when the proper interrogation is received from a radar or an interrogator. (AES) 686-1997

transponder beacon *See:* transponder.

transponder, crossband *See:* crossband transponder.

transponder reply efficiency (navigation aids) The ratio of the number of replies emitted by a transponder to the number of interrogations which the transponder recognizes as valid. The interrogations recognized as valid include those accidentally combined to form recognizable codes, a statistical computation of them normally being made. (AES/GCS) 172-1983w

transport *See:* tape transport; tape drive.

transportability *See:* portability.

transportable (x-ray) X-ray equipment to be installed in a vehicle or that may be readily disassembled for transport in a vehicle. (NEC/NESC) [86]

transportable computer A personal computer that weighs more than 21 lb, yet is designed and configured to permit easy transportation. *See also:* portable computer. (C) 610.2-1987, 610.10-1994w

transportable transmitter A transmitter designed to be readily carried or transported from place to place, but which is not normally operated while in motion. *Note:* This has been commonly called a portable transmitter, but the term transportable transmitter is preferred. *See also:* radio transmitter; radio transmission. (AP/BT/ANT) 145-1983s, 182A-1964w

transportation and storage conditions The conditions to which a device may be subjected between the time of construction and the time of installation. Also included are the conditions that may exist during shutdown. *Note:* No permanent physical damage or impairment of operating characteristics shall take place under these conditions, but minor adjustments may be needed to restore performance to normal. (EEC/EMI) [112]

transportation lag* *See:* lag.
* Deprecated.

transport delay *See:* time delay.

transport lag* *See:* lag.
* Deprecated.

transport layer (1) (Layer 4) The layer of the ISO Reference Model that accomplishes the transparent transfer of data over the established link, providing an end-to-end service with high data integrity. (DIS/C) 1278.2-1995
(2) The middle layer in the ISO seven-layer open system communications reference model, and the boundary between the communication subnet layers (physical, data link, and network) and the host process layers (session, presentation, and application). (C/MM) 1284.1-1997
(3) The fourth layer of the seven-layer OSI model, responsible for error-free end-to-end communication. *See also:* application layer; physical layer; data link layer; presentation layer; session layer; entity layer; client layer; logical link control sublayer; network layer; sublayer; medium access control sublayer. (C) 610.7-1995

transport standards Standards of the same nominal value as the basic reference standards of a laboratory (and preferably of equal quality), which 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) C12.1-1982s

transport time (feedback system) The time required to move an object, element or information from one predetermined position to another. *See also:* feedback control system. (IA/ICTL/APP/IAC) [69], [60]

transport vehicle (handling and disposal of transformer grade insulating liquids containing PCBs) A motor vehicle or rail car used for the transportation of cargo by any mode, each cargo carrier (for trailer, freight car) is a separate vehicle. (LM/C) 802.2-1985s

transposed file A file in which corresponding fields in corresponding records are stored contiguously, in contrast to the usual practice of storing entire records contiguously. (C) 610.5-1990w

transposition (1) (A) (data transmission) An interchange of positions of the several conductors of a circuit between successive lengths. *Notes:* 1. It is normally used to reduce inductive interference on communication or signal circuits by cancellation. 2. The term is most frequently applied to open wire circuits. **(B) (data transmission)** The ordered permutation of the pattern of the multiple of a switching stage to improve traffic carrying characteristics and reduce crosstalk. (PE) 599-1985
(2) (transmission lines) An interchange of positions of the several conductors of a circuit between successive lengths. *Notes:* 1. It is normally used to reduce inductive interference on communication or signal circuits by cancellation. 2. The term is most frequently applied to open-wire circuits. *See also:* signal; tower. (T&D/PE) [10]
(3) (rotating machinery) An arrangement of the strands or laminations of a conductor or of the conductors comprising a turn or coil whereby they take different relative positions in a slot for the purpose of reducing eddy current losses. (PE) [9]

transposition section A length of open wire line to which a fundamental transposition design or pattern is applied as a unit. (EEC/PE) [119]

transreactance The imaginary part of the transimpedance. (IM/HFIM) [40]

transrectification factor The quotient of the change in average current of an electrode by the change in the amplitude of the alternating sinusoidal voltage applied to another electrode, the direct voltages of this and other electrodes being maintained constant. *Note:* Unless otherwise stated, the term refers to cases in which the alternating sinusoidal voltage is of infinitesimal magnitude. *See also:* rectification factor. (ED) 161-1971w

transrectifier A device, ordinarily a vacuum tube in which rectification occurs in one electrode circuit when an alternating voltage is applied to another electrode. *See also:* rectifier. (EEC/PE) [119]

transresistance The real part of the transimpedance. (IM/HFIM) [40]

transsusceptance The imaginary part of the transadmittance. (IM/HFIM) [40]

transverse-beam traveling-wave tube A traveling-wave tube in which the direction of motion of the electron beam is transverse to the average direction in which the signal wave moves. (ED) 161-1971w

transverse crosstalk coupling (between a disturbing and a disturbed circuit in any given section) The vector summation of the direct couplings between adjacent short lengths of the two circuits, without dependence on intermediate flow in other nearby circuits. *See also:* coupling. (EEC/PE) [119]

transverse-electric hybrid wave (radio-wave propagation) An electromagnetic wave in which the electric field vector is linearly polarized normal to the plane of propagation and the magnetic field vector is elliptically polarized in this plane. (AP) 211-1977s

transverse electric mode (TE) (1) (fiber optics) A mode whose electric field vector is normal to the direction of propagation. *Note:* In an optical fiber, TE and transverse magnetic (TM) modes correspond to meridional rays. *See also:* mode; meridional ray. (Std100) 812-1984w

(2) A mode in which the longitudinal components of the electric and magnetic fields are everywhere zero. *Synonym:* TEM mode. *See also:* waveguide. (AP/ANT) [35], [84]

transverse electric resonant mode ($TE_{m,n,p}$) (cylindrical cavity) In a hollow metal cylinder closed by two plane metal surfaces perpendicular to its axis, the resonant mode whose transverse field pattern is similar to the $TE_{m,n}$ wave in the corresponding cylindrical waveguide and for which p is the number of half-period field variations along the axis. *Note:* When the cavity is a rectangular parallelepiped, the axis of the cylinder from which the cavity is assumed to be made should be designated since there are three such axes possible. *See also:* waveguide. (MTT) 146-1980w

transverse electric wave (1) (A) (circular waveguide) (hollow circular metal cylinder). The transverse electric wave for which *m* is the number of axial planes along which the normal component of the electric vector vanishes, and *n* is the number of coaxial cylinders (including the boundary of the waveguide) along which the tangential component of the electric vector vanishes. *Notes:* 1. $TE_{0,n}$ waves are circular electric waves of order *n*. The $TE_{0,1}$ wave is the circular electric wave with the lowest cutoff frequency. 2. The $TE_{1,1}$ wave is the dominant wave. Its lines of electric force are approximately parallel to a diameter. *Synonym:* TE. *See also:* waveguide. **(B) (rectangular waveguide)** (hollow rectangular metal cylinder) The transverse electric wave for which *m* is the number of half-period variations of the field along the *x* coordinate, which is assumed to coincide with the larger transverse dimension, and *n* is the number of half-period variations of the field along the *y* coordinate, which is assumed to coincide with the smaller transverse dimension. *Note:* The dominant wave in a rectangular waveguide is $TE_{1,0}$: its electric lines are parallel to the shorter side. *See also:* waveguide; guided wave. **(C)** In a homogeneous isotropic medium, an electromagnetic wave in which the electric field vector is everywhere perpendicular to the direction of propagation. *See also:* waveguide. (MTT) 146-1980

(2) For waves propagating in homogeneous space, an electromagnetic wave whose electric field is perpendicular to the direction of propagation. For waves incident on a scatterer, the wave whose electric field is perpendicular to the plane of incidence. (AP/PROP) 211-1997

transverse-electromagnetic cell A rectangular transmission line segment that produces a transverse electromagnetic (TEM). Cables, cable/connector assemblies, and/or electronic devices are placed inside the cell. Alternatively, the cell can be used as a detector to measure radiation emitted by a cable or device inside the cell. *Synonym:* Crawford cell. *See also:* absorbing clamp. (PE/IC) 1143-1994r

transverse-electromagnetic mode (1) (fiber optics) A mode whose electric and magnetic field vectors are both normal to the direction of propagation. *Synonym:* TEM mode. *See also:* mode. (Std100) 812-1984w

(2) (waveguide) A mode in which the longitudinal components of the electric and magnetic fields are everywhere zero. *Synonym:* TEM mode. *See also:* waveguide. (AP/ANT) [35], [84]

(3) (planar transmission lines) *Synonym:* TEM mode. (MTT) 1004-1987w

transverse-electromagnetic wave (1) In a homogeneous isotropic medium, an electromagnetic wave in which both the electric and magnetic field vectors are everywhere perpendicular to the direction of propagation. *Synonym:* TEM wave. *See also:* radio-wave propagation; waveguide. (MTT) 146-1980w

(2) A wave that propagates with the electric field and magnetic field vectors transverse (at right angles to) the direction of propagation. (At high frequencies waves may also propagate in transverse electric [TE] or transverse magnetic [TM] waves that bounce back and forth between guiding structures such as waveguides.) (PE/IC) 1143-1994r

(3) (radio-wave propagation) An electromagnetic wave in which both the electric and magnetic field vectors are everywhere perpendicular to the direction of propagation. *Synonym:* TEM wave. (AP/EMC/PROP) 211-1997, 1128-1998

transverse-field traveling-wave tube A traveling-wave tube in which the traveling electric fields that interact with electrons are essentially transverse to the average motion of the electrons. (ED) 161-1971w

transverse interference *See:* signal; differential-mode interference; normal-mode interference.

transverse interferometry (fiber optics) The method used to measure the index profile of an optical fiber by placing it in an interferometer and illuminating the fiber transversely to its axis. Generally, a computer is required to interpret the interference pattern. *See also:* interferometer. (Std100) 812-1984w

transverse-magnetic hybrid wave (radio-wave propagation) An electromagnetic wave in which the magnetic field vector is linearly polarized normal to the plane of propagation and the electric field vector is elliptically polarized in this plane. (AP) 211-1977s

transverse magnetic mode A mode whose magnetic field vector is normal to the direction of propagation. *Note:* In a planar dielectric waveguide (as within an injection laser diode), the field direction is parallel to the core-cladding interface. In an optical waveguide, transverse electric (TE) and TM modes correspond to meridional rays. *Synonym:* TM mode. *See also:* mode; meridional ray. (Std100) 812-1984w

transverse-magnetic polarization *See:* parallel polarization.

transverse magnetic resonant mode (cylindrical cavity) In a hollow metal cylinder closed by two plane metal surfaces perpendicular to its axis, the resonant mode whose transverse field pattern is similar to the $TM_{m,n}$ wave in the corresponding cylindrical waveguide and for which p is the number of half-period field variations along the axis. *Note:* When the cavity is a rectangular parallelepiped, the axis of the cylinder from which the cavity is assumed to be made should be designated since there are three such axes possible. *See also:* waveguide. (MTT) 146-1980w

transverse-magnetic wave (1) (A) In a homogeneous isotropic medium, an electromagnetic wave in which the magnetic field vector is everywhere perpendicular to the direction of propagation. *See also:* waveguide. **(B) (hollow circular metal cylinder) (circular waveguide)** The transverse magnetic wave for which *m* is the number of axial planes along which the normal component of the magnetic vector vanishes, and *n* is the number of coaxial cylinders to which the electric vector is normal. *Note:* $TM_{0,n}$ waves are circular magnetic waves of order *n*. The $TM_{0,1}$ wave is the circular magnetic wave with the lowest cutoff frequency. *See also:* circular magnetic wave; waveguide; guided wave. **(C) (hollow rectangular metal cylinder) (rectangular waveguide)** The transverse magnetic wave for which *m* is the number of half-

period variations of the magnetic field along the longer transverse dimension, and *n* is the number of half-period variations of the magnetic field along the shorter transverse dimension. *See also:* guided wave; circular magnetic wave; waveguide. (MTT) 146-1980

(2) For waves propagating in homogeneous space, an electromagnetic wave whose magnetic field is perpendicular to the direction of propagation. For waves incident on a scatterer, the wave whose magnetic field is perpendicular to the plane of incidence. (AP/PROP) 211-1997

transverse magnetization Magnetization of the recording medium in a direction perpendicular to the line of travel and parallel to the greatest cross-sectional dimension. *See also:* phonograph pickup. (SP/MR) [32]

transverse mode (laser maser) A mode which is detected by measuring one or more maxima in transverse field intensity in the cross-section of a beam. (LEO) 586-1980w

transverse (differential) mode voltage (low-voltage air-gap surge-protective devices) (gas-tube surge protective devices) The voltage at a given location between two conductors of a group. *Synonym:* differential-mode voltage. (SWG/PE/SPD) C37.100-1992, C62.31-1987r, C62.32-1981s

transverse-mode interference *See:* differential-mode interference.

transverse-mode noise (with reference to load device input ac power) Noise signals measurable between or among active circuit conductors feeding the subject load, but not between the equipment grounding conductor or associated signal reference structure and the active circuit conductors. (IA/PSE) 1100-1999

transverse-mode voltage (1) (gas-tube surge protective devices) (surge withstand capability tests) (low-voltage air-gap surge-protective devices) The voltage at a given location between two conductors of a group. *Synonym:* differential-mode voltage. (SWG/SPD/PE/PSR) C62.31-1987r, C62.32-1981s, C37.100-1992, C37.90-1978s

(2) (protective relays and relay systems) The voltage between two conductors of a circuit at a given location. (PE/PSR) C37.90.1-1989r

transverse offset loss *See:* lateral offset loss.

transverse propagation constant (fiber optics) The propagation constant evaluated along a direction perpendicular to the waveguide axis. *Note:* The transverse propagation constant for a given mode can vary with the transverse coordinates. *See also:* propagation constant. (Std100) 812-1984w

transverse scattering (fiber optics) The method for measuring the index profile of an optical fiber or preform by illuminating the fiber or preform coherently and transversely to its axis, and examining the far-field irradiance pattern. A computer is required to interpret the pattern of the scattered light. *See also:* scattering. (Std100) 812-1984w

transverse wave A wave in which the direction of displacement at each point of the medium is perpendicular to the direction of propagation. *Note:* In those cases where the displacement makes an acute angle with the direction of propagation, the wave is considered to have longitudinal and transverse components. (Std100) 270-1966w

trap (1) (burglar-alarm system) An automatic device applied to a door or window frame for the purpose of producing an alarm condition in the protective circuit whenever a door or window is opened. *See also:* protective signaling. (EEC/PE) [119]

(2) (computers) An unprogrammed conditional jump to a known location, automatically activated by hardware, with the location from which the jump occurred recorded. (C) [20], [85]

(3) (A) (software) A conditional jump to an exception or interrupt handling routine, often automatically activated by hardware, with the location from which the jump occurred recorded. **(B) (software)** To perform the operation in definition (A). (C) 610.12-1990

(4) A vectored transfer of control to supervisor software through a table, the address of which is specified by a privileged **integer unit** register referred to as the trap base register (TBR). (C/MM) 1754-1994

trap circuit A circuit used at locations where it is desirable to protect a section of track on which it is impracticable to maintain a track circuit. It usually consists of an arrangement of one or more stick circuits so connected that when a train enters the trap circuit the stick relay drops and cannot be picked up again until the train has passed through the other end of the trap circuit. (EEC/PE) [119]

trapezium distortion (cathode-ray tubes) A fault characterized by a variation of the sensitivity of the deflection parallel to one axis (vertical or horizontal) as a function of the deflection parallel to the other axis and having the effect of transforming an image that is a rectangle into one which is a trapezium. (EEC/ACO) [109], [84]

trapped flux (superconducting material) Magnetic flux that links with a closed superconducting loop. *See also:* superconductivity. (ED) [46]

trapped inverted microstrip A type of inverted microstrip where the ground plane below the substrate completely encloses the strip conductor. (MTT) 1004-1987w

trapped mode *See:* bound mode.

trapped ray *See:* guided ray.

trapping *See:* ducting.

travel (1) (elevators) (rise) Of an elevator, dumbwaiter, escalator, or of a private-residence inclined lift, the vertical distance between the bottom terminal landing and the top terminal landing. *See also:* elevator. (PE/PSR) C37.90-1978s

(2) (of a relay) The amount of movement in either direction (towards pickup or reset) of a responsive element. *Note:* Travel may be specified in linear, angular, or other measure. (SWG/PE) C37.100-1992

traveled way The portion of the roadway for the movement of vehicles, exclusive of shoulders and full-time parking lanes. (NESC) C2-1997

traveler (conductor stringing equipment) A sheave complete with suspension arm or frame used separately or in groups and suspended from structures to permit the stringing of conductors. These devices are sometimes bundled with a center drum, or sheave and another traveler, and used to string more than one conductor simultaneously. For protection of conductors that should not be nicked or scratched, the sheaves are often lined with nonconductive or semiconductive neoprene or with nonconductive urethane. Any one of these materials acts as a padding or cushion for the conductor as it passes over the sheave. Traveler grounds must be used with lined travelers in order to establish an electrical ground. *Synonyms:* sheave; dolly; stringing block; stringing traveler; stringing sheave; block. (T&D/PE) 524a-1993r, 524-1992r, 1048-1990

traveler ground (conductor stringing equipment) A portable device designed to connect a moving conductor or wire rope, or both, to an electrical ground. Primarily used to provide safety for personnel during construction or reconstruction operations. This device is placed on the traveler (sheave, block, etc.) at a strategic location where an electrical ground is required. (T&D/PE) 524a-1993r, 524-1992r, 1048-1990

traveler, hold-down *See:* hold-down block.

traveler rack A device designed to protect, store, and transport travelers. It is normally designed to permit efficient use of transporting vehicles, spotting by helicopters on the line, and stacking during storage to utilize space. The exact design of each rack is dependent upon the specific travelers to be stored. *Synonym:* dolly car. (T&D/PE) 524-1992r

traveler sling A sling of wire rope, sometimes utilized in place of insulators, to support the traveler during stringing operations. Normally, it is used when insulators are not readily

available or when adverse stringing conditions might impose severe downstrains and cause damage or complete failure of the insulators. *Synonym:* choker. (T&D/PE) 524-1992r

traveling cable (elevators) A cable made up of electric conductors that provides electric connection between an elevator or dumbwaiter car and fixed outlet in the hoistway. *See also:* control. (PE/EEC) [119]

traveling ionospheric disturbance (TID) A localized disturbance in the electron density distribution propagating in the ionosphere. *Note:* A TID is the signature in the ionosphere of an atmospheric gravity wave (AGW) in the neutral thermosphere. (AP/PROP) 211-1997

traveling overvoltage (surge arresters) A surge propagated along a conductor. (PE) [8], [84]

traveling plane wave (1) (radio-wave propagation) A plane wave each of whose frequency components has an exponential variation of amplitude and a linear variation of phase with distance. (AP) 211-1977s

(2) (waveguide) A plane wave each of whose components have an exponential variation of amplitude and a linear variation of phase in the direction of propagation. (MTT) 146-1980w

traveling wave The resulting wave when an electrical variation in a circuit such as a transmission line takes the form of translation of energy along a conductor, such energy being always equally divided between current and potential forms. (SPD/PE) C62.22-1997

traveling-wave antenna An antenna whose excitation has a quasi-uniform progressive phase, as the result of a single feeding wave traversing its length in one direction only. (AP/ANT) 145-1993

traveling-wave magnetron A traveling-wave tube in which the electrons move in crossed static electric and magnetic fields which are substantially normal to the direction of wave propagation. (ED) 161-1971w

traveling-wave magnetron oscillations Oscillations sustained by the interaction between the space-charge cloud of a magnetron and a traveling electromagnetic field whose phase velocity is approximately the same as the mean velocity of the cloud. (ED) [45]

traveling-wave parametric amplifier A parametric amplifier that has a continuous or iterated structure incorporating nonlinear reactors and in which the signal, pump, and difference-frequency wave are propagated along the structure. *See also:* parametric device. (ED) [46]

traveling-wave tube An electron tube in which a stream of electrons interacts continuously or repeatedly with a guided electromagnetic wave moving substantially in synchronism with it, and in such a way that there is a net transfer of energy from the stream to the wave. *See also:* transverse-field traveling-wave tube; transverse-beam traveling-wave tube. (ED) 161-1971w

traveling-wave-tube interaction circuit An extended electrode arrangement in a traveling-wave tube designed to propagate an electromagnetic wave in such a manner that the traveling electromagnetic fields are retarded and extended into the space occupied by the electron stream. *Note:* traveling-wave tubes are often designated by the type of interaction circuit used, as in helix traveling-wave tube. (ED) 161-1971w

travel trailer A vehicular unit mounted on wheels, designed to provide temporary living quarters for recreational, camping, or travel use, of such size or weight as not to require special highway movement permits when drawn by a motorized vehicle, and with a living area of less than 220 sq ft, excluding built-in equipment such as wardrobes, closets, cabinets, kitchen units or fixtures) and bath and toilet rooms. *See also:* recreational vehicle. (NESC/NEC) [86]

traversable widget A widget that can receive input focus. (C) 1295-1993w

traversal The process of enumerating or visiting each of the nodes of an ordered tree exactly once. *See also:* postorder traversal; traversal order; inorder traversal; converse postorder traversal; converse inorder traversal; converse preorder traversal; preorder traversal; traverse. (C) 610.5-1990w

traversal order The order in which the nodes of a tree are visited in a traversal. (C) 610.5-1990w

traverse To enumerate or to visit each of the nodes of an ordered tree exactly once. *See also:* traversal. (C) 610.5-1990w

tray (storage battery) (storage cell) A support or container for one or more storage cells. *See also:* battery. (PE/EEC) [119]

TR box *See:* transmit-receive box.

treated fabric (rotating machinery) A fabric or mat in which the elements have been essentially coated but not filled with an impregnant such as a compound or varnish. *Synonym:* treated mat. *See also:* stator; rotor. (PE) [9]

treated mat *See:* treated fabric.

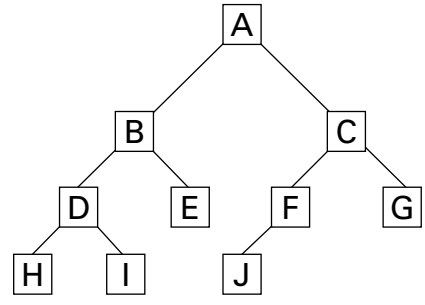
treatment The systematic application of some agent (e.g., chemical, electric field) to a sample of organisms in an experimental setting for the purpose of determining the biological effect(s) of the agent. (T&D/PE) 539-1990

treble boost An adjustment of the amplitude-frequency response of a system or transducer to accentuate the higher audio frequencies. (SP) 151-1965w

tree (1) A set of connected branches including no meshes. *See also:* network analysis. (NIR) C95.1-1982s

(2) (software) An abstract hierarchical structure consisting of nodes connected by branches, in which: each branch connects one node to a directly subsidiary node; there is a unique node called the root which is not subsidiary to any other node; and every node besides the root is directly subsidiary to exactly one other node. (C/SE) 729-1983s

(3) (data management) A nonlinear data structure consisting of a finite set of nodes in which one node is called the root node and the remaining nodes are partitioned into disjoint sets, called subtrees, each of which is itself a tree. (See the corresponding figure.) *Note:* The nodes are connected by pointers. *Synonyms:* tree structure; rooted tree. *See also:* subtree; ordered tree; threaded tree; height-balanced tree; *n–m* tree; search tree; unordered tree; null tree; n-ary tree.



tree

(C) 610.5-1990w

treeing (composite insulators) Irreversible internal degradation by the formation of conductive carbonized paths. (T&D/PE) 987-1985w

tree insertion sort An insertion sort in which the items in the set to be sorted are treated as nodes on a tree. *Contrast:* tree selection sort. (C) 610.5-1990w

tree machine A multiprocessor whose processing elements are connected in an n-ary tree arrangement. (C) 610.10-1994w

trees and nodules Projections formed on a cathode during electrodeposition. Trees are branched whereas nodules are rounded. (EEC/PE) [119]

tree selection sort A selection sort in which the items in the set to be sorted are treated as nodes on a tree. *Contrast:* tree insertion sort. (C) 610.5-1990w

tree structure (1) (data management) *See also:* tree. (C) 610.5-1990w

(2) A set of connected segments with no loops (cross connections). (NID) 960-1993

tree topology A topology in which stations are attached in a tree layout fashion on a shared transmission medium. The tree layout begins at the head/end and each of these may have branches. The branches in turn may have additional branches to allow quite complex layouts. *See also:* bus topology; star-ring topology; loop topology; star-bus topology; bus-ring topology; star topology; ring topology. (C) 610.7-1995

tree wire A conductor with an abrasion-resistant outer covering, usually nonmetallic, and intended for use on overhead lines passing through trees. *See also:* armored cable; conductor. (T&D/PE) [10]

triad A group of three closely related items or digits. (C) 1084-1986w

trial operation (1) A period during which the equipment or system is placed under service conditions and is also monitored for stable, smooth, and reliable performance. (SUB/PE) 1303-1994

(2) A period of normal operation of the dc system near the end of commissioning. (PE/SUB) 1378-1997

triangular array *See:* triangular grid array.

triangular grid array A regular arrangement of array elements, in a plane, such that lines connecting corresponding points of adjacent elements form triangles, usually equilateral. (AP/ANT) 145-1993

triaxial Testing or analysis in the two horizontal orthogonal directions and the vertical direction simultaneously. (PE/SUB) 693-1997

triboelectric charging The generation of electrostatic charges when two pieces of material are brought into intimate contact and are then separated. *Synonym:* triboelectrification. (SPD/PE) C62.47-1992r

triboelectric series A list of substances in an order of relative positive to negative charging as a result of the triboelectric charging effect. (SPD/PE) C62.47-1992r

triboelectrification (electrification by friction) The mechanical separation of electric charges of opposite sign by processes such as: the separation (as by sliding) of dissimilar solid objects; interaction at a solid-liquid interface; breaking of a liquid-gas interface. (Std100) 270-1966w

tri-bundle *See:* bundle; bundle, two-conductor, three-conductor, four-conductor, multiconductor.

tributary office A telephone central office that passes toll traffic to, and receives toll traffic from, a toll center. (EEC/PE) [119]

tributary trunk (data transmission) A trunk circuit connecting a local exchange with a toll center or other toll office through which access to the long-distance network is achieved. (PE) 599-1985w

Trichel streamers (overhead power-line corona and radio noise) Streamers occurring at a negative electrode with electric field strengths at and above the corona inception voltage gradient. A Trichel streamer appears as a small, constantly moving purple fan. The current pulse is of small amplitude, short duration (in the range of a hundred nanoseconds), and high repetition rate (in the range of tens of kilohertz or more). (T&D/PE) 539-1990

trickle charge (storage battery) (storage cell) A continuous charge at a low rate approximately equal to the internal losses and suitable to maintain the battery in a fully charged condition. *Note:* This term is also applied to very low rates of charge suitable not only for compensating for internal losses but to restore intermittent discharges of small amount delivered from time to time to the load circuit. *See also:* charge; floating. (EEC/PE) [119]

triclinic system (piezoelectricity) A triclinic crystal has neither symmetry axes nor symmetry planes. The lengths of the three axes are in general unequal; and the angles α, β, and g between axes *b* and *c*, *c* and *a*, and *a* and *b*, respectively, are also unequal. The *a* axis has the direction of the intersection of the faces *b* and *c* (extend the faces to intersection if necessary), the *b* axis has the direction of the intersection of faces *c* and *a*, the *c* axis has the direction of the intersection of faces *a* and *b*. The *X*, *Y*, *Z* axes are associated as closely as possible with the *a*, *b*, *c* axes, respectively. The *Z* axis is parallel to *c*, *Y* is normal to the *ac* plane, and *X* is thus in the *ac* plane. The $+Z$ and $+X$ axes are chosen so that d_{33} and and d_{11} are positive. The $+Y$ axis is chosen so that it forms a right-handed system with $+Z$ and $+X$. *See also:* crystal systems. (UFFC) 176-1978s

trie An *n*-ary tree each of whose nonterminal nodes is the parent of a sequence of subtrees, where the *k*-th subtree represents the *k*-th digit or character in an *n*-character alphabet. *Notes:* 1. A sequence of nodes (length *p*) from the root of a trie to the root of a subtree represents the first *p* digits or characters of the keys of the elements represented by that subtree. 2. The term is pronounced "try" and is derived from the word "retrie-val." *See also:* binary radix trie search; radix trie search; multiway radix trie search. (C) 610.5-1990w

Triex *See:* explosives.

trigatron (1) A triggered spark-gap switch on which control is obtained by a voltage applied to a trigger electrode. *Note:* This voltage distorts the field between the two main electrodes converting the sphere-to-sphere gap to a point to sphere gap. *See also:* electron device. (ED) [45], [84]

(2) (radar) An electronic switch in which conduction is initiated by the breakdown of an auxiliary gap. (AES/RS) 686-1990, [42]

trigger (1) To start action in another circuit which then functions for a period of time under its own control. (EEC/PE) [119]

(2) A pulse used to initiate some function, for example, a triggered sweep or delay ramp. *Note:* Trigger may loosely refer to a waveform of any shape used as a signal from which a trigger pulse is derived as in trigger source, trigger input, etc. *See also:* triggering signal; oscillograph. (IM/HFIM) [40]

(3) (thyristor) The act of causing a thyristor to switch from the off-state to the on-state. *See also:* gate trigger current. (IA) [12]

(4) A signal to start an action. A trigger is a signal from the Network Capable Application Processor serving as a command to the Smart Transducer Interface Module for an action to occur. (IM/ST) 1451.2-1997

(5) (A) To cause a circuit or device to change state or to perform some other operaton. *See also:* clock. **(B)** A signal that causes a circuit or device to change state as in (A). (C) 610.10-1994

trigger circuit (1) A circuit that has two conditions of stability, with means for passing from one to the other when certain conditions are satisfied, either spontaneously or through application of an external stimulus. (EEC/PE) [119]

(2) A sequential circuit that has a number of states, at least one of which is stable, and has one or more inputs that allow external signals to force a change of state. *See also:* multivibrator; strobe; flip-flop. (C) 610.10-1994w

trigger countdown A process that reduces the repetition rate of a triggering signal. *See also:* oscillograph. (IM/HFIM) [40]

trigger cycle A complete cycle comprising the assertion of the trigger signal by the Network Capable Application Processor followed by the acknowledgment by the Smart Transducer Interface Module. (IM/ST) 1451.2-1997

trigger delay The elapsed time from the occurrence of a trigger pulse at the trigger input connector to the time at which the first or a specified data sample is recorded. (IM/WM&A) 1057-1994w

triggered sweep A sweep that can be initiated only by a trigger signal, not free running. *See also:* oscillograph. (IM/HFIM) [40]

trigger, external *See:* external trigger.

trigger gap (series capacitor) Enclosed electrodes that initiate the sparkover of the bypass gap. (T&D/PE) 824-1985s

triggering (pulse terminology) A process in which a pulse initiates a predetermined event or response. (IM/WM&A) 194-1977w

triggering level The instantaneous level of a triggering signal at which a trigger is to be generated. Also, the name of the control that selects the level. *See also:* oscillograph. (IM/HFIM) [40]

triggering, line *See:* line triggering.

trigger minimum rate of change The slowest rate of change of the leading edge of a pulse of a specified level that will trigger the recorder. (IM/WM&A) 1057-1994w

triggering signal The signal from which a trigger is derived. *See also:* oscillograph. (IM/HFIM) [40]

trigger signal coupling The ratio of the spurious signal level (that is recorded by an input to the recorder) to the trigger signal level. (IM/WM&A) 1057-1994w

triggering slope The positive-going (+slope) or negative-going (−slope) portion of a triggering signal from which a trigger is to be derived. Also, the control that selects the slope to be employed. *Note:* + and − slopes apply to the slope of the waveform only and not to the absolute polarity. *See also:* oscillograph. (IM/HFIM) [40]

triggering stability *See:* stability.

trigger jitter The standard deviation in the trigger delay time over multiple records. (IM/WM&A) 1057-1994w

trigger level (1) (navigation aids) (transponder) The minimum input to the receiver that is capable of causing the transmitter to emit a reply. (AES/GCS) 172-1983w
(2) In a transponder, the minimum input to the receiver that is capable of causing the transmitter to emit a reply. (AES/RS) 686-1990

trigger pickoff A process or a circuit for extracting a triggering signal. *See also:* oscillograph. (IM/HFIM) [40]

trigger pulse converter (TPC) A device in the control system that converts the control signal to a signal that can be transmitted to the thyristor valve. (SUB/PE) 1303-1994

trigger-starting systems (fluorescent lamps) Applied to systems in which hot-cathode electric discharge lamps are started with cathodes heated through low-voltage heater windings built into the ballast. Sufficient voltage is applied across the lamp and between the lamp and fixture to initiate the discharge when the cathodes reach a temperature high enough for adequate emission. The ballast is so designed that the cathode-heating current is greatly reduced as soon as the arc is struck. (EEC/LB) [94]

trigger tube A cold-cathode gas-filled tube in which one or more electrodes initiate, but do not control, the anode current. (ED) [45]

trigonal and hexagonal systems (piezoelectricity) These systems are distinguished by an axis of sixfold (or threefold) symmetry. This axis is always called the *c* axis. According to the Bravais-Miller axial system, which is most commonly used, there are three equivalent secondary axes, a_1, a_2, and a_3, lying 120 degrees apart in a plane normal to *c*. These axes are chosen as being either parallel to a twofold axis or perpendicular to a plane of symmetry, or if there are neither twofold axes perpendicular to *c* nor planes of symmetry parallel to *c*, the a axes are chosen so as to give the smallest unit cell. The *Z* axis is parallel to *c*. The *X* axis coincides in direction and sense with any one of the *a* axes. The *Y* axis is perpendicular to *Z* and *X*, so oriented as to form a right-handed system. Positive-sense rules for $+Z$, $+X$, $+Y$ are listed in the table below for the piezoelctric trigonal and hexagonal crystals. *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

trilateration *See:* multilateration.

trimmer capacitor (trimming capacitor) A small adjustable capacitor associated with another capacitor and used for fine adjustment of the total capacitance of an element or part of a circuit. (IM) [120]

trimmer signal A signal that gives indication to the engineman concerning movements to be made from the classification tracks into the switch and retarder area. (EEC/PE) [119]

triode A three-electrode electron tube containing an anode, a cathode, and a control electrode. (ED) 161-1971w

triode region of an insulated-gate field-effect transistor (metal-nitride-oxide field-effect transistor) The same as non-saturation region. (ED) 581-1978w

trip (A) A release that initiates either an opening or a closing operation or other specified action. **(B)** A release that initiates an opening operation only. **(C)** A complete opening operation. **(D)** The action associated with the opening of a circuit breaker or other interrupting device. **(E)** To release in order to initiate either an opening or a closing operation or other specified action. **(F)** To release in order to initiate an opening operation only. **(G)** To initiate and complete an opening operation. **(H)** Pertaining to a release that initiates either an opening or a closing operation or other specified action. *Synonym:* tripping. **(I)** Pertaining to a release that initiates an opening operation only. *Synonym:* tripping. **(J)** Pertaining to a complete opening operation. *Synonym:* tripping. (SWG/PE) C37.100-1992

trip arm *See:* mechanical trip.

trip/close A type of digital output that stops or starts an action, usually affecting actual electric power circuits. (PE/SUB) 1379-1997

trip coil *See:* release coil.

trip current (faulted circuit indicators) The actual value of current in amperes rms (root-mean-square) that will cause the FCI (faulted circuit indicator) to indicate FAULT. (T&D/PE) 495-1986w

trip current rating (faulted circuit indicators) The published rms (root-mean-square) sinusoidal fault current in amperes that causes the FCI (faulted circuit indicator) to indicate FAULT. (T&D/PE) 495-1986w

trip delay setting *See:* release-delay setting.

trip device, impulse *See:* impulse trip device.

trip device (opening release), impulse A trip device that is designed to operate only by the discharge of a capacitor into its release (trip) coil and is utilized on high speed circuit breakers to produce tripping times that are independent of di/dt. (SWG/PE) C37.100-1992, C37.14-1992s

trip-free The capability of a switching device to have the moving contacts return to and remain in the opening position when the opening operation is initiated after the initiation of the closing operation, even if the closing force and command are maintained. *Notes:* 1. To ensure proper breaking of the current that may be established, it may be necessary for the contacts to momentarily reach the closed position. 2. If the release circuit is completed through an auxiliary switch, electrical release will not take place until such auxiliary switch is closed. *Synonym:* release-free. (SWG/PE) C37.100-1992

trip-free in any position *See:* release-free.

trip-free relay An auxiliary relay whose function is to open the closing circuit of an electrically operated switching device so that the opening operation can prevail over the closing operation. *Synonym:* release-free relay. (SWG/PE) C37.100-1992

trip lamp A removable self-contained mine lamp, designed for marking the rear end of a train (trip) of mine cars. (EEC/PE) [119]

triple-address Same as three-address.

triple-address instruction *See:* three-address instruction.

triple detection *See:* double-superheterodyne reception.

triple-length register Three registers that function as a single register. *Note:* Typically used in display controllers to store x, y, z information. *Synonym:* triple register. *See also:* n-tuple length register; double-length register. (C) 610.10-1994w

triplen (rotating machinery) An order of harmonic that is a multiple of three. *See also:* asynchronous machine. (PE) [9]

triple precision Pertaining to the use of three computer words to represent a number in order to preserve or gain precision. *Contrast:* double precision; single precision. *See also:* multiple precision. (C) 610.5-1990w, 1084-1986w

triple-precision arithmetic Computer arithmetic performed with operands that are expressed in triple-precision representation. (C) 1084-1986w

triple register *See:* triple-length register.

triplet (1) (mathematics of computing) (data management) A group of three adjacent digits operated upon as a unit. *Synonym:* three-bit byte. (C) 610.5-1990w, 1084-1986w

(2) (navigation systems) (navigation aids) Three radio stations, operated as a group, for the determination of positions. (AES/GCS) 172-1983w

(3) An ordered set of three adjacent bytes. (C/BA) 1014.1-1994w

(4) A byte composed of three bits. *Synonym:* three-bit byte. (C) 610.10-1994w

triple transit echo (TTE) Normally unwanted signals in a surface acoustic wave device that arise from reflection of the wave at the output and input transducers and subsequent transduction at the output; the propagation path between input and output interdigital transducer is traversed three times. (UFFC) 1037-1992w

triplex cable A cable composed of three insulated single-conductor cables twisted together. *Note:* The assembled conductors may or may not have a common covering of binding or protecting material. (T&D/PE) [10]

triply-threaded tree A binary tree in which each node contains three link fields: one for its parent node and one for each of its left child and right child nodes. *Contrast:* doubly-threaded tree. (C) 610.5-1990w

trip OFF control signal (magnetic amplifier) The final value of signal measured when the amplifier has changed from the ON to the OFF state as the signal is varied so slowly that an incremental increase in the speed with which it is varied does not affect the measurement of the trip OFF control signal. That is, the change in trip OFF control signal is below the sensitivity of the measuring instrument. (MAG) 107-1964w

trip ON control signal (magnetic amplifier) The final value of signal measured when the amplifier has changed from the OFF to the ON state as the signal is varied so slowly than an incremental increase in the speed with which it is varied does not affect the measurement of the trip ON control signal. That is, the change in trip ON control signal is below the sensitivity of the measuring instrument. (MAG) 107-1964w

tripping *See:* automatic opening.

tripping delay *See:* release delay.

tripping mechanism *See:* release.

tripping or trip-free relay (power system device function numbers) A relay that functions to trip a circuit breaker, contactor, or equipment, or to permit immediate tripping by other devices; or to prevent immediate reclosure of a circuit interrupter if it should open automatically even though its closing circuit is maintained closed. (SUB/PE) C37.2-1979s

trip-point repeatability (magnetic amplifier) The change in trip point (either trip OFF or trip ON, as specified) control signal due to uncontrollable causes over a specified period of time when all controllable quantities are held constant. (MAG) 107-1964w

trip-point repeatability coefficient (magnetic amplifier) The ratio of: the maximum change in trip-point control signal due to uncontrollable causes, to the specified time period during which all controllable quantities have been held constant. *Note:* The units of this coefficient are the control signal units per the time period over which the coefficient was determined. (MAG) 107-1964w

trip setting *See:* release setting.

trip switch A device mounted on the truck of a vehicle, responding to a raised arm on the way-side, used to cause an emergency brake application if a train attempts to pass a mandatory stop signal. (VT) 1475-1999

tristimulus values (television) (of a light) The amounts of the three reference or matching stimuli required to give a match with the light considered, in a given trichromatic system. *Notes:* 1. In the standard colorimetric system, CIE (1931), the symbols, *X*, *Y*, *Z* are recommended for the tristimulus values. 2. These values may be obtained by multiplying the spectral concentration of the radiation at each wavelength by the distribution coefficients $\bar{x}_\lambda$, $\bar{y}_\lambda$, $\bar{z}_\lambda$ and integrating these products over the whole spectrum. (BT/AV) 201-1979w

tristimulus values of a light, *X*, *Y*, *Z* (illuminating engineering) The amounts of each of three specific primaries required to match the color of the light. *See also:* color matching functions. (EEC/IE) [126]

troff A text-formatting language used widely in the UNIX environment. (C) 610.13-1993w

troffer (illuminating engineering) A long recessed lighting unit usually installed with the opening flush with the ceiling. The term is derived from "trough" and "coffer." (EEC/IE) [126]

troland (illuminating engineering) A unit of retinal illuminance which is based upon the fact that retinal illuminance is proportional to the product of the luminance of the distal stimulus and the area of entrance pupil. One troland is the retinal illuminance produced when the luminance of the distal stimulus is one candela per square meter and the area of the pupil is one square millimeter. *Note:* The troland makes no allowance for interocular attenuation or for the Stiles-Crawford effect. *See also:* Stiles-Crawford effect. (EEC/IE) [126]

TROLL A nonprocedural computer language. (C) 610.13-1993w

trolley A current collector, the function of which is to make contact with a contact wire. *See also:* contact conductor. (VT/LT) 16-1955w

trolley bus *See:* trolley coach.

trolley car An electric motor car that collects propulsion power from a trolley system. *See also:* electric motor car. (EEC/PE) [119]

trolley coach An electric bus that collects propulsion power from a trolley system. *Synonyms:* trackless trolley coach; trolley bus. *See also:* electric bus. (EEC/PE) [119]

trolley locomotive An electric locomotive that collects propulsion power from a trolley system. *See also:* electric locomotive. (EEC/PE) [119]

trombone line (transmission lines and waveguides) A U-shaped length of waveguide or transmission line of adjustable length. *See also:* waveguide. (IM/HFIM) [40]

tropopause The upper boundary of the troposphere. (AP/PROP) 211-1997

troposcatter *See:* tropospheric scatter propagation.

troposphere (1) (data transmission) That part of the earth's atmosphere in which temperature generally decreases with altitude, clouds form, and convection is active. *Note:* Experiments indicate that the troposphere occupies the space above the earth's surface up to a height ranging from about 6 km (kilometers) at the poles to about 18 km at the equator. (PE) 599-1985w

(2) The lower part of the Earth's atmosphere, situated immediately above the surface of the Earth and in which the temperature decreases with increasing altitude except in certain local temperature inversion layers. The troposphere extends to an altitude of around 9 km at the poles and 17 km at the equator. (AP/PROP) 211-1997

tropospheric layer An elevated portion of the troposphere having radio propagation properties that are clearly distinguished from those of the surrounding atmosphere. Horizontal dimensions are generally in excess of 100 km, and vertical dimensions are on the order of 1 km. (AP/PROP) 211-1997

tropospheric propagation Propagation within the troposphere. (AP/PROP) 211-1997

tropospheric radio duct *See:* atmospheric radio duct.

tropospheric scatter propagation Propagation of radio waves through the atmosphere caused by scattering from inhomogeneities in the refractive index of the troposphere. *Note:* Troposcatter enables propagation beyond the radio horizon. *Synonym:* troposcatter. (AP/PROP) 211-1997

tropospheric wave (1) (data transmission) A radio wave that is propagated by reflection from a place of abrupt change in the dielectric constant or its gradient in the troposphere. *Note:* In some cases the ground wave may be so altered that new components appear to arise from reflections in regions of rapidly changing dielectric constant. When these components are distinguishable from the other components, they are called tropospheric waves. (PE) 599-1985w

(2) A radio wave that propagates in the troposphere. (AP/PROP) 211-1997

trouble Equipment malfunction or loss of power. (PE/NP) 692-1997

trouble recorder (telephone switching systems) A device or system associated with one or more switching systems for automatically recording data on calls encountering trouble. (COM) 312-1977w

troubleshoot (supervisory control, data acquisition, and automatic control) Action taken by operating or maintenance personnel, or both, to isolate a malfunctioned component of a system. Actions may be supported by printed procedures, diagnostic circuits, test points, and diagnostic routines. *See also:* debug; fault isolation. (PE/SUB) C37.1-1994

troughing An open channel of earthenware, wood, or other material in which a cable or cables may be laid and protected by a cover. (T&D/PE) [10]

TRR *See:* test readiness review.

TRS *See:* test response spectrum.

TR switch *See:* transmit-receive switch.

truck A rail vehicle component that consists of a frame—normally two axles, brakes, suspension, and other parts—and supports the vehicle body and can swivel under it on curves. If powered, it may also contain traction motors and associated drive mechanisms. (VT) 1475-1999

truck camper A portable unit constructed to provide temporary living quarters for recreational, travel, or camping use, consisting of a roof, floor, and sides, designed to be loaded onto and unloaded from the bed of a pick-up truck. *See also:* recreational vehicle. (NESC/NEC) [86]

truck generator suspension A design of support for an axle generator in which the generator is supported by the vehicle truck. (EEC/PE) [119]

true air speed (navigation aids) The actual speed of an aircraft relative to the surrounding air. (AES/GCS) 172-1983w

true air-speed indicator (navigation aids) An instrument for measuring indicated true air speed. (AES/GCS) 172-1983w

true bearing (navigation aids) Bearing relative to true north. (AES/GCS) 172-1983w

true complement (1) A number representation that can be derived from another by subtracting each digit from one less than the base and then adding one to the least significant digit and executing all carries required. Tens complements and twos complements are true complements. (C) 162-1963w

(2) *See also:* radix complement. (C) 1084-1986w

true course (navigation aids) Course relative to true north. (AES/GCS) 172-1983w

true density (fly ash resistivity) The weight of the particles divided by the solid volume of the particles. (PE/EDPG) 548-1984w

true heading (navigation aids) Heading relative to true north. (AES/GCS) 172-1983w

true-motion display A display in a vehicle- or ship-mounted radar that shows the motions of the radar and of targets tracked by that radar, relative to a fixed background. True-motion display is accomplished by inserting compensation for the motion of the vehicle carrying the radar. (AES) 686-1997

true neutral point (at terminals of entry) Any point in the boundary surface that has the same voltage as the point of junction of a group of equal nonreactive resistors placed in the boundary surface of the region and connected at their free ends to the appropriate terminals of entry of the phase conductors of the circuit, provided that the resistance of the resistors is so great that the voltages are not appreciably altered by the introduction of the resistors. *Notes:* 1. The number of resistances required is two for direct-current or single-phase alternating-current circuits, four for two-phase four-wire or five-wire circuits, and is equal to the number of phases when the number of phases is three or more. Under normal symmetrical conditions the number of resistors may be reduced to three for six- or twelve-phase systems when the terminals are properly selected, but the true neutral point may not be obtained by this process under all abnormal conditions. The concept of a true neutral point is not considered applicable to a two-phase, three-wire circuit. 2. Under abnormal conditions the voltage of the true neutral point may not be the same as that of the neutral conductor. *See also:* network analysis. (Std100) 270-1966w

true north (navigation aids) The direction of the north geographical pole. (AES/GCS) 172-1983w

true power factor For user equipment, the true power factor is the ratio of the active, or real, power (P) consumed in watts to the apparent power (S) drawn in volt-amperes, with

$$PF = P/S$$

and

$$S = \sqrt{P^2 + Q^2}$$

where

PF = power factor;
P = active power in watts;
Q = reactive power in vars;
S = total power in volt-amperes.

This definition of power factor includes the effect of both displacement and distortion in the input current (and/or voltage) waveform. Alternatively, if there are no interharmonics, the previous equation can be simplified to

$$F = PF_{dp} \cdot PF_{d}$$

(PEL) 1515-2000

true ratio (1) (power and distribution transformers) The ratio of the root-mean-square (rms) primary value of the rms secondary value under specified conditions. (PE/TR) C57.12.80-1978r

(2) The ratio of the root-mean-square (rms) primary voltage or current to the rms secondary voltage or current under specified conditions. (PE/TR) C57.13-1993

true rms detector A detector that contains a circuit component that performs the mathematical operation

$$\sqrt{\frac{1}{T}\int_0^T ([v(t)]^2 dt)}$$

to a periodic signal, $v(t)$

where

T is the period of the signal.

Note: If there are harmonics in the field and $v(t)$ is proportional to the time-derivative of the field, the detector circuit must also contain a stage of integration prior to the rms operation in order to avoid error. This type of detector gives the true rms value of a field containing harmonics provided that the frequency response of the detector is flat over the frequency range of interest. If significant levels of harmonics are present in $v(t)$, particular attention should be given to the possibility of amplifier saturation effects if the integration fol-

lows one or more stages of amplification. *See also:* average sensing rms detector. (T&D/PE) 1308-1994

true time *See:* real time.

true value (measured quantity) The actual value of a precisely defined quantity under the conditions existing during its measurement. (IM/HFIM) 314-1971w

truncate (computers) To terminate a computational process in accordance with some rule; for example, to end the evaluation of a power series at a specified term. *See also:* round down. (C) [20], [85], 1084-1986w

(2) (A) To remove the beginning or ending entities in a string; for example, the string 'PINEAPPLE,' when truncated on the right to six characters, is 'PINEAP.'. **(B)** To delete or omit one or more of the digits in a representation of a number; for example, the numbers 57.5634 and 25.437, when truncated to two decimal digits, become 57.56 and 25.43. *Contrast:* round. (C) 610.5-1990

truncation The process of truncating. (C) 610.5-1990w

truncation error An error caused by truncation. (C) 1084-1986w

truncation loss In a modulated data waveform, the power difference before and after implementation filtering necessary to constrain its spectrum to a specified frequency band. (C/LM) 802.3-1998

trunk (1) (analog computer) A connecting line between one analog computer and another, or between an analog compute and an external point, allowing the input (or output) of an analog component to communicate directly with the output (or input) or another component which is located outside of the analog computer. (C) 165-1977w

(2) (data transmission) A telephone line or channel between two central offices or switching devices, which is used in providing telephone connections between subscribers. (PE) 599-1985w

(3) (telephone switching systems) A channel provided as a common traffic artery between switching entities. (COM) 312-1977w

(4) (broadband local area networks) (system) That portion of a broadband coaxial cable system that serves as the RF signal path between the headend and the feeders. (LM/C) 802.7-1989r

(5) (A) A transmission path between exchanges or central offices. **(B)** A telephone exchange line that ends in a PBX. (C) 610.7-1995

trunk amplifier station A low-distortion amplifier that amplifies RF signals for long-distance transport. An active device designed to compensate for cable losses in the trunk system. (LM/C) 802.7-1989r

trunk cable (1) (medium attachment units and repeater units) The trunk coaxial cable system.

(2) (broadband local area networks) Coaxial cable used for distribution of RF signals over long distances throughout a cable system. Usually the largest rigid cable used in the system. (C) 802.7-1989r

(3) (A) A cable circuit between two switching centers or two individual distribution points. **(B)** The main (large-diameter) cable of a broadband coaxial cable system. *See also:* drop cable. (C) 610.7-1995

(4) The transmission medium for interconnection of concentrators providing a main signal path and a back-up signal path, exclusive of the lobe cabling. (C/LM) 8802-5-1998

(5) The main (often large diameter) cable of a coaxial cable system. *See also:* drop cable. (C/LM) 802.3-1998

trunk circuit (1) (telephone switching systems) An interface circuit between a trunk and a switching system. (COM) 312-1977w

(2) A pair of complementary circuits with associated equipment terminating in two switching centers. *Synonym:* toll circuit. (C) 610.7-1995

trunk circuit, combined line and recording (CLR) (A) Name given to a class of trunk circuits that provide access to operator positions generally referred to by abbreviation only.

(B) Recording-completing trunk circuit for operator recording and completing of toll calls originated by subscribers of central offices. (COM) [48]

trunk concentrator (telephone switching systems) A concentrator in which all inlets and outlets are trunks. (COM) 312-1977w

trunk conditioning *See:* carrier group alarm.

trunk coupling unit (TCU) (1) A physical device that enables a data terminal equipment (DTE) to connect to a trunk cable. *Note:* The trunk coupling unit may be a passive connector, or may contain active elements. A drop cable may be used between the trunk coupling unit and the DTE to facilitate communication. (C/Std100) 610.7-1995

(2) A device that couples a station to the main ring path. A TCU provides the mechanism for insertion of a station into the ring and removal of it from the ring. (C/LM) 8802-5-1998, 610.7-1995

trunk failure rate The expected frequency of outages a trunk can experience due to switching system and subsystem malfunctions. The trunk failure rate may be given for hardware faults alone. (COM/TA) 973-1990w

trunk feeder A feeder connecting two generating stations or a generating station and an important substation. *See also:* center of distribution. (T&D/PE) [10]

trunk group (telephone switching systems) A number of trunks that can be used interchangeably between two switching entities. (COM) 312-1977w

trunk hunting The operation of a selector or other similar device, to establish connection with an idle circuit of a chosen group. This is usually accomplished by successively testing terminals associated with this group until a terminal is found that has an electrical condition indicating it to be idle. (EEC/PE) [119]

trunk line The major cable from the headend to downstream branches. *Synonym:* main trunk. (LM/C) 802.7-1989r

trunk-line conduit A duct-bank provided for main or trunk-line cables. (T&D/PE) [10]

trunk loss That part of the repetition equivalent assignable to the trunk used in the telephone connection. *See also:* transmission loss. (EEC/PE) [119]

trunk multifrequency pulsing (telephone switching systems) A means of pulsing embodying a simultaneous combination of two out of six frequencies to represent each digit or character. (COM) 312-1977w

trunks Interoffice facilities. (COM/TA) 973-1990w

trunk transmission line A transmission line acting as a source of main supply to a number of other transmission circuits. *See also:* transmission line. (T&D/PE) [10]

trussed blade (of a switching device) A blade that is reinforced by truss construction to provide stiffness. (SWG/PE) C37.100-1992

trusted communications path A path by which a network user, program, process, or device can communicate directly with the trusted network base. (C) 610.7-1995

trusted computing base (TCB) The totality of security controls and mechanisms within an information system. (C/BA) 896.3-1993w

trusted functionality That which is perceived to be correct with respect to some criteria, e.g., as established by a security policy. (LM/C) 802.10-1992

trusted identification forwarding In networks, an identification method in which a sending host transmits user authentication information to the receiving host and the receiving host can verify that the user is authorized for access to its systems. (C) 610.7-1995

trusted network base The totality of security mechanisms within a network that are responsible for enforcing a security policy on the network. (C) 610.7-1995

trusted network component base The totality of the security mechanisms within a network component that are responsible for enforcing the component security policy. (C) 610.7-1995

trusted path A path by which a user at a terminal can communicate directly with the trusted network base in a computer system. *Synonym:* secure path. *See also:* trusted communications path. (C) 610.7-1995

truth function A function that may take one of two possible values: true or false. (C) 1084-1986w

truth table (1) (computers) A table that describes a logic function by listing all possible combinations of input values and indicating, for each combination, the true output values. (MIL/C) [2], [85], [20]

(2) (mathematics of computing) An operation table that describes a truth function by listing all possible combinations of input values and giving the corresponding output values. *Synonym:* Boolean operation table. *See also:* NOT; AND; OR. (C) 1084-1986w

(3) An operation table for a logic operation. (C) 610.10-1994w

TSC *See:* thyristor-switched capacitor.

TSI *See:* threshold signal-to-interference ratio.

TSR *See:* thyristor-switched reactor.

T step (linear waveform distortion) A $\sin^2$ step with a 10% to 90% rise (fall) time of nominally 125 ns (nanoseconds). The amplitude of the envelope of the frequency spectrum is effectively zero at and beyond 8 MHz. *Note:* In practice, the T step is part of a square wave (or line bar), so that there is a T step rise and fall. *See also:* line bar. (BT) 511-1979w

TTE *See:* triple transit echo.

T3 A carrier facility that transmits digital signal level three. The data rate is 44.736 Mb/s, the equivalent of 672 voice-band channels. (C) 610.7-1995

TTL *See:* transistor-transistor logic.

TTS *See:* teletypesetting.

T2 A carrier facility that transmits digital signal level two. The data rate is 6.312 Mb/s, the equivalent of 96 voice-band channels. (C) 610.7-1995

T-2 A two-conductor twisted construction designed to control wind-induced motion. (T&D/PE) 524-1992r

tube (1) (protection and coordination of industrial and commercial power systems) The cylindrical enclosure of a fuse. Such a tube may be made of laminated paper, special fiber, melamine impregnated glass cloth, bakelite, ceramic, glass, plastic, or other materials. (IA/PSP) 242-1986r

(2) (interior wiring) A hollow cylindrical piece of insulating material having a head or shoulder at one end, through which an electric conductor is threaded where passing through a wall, floor, ceiling, joist, stud, etc. *See also:* raceway. (EEC/PE) [119]

(3) (primary cell) A cylindrical covering of insulating material, without closure at the bottom. *See also:* electrolytic cell. (EEC/PE) [119]

(4) A generic term for any kind of vacuum or electron tube. *See also:* cathode ray tube display device; storage tube display device; Nixie tube display device. (C) 610.10-1994w

(5) *See also:* fuse tube; melting-speed ratio; clearing time. (SWG/PE) C37.100-1992

tube count A terminated discharge produced by an ionizing event in a radiation-counter tube. (NI/NPS) 309-1999

tube current averaging time The time interval over which the current is averaged in defining the operating capability of the tube. *See also:* rectification. (EEC/PCON) [110]

tube, display *See:* display tube.

tube, electron *See:* electron tube.

tube fault current The current that flows through a tube under fault conditions, such as arc-back or short circuit. *See also:* rectification. (EEC/PCON) [110]

tube, fuse *See:* fuse tube.

tube heating time (mercury-vapor tube) The time required for the coolest portion of the tube to attain operating temperature. *See also:* electronic controller; preheating time; gas tube. (ED) 161-1971w

tubelet *See:* eyelet.

tuberculation The formation of localized corrosion products scattered over the surface in the form of knoblike mounds. (IA) [59]

tube scintillation pulses (photomultipliers) Dark pulses caused by scintillations within the photomultiplier structure. Example: cosmic-ray-induced events. (NPS) 398-1972r

tube-type plate (storage cell) A plate of an alkaline storage battery consisting of an assembly of metal tubes filled with active material. *See also:* battery. (EEC/PE) [119]

tube voltage drop (electron tube) The anode voltage during the conducting period. *See also:* electronic controller; electrode voltage. (ED) 161-1971w

tubing (rotating machinery) A tubular flexible insulation, extruded or made of layers of film plastic, into which a conductor is inserted to provide additional insulation. Tubing is frequently used to insulate connections and crossovers. *See also:* asynchronous machine. (PE) [9]

Tudor plate (storage cell) A lead storage battery plate obtained by molding and having a large area. *See also:* battery. (EEC/PE) [119]

tugger *See:* drum puller; two-drum, three-drum puller.

tugger setup *See:* pull site.

tumbling (gyros) The loss of reference in a two-degree-of-freedom gyro due to gimbal lock or contact between a gimbal and a mechanical stop. This is not to be confused with "tumble testing," which is a method of evaluating gyro performance. (AES/GYAC) 528-1994

tuned filter (harmonic control and reactive compensation of static power converters) A filter consisting generally of combinations of capacitors, inductors, and resistors which have been selected in such a way as to present a relative minimum (maximum) impedance to one or more specific frequencies. For a shunt (series) filter the impedance is a minimum (maximum). Tuned filters generally have a relatively high $Q(X/R)$. (IA/SPC) 519-1981s

tuned-grid oscillator An oscillator whose frequency is determined by a parallel-resonance circuit in the grid circuit coupled to the plate to provide the required feedback. *See also:* oscillatory circuit. (AP/ANT) 145-1983s

tuned grid-tuned plate oscillator An electron tube circuit in which both grid and plate circuits are tuned to resonance where the feedback voltage normally is developed through the inter-electrode capacity of the tube. *See also:* radio-frequency generator. (IA) 54-1955w

tuned-plate oscillator An oscillator whose frequency is determined by a parallel-resonance circuit in the plate circuit coupled to the grid to provide the required feedback. *See also:* oscillatory circuit. (AP/ANT) 145-1983s

tuned rotor gyro *See:* dynamically tuned gyro.

tuned speed (dynamically tuned gyro) The rotor spin velocity at which the dynamically induced spring rate is equal in magnitude, and of opposite sign, to the physical spring rate of the rotor suspension. (AES/GYAC) 528-1994

tuned transformer A transformer, the associated circuit elements of which are adjusted as a whole to be resonant at the frequency of the alternating current supplied to the primary, thereby causing the secondary voltage to build up to higher values than would otherwise be obtained. *See also:* power pack. (IM) [120]

tuner (1) (radio receivers) In the broad sense, a device for tuning. Specifically, in radio receiver practice, it is (A) a packaged unit capable of producing only the first portion of the functions of a receiver and delivering either radio-frequency, intermediate-frequency, or demodulated information to some other equipment, or (B) that portion of a receiver that contains the circuits that are tuned to resonance at the received-signal frequency. *See also:* radio receiver. (EEC/PE) [119]

(2) (transmission lines) (waveguide) An ideally lossless, fixed or adjustable, network capable of transforming a given impedance into a different impedance. *See also:* transmission loss; waveguide. (AP/IM/ANT/HFIM) [35], [40]

tuner, waveguide *See:* waveguide tuner.

tungsten-halogen lamp (illuminating engineering) A gas filled tungsten filament incandescent lamp containing a certain proportion of halogens. *Note:* The tungsten-iodine lamp (UK) and quartz-iodine lamp (USA) belong to this category. (EEC/IE) [126]

tuning (data transmission) The adjustment in relation to frequency of a circuit or system to secure optimum performance; commonly the adjustment of a circuit or circuits to resonance. (PE) 599-1985w

tuning creep (oscillators) The change of an essential characteristic as a consequence of repeated cycling of the tuning element. (ED) 158-1962w

tuning, electronic *See:* electronic tuning.

tuning hysteresis (oscillators) (microwave) The difference in a characteristic when a tuner position, or input to the tuning element, is approached from opposite directions. (ED) 158-1962w

tuning indicator An electron-beam tube in which the signal supplied to the control electrode varies the area of luminescence of the screen. (ED) [45]

tuning probe (waveguides) An essentially lossless probe of adjustable penetration extending through the wall of the waveguide or cavity resonator. *See also:* waveguide.

tuning range (1) (switching tubes) The frequency range over which the resonance frequency of the tube may be adjusted by the mechanical means provided on the tube or associated cavity. *See also:* gas tube. (ED) 161-1971w

(2) (oscillators) The frequency range of continuous tuning within which the essential characteristics fall within prescribed limits. (ED) 158-1962w

tuning range, electronic *See:* electronic tuning range.

tuning rate, thermal *See:* thermal tuning rate.

tuning screw (waveguide technique) An impedance-adjusting element in the form of a rod whose depth of penetration through the wall into a waveguide or cavity is adjustable by rotating the screw. *See also:* waveguide. (AP/ANT) [35]

tuning sensitivity (oscillators) The rate of change of frequency with the control parameter (for example, the position of a mechanical tuner, electric tuning voltage, etc.) at a given operating point. (ED) 158-1962w

tuning sensitivity, electronic *See:* electronic tuning sensitivity.

tuning sensitivity, thermal *See:* thermal tuning sensitivity.

tuning susceptance (anti-transmit-receive tube) The normalized susceptance of the tube in its mount due to the deviation of its resonance frequency from the desired resonance frequency. *Note:* Normalization is with respect to the characteristic admittance of the transmission line at its junction with the tube mount. (ED) 161-1971w

tuning, thermal *See:* thermal tuning.

tuning time constant, thermal *See:* thermal tuning time constant.

tuning time thermal (1) (cooling) The time required to tune through a specified frequency range when the tuner power is instantaneously changed from the specified maximum to zero. *Note:* The initial condition must be one of equilibrium. *See also:* electron emission. (ED) 161-1971w

(2) (heating) The time required to tune through a specified frequency range when the tuner power is instantaneously changed from zero to the specified maximum. *Note:* The initial condition must be one of equilibrium. *See also:* electron emission. (ED) 161-1971w

tunneled arrow An arrow left undrawn between its attachment to an ancestral box and its appearance as a boundary arrow on some hierarchically consecutive descendent diagram. (C/SE) 1320.1-1998

tunneling The act of applying tunnel notation to an arrow segment. (C/SE) 1320.1-1998

tunneling mode *See:* leaky mode.

tunneling ray *See:* leaky ray.

tunnel notation A pair of short shallow arcs, resembling a pair of left and right parentheses characters, that bracket the arrowhead or the arrowtail of an arrow segment. (C/SE) 1320.1-1998

tuple (A) A suffix meaning "an ordered set of items," as in *n*-tuple. **(B)** In a relational data model, a set of values of related attributes. *Note:* Often thought of as a row in a table. *Synonym:* row. *See also:* relation; attribute. (C) 610.5-1990

turbine-control servomotor (hydraulic turbines) The actuating element that moves the turbine-control mechanism in response to the action of the governor control actuator. Turbine-control servomotors are designated as: gate servomotor; blade servomotor; deflector servomotor; needle servomotor. (PE/EDPG) 125-1988r

turbine-driven generator An electric generator driven by a turbine. (EEC/PE) [119]

turbine end (rotating machinery) The driven or power-input end of a turbine-driven generator. (PE) [9]

turbine-generator *See:* cylindrical-rotor generator.

turbine/generator testing Consists of four testing phases: subsystem verification, prestartup, startup, and performance testing. (PE/EDPG) 1248-1998

turbine-generator unit An electric generator with its driving turbine. (EEC/PE) [119]

turbine-nozzle control system (gas turbines) A means by which the turbine diaphragm nozzles are adjusted to vary the nozzle angle or area, thus varying the rate of energy input to the turbine(s). (PE/EDPG) [5]

turbine, reversible *See:* reversible turbine.

turbine-type (rotating machinery) Applied to alternating-current machines designed for high-speed operation and having an excitation winding embedded in slots in a cylindrical steel rotor made from forgings or thick disks. *See also:* asynchronous machine. (PE) [9]

turbo-machine (rotating machinery) (turbo-generator) A machine of special design intended for high-speed operation. Turbo-generators usually are directly connected to gas or steam turbines. (PE) [9]

turbulence Random movements within a liquid or gaseous medium inducing heterogeneous values of certain characteristics of the medium. (AP/PROP) 211-1997

turbulence scale A length representative of the average size of the irregularities of a specified property of a medium subject to turbulence. (AP/PROP) 211-1997

Turing machine A mathematical model of a device that changes its internal state and reads from, writes on, and moves a potentially infinite tape, all in accordance with its present state, thereby constituting a model for computerlike behavior. *See also:* universal Turing machine. (C) [20], [85]

turn (rotating machinery) The basic coil element which forms a single conducting loop comprising one insulated conductor. *Note:* The conductor may consist of a number of strands or laminations. Each strand or lamination is in the form of a wire, rod, strip or bar, depending on its cross-section, and may be either uninsulated or insulated for the sole purpose of reducing eddy currents. (PE) [9]

turnaround time (1) The elapsed time between the submission of a job to a batch processing system and the return of completed output. *See also:* port-to-port time; response time; think time. (C) 610.12-1990

(2) In data communications, the amount of time required to reverse the direction of transmission from send to receive or vice-versa in a half duplex transmission. (C) 610.7-1995

(3) The elapsed time between the submission of a job and the return of the completed output. (C) 610.10-1994w

(4) (test, measurement, and diagnostic equipment) The time needed to service or check out an item for recommitment. (MIL) [2]

turnbuckle A threaded device inserted in a tension member to provide minor adjustment of tension or sag. *See also:* tower. (T&D/PE) [10]

turn error (gyros) An error in gyro output due to cross coupling and acceleration encountered during vehicle turns. (AES/GYAC) 528-1994

turning center A numerical control machine capable of performing lathe-oriented operations, such as boring, facing, turning, and threading. (C) 610.2-1987

turning gear (rotating machinery) A separate drive to rotate a machine at very low speed for the purpose of thermal equilization at a time when it would otherwise be at rest. *See also:* rotor. (PE) [9]

turn insulation (rotating machinery) Insulation applied to provide electrical separation between turns of a coil. *Note:* In the usual case, the insulation encircles each turn. However, in the case of edgewise-wound field coils for salient pole synchronous machines, the outer edges may be left bare to facilitate cooling. (PE) [9]

turnkey Pertaining to a hardware or software system delivered in a complete, operational state. (C) 610.12-1990

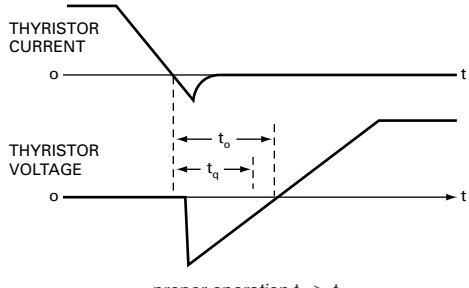
turnkey system A complete computer system that is fully operational and supplied to the user in a ready-to-run condition. (C) 610.10-1994w

turn-off and/or turn-on response time The time between a rapid change in light level and the switching of the load. Turn-off delay may be different than turn-on delay. The response time is measured at 25°C and rated voltage. (RL) C136.10-1996

turn-off branch (self-commutated converters) (converter circuit elements) An auxiliary branch intended to take over the current transiently from a previously conducting principal branch. (IA/SPC) 936-1987w

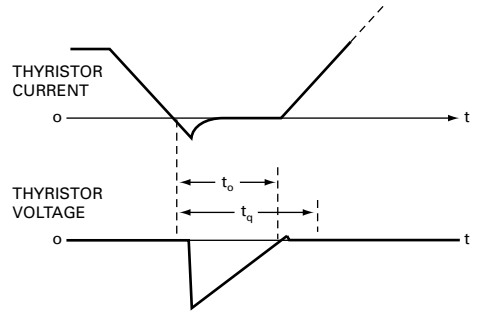
turn-off thyristor (gate controlled switch) A thyristor that can be switched from the ON state to the OFF state and vice versa by applying control signals of appropriate polarities to the gate terminal, with the ratio of triggering power appreciably less than one. (IA/IPC) 428-1981w

turn-off time (1) (self-commutated converters) (circuit properties) (applies to converters that use circuit-commutated thyristor devices) The time interval between that instant when the principal current of a thyristor device has been reduced to zero and that instant when the same thyristor device is again subjected to voltage that could cause conduction. *Note:* for proper operation, the turn-off time, t_o, made available by the action of the circuit must exceed the turn-off time, t_q, required by the thyristor device for recovery of its voltage-blocking ability. Both the available and required turn-off times depend on the operating conditions of the converter. (See the corresponding figures.)



proper operation $t_o > t_q$

turn-off time



(IA/SPC) 936-1987w

(2) (thyristor) *See also:* gate-controlled turn-off time; circuit-commutated turn-off time.

turn-on time (accelerometer) (inertial sensors) (gyros) The time from the initial application of power until a sensor produces a specified useful output, though not necessarily at the accuracy of full specification performance. (AES/GYAC) 528-1994

turn-off/turn-on ratio The turn-off light level divided by the turn-on light level. (RL) C136.10-1996

turnover frequency *See:* transition frequency.

turn ratio (1) (constant-current transformer) The ratio of the number of turns in the primary winding to that in the secondary winding. *Note:* In case of a constant-current transformer having taps for changing its voltage ratio, the turn ratio is based on the number of turns corresponding to the normal rated voltage of the respective windings, to which operation and performance characteristics are referred. (PE/TR) [117]

(2) (current transformer) The ratio of the secondary winding turns to the primary winding turns. (PE/TR/PSR) C57.12.80-1978r, C57.13-1978s, C57.13-1993, C37.110-1996

(3) (potential transformer) (voltage transformer) The ratio of the primary winding turns to the secondary winding turns. (PE/TR) [57], C57.13-1978s, C57.13-1993, C57.12.80-1978r

(4) (rectifier transformer) The ratio of the number of turns in the alternating-current winding to that in the direct-current winding. *Note:* The turn ratio is based on the number of turns corresponding to the normal rated voltage of the respective windings to which operating and performance characteristics are referred. *See also:* rectifier transformer. (Std100) C57.18-1964w

(5) (power and distribution transformers) The ratio of the number of turns in a higher voltage winding to that in a lower voltage winding. *Note:* In the case of a constant-voltage transformer having taps for changing its voltage ratio, the nominal turn ratio is based on the number of turns corresponding to the normal rated voltage of the respective windings, to which operating and performance characteristics are referred. (PE) C57.12.80-1978r

turn separator (rotating machinery) An insulation strip between turns: a form of turn insulation. *See also:* rotor; stator. (PE) [9]

turns factor (magnetic core testing) Under stated conditions the number of turns that a coil of specified shape and dimensions placed on the core in a given position should have to obtain a given unit of self inductance. When measured with a measuring coil of the specified shape and dimensions and placed in the same position, it is defined as:

$$\alpha = \frac{N}{\sqrt{L}}$$

where
α = turns factor
N = number of turns of the measuring coil

L = self-inductance in henrys of the measuring coil placed on the core.

turn-signal operating unit (illuminating engineering) That part of a signal system by which the operator of a vehicle indicates the direction a turn will be made, usually by a flashing light. (EEC/IE) [126]

turns per phase, effective *See:* effective turns per phase.

turns ratio (1) (electronic power transformer) The number of turns of a given secondary divided by the number of primary turns. Thus a ratio less than one is a step-down transformation, a ratio greater than one is a step-up transformation, and a ratio equal to one is unity ratio. (PEL/ET) 295-1969r

(2) (potential transformer) (voltage transformer) (of a voltage transformer) The ratio of the primary winding turns to the secondary winding turns. (PE/TR) C57.13-1993, [57], C57.12.80-1978r, C57.13-1978s

(3) (current transformer) (of a current transformer) The ratio of the secondary winding turns to the primary winding turns. (PE/TR/PSR) C57.13-1993, C37.110-1996, C57.12.80-1978r, C57.13-1978s

turnstile antenna An antenna composed of two dipole antennas, perpendicular to each other, with their axes intersecting at their midpoints. Usually, the currents on the two dipole antennas are equal and in phase quadrature. (AP/ANT) 145-1993

turntable rumble (audio and electroacoustics) Low-frequency vibration mechanically transmitted to the recording or reproducing turntable and superimposed on the reproduction. *See also:* rumble; phonograph pickup. 188-1952w

turn-to-turn test (rotating machinery) A test for applying or more often introducing between adjacent turns of an insulated component, a voltage of predetermined amplitude, for the purpose of checking the integrity of the interturn insulation. *Synonym:* interturn test. (PE) [9]

turn-to-turn voltage (rotating machinery) The voltage existing between adjacent turns of a coil. *See also:* rotor; stator. (PE) [9]

turtle graphics *See:* LOGO.

tutorial simulation *See:* instructional simulation.

TV *See:* television.

TV broadcast band (overhead-power-line corona and radio noise) Any one of the frequency bands assigned for the transmission of audio and video signals for television (TV) broadcasting to the general public. *Note:* In the United States and Canada, the frequency bands are 54–72 MHz; 76–88 MHz; 174–216 MHz, and 400–890 MHz. (T&D/PE) 539-1990

TVL *See:* television lines.

TV waveform signal (linear waveform distortion) An electrical signal whose amplitude varies with time in a generally nonsinusoidal manner and whose shape (that is, duration and amplitude) carries the TV signal information. (BT) 511-1979w

TW *See:* shaped wire compact conductor.

TWA *See:* two-way alternating.

twelve punch A zone punch in punch row twelve (top row) of a twelve-row punch card. *Synonym:* Y punch. *See also:* eleven punch; zone punch. (C) 610.10-1994w

twelve-row punch card A punch card with twelve rows. (C) 610.10-1994w

21-type repeater *See:* twenty-one-type repeater.

twenty-one-type repeater (data transmission) A two-wire telephone repeater in which there is one amplifier serving to amplify the telephone current in both directions, the circuit being arranged so that the input and output terminals of the amplifier are in one pair of conjugate branches, while the lines in the two directions are in another pair of conjugate branches. (PE) 599-1985w

22-type repeater *See:* twenty-two-type repeater.

twenty-two-type repeater (data transmission) A two-wire telephone repeater in which there are two amplifiers, one serving to amplify the telephone current being transmitted in one direction and the other serving to amplify the telephone currents in the other direction. (PE) 599-1985w

twinaxial cable A cable consisting of two conductors, insulated from each other, within and insulated from another conductor of larger diameter. *Contrast:* coaxial cable. (C) 610.7-1995

twin-bundle *See:* bundle; bundle, two-conductor, three-conductor, four-conductor, multiconductor.

twin cable A cable composed of two insulated conductors laid parallel and either attached to each other by the insulation or bound together with a common covering. (T&D/PE) [10]

twinkle box An input device employing light sensors, rotating disks, and a stylus, used to measure three-dimensional positions by angular light sensing. (C) 610.10-1994w

twin segment In a hierarchical database, a child segment N that shares a common parent segment with another child segment M. Segments N and M are said to be twin segments. *See also:* logical twin segment; physical twin segment. (C) 610.5-1990w

twin-T network *See:* parallel-T network.

twin wire A cable composed of two small insulated conductors laid parallel, having a common covering. *See also:* conductor. 30-1937w

twist (measuring the performance of tone address signaling systems) In a two-tone signal, during the signal present condition, the level of the higher-frequency tone relative to the level of the lower-frequency tone, expressed in decibels. Twist is negative if the higher-frequency tone level is below the lower-frequency tone level. (COM/TA) 752-1986w

twisted-lead transposition (rotating machinery) A form of transposition used on a distributed armature winding wherein the strands comprising each turn are kept insulated from each other throughout all the coils in a phase belt, and the last half turn of each coil is given a 180-degree twist prior to connecting it to the first half turn of the next coil in the series. *See also:* rotor; stator. (PE) [9]

twisted pair (1) A cable composed of two small insulated conductors, twisted together without a common covering. *Note:* The two conductors of a twisted pair are usually substantially insulated, so that the combination is a special case of a cord. *See also:* conductor. (T&D/PE) [10]

(2) A medium consisting of two insulated wires arranged in a regular spiral pattern. (C) 610.7-1995

(3) A cable element that consists of two insulated conductors twisted together in a regular fashion to form a balanced transmission line. (C/LM) 802.3-1998

(4) (local area networks) Two continuous, insulated copper conductors twisted around each other in a helical manner. Twisted-pair cable may be unshielded (UTP) or shielded (STP). (C) 8802-12-1998

twisted-pair cable (1) A group of twisted pairs within a single protective sheath. (C) 610.7-1995

(2) A bundle of multiple twisted pairs within a single protective sheath. (C/LM) 802.3-1998

(3) (local area networks) A group of two or four twisted pairs within a single sheath. (C) 8802-12-1998

twisted-pair cable binder group (1) A group of twisted pairs within a cable that are bound together. Large telephone cables have multiple binder groups with high interbinder group near-end crosstalk loss. (C/LM) 802.3-1998

(2) (local area networks) A group of twisted pairs within a cable that are bound together. (C) 8802-12-1998

twisted-pair link (1) A twisted-pair cable plus connecting hardware. (LM/C) 802.3u-1995s

(2) (local area networks) A link segment consisting of a twisted-pair cable and two attached MDI connectors. (C) 8802-12-1998

twisted-pair link segment In 100BASE-T, a twisted-pair link for connecting two Physical Layers (PHYs). (C/LM) 802.3-1998

twist, waveguide *See:* waveguide twist.

two-address Pertaining to an instruction code in which each instruction has two address parts. Some two-address instructions use the addresses to specify the location of one operand and the destination of the result, but more often they are one-plus-one-address instructions. (C) 162-1963w

two-address instruction (1) A computer instruction that contains two address fields. For example, an instruction to add the contents of A to the contents of B. *Synonym:* double-operand instruction. *Contrast:* four-address instruction; three-address instruction; one-address instruction; zero-address instruction. (C) 610.12-1990

(2) An instruction containing two addresses. *Synonym:* double-address instruction. *See also:* address format. (C) 610.10-1994w

two-bit byte *See:* doublet.

two-conductor bundle *See:* bundle.

two-degree-freedom gyro A gyro in which the rotor axis is free to move in any direction. *See also:* navigation. (AES/RS) 686-1982s, [42]

two-dimensional radar A radar that provides information in range and one angle coordinate, as in a 2-D air-surveillance radar that uses a fan-beam antenna to obtain range and azimuth angle. (AES) 686-1997

two-dimensional scanning Scanning the beam of a directive antenna using two degrees of freedom to provide solid angle coverage. (AP/ANT) 145-1993

two-directional signal line A signal line that may be defined in either direction across an interface, and that cannot be defined in both directions simultaneously. The direction of operation for a two-directional signal line in a system is a configuration option. (C/MM) 959-1988r

two-drum, three-drum puller The definition and application for this unit is essentially the same as that for the drum puller. It differs in that this unit is equipped with two or three drums and thus can pull one, two, or three conductors individually or simultaneously. *Synonyms:* tugger; hoist, double drum; hoist, triple drum; winch, double-drum; winch, triple-drum; winch, three-drum; winch, two-drum. *See also:* drum puller. (T&D/PE) 524-1992r

two-element relay An alternating-current relay that is controlled by current from two circuits through two cooperating sets of coils. (EEC/PE) [119]

two-family dwelling A building consisting solely of two dwelling units. (NESC/NEC) [86]

two-fluid cell A cell having different electrolytes at the two electrodes. *See also:* electrochemistry. (EEC/PE) [119]

two-frequency mutual coherence function The correlation between two fields at two frequencies measured at the same point in space and time. (AP/PROP) 211-1997

two-frequency simplex operation (radio communication) The operation of a two-way radio-communication circuit utilizing two radio-frequency channels, one for each direction of transmission, in such manner that intelligence can be transmitted in only one direction at a time. *See also:* channel spacing. (VT) [37]

2GL *See:* assembly language.

two-input adder *See:* half adder.

two-layer winding A winding in which there are two coil sides in the depth of a slot. *See also:* rotor; stator. (PE) [9]

two-level address (1) An indirect address that specifies the storage location containing the address of the desired operand. *See also: n*–level address. (C) 610.12-1990

(2) *See also:* n-level address; indirect address. (C) 610.10-1994w

two-level encoding A microprogramming technique in which different microoperations may be encoded identically into the same field of a microinstruction, and the one that is executed depends upon the value in another field internal or external to the microinstruction. *Contrast:* single-level encoding. *See also:* residual control; bit steering. (C) 610.12-1990

two-N (2N) angular sensitivity (dynamically tuned gyro) The coefficient that relates drift rate to angular vibration at twice spin frequency applied about an axis perpendicular to the spin axis. It has the dimensions of angular displacement per unit time, per unit of angle of the input vibration. *See also:* angular-case-motion sensitivity. (AES/GYAC) 528-1994

two-N (2N) translational sensitivity (dynamically tuned gyro) The coefficient that relates drift rate to linear vibrations at twice spin frequency applied perpendicularly to the spin axis. It has the dimensions of angular displacement per unit time, per unit of acceleration of the input vibration. (AES/GYAC) 528-1994

two-out-of-five code (A) A BCD code in which each decimal digit is represented by a five-digit numeral of which two bits are in one state (usually ones) and three are in the other state. *See also: m*–out–of–*n* code. **(B)** A code in which each decimal digit is represented by five binary digits of which two are one kind (for example, ones) and three are the other kind (for example, zeros). (C) 1084-1986, [20], [85]

two-phase circuit (power and distribution transformers) A polyphase circuit of three, four, or five distinct conductors intended to be so energized that in the steady state the alternating voltages between two selected pairs of terminals of entry, other than the neutral terminal when one exists, have the same periods, are equal in amplitude, and have a phase difference of 90 degrees. When the circuit consists of five conductors, but not otherwise, one of them is a neutral conductor. *Note:* A two-phase circuit as defined here does not conform to the general pattern of polyphase circuits. Actually a two-phase, four-wire, or five-wire circuit could more properly be called a four-phase circuit, but the term two-phase is in common usage. A two-phase three-wire circuit is essentially a special case, as it does not conform to the general pattern of other polyphase circuits. (PE/TR) C57.12.80-1978r

two-phase five-wire system A system of alternating-current supply comprising five conductors, four of which are connected as in a four-wire two-phase system, the fifth being connected to the neutral points of each phase. *Note:* The neutral is usually grounded. Although this type of system is usually known as the two-phase five-wire system, it is strictly a four-phase five-wire system. *See also:* network analysis; alternating-current distribution. (T&D/PE) [10]

two-phase four-wire system A system of alternating-current supply comprising two pairs of conductors between one pair of which is maintained an alternating difference of potential displaced in phase by one-quarter of a period from an alternating difference of potential of the same frequency maintained between the other pair. *See also:* network analysis; alternating-current distribution. (T&D/PE) [10]

two-phase three-wire system A system of alternating-current supply comprising three conductors between one of which (known as the common return) and each of the other two are maintained alternating differences of potential displaced in phase by one quarter of a period with relation to each other. *See also:* alternating-current distribution; network analysis. (T&D/PE) [10]

two-plus-one address (electronic computation) Pertaining to an instruction that contains two operand addresses and a control address. *See also:* operand; instruction. (C) 162-1963w

two-plus-one address format *See:* address format.

two-plus-one address instruction A computer instruction that contains three address fields, the third containing the address of the instruction to be executed next. For example, an instruction to add the contents of A to the contents of B, then

execute the instruction at location C. *Contrast:* four-plus-one address instruction; three-plus-one address instruction; one-plus-one address instruction. (C) 610.12-1990

two-port surge protective device A surge protective device with two sets of terminals, input and output. A specific series impedance is inserted between these terminals. (PE) C62.34-1996

two-quadrant DAM (hybrid computer linkage components) A digital-to-analog multiplier (DAM) that multiplies with a single sign only for the digital value. (C) 166-1977w

two-quadrant multiplier (1) (analog computer) A multiplier in which operation is restricted to a single sign of one input variable only. *See also:* electronic analog computer. (C) 165-1977w, 166-1977w

(2) A multiplier in which the multiplication operation is restricted to a single sign of one input variable. *Contrast:* four-quadrant multiplier; one-quadrant multiplier. (C) 610.10-1994w

two-rail logic *See:* double-rail logic.

two-range Decca *See:* lambda.

two-rate watthour meter A meter having two sets of register dials, with a changeover arrangement such that integration of the quantity will be registered on one set of dials during a specified time each day, and on the other set of dials for the remaining time. (ELM) C12.1-1982s

two-sample deviation ($\sigma_y(\tau)$) The square root of the two-sample variance. *Synonym:* Allan deviation. (SCC27) 1139-1999

two-sample variance ($\sigma_y^2(\tau)$) Time average over the sum of the squares of the differences between successive readings of the normalized frequency departure sampled over the sampling time τ, under the assumption that there is no dead time between the normalized frequency departure samples. *Synonym:* Allan deviation. (SCC27) 1139-1999

two-scale *See:* binary notation.

twos complement (mathematics of computing) The radix complement of a binary numeral, which may be formed by subtracting each digit from 1, then adding 1 to the least significant digit and executing any required carries. For example, the twos complement of 1101 is 0011. *Synonym:* complement on two. (C) 1084-1986w

twos-complement arithmetic Computer arithmetic performed with operands that are expressed in twos-complement notation. (C) 1084-1986w

twos-complement notation A binary numeration system in which negative numbers are represented by their twos complement and positive numbers are expressed in their usual binary form. *Contrast:* sign-magnitude notation. (C) 1084-1986w

two-sided z transform (data processing) The two-sided z transform of $f(t)$ is

$$F(z) = \sum_{n=\infty}^{-1} f(nT)z^{-n} + \sum_{n=0}^{\infty} f(nT)z^{-n}$$

where the first summation is for $f(t)$ over all negative time and the second summation is for $f(t)$ over all positive time. (IM) [52]

two-signal selectivity (frequency-modulated mobile communications receivers) The characteristic that determines the extent to which the receiver is capable of differentiating between the desired signal and disturbances of signals at other frequencies. It is expressed as the amplitude ratio of the modulated desired signal and the unmodulated disturbing signal when the reference sensitivity sinad of the desired signal is degraded six decibels. (VT) 184-1969w

two-source frequency keying That form of keying in which the modulating wave abruptly shifts the output frequency between predetermined values, where the values of output frequency are derived from independent sources. *Note:* Therefore, the output wave is not coherent and, in general, will have a phase discontinuity. *See also:* telegraphy. (AP/ANT) 145-1983s

two-speed alternating-current control A control for two-speed driving-machine induction motor that is arranged to run near two different synchronous speeds by connecting the motor windings so as to obtain different numbers of poles. *See also:* control. (EEC/PE) [119]

two-state indication *See:* supervisory control functions.

two-state variable *See:* binary variable.

two-step control system A control system in which the manipulated variable alternates between two predetermined values. *Note:* A control system in which the manipulated variable changes to other predetermined value whenever the actuating signal passes through zero is called a two-step single-point control system. A two-step neutral-zone control system is one in which the manipulated variable changes to the other predetermined value when the actuating signal passes through a range of values known as the neutral zone. The neutral zone may be produced by a mechanical differential gap. The neutral zone is also called overlap, and two-step neutral-zone control overlap control. *See also:* feedback control system. (IM/PE/EDPG) [120], [3]

two-step neutral zone control system *See:* two-step control system.

two-step single-point control system *See:* two-step control system.

two-terminal capacitor Two conductors separated by a dielectric. The construction is usually such that one conductor essentially surrounds the other and therefore the effect of the presence of other conductors, except in the immediate vicinity of the terminals, is eliminated. (Specialized usage). (Std100) 270-1966w

two-terminal pair network (quadripole) (four-pole) A network with four accessible terminals grouped in pairs, for example, input pair, output pair. (CAS) [13]

two-tone keying That form of keying in which the modulating wave causes the carrier to be modulated with a single tone for the marking condition and modulated with a different single tone for the spacing condition. *See also:* telegraphy. (AP/ANT) 145-1983s

2T pulse (television) (waveform test signals) A $\sin^2$ pulse with a half-amplitude duration (HAD) of 250 ns. The amplitude of the envelope of the frequency spectrum at 2 MHz is 0.5 of the amplitude at zero frequency and effectively zero at and beyond 4 MHz. *Note:* The 2T pulse is mentioned here for the sake of completeness. The short-time domain may be tested by the 2T pulse in conjunction with the T pulse and a reference signal. This method is not used in this standard since the T step alone tests the short-time domain in a simpler and more direct manner. (BT) 511-1979w

two-transistor cell A memory cell consisting of two MNOS transistors. (ED) 641-1987w

two-value capacitor motor A capacitor motor using different values of effective capacitance for the starting and running conditions. *See also:* asynchronous machine. (PE) [9]

two-valued variable *See:* binary variable.

two-way alternate operation A mode of operation of a data link in which data may be transmitted in both directions, one direction at a time. *Synonym:* either-way operation. *See also:* two-way simultaneous operation; one-way-only operation. (C) 610.7-1995

two-way alternating (TWA) A subset of HDLC defining half-duplex, rather than simultaneous, two-way communications. (EMB/MIB) 1073.3.1-1994

two-way automatic maintaining leveling device A device that corrects the car level on both underrun and overrun, and maintains the level during loading and unloading. *See also:* elevator car-leveling device. (EEC/PE) [119]

two-way automatic nonmaintaining leveling device A device that corrects the car level on both underrun and overrun, but will not maintain the level during loading and unloading. *See also:* elevator car-leveling device. (EEC/PE) [119]

two-way chain *See:* doubly-linked list.

two-way circuit A circuit in which the transmission of signals is permitted in both directions. *Contrast:* simple circuit. (C) 610.10-1994w

two-way correction A method of register control that effects a correction in register in either direction. (IA/ICTL/CEM) [58]

two-way insertion sort An insertion sort in which each item in the set to be sorted is inserted in its proper position in the sorted set such that the first item is placed in the middle of the output set and space is made for subsequent items by moving the previously-inserted items to the right or left. *Contrast:* binary insertion sort. (C) 610.5-1990w

two-way merge sort A merge sort in which the set to be sorted is divided into two subsets, the items in each subset are sorted, and the subsets are merged by comparing the smallest items of each subset, outputting the smallest of those, then repeating the process. *See also:* natural two-way merge sort; multiway merge sort; straight two-way merge sort. (C) 610.5-1990w

two-way simultaneous operation A mode of operation of a data link in which data may be transmitted over a link simultaneously in both directions. *See also:* one-way-only operation; two-way alternate operation. (C) 610.7-1995

two-way trunk (telephone switching systems) A trunk between two switching entities used for calls that originate from either end. (COM) 312-1977w

two-wire channel (1) (data transmission) (two-wire circuit) A metallic circuit formed by two adjacent conductors insulated from each other. *Note:* Also used in contrast with four-wire circuit to indicate a circuit using one line or channel for transmission of electric waves in both directions. (PE) 599-1985w

(2) (telephone loop performance) A transmission medium that simultaneously carries, without multiplexing, two signals traveling in opposite directions. (COM/TA) 820-1984r

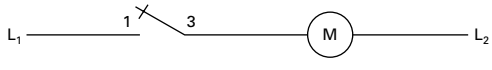
two-wire circuit (1) (data transmission) A metallic circuit formed by two adjacent conductors insulated from each other. *Note:* Also used in contrast with four-wire circuit to indicate a circuit using one line or channel for transmission of electric waves in both directions. (PE) 599-1985w

(2) (transmission performance of telephone sets) A metallic circuit formed by two conductors insulated from each other. The electric waves are transmitted in both directions over the path provided by the two-wire circuit. (COM/TA) 269-1983s

(3) A leased circuit in which two conductors are used, each for a one-way transmission path. *See also:* foreign exchange circuit; dial-up circuit; simplex circuit; four-wire circuit. (C) 610.7-1995

(4) A circuit formed by a pair of conductors that are insulated from one another and that each feed a load in one direction at a time. (C) 610.10-1994w

two-wire control A control function that utilizes a maintained-contact type of pilot device to provide undervoltage release. (See the corresponding figure.) *See also:* undervoltage release; control.



two-wire control

(IA/ICTL/IAC) [60]

two-wire repeater (data transmission) A telephone repeater that provides for transmission in both directions over a two-wire telephone circuit. (PE) 599-1985w

two-wire switching (telephone switching systems) Switching using the same path, frequency, or time interval for both directions of transmission. (COM) 312-1977w

two-wire system *See:* two-wire circuit.

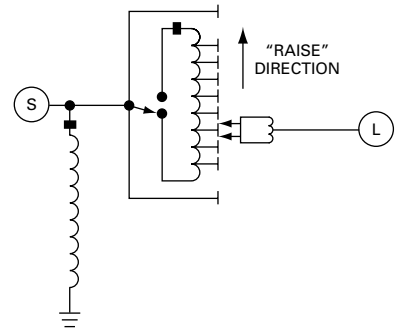
two-wire transmission A transmission scheme where the send and receive signals are carried in one pair of wires. (COM/TA) 269-1992, 1329-1999

TWS *See:* track-while-scan.

type (1) A category into which attribute values are placed on the basis of their purpose. (C/PA) 1224-1993w

(2) *See also:* class. (C/SE) 1320.2-1998

Type A step-voltage regulator A step-voltage regulator in which the primary circuit is connected directly to the shunt winding of the regulator. The series winding is connected to the shunt winding and, in turn, via taps, to the regulated circuit, per the figure below. In a Type A step-voltage regulator, the core excitation varies because the shunt winding is connected across the primary circuit.



Schematic diagram of single-phase, Type A step-voltage regulator

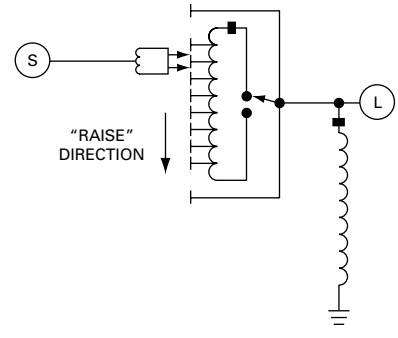
Type A step-voltage regulator

(PE/TR) C57.15-1999

type attributes The classification of each source statement as either executable, data declaration, compiler directive, or comment. (C/SE) 1045-1992

type bar In a bar printer, a print element in the form of a bar that holds type slugs. *Synonym:* print bar. (C) 610.10-1994w

Type B step-voltage regulator A step-voltage regulator in which the primary circuit is connected, via taps, to the series winding of the regulator. The series winding is connected to the shunt winding, which is connected directly to the regulated circuit, per the figure below. In a Type B step-voltage regulator, the core excitation is constant because the shunt winding is connected across the regulated circuit.



Schematic diagram of single-phase, Type B step-voltage regulator

Type B step-voltage regulator

(PE/TR) C57.15-1999

Type DB (1) (cable systems in power generating stations) (formerly Type II) Conduit designed for underground installation without encasement in concrete. (C) 166-1977w

(2) Duct designed for direct burial without encasement in concrete (also referred to as Type II duct), fabricated from PVC or ABS. (SUB/PE) 525-1992r

Type EB (1) (cable systems in power generating stations) (formerly Type I) Conduit designed to be encased in concrete when installed. (C) 166-1977w

(2) Duct designed to be encased in concrete when installed (also referred to as Type I duct), fabricated from PVC or ABS. (SUB/PE) 525-1992r

type element *See:* print element.

type error An error that occurs when a node is encountered with improper protocol information. (C) 610.7-1995

type_error A status code that is returned when the transaction is directed to an existing address, but the transaction command (for example, a read64 directed to a quadlet register) is not implemented. (C/MM) 1212-1991s

type font (1) A type face of a given size and design; for example, 10-point Bodoni Book Medium, or 9-point Gothic. (C) [20], [85]

(2) *See also:* character font. (C) 610.2-1987

(3) *See also:* font. (C) 610.10-1994w

Type IV Duct designed for heavy-duty applications above grade. (SUB/PE) 525-1992r

type of emission (mobile communication) A system of designating emission, modulation, and transmission characteristics of radio-frequency transmissions, as defined by the Federal Communications Commission. *See also:* mobile communication system. (VT) [37]

type of piezoelectric crystal cut The orientation of a piezoelectric crystal plate with respect to the axes of the crystal. It is usually designated by symbols. For example, *GT*, *AT*, *BT*, *CT*, and *DT* identify certain quartz crystal cuts having very low temperature coefficients. *See also:* crystal. (EEC/PE) [119]

type of service The specific type of application in which the controller is to be used; for example: general purpose; special purpose—namely, crane and hoist, elevator, steel mill, machine tool, printing press, etc. *See also:* electric controller. (IA/ICTL/IAC) [60]

Type I Duct designed to be encased in concrete. (SUB/PE) 525-1992r

type I error *See:* misidentification.

type slug A type element, usually with two characters arranged one above the other, for mounting on a type bar. (C) 610.10-1994w

types of metal-enclosed bus assemblies (metal-enclosed bus and calculating losses in isolated-phase bus) In general, three basic types of construction are used: nonsegregated-phase, segregated-phase, and isolated-phase.

1) (nonsegregated-pase bus) One in which all phase conductors are in a common metal enclosure without barriers between the phases. When associated with metal-clad switchgear, the primary bus and connections are covered with insulating material equivalent to the switchgear insulating system.
2) (segregated-phase bus) One in which all phase conductors are in a common metal enclosure but are segregated by metal barriers between phases.
3) (isolated-phase bus) One 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 force-cooled by means of circulating a gas or liquid. (SWG/PE) C37.23-1987r

type test (1) (electrical heat tracing for industrial applications) A test or series of tests carried out on equipment, representative of a type, to determine compliance of the design, construction, and manufacturing methods within the requirements of IEEE Std 515-1983. (BT/AV) 152-1953s

(2) (valve actuators) Tests made on one or more sample actuators to verify adequacy of design and the manufacturing processes. (PE/NP) 382-1985

(3) (rotating electric machinery) A test made by the manufacturer on a machine that is identical in all essential respects with those supplied on an order, to demonstrate that it complies with this standard. (PE/EM) 11-1980r

(4) A test or series of tests carried out on heating cables and accessories, representative of a type, to determine compliance of the design, construction, and manufacturing methods within the requirements of the specified standard (in this case, IEEE Std 515.1-1995). (IA/PC) 515.1-1995

(5) A test or series of tests carried out on heating cables or surface heating devices and accessories, representative of a type, to determine compliance of the design, construction, and manufacturing methods within the requirements of this standard. (IA) 515-1997

type testing Evaluation or measurement of all identified performance characteristics of a representative sample of production model instruments. (NI) N42.17B-1989r

type tests (1) (Class 1E battery chargers and inverters) (nuclear power generating station) Tests made on one or more sample equipment to verify adequacy of design and the manufacturing processes. (PE/NP) 323-1974s, 650-1979s

(2) (rotating machinery) The performance tests taken on the first machine of each type of design. *See also:* asynchronous machine. (PE) [9]

(3) Tests made on representative samples that are intended to be used as a part of routine production. The applicable portions of these type tests may also be used to evaluate modifications of a previous design and to ensure that performance has not been adversely affected. (SUB/PE) C37.122-1993

(4) Tests made on representative samples that are intended to be used as part of routine production. The applicable portions of these type tests may also be used to evaluate modifications of a previous design and to ensure that performance has not been adversely affected. (SUB/PE) C37.122.1-1993

Type III Duct designed for normal-duty applications above grade. (SUB/PE) 525-1992r

Type II Duct designed for underground installation without encasement in concrete. (SUB/PE) 525-1992r

type wheel *See:* print wheel.

typewriter key *See:* typing key.

typing key Any key on a keyboard that represents a printable character, an alphanumeric or special character. *Synonym:* typewriter key. *Contrast:* control key. (C) 610.10-1994w

T0 Pronounced "tee-zero." A reference to a MASTER clock that synchronizes all events across all signals to a common starting point. Initiates the start of each test vector. (C/TT) 1450-1999