P

p *See:* pico.

PA Pre-arbitrated. (LM/C) 802.6-1990r

PA access function *See:* pre-arbitrated (PA) access function.

PABX *See:* private automatic branch exchange.

pace voltage (surge arresters) A voltage generated by ground current between two points on the surface of the ground at a distance apart corresponding to the conventional length of an ordinary pace. (PE) [8], [84]

PACF *See:* phase angle correction factor.

pacing (1) (Class 1E connection assemblies) A method of ongoing qualification by parallel age conditioning. (PE/NP) 572-1985r

(2) A method to regulate the flow of bytes read from or written to a Smart Transducer Interface Module. (IM/ST) 1451.2-1997

pack (1) To compress several items of data in a storage medium in such a way that the individual items can later be recovered. (C) [20], [85]

(2) (data management) (software) To store data in a compact form in a storage medium, using known characteristics of the data and medium in such a way as to permit recovery of the data. *Contrast:* unpack. *See also:* packed data. (C) 610.5-1990w, 610.12-1990

package (1) (software) A separately compilable software component consisting of related data types, data objects, and subprograms. *See also:* encapsulation; information hiding; data abstraction. (C) 610.12-1990

(2) The combination of a node's properties, methods, and private data. (C/BA) 1275-1994

(3) An external container, substrate, or platform used to hold a semiconductor or circuit. *Note:* it may be made of plastic or ceramic with many interfacing pins. (C) 610.10-1994w

(4) A group of related OM classes. (C/PA) 1328.2-1993w, 1327.2-1993w, 1224.2-1993w, 1326.2-1993w

(5) A group of related classes. (C/PA) 1328-1993w, 1238.1-1994w, 1224-1993w, 1224.1-1993w, 1327-1993w

package closure The set of classes that need to be supported in order to be able to create all possible instances of all classes defined in the package. (C/PA) 1328-1993w, 1224-1993w, 1327-1993w

package, core *See:* core package.

package instance A data structure resulting from the opening of a particular package, consisting of a set of values for the package's private data. (C/BA) 1275-1994

packaged magnetron An integral structure comprising a magnetron, its ma gnetic circuit, and its output matching device. *See also:* magnetron. (ED) 161-1971w, [45]

packager role Where software that has been developed is organized in a form suitable for distribution. (C/PA) 1387.2-1995

packaging (1) (software) In software development, the assignment of modules to segments to be handled as distinct physical units for execution by a computer. (C) 610.12-1990

(2) The process of containing, connecting, protecting, and sealing circuits and components into enclosures such as devices, modules, or housings. (C) 610.10-1994w

packaging machine Any automatic, semiautomatic, or hand-operated apparatus that performs one or more packaging functions, such as, but not limited to, the fabrication, preparation, filling, closing, labeling, or preparing, or both, for final distribution of any type of package or container used to protect or display, or both, any product. (IA/PKG) 333-1980w

packed array An array in which all data elements in the set have non-trivial values. *Synonym:* dense list. (C) 610.5-1990w

packed binary data Binary data stored in a compact form in a storage medium, using known characteristics of the data and the medium to permit recovery of the data. (C) 610.5-1990w

packed data Data stored in a compact form in a storage medium, using known characteristics of the data and the medium to permit recovery of the data. *See also:* packed decimal data; packed binary data. (C) 610.5-1990w

packed decimal data Integer data stored in a compact form in a storage medium, using known characteristics of the data and the medium to permit recovery of the data. In the most common implementation, each decimal digit is represented in binary, occupying four bits, and the right-most decimal digit is followed by a four-bit sign digit (hexadecimal A,C,E, or F for positive; B or D for negative).

decimal	275_{10}
packed decimal	$0010\ 0111\ 0101\ 1111_2 = 275F_{16}$
decimal	-91_{10}
packed decimal	$0000\ 1001\ 0001\ 1011_2 = 091B_{16}$

See also: unsigned packed decimal data. (C) 610.5-1990w

packet (1) A group of binary digits including data and control elements which is switched and transmitted as a composite whole. The data and control elements and possibly error control information are arranged in a specified format. (LM/COM) 168-1956w

(2) (MULTIBUS II) A block of information that is transmitted within a single transfer operation in message space. *See also:* message space; transfer operation. (C/MM) 1296-1987s

(3) A collection of symbols that contains addressing information and is protected by a CRC. A subaction consists of two packets, a send packet and an echo packet. (C/MM) 1596-1992

(4) A 17-bit unit of data consisting of a 16-bit word plus 1 parity bit. (TT/C) 1149.5-1995

(5) A sequence of N_chars with a specific order and format. A packet consists of a destination followed by a payload. A packet is delimited by an end_of_packet marker. *See also:* destination; payload. (C/BA) 1355-1995

(6) A unit of data of some finite-size that is transmitted as a unit. *Note:* Usually consists of a header containing control information such as a sequence number, the network address of the station that originated the packet, and the network address of the packet's destination. *See also:* long packet; short packet. (C) 610.7-1995, 610.10-1994w

(7) A serial stream of clocked data bits. A packet is normally the PDU for the link layer, although the cable physical layer can also generate and receive special short packets for management purposes. (C/MM) 1394-1995

(8) A collection of symbols that contains addressing information and is protected by a CRC. A subaction consists of two packets: a send packet and an echo packet. (C/MM) 1596.3-1996

(9) A block of information that is transmitted within a single transfer operation. (C/MM) 1596.4-1996

(10) A structured field, having a start byte, a two-byte length field (the first two bytes), a flag byte, a command byte, followed by the subcommand and/or data fields. (C/MM) 1284.1-1997

(11) Consists of a data frame as defined previously, preceded by the Preamble and the Start Frame Delimiter, encoded, as appropriate, for the Physical Layer (PHY) type. (C/LM) 802.3-1998

(12) (local area networks) The total information transmitted over the link medium, including the preamble, the MAC frame, and the start of stream and end of stream delimiters. *See also:* frame. (C) 8802-12-1998

(13) A sequence of bits transmitted on Serial Bus and delimited by DATA_PREFIX and DATA_END. (C/MM) 1394a-2000

(14) A group of bytes, including address, data, and control elements. (C/MM) 1284.4-2000

packet assembler/disassembler (PAD) (1) A device that assembles and disassembles packets. (LM/C/COM) 8802-9-1996

(2) A protocol conversion device that performs packet assembly/disassembly. *Note:* Generally refers to a terminal multiplexer device that connects hosts and terminals on a network. (C) 610.7-1995

packet assembly/disassembly The process of dividing a message into packets for transmission over a packet switching network and then reassembling the packets in the original message. (C) 610.7-1995

PACKET COUNT packet A packet by means of which an M-module conveys to addressed S-modules the number of packets to follow in the current message. S-modules may or may not include the ability to use the data in this packet. (TT/C) 1149.5-1995

packet data network *See:* packet switching network.

packet data transfer A very fast, but technology-dependent, noncompelled transfer mechanism used to transfer data from a source to a destination. (C/BA) 1014.1-1994w

packet data transfer protocol A very fast but technology-dependent noncompelled transfer mechanism that uses a compelled protocol over the entire packet to provide flow control. (C/BA/C/BA) 10857-1994, 896.4-1993w

packet error An error that occurs when a packet is lost in the network. *See also:* type error; address error; abnormal preamble; alignment error. (C) 610.7-1995

packet handler (PH) A device for processing packets or frames in a manner so as to be able to route individual frames or packets out of one data stream into multiple different data streams. (LM/C/COM) 8802-9-1996

packetized data transfer Transfer of data through a network where data is conveyed in packets and/or frames in a statistical manner. Packets or frames are propagated through the network and delivered to destinations based on addressing information contained therein. (LM/C/COM) 8802-9-1996

packet latency During a send/receive message, the number of packet transfers by which the first non-NULL DATA packet returned by the addressed S-module lags the first non-null DATA packet transmitted by the M-module. (TT/C) 1149.5-1995

packet layer The layer of the protocol concerned with end-to-end transmission of information, possibly through a number of intermediate routers. It is at the packet layer that the routing decisions are taken. (C/BA) 1355-1995

packet mode protocol The access protocol based on the use of out-of-band control and Link Layer multiplexing. (LM/C/COM) 8802-9-1996

packet pair Two packets, one transmitted by the M-module and one by an S-module, such that the last 14 bits of the M-module-originated packet are transmitted simultaneously with the first 14 bits of the S-module-originated packet. (TT/C) 1149.5-1995

packet-switched data network (PSDN) A packet-switched subnetwork that can be a PPSN (private) or a PSPDN (public) packet-switched network. (LM/C/COM) 8802-9-1996

packet switched network *See:* packet switching network.

packet switched public data network (PSPDN) A public subnetwork that is accessed via the CCITT X.25 protocol and that provides virtual circuit service. (LM/C/COM) 8802-9-1996

packet switching (1) A data transmission process, utilizing addressed packets, whereby a channel is occupied only for the duration of transmission of the packet. *See also:* store-and-forward switching; message switching; circuit switching. (LM/COM) 168-1956w

(2) A technique used in data communications in which messages are broken into finite-size packets and are forwarded to the other party over the network. Packets may vary in size so long as the size does not exceed the maximum size convention for the local network or protocol in use. *Note:* The packets need not travel the same path. At the end of the circuit, the packets are reassembled into the messages and are then passed on to the receiving terminals. *Contrast:* cell switching. *See also:* fast packet switching; virtual circuit. (C) 610.7-1995

packet switching network A network that uses packet switching techniques for transmission of data. *Synonyms:* packet switched network; packet data network. (C) 610.7-1995

packet symbol A symbol contained within a packet and protected by the packet's CRC. (Exception: part of the second symbol in a packet contains flow control information that is not covered by the CRC, but the symbol as a whole is still considered to be within the packet.) (C/MM) 1596-1992

packing density (computers) The number of useful storage cells per unit of dimension, for example, the number of bits per inch stored on a magnetic tape or drum track. (MIL/C) [2], [85], [20]

packing fraction (fiber optics) In a fiber bundle, the ratio of the aggregate fiber cross-sectional core area to the total cross-sectional area (usually within the ferrule) including cladding and interstitial areas. *See also:* ferrule; fiber bundle. (Std100) 812-1984w

packing gland An explosion-proof entrance for conductors through the wall of an explosionproof enclosure, to provide compressed packing completely surrounding the wire or cable, for not less than 0.5 in measured along the length of the cable. *See also:* mine feeder circuit. (EEC/PE) [119]

PAD *See:* packet assembler/disassembler; packet assembly/disassembly.

pad (1) (data transmission) (attenuating pad) A nonadjustable passive network that reduces the power level of a signal without introducing appreciable distortion. *Note:* A pad may also provide impedance matching. (PE) 599-1985w

(2) (data management) To fill an item such as a record or block with one or more filler characters in order to satisfy some prescribed condition. For example, in order to right justify a seven-character string in a ten-position field, three blank characters are used to pad the data. *See also:* zero fill; character fill. (C) 610.5-1990w

(3) (local area networks) Any combination of octets used to extend the end of the data field of the ISO/IEC 8802-3 MAC frame so that it will meet minimum length requirements. (C) 8802-12-1998

padding (A) The technique of filling out a fixed-length block of data with dummy characters, words, or records. **(B)** Dummy characters, words, or records used to fill out a fixed-length block of data. (C) 610.12-1990

paddle A cursor control device consisting of a rotatable knob and potentiometer used to control the position of a cursor on a display device. (C) 610.10-1994w

pad electrode (dielectric heating) One of a pair of electrode plates between which a load is placed for dielectric heating. (IA) 54-1955w, 169-1955w

pad-mounted (1) A method of supporting equipment, generally at ground level. (NESC) C2-1977s

(2) A general term describing equipment positioned on a surface-mounted pad located outdoors. The equipment is usually enclosed with all exposed surfaces at ground potential. (SWG/PE) C37.100-1992

pad-mounted equipment A general term describing enclosed equipment, the exterior of which enclosure is at ground potential, positioned on a surface-mounted pad. (NESC) C2-1997

pad-mounted fused switchgear (PMFSG) Load-interrupter switch and fuse assemblies in which all energized parts are insulated and completely enclosed within an enclosure when the doors and covers are securely closed. The overall enclo-

sure is of suitable environmental and tamper-resistant construction for out-door, above-ground installation. (SWG/PE) C37.73-1998

pad-mounted transformer (power and distribution transformers) An outdoor transformer utilized as part of an underground distribution system, with enclosed compartment(s) for high-voltage and low-voltage cables entering from below, and mounted on a foundation pad. (PE/TR) C57.12.80-1978r

pad-type bearing (rotating machinery) A journal or thrust-type bearing in which the bearing surface is not continuous but consists of separate pads. *See also:* bearing. (PE) [9]

PAGE A text-formatting language that uses two-character instruction codes to control typesetting. (C) 610.13-1993w

page (1) (A) A fixed-length segment of data or of a computer program treated as a unit in storage allocation. **(B)** In a virtual storage system, a fixed-length segment of data or of a computer program that has a virtual address and is transferred as a unit between main and auxiliary storage. (C/Std100) 610.12-1990, 610.5-1990

(2) A screenful of information on a video display terminal. (C) 610.12-1990

(3) (or segment) The smallest portion of memory that can be relocated by memory mappingtechniques. (BA/C) 896.3-1993w

(4) A unit of memory with a specific size defined as a power of 2. (C/BA) 1014.1-1994w

(5) (A) In virtual storage, a fixed length block of instructions or data that has a virtual address and that is transferred as a unit between real storage and auxiliary storage. **(B)** To transfer data between real and auxiliary storage as in definition (A). (C/Std100) 610.10-1994

(6) The granularity of process memory mapping or locking. Physical memory and memory objects can be mapped into the address space of a process on page boundaries and in integral multiples of pages. Process address space can be locked into memory—made memory-resident—on page boundaries and in integral multiples of pages. (C/PA) 9945-1-1996

(7) A section of the array that may be written to simultaneously. This usually refers to more than one byte. (ED) 1005-1998

(8) (A) A fixed-length block of data, especially that which fits into a single printed sheet. **(B)** To summon a particular page or the next logical page. *See also:* paging. (PE/NP) 1289-1998

(9) A logical representation of a single unit of printing media. It is a function of the document formatting rather than the printing process. There are one or more pages per impression. A "four-up" single-color printing will typically have four pages per impression. (C/MM) 1284.1-1997

(10) In Auto-Negotiation, the encoding for a Link Code Word. Auto-Negotiation can support an arbitrary number of Link Code Word encodings. Additional pages may have a predefined encoding or may be custom encoded. *See also:* message page; Unformatted Page. (C/LM) 802.3-1998

(11) The granularity of memory mapping and locking, *i.e.*, a fixed-length contiguous range of the address space of a process. Physical memory and memory objects can be mapped into the address space of a process on page boundaries and in integral multiples of pages. Process address space can be locked into memory (*i.e.*, made memory-resident) on page boundaries and in integral multiples of pages. *Note:* There is no implied requirement that usage of the term *page* in this interface for memory mapping necessarily be the same as the term might be used in a virtual memory implementation. (C) 1003.5-1999

page breakage A portion of main storage that is unused when the last page of data or of a computer program does not fill the entire block of storage allocated to it. *See also:* paging. (C) 610.12-1990

page description language (PDL) (1) A computer language in which commands from a text-formatting language are combined into higher-level instructions that can be used in other documents. Examples include GML, HPGL, Postscript, and TEX. *Synonym:* markup language. (C) 610.13-1993w

(2) A formal printer machine language, consisting of commands and data (or equivalently, operators and operands) used to specify and control the content and format of printed pages. A data stream encoded in a PDL is rendered into the printed page image by an interpreter. (C/MM) 1284.1-1997

page eject character *See:* form feed character.

page fault In demand paging, a condition that causes a program interrupt when a page must be read in from disk into main storage. (C) 610.10-1994w

page frame A block of main storage having the size of, and used to hold, a page. *See also:* paging. (C) 610.12-1990

(2) (A) In real storage, a storage location that has the size of a page. **(B)** An area of main storage used to hold a page. (C) 610.10-1994

page makeup *See:* computer-aided page makeup; photocomposition.

page mode A method of operation in which more than one memory location is written simultaneously. (ED) 1005-1998

page orientation The direction of print on a display device or page of paper; that is, left-to-right or top-to-bottom. *See also:* portrait orientation; landscape orientation. (C) 610.10-1994w

page printer A printer that prints one complete page of output at a time. For example, a computer-output microfilm printer or a laser printer. *Contrast:* character-at-a-time printer; line printer. (C) 610.10-1994w

pager A routine that initiates and controls the transfer of pages between main and auxiliary storage. *See also:* paging. (C) 610.12-1990

page reader A character reader whose input data are in the form of printed text. *See also:* optical character reader. (C) 610.10-1994w

page reference An expression that unambiguously identifies a model page. The page reference incorporates a diagram reference to the associated diagram, the type of page, and any sequencing data needed to distinguish different pages of the same type that are associated with the same diagram. (C/SE) 1320.1-1998

page size (1) The edge-to-edge dimensions of hard-copy documents, or the average characters per line and the number of lines per screen for electronically displayed documents. (C/SE) 1045-1992

(2) The number of storage units in a page. (C) 1003.5-1999

page swapping The exchange of pages between main storage and auxiliary storage. *See also:* paging. (C) 610.12-1990, 610.10-1994w

page table A table that identifies the location of pages in storage and gives significant attributes of those pages. *See also:* paging. (C) 610.12-1990

page turning *See:* paging.

page type letter The uppercase letter in a page reference that denotes a specific type of model page. (C/SE) 1320.1-1998

page zero In the paging method of storage allocation, the first page in a series of pages. (C) 610.12-1990

pagination *See:* automatic pagination.

paging (1) (A) A storage allocation technique in which programs or data are divided into fixed-length blocks called pages, main storage is divided into blocks of the same length called page frames, and pages are stored in page frames, not necessarily contiguously or in logical order. *Synonym:* block allocation. *Contrast:* contiguous allocation. **(B)** A storage allocation technique in which programs or data are divided into fixed-length blocks called pages, main storage is divided into

blocks of the same length called page frames, and pages are transferred between main and auxiliary storage as needed. *See also:* virtual storage; demand paging; anticipatory paging. **(C)** The transfer of pages as in definition (B). *Synonym:* page turning. *See also:* working set; page; page swapping; page frame; page zero; page breakage; page table; pager. (C) 610.12-1990

(2) (A) A storage allocation technique in which programs or data are divided into fixed-length blocks called pages, main stage is divided into blocks of the same called page frames, and pages are stored in page frames, not necessarily contiguously or in logical order. *See also:* segment. **(B)** The transfer of pages between main and auxiliary memory, as in definition (A). *Synonym:* page turning. (C) 610.10-1994

(3) A method of viewing and moving through data in which a user conceives of data as being grouped into pages and moves through it by discrete steps. *See also:* page. (PE/NP) 1289-1998

paging device An auxiliary storage device used primarily to hold pages. (C) 610.10-1994w

paging rate In a virtual memory system, the rate at which pages are being transferred between real storage and auxiliary storage. (C) 610.10-1994w

pair A term applied in electric transmission to two like conductors employed to form an electric circuit. *See also:* cable. (EEC/PE) [119]

paired brushes (rotating machinery) (pair of brushes) Two individual brushes that are joined together by a common shunt or terminal. *Note:* They are not to be confused with a split brush. *See also:* brush. (PE) [9]

paired cable (nonquadded cable) A cable in which all of the conductors are arranged in the form of twisted pairs, none of which is arranged with others to form quads. *See also:* cable. (EEC/PE) [119]

pairing (scanning) (television) The condition in which lines appear in groups of two instead of being equally spaced. (BT/AV) 201-1979w

pair of brushes *See:* paired brushes.

PAL *See:* programmable array logic.

PAM *See:* pulse amplitude modulation.

PAM5×5 A block coding technique utilizing a 5×5 matrix (representing two 5-level signals) to generate pairs of quinary codes representing data nibbles and control characters. In 100BASE-T2, PAM5×5 code pairs are sent in parallel across two wire pairs. (C/LM) 802.3-1998

pancake coil A coil having the shape of a pancake, usually with the turns arranged in the form of a flat spiral. (EEC/PE) [119]

pancake motor A motor that is specially designed to have an axial length that is shorter than normal. (PE) [9]

pane (1) The rectangular area within a window where an application displays text or graphics. (C) 1295-1993w

(2) A component of a window. (C) 610.10-1994w

paned window A window that allows a user to view information in different panes of a window, separated by sashes. Panes can be shrunk or enlarged by moving the sash, but the total screen area occupied by the pane window remains constant. (C) 1295-1993w

panel (1) (Class 1E control boards) A unit of one or more sections of flat material suitable for mounting electric devices. (SWG/PE/NP) 420-1982, C37.100-1992

(2) (packaging machinery) An element of an electric controller consisting of a slab or plate on which various component parts of the controller are mounted and wired. (IA/ICTL/PKG/IAC) 330-1980w, 333-1980w, [60]

(3) (A) (photovoltaic converter) Combination of shingles or subpanels as a mechanical and electric unit required to meet performance specifications. *See also:* semiconductor. **(B) (solar cells)** The largest unit combination of solar cells or subpanels that is mechanically designed to facilitate manufacture and handling and that will establish a basis for electrical performance by test. **(C)** A distinct portion of an equipment's surface, usually defined by or contained within a frame or border; for example, a maintenance panel or an operator control panel. *See also:* control panel; plasma panel; display panel. (AES/C/SS) 307-1969, 610.10-1994

(4) (computers) *See also:* problem board; control panel. (AES/SS) 307-1969w

panelboard A single panel or group of panel units designed for assembly in the form of a single panel; including buses, automatic overcurrent devices, and with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall or partition and accessible only from the front. *See also:* switchboard. (NESC/NEC) [86]

panel control An assembly of man-machine interface devices. (SWG/PE) C37.100-1992

panel efficiency (1) (photoelectric converter) The ratio of available power output to incident radiant power intercepted by a panel composed of photoelectric converters. *Note:* This is less than the efficiency of the individual photoelectric converters because of area not covered by photoelectric converters, Joule heating, and photoelectric-converter mismatches. *See also:* semiconductor. (AES) [41]

(2) (solar cells) The ratio of available electric power output to total incident radiant power intercepted by the area of a panel composed of solar cells. *Note:* This depends on the spectral distribution of the radiant power source and junction temperature(s), requires uniform normal illumination on the intercepting area, and results in an efficiency less than the efficiency of the individual solar cells because of area not covered by solar cells, incident energy heating, solar cell mismatch, optical losses, and wiring losses. (AES/SS) 307-1969w

panel-frame mounting (of a switching device) Mounting on a panel frame in the rear of a panel with the operating mechanism on the front of the panel. (SWG/PE) C37.100-1992

panel interface A screen-oriented user interface designed to permit interactive processing. (C) 610.10-1994w

panel system An automatic telephone switching system that is generally characterized by the following features:

a) The contacts of the multiple banks over which selection occurs are mounted vertically in flat rectangular panels;
b) The brushes of the selecting mechanism are raised and lowered by a motor that is common to a number of these selecting mechanisms;
c) The switching pulses are received and stored by controlling mechanisms that govern the subsequent operations necessary in establishing a telephone connection.

(EEC/PE) [119]

panic brake Using any available form of braking, whether or not fail-safe, to obtain the shortest possible stopping distance. (VT) 1475-1999

panning (1) (computer graphics) In computer graphics, the process of moving an entire display image in such a manner that new data appears within the viewport as old data disappears, to give a visual impression of horizontal movement of the image. *Note:* The term panning is sometimes used to mean horizontal or vertical movement. *Contrast:* scrolling. (C) 610.6-1991w

(2) *See also:* scrolling. (C) 610.2-1987

paper feed A mechanism that positions the printing medium as the paper is moved into a printing device. (C) 610.10-1994w

paperless office An office that has been automated so that no paper documents are needed. *See also:* office automation; electronic office. (C) 610.2-1987

paper-lined construction (dry cell) (primary cell) A type of construction in which a paper liner, wet with electrolyte, forms the principal medium between the negative electrode, usually zinc, and the depolarizing mix. (A layer of paste may lie between the paper liner and the negative electrode.) *See also:* electrolytic cell. (PE/EEC) [119]

paper tape *See:* punch tape.

paper tape reader A reader that senses hole patterns in punched paper tape and translates them into internal machine data representations. *Synonym:* perforated tape reader. (C) 610.10-1994w

paper throw character *See:* form feed character.

paper traffic *See:* information traffic.

PAR *See:* precision-approach radar.

parabolic approximation *See:* parabolic equation.

parabolic equation Results when the Helmholtz equation is approximated to emphasize preferred propagation in the axial direction, leading to a differential equation of parabolic form. *Synonym:* parabolic approximation. (AP/PROP) 211-1997

parabolic profile (fiber optics) A power-law index profile with the profile parameter, g, equal to 2. *Synonym:* quadratic profile. *See also:* multimode optical waveguide; profile parameter; power-law index profile; graded index profile. (Std100) 812-1984w

parabolic torus reflector A toroidal reflector formed by rotating a segment of a parabola about a non-intersecting co-planar line. (AP/ANT) 145-1993

paraboloidal reflector An axially symmetric reflector that is a portion of a paraboloid. *Note:* This term may be applied to any reflector that is a portion of a paraboloid, provided the term is appropriately qualified. For example, if the reflector is a portion of a paraboloid but does not include its vertex, then it may be called an off-set paraboloidal reflector. (AP/ANT) 145-1993

parachute harness An assembly of webbing, strapping, and attachments, that permits the attachment of a support device (e.g. D-ring), and fits the human such that the entire weight of same can be supported without injury. The lanyard is constructed so that it will support the normal weight of a human, but can be released by pulling on a disconnection means. Upon this action, there will be separation of the body support assembly from the lanyard that has been attached to the harness, thus permitting the movement of the body support means from the human body support assembly. A parachute harness allows separation of the lanyard supporting assembly from an object, commonly an aircraft or helicopter. As released, the force to complete the full separation of the harness is of the order of 1/3 of that required to produce separation resulting from the actuation of the master (main) release (disconnection) means. (T&D/PE) 1307-1996

paraelastic crystal (primary ferroelectric terms) By analogy with paraelectric crystals, a crystal in which mechanical strain S is a single-valued function of mechanical stress T, whose elastic compliance exhibits an obvious Curie-Weiss behavior with temperature over some given temperature range, and that at some critical temperature T_c undergoes a phase transition to a ferroelastic phase. Crystals that clearly have a paraelastic phase include the metallic alloys Nb_3 Sn, In-Th, Au-Zn-Sn, and lithium ammonium tartrate. (UFFC) 180-1986w

paraelastic phase (primary ferroelectric terms) A phase that encompasses the range of temperature in which the elastic compliance exhibits Curie-Weiss behavior. (UFFC) 180-1986w

paraelectric Curie temperature (of a ferroelectric material) The intercept of the linear portion of the plot of $1/\varepsilon$ versus T, where ε is the small signal dielectric permittivity measured at zero bias field and T is the absolute temperature in the region above the ferroelectric Curie temperature where ε generally follows the Curie-Weiss relation. *See also:* ferroelectric domain. (UFFC) 180w

paraelectric phase (primary ferroelectric terms) Encompasses the range of temperature or pressure over which the permittivity exhibits Curie-Weiss behavior. (UFFC) 180-1986w

paraelectric region The region above the Curie point where the small signal permittivity increases with decreasing temperature. *See also:* small-signal permittivity; ferroelectric Curie point. (UFFC) [21]

parallax (computer graphics) The apparent displacement of an object as seen from two different points. It is used to simulate a three-dimensional image on a graphical display device. (C) 610.6-1991w

parallel (1) (A) (networks) (parallel elements) Two-terminal elements are connected in parallel when they are connected between the same pair of nodes. **(B) (networks) (parallel elements)** Two-terminal elements are connected in parallel when any cut-set including one must include the others. *See also:* network analysis. (Std100) 270-1966

(2) (A) Pertaining to the simultaneity of two or more processes. **(B)** Pertaining to the simultaneity of two or more similar or identical processes. **(C)** Pertaining to simultaneous processing of the individual parts of a whole, such as the bits of a character and the characters of a word using separate facilities for the various parts. *See also:* serial-parallel. (C) 162-1963, [20], [85], 270-1966

(3) (radio-wave propagation) Of a propagating wave for which the electric field vector lies parallel to the plane of incidence. *Note:* Sometimes called vertical polarization. (AP) 211-1977s

(4) (software) Pertaining to the simultaneous transfer, occurrence, or processing of the individual parts of a whole, such as the bits of a character, using separate facilities for the various parts. *Contrast:* serial. *See also:* concurrent. (C) 610.12-1990

(5) Many bits transmitted over a single pathway simultaneously. *Contrast:* serial. *See also:* bit parallel. (C) 610.10-1994w

(6) In a propulsion system, the motor circuit in which the final parallel or series-parallel motor connection is achieved and the maximum available per-motor voltage is applied. (VT) 1475-1999

parallel adder An adder in which addition is performed concurrently on multiple digits of the operands. *Contrast:* serial adder. (C) 610.10-1994w

parallel addition Addition that is performed concurrently on all digit places of the operands. *Note:* This technique uses partial sums and partial carries to obtain its results. *Contrast:* serial addition. (C) 1084-1986w

parallel architecture A multiprocessor architecture in which parallel processing can be performed, that is, different parts of a single task can be executed concurrently on different processors. *See also:* fine-grain parallel architecture; medium-grain parallel architecture; coarse-grain parallel architecture. (C) 610.10-1994w

parallel classes A pair of classes that are distinct, are not mutually exclusive and have a common generic ancestor class and for which neither is a generic ancestor of the other. (C/SE) 1320.2-1998

parallel computer (A) A computer that has multiple arithmetic units or logic units that are used to accomplish parallel operations or parallel processing. *Contrast:* sequential computer; serial computer. **(B)** A computer design in which more than one operation can occur simultaneously. *See also:* simultaneous computer. (C) 610.10-1994

parallel-connected capacitance (as applied to interrupter switches) Capacitances are defined to be parallel-connected when the crest value of inrush current to the capacitance being switched exceeds the switch inrush current capability for single capacitance. (SWG/PE) C37.100-1992

parallel-connected capacitor unit A capacitor unit with the elements connected in parallel groups, with the parallel groups connected in series between the line terminals. A capacitor unit that has only one string of capacitor elements between the capacitor terminals is considered to be parallel-connected.power systems relaying. (PE) C37.99-2000

parallel connection The arrangement of cells in battery made by connecting all positive terminals together and all negative terminals together, the voltage of the group being only that of one cell and the current drain through the battery being divided among the several cells. *See also:* battery. (EEC/PE) [119]

parallel construct A program construct consisting of two or more procedures that can occur simultaneously. (C) 610.12-1990

parallel contention arbitration A process whereby modules assert their unique arbitration number on a parallel bus and release signals according to an algorithm such that after a period of time the winner's number appears on the bus. (C/BA) 10857-1994, 896.4-1993w

parallel detection In Auto-Negotiation, the ability to detect 100BASE-TX and 100BASE-T4 technology specific link signaling while also detecting the Normal Link Pulse (NLP) sequence or Fast Link Pulse (FLP) Burst sequence. (C/LM) 802.3-1998

parallel digital computer One in which the digits are handled in parallel. Mixed serial and parallel machines are frequently called serial or parallel according to the way arithmetic processes are performed. An example of a parallel digital computer is one that handles decimal digits in parallel although it might handle the bits that comprise a digit either serially or in parallel. *See also:* serial digital computer. (Std100) 270-1966w

parallel disk array (PDA) A form of RAID storage, known as level 3, in which an array of disk drives transfer data in parallel with one redundant drive that functions as a parity check disk. (C) 610.10-1994w

parallel feeder A feeder that operates in parallel with one or more feeders of the same type from the same source. *Note:* These feeders may be of the stub-, multiple-, or tie-feeder type. (SWG/PE) C37.100-1992

parallel heating cable Heating elements that are electrically connected in parallel, either continuously or in zones, so that watt density per lineal length is maintained irrespective of any change in length for the continuous type or for any number of discrete zones. (BT/IA/AV/PC) 152-1953s, 515.1-1995, 515-1997

parallel inference machine A computer containing an inference engine that can perform logic inference processing concurrently on two or more rules or goal clauses. (C) 610.10-1994w

paralleling (rotating machinery) The process by which a generator is adjusted and connected to run in parallel with another generator or system. *See also:* direct-current commutating machine; asynchronous machine. (PE) [9]

paralleling reactor (power and distribution transformers) A current-limiting reactor for correcting the division of load between parallel-connected transformers which have unequal impedance voltages. *See also:* reactor. (PE/TR) C57.12.80-1978r, [57]

parallelism (A) Concurrent operation of several parts of a computer system. *Note:* This could be simultaneous processing of multiple programs, or simultaneous operation of multiple computers. **(B)** Pertaining to specific techniques for implementing parallel operations. *See also:* AND-parallelism; OR-parallelism. (C) 610.10-1994

parallel-mode interference *See:* common-mode interference.

parallel noise (of a device) Electrical noise that can be attributed to a hypothetical white noise generator connected in parallel with the input of the device. (NPS) 325-1996

parallel operation (power supplies) Voltage regulators, connected together so that their individual output currents are added and flow in a common load. Several methods for parallel connection are used: spoiler resistors, master/slave connection, parallel programming, and parallel padding. Current regulators can be paralleled without special precaution. (AES) [41]

parallel padding (power supplies) A method of parallel operation for two or more power supplies in which their current limiting or automatic crossover output characteristic is employed so that each supply regulates a portion of the total current, each parallel supply adding to the total and padding the output only when the load current demand exceeds the capability or limit setting-of the first supply. (AES) [41]

parallel polarization (1) (facsimile) A linear polarization for which the field vector is parallel to some reference plane. *Note:* These terms are applied mainly to uniform plane waves incident upon a plane of discontinuity (surface of the earth, surface of a dielectric or a conductor). Then the convention is to take as reference the plane of incidence, that is, the plane containing the direction of propagation and the normal to the surface of discontinuity. If these two directions coincide, the reference plane must be specified by some other convention. (COM/AP/ANT) 167-1966w, 145-1993

(2) The polarization of a wave for which the electric field vector lies in the plane of incidence. *Note:* This is sometimes called vertical or transverse magnetic (TM) polarization. (EMC) 1128-1998

(3) The polarization of a wave for which the electric field vector lies parallel to the plane of incidence. *Note:* Sometimes called vertical or transverse magnetic (TM) polarization. In optics, it is called "p" polarization. In radio propagation, *H* is parallel to the ground. *Synonyms:* transverse-magnetic polarization; vertical polarization. (AP/PROP) 211-1997

parallel port A port that transfers data one byte at a time, each bit over its own line. *Contrast:* serial port. (C) 610.10-1994w

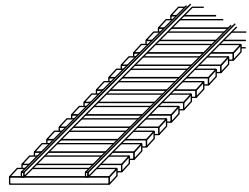
parallel printer A printer that receives its input data in the form of a parallel stream of data. *Contrast:* serial printer. (C) 610.10-1994w

parallel processing (1) (computers) Pertaining to the simultaneous execution of two or more sequences of instructions or one sequence of instructions operating on two or more sets of data, by a computer having multiple arithmetic and.or logic units. *See also:* multiprocessing; multiprogramming. (C) [20], [85]

(2) Pertaining to the concurrent or simultaneous execution of two or more processes in multiple devices, such as processing units or channels. *Contrast:* serial processing. *See also:* pipelining. (C) 610.10-1994w

parallel programming (power supplies) A method of parallel operation for two or more power supplies in which their feedback terminals (voltage-control terminals) are also paralleled. These terminals are often connected to a separate programming source. (AES) [41]

parallel projection (computer graphics) The projection of a three-dimensional image onto a two-dimensional surface such that objects that are farther from the viewer in three dimensions are rendered the same size as closer ones. *Note:* The resulting image is less realistic than that achieved by a perspective projection. *Contrast:* perspective projection.



parallel projection

(C) 610.6-1991w

parallel rectifier A rectifier in which two or more similar rectifiers are connected in such a way that their direct currents add and their commutations coincide. *See also:* power rectifier. (IA) [62]

parallel rectifier circuit A rectifier circuit in which two or more simple rectifier circuits are connected in such a way that their direct currents add and their commutations coincide. *See also:* rectifier circuit element; rectification. (IA) [12]

parallel redundant UPS configuration Consists of two or more UPS modules with static inverter turn-off(s), a system control cabinet, and either individual module batteries or a common battery. (IA/PSE) 241-1990r

parallel resonance The sinusoidal steady state condition that exists in a circuit composed of an inductor and a capacitor

connected in parallel when the applied frequency is such that: the driving-point impedance is a maximum; or the susceptance of the two parallel arms are equal in magnitude; or the phase-angle of the driving-point impedance is zero. Sometimes defined as above for more general RLC (resistance-inductance-capacitance) networks. (CAS) [13]

parallel search storage A type of storage in which one or more parts of all storage locations are queried simultaneously or concurrently. *See also:* associative storage. (C) 610.10-1994w

parallel-serial converter *See:* serializer.

parallel storage A storage device in which digits, characters, or words, are dealt with simultaneously or concurrently. (C) [20], [85], 610.10-1994w

parallel system bus The signals, media, and protocol used to interconnect agents in the IEEE Std 1296-1987 system). (C/MM) 1296-1987s

parallel thyristor converter A thyristor converter in which two or more simple converters are connected in such a way that their direct currents add and their commutations coincide. (IA/IPC) 444-1973w

parallel-T network (twin-T network) A network composed of separate T networks with their terminals connected in parallel. *See also:* network analysis. (EEC/PE) [119]

parallel transmission (1) (data transmission) Simultaneous transmission of the bits making up a character, either over separate channels or on different carrier frequencies on one channel. (COM) [49]

(2) In data communications, the simultaneous transmission of all the bits making up a character or byte where each bit travels on a different path. *Contrast:* serial transmission. (C) 610.7-1995

parallel two-terminal pair networks Two-terminal pair networks are connected in parallel at the input or at the output terminals when their respective input or output terminals are in parallel. *See also:* network analysis. (BT) 153-1950w

parallel vector A representation specifying a set of waveforms across all primary signals, to be applied to those signals in a parallel fashion (i.e., simultaneously). (C/TT) 1450-1999

paralyzable system (x-ray energy spectrometers) Any system or device whose response characteristics contain a region where the ratio of output-to-input count rate decreases with increasing input count rate. (NPS/NID) 759-1984r

paramagnetic material Material whose relative permeability is slightly greater than unity and practically independent of the magnetizing force. (Std100) 270-1966w

Parameter An instance of the class `IEEE1451_Parameter` or of a subclass thereof. A Parameter is a representation of a variable. Parameters may selectively be manipulated across a network, and can be an externally visible representation for data. (IM/ST) 1451.1-1999

parameter (1) (mathematical) A variable that is given a constant value for a specific purpose or process. (C) [20], [85]

(2) (A) (physical) One of the constants entering into a functional equation and corresponding to some characteristic property, dimension, or degree of freedom. **(B) (electrical)** One of the resistance, inductance, mutual inductance, capacitance, or other element values included in a circuit or network. Also called network constant. (Std100) 270-1966

(3) A quantity of property treated as a constant but which may sometimes vary or be adjusted. (CS/PE/EDPG) [3]

(4) (A) (test, measurement, and diagnostic equipment) Any specific quantity or value affecting or describing the theoretical or measurable characteristics of a unit being considered which behaves as an independent variable or which depends upon some functional interaction of other quantities in a theoretically determinable manner. **(B) (test, measurement, and diagnostic equipment)** In programming, a variable that is given a constant value for a specific purpose or process. (MIL) [2]

(5) (A) (software) A variable that is given a constant value for a specified application. *See also:* adaptation parameter. **(B) (software)** A constant, variable, or expression that is used to pass values between software modules. *See also:* argument; formal parameter. (C) 610.12-1990

(6) In the shell command language, an entity that stores values. There are three types of parameters: variables (named parameters), positional parameters, and special parameters. Parameter expansion is accomplished by introducing a parameter with the $ character. (C/PA) 9945-2-1993

(7) A data item required for the calculation of some result. (C/DA) 1481-1999

(8) An attribute usually representing some property subject to change, for example, a configuration parameter. (IM/ST) 1451.1-1999

parameter bunching One-half the product of the bunching angle in the absence of velocity modulation and the depth of velocity modulation. *Note:* In a reflex klystron the effective bunching angle must be used. *See also:* electron device. (ED) 161-1971w

parameterized collection class A kind of collection class restricted to hold only instances of a specified type (class). (C/SE) 1320.2-1998

parameter potentiometer A potentiometer employed in analog computers to represent a problem parameter such as a coefficient or a scale factor. *See also:* coefficient potentiometer. (C) 610.10-1994w, 166-1977w, 165-1977w

Parameter With Update An instance of the class `IEEE1451_ParameterWithUpdate` or of a subclass thereof. (IM/ST) 1451.1-1999

parameter word A word that directly or indirectly provides or designates one or more parameters. (C) 610.10-1994w

parametric amplifier An inverting parametric device used to amplify a signal without frequency translation from input to output. *Note:* In common usage, this term is a synonym for reactance amplifer. *See also:* parametric device. (ED) 254-1963w, [46]

parametric converter An inverting parametric device or noninverting parametric device used to convert an input signal at one frequency into an output signal at a different frequency. *See also:* parametric device. (ED) [46]

parametric data Data representing an internal state variable of an object that is represented by a Parameter. More specifically, physical parametric data generally represents some aspect of the physical world. (IM/ST) 1451.1-1999

parametric device A device whose operation depends essentially upon the time variation of a characteristic parameter usually understood to be a reactance. (ED) [46]

parametric down-converter A parametric converter in which the output signal is at a lower frequency than the input signal. *See also:* parametric device. (ED) [46]

parametric test A test that is performed to verify device behavior such as output drive current, input leakage current, or output voltage. (C/TT) 1450-1999

parametric test data The values of the observed or measured electrical or physical properties of a unit under test (UUT) that may be used to determine its characteristics or its conformance to requirements. (SCC20) 1545-1999

parametric up-converter A parametric converter in which the output signal is at a higher frequency than the input signal. *See also:* parametric device. (ED) [46]

parametric variation (automatic control) A change in those system properties generally regarded as constants which affect the dependent variables describing system operation. (PE/EDPG) [3]

parasitic element (1) (data transmission) A radiating element that is not coupled directly to the feed lines of an antenna and that materially affects the radiation pattern or impedance of an antenna, or both. (PE) 599-1985w

(2) An unwanted circuit element that is an unavoidable adjunct of a wanted circuit element. (CAS) [13]

(3) A radiating element that is not connected to the feed lines of an antenna and that materially affects the radiation pattern or impedance of an antenna, or both. *Contrast:* driven element. (AP/ANT) 145-1993

parasitic oscillations Unintended self-sustaining oscillations, or transient impulses. *See also:* oscillatory circuit. (AP/BT/ANT) 145-1983s, 182A-1964w

parasitics Electrical properties of a design (resistance, capacitance, and impedance) that arise due to the nature of the materials used to implement the design. (C/DA) 1481-1999

paraxial approximation An approximation in which the waves are constrained to travel predominantly in one direction. (AP/PROP) 211-1997

paraxial ray (fiber optics) A ray that is close to and nearly parallel with the optical axis. *Note:* For purposes of computation, the angle, θ, between the ray and the optical axis is small enough for sin θ or tan θ to be replaced by θ (radians). *See also:* light ray. (Std100) 812-1984w

parcel plating Electroplating upon only a part of the surface of a cathode. *See also:* electroplating. (EEC/PE) [119]

PARD *See:* PARD.

parent A widget that is the immediate superior of the current widget in the widget instance hierarchy. (C) 1295-1993w

parent box An ancestral box related to its child diagram by exactly one parent/child relationship, that is, a box detailed by a child diagram. The existence of this child diagram is indicated by a box detail reference. (C/SE) 1320.1-1998

parent diagram A diagram that contains a parent box. (C/SE) 1320.1-1998

parent directory (A) When discussing a given directory, the directory that contains a directory entry for the given directory. The parent directory is represented by the pathname dot-dot in the given directory. **(B)** When discussing other types of files, a directory containing a directory entry for the file under discussion. This concept does not apply to dot and dot-dot. (C/PA) 9945-1-1996, 9945-2-1993, 1003.5-1999

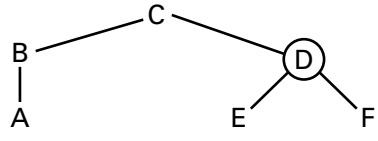
parent entity (1) An entity set that has other entities dependent on and related to it called subset entities. The subset entities are linked and related to other entity sets through the parent entity set. (PE/EDPG) 1150-1991w

(2) An entity in a specific relationship whose instances can be related to a number of instances of another entity (child entity). (C/SE) 1320.2-1998

parent function A function modeled by a parent box. (C/SE) 1320.1-1998

parenthesis-free notation *See:* prefix notation.

parent node In a tree, a node having a given node as a child node. *Synonym:* father. *Contrast:* dependent node; child node. *See also:* descendant node.



Node D is the parent node for node E

parent node

(C) 610.5-1990w

(2) The node to which a device node is attached. Each device node has exactly one parent node, except the root node, which has none. (A device node descends from its parent node. Traveling "up" the device tree takes one through parent nodes to the root node. Traveling "down" the device tree takes one through child nodes to the leaf nodes.) (C/BA) 1275-1994

parent process *See:* POSIX process.

parent process ID An attribute of a new process after it is created by a currently active process. The parent process ID of a process is the process ID of its creator, for the lifetime of the creator. After the lifetime of the creator has ended, the parent process ID is the process ID of an implementation-defined system process. (C/PA) 1003.5-1999, 9945-2-1993, 9945-1-1996

parent segment In a hierarchical database, a segment that has one or more dependent segments, called child segments, below it in a hierarchy. (C) 610.5-1990w

parity (1) (A) (mathematics of computing) An error detection method in which the total number of ones in a binary word, byte, character, or message is set to an odd or even number by appending a redundant bit. This number is subsequently checked to ensure that it remains odd or even. **(B) (mathematics of computing)** The property of oddness or evenness possessed by a word, byte, character, or message. This property is determined by the total number of ones. *See also:* even parity; odd parity. (C) 1084-1986

(2) (for FASTBUS) A bit, optionally appended to a FASTBUS word, whose value is chosen to make the total number of one bits (including the parity bit) odd. It is used for error checking since receipt of an even number of one bits implies a transmission error. (NID) 960-1993

(3) The value, even or odd, of the sum of a string of binary digits. For example, the parity of the string 0000111101001 is even. *Contrast:* cyclic redundancy check. *See also:* parity bit; parity error; parity check. (C) 610.7-1995

parity bit (1) (computers) A binary digit appended to an array of bits to make the sum of all the bits always odd or always even. (MIL/C) [2], [85], [20]

(2) (mathematics of computing) A binary digit appended to a binary word, byte, character, or message to make the total number of ones an odd or an even number. *See also:* parity check. (C) 1084-1986w

(3) An extra bit attached to a byte, character string, or word, used to enable detection of transmission errors. Based on system convention, the bit is set making the number of ones in a grouping of bits either always even or always odd. *Note:* This permits detection of bit groupings containing single errors. (C) 610.7-1995

(4) An extra bit attached to a byte, character string or word, used to detect transmission errors. (C) 610.10-1994w

parity check (1) (electronic computation) A summation check in which the bits in a character or block are added (modulo 2) and the sum checked against a single, previously computed parity digit; that is, a check that tests whether the number of ones is odd or even. (MIL/C/COM) [2], [85], [20], [49]

(2) (mathematics of computing) A check to determine whether the total number of ones in a binary word, byte, character, or message is odd or even. *Synonyms:* odd-even check; even-odd check. (C) 1084-1986w

(3) An error detecting code that uses the parity bit(s). *Contrast:* cyclic redundancy check. *See also:* vertical redundancy check; longitudinal redundancy check. (C) 610.7-1995

parity error (1) The failure of a binary word, byte, character, or message to pass a parity check. (C) 1084-1986w

(2) An error that occurs when the parity bit of a string is found to be incorrect. (C) 610.7-1995

Parity Error (PRE) bit A bit in the Bus Error register of all S-modules. An S-module sets this bit to indicate that the module has detected a Parity Error on a DATA packet received. (TT/C) 1149.5-1995

parity violation If the received parity and the parity calculation on the data do not agree, a parity violation has occurred. (COM/TA) 1007-1991r

park electrical wiring systems All of the electrical wiring fixtures, equipment and appurtenances related to electrical installations within a mobile home park, including the mobile home service equipment. (NESC/NEC) [86]

parking (1) (multiprocessor architecture) The process whereby the current master retains control of the bus when there are no other masters wishing to use it. (C/MM) 896.1-1987s

(2) (MULTIBUS II) The state of the bus owner where, after the completion of the current transfer operation, ownership is retained until there is a request by another agent for the use of the bus. (C/MM) 1296-1987s

parking brake A means that supplies static braking forces to maintain a vehicle or train in a no motion state. (VT) 1475-1999

parking lamp (illuminating engineering) A lighting device placed on a vehicle to indicate its presence when parked. (EEC/IE) [126]

parking stand A bracket, designed for installation on an apparatus, suitable for holding accessory devices, such as the insulated parking bushing and the grounding bushing. (T&D/PE) 386-1995

PARLOG A logic programming language used widely for parallel computing, supporting declarative programming. (C) 610.13-1993w

parse (1) (software) To determine the syntactic structure of a language unit by decomposing it into more elementary subunits and establishing the relationships among the subunits. For example, to decompose blocks into statements, statements into expressions, expressions into operators and operands. (C) 610.12-1990

(2) To resolve a request or response into component parts. In the context of messages, a device can break the message into pieces, each of which consists of a header and sometimes some corresponding data. If a device is able to parse a message, it can recognize each piece of a message. It does not necessarily make use of the data found in that message. However, it shall make any confirmation responses or other responses that the message requires. (PE/SUB) 1379-1997

PARSEC *See:* PARser and Extensible Compiler.

parsec (pc) The distance at which 1 astronomical unit subtends an angle of 1 second of arc; approximately, 1 pc = 206 265 AU = 30857×10^{12} m. (QUL) 268-1982s

parser A software tool that parses computer programs or other text, often as the first step of assembly, compilation, interpretation, or analysis. (C) 610.12-1990

PARser and Extensible Compiler (PARSEC) An extensible language using syntax similar to PL/1; PARSEC is derived from PROTEUS and is yused as the base language for writing PL/PROPHET. (C) 610.13-1993w

part (1) (unique identification in power plants and related facilities) An element of a component not amenable to further disassembly for maintenance purposes. (PE/EDPG) 804-1983r, 803-1983r

(2) The lowest element of a physical or system architecture, specification tree, or system breakdown structure that can not be partitioned (e.g., bolt, nut, bracket, semiconductor, computer software unit). (C/SE) 1220-1994s

partial An incomplete mapping, i.e., some instances map to no related instance. An attribute may be declared partial, meaning it may have no value. A participant property is declared optional as part of the relationship syntax. An operation is declared partial when it may have no meaning for some instances, i.e., it may not give an answer or produce a response. *Contrast:* total. *See also:* mapping completeness; optional. (C/SE) 1320.2-1998

(2) (A) A physical component of a complex tone. **(B) (audio and electroacoustics)** A component of a sound sensation that may be distinguished as a simple tone that cannot be further analyzed by the ear and that contributes to the timbre of the complex sound. *Notes:* 1. The frequency of a partial may be either higher or lower than the basic frequency and may or may not be an integral multiple or submultiple of the basic frequency. If the frequency is not a multiple or submultiple, the partial is inharmonic. 2. When a system is maintained in steady forced vibration at a basic frequency equal to one of the frequencies of the normal modes of vibration of the system, the partials in the resulting complex tone are not necessarily identical in frequency with those of the other normal modes of vibration. (SP) [32]

partial automatic control Control that is a combination of manual and automatic control. For example, to cause a voltage reduction, the local automatic load tap changing closed-loop control may be biased by way of a supervisory control command. (SWG/PE/SUB) C37.100-1992, C37.1-1994

partial-automatic station A station that includes protection against the usual operating emergencies, but in which some or all of the steps in the normal starting or stopping sequence, or in the maintenance of the required character of service, must be performed by a station attendant or by supervisory control. (SWG/PE) C37.100-1992

partial-automatic transfer equipment (or throwover) Equipment that automatically transfers load to another (emergency) source of power when the original (preferred) source to which it has been connected fails, but that will not automatically retransfer the load to the original source under any conditions. *Note:* The restoration of the load to the preferred source from the emergency source upon the reenergization of the preferred source after an outage may be of the continuous-circuit restoration type or the interrupted-circuit restoration type. (SWG/PE) C37.100-1992

partial-body exposure Exposure that results when RF fields are substantially nonuniform over the body. Fields that are nonuniform over volumes comparable to the human body may occur due to highly directional sources, standing-waves, reradiating sources, or in the near field region of a radiating structure. *See also:* radio-frequency hot spot. (NIR) C95.1-1999

partial-body irradiation (electrobiology) Pertains to the case in which part of the body is exposed to the incident electromagnetic energy. *See also:* electrobiology. (NIR) C95.1-1982s

partial carry (parallel addition) A technique in which some or all of the carries are stored temporarily instead of being allowed to propagate immediately. *See also:* carry. (C) [85], [20]

(2) (A) (mathematics of computing) A carry process in which the carry digits are stored temporarily, instead of being processed as they occur. *Contrast:* complete carry. *See also:* cascaded carry; partial sum. **(B) (mathematics of computing)** The numeral that represents the carry digits generated in definition "A". (C) 1084-1986

partial checkback message Message from the initiating end is mirrored by the receiving end back to the initiating end to verify error-free transmission of the message. (SWG/PE/SUB) C37.100-1992, C37.1-1987s

partial cluster A subclass cluster in which an instance of the superclass may exist without also being an instance of any of the subclasses. *Contrast:* total cluster. *See also:* superclass. (C/SE) 1320.2-1998

partial correctness (software) In proof of correctness, a designation indicating that a program's output assertions follow logically from its input assertions and processing steps. *Contrast:* total correctness. (C) 610.12-1990

partial dial abandon or a partial dial timeout Occurs if the call is abandoned or times out without sufficient digits dialed. (COM/TA) 973-1990w

partial-dialing timing The time interval following each dialed digit except the last that determines if the call shall be treated as if dialing had stopped prematurely. For nonimmediate start trunk types, the partial-dial timing interval may be shorter. Instead of timing each digit, an alternative for multifrequency trunks is an overall time limit from the beginning of the start signal until end of pulsing. (COM/TA) 973-1990w

Partial Differential Equation Language (PDEL) An application-oriented language used for solving partial differential equations in which the user does not have to program the numerical analysis algorithms. *Note:* Used as a preprocessor to PL/1. (C) 610.13-1993w

partial directivity (of an antenna for a given polarization) In a given direction, that part of the radiation intensity corresponding to a given polarization divided by the total radiation intensity averaged over all directions. *Note:* The (total) directivity of an antenna, in a specified direction, is the sum of the

partial directivities for any two orthogonal polarizations. (AP/ANT) 145-1993

partial discharge (PD) (1) (power and distribution transformers) An electric discharge which only partially bridges the insulation between conductors, and which may or may not occur adjacent to a conductor. *Notes:* 1. Partial discharges occur when the local electric-field intensity exceeds the dielectric strength of the dielectric involved, resulting in local ionization and breakdown. Depending on intensity, partial discharges are often accompanied by emission of light, heat, sound, and radio influence voltage (with a wide frequency range). 2. The relative intensity of partial discharge can be observed at the transformer terminals by measurement of the apparent charge (coulombs). However, the apparent charge (terminal charge) should not be confused with the actual charge transferred across the discharging element in the dielectric which in most cases cannot be ascertained. Partial discharges tests using the radio influence voltage techniques which are responsive to the apparent terminal charges are generally used for measurement of relative discharge intensity. 3. Partial discharges can also be detected and located using sonic techniques. 4. "Corona" has also been used to describe partial discharges. This is a non-preferred term since it has other unrelated meanings. (PE/TR) C57.12.80-1978r **(2) (dry-type transformers)** An electric discharge that only partially bridges the insulation between conductors. The term "corona" has also been used frequently with this connotation. Such usage is imprecise and is gradually being discontinued in favor of the term "partial discharge." (PE/PSIM/TR) 454-1973w, C57.124-1991r **(3)** A localized electric discharge resulting from ionization in an insulation system when the voltage stress exceeds the critical value. This discharge partially bridges the insulation between electrodes. (SWG/PE) 1291-1993r, C37.100-1992 **(4) (liquid-filled power transformers)** An electric discharge that only partially bridges the insulation between conductors. (PE/TR/PSIM) C57.113-1988s, 62-1995 **(5)** A discharge that does not completely bridge the insulation between electrodes. (PE/PSIM) 4-1995 **(6)** An electric discharge that only partially bridges the insulation between conductors, and that may or may not occur adjacent to the conductor. (PE/TR) C57.104-1991 **(7)** A discharge that does not completely bridge the insulation between electrodes. *Note:* The term "corona" is preferably reserved for partial discharges in air around a conductor, but not within the bushing assembly. (PE/TR) C57.19.03-1996

partial discharge energy (dielectric tests) The energy dissipated by an individual discharge. The partial discharge energy is expressed in joules. (PE/PSIM) 454-1973w

partial discharge extinction voltage (1) (dry-type transformers) The voltage at which partial discharges exceeding a specified level cease under specified conditions when the voltage is gradually decreased from a value exceeding the inception voltage. This voltage is expressed as the peak value divided by the square root of two. (PE/TR) C57.124-1991r **(2)** The voltage at which partial discharge (corona) is no longer detectable on instrumentation adjusted to a specified sensitivity, following application of a specified higher voltage. (SWG/PE/IC) 1291-1993r, 48-1996

partial discharge-free test voltage (dry-type transformers) A specified voltage, applied in accordance with a specified test procedure, at which the test object should not exhibit partial discharges above the acceptable energized background noise level. (PE/TR) C57.124-1991r, C57.113-1991

partial discharge inception voltage (1) (dry-type transformers) The lowest voltage at which partial discharges exceeding a specified level are observed under specified conditions when the voltage applied to the test object is gradually increased from a lower value. This voltage is expressed as the peak value divided by the square root of two. (PE/TR) C57.124-1991r **(2)** The voltage that should be recorded on the device or system under test when raised to a point where the PD signal rises above the energized background noise level. (SWG/PE) 1291-1993r

partial discharge power (dielectric tests) The power fed into the terminals of the test object due to partial discharges. The average discharge power is expressed in watts. (PE/PSIM) 454-1973w

partial duplex An operating condition that allows simultaneous communication in both send and receive directions with 3-20 dB switched loss in either direction. (COM/TA) 1329-1999

partial effective area (of an antenna for a given polarization and direction) In a given direction, the ratio of the available power at the terminals of a receiving antenna to the power flux density of a plane wave incident on the antenna from that direction and with a specified polarization differing from the receiving polarization of the antenna. (AP/ANT) 145-1993

partial failure *See:* failure.

partial-fraction expansion A sum of fractions that is used to represent a function that is a ratio of polynomials. The denominators of the fractions are the poles of the function. (CAS) [13]

partial gain (of an antenna for a given polarization) In a given direction, that part of the radiation intensity corresponding to a given polarization divided by the radiation intensity that would be obtained if the power accepted by the antenna were radiated isotropically. *Note:* The (total) gain of an antenna, in a specified direction, is the sum of the partial gains for any two orthogonal polarizations. (AP/ANT) 145-1993

partially dead region or layer (x-ray energy spectrometers) (of a semiconductor detector) Any region or layer on or in the detector which contributes an output pulse which is less than the full energy peak for that incident radiation. (NPS/NID) 759-1984r

partially inverted file A file that has been inverted on some of its secondary keys. *Contrast:* fully inverted file. (C) 610.5-1990w

partially polarized wave A wave with some randomly polarized content. (AP/PROP) 211-1997

partially shielded insulated splice (power cable joints) An insulated splice in which a conducting material is employed over a portion of the insulation for electric stress control. (PE/IC) 404-1986s

partial outage state The component or unit is at least partially energized, or is not fully connected to all of its terminals, or both, so that it is not serving some of its functions within the power system. *Note:* A unit composed of a three-terminal line would be in the partial outage state if it were disconnected from one terminal with two line sections still carrying power. (PE/PSE) 859-1987w

partial product The result obtained by multiplying the multiplicand by one of the digits of the multiplier. *Synonym:* intermediate product. (C) 1084-1986w

partial-read pulse Any one of the currents applied that cause selection of a cell for reading. *See also:* coincident-current selection. (Std100) 163-1959w

partial realized gain (of an antenna for a given polarization) The partial gain of an antenna for a given polarization reduced by the loss due to the mismatch of the antenna input impedance to a specified impedance. (AP/ANT) 145-1993

partial reference designation (electric and electronics parts and equipment) A reference designation that consists of a basic reference designation and which may include, as prefixes, some but not all of the reference designations that apply to the subassemblies or assemblies within which the item is located. (GSD) 200-1975w

partial-select output (A) The voltage response of an unselected magnetic cell produced by the application of partial-read pulses or partial-write pulses. **(B)** The integrated voltage response of an unselected magnetic cell produced by the appli-

cation of partial-read pulses or partial-write pulses. *See also:* coincident-current selection. (Std100) 163-1959

partial sum The result obtained from the addition of two or more numbers without regard to carries. *Note:* In the binary numeration system, the partial sum is the same result as is obtained from the exclusive-OR operation. *See also:* cascaded carry. (C) 1084-1986w

partial system downtime A weighted time out of service for switching system failures that put a number of lines out of service simultaneously. This measure is the expected probability that two randomly chosen lines will be out of service simultaneously due to the same fault cause. It may be expressed in minutes per year. It protects customers under circumstances that are not fully covered by individual line downtime or total system downtime. *Synonym:* simultaneous line downtime. (COM/TA) 973-1990w

partial-write pulse Any one of the currents applied that cause selection of a cell for writing. *See also:* coincident-current selection. (Std100) 163-1959w

participant property A kind of property of a state class that reflects that class' knowledge of a relationship in which instances of the class participate. When a relationship exists between two state classes, each class contains a participant property for that relationship. A participant property is a mapping from a state class to a related (not necessarily distinct) state class. The name of each participant property is the name of the role that the other class plays in the relationship, or it may simply be the name of the class at the other end of the relationship (as long as using the class name does not cause ambiguity). A value of a participant property is the identity of a related instance. (C/SE) 1320.2-1998

participate With regard to the action of an S-module during message transmission, to execute the command contained in the HEADER packet of the current message and return packets as required by that command and by the state of the Acknowledge bit in the HEADER packet. The handling of some errors may cause an S-module to cease to participate in a message (e.g., by ceasing to execute the current command, by returning NULL packets when data is expected, by driving a constant value on the MSD signal without regard to packet transmission timing, etc). (TT/C) 1149.5-1995

participating slave A slave involved in a transaction as either a selected slave, an intervening slave, a broadcast slave, or a slave involved in multiple packet mode. (C/BA) 10857-1994, 896.3-1993w, 896.4-1993w

particle accelerator Any device for accelerating charged particles to high energies, for example, cyclotron, betatron, Van der Graaff generator, linear accelerator, etc. (ED) [45]

particle size distribution The probability density function describing the size distribution of particles in a medium. (AP/PROP) 211-1997

particle velocity (sound field) The velocity of a given infinitesimal part of the medium, with reference to the medium as a whole, due to the sound wave. *Note:* The terms instantaneous particle velocity, effective particle velocity, maximum particle velocity, and peak particle velocity have meanings that correspond with those of the related terms used for sound pressure. (SP) [32]

particulate A small particle that is created by thermal decomposition of organic materials present inside the generator. (PE/EM) 1129-1992r

parting The selective corrosion of one or more components of a solid solution alloy. (IA) [59]

parting limit The maximum concentration of a more-noble component in an alloy, above which parting does not occur within a specific environment. (IA) [59]

Partition An addressable portion of a Partitioned File. (IM/ST) 1451.1-1999

partition (1) (A) A portion of a computer's main storage that is set aside to hold a single program. **(B)** A portion of a storage medium that is set aside for some special purpose; for example, the boot partition of a magnetic disk contains operating system files from which the computer can be booted. **(C)** A portion of a storage medium that is treated as if it were an individual medium; as in a partition of a hard disk. (C) 610.10-1994

(2) A partition is a program or part of a program that can be invoked from outside the Ada implementation. Each partition may run in a separate address space, possibly on a separate computer. An *active partition* is a partition that contains at least one task. Every active partition has an *environment task*, on which all the other tasks of that partition depend. An active partition corresponds to a POSIX process. (C) 1003.5-1999

(3) A subdivision of a file. (IM/ST) 1451.1-1999

(4) A portion of a side of a cartridge that is accessible as a unit. (C/SS) 1244.1-2000

partitioned access The process of storing and retrieving data from storage in such a way that the data is divided into subunits, called members, and the data may be processed as a whole or member by member. *Note:* The directory used to retrieve each member is stored along with the data. *See also:* partitioned data set; basic partitioned access method. (C) 610.5-1990w

partitioned data set A file that is divided into subunits, called members, each of which may be processed individually. *Contrast:* indexed file; sequential file. (C) 610.5-1990w

Partitioned File An instance of the class `IEEE1451_PartitionedFile` or of a subclass Thereof. (IM/ST) 1451.1-1999

partitioning (software) (software requirements specifications) Decomposition; the separation of the whole into its parts. (C/SE) 830-1984s, 610.12-1990

partition noise Noise caused by random fluctuations in the distribution of current between the various electrodes. (ED) [45]

partly cloudy sky (illuminating engineering) A sky that has 30% to 70% cloud cover. (EEC/IE) [126]

Partner The remote entity in a Link Aggregation Control Protocol exchange. (C/LM) 802.3ad-2000

part programming, computer (numerically controlled machines) The preparation of a manuscript in computer language and format required to accomplish a given task. The necessary calculations are to be performed by the computer. (IA/EEC) [61], [74]

part programming, manual (numerically controlled machines) The preparation of a manuscript in machine control language and format required to accomplish a given task. The necessary calculations are to be performed manually. (IA/EEC) [61], [74]

parts (replacement parts for Class 1E equipment in nuclear power generating stations) Items from which the equipment is assembled (for example, resistors, capacitors, wires, connectors, transistors, tubes, lubricants, O-rings, and springs). (PE/NP) 934-1987w

parts per million $x/10^6$ is x parts per million. (CAS) [13]

parts per million by volume (PPMV) (1) The volume of water vapor in the total SF6 system at the pressure the system is operated. (SUB/PE) C37.122-1983s

(2) One million times the ratio of the volume of water vapor present in the gas to the total volume of the gas (including water vapor). (PE/IC) 1125-1993

parts per million by weight (PPMW) (1) The weight of water vapor in the total SF6 system at the pressure the system is operated. (SUB/PE) C37.122-1983s

(2) One million times the ratio of the weight of water vapor present in the gas to the total weight of the gas (including water vapor). (PE/IC) 1125-1993

parts program A set of computer instructions used to control the action of a numerical control machine in producing a particular manufactured part. (C) 610.2-1987

part-winding starter A starter that applies voltage successively to the partial sections of the primary winding of an alternating-current motor. *See also:* starter. (IA/ICTL/IAC) [60]

part-winding starting (rotating machinery) A method of starting a polyphase induction or synchronous motor, by which certain specially designed circuits of each phase of the primary winding are initially connected to the supply line. The remaining circuit or circuits of each phase are connected to the supply in parallel with initially connected circuits, at a predetermined point in the starting operation. (PE) [9]

party line (1) (data transmission) A subscriber line arranged to serve more than one main station, with discriminatory ringing for each station. (PE) 599-1985w

(2) (telephone switching systems) A line arranged to serve more than one main station, with distinctive ringing for each station. (COM) 312-1977w

(3) A communication channel that services multiple terminals. (SUB/PE) 999-1992w

Pascal A general-purpose programming language standardized by IEEE & ASC X3 adapted for use on a variety of computers; characterized by its ability to handle algorithms, various data types, and block-structured. *Note:* Often used in teaching programming concepts, Pascal was named after Blaise Pascal, a French mathematician, and was developed by Niklaus Wirth. *See also:* block-structured language; MODULA II; JOSEF; Rascal; high-order language. (C) 610.13-1993w

Paschen's law (gas) The law stating that, at a constant temperature, the breakdown voltage is a function only of the product of the gas pressure by the distance between parallel plane electrodes. *See also:* discharge. (ED) [45], [84]

pass (1) A single cycle in the processing of a set of data, usually performing part of an overall process. For example, a pass of an assembler through a source program; a pass of a sort program through a set of data. (C) 610.12-1990

(2) The lack of any deviation from the expected post condition of a test case signifies a pass for that specific test case. Adherence to specification or documentation, or functional baseline indicates a pass. (C/PA) 2000.2-1999

pass band (1) (data transmission) A range of frequency spectrum that can pass at low attenuation. *See also:* band-pass filter. (T&D/PE) 1308-1994, 599-1985w

(2) A range of frequencies transmitted to a terminal at low attenuation. *See also:* bandwidth. (C/CAS) 610.7-1995, [13]

(3) A band of frequencies that pass through a filter with little attenuation (relative to other frequency bands such as a stop band). (CAS/T&D/PE) 1308-1994

pass-band ripple The difference between maxima and minima of loss in a filter passband. If the differences are of constant amplitude then the filter is said to be equiripple. (CAS) [13]

pass element (power supplies) A controlled variable-resistance device, either a vacuum tube or power transistor, in series with the source of direct-current power. The pass element is driven by the amplified error signal to increase its resistance when the output needs to be lowered or to decrease its resistance when the output must be raised. *See also:* series regulator. (AES) [41]

passenger elevator An elevator used primarily to carry persons other than the operator and persons necessary for loading and unloading. *See also:* elevator. (EEC/PE) [119]

passenger information sign A device that displays or annunciates transit trip information to passengers. (VT) 1477-1998

passenger vessel A vessel that carries more than 12 persons in addition to the crew. (IA/MT) 45-1998

pass/fail criteria Decision rules used to determine whether a software item or a software feature passes or fails a test. (C/SE) 829-1998

pass gate The transistor(s), controlled by the word-line, to enable the programming of bits along the selected word-line and the isolating of bits on unselected word-lines from the array source. (ED) 1005-1998

passivation The process or processes (physical or chemical) by means of which a metal becomes passive. (IA) [59]

passivator An inhibitor that changes the potential of a metal appreciably to a more cathodic or noble value. (IA) [59]

passive-active cell A cell composed of passive and active areas. *See also:* electrolytic cell. (IA) [59]

passive angle tracking (PAT) A tracking technique that uses a received signal other than the backscattered radar emissions with which to track an object, jammer, or other signal source. Passive homing, home-on-jam (HOJ), and track-on-jam (TOJ) are examples of PAT using a radar receiving system. (AES) 686-1997

passive concentrator A type of token ring concentrator that contains no active elements in the signal path of any lobe port. Embedded repeater functions may be provided by the ring in and ring out port. (C/LM) 8802-5-1998

passive data dictionary A data dictionary that is only a repository for data definitions. *Note:* No active measures are taken to ensure that the data dictionary is consistent with the data items actually used in the system. *Synonym:* stand-alone data dictionary. *Contrast:* active data dictionary. (C) 610.5-1990w

passive device A device that does not require power and contains no active components. The term encompasses taps, directional couplers, splitters, power inserters, and in-line equalizers. (LM/C) 802.7-1989r

passive electric network An electric network containing no source of energy. *See also:* network analysis. (EEC/PE) [119]

passive filter A filter network containing only passive elements, such as inductors, capacitors, resistors and transformers. (CAS) [13]

passive fire protection The selection of materials that resist ignition and fire propagation, and produce low levels of fire products. (DEI) 1221-1993w

passive graphics A method of operation of a computer graphics system in which the graphics system does not accept input from a user and does not allow the user to influence its processing while it is in progress. *Contrast:* interactive graphics. (C) 610.6-1991w

passive homing guidance (navigation aid terms) Guidance in which a craft or missile is directed toward a destination by means of natural radiation from the destination. (AES/GCS) 172-1983w

passive limiter (nonlinear, active, and nonreciprocal waveguide components) A nonlinear device that suppresses input radio-frequency (rf) power without the aid of an external bias. (MTT) 457-1982w

passive satellite (communication satellite) A communication satellite that is a reflector and performs no active signal processing. (COM) [24]

passive sensor (test, measurement, and diagnostic equipment) A sensor requiring no source of power other than the signal being measured. (MIL) [2]

Passive-Star Coupler A component of a 10BASE-FP fiber optic mixing segment that divides optical power received at any of N input ports among all N output ports. The division of optical power is approximately uniform. (C/LM) 802.3-1998

passive station (data transmission) All stations on a multipoint network, other than the master and slave(s), that, during the information message transfer state, monitor the line for supervisory sequences, ending characters, etc. (PE) 599-1985w

passive test (test, measurement, and diagnostic equipment) A test conducted upon an equipment or any part thereof when the equipment is not energized. *Synonym:* cold test. (MIL) [2]

passive transducer A transducer that has no source of power other than the input signal(s), and whose output signal-power

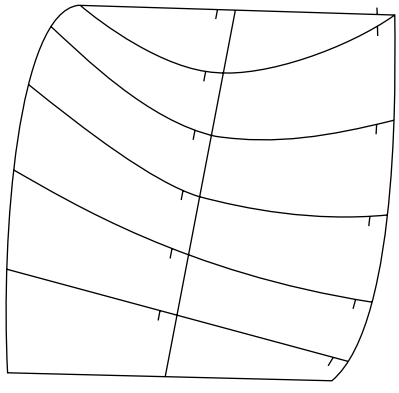
cannot exceed that of the input. *Note:* The definition of a passive transducer is a restriction of the more general passive network, that is, one containing no impressed driving forces. *See also:* transducer. (Std100) 270-1966w

passivity (A) (chemical) The condition of a surface that retards a specified chemical reaction at that surface. *See also:* electrochemistry. **(B) (electrolytic or anodic)** Such a condition of an anode that the normal anodic reaction is retarded. *See also:* electrochemistry. (EEC/PE) [119]

paste (dry cell) (primary cell) A gelatinized layer containing electrolyte that lies adjacent to the negative electrode. *See also:* electrolytic cell. (EEC/PE) [119]

pasted sintered plate (alkaline storage battery) A plate consisting of fritted metal powder in which the active material is impregnated. *See also:* battery. (EEC/PE) [119]

patch (1) To connect circuits together temporarily by means of a cord, known as a patch cord. (EEC/PE) [119]
(2) (computers) To modify a routine in a rough or expedient way. (C) [20], [85]
(3) (A) (software) A modification made directly to an object program without reassembling or recompiling from the source program. **(B) (software)** A modification made to a source program as a last-minute fix or afterthought. **(C) (software)** Any modification to a source or object program. **(D) (software)** To perform a modification as in definitions (A), (B), or (C). (C) 610.12-1990
(4) (computer graphics) A portion of the surface of a three-dimensional object, as displayed on a graphical display device. (See the corresponding figure.)



patch

(C) 610.6-1991w

patch bay (1) (analog computer) In an analog computer, a concentrated assembly of the inputs and outputs of computing elements, control elements, tie points, reference voltages, and ground points that offers a means of electrical connection. (C) 165-1977w
(2) A specially designed rewireable panel that allows its user to dynamically rewire or perform analog programming. *Synonym:* wiring panel. (C) 610.10-1994w

patch board A specially designed reconfigurable connection board used to prototype or test integrated circuits. *Synonym:* patch panel. *See also:* problem board. (C) 610.10-1994w

patchcord (test, measurement, and diagnostic equipment) An interconnecting cable for plugging or patching between terminals; commonly employed on patchboard, plugboard, and in maintenance operations. (MIL) [2]

patch cord Flexible cable unit or element with connectors(s) used to establish connections on a patch panel. (C/LM) 802.3-1998

patch panel *See:* electronic analog computer; problem board.

patent A document protecting an invention that grants an inventor the right to prevent others from making, using, or selling the invention for 20 years from the date of application for patent. (C/SE) 1420.1b-1999

path (1) (navigation) (navigation aid terms) A line connecting a series of points in space and constituting a proposed or traveled route. *See also:* course line; flight track; flight path. (AES/GCS) 172-1983w
(2) (network analysis) Any continuous succession of branches, traversed in the indicated branch directions. (CAS) 155-1960w
(3) (telephone switching systems) The set of links and junctors joined in series to establish a connection. (COM) 312-1977w
(4) (A) (telecommunications switching systems) A continuous physical connection. **(B) (telecommunications switching systems)** A time slot in a shared facility. (COM/TA) 973-1990
(5) (A) (software) In software engineering, a sequence of instructions that may be performed in the execution of a computer program. **(B) (software)** In file access, a hierarchical sequence of directory and subdirectory names specifying the storage location of a file. (C) 610.12-1990
(6) In the critical path method, any sequence of activities that goes from the beginning to the end of a project. (C) 610.2-1987
(7) (A) (data management) In a hierarchical database, a sequence of segments encountered in traversing from the root segment to an individual dependent segment. **(B) (data management)** With respect to a network or graph, some sequence of nodes such that each successive node is connected to its predecessor by an edge. *See also:* simple path. (C) 610.5-1990
(8) A bridged route between a source and a destination. (LM/C/CC) 8802-2-1998
(9) The concatenation of all the physical links between the link layers of two nodes. (C/MM) 1394-1995
(10) The sequence of segments and repeaters providing the connectivity between two DTEs in a single collision domain. In CSMA/CD networks there is one and only one path between any two DTEs. (LM/C/LM) 802.3-1998
(11) (data transmission) *See also:* channel. 599-1985w

path analysis (software) Analysis of a computer program to identify all possible paths through the program, to detect incomplete paths, or to discover portions of the program that are not on any path. (C) 610.12-1990

path assertion *See:* common ancestor constraint.

path cofactor *See:* path factor.

path condition (software) A set of conditions that must be met in order for a particular program path to be executed. (C) 610.12-1990

path delay value (PDV) The sum of all segment delay values for all segments along a given path. (C/LM) 802.3-1998, 802.9a-1995w

path expression A logical expression indicating the input conditions that must be met in order for a particular program path to be executed. (C) 610.12-1990

path factor (network analysis) The graph determinant of that part of the graph not touching the specified path (loop). *Notes:* 1. A path (loop) factor is obtainable from the graph determinant by striking out all terms containing transmittance products of loops that touch that path (loop). 2. For loop Lk, the loop factor is $-\partial\Delta/\partial \boldsymbol{L}_{\boldsymbol{k}}$. (CAS) 155-1960w

path length (1) The length of a magnetic flux line in a core. *Note:* In a toroidal core with nearly equal inside and outside diameters, the value

$$l_m = \frac{\pi}{2}\,(\text{O.D.} + \text{I.D.})$$

where O.D. and I.D. are the outside and inside diameters of the core, is commonly used. (Std100) 163-1959w
(2) (interferometer fiber optic gyro) (laser gyro) The geometrical length of the path traversed in a single pass by an optical beam. *See also:* optical path length. (AES/GYAC) 528-1994

path loss The amount of attenuation between a headend port and a user outlet port. (LM/C) 802.7-1989r

pathname (1) A string that is used to identify a file. A pathname consists of, at most, {PATH_MAX} bytes, including the terminating null character. It has an optional beginning slash, followed by zero or more filenames separated by slashes. If the pathname refers to a directory, it may also have one or more trailing slashes. Multiple successive slashes are considered to be the same as one slash. A pathname that begins with two successive slashes may be interpreted in an implementation-defined manner, although more than two leading slashes shall be treated as a single slash. (C/PA) 9945-1-1996, 9945-2-1993

(2) A POSIX.1 pathname with characters drawn from the POSIX.1 portable character set. (C/PA) 1387.2-1995

(3) A nonempty string that is used to identify a file. A pathname consists of, at most, `POSIX_Limits.Pathname_Maxima'Last` components of type `POSIX.POSIX_Character`. It has an optional beginning slash followed by zero or more filenames separated by slashes. If the pathname refers to a directory, it may also have one or more trailing slashes. Multiple successive slashes are considered the same as one slash. A pathname that begins with two successive slashes may be interpreted in an implementation-defined manner, although more than two leading slashes shall be treated exactly the same as a single slash. (C) 1003.5-1999

pathname character string A sequence of characters from the portable filename character, including the / (slash) character. Within software definition files of exported catalogs, all such strings shall be encoded using IRV. (C/PA) 1387.2-1995

pathname component *See:* filename.

pathname resolution Pathname resolution is performed for a process to resolve a pathname to a particular file in a file hierarchy. There may be multiple pathnames that resolve to the same file. Each filename in the pathname is located in the directory specified by its predecessor (for example, in the pathname fragment "a/b", file "b" is located in directory "a"). Pathname resolution fails if this cannot be accomplished. If the pathname begins with a slash, the predecessor of the first filename in the pathname is taken to be the root directory of the process (such pathnames are referred to as absolute pathnames). If the pathname does not begin with a slash, the predecessor of the first filename of the pathname is taken to be the current working directory of the process (such pathnames are referred to as "relative pathnames"). The interpretation of a pathname component is dependent on the values of {NAME_MAX} and {_POSIX_NO_TRUNC} associated with the path prefix of that component. If any pathname component is longer than {NAME_MAX}, and {_POSIX_NO_TRUNC} is in effect for the path prefix of that component, the implementation shall consider this an error condition. Otherwise, the implementation shall use the first {NAME_MAX} bytes of the pathname component. The special filename, dot, refers to the directory specified by its predecessor. The special filename, dot-dot, refers to the parent directory of its predecessor directory. As a special case, in the root directory, dot-dot may refer to the root directory itself. A pathname consisting of a single slash resolves to the root directory of the process. A null pathname is invalid. (C/PA) 9945-1-1996, 9945-2-1993

pathocathode radiant sensitivity *See:* cathode radiant sensitivity.

pathological coupling A type of coupling in which one software module affects or depends upon the internal implementation of another. *Contrast:* control coupling; data coupling; content coupling; common-environment coupling; hybrid coupling. (C) 610.12-1990

path prefix A pathname, with an optional ending slash, that refers to a directory. (PA/C) 9945-1-1996, 9945-2-1993, 1003.5-1999

path testing Testing designed to execute all or selected paths through a computer program. *Contrast:* branch testing; statement testing. (C) 610.12-1990

path transmittance (network analysis) The product of the branch transmittances in that path. (CAS) 155-1960w

path variability value (PVV) (1) A value that is bounded by the sum of the segment variability values (SVVs) for all the segments along a given path. (C/LM) 802.9a-1995w

(2) The sum of all segment variability values for all the segments along a given path. (C/LM) 802.3-1998

pathway A facility for the placement of telecommunications. (IA/PSE) 1100-1999

patient care information system A broad classification of computational-based systems used for clinical support of patient care. For the purposes of this standard the scope of patient care information systems is further limited to medical device data exchange. (EMB/MIB) 1073-1996

patient care-related electrical appliance (health care facilities) An electrical appliance that is intended to be used for diagnostic, therapeutic or monitoring purposes in a patient care area. (EMB) [47]

patient care system (PCS) A patient care information system which is actively connected to a 1073-type communications link. (EMB/MIB) 1073-1996

patient data management system *See:* patient care information system.

patient equipment grounding point (health care facilities) A jack or terminal which serves as the collection point for redundant grounding of electric appliances serving a patient vicinity or for grounding other items in order to eliminate electromagnetic interference problems. (EMB) [47]

patient grounding point (health care facilities) A jack or terminal bus which serves as the collection point for redundant grounding of electric appliances serving a patient vicinity. (NESC/NEC) [86]

patient lead (health care facilities) Any deliberate electrical connection which may carry current between an appliance and a patient. This may be a surface contact (for example, an electrocardiogram (ECG) electrode); an invasive connection (for example, implanted wire or catheter); or an incidental long-term connection (for example, conductive tubing). It is not intended to include adventitious or casual contacts such as pushbutton, bed surface, lamp, hand-held appliance, etc. (EMB) [47]

patient vicinity (health care facilities) In an area which patients are normally cared for the patient vicinity is the space with surfaces likely to be contacted by the patient or an attendant who can touch the patient. This encloses a space within the room 6 ft beyond the perimeter of the bed in its nominal location, and extending vertically 7.5 ft above the floor. (NESC/NEC) [86]

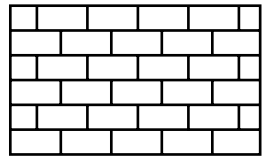
patina A green coating consisting principally of basic sulfate and occasionally containing small amounts of carbonate or chloride, that forms on the surface of copper or copper alloys exposed to the atmosphere a long time. (IA) [59]

patrol tour An inspection by a member of the security organization along a predetermined route to observe the route area's security conditions. (PE/NP) 692-1997

patrol tour stations (nuclear security systems) Points along patrol tour routes where security force member progress is acknowledged. (PE/NP) 692-1986s

pattern (1) (image processing and pattern recognition) A meaningful regularity that can be used to classify objects or other items of interest. (C) 610.4-1990w

(2) (computer graphics) A series of repeated entities or a repetitious design within a closed boundary on a display surface. (See the corresponding figure.)



pattern

(C) 610.6-1991w

(3) (test pattern language) The sequence of addresses and data used to test a semiconductor memory. (TT/C) 660-1986w

(4) A sequence of characters used either with RE notation or for pathname expansion as a means of selecting various character strings or pathnames, respectively. The syntaxes of the two patterns are similar, but not identical; this standard always indicates the type of pattern being referred to in the immediate context of the use of the term. (C/PA) 9945-2-1993

(5) One or more vectors comprising a functionality test for a specific portion of a device under test (DUT). (C/TT) 1450-1999

(6) *See also:* radiation pattern.

pattern class One of a set of mutually exclusive categories into which a pattern can be classified. *Synonyms:* class; category. (C) 610.4-1990w

pattern classification The process of assigning patterns to pattern classes. *Synonym:* pattern identification. (C) 610.4-1990w

pattern distortion (oscilloscopes) Any deformation of the pattern from its intended form. (IEC 151-14.). *Notes:* 1. In an oscilloscope the intended form is rectilinear and rectangular. 2. An oscilloscope control that affects pattern distortion may be labeled "pattern" or "geometry." (IM) 311-1970w

pattern, heating *See:* heating pattern.

pattern identification *See:* pattern classification.

pattern insensitivity The ability to write, store, and read streams of data without regard to the sequence of the data and the pattern of distribution of ones and zeros across the memory locations. (ED) 641-1987w

pattern jitter *See:* correlated jitter.

pattern-propagation factor Ratio of the field strength that is actually present at a point in space to that which would have been present if free-space propagation had occurred with the antenna beam directed toward the point in question. This factor is used in the radar equation to modify the strength of the transmitted or received signal to account for the effect of multipath propagation, diffraction, refraction, and pattern of an antenna. (AES) 686-1997

pattern recognition (1) The identification of shapes, forms, or configurations by automatic means. (C) [20], [85]

(2) (image processing and pattern recognition) The analysis, description, identification, and classification of objects or other meaningful regularities by automatic or semiautomatic means. *Synonym:* machine recognition. (C) 610.4-1990w

patterns A set of unit under test (UUT) stimulus and expected response states. A pattern contains one unit of logic state (0, 1, X, Z) data for each UUT input and each UUT output pin. (SCC20) 1445-1998

pattern segmentation The process of determining which regions or areas of in-terest in an image or other set of data constitute patterns of interest for pattern recognition. (C) 610.4-1990w

pattern select A broadcast address specifying that all devices seeing the broadcast remain attached to the master only if their T pins are asserted during the immediately ensuing write data cycle. (NID) 960-1993

pattern-sensitive fault A fault that appears in response to some particular pattern of data. *See also:* data-sensitive fault. (C) [20], [85]

pause (1) To suspend the execution of a computer program. *Synonym:* halt. *Contrast:* stop. (C) 610.12-1990

(2) A mechanism for full duplex flow control. (C/LM) 802.3-1998

pause instruction A computer instruction that specifies suspension of the execution of a computer program. *Note:* A pause instruction does not cause an exit from the program. *Synonym:* halt instruction. *See also:* stop instruction; optional-pause instruction. (C) 610.10-1994w

Pause Interrupt Enabled (PIE) bit A bit in the Slave Status register of every S-module that is set to indicate that the S-module may generate an interrupt during the PAUSE Slave Controller state when the S-module is addressed. (TT/C) 1149.5-1995

PAX *See:* private automatic exchange.

payback A financial analysis technique where the cost to implement a project is compared to the annual savings due from the project. (SCC22) 1346-1998

payload (1) The information bits (within a frame). (COM/TA) 1007-1991r

(2) The data (a message, a memory access request, an acknowledgment, etc.) that is to be transferred from the source node to the destination node. It has a specific format, defined in the transaction layer. Note that a payload may be null. *See also:* packet. (C/BA) 1355-1995

(3) The portion of a primary packet that contains data defined by an application layer. (C/MM) 1394-1995

(4) The portion of a primary packet that contains data defined by an application. (C/MM) 1394a-2000

payout site *See:* tension site.

pay station *See:* public telephone station.

P-band A letter-band designation no longer applicable and which should not be used. Originally it denoted frequencies in the vicinity of 230 MHz, which are no longer allowed for radar usage. Later it was sometimes applied to denote the 420–450 MHz International Telecommunication Union (ITU) allocated radiolocation band that is now called UHF by IEEE Std 521-1984, IEEE Standard Letter Designations for Radar-Frequency Bands. (AES) 686-1997

PBX *See:* private branch exchange.

PBX trunk *See:* private-branch-exchange trunk.

PC *See:* personal computer; printed circuit.

PCA *See:* physical configuration audit.

PCB *See:* polychlorinated biphenyl; askarel.

PCC *See:* point of common coupling.

PCD *See:* POSIX Conformance Document.

P channel (1) (for the ISLAN16-T) A 10 Mbit/s packet channel, that provides a Physical Layer service to an ISO/IEC 8802-3 MAC. (C/LM) 802.9a-1995w

(2) A full duplex packet channel that provides IEEE 802 MAC Layer services. The P channel may optionally carry CCITT Q.93x (where x refers to the family of CCITT Q.930 protocols) call control in a logically out-of-band fashion, which may be highlighted by referring to it as P_D. Presently there is only one P channel defined per ISLAN interface. The minimum size of the P channel shall be limited by the application requirements of the topology that represents the connection of the AU to the backbone LAN application. The support of station management communication will be an important factor in the characterization of P channel bandwidth size. (LM/C/COM) 8802-9-1996

p-channel device (metal-nitride-oxide field-effect transistor) Insulated-gate field-effect transformer (IGFET) where source and drain are regions of p-type conductivity. (ED) 581-1978w

p-channel metal-oxide semiconductor (PMOS) A type of semiconductor technology which employs metal oxide field effect transistors, using holes to conduct current in the semiconductor channel. *Note:* The channel has a predominantly positive charge. *Contrast:* n-channel metal-oxide semiconductor. *See also:* complementary metal-oxide semiconductor. (C) 610.10-1994w

PCM *See:* punched card machine; pulse code modulation.

PC parallel port The parallel printer port used as the parallel interface for most printers and supported by most PCs. This interface has been variously defined by different PC and peripheral manufacturers. This standard describes the more prevalent variations of the interface and defines a family of signaling methods that are backward compatible with the typical PC parallel port. (C/MM) 1284-1994

PCS *See:* print contrast signal; power conditioning subsystem; physical coding sublayer; patient care system.

PCSN *See:* private circuit switching network.

PCTP *See:* POSIX Conformance Test Procedure.

PCTS *See:* POSIX Conformance Test Suite.

P.D *See:* control action, proportional plus derivative.

PD *See:* partial discharge.

PDA *See:* parallel disk array.

PDEL *See:* Partial Differential Equation Language.

PDES *See:* Product Data Exchange Specification.

P-display A name for the type of display commonly known as plan-position indicator (PPI). (AES) 686-1997

PDL *See:* program design language.

PDM *See:* pulse-duration modulation.

PDN *See:* public data network.

PDR *See:* preliminary design review.

PDS *See:* partitioned data set.

PDS/MaGen *See:* Problem Descriptor System.

PDU *See:* protocol data unit; command protocol data unit.

PDV *See:* path delay value.

PE Conduit fabricated from polyethylene. (SUB/PE) 525-1992r

PEAK Channel number corresponding to the peak of a distribution. (NPS) 398-1972r

peak *See:* line.

peak alternating gap voltage (electron tube) (traveling-wave tubes) The negative of the line integral of the peak alternating electric field taken along a specified path across the gap. *Note:* The path of integration must be stated. (ED) 161-1971w

peak anode current The maximum instantaneous value of the anode current. *See also:* electronic controller. (IA/IAC) [60]

peak burst magnitude (audio and electroacoustics) The maximum absolute peak value of voltage, current, or power for a burstlike excursion. *See also:* burst duration; burst. (SP) [32]

peak cathode current (steady-state) The maximum instantaneous value of a periodically recurring cathode current. (ED) 161-1971w

peak-charge characteristic (nonlinear capacitor) The function relating one-half the peak-to-peak value of transferred charge in the steady state to one-half the peak-to-peak value of a specified applied symmetrical alternating capacitor voltage. *Note:* Peak-charge characteristic is always single-valued. *See also:* nonlinear capacitor. (ED) [46]

peak code The codes that will produce the maximum decoder output level. (COM/TA) 1007-1991r

peak current (low-voltage dc power circuit breakers used in enclosures) The instantaneous value of current at the time of its maximum value. (SWG/PE) C37.14-1979s, C37.100-1992

peak demand *See:* maximum demand.

peak detector (overhead-power-line corona and radio noise) A detector, the output voltage of which is the true peak value of an applied signal or noise. (T&D/PE) 539-1990

peak discharge current The peak current occurring during a transient discharge. *Note:* Due to the very short discharge time, substantial peak currents (up to a few amperes) can be encountered in typical induction circumstances. (T&D/PE) 539-1990

peak distortion (data transmission) The largest total distortion of telegraph signals noted during a period of observation. (PE) 599-1985w

peak electrode current (electron tube) The maximum instantaneous current that flows through an electrode. *See also:* electrode current. (ED) [45]

peak error The residual with the largest absolute value. (IM/WM&A) 1057-1994w

peak flux density The maximum flux density in a magnetic material in a specified cyclically magnetized condition. (Std100) 163-1959w

peak forward anode voltage (electron tube) The maximum instantaneous anode voltage in the direction in which the tube is designed to pass current. *See also:* electronic controller; electrode voltage. (ED) [45]

peak forward current rating (rectifier circuit element) (repetitive) The maximum repetitive instantaneous forward current permitted by the manufacturer under stated conditions. *See also:* average forward current rating. (IA) [62]

peak forward voltage (of a rectifying element) The maximum instantaneous voltage between the anode and cathode during the positive nonconducting period. *See also:* rectification. (EEC/PE) [119]

peak full-width-half-maximum calibration coefficients The full-width-half-maximum (also called shape) (F) versus channel number (Ch) coefficients as

$$F = P + Q \cdot Ch^{I} + R \cdot Ch^{2I} + W \cdot Ch^{3I}$$

with the coefficients, P, Q, R, and W stored as four successive 14-character numbers including the decimal point, and I as a four-character number including the decimal point. Leading spaces are interpreted as zeros. Any values not used or calculated should be set to all spaces. The P term is usually called the offset or zero intercept. The I is the lowest exponent of the channel number. In most cases I will be 0.5 for a quadratic dependance of the FWHM with channel and I will be 1.0 for linear dependance of the FWHM with channel. The Q term is the multiplier for the lowest power dependance of the FWHM-channel curve. The R term is the multiplier of the second exponent term of the FWHM-channel curve. The W term is the multiplier of the third exponent term of the FWHM-channel curve. (NPS/NID) 1214-1992r

peak induction (of toroidal magnetic amplifier cores) The magnetic induction corresponding to the peak applied magnetizing force specified. *Note:* It will usually be slightly less than the true saturation induction. *Synonym:* peak flux density. (Std100) 106-1972

peaking circuit A circuit capable of converting an input wave into a peaked waveform. (EEC/PE) [119]

peaking network A type of interstage coupling network in which an inductance is effectively in series (series peaking network) or in shunt (shunt peaking network) with the parasitic capacitance to increase the amplification at the upper end of the frequency range. *See also:* network analysis. (EEC/PE) [119]

peaking station (power operations) A generating station that is normally operated to provide power only during maximum load periods. (PE/PSE) 858-1987s, 346-1973Tw

peaking time (1) (semiconductor radiation detectors) The time elapsed from the first zero crossing of the defined zero level to the departure from peak amplitude of a pulse equal to the maximum rated amplifier output. (NID) 301-1976s
(2) (germanium gamma-ray detectors) (charged-particle detectors) (of an amplifier output pulse) The time between the 1% amplitude point on the leading edge and the 100% amplitude point of a pulse (provided that the pulse does not have a flat top). For flat-top pulses, the peaking time is defined as the time between the 1% amplitude point and the midpoint of the flat top. (NPS) 325-1986s
(3) The time interval between the 1% point on the first transition and the top centerline. (NPS) 300-1988r

peaking time tp (of a pulse) The interval between the 1% point on the first transition, with respect to the peak height, and the top center line. *See also:* transition; top centerline. (NPS) 325-1996

peak inrush current (electronic power transformer) The peak instantaneous current value resulting from the excitation of the transformer with no connected load, and with essentially zero source impedance, and using the minimum turns primary tap and rated voltage. (PEL/ET) 295-1969r

peak instantaneous sound pressure level (measurement of sound pressure levels of ac power circuit breakers) Maximum unweighted positive or negative pressure peak value reached by an impulsive sound wave at any time during the period of observation. Unit: decibel (dB). Readings can be considered as peak instantaneous sound pressure level if the C-weighting is used and the response time of the instrument is 50 μs or less. Peak instantaneous sound pressure level is sometimes referred to as impact noise. (SWG/PE) C37.100-1992, C37.082-1982r

peak inverse anode voltage (electron tube) The maximum instantaneous anode voltage in the direction opposite to that in which the tube is designed to pass current. *See also:* electrode voltage; electronic controller. (ED) [45]

peak inverse voltage (PIV) (semiconductor diode) The maximum instantaneous anode-to-cathode voltage in the reverse direction that is actually applied to the diode in an operating circuit. *Notes:* 1. This is an applications term not to be confused with breakdown voltage, which is a property of the device. 2. In semiconductor work the preferred term is peak reverse voltage. *See also:* semiconductor; peak reverse voltage. (ED) 216-1960w

peak inverse voltage, maximum rated (semiconductor diode) The recommended maximum instantaneous anode-to-cathode voltage that may be applied in the reverse direction. *See also:* semiconductor. (ED) 216-1960w

peak jitter *See:* jitter.

peak let-through characteristic curve *See:* current-limiting characteristic curve.

peak let-through current (1) (protection and coordination of industrial and commercial power systems) The maximum instantaneous current through a current-limiting fuse during the total clearing time. Since this is an instantaneous value, it may well exceed the root-mean-square (rms) available current, but will be less than the peak current available without a fuse in the circuit if the fault level is high enough for it to operate in its current-limiting mode. (IA/PSP) 242-1986r **(2)** The highest current flowing in the circuit following the inception of the fault that the circuit breaker and the protected system must withstand, expressed as an instantaneous rather than an rms value. (IA/PSP) 1015-1997

peak let-through cutoff current (of a current-limiting fuse) The highest instantaneous current passed by the fuse during the interruption of the circuit. (SWG/PE) C37.100-1992, C37.40-1993

peak limiter A device that automatically limits the magnitude of a signal to a predetermined maximum value by changing its amplification. *Notes:* 1. The term is frequently applied to a device whose gain is quickly reduced and slowly restored when the instantaneous magnitude of the input exceeds a predetermined value. 2. In this context, the terms instantaneous magnitude and instantaneous peak power are used interchangeably. (BT/AV) [34]

peak load (1) (A) The maximum load consumed or produced by a unit or group of units in a stated period of time. It may be the maximum instantaneous load or the maximum average load over a designated interval of time. *Note:* Maximum average load is ordinarily used. In commercial transactions involving peak load (peak power) it is taken as the average load (power) during a time interval of specified duration occurring within a given period of time, that time interval being selected during which the average power is greatest. *See also:* generating station. **(B)** The maximum load of a specified unit or group of units in a stated period of time. (T&D/PE/IA/PSE) [10], 241-1990, 141-1993 **(2) (rotating machinery) (motors)** The largest momentary or short-time load expected to be delivered by a motor. It is expressed in percent of normal power or normal torque. *See also:* asynchronous machine. (PE) [9]

peak load duty (thyristor converter) A type of duty where the rating of the converter is specified in terms of the magnitude and duration of the peak load together with the time of no-load between peaks. (IA/IPC) 444-1973w

peak load station (electric power supply) A generating station that is normally operated to provide power during maximum load periods. *See also:* generating station. (PE/PSE) [54]

peak magnetizing force (1) (toroidal magnetic amplifier cores) The maximum value of applied magnetomotive force per mean length of path of the core. (MAG) 393-1977s **(2) (peak field strength)** The upper or lower limiting value of magnetizing force associated with a cyclically magnetized condition. (Std100) 163-1959w

peak nominal varistor voltage (low voltage varistor surge arresters) Voltage across the varistor measured at a specified pulsed direct-current (dc) current of specific duration coincident with a specified alternating-current (ac) current crest. (PE) [8]

peak overvoltages (for current-limiting fuses) The peak value of the voltage that can exist across a current-limiting fuse during its arcing interval. (SWG/PE) C37.100-1992, C37.40-1993

peak percent curve *See:* integrated energy curve.

peak point (tunnel-diode characteristic) The point on the forward current-voltage characteristic corresponding to the lowest positive (forward) voltage at which $d/dV = 0$.

peak-point current (tunnel-diode characteristic) The current at the peak point. *See also:* peak point. (ED) 253-1963w, [46]

peak-point voltage (tunnel-diode characteristic) The voltage at which the peak point occurs. *See also:* peak point. (ED) 253-1963w, [46]

peak power density The maximum instantaneous power density occurring when power is transmitted. (NIR) C95.1-1999

peak power, instantaneous *See:* instantaneous peak power.

peak power output (modulated carrier system) The output power, averaged over a carrier cycle, at the maximum amplitude that can occur with any combination of signals to be transmitted. *See also:* television; radio transmitter. (AP/ANT) 145-1983s

peak power pulse (waveguide) The root-mean-square (rms) value of rectangular pulse of radio frequency (RF) power passing through the transverse section of a waveguide. (MTT) 146-1980w

peak pulse amplitude (television) The maximum absolute peak value of the pulse excluding those portions considered to be unwanted, such as spikes. *Note:* Where such exclusions are made, it is desirable that the amplitude chosen be illustrated pictorially. *See also:* pulse. (PE) 599-1985w

peak pulse power, carrier-frequency The power averaged over that carrier-frequency cycle that occurs at the maximum of the pulse of power (usually one half the maximum instantaneous power). (IM/WM&A) 194-1977w

peak radiant responsivity (diode-type camera tube) The peak value of the spectral response of the tube usually specified together with the wavelength at which it occurs. Units: amperes watt^{-1} (AW^{-1}). (ED) 503-1978w

peak repetitive ON-state current (thyristor) The peak value of the on-state current including all repetitive transient currents. *See also:* principal current. (ED/IA) [46], [123], [12], [62]

peak responsibility The load of a customer, a group of customers, or a part of the system at the time of occurrence of the system peak load. *See also:* generating station. (T&D/PE) [10]

peak restriking voltage (surge arresters) The maximum instantaneous voltage that is attained by the re-striking voltage. (PE) [8], [84]

peak reverse voltage (semiconductor rectifiers) The maximum instantaneous value of the reverse voltage that occurs across a semiconductor rectifier device, or rectifier stack. *See also:* rectification. (IA) [12]

peak sound pressure (for any specified time interval) The maximum absolute value of the instantaneous sound pressure in that interval. *Note:* In the case of a periodic wave, if the time interval considered is a complete period, the peak sound pressure becomes identical with the maximum sound pressure. (SP) [32]

peak switching current (rotating machinery) The maximum peak transient current attained following a switching operation on a machine. *See also:* asynchronous machine. (PE) [9]

peak-to-Compton ratio for the 1332 keV ^{60}Co peak The ratio of the full-energy peak height, for ^{60}Co measured at 1332 keV, to the average height of the corresponding Compton plateau between 1040 keV and 1096 keV. (NI) N42.14-1991

peak torque (electric coupling) The maximum torque an electric coupling will transmit or develop for any speed relation on input and output members, with rated excitation and at specified operating conditions. (EM/PE) 290-1980w

peak value (1) (A) (of alternating voltage) The maximum value, disregarding small high-frequency oscillations (greater than 10 kHz) such as those arising from partial discharges. **(B)** (of impulse voltages) The maximum value of impulses that are smooth double exponential waves without overshoot. (PE/PSIM) 4-1995

(2) (surge arresters) (voltage or current) The maximum value of an impulse. If there are small oscillations superimposed at the peak, the peak value is defined by the maximum value and not the mean curve drawn through the oscillations. (PE) [8], [84]

(3) (electrical measurements in power circuits) The largest absolute value (y_p) of y. (PE/PSIM) 120-1989r

(4) *See also:* crest value. (SPD/PE) C62.22-1997

peak wavelength (1) (fiber optics) The wavelength at which the radiant intensity of a source is maximum. *See also:* spectral width; spectral line. (Std100) 812-1984w

(2) (light-emitting diodes) The wavelength at which the spectral radiant intensity is a maximum. (ED) [127]

peak withstand current (1) (of an air switch) The crest value of the total current during the maximum cycle that a switch is required to carry at rated frequency. (SWG/PE) C37.34-1994

(2) The maximum instantaneous current at the major peak of an offset power-frequency sinusoidal current that a switch is required to carry. (SWG/PE) 1247-1998

peak working voltage (1) (pulse transformers) The maximum instantaneous voltage stress that may appear under operation across the insulation being considered, including abnormal and transient conditions. (PEL/ET) 390-1987r

(2) (charging inductors) The algebraic sum of the maximum alternating crest voltage and the direct voltage of the same polarity appearing between the terminals of the inductor winding or between the inductor winding and the grounded elements. (MAG) 306-1969w

(3) (corona measurement) The maximum instantaneous voltage that may appear under normal rated conditions across the insulation being considered. This insulation may be within a winding, between windings, or between winding and grounds. (MAG/ET) 436-1977s

peanut *See:* rope connector.

PEARL *See:* Process and Experiment Automation Realtime Language.

PEC *See:* protocol error counter.

Pederson ray The upper ionospheric ray in oblique-incidence propagation. *See also:* junction frequency. (AP/PROP) 211-1997

pedestal A substantially flat-topped pulse that elevates the base level for another wave. *See also:* pulse. (EEC/PE) [119]

pedestal bearing (rotating machinery) A complete assembly of a bearing with its supporting pedestal. (PE) [9]

pedestal bearing insulation (rotating machinery) The insulation applied either below the bearing liner shell and the adjacent pedestal support or between the base of the pedestal and the machine bed plate, to break the current path that may be formed through the shaft to the outboard bearing to the frame to the drive-end bearing and thence back to the shaft. *Note:* The voltage is usually very low. However, very destructive bearing currents can flow in this path if some insulating break is not provided. High-pressure moulded laminates are usually employed for this type of insulation. (PE) [9]

pedestal delay time (amplitude, frequency, and pulse modulation) The time elapsed between the application of an electronic command signal to the electronic driver and the time the diffracted light reaches the 10% intensity point. (UFFC) [17]

peeling The unwanted detachment of a plated metal coating from the base metal. *See also:* electroplating. (EEC/PE) [119]

peer (1) Elements of a distributed system that communicate with each other using a common protocol. (DIS/C) 1278.2-1995

(2) Service layer on a remote node at the same level. For instance a "peer link layer" is the link layer on a different node. (C/MM) 1394-1995

peer-entity authentication The corroboration that a peer entity in an association is the one claimed. This service, when provided by the (N)-layer, provides corroboration to the (N+1)-entity that the peer entity is the claimed (N+1)-entity. This is primarily intended for, although not limited to, connection-oriented service and may be either unilateral or mutual. (LM/C) 802.10-1992

peer graphics *See:* information graphics.

peer Port (of a Virtual Port) A Virtual Port is a peer (Virtual) Port of a given Virtual Port when both Virtual Ports attach to the same Group and both represent the capability for communication between the Remote Bridges to which they belong. (C/LM) 802.1G-1996

peer protocol The sequence of message exchanges between two entities in the same layer that utilize the services of the underlying layers to effect the successful transfer of data and/or control information from one location to another location. (C/LM/CC) 8802-2-1998

peer-to-peer communication (A) Communication between two or more processes or programs by which both computers can exchange data freely. *Note:* Any physical differences between the computers are rendered transparent to the application. **(B)** Communication between two or more network nodes in which either node can initiate sessions, and is able to poll or answer to polls. (C) 610.7-1995

peg count (1) (telephone switching systems) The notation of the number of occurrences of an event. (COM) 312-1977w

(2) *See also:* traffic peg count. (COM/TA) 973-1990w

pel *See:* pixel.

Peltier coefficient, absolute The product of the absolute temperature and the absolute Seebeck coefficient of the material; the sign of the Peltier coefficient is the same as that of the Seebeck coefficient. *Note:* The opposite sign convention has also been used in the technical literature. *See also:* thermoelectric device. (ED) [46]

Peltier coefficient, quotient The quotient of: "A," the rate of Peltier heat absorption by the junction of the two conductors by "B," the electric current through the junction; the Peltier coefficient is positive if Peltier heat is absorbed by the junction when the electric current flows from the second-named conductor to the first conductor. *Notes:* 1. The opposite sign convention has also been used in the technical literature. 2. The Peltier coefficient of a couple is the algebraic difference of either the relative or absolute Peltier coefficients of the two conductors. *See also:* thermoelectric device. (ED) [46]

Peltier coefficient, relative The Peltier coefficient of a couple composed of the given material as the first-named conductor and a specified standard conductor. *Note:* Common standard conductors are platinum, lead, and copper. *See also:* thermoelectric device. (ED) [46]

Peltier effect The absorption or evolution of thermal energy, in addition to the Joule heat, at a junction through which an electric current flows; and in a nonhomogeneous, isothermal conductor, the absorption or evolution of thermal energy, in addition to the Joule heat, produced by an electric current. *Notes:* 1. For the case of a nonhomogeneous, nonisothermal conductor, the Peltier effect cannot be separated from the Thomson effect. 2. A current through the junction of two dissimilar materials causes either an absorption or liberation of heat, depending on the sense of the current, and at a rate directly proportional to it to a first approximation. *See also:* thermoelectric device. (ED) [46], 270-1966w

Peltier heat The thermal energy absorbed or evolved as a result of the Peltier effect. *See also:* thermoelectric device. (ED) [46]

penalty brake A function of the automatic train protection portion of the master control system, accomplished by a safety critical, full-service, or emergency brake application. *Note:* Although most commonly associated with an overspeed operating condition, penalty braking may be initiated for a variety of reasons, depending on the vehicle design and the requirements of the authority having jurisdiction. (VT) 1475-1999

penalty factor A factor that produces the incremental cost of delivered power from a source when multiplied by the incremental cost of power at the source. Mathematically, it is:

$$\frac{1}{(1 - \text{Incremental Transmission Loss})^*}$$

* Expressed as a decimal. (PE/PSE) 94-1991w

pencil-beam antenna (1) An antenna whose radiation pattern consists of a single main lobe with narrow principal half-power beamwidths and side lobes having relatively low levels. *Note:* The main lobe usually has approximately elliptical contours of equal radiation intensity in the angular region around the peak of the main lobe. This type of pattern is diffraction-limited in practice. It is often called a sum pattern in radar applications. (AP/ANT) 145-1993
(2) Antenna beam with a narrow radiation lobe with approximately equal azimuth and elevation beamwidths (i.e., one with circular or almost circular shape in the plane perpendicular to the direction of propagation). (AES) 686-1997

pendant A device or equipment that is suspended from overhead either by means of the flexible cord carrying the current or otherwise. (EEC/PE) [119]

pending master The master that participated in and won the most recent arbitration cycle. As a result it will assume bus mastership when the current master releases the bus. (NID) 960-1993

pendulosity (accelerometer) (gyros) The product of the inertial-sensing mass and the distance from the center of mass to the center of support measured along the pendulous axis. (AES/GYAC) 528-1994

pendulous accelerometer An accelerometer that employs a proof mass that is suspended to permit a rotation about an axis perpendicular to an input axis. (AES/GYAC) 528-1994

pendulous axis (accelerometer) In pendulous devices, an axis through the mass center of the proof mass, perpendicular to and intersecting the output axis. The positive direction is defined from the output axis to the proof mass. (AES/GYAC) 528-1994

pendulous integrating gyro accelerometer (PIGA) A device using a single-degree-of-freedom gyro having an intentional pendulosity along the spin axis that is servo-driven about the input axis at a rate that balances the torque induced by acceleration along the input axis. The angle through which the servoed axis rotates is proportional to the integral of applied acceleration. (AES/GYAC) 528-1994

pendulous reference axis (PRA) (accelerometer) The direction of an axis, as defined by the case mounting surfaces or external case markings or both. It is nominally parallel to the pendulous axis. (AES/GYAC) 528-1994

penetration Attacks by unauthorized persons in attempts to gain system access by defeating the system security perimeter (e.g., log-in controls, access controls, bypass controls). Penetration often is in conjunction with browsing or misuse, and could result in unauthorized disclosure or modification of information, unauthorized receipt of services, or denial of service to legitimate users or critical functions. (C/BA) 896.3-1993w

penetration CRT display device A CRT display device characterized by a display screen covered with several layers of phosphor that are selectively energized by varying the voltage of the electron beam, allowing the display of multiple colors. *Note:* Often used to add color to a random-scan display device. (C) 610.10-1994w

penetration depth (1) For a given frequency, the depth at which the electric field strength of an incident plane wave, penetrating into a lossy medium, is reduced to $1/e$ of its value just beneath the surface of the lossy medium. *Note:* The penetration depth, also called the skin depth, is equal to the reciprocal of the attenuation constant in the lossy medium. *Synonym:* skin depth. (AP/PROP) 211-1997
(2) For a plane electromagnetic wave incident on the boundary of a medium, the distance from the boundary into the medium along the direction of propagation in the medium, at which the field strengths of the wave have been reduced to $1/e$ ($\sim$36.8%) of the boundary values. (NIR) C95.1-1999

penetration, depth of *See:* depth of current penetration.

penetration frequency (A) For a given angle of incidence, the lowest frequency that just penetrates the ionosphere. **(B)** *See also:* critical frequency. (AP/PROP) 211-1997

penetration frequency, oblique incidence propagation (radio-wave propagation) For a given angle of incidence, the lowest frequency that just penetrates the ionosphere. (AP/PROP) 211-1990s

penetration frequency, vertical incidence propagation *See:* critical frequency.

pentode A five-electrode electron tube containing an anode, a cathode, a control electrode, and two additional electrodes that are ordinarily grids. (ED) 161-1971w

pen travel The length of the path described by the pen in moving from one end of the chart scale to the other. The path may be an arc or a straight line. *See also:* moving element. (EEC/EMI) [112]

perceived chroma of an area of surface color (illuminating engineering) The attribute according to which it appears to exhibit more or less chromatic color judged in proportion to the brightness of a similarly illuminated area that appears to be white or highly transmitting. In a given set of viewing conditions, and at luminance levels that result in photopic vision, a stimulus of a given chromaticity and luminance factor exhibits approximately constant perceived chroma for all levels of illumination; but for a stimulus of a given chromaticity viewed at a given level of illumination, the perceived chroma generally increases if the luminance factor is increased. (EEC/IE) [126]

perceived color (illuminating engineering) The proximal stimulus applied to the retina initiates color which is perceived as a substance occupying the space in front of the observer's eyes. Color may be perceived as self-luminous or as being reflected or transmitted light. It may be perceived as being confined to a point or line or arrayed as a surface or film or distributed in three dimensions as in the case of the perceived image of a patch of fog. A perceived image may be perceived as composed of volume color as in the case of fog or as covered by surface color as in the case of a piece of chalk. In the case of the sky or a patch of color seen through an

aperture where it cannot be identified as belonging to a specific object, it is called aperture color and judgement is suspended as to whether the color is self-luminous or perceived by reflected or transmitted light. The color of a point source of light may be perceived and described as such. This is a special case of a self-luminous color. (EEC/IE) [126]

perceived light-source color (illuminating engineering) The color perceived to belong to a light source. (EEC/IE) [126]

perceived object color The color perceived to belong to an object, resulting from characteristics of the object, of the incident light, and of the surround, the viewing direction, and observer adaptation. *See also:* color. (EEC/IE) [126]

percentage differential relay A differential relay in which the designed response to the phasor difference between incoming and outgoing electrical quantities is modified by a restraining action of one or more of the input quantities. *Note:* The relay operates when the magnitude of the phasor difference exceeds the specified percentage of one or more of the input quantities. (SWG/PE) C37.100-1992

percentage error (watthour meter) The difference between a meter's percentage registration and 100%. A meter whose percentage registration is 95% is said to be 5% slow, or its error is −5%. A meter whose percentage registration is 105% is 5% fast, or its error is +5%. (ELM) C12.1-1982s

percentage immediate appreciation (telephone transmission system) The percentage of the total number of spoken sentences that are immediately understood without conscious deductive effort when each sentence conveys a simple and easily understandable idea. *See also:* volume equivalent. (PE/EEC) [119]

percentage modulation (A) In angle modulation, the fraction of a specified reference modulation, expressed in percent. **(B)** In amplitude modulation, the modulation factor expressed in percent. *Note:* It is sometimes convenient to express percentage modulation in decibels below 100% modulation. *See also:* radio transmission. (BT) 182A-1964

percentage modulation, effective (single, sinusoidal input component) The ratio of the peak value of the fundamental component of the envelope to the direct-current component in the modulated conditions, expressed in percent. *Note:* It is sometimes convenient to express percentage modulation in decibels below 100% modulation. (AP/ANT) 145-1983s

percentage registration (accuracy) (percentage accuracy) (watthour meter) The ratio of the actual registration of the meter to the true value of the quantity measured in a given time, expressed as a percentage. *See also:* electricity meter. (ELM) C12.1-1982s

percent energy resolution *See:* energy resolution.

percent flutter (reproduced tone) (sound recording and reproducing) The root-mean-square deviation from the average frequency, expressed as a percentage of average frequency. (SP) 193-1971w

percent harmonic distortion (electroacoustics) A measure of the harmonic distortion in a system or transducer, numerically equal to 100 times the ratio of the square root of the sum of the squares of the root-mean-square voltages (or currents) of each of the individual harmonic frequencies, to the root-mean-square voltage (or current) of the fundamental. *Note:* It is practical to measure the ratio of the root-mean-square amplitude of the residual harmonic voltages (or currents), after the elimination of the fundamental, to the root-mean-square amplitude of the fundamental and harmonic voltages (or currents) combined. This measurement will indicate percent harmonic distortion with an error of less than 5% if the magnitude of the distortion does not exceed 30%. *See also:* distortion. (SP) 151-1965w

percent impairment of hearing (percent hearing loss) An estimate of a person's ability to hear correctly. It is usually based, by means of an arbitrary rule, on the pure-tone audiogram. The specific rule for calculating this quantity from the audiogram now varies from state to state according to a rule or law. *Note:* The term disability of hearing is sometimes used for impairment of hearing. Impairment refers specifically to a person's illness or injury that affects his personal efficiency in the activities of daily living. Disability has the additional medicolegal connotation that an impairment reduces a person's ability to engage in gainful activity. Impairment is only a contributing factor to the disability. (SP) [32]

percent impedance (1) (rectifier transformer) The percent of rated alternating-current winding voltage required to circulate current equivalent to rated line kilovolt-amperes in the alternating-current winding with all direct-current winding terminals short-circuited. *See also:* rectifier transformer. (Std100) C57.18-1964w

(2) (rectifier transformer) The percent of rated primary winding voltage required to circulate current equivalent to rated kilovoltamperes in the primary winding with all secondary winding terminals short-circuited. (PE/TR) C57.18.10-1998

percent loss of life The equivalent aging in hours at the reference hottest-spot temperature over a time period (usually 24 h) times 100 divided by the total normal insulation life in hours at the reference hottest-spot temperature. The equivalent aging in hours at different hot-spot temperatures is obtained by multiplying the aging acceleration factors for the hottest-spot temperatures times the time periods of the various hottest-spot temperatures. (PE/TR) C57.91-1995

percent-make-and-break (telephone switching systems) The proportions of a dial pulse cycle during which the circuit is closed (make) and opened (break) respectively. (COM) 312-1977w

percent polarized The degree of polarization expressed in percent. *See also:* degree of polarization. (AP/PROP) 211-1997

percent pulse waveform distortion (pulse terminology) Pulse waveform distortion expressed as a percentage of, unless otherwise specified, the pulse amplitude of the reference pulse waveform. (IM/WM&A) 194-1977w

percent pulse waveform feature distortion (pulse terminology) Pulse waveform feature distortion expressed as a percentage of, unless otherwise specified, the pulse amplitude of the reference pulse waveform. (IM/WM&A) 194-1977w

percent ratio (instrument transformers) The true ratio expressed in percent of the marked ratio. (PE/TR) C57.13-1978s, C57.12.80-1978er

percent ratio correction The difference between the ratio correction factor and unity, expressed in percent [(RCF − 1) × 100]. *See also:* ratio correction factor. (PE/TR) C57.13-1993, [57]

percent ripple (1) (power system communication equipment) The ratio of the effective (root-mean-square) value of the ripple voltage or current to the average value of the total (direct current) voltage or current, expressed in percent. (PE/PSC) 281-1984w

(2) (electrical conversion) The ratio of the root-mean-square (RMS) value of the voltage pulsations (E_{max} to E_{min}) to the average value of the total voltage.

$$\text{percent ripple} = \frac{\text{RMS ripple}}{E_{\text{nominal}}}\,(100\%)$$

Note: In most applications, the definition has been revised to simplify the calculations by defining percent ripple as the ratio of the root-mean-square (RMS) value of the voltage pulsations to the nominal no-load output voltage of the converter E_{nominal}.

$$\text{percent ripple} = \frac{\text{RMS ripple}}{E_{\text{av}}}\,(100\%)$$

(AES) [41]

(3) The ratio of the value of the ripple voltage to the value of the total voltage multiplied by 100. (PEL/ET) 388-1992r

percent ripple voltage or current *See:* percent ripple.

percent steady-state deviation (control) The difference between the ideal value and the final value, expressed as a per-

centage of the maximum rated value of the directly controlled variable (or another variable if specified). *See also:* feedback control system. (IA/IAC) [60]

percent syllable articulation *See:* syllable articulation.

percent system deviation (control) At any given point on the time response, the difference between the ideal value and the instantaneous value, expressed as a percentage of the maximum rated value of the directly controlled variable (or another variable if specified). *See also:* deviation; feedback control system. (IA/IAC) [60]

percent total flutter (sound recording and reproducing) The value of flutter indicated by an instrument that responds uniformly to flutter of all rates from 0.5 up to 200 Hz. *Note:* Except for the most critical tests, instruments that respond uniformly to flutter of all rates up to 120 Hz are adequate, and their indications may be accepted as showing percent total flutter. (SP) 193-1971w

percent transformer correction-factor error Difference between the transformer correction factor and unity expressed in percent. *Note:* The percent transformer correction-factor error is positive if the transformer correction factor is greater than unity. If the percent transformer correction-factor error is positive, the measured watts or watthours will be less than the true value. (PE/TR) [57], C57.13-1978s

percent transient deviation (control) The difference between the instantaneous value and the final value, expressed as a percentage of the maximum rated value of the directly controlled variable (or another variable if specified). *See also:* feedback control system. (IA/IAC) [60]

percent unbalance of phase voltages (electrical conversion) The ratio of the maximum deviation of a phase voltage from the average of the total phases to the average of the phase voltages, expressed in percent.

$$\text{percent unbalance} = \frac{\text{RMS phase voltage} - \text{RMS average phase voltages}}{\text{RMS average phase voltage}} \times 100\%$$

(AES) [41]

perfect conductor A medium for which the conductivity is infinite. In a perfect conductor, the total electric and magnetic fields are identically zero regardless of the exciting source. *Synonyms:* ideal conductor; perfectly conducting medium. (AP/PROP) 211-1997

perfect dielectric (1) (ideal dielectric) A dielectric in which all of the energy required to establish an electric field in the dielectric is recoverable when the field or impressed voltage is removed. Therefore, a perfect dielectric has zero conductivity and all absorption phenomena are absent. A complete vacuum is the only known perfect dielectric. (Std100) 270-1966w
(2) A dielectric medium in which the conductive and dielectric losses are identically zero. *See also:* ideal dielectric. (AP/PROP) 211-1997

perfect diffusion (illuminating engineering) That in which flux is uniformly scattered in accordance with Lambert's cosine law. *See also:* Lambert's cosine law. (EEC/IE) [126]

perfective maintenance (1) (software) Software maintenance performed to improve the performance, maintainability, or other attributes of a computer program. *Contrast:* adaptive maintenance; corrective maintenance. (C) 610.12-1990
(2) Modification of a software product after delivery to improve performance or maintainability. (C/SE) 1219-1998

perfectly conducting medium *See:* perfect conductor.

perforated punch tape *See:* perforated tape.

perforated tape (1) Tape in which a code hole(s) and a tape-feed hole have been punched in a row. (IA) [61]
(2) A tape on which a pattern of holes is used to represent information. *Synonyms:* perforated punch tape; punched tape. *See also:* paper tape reader; chadless tape. (C) 610.10-1994w

perforated tape reader *See:* paper tape reader.

perforator (1) (telegraph practice) A device for punching code signals in paper tape for application to a tape transmitter. *Note:* A perforating device that is automatically controlled by incoming signals is called a reperforator. *See also:* telegraphy. (C/COM) [20], [49], [85]
(2) (test, measurement, and diagnostic equipment) A device for punching digital information into tape for application to a tape transmitter or tape reader. *Synonym:* tape punch. (MIL) [2]

performance (1) (software) The degree to which a system or component accomplishes its designated functions within given constraints, such as speed, accuracy, or memory usage. (C) 610.12-1990
(2) A measure of a computer system or subsystem to perform its functions; for example, response time, throughput, or number of transactions per second. The efficiency of a system in accomplishing pieces of work is an attribute of performance. (C/PA) 14252-1996

performance characteristic(s) (1) Those characteristics (such as impedance, losses, dielectric test levels, temperature rise, sound level, etc.) that describe the performance of the equipment under specified conditions of operation. (PE/TR) C57.12.80-1978r
(2) (of a device) An operating characteristic, the limit or limits of which are given in the design test specifications. (SWG/PE) C37.100-1992, [56], C37.40-1993
(3) The parameters that are essential to describe the behavior or applicability of the device under specified conditions of operation. (SPD/PE) C62.62-2000

performance chart (magnetron oscillators) A plot on coordinates of applied anode voltage and current showing contours of constant magnetic field, power output, and over-all efficiency. *See also:* magnetron. (ED) 161-1971w

performance criteria The established level of quality (bias, precision, detection sensitivity, etc.) and operational commitments (turnaround times, reporting protocol, etc.) that are:

1) Agreed upon between the Service Laboratory and the customer (or inter-governmental agencies or intra-company entities) within a formal contract.
2) Established by the Service Laboratory and documented within the Laboratory's Operational or Quality Assurance Program Manual or
3) Both 1 and 2 above.

(NI) N42.23-1995

performance criterion The criterion upon which the insulation strength or withstand voltages and clearances are selected. The performance criterion is based on an acceptable probability of insulation failure and is determined by the consequence of failure, required level of reliability, expected life of equipment, economics, and operational requirements. The criterion is usually expressed in terms of an acceptable failure rate (number of failures per year, years between failures, risk of failure, etc.) of the insulation configuration. (PE/C) 1313.1-1996

performance evaluation (1) (software) The technical assessment of a system or system component to determine how effectively operating objectives have been achieved. *See also:* component; system. (C/SE) 729-1983s
(2) The analysis, in terms of initial objectives and estimates, usually made on site to provide information on operating experience and to identify required corrective actions. (PE/NP) 933-1999

performance factor The ratio PL/RRS where PL, the performance level, is the level of ground shaking and RRS, the required response spectrum, is the test or analysis level. (PE/SUB) 693-1997

performance index (excitation systems) A scalar measure of the quality of system behavior. It is frequently a function of system output and control input over some specified time interval and/or frequency range. A quadratic performance index is a quadratic function of system states and this form finds

wide applications to linear systems.
(PE/EDPG) 421A-1978s

performance level (PL) A specified level of earthquake ground shaking that is used to define standardized seismic qualification levels (high, moderate, and low) for substation equipment. (PE/SUB) 693-1997

Performance Level 1 Environment primarily intended for aircraft applications subject to extreme vibration, shock, and temperature variations. (C/MM) 1156.1-1993

Performance Level 2 Environment primarily intended for shipboard, subsurface ship, and shore applications subject to substantial vibration, extreme shock, and temperature variations. (C/MM) 1156.1-1993

Performance Level 3 Environment primarily intended for shipboard, vehicular, and shore applications subject to vibration, shock, and temperature variations. (C/MM) 1156.1-1993

Performance Level 4 Environment primarily intended for sheltered applications subject to vibration, corrosion, shock, and temperature variations. (C/MM) 1156.1-1993

Performance Level 5 Environment primarily intended for sheltered applications subject to minimal vibration, shock, or temperature variations. (C/MM) 1156.1-1993

performance management In networking, a management function defined for controlling and analyzing the throughput and error rate of the network. (C) 610.7-1995

performance monitor (test, measurement, and diagnostic equipment) A device that continuously or periodically scans a selected number of test points to determine if the unit is operating within specified limits. The device may include provisions for insertion of stimuli. (MIL) [2]

performance monitoring Determining whether equipment is operating or capable of operating within specific limits.
(PE/NP) 933-1999

performance requirement (1) (software) A requirement that imposes conditions on a functional requirement; for example a requirement that specifies the speed, accuracy, or memory usage with which a given function must be performed.
(C) 610.12-1990

(2) A requirement that specifies a performance characteristic that a system or system component must possess; for example, speed, accuracy, frequency. (C/PA) 14252-1996

(3) The measurable criteria that identifies a quality attribute of a function, or how well a functional requirement must be accomplished. (C/SE) 1220-1998

performance specification (software) A document that specifies the performance characteristics that a system or component must possess. These characteristics typically include speed, accuracy, and memory usage. Often part of a requirements specification. (C) 610.12-1990

performance test A constant current or constant power capacity test, made on a battery after it has been in service, to detect any change in the capacity.
(PE/SB/EDPG) 1106-1995, 450-1995, 1188-1996

performance testing Testing conducted to evaluate the compliance of a system or component with specified performance requirements. *See also:* functional testing.
(C/PE/EDPG) 610.12-1990, 1248-1998

performance tests (rotating machinery) The tests required to determine the characteristics of a machine and to determine whether the machine complies with its specified performance. *See also:* direct-current commutating machine; asynchronous machine. (PE) [9]

performance verification (test, measurement, and diagnostic equipment) A short, precise check to verify that the unit under test is operational and performing its intended function.
(MIL) [2]

performing activity The person(s) or organization that performs the tasks specified in this standard.
(C/SE) 1220-1994s

periapsis (communication satellite) The least distant point from the center of a primary body (or planet) to an orbit around it. (COM) [19]

perigee (navigation aid terms) That orbital point nearest the earth when the earth is the center of attraction.
(AES/GCS) 172-1983w

perimeter In image processing, the number of pixels in the border of a region. (C) 610.4-1990w

perimeter lights (illuminating engineering) Aeronautical ground lights provided to indicate the perimeter of a landing pad for helicopters. (EEC/IE) [126]

period (1) (pulse terminology) The absolute value of the minimum interval after which the same characteristics of a periodic waveform or a periodic feature recur.
(IM/WM&A) 194-1977w

(2) (modeling and simulation) The time interval between successive events in a discrete simulation.
(C) 610.3-1989w

(3) (NuBus) Time between two driving edges.
(C/MM) 1196-1987w

(4) An interval of time in the battery duty cycle during which the load is assumed to be constant for purposes of cell sizing calculations. (PE/EDPG) 1115-1992

(5) The character ".". The term *period* is contrasted against *dot* which is used to describe a specific directory entry.
(C/PA) 9945-2-1993

(6) An interval of time in the battery duty cycle during which the load is assumed to be constant for purposes of cell sizing calculations. (SCC29) 485-1997

period, critical hydro *See:* critical hydro period.

period hours (electric generating unit reliability, availability, and productivity) The number of hours a unit was in the active state. (PE/PSE) 762-1987w

periodically sampled equivalent time format (pulse measurement) A format that is identical to the periodically sampled real time format, below, except that the time coordinate is equivalent to and convertible to real time. Typically, each datum point is derived from a different measurement on a different wave in a sequence of waves. *See also:* sampled format. (IM/WM&A) 181-1977w

periodically sampled real time format (pulse measurement) A finite sequence of magnitudes $m_0, m_1, m_2, \ldots m_n$ each of which represents the magnitude of the wave at times $t_0, t_0 + \Delta t, t_0 + 2\Delta t, \ldots t_0 + n\Delta t$, respectively, wherein . . . the data may exist in a pictorial format or as a list of numbers. *See also:* sampled format. (IM/WM&A) 181-1977w

periodic and random deviation The sum of all ripple and noise components measured over a specified bandwidth and state, unless otherwise specified, in peak-to-peak values.
(PEL) 1515-2000

periodic-automatic-reclosing equipment A piece of equipment that provides for automatically reclosing a circuit-switching device a specified number of times at specified intervals between reclosures. *Note:* This type of automatic reclosing equipment is generally used for ac circuits.
(SWG/PE) C37.100-1992

periodic check (test, measurement, and diagnostic equipment) A test or series of tests performed at designated intervals to determine if all elements of the unit under test are operating within their designated limits. (MIL) [2]

periodic damping *See:* underdamping.

periodic duty (packaging machinery) (power and distribution transformers) Intermittent operation in which the load conditions are regularly recurrent.
(NEC/NESC/IA/PE/PKG/TR) 333-1980w, C57.16-1996, C57.12.80-1978r, [86]

periodic electromagnetic wave (radio-wave propagation) A wave in which the electric field vector is repeated in detail in either of two ways: at a fixed point, after the lapse of a time known as the period, or at a fixed time, after the addition of a distance known as the wavelength. (AP) 211-1977s

periodic frequency modulation (converters having ac output) (self-commutated converters) The periodic variation of the output frequency from its rated value.
(IA/SPC) 936-1987w

periodic function A function that satisfies $f(x) = f(x + nk)$ for all x and for all integers n, k being a constant. For example, $\sin(x + a) = \sin(x + a + 2n\pi)$. (Std100) 270-1966w

periodic line (transmission lines) A line consisting of successive identically similar sections, similarly oriented, the electrical properties of each section not being uniform throughout. *Note:* The periodicity is in space and not in time. An example of a periodic line is the loaded line with loading coils uniformly spaced. *See also:* transmission line. (Std100) 270-1966w

periodic monitoring The process of sampling the state of some phenomenon at a sample interval greater than 1 s. (SWG/SUB/PE) C37.122-1983s, C37.122.1-1993, C37.100-1992

periodic output voltage modulation (self-commutated converters) (converters having ac output) The periodic variation of output voltage amplitude at frequencies less than the fundamental output frequency. (IA/SPC) 936-1987w

periodic permanent-magnet focusing (PPM) (microwave tubes) Magnetic focusing derived from a periodic array of permanent magnets. *See also:* magnetron. (ED) [45]

periodic pulse train (automatic control) A pulse train made up of identical groups of pulses, the groups repeating at regular intervals. (PE/EDPG) [3]

periodic rating (1) (electric power sources) The load that can be carried for the alternate periods of load and rest specified in the rating, the apparatus starting at approximately room temperature, and for the total time specified in the rating, without causing any of the specified limitations to be exceeded. *See also:* asynchronous machine. (IA/IAC) [60]

(2) (relay) A rating that defines the current or voltage that may be sustained by the relay during intermittent periods of energization as specified, starting cold and operating for the total time specified without causing any of the prescribed limitations to be exceeded. (SWG/PE) C37.100-1981s

periodic slow-wave circuit (microwave tubes) A circuit whose structure is periodically recurring in the direction of propagation. *See also:* microwaves. (ED) [45]

periodic tasks Tasks that have to be processed at regular intervals, and each instance shall be normally completed before the next instance of the same task arrives. (C/BA) 896.3-1993w

periodic test Test performed at scheduled intervals to detect failures and verify operability. (PE/NP) 379-1994, 308-1980Gs, 381-1977w, 338-1987r

periodic wave A wave in which the displacement at each point of the medium is a periodic function of the time. Periodic waves are classified in the same manner as periodic quantities. (Std100) 270-1966w

periodic waveguide A waveguide in which propagation is obtained by periodically arranged discontinuities or periodic modulations of the material boundaries. (MTT) 146-1980w

period timing check A timing check that specifies the allowable time between successive periods of a signal. (C/DA) 1481-1999

peripheral (1) A device, attached to a host via a communication link. (C/MM) 1284-1994

(2) Pertaining to a device that operates in combination or conjunction with the computer but is not physically part of the computer and is not essential to the basic operation of the system; for example, printers, keyboards, graphic digital converters, disks, and tape drives. *Note:* Such devices are often referred to as "peripherals" or "peripheral equipment." *See also:* input-output device. (C) 610.10-1994w

peripheral air-gap leakage flux (rotating machinery) The component of air-gap magnetic flux emanating from the rotor or stator, that flows from pole to pole without entering the radially opposite surface of the air gap. *See also:* rotor; stator. (PE) [9]

peripheral controller *See:* input-output controller.

peripheral control unit *See:* controller.

peripheral device A device connected to another device (host) that, in turn, controls its operation. (EMC) C63.4-1991

peripheral equipment (test, measurement, and diagnostic equipment) Equipment external to a basic unit. A tape unit, for example, is peripheral equipment to a computer. (MIL) [2]

peripheral personality The characteristics of a language processor or operating environment that a peripheral runs to interpret commands and data being sent. (C/MM) 1284-1994

peripheral stimulation Action by a chemical or physical agent at or near the surface of an organism. (T&D/PE) 539-1990

peripheral storage *See:* auxiliary storage.

peripheral transfer The process of transmitting data between two peripheral units. *See also:* radial transfer. (C) 610.10-1994w

peripheral unit With respect to a particular processing unit, any equipment that can communicate directly with that unit. (C) 610.10-1994w

peripheral vision (illuminating engineering) The seeing of objects displaced from the primary line of sight and outside the central visual field. (EEC/IE) [126]

peripheral visual field (illuminating engineering) That portion of the visual field which falls outside the region corresponding to the foveal portion of the retina. (EEC/IE) [126]

periphery The outer part of an integrated circuit where instances of cell types designed specifically to interface the internal circuitry to the "outside world" are placed. This part includes "pad" cells (which are input and output buffers) and power and ground pads; it may also include test circuitry, such as boundary scan cells. (C/DA) 1481-1999

periscope (navigation aid terms) An optical instrument which displaces the line of sight parallel to permit a view which otherwise may be obstructed itself. (AES/GCS) 172-1983w

periscope antenna An antenna consisting of a very directive feed located close to ground level and oriented so that its beam illuminates an elevated reflector that is oriented so as to produce a horizontal beam. (AP/ANT) 145-1993

periscopic sextant (navigation aid terms) A sextant designed to be mounted inside a vehicle, with a tube extending vertically upward through the skin of the vehicle. (AES/GCS) 172-1983w

permanent connection (substation grounding) A grounding connector that will retain its electrical and mechanical integrity for the design life of the conductor within limits established in IEEE Std 837-1984. (SUB/PE) 837-1989r

permanent echo A signal reflected from an object fixed with respect to the radar site. (AES) 686-1997

permanent fault (1) (surge arresters) A fault that can be cleared only by action taken at the point of fault. (PE) [8], [84]

(2) A continuous and stable failure or error. (C/BA) 896.3-1993w

(3) One that will persist regardless of how fast the system is de-energized or the number of times that the system is de-energized and re-energized. (T&D/PE) 1250-1995

permanent-field synchronous motor A synchronous motor similar in construction to an induction motor in which the member carrying the secondary laminations and windings carries also permanent-magnet field poles that are shielded from the alternating flux by the laminations. It starts as an induction motor but operates normally at synchronous speed. *See also:* permanent-magnet synchronous motor. (PE) [9]

permanent font *See:* internal font.

permanent forced outage (1) A forced outage where the component or unit is damaged and cannot be restored to service

until repair or replacement is completed. *Note:* Repairs can be further classified by urgency as high, normal, and low urgency repairs. (PE/PSE) 859-1987w

(2) (electric power system) An outage whose cause is not immediately self-clearing, but must be corrected by eliminating the hazard or by repairing or replacing the component before it can be returned to service. An example of a permanent forced outage is a lightning flashover which shatters an insulator thereby disabling the component until repair or replacement can be made. *Note:* This definition derives from transmission and distribution applications and does not necessarily apply to generation outages. (PE/PSE) 346-1973w

permanent forced outage duration (electric power system) The period from the initiation of the outage until the component is replaced or repaired. (PE/PSE) 346-1973w

permanently grounded device A grounding device designed to be permanently connected to ground, either solidly or through current transformers and/or another grounding device. (SPD/PE) 32-1972r

permanently installed decorative fountains and reflection pools Those that are constructed in the ground, on the ground, or in a building in such a manner that the pool cannot be readily disassembled for storage and are served by electrical circuits of any nature. These units are primarily constructed for their aesthetic value and not intended for swimming or wading. (NESC/NEC) [86]

permanently installed swimming, wading and therapeutic pools Those that are constructed in the ground, on the ground, or in a building in such a manner that the pool cannot be readily disassembled for storage, whether or not served by electrical circuits of any nature. (NESC/NEC) [86]

permanent magnet (PM) A ferromagnetic body that maintains a magnetic field without the aid of external electric current. (Std100) [84]

permanent-magnet erasing head (electroacoustics) A head that uses the fields of one or more permanent magnets for erasing. *See also:* phonograph pickup. (SP) [32]

permanent-magnet focusing (microwave tubes) Magnetic focusing derived from the use of a permanent magnet. *See also:* magnetron. (ED) [45]

permanent-magnet generator (1) (magneto) A generator in which the open-circuit magnetic flux field is provided by one or more permanent magnets. (PE) [9]

(2) An electric generator in which the magnetic flux is provided by one or more pairs of permanent magnets. (IA/MT) 45-1998

permanent-magnet loudspeaker A moving-conductor loudspeaker in which the steady field is produced by means of a permanent magnet. (EEC/PE) [119]

permanent-magnet moving-coil instrument (d'arsonval instrument) An instrument that depends for its operation on the reaction between the current in a movable coil or coils and the field of a fixed permanent magnet. *See also:* instrument. (PE/EEC) [119]

permanent-magnet moving-iron instrument (polarized-vane instrument) An instrument that depends for its operation on the action of an iron vane in aligning itself in the resultant magnetic field produced by a permanent magnet and the current in an adjacent coil of the instrument. *See also:* instrument. (EEC/PE) [119]

permanent-magnet, second-harmonic, self-synchronous system A remote-indicating arrangement consisting of a transmitter unit and one or more receiver units. All units have permanent-magnet rotors and toroidal stators using saturable ferromagnetic cores and excited with alternating current from a common external source. The coils are tapped at three or more equally spaced intervals, and the corresponding taps are connected together to transmit voltages that consist principally of the second harmonic of the excitation voltage. The rotors of the receiver units will assume the same angular position as that of the transmitter rotor. *See also:* synchro system. (EEC/PE) [119]

permanent-magnet synchronous motor (rotating machinery) A synchronous motor in which the field system consists of one or more permanent magnets. *See also:* permanent-field synchronous motor. (PE) [9]

permanent master *See:* master.

permanent record Records that shall be maintained for the lifetime of the project or as long as required by contract. These records may be forwarded to the customer for retention by the customer's record keeping system upon request or at the end of the contract period. (NI) N42.23-1995

permanent signal (A) (telephone switching systems) A sustained off-hook supervisory signal originating outside a switching system. **(B)** Occurs if no dialed (or outpulsed) digits are received and the system times out. (COM/TA) 312-1977, 973-1990

permanent-signal alarm (telephone switching systems) An alarm resulting from the simultaneous accumulation of a predetermined number of permanent signals. (COM) 312-1977w

permanent signal timing or no dial timing The time from the beginning of line or trunk seizure until the first character dialed is detected. This applies for individual lines and immediate start trunks. (COM/TA) 973-1990w

permanent-signal tone (telephone switching systems) A tone that indicates to an operator or other employee that a line is in a permanent-signal state. (COM) 312-1977w

permanent-split capacitor motor A capacitor motor with the same value of effective capacitance for both starting and running operations. *See also:* asynchronous machine. (PE) [9]

permanent storage A type of storage whose contents cannot be modified. *Synonym:* nonerasable storage. *Contrast:* erasable storage. *See also:* read-only storage. (C) 610.10-1994w

permanent virtual circuit A virtual circuit that is established at service subscription time and always connects the same two user end points. *Note:* Bandwidth on a PVC is always available but lacks the flexibility of dynamically connecting to different end users. *See also:* switched virtual circuit. (C) 610.7-1995

permeability (μ) (1) (A) (general) A general term used to express various relationships between magnetic induction and magnetizing force. These relationships are either:

a) absolute permeability, that in general is the quotient of a change in magnetic induction divided by the corresponding change in magnetizing force; or
b) specific (relative) permeability, which is the ratio of the absolute permeability to the magnetic constant.

Note: Relative permeability is a pure number that is the same in all unit systems; the value and dimension of absolute permeability depend upon the system of units employed.

(B) (general) In anisotropic media, permeability becomes a matrix. (Std100) 270-1966

(2) (electrical heating systems) Ratio of the magnetic flux density to the corresponding magnetizing force. (IA/PC) 844-1991

(3) The drainage characteristic of soil that denotes its capacity to conduct or discharge fluids under a given hydraulic gradient. (SUB/PE) 980-1994

(4) A macroscopic material property of a medium that relates the magnetic flux density, $\vec{B}$, to the magnetic field, $\vec{H}$, in the medium. For a monochromatic wave in a linear medium, that relationship is described by the (phasor) equation:

$$\vec{B} = \pi = \cdot \vec{H}$$

where

$\pi = =$ a tensor that is generally frequency dependent

For an isotropic medium, the tensor reduces to a complex scalar:

$$\mu = \mu' - j\mu''$$

where
μ' = the real part of the permeability
μ'' accounts for losses

(AP/PROP) 211-1997

permeability, complex *See:* complex permeability.

permeability, relative complex *See:* relative complex permeability.

permeameter An apparatus for determining corresponding values of magnetizing force and flux density in a test specimen. From such values of magnetizing force and flux density, normal induction curves or hysteresis loops can be plotted and magnetic permeability can be computed. *See also:* magnetometer. (EEC/PE) [119]

permeance The reciprocal of reluctance. (Std100) 270-1966w

permissible mine equipment Equipment that complies with the requirements of and is formally approved by the United States Bureau of Mines after having passed the inspections and the explosion and.or other tests specified by that Bureau. *Note:* All equipment so approved must carry the official approval plate required as identification for permissible equipment. (EEC/PE) [119]

permissible response rate (A) (steam generating unit) The maximum assigned rate of change in generation for load-control purposes based on estimated and known limitations in the turbine, boiler, combustion control, or auxiliary equipment. The permissible response rate for a hydro-generating unit is the maximum assigned rate of change in generation for load-control purposes based on estimated and known limitations of the water column, associated piping, turbine, or auxiliary equipment. *See also:* speed-governing system. **(B)** steam-generating unit. The maximum allowable rate of change of generation under load control, which is based on the limitations of the turbine, boiler, combustion control, and/or auxiliary equipment. **(C)** hydro-generating unit. The maximum allowable rate of change of generation under load-control, which is based on the limitations of the water column, piping, turbine, and/or auxiliary equipment. (PE/PSE) 94-1970, 94-1991

permission *See:* file permission.

permissions *See:* file access permissions.

permissive (1) (as applied to a relay system) A general term indicating that functional cooperation of two or more relays is required before control action can become effective. (SWG/PE/PSR) C37.90-1978s, C37.100-1992

(2) A term that describes the constraints placed on accesses of a data format; the read, write, and lock accesses can be performed divisibly (i.e., using multiple transations) using a multiphase fetch and/or update process. (C/MM) 1596.5-1993

(3) Pertaining to a scheme requiring permission to trip from a remote terminal, usually in the form of a pilot signal. (PE/PSR) C37.113-1999

permissive block A block in manual or controlled manual territory, governed by the principle that a train other than a passenger train may be permitted to follow a train other than a passenger train in the block. *See also:* block-signal system; controlled manual block signal system. (EEC/PE) [119]

permissive connection A connection in which non-voice information can be sent over the voice communications network. *See also:* programmable connection; RJ-45. (C) 610.7-1995

permissive control (electric power system) An automatic generation control methodology that reduces generating unit control error only when unit change will reduce area control error. (PE/PSE) 94-1991w

permissive control device (power system device function numbers) Generally a two-position device that in one position permits the closing of a circuit breaker, or the placing of an equipment into operation, and in the other position prevents the circuit breaker or the equipment from being operated. (SUB/PE) C37.2-1979s

permissive [security] attribute A security attribute that identifies an active entity or a resource as member of a group. An entity is granted access to all resources in the groups of which it is a member. Permissive attributes could be used alone or in combination with restrictive attributes. Commonly, when used in combination with restrictive attributes, they are secondary in the determination of access privilege. (C/LM) 802.10-1998, 802.10g-1995

permit *See:* clearance.

permittivity (ε) (1) (primary ferroelectric terms) (small-signal, ferroelectric material) The incremental change in electric displacement per unit electric field when the magnitude of the measuring field is very small compared to the coercive electric field. The small signal relative permittivity, κ, is equal to the ratio of the absolute permittivity ε to the permittivity of free space ε_0, that is $\kappa = \varepsilon/\varepsilon_0$. Macroscopically, ε is found by measuring the capacitance. The units of permittivity are coulombs/volt-meter or farads/meter. In a ferroelectric, the measuring field or voltage must be sufficiently small in order to prevent ferroelectric domain reorientation from contributing to the permittivity. *Note:* The value of the small-signal permittivity may depend on the remanent polarization, electric field, mechanical stress, sample history, or frequency of the measuring field. (Measurements are usually made at a frequency of 1 kHz or higher.) (UFFC) 180-1986w

(2) A macroscopic material property of the medium that relates the electric flux density, D, to the electric field, $\vec{E}$, in the medium. For a monochromatic wave in a linear medium, that relationship is described by the (phasor) equation:

$$\vec{D} = \varepsilon = \cdot \vec{E}$$

where $\varepsilon=$, the complex permittivity, is a tensor that is generally frequency dependent. For an isotropic medium, the tensor reduces to a complex scalar:

$$\varepsilon = \varepsilon' - j\varepsilon''$$

where
ε' = the real part of the permittivity
ε'' accounts for losses

(AP/PROP) 211-1997

permittivity, complex *See:* complex permittivity.

permittivity, free space *See:* free space permittivity.

permittivity in physical media The real part of the complex permittivity. *See also:* complex dielectric constant. (AP/ANT) 145-1983s

permittivity, relative complex *See:* relative complex permittivity.

permutation An ordered sequence of a given number of items chosen from a set. *Contrast:* combination. (C) 610.5-1990w

permutation index An automatic index in which each item appears repeatedly, each time with a different word of the item as the first word, followed by the subsequent words in the item, then by that part of the item that came before the word. *See also:* permutation on subject headings index; keyword and context index. (C) 610.2-1987

permutation on subject headings (POSH) *See:* permutation on subject headings index.

permutation on subject headings index A permutation index in which the item entries are subject headings. (C) 610.2-1987

perpendicular magnetic recording A type of magnetic recording in which magnetic polarities representing data are aligned perpendicularly to the plane of the recording surface. *Synonym:* vertical magnetic recording. *Contrast:* longitudinal magnetic recording. (C) 610.10-1994w

perpendicular magnetization Magnetization of the recording medium in a direction perpendicular to the line of travel and parallel to the smallest cross-sectional dimension of the medium. *Note:* In this type of magnetization, either single pole-piece or double pole-piece magnetic heads may be used. *See also:* phonograph pickup. (SP/MR) [32]

perpendicular polarization (1) (facsimile) A linear polarization for which the field vector is parallel to some reference plane. *Note:* These terms are applied mainly to uniform plane waves incident upon a plane of discontinuity (surface of the earth, surface of a dielectric or a conductor). Then the convention is to take as reference the plane of incidence, that is, the plane containing the direction of propagation and the normal to the surface of discontinuity. If these two directions coincide, the reference plane must be specified by some other convention. (COM/AP/ANT) 167-1966w, 145-1993

(2) The polarization of a wave for which the electric field is perpendicular to the plane of incidence. Sometimes called horizontal or transverse electric (TE) polarization. (EMC) 1128-1998

(3) The polarization of a wave for which the electric field vector is perpendicular to the plane of incidence. *Note:* Sometimes called horizontal or transverse electric (TE) polarization; in optics, such a wave is said to be "s" polarized. (AP/PROP) 211-1997

persistence (1) (oscilloscopes) The decaying luminosity of the luminescent screen (phosphor screen) after the stimulus has been reduced or removed. *See also:* phosphor decay. (IM) 311-1970w

(2) (A) (computer graphics) The length of time that a display image remains on a display surface without being refreshed. **(B) (computer graphics)** The tendency of a phosphor to continue to emit light when no longer energized by an electron beam. (C) 610.6-1991

(3) A mode for semaphores, shared memory, and message queues requiring that the object and its state (including data, if any) are preserved after the object is no longer referenced by any process. Persistence of an object does not imply that the state of the object is maintained across a system crash or a system reboot. (C/PA) 9945-1-1996

(4) A characteristic of semaphores, shared memory, and message queues requiring that the object and its state (including data, if any) are preserved after last close (the object is no longer referenced by any process). Persistence of an object does not necessarily imply that the state of the object is maintained across a system crash or a system reboot. (C) 1003.5-1999

persistence characteristic (1) (camera tubes) The temporal step response of a camera tube to illumination. (ED) 161-1971w

(2) (decay characteristic) (luminescent screen) A relation, usually shown by a graph, between luminance (or emitted radiant power) and time after excitation is removed. (ED) 161-1971w

persistent-cause forced outage (electric power system) A component outage whose cause is not immediately self-clearing but must be corrected by eliminating the hazard or by repairing or replacing the affected component before it can be returned to service. *Note:* An example of a persistent-cause forced outage is a lightning flashover that shatters an insulator thereby disabling the component until repair or replacement can be made. *See also:* outage. (PE/PSE) [54]

persistent-cause forced-outage duration (electric power system) The period from the initiation of a persistent-cause forced outage until the affected component is replaced or repaired and made available to perform its intended function. *See also:* outage. (PE/PSE) [54]

persistent current (superconducting material) A magnetically induced current that flows undiminished in a superconducting material or circuit. *See also:* superconductivity. (ED) [46]

persistent-image device An optoelectronic amplifier capable of retaining a radiation image for a length of time determined by the characteristics of the device. *See also:* optoelectronic device. (ED) [46]

persistent-image panel (optoelectronic device) A thin, usually flat, multicell persistent-image device. *See also:* optoelectronic device. (ED) [46]

persistent menu A menu that popped up and stayed visible for one round of use. Menus stay on the screen until the user chooses an item or dismisses the menu. (C) 1295-1993w

persistent URI A Uniform Resource Identifier (URI) is persistent if it is a reference that does not need to change at the link in a document, and can still reach the desired object even though that object may have changed locations. (C) 2001-1999

personal computer (1) (measurement of radio-noise emissions) A system, containing a host and a limited number of peripherals designed to be used in the home or in small offices, that enables individuals to perform a variety of computing or word-processing functions or both, and that typically is of a size permitting it and its peripherals to be located on a table surface. *Note:* Other definitions given in product standards or applicable regulations may take precedence. (EMC) C63.4-1991

(2) A single-user microcomputer designed for personally controllable applications. *See also:* workstation; laptop computer; desktop computer; home computer. (C) 610.2-1987, 610.10-1994w

personal computing (A) Computing performed using a personal computer. **(B)** Computing performed in an environment in which the user has complete control over the data and access to software with which the data may be manipulated. *Synonym:* personal processing. (C) 610.2-1987

personal ground (conductor stringing equipment) A portable device designed to connect (bond) a deenergized conductor or piece of equipment, or both, to an electrical ground. It is distinguished from a master ground in that it is utilized at the immediate site when work is to be performed on a conductor or piece of equipment that could accidentally become energized. *Synonyms:* ground stick; working ground; red head. (T&D/PE) 524a-1993r, 524-1992r, 1048-1990

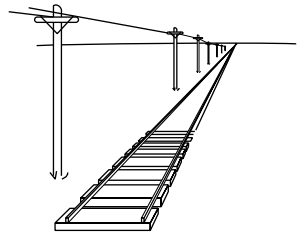
personal name attributes The Organizational-Unit-Name-1, Organizational-Unit-Name-2, Organizational-Unit-Name-3, and Organizational-Unit-Name-4 attributes specific to the class. (C/PA) 1224.1-1993w

personal processing *See:* personal computing.

personnel security Procedures to ensure that personnel with access to sensitive information and critical services have the appropriate authorizations and training. (C/BA) 896.3-1993w

person-to-person call (telephone switching systems) A call intended for a designated person. (COM) 312-1977w

perspective projection (computer graphics) The projection of a three-dimensional image onto a two-dimensional surface such that objects that are farther from the viewer in three dimensions are rendered smaller than closer ones. *Contrast:* parallel projection.



perspective projection

(C) 610.6-1991w

PERT *See:* program evaluation and review technique.

perturbation technique An approximate analytical method, the accuracy of which is based on the smallness of one or more characteristics of the medium or interface. (AP/PROP) 211-1997

perturbed electric or magnetic field (A) (electric and magnetic fields from ac power lines) (weakly perturbed field) The field at a point will be regarded as weakly perturbed if the magnitude does not change by more than 5% or the di-

rection does not vary by more than 5 degrees, or both, when an object is introduced into the vicinity. The electric field at the surface of the object is in general strongly perturbed [see definition (C) below] by the presence of the object. At power frequencies the magnetic field is not in general perturbed by the presence of objects which are free of magnetic materials. Exceptions to this are regions near the surface of nonmagnetic electric conductors which develop eddy currents because of the B-field time variation. **(B) (electric and magnetic fields from ac power lines)** (moderately perturbed field) The field at a point will be regarded as moderately perturbed if the magnitude varies between 5% and 30% or the direction varies between 5 degrees and 30 degrees, or both, when an object is introduced into the vicinity. **(C) (electric and magnetic fields from ac power lines)** (strongly perturbed field) The field at a point will be regarded as strongly perturbed if the magnitude varies in excess of 30% or the direction varies in excess of 30 degrees, or both, when an object is introduced into the vicinity. (T&D/PE) 644-1979

perturbed field (1) (measurement of power frequency electric and magnetic fields from ac power lines) A field that is changed in magnitude or direction, or both, by the introduction of an object. *Note:* The electric field at the surface of the object is, in general, strongly perturbed by the presence of the object. At power frequencies the magnetic field is not, in general, greatly perturbed by the presence of objects that are free of magnetic materials. Exceptions to this are regions near the surface of thick electric conductors where eddy currents alter time-varying magnetic fields. (T&D/PE) 644-1994

(2) (overhead power lines) A field that is changed in magnitude and/or direction by the introduction of an object or by an electric charge in the region. *Note:* The electric field close to the object is, in general, strongly perturbed by the presence of the object. At power frequencies the magnetic field is not, in general, greatly perturbed by the presence of objects that are free of magnetic materials. Exceptions to this are regions near the surface of thick electric conductors where eddy currents alter time-varying magnetic fields. (T&D/PE) 539-1990

per-unit quantity (rotating machinery) The ratio of the actual value of a quantity to the base value of the same quantity. The base value is always a magnitude, or in mathematical terms, a positive, real number. The actual value of the quantity in question (current, voltage, power, torque, frequency, etc.) can be of any kind: root-mean-square, instantaneous, phasor, complex, vector, envelope, etc. *Note:* The base values, though arbitrary, are usually related to characteristic values, for example, in case of a machine, the base power is usually chosen to be the rated power (active or apparent), the base voltage to be the rated root-mean-square voltage, the base frequency, the rated frequency. Despite the fact that the choice of base values is rather arbitrary, it is of advantage to choose base values in a consistent manner. The use of a consistent per-unit system becomes a practical necessity when a complicated system is analyzed. *See also:* asynchronous machine. (PE) [9]

per unit reactance On a rated current base, a dimensionless quantity obtained by referencing the magnitude of the reactance to the rated system line-to-neutral voltage divided by the rated current of the reactor. *Note:* Per unit reactance can also be defined on an arbitrary MVA base. (PE/TR) C57.16-1996

per-unit resistance The measured watts expressed in per-unit on the base of the rated kilovolt-amperes of the teaser winding. *See also:* efficiency. (EEC/PE) [119]

per-unit system (1) (rotating machinery) The system of base values chosen in a consistent manner to facilitate analysis of a device or system, when per-unit quantities are used. Its importance becomes paramount when analog facilities (network analyzer, analog and hybrid computers) are utilized. *Note:* In electric network analysis and electromechanical system studies, usually four independent fundamental base values are chosen. The rest of the base values are derived from the fundamental ones. In most cases power, voltage, frequency, and time are chosen as fundamental base values. The base power must be the same for all types: apparent, active, reactive, instantaneous. The base time is usually one second. From the above, all other base values can be found, for example, base power times base time equals base energy, etc. The per-unit system can cover extensive networks because the base voltages of network sections connected by transformers can differ, in which case an ideal per-unit transformer is usually introduced having a turns ratio equal to the quotient of the effective turns ratio of the actual transformer and the ratio of base voltage values. By keeping the power, frequency, and time bases the same, only those base quantities will differ for different network sections that are directly or indirectly related to voltage (for example, current, impedance, reactance, inductance, capacitance, etc.) but those related to power, frequency, and time only (for example, energy, torque, etc.) will remain unchanged. *See also:* asynchronous machine. (PE) [9]

(2) The reference unit, established as a calculating convenience, for expressing all power system electrical parameters on a common reference base. One per unit (pu) is 100% of the base chosen. The pu system in power system engineering is used to obtain a better comparison of the performance of the power system elements of different ratings, similar to the decibel system used for equating the losses and levels of different telecommunications systems. (PE/PSC) 367-1996

per-unit value (ac rotating machinery) (basic per-unit quantities for ac rotating machines) The actual value divided by the base quantity when both actual and base values are expressed in the same units. (EM/PE) 86-1987w

perveance The quotient of the space-charge-limited cathode current by the three-halves power of the anode voltage in a diode. *Note:* Perveance is the constant G appearing in the Child-Langmuir-Schottky equation

$$i_k = \mathrm{G}e_b^{3/2}$$

When the term perveance is applied to triode or multigrid tube, the anode voltage e_b is replaced by the composite controlling voltage e of the equivalent diode. (ED) [45]

Petri net (software) An abstract, formal model of information flow, showing static and dynamic properties of a system. A Petri net is usually represented as a graph having two types of nodes (called places and transitions) connected by arcs, and markings (called tokens) indicating dynamic properties. (C) 610.3-1989w, 610.12-1990

PFM telemetry *See:* pulse frequency modulation telemetry.

p gate thyristor (cathode date SCR) A thyristor in which the gate terminal is connected to the p region adjacent to the region to which the cathode terminal is connected and that is normally switched to the ON state by applying a positive signal between gate and cathode terminals. (IA/IPC) 428-1981w

pH (of a solution A) The pH is obtained from the measurements of the potentials E of a galvanic cell of the form H_2: solution A: saturated potassium chloride (KCl); reference electrode with the aid of the equation

$$\mathrm{pH} = \frac{E - E_0}{(\mathrm{R}T/\mathrm{F})\ln 10} = \frac{E - E_0}{2.303\mathrm{R}T/\mathrm{F}}$$

in which E_0 is a constant depending upon the nature of the reference electrode, R is the gas constant in joules per mole per degree, T is the absolute temperature in kelvins, and F is the Faraday constant in coulombs per gram equivalent. Historically, pH was defined by

$$\mathrm{pH} = \log \frac{1}{[H+]}$$

in which $[H+]$ is the hydrogen ion concentration. According to present knowledge there is no simple relation between hydrogen ion concentration or activity and pH. Values of pH

may be regarded as a convenient scale of acidities. *See also:* ion; ion activity. (EEC/PE) [119]

PH *See:* packet handler.

phandle A cell-sized datum identifying a particular package. (C/BA) 1275-1994

phanotron A hot-cathode gas diode. *Note:* This term is used primarily in the industrial field. (ED) [45]

phantom circuit (data transmission) A third circuit derived from two physical circuits by means of repeating coils installed at the terminals of the physical (side) circuits. A phantom circuit is a superimposed circuit derived from two suitably arranged pairs of wires, called side circuits, the two wires of each pair being effectively in parallel. (PE) 599-1985w

phantom-circuit loading coil A loading coil for introducing a desired amount of inductance in a phantom circuit and a minimum amount of inductance in the constituent side circuits. *See also:* loading. (EEC/PE) [119]

phantom-circuit repeating coil (phantom-circuit repeat coil) A repeating coil used at a terminal of a phantom circuit, in the terminal circuit extending from the midpoints of the associated side-circuit repeating coils. (EEC/PE) [119]

phantom group A group of four open wire conductors suitable for the derivation of a phantom circuit. (EEC/PE) [119]

phantom signaling A technique where a dc power source is superimposed on the transmit and receive signal pairs in a transparent or "phantom" fashion such that its application does not affect the data bearing signals on either pair. This dc power source is normally applied to request a concentrator to insert a lobe into the ring. (C/LM) 8802-5-1998

phantom target (A) (radar) An echo box, or other reflection device, that produces a particular blip on the radar indicator. **(B) (radar)** A condition, maladjustment, or phenomenon (such as a temperature inversion) that produces a blip on the radar indicator resembling blips of targets for which the system is being operated. *See also:* echo box; navigation. (AES/RS) 686-1982

phase (1) (of a periodic phenomenon $f(t)$, for a particular value of t) The fractional part t/P of the period P through which t has advanced relative to an arbitrary origin. *Note:* The origin is usually taken at the last previous passage through zero from the negative to the positive direction. (IM) [120]
(2) (A) A distinct part of a process in which related operations are performed, as in the shift phase of a shift-and-carry operation. **(B)** A relative measurement that describes the temporal relationship between two signals that have the same frequency. (C) 610.10-1994
(3) A major stage within the generating-plant life cycle. *See also:* plant life cycle. (PE/EDPG) 1150-1991w
(4) The time within a timing cycle when a primary input is in transition between logic states. (SCC20) 1445-1998

phase advancer A phase modifier that supplies leading reactive volt-amperes to the system to which it is connected. Phase advancers may be either synchronous or asynchronous. *See also:* converter. (EEC/PE) [119]

phase angle (1) (general) The measure of the progression of a periodic wave in time or space from a chosen instant or position. *Notes:* 1. The phase angle of a field quantity, or of voltage or current, at a given instant of time at any given plane in a waveguide is $(wt - \beta z + \theta)$, when the wave has a sinusoidal time variation. The term waveguide is used here in its most general sense and includes all transmission lines; for example, rectangular waveguide, coaxial line, strip line, etc. The symbol β is the imaginary part of the propagation constant for that waveguide, propagation is in the $+z$ direction, and θ is the phase angle when $z = t = 0$. At a reference time $t = 0$ and at the plane z, the phase angle $(-\beta z + \Theta)$ will be represented by Φ. 2. Phase angle is obtained by multiplying the phase by 360 degrees or by 2π radians. (IM) [38]
(2) (speed governing of hydraulic turbines) Referring to a simultaneous phasor diagram of the input and output, the angle by which the output signal lags or leads the input signal. (PE/EDPG) 125-1977s
(3) (electronics) The phase angle of a current transformer is the phase displacement between the primary and secondary currents. The phase angle is positive when the secondary current leads the primary current. (PEL/ET) 389-1990

phase angle correction factor (PACF) The ratio of the true power factor to the measured power factor. It is a function of both the phase angles of the instrument transformers and the power factor of the primary circuit being measured. *Note:* The phase angle correction factor corrects for the phase displacement of the secondary current or voltage, or both, due to the instrument transformer phase angle(s). For a current transformer, the phase angle correction factor:

$$\text{PACF} = \cos(\theta_2 + \beta)/\cos(\theta_2)$$

For a voltage transformer, the phase angle correction factor:

$$\text{PACF} = \cos(\theta_2 - \beta)/\cos(\theta_2)$$

When both voltage and current transformers are used, the combined phase angle correction:

$$\text{PACF} = \cos(\theta_2 + \beta - \gamma)/\cos(\theta_2)$$

θ_2 is the apparent power factor angle of the circuit being measured. (PE/TR) C57.13-1993

phase angle, dielectric *See:* dielectric phase angle.

phase angle, loop *See:* loop phase angle.

phase-angle measuring (power system device function numbers) A relay that functions at a predetermined phase angle between two voltages or between two currents or between voltage and current. (PE/SUB) C37.2-1979s

phase angle of an instrument transformer The phase displacement, in minutes or radians, between the primary and secondary values. The phase angle of a current transformer is designated by the Greek letter beta (β) and is positive when the current leaving the identified secondary terminal leads the current entering the identified primary terminal. The phase angle of a voltage transformer is designated by the Greek letter gamma (γ) and is positive when the secondary voltage from the identified to the unidentified terminal leads the corresponding primary voltage. (PE/TR) C57.13-1993, C57.12.80-1978r

phase back (electrical heating systems) The amount of retardation (expressed in percent or as an angle) during which the controlling element is prevented from conducting. (IA/PC) 844-1985s

phase-balance relay A relay that responds to differences between quantities of the same nature associated with different phases of a normally balanced polyphase circuit. (SWG/PE) C37.100-1992

phase belt (coil group) A group of adjacent coils in a distributed polyphase winding of an alternating-current machine that are ordinarily connected in series to form one section of a phase winding of the machine. Usually, there are as many such phase belts per phase as there are poles in the machine. *Note:* The adjacent coils of a phase belt do not necessarily occupy adjacent slots; the intervening slots may be occupied by coils of another winding on the same core. Such may be the case in a two-speed machine. *See also:* rotor; stator. (PE) [9]

phase center The location of a point associated with an antenna such that, if it is taken as the center of a sphere whose radius extends into the far-field, the phase of a given field component over the surface of the radiation sphere is essentially constant, at least over that portion of the surface where the radiation is significant. *Note:* Some antennas do not have a unique phase center. (AP/ANT) 145-1993

phase-change recording A method of recording information on optical storage in which the laser strikes the optical medium, causing it to crystallize in a controlled manner such that the change can be interpreted as a binary 0 or 1. (C) 610.10-1994w

phase characteristic (1) The variation with frequency of the phase angle of a phasor quantity. (Std100) 270-1966w

(2) (linear passive networks) The angle of a response function evaluated on the imaginary axis of the complex-frequency plane. (CAS) 156-1960w

phase characteristic, loop (automatic control) (closed loop) The phase angle of the loop transfer function for real frequencies. *See also:* feedback control system. (PE/EDPG) [3]

phase-coded transducer An interdigital transducer in which the electrodes do not strictly alternate in polarity, thus creating a coded time-phase relationship; the phase of the signal is determined by the polarity of the connections to the interdigital transducer bus bars. (UFFC) 1037-1992w

phase coherence *See:* coherent.

phase-coil insulation (rotating machinery) Additional insulation between adjacent coils that are in different phases. *See also:* asynchronous machine. (PE) [9]

phase-comparison monopulse A form of monopulse employing receiving beams with different phase centers as obtained, for example, from side-by-side antennas or separate portions of an array. *Note:* The information on target displacement from the antenna axis appears as a relative phase between signals received at the two phase centers. *See also:* amplitude-comparison monopulse; monopulse. (AES) 686-1997

phase-comparison protection A form of pilot protection that compares the relative phase-angle position of specified currents at the terminals of a circuit. (SWG/PE/PSR) C37.100-1992, C37.113-1999

phase conductor (alternating-current circuit) The conductors other than the neutral conductor. *Note:* If an alternating-current circuit does not have a neutral conductor, all the conductors are phase conductors. (Std100) 270-1966w

phase connections (rotating machinery) The insulated conductors (usually arranged in peripheral rings) that make the necessary connections between appropriate phase belts in an alternating-current winding. *See also:* stator; rotor. (PE) [9]

phase constant (β) (1) (A) (fiber optics) The imaginary part of the axial propagation constant for a particular mode, usually expressed in radians per unit length. *See also:* axial propagation constant. **(B)** The imaginary component of the propagation constant. This is the spatial rate of decrease of phase of a field component in the direction of propagation in radians per unit length. (Std100/MTT) 812-1984, 1004-1987

(2) (waveguide) Of a traveling wave, the space rate of change of phase of a field component (or of the voltage or current) in the direction of propagation, in radians per unit length. (MTT) 146-1980w

(3) The magnitude of the phase vector. *See also:* propagation vector. (AP/PROP) 211-1997

phase contours Loci of the return transfer function at constant values of the phase angle. *Note:* Such loci may be drawn on the Nyquist, inverse Nyquist, or Nichols diagrams for estimating performance of the closed loop with unity feedback. In the complex plane plot of $KG(j\omega)$, these loci are circles with centers at $-1/2, j/2N$ and radiuses such that each circle passes through the origin and the point $-1, j0$. In the inverse Nyquist diagram they are straight lines $\gamma = -N(x + 1)$ radiating from the point $-1,0$. *See also:* Nyquist diagram; Nichols chart; inverse Nyquist diagram. (IM) [120]

phase control (1) (rectifier circuits) The process of varying the point within the cycle at which forward conduction is permitted to begin through the rectifier circuit element. *Note:* The amount of phase control may be expressed in two ways: the reduction in direct-current voltage obtained by phase control or the angle of retard or advance. (IA) [62]

(2) (thyristor) The starting instant is synchronous with respect to the line voltage. The controller ON-state interval is equal to or less than half the line period. (IA/IPC) 428-1981w

phase control power (thyristor converter) The power used to synchronize the phase control of the thyristor converter to the ac supply input phases. (IA/IPC) 444-1973w

phase control range (thyristor) The range over which it is possible to adjust the angle of retard expressed in electrical degrees. (IA/IPC) 428-1981w

phase converter (rotating machinery) A converter that changes alternating-current power of one or more phases to alternating-current power of a different number of phases but of the same frequency. *See also:* converter. (PE) [9]

phase-corrected horn A horn designed to make the emergent electromagnetic wave front substantially plane at the mouth. *Note:* Usually this is achieved by means of a lens at the mouth. *See also:* waveguide; circular scanning. (AP/ANT) [35], [84]

phase correction (telegraph transmission) The process of keeping synchronous telegraph mechanisms in substantially correct phase relationship. *See also:* telegraphy. (EEC/PE) [119]

phase correction pattern A metallized area of varying width applied to the device substrate such that the resulting piezoelectric "shorting" effect adjusts the relative phase of the passing acoustic wavefront along its entire length. (UFFC) 1037-1992w

phase corrector A network that is designed to correct for phase distortion. *See also:* network analysis. (Std100) 270-1966w

phase-crossover frequency (hydraulic turbines) The frequency at which the phase angle reaches 180 degrees. (PE/EDPG) 125-1977s

phased-array antenna An array attenna whose beam directon or radiation pattern is controlled primarily by the relative phases of the excitation coefficients of the radiating elements. *See also:* antenna. (AP/ANT) 145-1983s

phase delay (1) (facsimile) (in the transfer of a single-frequency wave from one point to another in a system) The time delay of a part of the wave identifying its phase. *Note:* The phase delay is measured by the ratio of the total phase shift in cycles to the frequency in hertz. *See also:* facsimile transmission. (COM) 168-1956w

(2) (dispersive and nondispersive delay lines) The ratio of total radian phase shift, to the specified radian frequency, w. Phase delay is nominally constant over the frequency band of operation for nondispersive delay devices. *See also:* phase lag. (UFFC) [22]

(3) The ratio of total radian insertion phase shift ϕ to the specified radian frequency ω. Phase delay is nominally constant over the frequency band of operation for nondispersive delay devices (dispersive and nondispersive delay line). (UFFC) 1037-1992w

(4) (as applied to relaying) An equal delay of both the leading and trailing edges of a locally generated block. (SWG/PE) C37.100-1992

(5) The ratio of the total phase shift (radians) experienced by a sinusoidal signal in transmission through a system or transducer, to the frequency (radians/second) of the signal. *Note:* The unit of phase delay is the second. (SP) 151-1965w

phase delay distortion (system or transducer) The difference between the phase delay at one frequency and the phase delay at a reference frequency. (SP) 151-1965w

phase delay time In the transfer of a single-frequency wave from one point to another in a system, the time delay of a part of the wave identifying its phase. *Note:* The phase delay time is measured by the ratio of the total phase delay through the network, in cycles, to the frequency, in hertz. *See also:* measurement system. (IM) 285-1968w, [38]

phase deviation ($\phi(t)$) (1) (angle modulation) (phase modulation) The peak difference between the instantaneous angle of the modulated wave and the angle of the carrier. *Note:* In the case of a sinusoidal modulating function, the value of the phase deviation, expressed in radians, is equal to the modulation index. *See also:* angle or phase; phase modulation. (Std100) [123]

(2) (data transmission) The lack of direct proportionality of phase shift to frequency over the frequency range required

for transmission, or the effect of such departure on a transmitted signal. (PE) 599-1985w

(3) Instantaneous phase departure from a nominal phase. (SCC27) 1139-1999

phase difference (general) The difference in phase between two sinusoidal functions having the same periods. (Std100) 270-1966w

(2) (A) (automatic control) Between sinusoidal input and output of the same frequency, phase angle of the output minus phase angle of the input: it is called "phase lead" if the input angle is the smaller, "phase lag" if the larger. **(B) (automatic control)** Of two periodic phenomena (for example, in nonlinear systems) the difference between the phase angles of their two fundamental waveforms. *Note:* Regarded as part of the transfer function which relates output to input at a specified frequency, phase difference is simply the phase angle $\theta(j\omega)$ in $A(j\omega) \exp j\theta(j\omega)$. Measurement of phase difference in the complex case is sometimes made in terms of the angular interval between respective crossings of a mean reference line, but values so measured will generally differ from those made in terms of the fundamental waveforms. *See also:* phase shift. (PE/EDPG) [3]

phase distance relay A distance relay designed to detect phase-to-phase and three-phase faults. (PE/PSR) C37.113-1999

phase distortion (1) (data transmission) Either the lack of direct proportionality of phase shift to frequency over the frequency range required for transmission, or the effect of such departure on a transmitted signal. (PE) 599-1985w

(2) (facsimile) *See also:* delay distortion; phase-frequency distortion. (C) 610.7-1995

phased satellite (communication satellite) A satellite, the center of mass of which is maintained in a desired relation relative to other satellites, to a point on earth or to some other point of reference such as the sub-solar point. *Note:* If it is necessary to identify those satellites that are not phased satellites, the term "unphased satellites" may be used. (COM) [19]

phase-failure protection *See:* open-phase protection; phase-undervoltage protection.

phase-frequency distortion (facsimile) Distortion due to lack of direct proportionality of phase shift to frequency over the frequency range required for transmission. *Notes:* 1. Delay distortion is a special case. 2. This definition includes the case of a linear phase-frequency relation with the zero frequency intercept differing from an integral multiple of p. *See also:* phase delay distortion; phase distortion; facsimile transmission; distortion. (COM) 168-1956w

phase function matrix The matrix that results when the elements of the Mueller matrix are averaged over all scatterer orientations. The phase function matrix relates the average scattered Stokes vector to the incident Stokes vector. (AP/PROP) 211-1997

phase grouping The same phase of a number of circuit breaker' poles is grouped in an adjacent configuration along the line of the same row. (SWG/SUB/PE) C37.122-1983s, C37.100-1992

phase hit or change A sudden change in the received signal phase (or frequency) lasting longer than 4 ms. Since two common modulation techniques for high-speed data transmission are phase and frequency modulation, phase hits cause errors by looking like data. *See also:* gain hit or change; dropouts. (PE/IC) 1143-1994r

phase instability ($S_\Phi(f)$) One-sided spectral density of the phase deviation. (SCC27) 1139-1999

phase-insulated terminal box (rotating machinery) A terminal box so designed that the protection of phase conductors against electric failure within the terminal box is by insulation only. (PE) [9]

phase jitter An instability in the phase of a transmission signal. *See also:* amplitude jitter. (C) 610.7-1995

phase lag (phase delay) (2-port network) The phase angle of the input wave relative to the output wave ($\phi_{in} - \phi_{out}$), or the initial phase angle of the output wave relative to the final phase angle of the output wave ($\phi_i - \phi_f$). *Note:* Under matched conditions, phase lag is the negative of the angle of the transmission coefficient of the scattering matrix for a 2-port network. *See also:* phase difference. (IM) 285-1968w, [38]

phase localizer (navigation aid terms) A localizer in which the on-course line is defined by the phase reversal of energy radiated by the sideband antenna system, a reference carrier signal being radiated and used for the detection of phase. (AES/GCS) 172-1983w

phase lock The state of synchronization between two ac signals in which they remain at the same frequency and with constant phase difference. This term is typically applied to a circuit that synchronizes a variable oscillator with an independent signal. (PE/PSR) 1344-1995

phase-locked Pertaining to two signals whose phases relative to each other are kept constant by a controlling device. (C) 610.10-1994w

phase lock loop (communication satellite) A circuit for synchronizing a variable local oscillator with the phase of a transmitted signal. Widely used in space communication for coherent carrier tracking, and threshold extension, bit synchronization and symbol synchronization. (COM) [24]

phase locus (for a loop transfer function, say G(s) H(s) A plot in the *s* plane of those points for which the phase angle, ang *GH*, has some specified constant value. *Note:* The phase loci for 180 degrees plus or minus *n* 360 degrees are also root loci. *See also:* feedback control system. (PE/EDPG) [3]

phase margin (1) (loop transfer function for a stable feedback control system) (excitation systems) 180 degrees minus the absolute value of the loop phase angle at a frequency where the loop gain is unity. *Note:* Phase margin is a convenient way of expressing relative stability of a linear system under parameter changes, in Nyquist, Bode, or Nichols diagrams. In a conditionally stable feedback control system where the loop gain becomes unity at several frequencies, the term is understood to apply to the value of phase margin at the highest of these frequencies. *See also:* feedback control system. (PE/EDPG) 421A-1978s

(2) (speed governing of hydraulic turbines) 180 degrees minus the absolute value of the open-loop phase angle at a frequency where the open-loop gain is unity. (PE/EDPG) 125-1977s

(3) The absolute value of loop phase angle subtracted from 180 degrees found in a feedback system at the frequency for which its gain reaches unity. The margin from 180 degrees represents a measure of dynamic stability. (PEL) 1515-2000

phase meter (phase-angle meter) An instrument for measuring the difference in phase between two alternating quantities of the same frequency. *See also:* instrument. (EEC/PE) [119]

phase modifier (rotating machinery) An electric machine, the chief purpose of which is to supply leading or lagging reactive power to the system to which it is connected. Phase modifiers may be either synchronous or asynchronous. *See also:* converter. (IA/PE/MT) 45-1983s, [9]

phase-modulated transmitter A transmitter that transmits a phase-modulated wave. (AP/BT/ANT) 145-1983s, 182-1961w

phase modulation (1) (data transmission) Angle modulation in which the angle of a carrier is caused to depart from its reference value by an amount proportional to the instantaneous value of the modulating function. *Notes:* 1. A wave phase modulated by a given function can be regarded as a wave frequency modulated by the time derivative of that function. 2. Combinations of phase and frequency modulation are commonly referred to as frequency modulation. *See also:* reactance modulator; angle or phase; pulse duration; phase deviation. (IT/AP/PE/ANT) 145-1983s, 599-1985w, [123]

(2) (overhead-power-line corona and radio noise) Modulation in which the angle of a carrier is caused to depart from

its reference value by an amount proportional to the instantaneous value of the modulating signal.
(T&D/PE) 539-1990

(3) A modulation technique in which a data signal is sent onto a fixed carrier frequency by modifying the phase of the carrier. (C) 610.7-1995

phase-modulation recording A type of magnetic recording in which each storage cell is divided into two regions that are each magnetized in opposite senses; the sequence of these senses indicates whether the binary character represented is zero or one. *See also:* double-pulse recording.
(C) 610.10-1994w

phase-modulation telemetering (electric power system) A type of telemetering in which the phase difference between the transmitted voltage and a reference voltage varies as a function of the magnitude of the measured quantity. *See also:* telemetering. (PE/PSE) 94-1970w

phase modulator, optical *See:* optical phase modulator.

phase nonlinearity The deviation in phase from a perfectly phase-linear response as a function of frequency. The phase response of a perfectly phase-linear system is directly proportional to frequency. (IM/WM&A) 1057-1989w

phase of a circularly polarized field vector In the plane of polarization, the angle that the field vector makes, at a time taken as the origin, with a reference direction and with the angle counted as positive if it is in the same direction as the sense of polarization and negative if it is in the opposite direction to the sense of polarization. (AP/ANT) 145-1993

phase overcurrent The current flowing in a phase conductor which exceeds a predetermined value.
(SWG/PE) C37.100-1981s

phase path (radio-wave propagation) For a monochromatic electromagnetic wave, the product of the phase constant and the physical path length. *Note:* In a slowly varying spatially inhomogeneous medium, the phase path length equals the line integral of the real part of the phase vector along the ray path.
(AP/PROP) 211-1990s

phase path length For a monochromatic electromagnetic wave, the product of the phase constant and the physical path length. *Note:* In a slowly varying spatially inhomogeneous medium, the path length equals the line integral of the real part of the phase constant along the ray path. *See also:* electrical length.
(AP/PROP) 211-1997

phase pattern (of an antenna) The spatial distribution of the relative phase of a field vector excited by an antenna. *Notes:* 1. The phase may be referred to any arbitrary reference. 2. The distribution of phase over any path, surface, or radiation pattern cut is also called a phase pattern.
(AP/ANT) 145-1993

phase recovery time (microwave gas tubes) The time required for a fired tube to deionize to such a level that a specified phase shift is produced in the low-level radio-frequency signal transmitted through the tube. *See also:* gas tube.
(ED) 161-1971w

phase, relative *See:* relative phase.

phase relay A relay that by its design or application is intended to respond primarily to phase conditions of the power system.
(SWG/PE) C37.100-1992

phase resolution The minimum change of phase that can be distinguished by a system. *See also:* measurement system.
(IM) [38]

phase-reversal protection *See:* phase-sequence reversal protection.

phase-reversals relay *See:* negative-phase-sequence relay.

phase-segregated terminal box A terminal box so designed that the protection of phase conductors against electric failure within the terminal box is by insulation, and additionally by grounded metallic barriers forming completely isolated individual phase compartments so as to restrict any electric breakdown to a ground fault. (PE) [9]

phase-selector relay A programming relay whose function is to select the faulted phase or phases, thereby controlling the operation of other relays or control devices.
(SWG/PE) C37.100-1992

phase-separated terminal box *See:* phase-segregated terminal box.

phase separator (rotating machinery) Additional insulation between adjacent coils that are in different phases. *See also:* stator; rotor. (PE) [9]

phase sequence (1) (set of polyphase voltages or currents) The order in which the successive members of the set reach their positive maximum values. *Note:* The phase sequence may be designated in several ways. If the set of polyphase voltages or currents is a symmetrical set, one method is to designate the phase sequence by specifying the integer that denotes the number of times that the angular phase lag between successive members of the set contains the characteristic angular phase difference for the number of phases m. If the integer is zero, the set is of zero phase sequence; if the integer is one, the set is of first phase sequence; and so on. Since angles of lag greater than $2p$ produce the same phase position for alternating quantities as the same angle decreased by the largest integral multiple of 2p contained in the angle of lag, it may be shown that there are only m distinct symmetrical sets normally designated from 0 to $m - 1$ phase sequence. It can be shown that only for the first phase sequence do all the members of the set reach their positive maximum in the order of identification at uniform intervals of time.
(PE) [9], 270-1966w

(2) (power and distribution transformers) The order in which the voltages successively reach their positive maximum values. *See also:* direction of rotation of phasors.
(PE/TR) C57.12.80-1978r

phase-sequence indicator A device designed to indicate the sequence in which the fundamental components of a polyphase set of potential differences, or currents, successively reach some particular value, such as their maximum positive value. *See also:* instrument. (EEC/PE) [119]

phase-sequence relay A relay that responds to the order in which the phase voltages or currents successively reach their maximum positive values. (SWG/PE) C37.100-1992

phase-sequence reversal A reversal of the normal phase sequence of the power supply. For example, the interchange of two lines on a three-phase system will give a phase reversal.
(IA/ICTL/IAC) [60]

phase-sequence reversal protection A form of protection that prevents energization of the protected equipment on the reversal of the phase sequence in a polyphase circuit.
(SWG/PE) C37.100-1992

phase-sequence test (rotating machinery) A test to determine the phase sequence of the generated voltage of a three-phase generator when rotating in its normal direction. *See also:* asynchronous machine. (PE) [9]

phase-sequence voltage relay (power system device function numbers) A relay that functions upon a predetermined value of polyphase voltage in the desired phase sequence.
(PE/SUB) C37.2-1979s

phase shift (1) The absolute magnitude of the difference between two phase angles. *Notes:* 1. The phase shift between two planes of a 2-port network is the absolute magnitude of the difference between the phase angles at those planes. The total phase shift, or absolute phase shift, is expressed as the total number of cycles, including any fractional number, between the two planes, where one complete cycle is 2π radians or 360 degrees. Relative phase shift is the total or absolute phase shift less the largest integral number of 2π radians or 360 degrees. The unit of phase shift is, therefore, the radian or the electrical degree. The term 2-port network is used in its most general sense to include structures of passive or active elements. This includes the case of a given length of waveguide but may also refer to any two ports of a multiport device, where it is understood that a signal is incident only at

one port. 2. A phase shift can be either a phase lead (advance) or a phase lag (delay). *See also:* measurement system. (IM) 285-1968w, [38]

(2) (A) (transfer function) A change of phase angle with frequency, as between points on a loop phase characteristic. *See also:* feedback control system. **(B) (signal)** A change of phase angle with transmission. (IM) [120]

(3) The total number of degrees or radians that a continuous-wave signal experiences as it is transmitted through the delay device at a given frequency within the band of operation. The phase shift is nominally linearly proportional to frequency within the frequency band of operation for a nondispersive delay device (dispersive and nondispersive delay lines). (UFFC) 1037-1992w, [22]

(4) The displacement in time of one waveform relative to another of the same frequency and harmonic content. (SCC22) 1346-1998

(5) The displacement between corresponding points on similar wave shapes, and is expressed in degrees leading or lagging. (IA/AES/PSE) 1100-1999, [41]

phase-shift circuit Anetwork that provides a voltage component shifted in phase with respect to a reference voltage. *See also:* electronic controller. (IA/ICTL/IAC) [60]

phase shifter (data transmission) A device in which the output voltage (or current) may be adjusted, in use or in its design, to have some desired phase relation with the input voltage (or current). (PE) 599-1985w

phase shifter, waveguide *See:* waveguide phase shifter.

phase-shifting transformer (1) (metering) An assembly of one or more transformers intended to be connected across the phases of a polyphase circuit so as to provide voltages in the proper phase relations for energizing varmeters, varhour meters, or other measurement equipment. This type of transformer is sometimes referred to as a phasing transformer. (ELM) C12.1-1988

(2) A transformer that advances or retards the phase-angle relationship of one circuit with rspect to another. *Notes:* 1. The terms "advance" and "retard" describe the electrical angular position of the load voltage with respect to the source voltage. 2. If the load voltage reaches its positive maximum sooner than the source voltage, this is an "advance" position. 3. Conversely, if the load voltage reaches its positive maximum later than the source voltage, this is a "retard" position. *See also:* regulating winding; excitation-regulating winding; main unit; load-tap-changing transformer; excited winding; series winding; regulated circuit; excitation winding; voltage-regulating relay; series unit; phase-shifting transformer; regulating transformer; line-drop compensator; voltage winding for regulating equipment. (PE/TR) C57.12.80-1978r

phase-shift keying (PSK) (modulation systems) The form of phase modulation in which the modulating function shifts the instantaneous phase of the modulated wave among predetermined discrete values. (Std100) 270-1964w

phase-shift oscillator An oscillator produced by connecting any network having a phase shift of an odd multiple of 180 degrees (per stage) at the frequency of oscillation, between the output and the input of an amplifier. When the phase shift is obtained by resistance-capacitance elements, the circuit is an R-C phase-shift oscillator. *See also:* oscillatory circuit. (AP/ANT) 145-1983s

phase space (A) The state space augmented by the independent time variable. **(B)** One used synonymously with the state space, usually with the state variables being successive time derivatives of each other. *See also:* control system. (CS/IM) [120]

phase spacing (1) The distance between center-lines of adjacent devices of differing phases. (SWG/PE) C37.40-1993

(2) (of a fuse or switching device) The distance between center-lines of the current-carrying parts of the adjacent poles of the switching device. (SWG/PE) C37.100-1992

phase splitter (data transmission) (phase splitting circuit) A device which produces, from a single input wave, two or more output waves that differ in phase from one another. (PE) 599-1985w

phase-splitting circuit *See:* phase splitter.

phase swinging (rotating machinery) Periodic variations in the speed of a synchronous machine above or below the normal speed due to power pulsations in the prime mover or driven load, possibly recurring every revolution. (PE) [9]

phase-to-ground insulation configuration An insulation configuration between a terminal and the neutral or ground. (PE/C) 1313.1-1996

phase-to-ground per unit overvoltage (power and distribution transformers) The ratio of a phase-to-ground overvoltage to the phase-to-ground voltage corresponding to the maximum system voltage. (PE/TR) C57.12.80-1978r

phase-to-phase insulation configuration An insulation configuration between two-phase terminals. (PE/C) 1313.1-1996

phase-to-phase per unit overvoltage (power and distribution transformers) The ratio of a phase-to-phase overvoltage to the phase-to-phase voltage corresponding to the maximum system voltage. (PE/TR) C57.12.80-1978r

phase-to-phase voltage on an alternating-current electric system *See:* nominal system voltage; maximum system voltage; medium voltage; high voltage; low voltage; service voltage; utilization voltage.

phase transfer function The argument $\Phi(N)$ of the modulation transfer function is designated as the phase transfer function. (ED) 503-1978w

phase transition (primary ferroelectric terms) A change in the crystal structure, usually occurring at a well-defined temperature, which alters the orientation or magnitude, or both, of the electric polarization. (UFFC) 180-1986w

phase-tuned tube (microwave gas tubes) A fixed-tuned broadband transmit-receive tube, wherein the phase angle through and the reflection introduced by the tube are controlled within limits. *See also:* gas tube. (ED) 161-1971w

phase-undervoltage protection A form of protection that disconnects or inhibits connection of the protected equipment on deficient voltage in one or more phases of a polyphase circuit. (SWG/PE) C37.100-1992

phase-undervoltage relay A relay that operates when one or more phase voltages in a normally balanced polyphase circuit is less than a predetermined value. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

phase vector ($\vec{\beta}$) The real part of the propagation vector, $\vec{k}$. *Note:* The phase vector points in the direction of maximum rate of change of the phase. *See also:* propagation vector. (AP/PROP) 211-1997

phase vector in physical media The imaginary part of the propagation vector. (AP/ANT) 145-1983s

phase velocity (1) (fiber optics) For a particular mode, the ratio of the angular frequency to the phase constant. *See also:* coherence time; axial propagation constant; group velocity. (Std100) 812-1984w

(2) (of a traveling plane wave at a single frequency) The velocity of an equiphase surface along the wave normal. *See also:* radio-wave propagation; waveguide. (AP/ANT/PROP) [35], [36]

(3) (waveguide) Of a traveling wave at a given frequency, and for a given mode, the velocity of an equiphase surface in the direction of propagation. (MTT) 146-1980w

(4) The velocity at which the equiphase planes of a propagating wave travel. *Note:* The minimum phase velocity is in the direction of the wave normal. (AP/PROP) 211-1997

phase-versus-frequency response characteristic A graph or tabulation of the phase shifts occurring in an electric transducer at several frequencies within a band. *See also:* transducer. (AP/ANT) 145-1983s

phase voltage (machine or apparatus) (of a winding) The potential difference across one phase of the machine or apparatus. *See also:* asynchronous machine. (PE) [9], [84]

phase weighting Response weighting by change in period of finger arrangement inside the interdigital transducer. (UFFC) 1037-1992w

phasing The adjustment of picture position along the scanning line. *See also:* scanning. (COM) 168-1956w

phasing signal A signal used for adjustment of the picture position along the scanning line. *See also:* facsimile signal. (COM) 168-1956w

phasing time (facsimile) The time interval during which the start positions of the scanning and recording strokes are aligned so as to ensure against a split image at the recorder. (COM) 167-1966w

phasing voltage (of a network protector) The voltage across the open contacts of a selected phase. *Note:* This voltage is equal to the phasor difference between the transformer voltage and the corresponding network voltage. (SWG/PE/TR) C37.100-1992, C57.12.44-1994

phasor (1) (metering) A complex number, associated with sinusoidally varying electrical quantities, such that the absolute value (modulus) of the complex number corresponds to either the peak amplitude or rms value of the quantity, and the phase (argument) to the phase angle at zero time. By extension, the term "phasor" can also be applied to impedance and related complex quantities that are not time-dependent. (ELM) C12.1-1988

(2) A complex number expressing the magnitude and phase of a time-varying quantity. Unless otherwise specified, it is used only within the context of steady-state alternating linear systems. In polar coordinates, it can be written as $Ae^{j\phi}$, where A is the amplitude or magnitude (usually rms, but sometimes indicated as peak value) and ϕ is the phase angle. The phase angle ϕ should not be confused with the space angle of a vector. *See also:* electric field strength. (T&D/PE) 644-1994

(3) A complex equivalent of a simple sine wave quantity such that the complex modulus is the sine wave amplitude and the complex angle (in polar form) is the sine wave phase angle. *See also:* vector. (PE/PSR) 1344-1995

phasor diagram (synchronous machines) A diagram showing the relationships of as many of the following phasor quantities as are necessary: armature current, armature voltages, the direct and quadrature axes, armature flux linkages due to armature and field winding currents, magnetomotive forces due to armature and field-winding currents, and the various components of air-gap flux. (PE) [9]

phasor difference *See:* phasor sum.

phasor function A functional relationship that results in a phasor. (Std100) 270-1966w

phasor notation For monochromatic fields, the complex notation used in the expressions for field quantities with the exponential time factor $\exp\{j\omega t\}$. For example, for plane waves

$$\vec{\boldsymbol{\epsilon}}(\vec{r}, t) = \mathrm{Re}\{\vec{\mathbf{E}}(\vec{r}, \omega)\exp(j\omega t)\}$$

where
$\vec{\boldsymbol{\epsilon}}(\vec{r}, t)$ = the instantaneous electric field
Re indicates the real part
$\vec{\mathbf{E}}(\vec{r}, \omega)$ = the phasor notation for the electric field

(AP/PROP) 211-1997

phasor power (rotating machinery) The phasor representing the complex power. *See also:* asynchronous machine. (PE) [9]

(2) (A) (polyphase circuit) At the terminals of entry of a polyphase circuit into a delimited region, a phasor (or plane vector) that is equal to the (phasor) sum of the phasor powers for the individual terminals of entry when the voltages are all determined with respect to the same arbitrarily selected common reference point in the boundary surface (which may be the neutral terminal of entry). The reference direction for the currents and the reference polarity for the voltages must be the same as for instantaneous power, active power, and reactive power. The phasor power for each terminal of entry is determined by considering each conductor and the common reference point as a single-phase, two-wire circuit and finding the phasor power for each in accordance with the definition of (B) below. The phasor power $\mathbf{S}$ is given by $\mathbf{S} = \mathbf{P} + \mathbf{jQ}$ where $\mathbf{P}$ is the active power for the polyphase circuit and $\mathbf{Q}$ is the reactive power for the same terminals of entry. If the voltages and currents are sinusoidal and of the same period, the phasor power $\mathbf{S}$ for a three-phase circuit is given by

$$\mathbf{S} = \mathbf{E}_a\mathbf{I}_a^* + \mathbf{E}_b\mathbf{I}_b^* + \mathbf{E}_c\mathbf{I}_c^*$$

where $\mathbf{E}_a$, $\mathbf{E}_b$, and $\mathbf{E}_c$ are the phasor voltages from the phase conductors a, b, and c, respectively, to the neutral conductor at the terminals of entry; $\mathbf{I}_a$, $\mathbf{I}_b$, and $\mathbf{I}_c$ are the conjugate of the phasor currents in the phase conductor, so that there are only three terminals of entry; the point of entry of one of the phase conductors may be chosen as the common voltage point; and the phasor from that conductor to the common voltage point becomes zero. If the terminal of entry of phase conductor b is chosen as the common point, the phasor power of a three- phase, three-wire circuit becomes

$$\mathbf{S} = \mathbf{E}_{ab}\mathbf{I}_a^* + \mathbf{E}_{cb}\mathbf{I}_c^*$$

where $\mathbf{E}_{ab}$, $\mathbf{E}_{cb}$ are the phasor voltages from phase conductor a to b and from c to b, respectively. If both the voltages and currents in the preceding equations constitute symmetrical sets of the same phase sequence $\mathbf{S} = 3\mathbf{E}_a\mathbf{I}_a^*$. In general, the phasor power at the $(m + 1)$ terminals of entry of a polyphase circuit of m phases to a delimited region, when one of the terminals is the neutral terminal of entry, and is expressed by the equation

$$\mathbf{S} = \sum_{s=1}^{s=m}\sum_{r=1}^{r=\infty}\mathbf{E}_{sr}\mathbf{I}_{sr}^*$$

where $\mathbf{E}_{sr}$ is the phasor representing the rth harmonic of the voltage from phase conductor s to neutral at the terminals of entry. $\mathbf{I}_{sr}^*$ is the conjugate of the phasor representing the rth harmonic of the current through the sth terminal of entry. The phasor power can also be stated in terms of the symmetrical components of the voltages and currents as

$$\mathbf{S} = m\sum_{k=0}^{k=m-1}\sum_{r=1}^{r=\infty}\mathbf{E}_{kr}\mathbf{I}_{kr}^*$$

where $\mathbf{E}_{kr}$ is the phasor representing the symmetrical component of kth sequence of the rth harmonic of the line-to-neutral set of polyphase voltages at the terminals of entry. $\mathbf{I}_{kr}^*$ is the conjugate of the phasor representing the symmetrical component of the kth sequence of the rth harmonic of the polyphase set of currents through the terminals of entry. Phasor power is expressed in voltamperes when the voltages are in volts and the currents in amperes. *Note:* This term was once defined as "vector power." With the introduction of the term "phasor quantity," the name of this term has been altered to correspond. The definition has also been altered to agree with the change in the sign of reactive power. *See also:* reactive power. **(B) (single-phase two-wire circuit)** At the two terminals of entry of a single-phase two-wire circuit into a delimited region, a phasor (or plane vector) of which the real component is the active power and the imaginary component is the reactive power at the same two terminals of entry. When either component of phasor power is positive, the direction of that component is in the reference direction. The phasor power $\mathbf{S}$ is given by $\mathbf{S} = P + jQ$ where P and Q are the active and reactive power, respectively. If both the voltage and current are sinusoidal, the phasor power is equal to the product of the phasor voltage and the conjugate of the phasor current.

$\mathbf{E} = Ee^{j\alpha}$; $\mathbf{I} = \mathbf{I}e^{j\beta}$;

the phasor power is

$$S = P + jQ = \mathbf{EI}^* = EIe^{j(\alpha-\beta)}$$
$$= EI[\cos(\alpha - \beta) + j\sin(\alpha - \beta)]$$

If the voltage is an alternating voltage and the current is an alternating current, the phasor power for each harmonic component is defined in the same way as for the sinusoidal voltage

and sinsuoidal current. Mathematically, the phasor power of the rth harmonic component $\mathbf{S}_r$ is given by

$$\mathbf{S}_r = P_r + jQ_r = \mathbf{E}_r\mathbf{I}_r^* = E_rI_re^{j(\alpha r-\beta r)}$$
$$= E_rI_r[\cos(\alpha_r - \beta_r) + j\sin(\alpha_r - \beta_r)]$$

The phasor power at the two terminals of entry of a single-phase two-wire circuit into a delimited region, for an alternating voltage and current, is equal to the (phasor) sum of the values of the phasor power for every harmonic. Mathematically, this relation may be expressed

$$\mathbf{S} = \mathbf{S}_1 + \mathbf{S}_2 + \mathbf{S}_3 + \ \ldots\ = \Sigma\mathbf{S}_r$$
$$= \mathbf{E}_1\mathbf{I}_1^* + \mathbf{E}_2\mathbf{I}_2^* + \mathbf{E}_3\mathbf{I}_3^* \ \ldots\ = \Sigma\ \mathbf{E}_r\mathbf{I}_r^*$$
$$= (\mathbf{P}_1 + \mathbf{P}_2 + \mathbf{P}_3 + \ \ldots\ ) + j(Q_1 + Q_2 + Q_3 + \ \ldots\ )$$
$$= \Sigma\ (P_r + jQ_r)$$

The amplitude of the phasor power is equal to the square root of the sum of the squares of the active power and the reactive power. Mathematically, if S is the amplitude of the phasor power and θ is the angle between the phasor power and the real-power axis,

$$\mathbf{S} + Se^{j\theta}$$
$$S = (P^2 + Q^2)^{1/2}$$
$$= [(P_1 + P_2 + P_3 + \ \ldots\ )^2 + (Q_1 + Q_2 + Q_3 + \ \ldots\ )^2]^{1/2}$$
$$\theta = \tan^{-1}\frac{\mathrm{Q}}{\mathrm{P}} = \tan^{-1}\frac{\mathrm{Q}_1 + Q_2 + Q_3}{P_1 + P_2 + P_3 + \ \ldots}$$

If the voltage and current are quasi-periodic and the amplitude of the voltage and current components are slowly varying, the phasor power may still be taken as the phasor having P and Q as its components, the values of P and Q being determined for these conditions, as specified in "power, active (single-phase two-wire circuit) (average power) (power)" and "power, reactive (magner) (single-phase two-wire circuit)," respectively. For this condition the phasor power will be a function of time. If the voltage and current have the same waveform, the amplitude of the phasor power is equal to the apparent power, but they are not the same for all other cases. The phasor power is expressed in voltamperes when the voltage is in volts and the current in amperes. *Note:* This term was once defined as "vector power." With the introduction of the term "phasor quantity," the name of this term has been altered to agree with the change in the sign of reactive power. *See also:* alternating current; reactive power.

(Std100) 270-1966

phasor power factor (A) The power factor of the synchronous machine defined by the cosine of the phasor angle between the fundamental sinusoidal phase voltage and the fundamental sinusoidal phase current. *Note:* This is not the angle between the load converter commutating voltage and the machine current. **(B)** The ratio of the active power to the amplitude of the phasor power. The phasor power factor is expressed by the equation

$$F_{pp} = \frac{P}{S}$$

where F_{pp} is the phasor power factor, P is the active power, and S is the amplitude of phasor power. If the voltages and currents are sinusoidal and, for polyphase circuits, form symmetrical sets,

$$\mathrm{A} = |A|e^{j\theta A}$$
$$\mathrm{B} = |B|e^{j\theta B}$$

See also: power factor, displacement.

(Std100/IA/ID) 995-1987, 270-1966

phasor product (quotient) A phasor whose amplitude is the product (quotient) of the amplitudes of the two phasors and whose phase angle is the sum (difference) of the phase angles of the two phasors. If two phasors are

$$F_{pp} = \cos(\alpha - \beta)$$

the phasor product is

$$AB = |AB|e^{f(\theta A+\theta B)}$$

and the quotient is

$$\frac{A}{B} = \left|\frac{A}{B}\right| e^{j(\theta A-\theta B)}$$

(Std100) 270-1966w

phasor quantity (A) A complex equivalent of a simple sine-wave quantity such that the modulus of the former is the amplitude A of the latter, and the phase angle (in polar form) of the former is the phase angle of the latter. **(B)** Any quantity (such as impedance) that is expressed in complex form. *Note:* In definition "A," sinusoidal variation with t enters; in definition "B," no time variation (in constant-parameter circuits) enters. The term "phasor quantity" covers both cases.

(Std100) 270-1966

phasor quotient *See:* phasor product.

phasor reactive factor (A) The ratio of the reactive power to the amplitude of the phasor power. The phasor reactive factor is expressed by the equation

$$F_{qp} = \frac{Q}{S}$$

where F_{qp} is the phasor reactive factor, Q is the reactive power, and S is the amplitude of the phasor power. If the voltages and currents are sinusoidal and, for polyphase circuits, form symmetrical sets. **(B)** $F_{\mathrm{pp}} = \sin(\alpha - \beta)$.

(Std100) 270-1966

phasor sum (difference) A phasor of which the real component is the sum (difference) of the real components of two phasors and the imaginary component is the sum (difference) of the imaginary components of two phasors. If two phasors are

$$A = a_1 + ja_2$$
$$B = b_1 + jb_2$$

phasor sum (difference) is

$$A \pm B = (a_1 \pm b_1) + j(a_2 \pm b_2)$$

(Std100) 270-1966w

PH_CHARACTERISTICS Physical layer characteristics indication primitive. A set of attributes used to delineate the optional capabilities of a BCC or DCC Physical layer. This set of capabilities is required to be labeled on a BCC or DCC. In addition, there is required to be a mechanism for providing this information to the BCC's or DCC's MIB upper layers. The list of attributes includes the following capabilities: low-speed (2400 Bd or 9600 Bd) operation, high-speed (1 Mb/s) operation, +12 V used from MIB connector, BCC capability, capability for DCC interrupt function, and capability for DCC sync function. (EMB/MIB) 1073.3.1-1994

PHIGS *See:* Programmer's Hierarchical Interactive Graphics System.

Philips gauge A vacuum gauge in which the gas pressure is determined by measuring the current in a glow discharge. *See also:* instrument. (EEC/PE) [119]

phi polarization (Φ polarization) The state of the wave in which the E vector is tangential to the lines of latitude of a given spherical frame of reference. *Note:* The usual frame of reference has the polar axis vertical and the origin at or near the antenna. Under these conditions, a vertical dipole will radiate only theta (θ) polarization, and a horizontal loop will radiate only phi (Φ) polarization. *See also:* antenna.

(AP/ANT) 149-1979r, 145-1983s

phon The unit of loudness level as specified in the definition of loudness level. (SP) [32]

Phong shading (computer graphics) A technique for shading a three-dimensional solid object by interpolating the normal vectors at the vertices of each polygon face, resulting in realistic highlights. *See also:* Gouraud shading.

(C) 610.6-1991w

phonograph pickup (mechanical reproducer) A mechanoelectrical transducer that is actuated by modulations present in the groove of the recording medium and that transforms this mechanical input into an electric output. *Notes:* 1. Where no confusion is likely the term phonograph pickup may be shortened to pickup. 2. A phonograph pickup generally includes a pivoted mounting arm and the transducer itself (the pickup cartridge). (SP) [32]

phosphene (A) (electrotherapy) (electrical) A visual sensation experienced by a human subject during the passage of current through the eye. *See also:* electrotherapy. **(B) (overhead power lines)** Visual sensations due to nonoptical stimulation of the visual system. (EMB/T&D/PE) [47], 539-1990

phosphor (1) A substance capable of luminescence. *See also:* television; radio navigation; fluorescent lamp; cathode-ray tube. (EEC/PE) [119]
(2) (computer graphics) A chemical coating, used on the inside face of a display surface, that emits light when energized by an electron beam. (C) 610.6-1991w

phosphor decay A phosphorescence curve describing energy emitted versus time. *See also:* oscillograph. (IM/HFIM) [40]

phosphorescence (illuminating engineering) The emission of light as the result of the absorption of radiation, and continuing for a noticeable length of time after excitation. (EEC/IE) [126]

phosphor screen All the visible area of the phosphor on the cathode-ray tube faceplate. *See also:* oscillograph. (IM/HFIM) [40]

phot* (illuminating engineering) A unit of illuminance equal to one lumen per square centimeter. (EEC/IE) [126]
* Deprecated.

photocathode An electrode used for obtaining a photoelectric emission when irradiated. *See also:* electrode; phototube. (NPS) 398-1972r

photocathode blue response The photoemission current produced by a specified luminous flux from a tungsten filament lamp at 2854 K color temperature when the flux is filtered by a CS 5-58 blue filter of half stock thickness (1.75–2.25 mm). This parameter is useful in characterizing response to scintillation counting sources. (NPS) 398-1972r

photocathode luminous sensitivity *See:* cathode luminous sensitivity.

photocathode response (diode-type camera tube) The response of a photocathode is the current emitted into vacuum per incident radiant power of specified spectral distribution. It is expressed in amperes watt^{-1} (AW^{-1}). (ED) 503-1978w

photocathode, semitransparent *See:* semitransparent photocathode.

photocathode spectral quantum efficiency (diode-type camera tube) The ratio of the average number of electrons emitted to the number of photons in the input signal irradiance on the photocathode face as a function of the photon energy, frequency, or wavelength. (ED) 503-1978w

photocathode transit time That portion of the photomultiplier transit time corresponding to the time for photoelectrons to travel from the photocathode to the first dynode. (NPS) 398-1972r

photocathode transit-time difference The difference in transit time between electrons leaving the center of the photocathode and electrons leaving the photocathode at some specified point on a designated diameter. (NPS) 398-1972r

photocell (1) (photoelectric cell) A solid-state photosensitive electron device in which use is made of the variation of the current-voltage characteristic as a function of incident radiation. *See also:* phototube. (NPS) 398-1972r
(2) (photoelectric cell) A device exhibiting photovoltaic or photoconductive effects. *See also:* phototube. (ED) [45], [84]
(3) A semiconductor device, the electrical properties of which are affected by illumination. *Note:* One common type of photocell is the photoelectric cell which generates electricity when exposed to light, and is used to power many portable devices. (C) 610.10-1994w

photochemical radiation (illuminating engineering) Energy in the ultraviolet, visible and infrared regions to produce chemical changes in materials. *Note:* Examples of photochemical processes are accelerated fading tests, photography, photoreproduction and chemical manufacturing. In many such applications a specific spectral region is of importance. (EEC/IE) [126]

photocomposer *See:* phototypesetter.

photocomposition The formation of text and graphics into discrete camera-ready pages. *Synonym:* page makeup. *See also:* computer-aided page makeup. (C) 610.2-1987

photoconductive cell A photocell in which the photoconductive effect is utilized. *See also:* phototube. (ED) [45], [84]

photoconductive effect (photoconductivity) A photoelectric effect manifested as a change in the electric conductivity of a solid or a liquid and in which the charge carriers are not in thermal equilibrium with the lattice. *Note:* Many semiconducting metals and their compounds (notably selenium, selenides, and tellurides) show a marked increase in electric conductance when electromagnetic radiation is incident on them. *See also:* photoemissive effect; phototube; photoelectric effect; photovoltaic effect. 270-1966w

photoconductivity (fiber optics) The conductivity increase exhibited by some nonmetallic materials, resulting from the free carriers generated when photon energy is absorbed in electronic transitions. The rate at which free carriers are generated, the mobility of the carriers, and the length of time they persist in conducting states (their lifetime) are some of the factors that determine the amount of conductivity change. *See also:* photoelectric effect. (Std100) 812-1984w

photocurrent (fiber optics) The current that flows through a photosensitive device (such as a photodiode) as the result of exposure to radiant power. Internal gain, such as that in an avalanche photodiode, may enhance or increase the current flow but is a distinct mechanism. *See also:* dark current; photodiode. (Std100) 812-1984w

photodetector A device that senses incident illumination. (C) 610.10-1994w

photodiode (fiber optics) A diode designed to produce photocurrent by absorbing light. Photodiodes are used for the detection of optical power and for the conversion of optical power to electrical power. *See also:* avalanche photodiode; photocurrent. (Std100) 812-1984w

photoelectric beam-type smoke detector (fire protection devices) A device which consists of a light source which is projected across the area to be protected into a photosensing cell. smoke between the light source and the receiving photosensing cell reduces the light reaching the cell, causing actuation. (NFPA) [16]

photoelectric cathode *See:* photocathode.

photoelectric color-register controller A photoelectric control system used as a longitudinal position regulator for a moving material or web to maintain a preset register relationship between repetitive register marks in the first color and reference positions of the printing cylinders of successive colors. *See also:* photoelectric control. (IA/IAC) [60]

photoelectric control Control by means of which a change in incident light effects a control function. (IA/ICTL/IAC) [60]

photoelectric counter A photoelectrically actuated device used to record the number of times a given light path is intercepted by an object. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

photoelectric current The current due to a photoelectric effect. *See also:* photoelectric effect. (IA/IAC) [60], [84]

photoelectric cutoff register controller A photoelectric control system used as a longitudinal position regulator that maintains

the position of the point of cutoff with respect to a repetitively referenced pattern on a moving material. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

photoelectric directional counter A photoelectrically actuated device used to record the number of times a given light path is intercepted by an object moving in a given direction. *See also:* photoelectric control. (IA/CEM) [58]

photoelectric door opener A photoelectric control system used to effect the opening and closing of a power-operated door. *See also:* photoelectric control. (IA/CEM) [58]

photoelectric effect (A) (fiber optics) *External photoelectric effect.* The emission of electrons from the irradiated surface of a material. **(B) (fiber optics)** *Internal photoelectric effect.* Photoconductivity. (Std100) 812-1984

photoelectric emission (electron tube) The ejection of electrons from a solid or liquid by electromagnetic radiation. *See also:* field-enhanced photoelectric emission. (ED) 161-1971w

photoelectric flame detector (fire protection devices) A device whose sensing element is a photocell which either changes its electrical conductivity or produces an electrical potential when exposed to radiant energy. (NFPA) [16]

photoelectric lighting controller A photoelectric relay actuated by a change in illumination to control the illumination in a given area or at a given point. *See also:* photoelectric control. (IA/IAC) [60]

photoelectric loop control A photoelectric control system used as a position regulator for a strip processing line that matches the average linear speed in one section to the speed in an adjacent section to maintain the position of the loop located between the two sections. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

photoelectric pinhole detector A photoelectric control system that detects the presence of minute holes in an opaque material. *See also:* photoelectric control. (IA/CEM) [58]

photoelectric power system *See:* photovoltaic power system.

photoelectric pyrometer An instrument that measures the temperature of a hot object by means of the intensity of radiant energy exciting a phototube. (IA/ICTL/IAC) [60]

photoelectric relay A relay that functions at predetermined values of incident light. *See also:* photoelectric control. (IA/IAC) [60]

photoelectric scanner A single-unit combination of a light source and one or more phototubes with a suitable optical system. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

photoelectric side-register controller A photoelectric control system used as a lateral position regulator that maintains the edge of, or a line on, a moving material or web at a fixed position. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

photoelectric smoke detector A photoelectric relay and light source arranged to detect the presence of more than a predetermined amount of smoke in air. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

photoelectric smoke-density control A photoelectric control system used to measure, indicate, and control the density of smoke in a flue or stack. *See also:* photoelectric control. (IA/IAC) [60]

photoelectric spot-type smoke detector (fire protection devices) A device which contains a chamber with either overlapping or porous covers which prevent the entrance of outside sources of light but which allow the entry of smoke. The unit contains a light source and a special photosensitive cell in the darkened chamber. The cell is either placed in the darkened area of the chamber at an angle different from the light path or has the light blocked from it by a light stop or shield placed between the light source and the cell. With the admission of smoke particles, light strikes the particles and is scattered and reflected into the photosensitive cell. This causes the photosensing circuit to respond to the presence of smoke particles in the smoke chamber. (NFPA) [16]

photoelectric system (protective signaling) An assemblage of apparatus designed to project a beam of invisible light onto a photoelectric cell and to produce an alarm condition in the protection circuit when the beam is interrupted. *See also:* protective signaling. (EEC/PE) [119]

photoelectric tube An electron tube, the functioning of which is determined by the photoelectric effect. *See also:* phototube. (ED) [45]

photo-electron An electron liberated by the photoemissive effect. *See also:* photoelectric effect. (ED) [45]

photo-electron irradiation dark current increase (diode-type camera tube) That irreversible dark current increase which is caused by bombardment of the charge storage target by photo-electrons. (ED) 503-1978w

photo-electron irradiation deterioration (diode-type camera tube) That irreversible dark current increase which is associated with bombardment of the charge storage target by photo-electrons. (ED) 503-1978w

photoemissive effect *See:* photoelectric effect.

photoemission spectrum (scintillator material) The relative numbers of optical photons emitted per unit wavelength as a function of wavelength interval. The emission spectrum may also be given in alternative units such as wave number, photon energies, frequency, etc. *Note:* Optical photons are photons with energies corresponding to wavelengths between 2000 and 15 000 angstroms. (NPS) 175-1960w

photoflash lamp (illuminating engineering) A lamp in which combustible metal or other solid material is burned in an oxidizing atmosphere to produce light of high intensity and short duration for photographic purposes. (EEC/IE) [126]

photoformer A function generator that operates by means of a cathode-ray beam optically tracking the edge of a mask placed on a screen. *See also:* electronic analog computer. (C) 165-1977w

photographic emulsion The light-sensitive coating on photographic film consisting usually of a gelatin containing silver halide. (SP) [32]

photographic sound recorder (optical sound recorder) Equipment incorporating means for producing a modulated light beam and means for moving a light-sensitive medium relative to the beam for recording signals derived from sound signals. (SP) [32]

photographic sound reproducer (optical sound reproducer) A combination of light source, optical system, photoelectric cell, or other light-sensitive device such as a photoconductive cell, and a mechanism for moving a medium carrying an optical sound record (usually film), by means of which the recorded variations may be converted into electric signals of approximately like form. (SP) [32]

photographic transmission density (optical density) The common logarithm of opacity. Hence, film transmitting 100 percent of the light has a density of zero, transmitting 10 percent a density of 1, and so forth. Density may be diffuse, specular, or intermediate. Conditions must be specified. (SP) [32]

photo-ionization Ionization of atoms or molecules caused by infrared, visible, or ultraviolet photons. (AP/PROP) 211-1997

photometer (illuminating engineering) An instrument for measuring photometric quantities such as luminance, luminous intensity, luminous flux or illuminance. (EEC/IE) [126]

photometric brightness *See:* luminance.

photometry (illuminating engineering) The measurement of quantities associated with light. *Note:* Photometry may be visual in which the eye is used to make a comparison, or physical in which measurements are made by means of physical receptors. (EEC/IE) [126]

(2) (A) (television) (general) The measurement of quantities referring to radiation evaluated in accordance with the visual effect it produces, as based on certain conventions.

(B) (television) (visual) That branch of photometry in which the eye is used to make comparison. **(C) (television)** (physical) That branch of photometry in which the measurement is made by means of physical receptors. (BT/AV) 201-1979

photomultiplier *See:* multiplier phototube.

photomultiplier transit time (scintillation counting) The time difference between the incidence of a delta-function light pulse on the photocathode of the photomultiplier and the occurrence of the half-amplitude point on the output-pulse leading edge. (NPS) 398-1972r

photomultiplier tube *See:* multiplier phototube.

photomultiplier tube gain The ratio of the signal output current to the photoelectric signal current from the photocathode. (NI) N42.15-1990

photon (1) (A) (fiber optics) A quantum of electromagnetic energy. The energy of a photon is $h\nu$ where h is Planck's constant and ν is the optical frequency. *See also:* nonlinear scattering; Planck's constant. **(B)** Ionizing electromagnetic radiation, irrespective of origin. (Std100/NI) 812-1984, N42.17B-1989

(2) (range protection) A quantum of electromagnetic radiation irrespective of origin. (NI) N323-1978r

photon emission spectrum, scintillator material (scintillation counting) The relative numbers of optical photons emitted per unit wavelength as a function of wavelength interval. The emission spectrum may also be given in alternative units such as wavenumber, photon energies, frequency, and so on. (NPS) 398-1972r

photon emitting diode (light-emitting diodes) A semiconductor device containing a semiconductor junction in which radiant flux is nonthermally produced when a current flows as a result of an applied voltage. (ED) [127]

photon noise *See:* quantum noise.

photo-optic storage *See:* optical storage.

photopic spectral luminous efficiency function ($V\lambda$) (photometric standard observer for photopic vision) The photopic spectral luminous efficiency function gives the ratio of the radiant flux at wavelength λ_m to that at wavelength λ, when the two fluxes produce the same photopic luminous sensations under specified photometric conditions, λ_m being chosen so that the maximum value of this ratio is unity. Unless otherwise indicated, the values used for the spectral luminous efficiency function relate to photopic vision by the photometric standard observer having the characteristics laid down by the International Commission on Illumination (CIE). (ED) [127]

photopic vision (illuminating engineering) Vision mediated essentially or exclusively by the cones. It is generally associated with adaptation to a luminance of at least 3.4 cd/m^2 (2.2×10^{-3} cd/in^2) (1.0fL). (EEC/IE) [126]

photosensitive recording (facsimile) Recording by the exposure of a photosensitive surface to a signal-controlled light beam or spot. *See also:* recording. (COM) 168-1956w

photosensitive tube *See:* photoelectric tube.

photosensitizers (laser maser) Substances that increase the sensitivity of a material to irradiation by electromagnetic radiation. (LEO) 586-1980w

phototube (photoelectric tube) An electron tube that contains a photocathode and has an output depending at every instant on the total photoelectric emission from the irradiated area of the photocathode. *See also:* field-enhanced photoelectric emission. (NPS) 398-1972r

phototube gain (liquid-scintillation counting) The ratio of the signal output current to the photoelectric signal current from the photocathode. (NI) N42.15-1980s

phototube housing An enclosure containing a phototube and an optical system. *See also:* photoelectric control. (IA/ICTL/IAC) [60]

phototube, multiplier *See:* multiplier phototube.

phototypesetter A nonimpact printer that creates characters using photographic techniques. *Synonym:* photocomposer. (C) 610.10-1994w

phototypesetting The preparation of textual material for printing using an optical system with a light source, a type store, a lens system, and a light-sensitive recording medium. *See also:* computer-aided typesetting. (C) 610.2-1987

photovaristor A varistor in which the current-voltage relation may be modified by illumination, for example, cadmium sulphide or lead telluride. *See also:* semiconductor device. (Std100) 102-1957w

photovoltaic array (terrestrial photovoltaic power systems) The smallest installed assembly of photovoltaic (PV) panels, support structure, foundation, and other components as required, such as a tracker. *Synonym:* PV array. *See also:* array control. (PV) 928-1986r

photovoltaic array subfield (terrestrial photovoltaic power systems) One or more arrays associated by a distinguishing feature, such as field geometry or electrical interconnection. *Synonym:* PV array subfield. *See also:* array control. (PV) 928-1986r

photovoltaic cell (terrestrial photovoltaic power systems) The basic device that converts sunlight directly into dc electricity. *Synonym:* PV cell. *See also:* array control. (PV) 928-1986r

photovoltaic effect (fiber optics) The production of a voltage difference across a pn junction resulting from the absorption of photon energy. The voltage difference is caused by the internal drift of holes and electrons. *Synonym:* PV effect. *See also:* photon. (Std100) 812-1984w

photovoltaic module (terrestrial photovoltaic power systems) The smallest, complete, environmentally protected assembly of photovoltaic (PV) cells (flat plte-type), or receiver(s) and optics (concentrator-type), and related components, such as interconnects and mounting, that accepts unconcentrated sunlight. *Synonym:* PV module. *See also:* array control. (PV) 928-1986r

photovoltaic panel (terrestrial photovoltaic power systems) One or more photovoltaic (PV) modules assembled and wired and designed to provide a field-installable unit. *Synonym:* PV panel. *See also:* array control. (PV) 928-1986r

photovoltaic power system (terrestrial photovoltaic power systems) A system that converts sunlight directly into electric energy and processes it into a form suitable for use by the intended load. The system will include an array subsystem and may also include the following major subsystems: power conditioning, storage, thermal, and system monitor and control. A photovoltaic (PV) system-utility interface may also be included. *Synonym:* PV power system. *See also:* array control. (PV) 928-1986r

photovoltaic receiver (terrestrial photovoltaic power systems) An assembly of one or more photovoltaic (PV) cells that accepts concentrated sunlight and incorporates means for thermal and electric energy removal. *Synonym:* PV receiver. *See also:* array control. (PV) 928-1986r

photovoltaic system-utility interface (terrestrial photovoltaic power systems) The interconnection between the power conditioning subsystem, the on-site ac loads, and the utility. *Synonym:* PV system-utility interface. *See also:* array control. (PV) 928-1986r

PhPDU *See:* physical protocol data unit.

PHR *See:* physical record.

PhsDU *See:* physical interface data unit.

PhSDU *See:* physical protocol service unit; physical service data unit.

PhS_User *See:* physical service user.

PHY Abbreviation for physical. *See also:* physical layer. (LM/C) 802.5-1989s

PHY layer *See:* physical layer.

PHY packet (1) A packet either generated or received by the cable physical layer. These packets are always exactly 64 bits long where the last 32 bits are the bit complement of the first 32 bits. (C/MM) 1394-1995

(2) A 64-bit packet where the most significant 32 bits are the one's complement of the least significant 32 bits. (C/MM) 1394a-2000

physical (data management) Pertaining to the representation and storage of data on a data medium such as magnetic disk, or to characteristics of the data such as the length of data elements or records. *Contrast:* logical. (C) 610.5-1990w

physical address (1) A unique identifier that selects a particular device from the set of all devices connected to a particular bus. (C/BA) 1275-1994

(2) The address of a data item in physical memory. *See also:* virtual address. (C) 610.10-1994w

physical address space The set of possible physical addresses for a particular bus. (C/BA) 1275-1994

physical architecture An arrangement of physical elements that provides the design solution for a consumer product or life-cycle process intended to satisfy the requirements of the functional architecture and the requirements baseline. (C/SE) 1220-1994s

physical characteristics The physical *design* attributes or distinguishing features that pertain to a measurable description of a product or process. (C/SE) 1220-1994s

physical child segment In a hierarchical database, a child segment in a physical database. *See also:* logical child segment. (C) 610.5-1990w

physical circuit (data transmission) A two-wire metallic circuit that is not arranged for phantom use. (PE) 599-1985w

physical coding sublayer (PCS) A sublayer used in 100BASE-T and 1000BASE-X to couple the Media Independent Interface (MII) and the Physical Medium Attachment (PMA). The PCS contains the functions to encode data bits into code-groups that can be transmitted over the physical medium. Four PCS structures are defined—one for 100BASE-X, one for 100BASE-T4, one for 100BASE-T2, and one for 1000BASE-X. (C/LM) 802.3-1998

physical concept Anything that has existence or being in the ideas of man pertaining to the physical world. Examples are magnetic fields, electric currents, electrons. (Std100) 270-1966w

physical configuration audit (software) An audit conducted to verify that a configuration item, as built, conforms to the technical documentation that defines it. *See also:* functional configuration audit. (C) 610.12-1990

physical connection The full-duplex physical layer association between directly connected nodes. In the case of the cable physical layer, this is a pair of physical links running in opposite directions. (C/MM) 1394-1995

physical damage (rotating machinery) This contributes to electrical insulation failure by opening leakage paths through the insulation. Included here are: physical shock, vibration, overspeed, short-circuit forces, erosion by foreign matter, damage by foreign objects, and thermal cycling. (PE/EM) 432-1976s

physical database (A) (data management) A database as it is actually stored. **(B) (data management)** A database containing a collection of related segments or records that are physically stored together. *Note:* Segments within a physical database are known as physical segments. *Contrast:* logical database. (C) 610.5-1990

physical data model (data management) A data model that represents the implementation of the data contained in a data structure. *Contrast:* logical data model. (C) 610.5-1990w

physical defect *See:* fault.

physical element A product, subsystem, assembly, component, subcomponent, subassembly, or part of the physical architecture defined by its designs, interfaces (internal and external), and requirements (functional, performance, constraints, and physical characteristics). (C/SE) 1220-1994s

physical entity *See:* physical quantity.

physical format *See:* low-level format.

physical ID (1) The six least significant bits of the node ID. On a particular bus, each node's physical ID is unique. (C/MM) 1394a-2000

(2) The least-significant 6 bits of the node_ID. This number is unique on a particular bus and is chosen by the physical layer during initialization. (C/MM) 1394-1995

physical interface (1) The circuitry that interfaces the module, board(s), and node(s) to the bus signals. (C/MM) 1212-1991s

(2) The circuitry that interfaces a module's nodes to the input link, output link, and miscellaneous signals. (C/MM) 1596.3-1996, 1596-1992

physical interface data unit (PhsDU) An octet (8 data bits) that is communicated across the interface between a BCC or a DCC Physical layer and Data Link layer. (EMB/MIB) 1073.3.1-1994

physical layer (PHY) (1) (Layer 1) The layer of the ISO Reference Model that provides the mechanical, electrical, functional, and procedural characteristics access to the transmission medium. (DIS/C) 1278.2-1995

(2) In this part of ISO/IEC 8802, the subdivision that provides the protocol to allow transfer of *slot octets, management information octets,* and *DQDB Layer* timing information over the *transmission link* between *DQDB Layer subsystems* at adjacent *nodes*. The Physical Layer provides the service to the *DQDB Layer*. (LM/C) 8802-6-1994

(3) The first layer of the seven-layer OSI model; responsible for transporting bits between adjacent systems. *Note:* This layer accepts a bit stream, called a frame, from the data link layer and places it on the media. It also performs the inverse operation of extracting a bit stream from the physical media and passes it to the data link layer. This layer describes mechanical and electrical characteristics of the connection, as well as the required interchange circuits. *See also:* medium access control sublayer; session layer; logical link control sublayer; entity layer; client layer; application layer; presentation layer; data link layer; sublayer; transport layer; network layer. (C) 610.7-1995

(4) The layer, in a stack of three protocol layers defined for the Serial Bus, that translates the logical symbols used by the link layer into electrical signals on the different Serial Bus media. The physical layer guarantees that only one node at a time is sending data and defines the mechanical interfaces for the Serial Bus. There are different physical layers for the backplane and for the cable environment. See figure 34 for the relation of the physical layer to the Serial Bus protocol stack. (C/MM) 1394-1995

(5) The layer responsible for interfacing with the transmission medium. This includes conditioning signals received from the MAC for transmitting to the medium and processing signals received from the medium for sending to the MAC. (C/LM) 8802-5-1998

(6) The Serial Bus protocol layer that translates the logical symbols used by the link layer into electrical signals on Serial Bus media. The physical layer is self-initializing. Physical layer arbitration guarantees that only one node at a time is sending data. The mechanical interface is defined as part of the physical layer. There are different physical layers for the backplane and for the cable environment. (C/MM) 1394a-2000

physical layer convergence procedure (PLCP) The part of the *Physical Layer* that supports the transfer of *slot octets, management information octets,* and *DQDB Layer* timing information in a manner that adapts the capabilities of the *transmission system* to the service expected by the DQDB Layer. (LM/C) 8802-6-1994

physical layer entity (PHY) That portion of the physical layer between the medium dependent interface (MDI) and media independent interface (MII), or between the MDI and gigabit media independent interface (GMII), consisting of the physical coding sublayer (PCS), physical medium attachment (PMA), and, if present, physical medium dependent (PMD) sublayers. The PHY contains the functions that transmit, re-

ceive, and manage the encoded signals that are impressed on and recovered from the physical medium. (C/LM) 802.3-1998

physical layer protocol data unit (PhPDU) A frame, consisting of both nondata symbols (delimiters or start and stop bits) and data symbols (data bits), that is transmitted from a bedside communications controller (BCC) to a device communications controller (DCC) or from a DCC to a BCC. A PhPDU includes mechanisms indicating the start and end of transmission. PhPDUs may be preceded and followed by idle periods on the serial transmission medium. Conditions exist in which two consecutive PhPDUs may be transmitted contiguously by the same station. (EMB/MIB) 1073.4.1-2000

physical layer service access point (PhSAP) The interface between the Physical layer entity and the Physical layer user entity. It consists of the set of services performed by the Physical layer entity. (EMB/MIB) 1073.4.1-2000

physical layer service data unit (PhSDU) A set of octets, constituting a frame, that is transferred between the PhS_user layer entity and the Physical layer entity. A PhSDU transferred from the PhS_user layer entity is transmitted on the physical medium. Alternatively, a PhSDU is a frame of octets that is received from the physical medium and is transferred to the PhS_user layer entity. (EMB/MIB) 1073.4.1-2000

physical layer signaling sublayer The portion of the physical layer, contained within the DTE, that provides the logical and functional coupling between the MAU and the data link layer. (C) 610.7-1995

physical link In the cable physical layer, the simplex path from the transmit function of the port of one node to the receive function of a port of a directly connected node. (C/MM) 1394-1995

physically connected The state when an IEEE 1073 connector is connected at both ends of the cable. This is indicated to both the DCC and the BCC by voltage levels. (EMB/MIB) 1073.3.1-1994

physical media components (PMC) (1) The sublayer of the PHY responsible for interfacing with the transmission medium. The functions of the PMC include receive, transmit, clock recovery, and ring access control. (C/LM) 8802-5-1998

(2) The sublayer of the PHY responsible for interfacing with the transmission medium. The functions of the PMC include receive, transmit, clock recovery, and ring access control. The PMCs for different medium rates and types are different. (C/LM) 802.5t-2000

physical medium *See:* transmission medium.

physical medium attachment (PMA) (medium attachment units and repeater units) The portion of the medium attachment interface (MAU) that contains the functional circuitry. (LM/C) 802.3-1985s

physical medium attachment sublayer (1) The portion of the MAU that contains the functional circuitry. *Synonym:* PMA sublayer. (LM/C) 610.7-1995

(2) That portion of the physical layer that contains the functions for transmission, reception, and (depending on the PHY) collision detection, clock recovery, and skew alignment. (C/LM) 802.3-1998

physical medium dependent sublayer (1) In 100BASE-X, that portion of the physical layer responsible for interfacing to the transmission medium. The PMD is located just above the medium dependent interface (MDI). (C/LM) 802.3-1998

(2) (local area networks) The medium dependent portion of the physical layer. (C) 8802-12-1998

physical medium independent sublayer (local area networks) The medium independent portion of the Physical Layer. (C) 8802-12-1998

physical memory The main storage actually provided in a computer. *See also:* virtual storage. (C) 610.10-1994w

physical model A model whose physical characteristics resemble the physical characteristics of the system being modeled; for example, a plastic or wooden replica of an airplane. *Contrast:* symbolic model. *See also:* scale model; mock-up; iconic model. (C) 610.3-1989w

physical optics (fiber optics) The branch of optics that treats light propagation as a wave phenomenon rather than a ray phenomenon, as in geometric optics. (Std100) 812-1984w

physical optics approximation Estimates the field scattered by a body by considering only the interaction of the incident wave with the local geometry of the body at every point illuminated by the incident wave. The physical optics approximation is the Kirchhoff approximation in the illuminated part of the body and zero in its shadow. (AP/PROP) 211-1997

Physical Parameter An instance of a subclass of `IEEE1451_PhysicalParameter`. (IM/ST) 1451.1-1999

Physical Parameter Type The syntax and interpretation of the Physical Parameter's data and metadata. (IM/ST) 1451.1-1999

physical parent segment (data management) In a hierarchical database, a parent segment in a physical database. *See also:* logical parent segment. (C) 610.5-1990w

physical photometer (illuminating engineering) An instrument containing a physical receptor and associated filters, which is calibrated so as to read photometric quantities directly. *See also:* physical receptor. (EEC/IE) [126]

physical property Any one of the generally recognized characteristics of a physical system by which it can be described. (Std100) 270-1966w

physical protocol data unit (PhPDU) A frame, consisting of both nondata symbols (delimiters or start and stop bits) and data symbols (data bits), that is transmitted from a BCC to a DCC or from a DCC to a BCC. A PhPDU includes mechanisms indicating the start and end of transmission. PhPDUs may be preceded and followed by idle periods on the serial transmission medium. There are conditions in which two consecutive PhPDUs may be transmitted contiguously by the same station. (EMB/MIB) 1073.3.1-1994, 1073.4.1-1994s

physical protocol service unit (PhSDU) A symbol for a single data bit transmitted on the physical medium between a BCC and a DCC. (EMB/MIB) 1073.3.1-1994

physical quantity (concrete quantity) (physical entity) A particular example of a measurable physical property of a physical system. It is characterized by both a qualitative and a quantitative attribute (that is, kind and magnitude). It is independent of the system of units and equations by which it and its relation to other physical quantities are described quantitatively. (Std100) 270-1966w

physical receptor (illuminating engineering) A device which generates electric current or voltage or undergoes a change of resistance or generates a charge when radiation is incident on it. (EEC/IE) [126]

physical record (PHR) (A) (data management) A record whose characteristics depend on the manner or form in which it is stored, retained, or moved. *Note:* A physical record may consist of all or part of a logical record or several physical records. **(B) (data management)** That which is accessed by a single read or write operation. (C) 610.5-1990

physical requirement (software) A requirement that specifies a physical characteristic that a system or system component must possess; for example, material, shape, size, weight. *Contrast:* functional requirement; implementation requirement; design requirement; interface requirement; performance requirement. (C) 610.12-1990

physical security (1) Protection of system resources from physical access, tampering, and destruction, such as through the use of barriers, locks, seals, and intrusion detection systems. (C/BA) 896.3-1993w

(2) The application of methods for preventing malevolent acts against safeguards and security interests, detecting such acts as they occur, and responding to such acts. (PE/NP) 692-1997

physical segment (data management) In a hierarchical database, the smallest unit of accessible data. *See also:* physical

child segment; physical twin segment; physical parent segment. (C) 610.5-1990w

physical sequential access *See:* sequential access.

physical service (PhS) The service performed by the Physical layer entity for the Physical layer user entity. (EMB/MIB) 1073.4.1-2000

physical service data unit (PhSDU) A set of octets, comprising a frame, that is transferred between the Ph_user layer entity and the Physical layer entity. A PhSDU transferred from the Ph_user layer entity is transmitted on the physical medium. Alternatively, a PhSDU is a frame of octets that is received from the physical medium and is transferred to the Ph_user layer entity. (EMB/MIB) 1073.4.1-1994s

physical service user (PhS_User) Refers to the Data Link layer entity, which is the user of a bedside communications controller (BCC) or a device communications controller (DCC) Physical layer entity. (EMB/MIB) 1073.4.1-2000

physical signaling components (PSC) (1) The sublayer of the PHY responsible for processing the signal elements received from the ring by the PMC for sending symbols to the MAC and for conditioning the symbols received from the MAC for inclusion as signal elements in the repeated data stream to the PMC. (C/LM) 8802-5-1998

(2) The sublayer of the PHY responsible for changing the signal elements received from the ring by the PMC into indicators and sending these indicators to the MAC. It is also responsible for conditioning the indicators received from the MAC for inclusion as signal elements by the PMC in the repeated data stream. At a particular medium rate, the PSC may be the same for different medium types. (C/LM) 802.5t-2000

physical signaling sublayer (PLS) In 10BASE-T, that portion of the physical layer contained within the data terminal equipment (DTE) that provides the logical and functional coupling between the medium attachment unit (MAU) and the data link layer. (C/LM) 802.3-1998

physical stimuli (illuminating engineering) May be either distal or proximal. (EEC/IE) [126]

physical structure (data management) The representation and storage of a database on a data medium. *See also:* reorganization; conceptual schema. (C) 610.5-1990w

physical source statements (PSS) Source statements that measure the quantity of software in lines of code. (C/SE) 1045-1992

physical system A part of the real physical world that is directly or indirectly observed or employed by mankind. (C) 270-1966w, 610.10-1994w

physical twin segment (data management) In a hierarchical database, a twin segment in a physical database. *Contrast:* logical twin segment. (C) 610.5-1990w

physical unit *See:* unit.

physical verification The process of evaluating whether or not the requirements of the physical architecture are traceable to the verified functional architecture and satisfy the validated requirements baseline. (C/SE) 1220-1994s

physical volume *See:* volume.

PI *See:* processor interface.

P.I *See:* proportional plus integral control action.

pick device (1) A logical input device used to select a display element on a display surface. A typical physical device is a light pen. *See also:* sonic pen. (C) 610.6-1991w

(2) An input device that is used to specify or detect a particular display element or segment. *Contrast:* pointing device. *See also:* electronic pen; light pen. (C) 610.10-1994w

pickle (electroplating) A solution or process used to loosen or remove corrosion products such as oxides, scale, and tarnish from a metal. *See also:* electroplating. (IA) [59]

pickling (A) (electroplating) (chemical) The removal of oxides or other compounds from a metal surface by means of a solution that acts chemically upon the compounds.

(B) (electrolytic) Pickling during which a current is passed through the pickling solution to the metal (cathodic pickling) or from the metal (anodic pickling). *See also:* electroplating. (PE/EEC) [119]

pickoff (1) (test, measurement, and diagnostic equipment) A sensing device that responds to movement to create a signal or to effect some type of control. (MIL) [2]

(2) (accelerometer) (gyros) A device that produces an output signal as a function of the relative linear or angular displacement between two elements. (AES/GYAC) 528-1994

pickoff axis (inertial sensors) (dynamically tuned gyro) The axis of angular displacement between the rotor and the case that results in the maximum signal per unit of rotation from the pickoff. (AES/GYAC) 528-1994

pickoff offset (dynamically tuned gyro) The difference in angular rotor position between operation at pickoff electrical null and at gyro operating null. (AES/GYAC) 528-1994

pickup (1) (electronics) A device that converts a sound, scene, or other form of intelligence into corresponding electric signals (for example, a microphone, a television camera, or a phonograph pickup). *See also:* television; phonograph pickup; microphone. (MIL/BT/AV) [2], [34]

(2) (of a relay) The action of a relay as it makes designated response to progressive increase of input. As a qualifying term, the state of a relay when all response to progressive increase of input has been completed. Also used to identify the minimum value of an input quantity reached by progressive increases that will cause the relay to reach the pickup state from reset. *Note:* In describing the performance of relays having multiple inputs, pickup has been used to denote contact operation, in which case pickup value of any input is meaningful only when related to all other inputs. (SWG/PE) C37.100-1992

pickup and seal voltage (magnetically operated device) The minimum voltage at which the device moves from its deenergized into its fully energized position. (IA/ICTL) 74-1958w

pickup current *See:* pickup value.

pickup factor, direction-finder antenna system An index of merit expressed as the voltage across the receiver input impedance divided by the signal field strength to which the antenna system is exposed, the direction of arrival and polarization of the wave being such as to give maximum response. *See also:* navigation. (AES/GCS/RS) 173-1959w, 686-1982s, [42], 172-1983w

pickup spectral characteristic (color television) The set of spectral responses of the device, including the optical parts, that converts radiation to electric signals, as measured at the output terminals of the pickup tubes. *Note:* Because of nonlinearity, the spectral characteristics of some kinds of pickup tubes depend upon the magnitude of radiance used in the measurement. (BT/AV) 201-1979w

pickup tube *See:* camera tube.

pickup value The minimum input that will cause a device to complete contact operation or similar designated action. *Note:* In describing the performance of devices having multiple inputs, the pickup value of an input is meaningful only when related to all other inputs. (SWG/PE) C37.100-1981s

pickup voltage (magnetically operated device) (or current) The voltage (or current) at which the device starts to operate when its operating coil is energized under conditions of normal operating temperature. *See also:* contactor. (VT/IA/LT/IAC) 16-1955w, [60]

pico (mathematics of computing) A prefix indicating 10^{-12}. (C) 1084-1986w

PICS *See:* protocol implementation conformance statement.

PICT A standard electronic format for exchanging graphical information. (ATLAS) 1232-1995

pictorial format (pulse measurement) A graph, plot, or display in which a waveform is presented for observation or analysis. Any of the waveform formats defined in the follow-

ing subsections may be presented in the pictorial format. (IM/WM&A) 181-1977w

pictorial pattern recognition The recognition of patterns in visual or pictorial data. (C) 610.4-1990w

picture *See:* image.

picture data (data management) Data that are associated with a picture specification. *Synonym:* pictured data. *See also:* decimal picture data; binary picture data. (C) 610.5-1990w

pictured data *See:* picture data.

picture element (1) (pixel) The smallest area of a television picture capable of being delineated by an electric signal passed through the system or part thereof. *Note:* It has three important properties, namely: P_v, the vertical height of the picture element; P_h, the horizontal length of the picture element; and P_a, the aspect ratio of the picture element. In addition, N_p, the total number of picture elements in a complete picture, is of interest since this number provides a convenient way of comparing systems. For convenience, P_v and P_h are normalized for V, the vertical height of the picture; that is, P_v or P_h must be multiplied by V to obtain the actual dimension in a particular picture. P_v is defined as $P_v = 1/N$, where N is the number of active scanning lines in the raster. P_h is defined as $P_h = t_r A/t_e$, where t_r is the average value of the rise and delay times (10 percent to 90 percent) of the most rapid transition that can pass through the system or part thereof, t_e is the duration of the part of a scanning line that carries picture information, and A is the aspect ratio of the picture. (At present all broadcast television systems have a horizontal to vertical aspect ratio of 4/3.) P_a is defined as $P_a = P_h/P_v = t_r AN/te$ and N_p is defined as $N_p = (1/P_v) \times (A/P_h) = Nt_e/T_r$. *See also:* television. (BT) [33]

(2) (image processing and pattern recognition) (computer graphics) *See also:* pixel. (C) 610.4-1990w, 610.6-1991w

picture frequencies (facsimile) The frequencies which result solely from scanning subject copy. *Note:* This does not include frequencies that are part of a modulated carrier signal. *See also:* scanning. (COM) 168-1956w

picture inversion (facsimile) A process that causes reversal of the black and white shades of the recorded copy. *See also:* facsimile transmission. (COM) 168-1956w

picture processing *See:* image processing.

picture signal (television or facsimile) The signal resulting from the scanning process. *See also:* television. (BT/AV) [34]

picture specification A character-by-character description of the composition and characteristics of the representation of some data item; for example, the picture S99V999 (S = sign character; 9 = decimal digit character; V = radix point character) may be used to describe the following items, resulting in the picture data as indicated:

value	picture data
.06	+00.060
−10.342	−10.342
3	+03.000

(C) 610.5-1990w

picture transmission (telephotography) The electric transmission of a picture having a gradation of shade values. (EEC/PE) [119]

picture tube (kinescope) (television) A cathode-ray tube used to produce an image by variation of the beam current as the beam scans a raster. *See also:* television. (BT/AV) 201-1979w

P.I.D *See:* proportional plus integral plus derivative control action.

PIE *See:* Pause Interrupt Enabled (PIE) bit.

Pierce gun (microwave tubes) A gun that delivers an initially convergent electron beam. If a magnetic focusing scheme is used, the beam is made to enter the field at the minimum beam diameter or else, if the magnetic field threads through the cathode, the magnetic field must have a shape that is consistent with the desired beam that imparts certain flow characteristics to the electron beam. In Brillouin flow, angular electron velocity about the axis is imparted to the beam on entry into the magnetic field and the resulting inwardly directed force balances both the space charge and centrifugal forces. In practice, values of field up to twice the theoretical equilibrium value may be found necessary. In confined flow there is no overall angular velocity of the beam about the beam axis. Individual electron trajectories are tight helices (of radius small compared to beam radius) whose axis is along a magnetic-field line. The required magnetic field is several times greater than the Brillouin value and the flux must intersect the cathode surface. (ED) [45]

Pierce oscillator An oscillator that includes a piezoelectric crystal connected between the input and the output of a three-terminal amplifying element, the feedback being determined by the internal capacitances of the amplifying elements. *Note:* This is basically a Colpitts oscillator. *See also:* oscillatory circuit; Colpitts oscillator. (AP/BT/ANT) 145-1983s, 182A-1964w

piezoelectric accelerometer A device that employs a piezoelectric material as the principal restraint and pickoff. It is generally used as a vibration or shock sensor. (AES/GYAC) 528-1994

piezoelectric crystal cut, type *See:* type of piezoelectric crystal cut.

piezoelectric-crystal element A piece of piezoelectric material cut and finished to a specified geometrical shape and orientation with respect to the crystallographic axes of the material. *See also:* crystal. (PE/EM) 43-1974s

piezoelectric-crystal plate A piece of piezoelectric material cut and finished to specified dimensions and orientation with respect to the crystallographic axes of the material, and having two major surfaces that are essentially parallel. *See also:* crystal. (PE/EM) 43-1974s

piezoelectric-crystal unit A complete assembly, comprising a piezoelectric-crystal element mounted, housed, and adjusted to the desired frequency, with means provided for connecting it in an electric circuit. Such a device is commonly employed for purposes of frequency control, frequency measurement, electric wave filtering, or interconversion of electric waves and elastic waves. *Note:* Sometimes a piezoelectric-crystal unit may be an assembly having in it more than one piezoelectric-crystal plate. Such an assembly is called a mutliple-crystal unit. *See also:* crystal. (PE/EM) 43-1974s

piezoelectric effect Some materials become electrically polarized when they are mechanically strained. The direction and magnitude of the polarization depend upon the nature and amount of the strain, and upon the direction of the strain. In such materials the converse effect is observed, namely, that a strain results from the application of an electric field. (Std100) 270-1966w

piezoelectric loudspeaker *See:* crystal loudspeaker.

piezoelectric microphone *See:* crystal microphone.

piezoelectric pickup *See:* crystal pickup.

piezoelectric transducer A transducer that depends for its operation on the interaction between electric charge and the deformation of certain materials having piezoelectric properties. *Note:* Some crystals and specially processed ceramics have piezoelectric properties. (SP) [32]

PIGA *See:* pendulous integrating gyro accelerometer.

piggyback board *See:* daughter board.

piggybacking A technique in which an acknowledgment of a previously received protocol data unit is carried within an outgoing protocol data unit. (C) 610.7-1995

pigtail (fiber optics) A short length of optical fiber, permanently fixed to a component, used to couple power between it and the transmission fiber. *See also:* launching fiber. (Std100) 812-1984w

pileup *See:* relay pileup.

pile-up (x-ray energy spectrometers) (of signal pulses) Two pulses (signals) are said to be piled-up when a second pulse

occurs before the transient response of the preceding pulse has decayed to a negligible value. (NPS/NID) 759-1984r

pile-up rejection (x-ray energy spectrometers) A technique used to identify and reject pulses (signals) that are piled up. (NPS/NID) 759-1984r

pillbox antenna A reflector antenna having a cylindrical reflector enclosed by two parallel conducting plates perpendicular to the cylinder, spaced less than one wavelength apart. *Contrast:* cheese antenna. (AP/ANT) 145-1993

PILOT *See:* Programmed Inquiry, Learning Or Teaching.

pilot (1) A signal transmitted either inbound or outbound through the system in order to provide a reference for automatic gain or automatic slope control (AGC or ASC circuits within the amplifier). (LM/C) 802.7-1989r

(2) A selected cell whose condition is assumed to indicate the condition of the entire battery. *See also:* battery. (EEC/PE) [119]

pilotage (navigation aid terms) The process of directing a vehicle by reference to recognizable landmarks or soundings, or to electronic or other aids to navigation. Observations may be by any means including optical, aural, mechanical, or electronic. (AES/GCS) 172-1983w

pilot cell (1) (storage battery) A selected cell whose condition is assumed to indicate the condition of the entire battery. *See also:* battery. (EEC/PE) [119]

(2) One or more cells chosen for monitoring the operating parameters, e.g., cell voltage, specific gravity and temperature, of the entire battery. (SCC21) 937-2000

pilot channel A channel over which a pilot is transmitted. (EEC/PE) [119]

pilot circuit The portion of a control apparatus or system that carries the controlling signal from the master switch to the controller. *See also:* control. (IA/ICTL/IAC) [60]

pilot communication scheme A protection scheme involving relays at two or more substations that share data or logic status via a communication channel to improve tripping speed and/or coordination. (PE/PSR) C37.113-1999

pilot director indicator A device that indicates to the pilot information as to whether or not the aircraft has departed from the target track during a bombing run. (EEC/PE) [119]

piloted ignition Initiation of combustion as a result of contact of a material or its vapors with an energy source such as a flame, spark, electrical arc, or glowing wire. (DEI) 1221-1993w

pilot exciter (1) (excitation systems for synchronous machines) The equipment providing the field current for the excitation of another exciter. (PE/EDPG) 421.1-1986r

(2) The source of all or part of the field current for the excitation of another exciter. (IA/MT) 45-1998

pilot fit (rotating machinery) (spigot fit) A clearance hole and mating projection used to guide parts during assembly. (PE) [9]

pilot house control (illuminating engineering) A mechanical means for controlling the elevation and train of a searchlight from a position on the other side of the bulkhead or deck on which it is mounted. (EEC/IE) [126]

pilot lamp A lamp that indicates the condition of an associated circuit. In telephone switching, a pilot lamp is a switchboard lamp that indicates a group of line lamps, one of which is or should be lit. (EEC/PE) [119]

pilot light A light, associated with a control, that by means of position or color indicates the functioning of the control. (EEC/PE) [119]

pilot line (conductor stringing equipment) A lightweight line, normally synthetic fiber rope, used to pull heavier pulling lines that, in turn, are used to pull the conductor. Pilot lines may be installed with the aid of finger lines or by helicopter when the insulators and travelers are hung. *Synonyms:* P-line; leader; lead line; P-line; pilot rope; leader; straw line. (T&D/PE) 524a-1993r, 524-1980s, 524-1992r

pilot line winder (1) (conductor stringing equipment) A device designed to payout and rewind pilot lines during stringing operations. It is normally equipped with its own engine which drives a drum or a supporting shaft for a reel mechanically, hydraulically or through a combination of both. These units are usually equipped with multiple drums or reels, depending upon the number of pilot lines required. The pilot line is payed out from the drum or reel, pulled through the travelers in the sag section, and attached to the pulling line on the reel stand or drum puller. It is then rewound to pull the pulling line through the travelers. (T&D/PE) 524-1980s

(2) (conductor stringing equipment) A device designed to payout and rewind pilot lines during stringing operations. It is normally equipped with its own engine, which drives a drum or a supporting shaft for a reel mechanically, hydraulically, or through a combination of both. These units are usually equipped with multiple drums or reels, depending upon the number of reels, pulled through the travelers in the sag section, and attached to the pulling line on the reel stand or drum puller. It is then rewound to pull the pulling line through the travelers. (T&D/PE) 524a-1993r

pilot protection A form of line protection that uses a communication channel as a means to compare electrical conditions at the terminals of a line. (SWG/PE) C37.100-1992

pilot rope *See:* pilot line.

pilot streamer (lightning) The initial low-current discharge that begins when the voltage gradient exceeds the breakdown voltage of air. *See also:* direct-stroke protection. (T&D/PE) [10]

pilot wire An auxiliary conductor used in connection with remote measuring devices or for operating apparatus at a distant point. *See also:* center of distribution. (T&D/PE) [10]

pilot-wire-controlled network A network whose switching devices are controlled by means of pilot wires. *See also:* alternating-current distribution. (T&D/PE) [10]

pilot wire protection Pilot protection in which a metallic circuit is used for the communicating means between relays at the circuit terminals. (SWG/PE) C37.100-1992

pilot-wire regulator An automatic device for controlling adjustable gains or losses associated with transmission circuits to compensate for transmission changes caused by temperature variations, the control usually depending upon the resistance of a conductor or pilot wire having substantially the same temperature conditions as the conductors of the circuits being regulated. *See also:* transmission regulator. (EEC/PE) [119]

pi mode (magnetrons) (π mode) The mode of operation for which the phases of the fields of successive anode openings facing the interaction space differ by p radians. *See also:* magnetron. (ED) 161-1971w

π-model A simplification of a general resistor/inductor/capacitor (RLC) network that represents the driving point admittance for an interconnect. (C/DA) 1481-1999

PIN *See:* plant information network.

pin (1) The point at which connection is made between the integrated circuit and the substrate on which it is mounted (e.g., the printed circuit board). For packaged components, this would be the package pin; for components mounted directly on the substrate, this would be the bonding pad. (TT/C) 1149.1-1990

(2) Any of the leads on a device that connect it to the system, each of which provides some function such as input, output, control, power, or ground. (C) 610.10-1994w

(3) A terminal point where an interconnect structure makes electrical contact with the fixed structures of a cell instance, or the conceptual point where a net connects to a lower level in the design hierarchy. (C/DA) 1481-1999

pinboard (1) A perforated board that accepts manually inserted pins to control the operation of equipment. (MIL/C) [2], [20], [85]

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

pinch (electron tube) The part of the envelope of an electron tube or valve carrying the electrodes and through which pass the connections to the electrodes. *See also:* electron tube. (ED) [45], [84]

pinch effect (1) (rheostriction) The phenomenon of transverse contraction and sometimes momentary rupture of a fluid conductor due to the mutual attraction of the different parts carrying currents. *See also:* induction heating; electrothermics. (Std100) 270-1966w

(2) (disk recording) A pinching of the reproducing stylus tip twice each cycle in the reproduction of lateral recordings due to a decrease of the groove angle cut by the recording stylus when it is moving across the record as it swings from a negative to a positive peak. (SP) [32]

(3) (induction heating) The result of an electromechanical force that constricts, and sometimes momentarily ruptures, a molten conductor carrying current at high density. *See also:* skin effect. (IA) 54-1955w

pin count The number of cell instance pins that an interconnect structure visits, including all input, output, and bidirectional pins. Pin count is the number of "places" the interconnect goes to on the chip. (C/DA) 1481-1999

pin-cushion distortion (1) A defect in a display surface that causes parallel lines to bow towards each other, causing a distorted image. *See also:* barrel distortion. (C) 610.6-1991w

(2) (camera tubes or image tubes) A distortion that results in a progressive increase in radial magnification in the reproduced image away from the axis of symmetry of the electron optical system. *Note:* For a camera tube, the reproducer is assumed to have no geometric distortion. *See also:* distortion, amplitude-frequency; hiss; distortion factor; percent harmonic distortion. (ED/BT) 161-1971w, 185-1975w

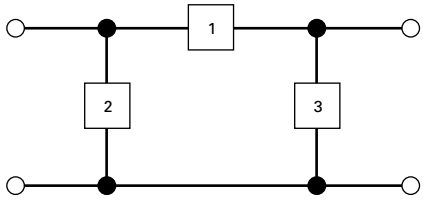
p-i-n detector (germanium gamma-ray detectors) (charged-particle detectors) (x-ray energy spectrometers) (semiconductor radiation detectors) A detector consisting of an intrinsic or nearly intrinsic region between a p- and n-region. (NPS/NID) 300-1988r, 301-1976s, 759-1984r, 325-1996

PIN diode (fiber optics) A diode with a large intrinsic region sandwiched between p- and n-doped semiconducting regions. Photons absorbed in this region create electron-hole pairs that are then separated by an electric field, thus generating an electric current in a load circuit. (Std100) 812-1984w

p-i-n diode attenuator (nonlinear, active, and nonreciprocal waveguide components) A device that provides a predetermined value of attenuation in a transmission line in response to a precise value of bias. (MTT) 457-1982w

p-i-n diode limiter (nonlinear, active, and nonreciprocal waveguide components) A passive microwave power limiter that utilizes the nonlinear conductivity of p-i-n diodes. (MTT) 457-1982w

pi network (π network) A network composed of three branches connected in series with each other to form a mesh, the three junction points forming an input terminal, an output terminal, and a common input and output terminal, respectively. *See also:* network analysis.



The junction point between branches 1 and 2 forms an input terminal, that between branches 1 and 3 forms an output terminal, and that between branches 2 and 3 forms a common input and output terminal.

pi (π) network

(Std100) 270-1966w

pin feed *See:* tractor feed.

ping Describes the transmission of a physical layer (PHY) packet to a particular node in order to time the response packet(s) provoked. (C/MM) 1394a-2000

ping-pong transmission technique *See:* time compression multiplexing.

pin insulator A complete insulator, consisting of one insulating member or an assembly of such members without tie wires, clamps, thimbles, or other accessories, the whole being of such construction that when mounted on an insulator pin it will afford insulation and mechanical support to a conductor that has been properly attached with suitable accessories. *See also:* insulator; tower. (T&D/PE) [10]

pin jack A single-conductor jack having an opening for the insertion of a plug of very small diameter. (PE/EM) 43-1974s

pink noise (speech quality measurements) A random noise whose spectrum level has a negative slope of 10 decibels per decade. 297-1969w

pin-on platform A platform attached by a pin to a boom to support a worker at an elevated worksite. A platform is a device used to support the worker in a standing position (generally without sides). (T&D/PE) 1307-1996

pins (electron tube or valve) Metal pins connected to the electrodes that plug into the holder. They ensure the electric connection between the electrodes and the external circuit and also mechanically fix the tube in its holder. *See also:* electron tube. (ED) [45], [84]

PIO *See:* programmed input-output.

pip A popular term for a sharp deflection in a visible trace. *See also:* radar. (EEC/PE) [119]

pipe (1) An object accessed by one of the pair of file descriptors created by the *pipe*() function. Once created, the file descriptors can be used to manipulate it, and it behaves identically to a FIFO special file when accessed in this way. It has no name in the file hierarchy. (C/PA) 9945-1-1996, 9945-2-1993

(2) The circuitry in a pipelined processor that implements the overlapping parallel functions. (C) 610.10-1994w

(3) An object accessed by one of the pair of file descriptors created by the `POSIX_IO.Create_Pipe` procedure. Once created, the file descriptors can be used to manipulate a pipe, and it behaves identically to a FIFO special file when accessed in this way. It has no name in the file hierarchy. (C) 1003.5-1999

pipe cable A pressure cable in which the container for the pressure medium is a loose-fitting rigid metal pipe. *See also:* oil-filled pipe cable; pressure cable. (T&D/PE) [10]

pipe guide A component of a switch-operating mechanism designed to maintain alignment of a vertical rod or shaft. (SWG/PE) C37.30-1992s

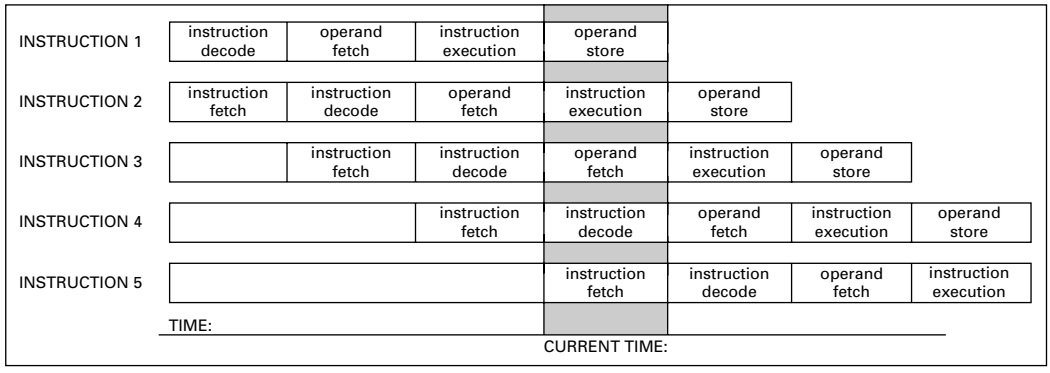
pipeline (1) (heating of pipelines and vessels) A length of pipe, including pumps, valves, flanges, control devices, strainers, or similar equipment for conveying fluids. (NESC/IA/PC) 844-1991, [86]

(2) (software) A software or hardware design technique in which the output of one process serves as input to a second, the output of the second process serves as input to a third, and so on, often with simultaneity within a single cycle time. (C) 610.12-1990

(3) In the shell command language, a sequence of one or more commands separated by the control operator "|". (C/PA) 9945-2-1993

pipelined transfer (FASTBUS acquisition and control) The portion of a FASTBUS operation in which a master either sends data to or causes data to be sent by an attached slave on every transition of data sync. The slave acknowledges receipt of or sends data with every transition of data acknowledge. The master does not wait for an acknowledge signal from the slave before causing another data sync transition. (NID) 960-1993

pipeline processing *See:* pipelining.



pipelining

pipeline processor A processor in which execution of instructions takes place as a series of units, arranged so that several units can be simultaneously processing appropriate parts of several instructions. (C) 610.10-1994w

pipelining The function of forwarding in sequence some or all of the Beginning of Message (BOM) and Continuation of Message (COM) *Derived MAC Protocol Data Units* (*DMPDU*s) before receipt of the End of Message (EOM) DMPDU. (LM/C) 8802-6-1994

(2) (A) Parallel processing in which instructions are executed in an assembly-line fashion: consecutive instructions are operated upon in sequence, but with several being initiated before the first is complete. *Synonym:* pipeline processing. **(B)** A technique for operation in which each instruction is broken into multiple steps, which are performed by different portions of the computer. A typical instruction stream allows a different instruction to be at each step in the pipeline at any point in time, allowing multiple instructions to overlap execution. See the corresponding figure. *Note:* In microprocessors, pipelining can make multiple cycle instructions appear to execute in a single clock cycle once the pipeline is full. (C) 610.10-1994

pipe-ventilated *See:* duct ventilated.

pip-matching display (navigation) (navigation aid terms) A display in which the received signal appears as a pair of blips, the comparison of the characteristics of which provides a measure of the desired quantity. (AES/GCS) 172-1983w

pi point (π point) A frequency at which the insertion phase shift of an electric structure is 180 degrees or an integral multiple thereof. (EEC/PE) [119]

Pirani gauge A bolometric vacuum gauge that depends for its operation on the thermal conduction of the gas present, pressure being measured as a function of the resistance of a heated filament ordinarily over a pressure range of 10^{-1} to 10^{-4} conventional millimeter of mercury. *See also:* instrument. (EEC/PE) [119]

piston (high-frequency communication practice) (plunger) A conducting plate movable along the inside of an enclosed transmission path and acting as a short-circuit for high-frequency currents. *See also:* waveguide. (PE/EEC) [119]

piston attenuator (waveguide) A variable cutoff attenuator in which one of the coupling devices is carried on a sliding member like a piston. *See also:* waveguide. (AP/ANT) [35], [84]

pistonphone A small chamber equipped witha reciprocating piston of measurable displacement that permits the establishment of a known sound pressure in the chamber. (SP) [32]

pit (rotating machinery) A depressed area in a foundation under a machine. (PE) [9]

pitch (1) (audio and electroacoustics) The attribute of auditory sensation in terms of which sounds may be ordered on a scale extending from low to high, such as a musical scale. *Notes:* 1. Pitch depends primarily upon the frequency of the sound stimulus, but it also depends upon the sound pressure and wave form of the stimulus. 2. The pitch of a sound may be described by the frequency of that simple tone, having a specified sound pressure or loudness level, that seems to the average normal ear to produce the same pitch. 3. The unit of pitch is the "mel." (SP/ACO) [32]

(2) (cable) *See also:* lay. 30-1937w

(3) The centerline to centerline spacing of modules or boards in a card cage or on a backplane. (C/BA) 14536-1995

(4) The center-to-center spacing between adjacent chassis module slots. (C/BA) 1101.3-1993

(5) The spacing from the side A surface of the guide rib on a module to the side A surface of the guide rib on an adjacent module. (C/BA) 1101.4-1993

(6) The nominal spacing from the centerline of a module to the centerline of an adjacent module. (C/BA) 1101.7-1995

pitch angle *See:* pitch attitude.

pitch attitude (navigation aid terms) The angle between the longitudinal axis of the vehicle and the horizontal. *Synonym:* pitch angle. (AES/GCS) 172-1983w

pitch factor (rotating machinery) The ratio of the resultant voltage induced in a coil to the arithmetic sum of the magnitudes of the voltages induced in the two coil sides. *See also:* armature. (PE) [9]

pits Depressions produced in metal surfaces by nonuniform electrodeposition or from electrodissolution; for example, corrosion. (EEC/PE) [119]

pitting Localized corrosion taking the form of cavities at the surface. (IA) [59]

pitting factor The depth of the deepest pit resulting from corrosion divided by the average penetration as calculated from weight loss. (IA) [59]

PIV *See:* peak inverse voltage; peak reverse voltage.

pivot-friction error Error caused by friction between the pivots and the jewels: it is greatest when the instrument is mounted with the pivot axis horizontal. *Note:* This error is included with other errors into a combined error defined in repeatability. *See also:* moving element. (EEC/AII) [102]

pivot year A year used to specify the beginning of a 100-year window and to interpret 2-digit year dates within that window. *Note:* In a window that spans the Year 2000 boundary, any two-digit year value greater than or equal to the last 2 digits of the pivot year is interpreted as having a prefix of "19," while any two-digit year value less than the last two digits of the pivot year is interpreted as having a prefix of "20." Thus, for example, in a system supporting a 1950 to 2049 window, a pivot year of 1950 causes two-digit year values between 50 and 99 to be interpreted as 1950 to 1999, and two-digit year values between 00 and 49 to be interpreted as 2000 to 2049. (C/PA) 2000.1-1999

pixel (1) (image processing and pattern recognition) In image processing, the smallest element of a digital image that can be assigned a gray level. *Note:* This term originated as a con-

traction for "picture element." *Synonyms:* pel; picture element; resolution cell. *See also:* edge pixel; line pixel. (C) 610.4-1990w

(2) (computer graphics) The smallest element of a display surface that can be assigned independent characteristics. *Note:* This term is derived from the term "picture element." *Synonyms:* pel; picture element. *See also:* voxel. (C) 610.6-1991w

(3) An abbreviation for picture element—the smallest unit of display on a video screen. (C) 1295-1993w

(4) The smallest element of a display surface whose characteristics are independent assigned. *Note:* This term is derived from the term "picture element." *Synonym:* pel; picture element. (C) 610.10-1994w

PL/1 *See:* Programming Language/1.

PL/I Deprecated for PL/1. (C) 610.13-1993w

PLA *See:* programmable logic array.

place (1) (elecronic digital computers) In positional notation, a position corresponding to a given power of the base, a given cumulated product, or a digit cycle of a given length. It can usually be specified as the nth character from one end of the numerical expression. (C) 162-1963w

(2) *See also:* digit place. (C) 1084-1986w

placeholder *See:* dummy.

place value In a positional notation system, the power of the radix that corresponds to a given place. For example, in a decimal integer the place values from right to left are 1, 100, etc. (C) 1084-1986w

plain conductor A conductor consisting of one metal only. *See also:* conductor. (T&D/PE) [10]

plain flange (waveguide) (plane flange) (plain connector) A coupling flange with a flat face. *See also:* waveguide. (AP/ANT) [35]

planar array A two-dimensional array of elements whose corresponding points lie in a plane. (AP/ANT) 145-1993

planar dielectric waveguide A planar transmission line consisting of one or more dielectric layers or dielectric strips of finite width, or both, located above a single or between a pair of extended conducting ground planes. (MTT) 1004-1987w

planar network A network that can be drawn on a plane without crossing of branches. *See also:* network analysis. (Std100) 270-1966w

planar transmission line A transmission line composed of one or more parallel plates, slabs, or sheets of conducting or insulating materials, including free space, and in which one or more layers are composed of materials of differing electromagnetic properties, arranged in strips of finite cross section and aligned with the axis of propagation to form the guiding structures. The line may be enclosed laterally by conducting walls aligned parallel to the axis of propagation. (MTT) 1004-1987w

Planckian locus (television) The locus of chromaticities of Planckian (blackbody or full) radiators having various temperatures. *See also:* chromaticity diagram. (BT/AV) 201-1979w

Planck radiation law (illuminating engineering) An expression representing the spectral radiance of a blackbody as a function of the wavelength and temperature. This law commonly is expressed by the formula

$$L_\lambda = I_\lambda/A' = c_{1L}\lambda^{-5}[e^{(c2/\lambda T} - 1]^{-1}$$

in which L_λ is the spectral radiance, I_λ is the spectral radiant intensity, A' is the projected area (A cos θ) of the aperture of the blackbody, e is the base of natural logarithms (2.71828), T is the absolute temperature, and c_{1L} and $_2$ are constants designated as the first and second radiation constraints. *Notes:* 1. The designation c_{1L} is used to indicate that the equation in the form given here refers to the radiance L, or to the intensity I per unit projected area A', of the source. Numerical values are commonly given not for c_{1L} but for c_1, which applies to the total flux radiated from a blackbody aperture, that is, in a hemisphere (2π steradians), so that, with the Lambert cosine law taken into account, $c_1 = \pi c_{1L}$. The currently recommended value of c_1 is 3.7415×10^{-16} W · m^2 or 3.7415×10^{-12} W · cm^2. Then c_{1L} is 1.1910×10^{-16} W · m^2 · sr^{-1} or 1.1910×10^{-12} W · cm^2 · sr^{-1}. If, as is more convenient, wavelengths are expressed in micrometers and area in square centimeters, $c_{1L} = 1.1910 \times 101$W · μm^4 × cm^{-2} · sr − 1, L_λ being given in W · cm^{-2} · sr^{-1} · μ^{-1}. The presently recommended value of c^2 is 1.43879 cm kelvin. The Planck law in the following form gives the energy radiated from the blackbody in a given wavelength interval ($\lambda_1 - \lambda_2$):

$$(Q = \int_{\lambda_1}^{\lambda_2} Q_\lambda d\lambda) = Atc_1 \int_{\lambda_1}^{\lambda_2} \lambda^{-5} (e^{(c_2/\lambda T)-1} d\lambda$$

If A is the area of the radiation aperture or surface in square centimeters, t is the time in seconds, λ is the wavelength in micrometers, $c_1 = 3.7415 \times 10^4$ W · μm^4 · cm^{-2}, then Q is the total energy in watt seconds (joules) emitted from this area (that is, in the solid angle 2π) in time t, within the wavelength interval ($\lambda_1 - \lambda_2$). 2. It often is convenient, as is done here, to use different units of length in specifying wavelengths and areas, respectively. If both quantities are expressed in centimeters and the corresponding value for c_1(3.7415×10^{-5} erg · cm · sec^{-1}) is used, this equation gives the total emission of energy in ergs from area A (that is in the solid angle 2π), for time t, and for the interval $\lambda_1 - \lambda_2$ in centimeters. (EEC/IE) [126]

Planck's constant (fiber optics) The number h that relates the energy E of a photon with the frequency ν of the associated wave through the relation $E = h\nu/h = 6.626 \times 10^{-34}$ joule second. *See also:* photon. (Std100) 812-1984w

Planck's radiation law Defines the emission spectrum of a blackbody in terms of its physical temperature. (AP/PROP) 211-1997

plane angle (SI) (International System of Units (SI)) The SI unit for plane angle is the radian. Use of the degree and its decimal submultiples is permissible when the radian is not a convenient unit. Use of the minute and second is discouraged except for special fields such as cartography. *See also:* units and letter symbols. (QUL) 268-1982s

plane bend (waveguide components) (corner) A waveguide bend (corner) in which the longitudinal axis of the guide remains in a plane parallel to the plane of the magnetic field vectors throughout the bend (corner). (MTT) 147-1979w

plane-earth factor (radio-wave propagation) The ratio of the electric field strength that would result from propagation over an imperfectly conducting plane earth to that which would result from propagation over a perfectly conducting plane. (AP) 211-1977s

plane flange *See:* cover flange.

plane of contraflexure In an H-frame structure, locates the inflection points for each pole. An inflection point is a point in the pole that separates an outward pole curvature from an inward pole curvature. This is also a location of zero moment. (T&D/PE) 751-1990

plane of incidence The plane containing the normal to the surface of a boundary and the phase vector, $\vec{\beta}$, of the incident wave. (AP/PROP) 211-1997

plane of polarization (1) (data transmission) For a plane polarized wave, the plane containing the electric intensity and the direction of propagation. (PE) 599-1985w

(2) (radio-wave propagation) For a plane-polarized wave, the plane containing the electric and magnetic field vectors. (AP) 211-1977s

(3) A plane containing the polarization ellipse. *Notes:* 1. When the ellipse degenerates into a line segment, the plane of polarization is not uniquely defined. In general, any plane containing the segment is acceptable; however, for a plane wave in an isotropic medium, the plane of polarization is taken to be normal to the direction of propagation. 2. In optics, the expression *plane of polarization* is associated with a linearly polarized plane wave (sometimes called a *plane po-*

larized wave) and is defined as a plane containing the field vector of interest and the direction of propagation. This usage would contradict the above one and is deprecated. (AP/ANT) 145-1993

plane of propagation (radio-wave propagation) Of an electromagnetic wave, the plane containing the attenuation vector and the wave normal; in the common degenerate case where these vectors have the same direction, the plane containing the electric vector and the wave normal. (AP) 211-1977s

plane-parallel resonator (laser maser) A beam resonator comprising a pair of plane mirrors oriented perpendicular to the axis of the beam. (LEO) 586-1980w

plane-polarized wave (1) (radio-wave propagation) At a point in a homogeneous medium, an electromagnetic wave whose electric and magnetic field vectors at all times lie in a fixed plane. (AP) 211-1977s

(2) *See also:* plane of polarization. (AP/ANT) 145-1993

plane wave (1) (fiber optics) A wave whose surfaces of constant phase are infinite parallel planes normal to the direction of propagation. (Std100) 812-1984w

(2) A wave in which the only spatial dependence of the field vectors is through a common exponential factor whose exponent is a linear function of position. *Notes:* 1. In a linear, homogeneous, and isotropic space the electric field vector, magnetic field vector and the propagation vector are mutually perpendicular. The ratio of the magnitude of the electric field vector to the magnitude of the magnetic field vector is equal to the intrinsic impedance of the medium; for free space the intrinsic impedance is equal to 376.730Ω or approximately $120\pi\Omega$. 2. A plane wave can be resolved into two component waves corresponding to two orthogonal polarizations. The total power flux density of the plane wave at a given point in space is equal to the sum of the power flux densities in the orthogonal component waves. (AP/ANT) 145-1993

(3) A wave whose equiphase surfaces form a family of parallel planes. (AP/PROP) 211-1997

plane-wave equivalent power density A commonly used term associated with any electromagnetic wave, equal in magnitude to the power density of a plane wave having the same electric (E) or magnetic (H) field strength. (NIR) C95.1-1999

plane wave exponential factor (radio-wave propagation) The factor $\exp(-j\vec{k}\cdot\vec{r})$ in the phasor expression for plane wave fields, where $\vec{k}$ is the wave vector and $\vec{r}$ is the position vector. (AP/PROP) 211-1990s

plane wave propagation factor The factor $\exp(-j\vec{k}\cdot\vec{r})$ in the phasor expression for plane wave fields, where $\vec{k}$ is the propagation vector (a constant) and $\vec{r}$ is the position vector. (AP/PROP) 211-1997

plane wave, uniform *See:* uniform plane wave.

PLANIT *See:* Programming LANguage for Interactive Teaching.

planned derated hours (electric generating unit reliability, availability, and productivity) The available hours during which a basic or extended planned derating was in effect. (PE/PSE) 762-1987w

planned derating (electric generating unit reliability, availability, and productivity) That portion of the unit derating that is scheduled well in advance. *See also:* extended planned derating; basic planned derating. (PE/PSE) 762-1987w

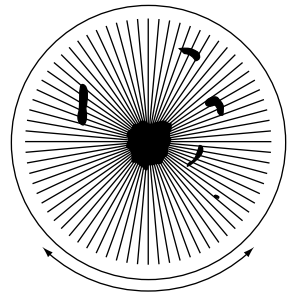
planned outage (electric generating unit reliability, availability, and productivity) The state in which a unit is unavailable due to inspection, testing, nuclear refueling, or overhaul. A planned outage is scheduled well in advance. (PE/PSE) 762-1987w

planned outage hours (electric generating unit reliability, availability, and productivity) The number of hours a unit was in the basic or extended planned outage state. (PE/PSE) 762-1987w

planned stop *See:* optional stop.

PLANNER A computer language and reasoning model used commonly in artificial intelligence for proving theorems and for manipulating models in a robot. (C) 610.13-1993w

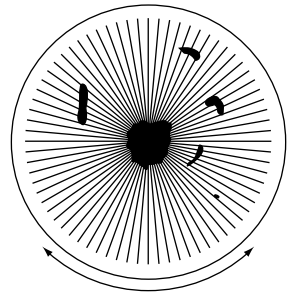
plan-position indication (PPI) (A) A type of radar display format. *See also:* display. **(B)** A display in which target blips are shown in plan position, thus forming a map-like display, with radial distance from the center representing range and with the angle of the radius vector representing azimuth angle.



PPI display

(AES/RS) 686-1990

Plan-position indicator (PPI) A display in which target echoes (blips) are shown in plan position, thus forming a map-like display, with radial distance from the center representing range and with the angle of the radius vector representing azimuth angle.



Plan-position indicator

(AES) 686-1997

plan-position indicator (PPI) (navigation aid terms) A type of radar display format. *See also:* display; display; display. (AES/GCS) 172-1983w, 686-1997

plan-position-indicator scope A cathode-ray oscilloscope arranged to present a plan-position-indicator display. (AES/RS) 686-1990

plan standard A standard that describes the characteristics of a scheme for accomplishing defined objectives or work within specified resources. (C) 610.12-1990

plant For a given system, that part which is to be controlled and whose parameters are unalterable. *See also:* process equipment. (CS/PE/EDPG) [3]

plant-capacity factor *See:* plant factor.

plant dynamics Equations which describe the behavior of the plant. *See also:* control system. (CS/IM) [120]

plant factor (plant-capacity factor) The ratio of the average load on the plant for the period of time considered to the aggregate rating of all the generating equipment installed in the plant. *See also:* generating station. (T&D/PE) [10]

plant information network (PIN) A representation of both the flow and the structure of the information that supports the discrete activities occurring during the life cycle of the plant. (PE/EDPG) 1150-1991w

plant life cycle The life of a power plant from conception to decommissioning. In this model, the cycle consists of five phases: site selection and plant concepts, design, construction, operation, and decommissioning. (PE/EDPG) 1150-1991w

plasma A macroscopically neutral assembly of charged and possibly also uncharged particles. *Note:* A plasma is said to be cold if the thermal effects of charged particles on dynamic

processes in the plasma can be neglected for the particular problem involved. A plasma is said to be hot (or warm) if the thermal effects are not negligible. (AP/PROP) 211-1997

plasma display device A display device employing a plasma panel to display data on the display screen. *Note:* An image can persist for relatively long periods of time on such a device. *Synonyms:* gas-discharge display device; gas plasma display device. (C) 610.10-1994w

plasma frequency (f_N) A natural frequency of oscillation of charged particles in a plasma given by:

$$(f_N)^2 = (2\pi)^{-2}\frac{Nq^2}{m\varepsilon_0}$$

where

q = the charge per particle
m = the particle mass
N = the particle number density
ε_0 = the permittivity of free space

Note: For electrons, with f_N in Hertz and N in electrons per cubic meter:

$$(f_N)^2 = 80.6N$$

(AP/PROP) 211-1997

plasma panel A grid of electrodes encased within two flat glass plates separated by an ionizing gas in which the energizing of selected electrodes causes the gas to be ionized and light to be emitted at that point. *Note:* Also called a matrix-addressed storage display device. *Synonym:* gas panel. *See also:* plasma display device. (C) 610.10-1994w

plasmapause The outer boundary of the plasmasphere, characterized by a steep decrease of the plasma density. (AP/PROP) 211-1997

plasma sheath A layer of charged particles, of substantially one sign, that accumulates around a body in a plasma. (AP/PROP) 211-1997

plasmasphere That ionized region of the topside ionosphere that encircles the Earth around the equator and follows the rotation of the Earth. *Note:* In the equatorial plane, the plasmasphere extends to a distance of 3–7 Earth radii, depending on local time and geomagnetic activity. (AP/PROP) 211-1997

plasma waves Electrostatic waves associated with a "warm" plasma, giving rise to density and velocity fluctuations. (AP/PROP) 211-1997

plastic (rotating machinery) A material that contains as an essential ingredient an organic substance of large molecular weight, is solid in its finished state, and, at some stage in its manufacture or in its processing into finished articles, can be shaped by flow. (PE) [9]

plastic-clad silica fiber (fiber optics) An optical waveguide having silica core and plastic cladding. (Std100) 812-1984w

plate (electron tube) A common name for an anode in an electron tube. *See also:* electrode. (ED) 161-1971w

plateau The portion of the counting-rate-versus-voltage characteristic in which the counting rate is substantially independent of the applied voltage. (NI/NPS) 309-1999

plateau length The range of applied voltage over which the plateau of a radiation-counter tube extends. (NI/NPS) 309-1999

plateau slope The slope of the plateau of a gas-filled counter tube expressed as the percentage change in counting rate per 100 V change in applied voltage. Alternatively, the slope can be expressed in percent counting rate per volt change in applied voltage. (NI/NPS) 309-1999

plateau slope, normalized *See:* normalized plateau slope.

plateau slope, relative *See:* relative plateau slope.

plate-circuit detector A detector functioning by virtue of a nonlinearity in its plate-circuit characteristic. (EEC/PE) [119]

plated-through hole (electronics) Deposition of metal on the side of a hole and on both sides of a base to provide electric connection, and an enlarged portion of conductor material surrounding the hole on both sides of the base. (EEC/AWM) [105]

plated wire storage A type of magnetic storage in which information is stored by magnetically recording it on a plated wire surface. (C) 610.10-1994w

plate (anode) efficiency The ratio of load circuit power (alternating current) to the plate power input (direct current). *See also:* network analysis. (AP/ANT) 145-1983s

plate keying Keying effected by interrupting the plate-supply circuit. *See also:* telegraphy. (AP/ANT) 145-1983s

plate (anode) load impedance The total impedance between anode and cathode exclusive of the electron stream. *See also:* network analysis. (AP/ANT) 145-1983s

plate (anode) modulation Modulation produced by introducing the modulating signal into the plate circuit of any tube in which the carrier is present. (AP/BT/ANT) 145-1983s, 182A-1964w

platen In impact printers, the surface against which a print element strikes in order to make character imprints. (C) 610.10-1994w

plate (anode) neutralization A method of neutralizing an amplifier in which a portion of the plate-to-cathode alternating voltage is shifted 180 degrees and applied to the grid-cathode circuit through a neutralizing capacitor. (AP/BT/ANT) 145-1983s, 182A-1964w

plate out (monitoring radioactivity in effluents) A thermal, electrical, chemical, or mechanical action that results in a loss of material by deposition on surfaces between sampling point and detector. (NI/PE/NP) N42.18-1980r, 380-1975w

plate (anode) power input The power delivered to the plate (anode) of an electron tube by the source of supply. *Note:* The direct-current power delivered to the plate of an electron tube is the product of the mean plate voltage and the mean plate current. (AP/ANT) 145-1983s

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

platform *See:* aerial platform.

platform, aerial *See:* aerial platform.

platform control power Energy source(s) available at platform potential for performing protection and control functions. (T&D/PE) 824-1994

platform erection (navigation aid terms) In the alignment of inertial systems, the process of bringing the vertical axis of a stable platform system into agreement with the local vertical. (AES/GCS) 172-1983w

platform fault-detection A means used to detect insulation failure on the platform that results in current flowing from normal current-carrying circuit elements to the platform. (T&D/PE) 824-1994

platform fault-detection device (series capacitor) A device to detect insulation failure on the platform that results in current flowing from normal current carrying circuit elements to the platform. (T&D/PE) 824-1985s

platform internal interface (PII) The interface between application platform service components within that platform. (C/PA) 14252-1996

platform, lineperson's *See:* lineperson's platform.

platform profile A profile whose focus is on functionality and interfaces for a particular type of platform, which may be a single processor shared by a group of applications or a large distributed system with each application dedicated to a single processor. (C/PA) 14252-1996

platform-to-ground signaling devices Devices to transmit protection, control, and alarm functions to and from the platform. (T&D/PE) 824-1994

plating rack (electroplating) Any frame used for suspending one or more electrodes and conducting current to them during electrodeposition. *See also:* electroplating. (EEC/PE) [119]

platter One disk within a stack of disks, such that the disks are attached to a common spindle. *See also:* disk. (C) 610.10-1994w

playback (1) A term used to denote reproduction of a recording. (EEC/PE) [119]

(2) *See also:* reversible execution. (C) 610.12-1990

(3) To output data or text for review purposes. *Synonyms:* playout; printout. (C) 610.10-1994w

playback head *See:* read head.

playback loss *See:* translation loss.

playout *See:* playback.

PL/C A subset of PL/1 characterized by its enhanced debugging, quick compilation, code optimization and error checking facilities. *Note:* The C stands for Cornell University, where the language was developed. (C) 610.13-1993w

PLCP *See:* physical layer convergence procedure.

PL/DB *See:* Programming Language/Data Base.

plenary capacitance (between two conductors) The capacitance between two conductors when the changes in the charges on the two are equal in magnitude but opposite in sign and the other n – 2 conductors are isolated conductors. (Std100) 270-1966w

plenum An air compartment or chamber to which one or more ducts are connected and which forms part of an air-distribution system. (NESC/NEC) [86]

PLI Deprecated for PL/1. (C) 610.13-1993w

plier clamp *See:* strand restraining clamp.

P-line *See:* pilot line.

pliotron A hot-cathode vacuum tube having one or more grids. *Note:* This term is used primarily in the industrial field. (ED) [45]

PII *See:* platform internal interface.

PL/M A procedure-oriented programming language derived from PL/1, designed specifically for microcomputers. (C) 610.13-1993w

plotter An output device that presents data on paper in the form of a two-dimensional graphic representation. *See also:* drum plotter; analog plotter; digital plotter; flatbed plotter; electrostatic plotter; raster plotter. (C) 610.10-1994w

plotter step size (1) The minimum distance between two points or parallel lines on a plotter. *See also:* increment size. (C) 610.6-1991w, 610.10-1994w

(2) The distance between adjacent addressable points of a plotter. (C) 610.10-1994w

plotting board The flat surface of a flatbed plotter on which the output is displayed. *Synonym:* plotting table. (C) 610.10-1994w

plotting chart (navigation aid terms) A chart designed primarily for plotting dead reckoning lines of position. (AES/GCS) 172-1983w

plotting head A head within a plotter that is used to create marks on the display surface. (C) 610.10-1994w

plotting table *See:* plotting board.

plow (cable plowing) Equipment capable of laying cable, flexible conduit, etc., underground. (T&D/PE) 590-1977w

plow blade (cable plowing) A soil-cutting tool. (T&D/PE) 590-1977w

plow blade amplitude (cable plowing) Maximum displacement of plow blade tip from mean position induced by the vibrator (half the stroke). (T&D/PE) 590-1977w

plow blade frequency (cable plowing) Rate of blade tip vibration in hertz. (T&D/PE) 590-1977w

plowing (cable plowing) A process for installing cable, flexible conduit, etc., by cutting or separating the earth, permitting the cable or flexible conduit to be placed or pulled in behind the blade. (T&D/PE) 590-1977w

PLPC *See:* physical layer convergence procedure.

PL/PROPHET A language similar in style to PL/1, used in conjunction with the PROPHET system in pharmacology research. *See also:* PARSEC. (C) 610.13-1993w

plug (1) A device, usually associated with a cord, that by insertion in a jack or receptacle establishes connection between a conductor or conductors associated with the plug and a conductor or conductors connected to the jack or receptacle. (PE/EM) 43-1974s

(2) A cluster of blades fixed to a photocontrol, shorting cap, or nonshorting cap to establish an electrical and mechanical connection when inserted into a mating receptacle. (RL) C136.10-1996

plug adapter (plug body) A device that by insertion in a lampholder serves as a receptacle. (EEC/PE) [119]

plug adapter lampholder (current tap) A device that by insertion in a lampholder serves as one or more receptacles and a lampholder. (EEC/PE) [119]

plugboard (1) (general) A perforated board that accepts manually inserted plugs to control the operation of equipment. *See also:* control panel. (C) [20], [85]

(2) (test, measurement, and diagnostic equipment) Patchboard the use of which is restricted to punched card machines. *See also:* patch board. (MIL) [2]

(3) A printed circuit board into which plugs or pins may be placed to control the operation of equipment. *Synonym:* pinboard. *See also:* jack. (C) 610.7-1995, 610.10-1994w

plugboard chart A chart that shows, for a given job, where plugs may be inserted into a plugboard. *Synonym:* plugging chart. (C) 610.10-1994w

plug braking (rotating machinery) A form of electric braking of an induction motor obtained by reversing the phase sequence of its supply. *See also:* asynchronous machine. (PE) [9]

plug fuses (protection and coordination of industrial and commercial power systems) Plug fuses are rated 125 volts (V) and are available with current artings up to 30 amperes (A). Their use is limited to circuits rated 125 V or less. However, they may also be used in circuits supplied from a system having a grounded neutral, and in which no conductor operates at more than 150 V to ground. The National Electrical Code (NEC) requires type S fuses in all new installations of plug fuses because they are tamper resistant and size limiting, thus making it difficult to overfuse. (IA/PSP) 242-1986r

plugging A control function that provides braking by reversing the motor line voltage polarity or phase sequence so that the motor develops a counter-torque that exerts a retarding force. *See also:* electric drive. (IA/ICTL/IAC) [60]

plugging chart *See:* plugboard chart.

plug-in A communication device when it is so designed that connections to the device may be completed through pins, plugs, jacks, sockets, receptacles, or other forms of ready connectors. (EEC/PE) [119]

plug-in device A device that may be installed and removed at will, especially a device that is attached to a bus intended for system expansion. (C/BA) 1275-1994

plug-in driver A package, usually associated with a plug-in device and serving as the interface to that device, that is created by evaluating an FCode program resident on that device. (C/BA) 1275-1994

plug-in-type bearing (rotating machinery) A complete journal bearing assembly, consisting of a bearing liner and bearing housing and any supporting structure that is intended to be inserted into a machine end-shield. *See also:* bearing. (PE) [9]

plug-in unit *See:* CAMAC plug-in unit.

plug-receptacle interface temperature The temperature either at the top of the receptacle or at the bottom of the control base with the control mounted in the receptacle in an ambient temperature of 25°C. (RL) C136.10-1996

plumb-bob gravity At a site on the earth, the force per unit mass acting on a mass at rest relative to the earth, not including any reaction force from the suspension. The plumb bob gravity includes the gravitational attraction of the earth, the effect of the centripetal acceleration due to the earth rotation,

and tidal effects. The time average of the plumb-bob-gravity acceleration in the earth-fixed frame is the vector difference of the earth-Newtonian-gravitational acceleration and the earth-rotation-centripetal acceleration. The earth-Newtonian-gravitational-acceleration vector points generally toward the center of mass of the earth, as modified by the effects of gravity anomalies and the earth's flattening due to the earth rotation. The earth-rotation-centripetal-acceleration vector points toward and is perpendicular to the earth-rotation axis. The magnitude and direction of the instantaneous plumb-bob-gravity acceleration vary about their averages by approximately ± 0.15 μg and ± 0.15 μrad, respectively, with an approximate 12.4 h period due to the effect of lunar-solar earth and ocean tides. The tidal acceleration is due to the difference between the lunar and solar attractions at the site and at the center of the earth, the variation in earth attraction caused by the variation in the distance of the site from the center of the earth due to tidal deformation and ocean tide loading, and the gravitational attraction of the solid earth and ocean tide deformations. The direction of the plumb-bob-gravity acceleration defines the local vertical down direction, and its magnitude defines the unit of acceleration *g* used in accelerometer scale factor calibration at a test site (with compensation for tidal effects if accuracy warrants).
(AES/GYAC) 1293-1998

plumb-bob vertical (navigation aid terms) The direction indicated by a simple, ideal, frictionless pendulum that is motionless with respect to the earth; it indicates the direction of the vector sum of the gravitational and centrifugal accelerations of the earth at the location of the observer.
(AES/GCS) 172-1983w

plumbing (1) (data transmission) A term employed in communication practice to designate coaxial lines or wave guides and accessory equipment for radio-frequency transmission.
(COM/PE) 599-1985w

(2) A colloquial expression for pipe-like waveguide circuit elements and transmission lines. *Synonym:* microwave plumbing. (AES) 686-1997

plumb mark (conductor stringing equipment) A mark placed on the conductor located vertically below the insulator point of support for steel structures and vertically above the pole center line at ground level for wood pole structures used as a reference to locate the center of the suspension clamp.
(T&D/PE) 524-1992r

plumb marker pole A small diameter, lightweight pole with a marking device attached to one end, having sufficient length to enable a worker to mark the conductor directly below him/her from a position on the bridge or arm of the structure. This device is utilized to mark the conductor immediately after completion of sagging. *Synonym:* marker.
(T&D/PE) 524-1992r

plume *See:* positive prebreakdown streamers.

plunger relay A relay operated by a movable core or plunger through solenoid action. *See also:* relay. (EEC/REE) [87]

plural service *See:* dual service.

plural tap *See:* multiple plug.

plus input (oscilloscopes) An input such that the applied polarity causes a deflection polarity in agreement with conventional deflection polarity. (IM) 311-1970w

plus/minus operation A winding arrangement in which one or the other end of the tap winding is connected by a reversing change-over selector to the main winding, and allows use of the taps in a buck or boost mode when travelling through the tapping range. (PE/TR) C57.131-1995

PM *See:* permanent magnet; phase modulation; protective margin; permanent-magnet focusing.

PMA *See:* physical medium attachment.

PMA sublayer *See:* physical medium attachment sublayer.

PMOS *See:* p-channel metal-oxide semiconductor.

PMSG *See:* dead-front pad-mounted switchgear.

pnet A physical net that has no correspondence to the logical function of the design, such as a route segment, which is reserved for future routes across a hard macro, or a power net not described in the design netlist. (C/DA) 1481-1999

pneumatically release-free (trip-free) (as applied to a pneumatically operated switching device) A term indicating that by pneumatic control the switching device is free to open at any position in the closing stroke if the release is energized. *Note:* This release-free feature is operative even though the closing control switch is held closed.
(SWG/PE) C37.100-1992

pneumatic bellows, relay *See:* relay pneumatic bellows.

pneumatic brake pipe A pressurized air line, continuous over the length of the train, used variously to indicate train integrity, provide indication of a emergency condition, equalize reservoir pressures, or propagate a brake application signal.
(VT) 1475-1999

pneumatic controller A pneumatically supervised device or group of devices operating electric contacts in a predetermined sequence. *See also:* multiple-unit control.
(VT/LT) 16-1955w

pneumatic loudspeaker A loudspeaker in which the acoustic output results from controlled variation of an air stream.
(EEC/PE) [119]

pneumatic operation Power operation by means of compressed gas. (SWG/PE) C37.100-1992

pneumatic switch A pneumatically supervised device opening or closing electric contacts, and differs from a pneumatic controller in being purely an ON and OFF type device. *See also:* control switch. (VT/LT) 16-1955w

pneumatic transducer A unilateral transducer in which the sound output results from a controlled variation of an air stream. (SP) [32]

pneumatic tubing system (protective signaling) An automatic fire-alarm system in which the rise in pressure of air in a continuous closed tube, upon the application of heat, effects signal transmission. *Note:* Most pneumatic tubing systems contain means for venting slow pressure changes resulting from temperature fluctuations and therefore operate on the so-called rate-of-rise principle. *See also:* protective signaling.
(EEC/PE) [119]

***p-n* junction (semiconductor)** A region of transition between *p*- and *n*-type semiconducting material. *See also:* semiconductor device. (PE/EEC) [119]

PN sequence *See:* pseudonoise sequence.

pocket A card stacker in a card sorter. *Synonym:* bin.
(C) 610.10-1994w

pocketbook *See:* insulator cover; conductor grip.

pocket sort *See:* distribution sort.

pocket-type plate (of a storage cell) A plate of an alkaline storage battery consisting of an assembly of perforated oblong metal pockets containing active material. *See also:* battery.
(EEC/PE) [119]

poid The curve traced by the center of a sphere when it rolls or slides over a surface having a sinusoidal profile. (SP) [32]

Poincaré sphere (1) A sphere whose points are associated in a one-to-one fashion with all possible polarization states of a plane wave [field vector] according to the following rules: The longitude equals twice the tilt angle and the latitude is twice the angle whose cotangent is the negative of the axial ratio of the polarization ellipse. *Notes:* 1. For this definition, the axial ratio carries a sign. 2. The points of the northern hemisphere of the Poincaré sphere represent polarizations with a left-hand sense and those of the southern hemisphere represent polarization with a right-hand sense. The north pole represents left-hand circular polarization and the south pole right-hand circular polarization. The points of the equator represent all possible linear polarizations. *See also:* axial ratio.
(AP/ANT) 145-1993

(2) A tool for graphically displaying the polarization state of a monochromatic wave. For a fully polarized wave, each point on the sphere's surface defines a unique polarization state, with axial ratio and tilt angle mapping into latitude and longitude, respectively. (AP/PROP) 211-1997

point (1) (A) (positional notation) The character, or the location of an implied symbol, that separates the integral part of a numerical expression from its fractional part. For example, it is called the binary point in binary notation and the decimal point in decimal notation. If the location of the point is assumed to remain fixed with respect to one end of the numerical expressions, a fixed-point system is being used. If the location of the point does not remain fixed with respect to one end of the numerical expression, but is regularly recalculated, then a floating-point system is being used. *Note:* A fixed-point system usually locates the point by some convention, while a floating-point system usually locates the point by expressing a power of the base. *See also:* variable point; checkpoint; breakpoint; rerun point; floating point; fixed point; branch point. **(B) (positional notation)** The character, or implied location of such a character, that separates the integral part of a numerical expression from the fractional part. Since the place to the left of the point has unit weight in the most commonly used systems, the point is sometimes called the units point, although it is frequently called the binary point in binary notation and the decimal point in decimal notation. *See also:* floating point; breakpoint; fixed point. (C) [20], 270-1966, [85], 162-1963

(2) (lightning protection) The pointed piece of metal used at the upper end of the elevation rod to receive a lightning discharge. (EEC/PE) [119]

(3) The standard typographical unit of measurement, approximately equal to 1/72 in. (C) 1295-1993w

(4) (for supervisory control or indication or telemeter selection) All of the supervisory control or indication devices in a system, exclusive of the common devices, in the master station and in the remote station that are necessary for

1) Energizing the closing, opening, or other circuits of a unit, or set of units of switchgear or other equipment being controlled, or
2) Automatic indication of the closed or open or other positions of the unit, or set of units of switchgear or other equipment for which indications are being obtained, or
3) Connecting a telemeter transmitting equipment into the circuit to be measured and to transmit the telemeter reading over a channel to a telemeter receiving equipment.

Note: A point may serve for any two or all three of the purposes described above; for example, when a supervisory system is used for the combined control and indication of remotely operated equipment, point (for supervisory control) and point (for supervisory indication) are combined into a single control and indication point. (SWG/PE) C37.100-1992

(5) (lightning protection) *See also:* radix point. (C) 1084-1986w

point contact (semiconductors) A pressure contact between a semiconductor body and a metallic point. *See also:* semiconductor device; semiconductor. (ED) 216-1960w

point-contact transistor A transistor having a base electrode and two or more point-contact electrodes. *See also:* transistor; semiconductor. (ED) 216-1960w

point coordination function (PCF) A class of possible coordination functions in which the coordination function logic is active in only one station in a basic service set (BSS) at any given time that the network is in operation. (C/LM) 8802-11-1999

point detector A device that is a part of a switch-operating mechanism and is operated by a rod connected to a switch, derail, or movable-point frog to indicate that the point is within a specified distance of the stock rail. (EEC/PE) [119]

point equipment (point) Elements of a supervisory system, exclusive of the basic common equipment, that are peculiar to and required for the performance of a discrete supervisory function.

1) **alarm point.** Station (remote or master, or both) equipment that inputs a signal to the alarm function.
2) **accumulator point.** Station (remote or master, or both) equipment that accepts a pulsing digital input signal to accumulate a total of pulse counts.
3) **analog point.** Station (remote or master, or both) equipment that inputs an analog quantity to the analog function.
4) **control point.** Station (remote or master, or both) equipment that operates to perform the control function.
5) **indication (status) point.** Station (remote or master, or both) equipment that accepts a digital input signal for the function of indication.
6) **sequence of events point.** Station (remote or master, or both) equipment that accepts a digital input signal to perform the function of registering sequence of events.
7) **telemetering selection point.** Station (remote or master, or both) equipment for the selective connection of telemetering transmitting equipment to appropriate telemetering receiving equipment over an interconnecting communication channel. This type of point is more commonly used in electromechanical or stand-alone type of supervisory control.
8) **spare point.** Point equipment that is not being utilized, but is fully wired and equipped.
9) **wired point.** Point for which all common equipment, wiring, and space are provided. To activate the point requires only the addition of plug-in hardware.
10) **space-only point.** Point for which cabinet space only is provided for future addition or wiring and other necessary plug-in equipment.

Note: A point may serve for one or more of the purposes described above, for example, when a supervisory system is used for combined control and supervision of remotely operated equipment, a point for supervisory control and point for supervisory indication may be combined into a single control and indication point. *See also:* supervisory control functions. (SWG/PE/SUB) C37.100-1992, C37.1-1987s

pointer (1) (software) A data item that specifies the location of another data item; for example, a data item that specifies the address of the next employee record to be processed. *Synonym:* link. *See also:* pointer segment; stack pointer. (C) 610.5-1990w, 610.12-1990

(2) An identifier that indicates the address or storage location of an data item. (C) 610.10-1994w

pointer data Data used to represent the addresses of other data items. (C) 610.5-1990w

pointer optimization A database reorganization technique in which database access is made more efficient by reestablishing the pointers within the database so that fewer pointers are needed to represent the database structure. (C) 610.5-1990w

pointer pusher (demand meter) The element that advances the maximum demand pointer in accordance with the demand and in integrated-demand meters is reset automatically at the end of each demand interval. *See also:* demand meter. (EEC/PE) [119]

pointer segment (data management) A segment in a database that establishes a parent/child relationship between segments. *Note:* The segment contains only a pointer to the physical child segment for its parent segment. (C) 610.5-1990w

pointer shift due to tapping The displacement in the position of a moving element of an instrument that occurs when the instrument is tapped lightly. The displacement is observed by a change in the indication of the instrument. *See also:* moving element. (EEC/AII) [102]

point ID printout (sequential events recording systems) A brief coded method of identifying inputs using alphanumeric characters, usually used in computer based systems. (PE/EDPG) [1]

pointing accuracy (communication satellite) The angular difference between the direction in which the main beam of an antenna points and the required pointing direction. (COM) [25]

pointing device (1) A device, such as a mouse, trackball, or joystick, used to move a pointer on the screen. (C) 1295-1993w

(2) An input deice that is used to specify a particular addressable location. *Contrast:* pick device. *See also:* stylus; cursor control device. (C) 610.10-1994w, 610.6-1991w

point-junction transistor A transistor having a base electrode and both point-contact and junction electrodes. *See also:* transistor. (EEC/PE) [119]

point method (illuminating engineering) (formerly called "point-by-point method") A lighting design procedure for predetermining the illuminance at various locations in lighting installations, by use of luminaire photometric data. The direct component of illuminance due to the luminaires and the interreflected component of illuminance due to the room surfaces are calculated separately. The sum is the total illumination at a point. (EEC/IE) [126]

point object A synthetic environment object that is geometrically anchored to the terrain with a single point. (C/DIS) 1278.1a-1998

point of common coupling (PCC) (1) The connection point between the SVC and the power system at which performance requirements are defined. (SUB/PE) 1303-1994

(2) The busbar from which other loads sensitive to voltage may be connected as well as the static var compensator (SVC) and any disturbing load it is required to compensate. (PE/SUB) 1031-2000

(3) The point at which the electric utility and the customer interface occurs. Typically, this point is the customer side of the utility revenue meter. *Note:* In practice, for building-mounted photovoltaic (PV) systems (such as residential PV systems) the customer distribution panel may be considered the PCC for convenience in making measurements and performing testing. (SCC21) 929-2000

point of connection For a static var compensator (SVC) with a dedicated transformer, the high voltage (HV) bus to which the whole is connected. For an SVC connected to an existing transformer, or direct connected at low voltage, the busbar to which it is connected. (PE/SUB) 1031-2000

point of fixation (illuminating engineering) A point or object in the visual field at which the eyes look, and upon which they are focused. (EEC/IE) [126]

point of measurement Place at which the conventionally true values are determined and at which the reference point of the monitor is placed for test purposes. (NI) N42.20-1995

point of observation (illuminating engineering) For most purposes it may be assumed that the distribution of luminance in the field of view can be described as if there were a single point of observation located at the midpoint of the baseline connecting the centers of the entrance pupils of the two eyes. For many problems it is necessary, however, to regard the centers of the entrance pupils as separate points of observation for the two eyes. (EEC/IE) [126]

point of presence The point at which the local telephone company terminates subscribers' circuits for long distance dial-up or leased line communications. (C) 610.7-1995

point of regulation (POR) The location in the subsystem (unit under test) where voltage is sensed for voltage regulation. The point of regulation can be remote or local to the voltage regulation equipment. (PEL) 1515-2000

point-of-sale terminal (1) A device for recording sales data in machine readable form at the time each sale is made. (C) 610.2-1987

(2) A job-oriented terminal for recording sales data in machine-readable form at the time and place at which each sale is made. (C) 610.10-1994w

point on tangent (POT) *See:* hub.

point operator An image operator that assigns a gray level to each output pixel based on the gray level of the corresponding input pixel. *Contrast:* neighborhood operator. (C) 610.4-1990w

point source (laser maser) A source of radiation whose dimensions are small enough compared with the distance between source and receptor for them to be neglected in calculations. (LEO) 586-1980w

point test A predefined location within equipment or routines at which a known result should be present if the equipment or routine is operating properly. (SWG/PE/SUB) C37.100-1992, C37.1-1994

point-to-multipoint connection A connection with multiple endpoints, wherein one endpoint that is designated as the root (originator) is connected by a point-to-point connection with all other endpoints. (C/LM) 802.9a-1995w

point-to-point (1) Descriptive of a communication channel that services just two terminals. (SUB/PE) 999-1992w

(2) Pertaining to a channel, line, or a circuit that has only two end points. *See also:* multipoint; multidrop. (C) 610.7-1995

point-to-point communications Communications that take place between exactly two devices. (C/MM) 1284.4-2000

point-to-point configuration A network configuration in which two communicating stations are connected by a point-to-point channel. (C) 610.7-1995

point-to-point connection A connection with only two endpoints. (C/LM) 802.9a-1995w

point-to-point control system *See:* positioning control system.

point-to-point radio communication Radio communication between two fixed stations. *See also:* radio transmission. (EEC/PE) [119]

point transposition A transposition, usually in an open wire line, that is executed within a distance comparable to the wire separation, without material distortion of the normal wire configuration outside this distance. (EEC/PE) [119]

Poisson's equation In rationalized form:

$$\nabla^2 V = -\frac{\rho}{\varepsilon_0 \varepsilon}$$

where $\varepsilon_0\varepsilon$ is the absolute capacitivity of the medium, V the potential, and ρ the charge density at any point. (Std100) 270-1966w

polar axis (primary ferroelectric terms) A direction that is parallel to the spontaneous polarization vector. When a polar crystal is heated or cooled, the internal or external electrical conduction generally cannot provide enough current to compensate for the change in polarization with temperature, and the crystal develops an electric charge on its surface. For this reason, polar crystals are called pyroelectric. *Note:* For crystal class m, the polar axis is in an arbitrary direction in a plane (the mirror plane). The polar axis for crystal class 1 can be in any arbitrary direction. (UFFC) 180-1986w

polar cap Polar region bounded by the auroral zone. (AP/PROP) 211-1997

polar cap absorption (PCA) The intense absorption of radio waves in the polar regions caused by the arrival of high-energy solar protons concentrated in this region by the lines of force of the Earth's magnetic field. (AP/PROP) 211-1997

polar contact A part of a relay against which the current-carrying portion of the movable polar member is held so as to form a continuous path for current. (EEC/PE) [119]

polar direct-current telegraph system A system that employs positive and negative currents for transmission of signals over the line. *See also:* telegraphy. (EEC/PE) [119]

polar-duplex signaling (telephone switching systems) Any method of bidirectional signaling over a line using ground potential compensation and polarity sensing. (COM) 312-1977w

polarential telegraph system A direct-current telegraph system employing polar transmission in one direction and a form of differential duplex transmission in the other direction. *Note:* Two kinds of polarential systems, known as types A and B, are in use. In half-duplex operation of a type-A polarential system the direct-current balance is independent of line re-

sistance. In half-duplex operation of a type-B polarential system the direct-current balance is substantially independent of the line leakage. *See also:* telegraphy. (COM) [49]

polarimetry The study of electromagnetic propagation, scattering, and emission that considers the complete polarization state of any arbitrarily polarized wave. (AP/PROP) 211-1997

Polaris correction (navigation aids) A correction to be applied to the corrected sextant altitude of Polaris to obtain latitude. (AES/GCS) 172-1983w

polarity (1) (instrument transformers) (power and distribution transformers) The designation of the relative instantaneous directions of the currents entering the primary terminals and leaving the secondary terminals during most of each half cycle. *Note:* Primary and secondary terminals are said to have the same polarity, when, at a given instant during most of each half cycle, the current enters the identified, similarity marked primary lead and leaves the identified, similarly marked secondary terminal in the same direction as though the two terminals formed a continuous circuit. (PE/PSR/TR) C37.110-1996, C57.12.80-1978r

(2) (batteries) An electrical condition determining the direction in which current tends to flow on discharge. By common usage the discharge current is said to flow from the positive electrode through the external circuit. *See also:* battery. (PE/EEC) [119]

(3) (television) (picture signal) The sense of the potential of a portion of the signal representing a dark area of a scene relative to the potential of a portion of the signal representing a light area. Polarity is stated as black negative or black positive. *See also:* television. (BT/AV) [34]

(4) The relative instantaneous directions of the currents entering the primary terminals and leaving the secondary terminals during most of each half cycle. *Note:* Primary and secondary terminals are said to have the same polarity when, at a given instant during most of each half cycle, current enters the primary terminal and leaves the secondary terminal in the same direction as though there was a continuous circuit between the two terminals. (PE/TR) C57.13-1993

(5) The orientation of any device that has poles or signed electrodes. (C) 610.10-1994w

(6) Polarity of the dc voltage with respect to ground, e.g., positive or negative. (PE/TR) C57.19.03-1996

(7) The polarity of a regulator is intrinsic in its design. Polarity is correct if the regulator boosts the voltage in the "raise" range and bucks the voltage in the "lower" range. The relative polarity of the shunt winding and the series windings of a step-voltage regulator will differ in the boost and buck modes between Type A and Type B regulators. (PE/TR) C57.15-1999

polarity and angular displacement (regulator) Relative lead polarity of a regulator or a transformer is a designation of the relative instantaneous direction of current in its leads. In addition to its main transformer windings, a regulator commonly has auxiliary transformers or auxiliary windings as an integral part of the regulator. The same principles apply to the polarity of all transformer windings. *Notes:* 1. Primary and secondary leads are said to have the same polarity when at a given instant the current enters an identified secondary lead in the same direction as though the two leads formed a continuous circuit. 2. The relative lead polarity of a single-phase transformer may be either additive or subtractive. If one pair of adjacent leads from the two windings is connected together and voltage applied to one of the windings, then:

a) The relative lead polarity is additive if the voltage across the other two leads of the windings is greater than that of the higher-voltage winding alone.
b) The relative lead polarity is subtractive if the voltage across the other two leads of the winding is less than that of the higher-voltage winding alone.

3. The polarity of a polyphase transformer is fixed by the internal connections between phases as well as by the relative locations of leads: it is usually designated by means of a vector line diagram showing the angular displacement of windings and a sketch showing the marking of leads. The vector lines of the diagram represent induced voltages and the recognized counterclockwise direction of rotation is used. The vector line representing any phase voltage of a given winding is drawn parallel to that representing the corresponding phase voltage of any other winding under consideration. *See also:* voltage regulator. (PE/TR) C57.15-1968s

polarity guard A device that guarantees proper tip and ring polarity. (SCC31) 1390.2-1999, 1390.3-1999

polarity marks (instrument transformers) The identifications used to indicate the relative instantaneous polarities of the primary and secondary current and voltages. *Notes:* 1. On voltage transformers during most of each half cycle in which the identified primary terminal is positive with respect to the unidentified primary terminal, the identified secondary terminal is also positive with respect to the unidentified secondary terminal. 2. The polarity marks are so placed on current transformers that during most of each half-cycle, when the direction of the instantaneous current is into the identified primary terminal, the direction of the instantaneous secondary current is out of the correspondingly identified secondary terminal. 3. This convention is in accord with that by which standard terminal markings H_1, X_1, etc., are correlated. *See also:* instrument transformer. (PE/TR) [57]

polarity or polarizing voltage device (power system device function numbers) A device that operates, or permits the operation of, another device on a predetermined polarity only, or verifies the presence of a polarizing voltage in the equipment. (PE/SUB) C37.2-1979s

polarity-related adjectives (A) (pulse terminology) Of, having, or pertaining to a single polarity. **(B) (bipolar)** Of, having, or pertaining to both polarities. (IM/WM&A) 194-1977

polarity reversal Change of voltage polarity from positive to negative or from negative to positive polarity. (PE/TR) C57.19.03-1996

polarity test (rotating machinery) A test taken on a machine to demonstrate that the relative polarities of the windings are correct. *See also:* asynchronous machine. (PE) [9]

polarizability The average electric dipole moment produced per molecule per unit of electric field strength. (Std100) 270-1966w

polarization (1) (primary ferroelectric terms) The electric dipole moment per unit volume. Polarization is related to electric displacement D through the linear expression

$$D_i = P_i + \varepsilon_0 E_i$$

where the derived constant ε_0 (usually called the permittivity of free space) equals $8.854 \cdot 10^{12}$ coulomb/volt-meter. In ferroelectric materials both D and P are nonlinear functions of E and may depend on previous history of the material. When the electric field is applied along a polar axis that is also a special axis of the prototype phase of the crystal, this expression may then be regarded as a scalar equation, since D, E, and P all point along the same direction. When the term $\varepsilon_0 E$ in the above expression is negligible compared to P (as in the case for most ferroelectric materials), D is nearly equal to P; therefore, the D versus E and P versus E plots of the hysteresis loop become, in practice, equivalent. *Note:* The polarization P may be expressed as the bound surface charge per unit area of a free surface normal to the direction of P. *See also:* desired polarization; polarization error. (UFFC) 180-1986w

(2) (primary ferroelectric terms) (of a waveguide mode) In some cases, the polarization of the electric field vector on the axis of symmetry of a waveguide. In general, however, the polarization of the mode is not identical to the polarization of the electric field vector in the mode, since the latter varies from point to point in the guide cross-section. *Notes:* 1. Polarization is that property of a degenerate waveguide mode which characterizes a particular mode within a set of degenerate modes. The main application of this concept is to

waveguides of square or circular cross-section. 2. When two orthogonal modes can be identified in a square or circular waveguide, a polarization ellipse can be associated with the field vectors and considered in terms of axial ratio, etc. (MTT) 146-1980w

(3) (radiated wave) That property of a radiated electromagnetic wave describing the time-varying direction and amplitude of the electric field vector; specifically, the figure traced as a function of time by the extremity of the vector at a fixed location in space, as observed along the direction of propagation. *Note:* In general the figure is elliptical and it is traced in a clockwise or counterclockwise sense. The commonly referenced circular and linear polarizations are obtained when the ellipse becomes a circle or a straight line, respectively. Clockwise sense rotation of the electric vector is designated right-hand polarization and counterclockwise sense rotation is designated left-hand polarization. *See also:* radiation. (AP/ANT) [35]

(4) (electronic navigation) (desired) The polarization of the radio wave for which an antenna system is designed. *See also:* navigation. (AES/RS/GCS) 686-1982s, 173-1959w, [42]

(5) (batteries) The change in voltage at the terminals of the cell or battery when a specified current is flowing, and is equal to the difference between the actual and the equilibrium (constant open-circuit condition) potentials of the plates, exclusive of the IR drop. *See also:* polarization. (EEC/PE) [119]

(6) (waveguide) (of a field vector) For a field vector at a single frequency at a fixed point in space, the polarization is that property which describes the shape and orientation of the locus of the extremity of the field vector and the sense in which this locus is traversed. *Notes:* 1. For a time harmonic (or single frequency) vector, the locus is an ellipse with center at the origin. In some cases, this ellipse becomes a circle or a segment of a straight line. The polarization is then called "circular" and "linear, " respectively. 2. The orientation of the ellipse is defined by its plane, called the plane of polarization, and by the direction of its axes. (For a linearly polarized field, any plane containing the segment locus of the field vector is a plane of polarization.) (MTT) 146-1980w

(7) (A) (of an antenna) In a given direction from the antenna, the polarization of the wave transmitted by the antenna. *Note:* When the direction is not stated, the polarization is taken to be the polarization in the direction of maximum gain. **(B)** [of a wave (radiated by an antenna in a specified direction)] In a specified direction from an antenna and at a point in its far field, the polarization of the (locally) plane wave that is used to represent the radiated wave at that point. *Note:* At any point in the far field of an antenna, the radiated wave can be represented by a plane wave whose electric field strength is the same as that of the wave and whose direction of propagation is in the radial direction from the antenna. As the radial distance approaches infinity, the radius of curvature of the radiated wave's phase front also approaches infinity, and thus, in any specified direction, the wave appears locally as a plane wave. (AP/ANT) 145-1993

(8) (as applied to a relay) The input that provides a reference for establishing the direction of system phenomena such as direction of power or reactive flow, or direction to a fault or other disturbance on a power system. (SWG/PE) C37.100-1992

(9) (of an electromagnetic wave) The locus of the tip of the electric field vector observed in a plane orthogonal to the wave normal. *Notes:* 1. Elliptical polarization is the most general case. 2. The polarization of an electromagnetic wave is defined by the tilt angle, the axial ratio and the sign of the axial ratio, which expresses the sense of rotation of the polarization ellipse. *See also:* circularly polarized wave; elliptically polarized wave; linearly polarized wave; parallel polarization; perpendicular polarization. (AP/PROP) 211-1997

polarization capacitance (biological) The reciprocal of the product of electrode capacitive reactance and 2π times the frequency.

$$C_p = \frac{1}{2\pi f X_p}$$

See also: electrode impedance. (EMB) [47]

polarization controller, optical *See:* optical polarization controller.

polarization coupling loss That part of the transmission loss due to the mismatch between the polarization of the incoming wave and the polarization of the receiving antenna. (AP/PROP) 211-1997

polarization current Time-dependent, decaying current in the specimen, following the instant that a constant voltage is applied until steady-state conditions have been obtained. *Notes:* 1. Polarization current does not include the conductance current. The sum of the polarization and conductance currents in the specimen is that which is normally observed during measurements. 2. Polarization current includes both polarization absorption and capacitive-charge currents. (PE) 402-1974w

polarization, desired *See:* desired polarization.

polarization diversity reception (data transmission) That form of diversity reception that utilizes separate vertically and horizontally polarized receiving antennas. (PE) 599-1985w

polarization efficiency The ratio of the power received by an antenna from a given plane wave of arbitrary polarization to the power that would be received by the same antenna from a plane wave of the same power flux density and direction of propagation, whose state of polarization has been adjusted for a maximum received power. *Notes:* 1. The polarization efficiency is equal to the square of the magnitude of the inner product of the polarization vector describing the receiving polarization of the antenna and the polarization vector of the plane wave incident at the antenna. 2. If the receiving polarization of an antenna and the polarization of an incident plane wave are properly located as points on the Poincaré sphere, then the polarization efficiency is given by the square of the cosine of one-half the angular separation of the two points. *Synonym:* polarization mismatch factor. *See also:* polarization vector. (AP/ANT) 145-1993

polarization ellipse (waveguide) The locus of the extremity of a field vector at a fixed point in space. *See also:* polarization. (MTT) 146-1980w

polarization error (navigation aid terms) (navigation) The error arising from the transmission or reception of an electromagnetic wave having a polarization other than that intended for the system. (AES/GCS) 172-1983w

polarization index ($P.I._{t2/t1}$) (1) (rotating machinery) The ratio of the the insulation resistance of a machine winding measured at 1 min after voltage has been applied divided into the measurement at 10 min. (PE/EM) 95-1977r

(2) Variation in the value of insulation resistance with time. The quotient of the insulation resistance at time (t_2) divided by the insulation resistance at time (t_1). If times t_2 and t_1 are not specified, they are assumed to be 10 min and 1 min, respectively. Unit conventions: values of 1 through 10 are assumed to be in minutes, values of 15 and greater are assumed to be in seconds (e.g., $P.I._{60/15}$ refers to IR_{60s}/IR_{15s}). (PE/EM) 43-2000

polarization index test (rotating machinery) A test for measuring the ohmic resistance of insulation at specified time intervals for the purpose of determining the polarization index. *See also:* asynchronous machine; direct-current commutating machine. (PE) [9]

polarization maintaining fiber (interferometric fiber optic gyro) A single-mode fiber that preserves the plane of polarization of light coupled into it as the beam propagates through its length. (AES/GYAC) 528-1994

polarization match The condition that exists when a plane wave, incident upon an antenna from a given direction, has a polarization that is the same as the receiving polarization of the antenna in that direction. *See also:* receiving polarization. (AP/ANT) 145-1993

polarization mismatch factor *See:* polarization efficiency.

polarization mismatch loss The magnitude, expressed in decibels, of the polarization efficiency. (AP/ANT) 145-1993

polarization pattern (of an antenna) (A) The spatial distribution of the polarizations of a field vector excited by an antenna taken over its radiation sphere. (B) The response of a given antenna to a linearly polarized plane wave incident from a given direction and whose direction of polarization is rotating about an axis parallel to its propagation vector; the response being plotted as a function of the angle that the direction of polarization makes with a given reference direction. *Notes:* 1. When describing the polarizations over the radiation sphere [definition (A)], or a portion of it, reference lines shall be specified over the sphere, in order to measure the tilt angles of the polarization ellipses and the direction of polarization for linear polarizations. An obvious choice, though by no means the only one, is a family of lines tangent at each point on the sphere to either the θ or ϕ coordinate line associated with a spherical coordinate system of the radiation sphere. 2. At each point on the radiation sphere, the polarization is usually resolved into a pair of orthogonal polarizations, the co-polarization and the cross polarization. To accomplish this, the co-polarization must be specified at each point on the radiation sphere. For certain linearly polarized antennas, it is common practice to define the co-polarization in the following manner: First specify the orientation of the co-polar electric field vector at a pole of the radiation sphere. Then, for all other directions of interest (points on the radiation sphere), require that the angle that the co-polar electric field vector makes with each great circle line through the pole remain constant over that circle, the angle being that at the pole. In practice, the axis of the antenna's main beam should be directed along the polar axis of the radiation sphere. The antenna is then appropriately oriented about this axis to align the direction of its polarization with that of the defined co-polarization at the pole. This manner of defining co-polarization can be extended to the case of elliptical polarization by defining the constant angles using the major axes of the polarization ellipses rather than the co-polar electric field vector. The sense of polarization must also be specified. 3. The polarization pattern [definition (B)] generally has the shape of a dumbbell. The polarization ellipse of the antenna in the given direction is similar to one that can be inscribed in the dumbbell shape with points of tangency at the maxima and minima points; thus, the axial ratio and tilt angle can be obtained from the polarization pattern. *See also:* cross polarization; tilt angle; co-polarization. (AP/ANT) 145-1993

polarization-phase vector (for a field vector) The polarization vector, among all of those that define the same polarization, that carries the phase information of the field vector whose polarization it represents. *Note:* The polarization-phase vector of the field vector $\vec{E}$ is given by $\vec{E} == \vec{E}/E$ where E is magnitude of $\vec{E}$ that is, the positive square root of $\vec{E} * \vec{E}$. *See also:* polarization vector. (AP/ANT) 145-1993

polarization potential (biological) The boundary potential over an interface. *See also:* electrobiology. (EMB) [47]

polarization ratio The magnitude of a complex polarization ratio. (AP/ANT) 145-1993

polarization reactance (biological) The impedance multiplied by the sine of the angle between the potential vector and the current vector.

$$X_p = Z_p \sin \theta$$

See also: electrode impedance. (EMB) [47]

polarization, receiving *See:* receiving polarization.

polarization receiving factor The ratio of the power received by an antenna from a given plane wave of arbitrary polarization to the power received by the same antenna from a plane wave of the same power density and direction of propagation, whose state of polarization has been adjusted for the maximum received power. *Note:* It is equal to the square of the absolute value of the scalar product of the polarization unit vector of the given plane wave with that of the radiation field of the antenna along the direction opposite to the direction of propagation of the plane wave. *See also:* waveguide. (MTT) 146-1980w

polarization resistance (biological) The impedance multiplied by the cosine of the phase angle between the potential vector and the current vector. $R_p = Z_p \cos \theta$. *See also:* electrode impedance. (EMB) [47]

polarization state *See:* state of polarization.

polarization unit vector (field vector) (at a point) A complex field vector divided by its magnitude. *Notes:* 1. For a field vector of one frequency at a point, the polarization unit vector completely describes the state of polarization, that is, the axial ratio and orientation of the polarization ellipse and the sense of rotation on the ellipse. 2. A complex vector is one each of whose components is a complex number. The magnitude is the positive square root of the scalar product of the vector and its complex conjugate. *See also:* waveguide. (MTT) 146-1980w

polarization vector (for a field vector) A unitary vector which describes the state of polarization of a field vector at a given point in space. *Notes:* 1. Polarization vectors differing only by a unitary factor ($e^{j\alpha}$ where α is real) correspond to the same polarization state. 2. The appropriate inner product, $\langle \hat{e}_1, \hat{e}_2 \rangle$, for two polarization vectors in the same plane of polarization is given by $\langle \hat{e}_1, \hat{e}_2 \rangle = \hat{e}_1^* \cdot \hat{e}_2$ where $\hat{e}_1$ and $\hat{e}_2$ represent the polarization vectors corresponding to polarizations 1 and 2. 3. The inner product of polarization vectors representing the same polarization is equal to unity. The inner product of two polarization vectors representing two orthogonal polarizations is zero. 4. The inner product of a polarization vector corresponding to a specified polarization, $\hat{e}_1$, and a complex electric field vector $\vec{E}$, at a point in space will yield the component of the electric field vector corresponding to the specified polarization, $\vec{E}_1$; that is $\vec{E}_1 = (\hat{e}_1^* \cdot \vec{E})\hat{e}_1$. 5. The basis vectors for the components of the polarization vector may correspond to any two orthogonal polarizations, the most common being two orthogonal linear polarizations or right-hand and left-hand circular polarizations. (AP/ANT) 145-1993

polarized dipole magnetization *See:* polarized return-to-zero recording.

polarized electrolytic capacitor An electrolytic capacitor in which the dielectric film is formed adjacent to only one metal electrode and in which the impedance to the flow of current in one direction is greater than in the other direction. (EEC/PE) [119]

polarized plug (packaging machinery) A plug so arranged that it may be inserted in its counterpart only in a predetermined position. (IA/PKG) 333-1980w

polarized relay A relay that consists of two elements, one of which operates as a neutral relay and the other of which operates as a polar relay. *See also:* polar relay; neutral relay. (EEC/PE) [119]

polarized return-to-zero recording (RZ(P)) Return-to-zero recording in which zeros are represented by magnetization in one sense, ones are represented by magnetization in the opposite sense, and the reference condition is the absence of magnetization. *Synonym:* polarized dipole magnetization. *Contrast:* non-polarized return-to-zero recording. (C) 610.10-1994w

polarized snubber (converter circuit elements) (self-commutated converters) A snubber, including a diode, in which the limiting action depends on the direction of voltage or current. (IA/SPC) 936-1987w

polarizer A substance that when added to an electrolyte increases the polarization. *See also:* electrochemistry. (EEC/PE) [119]

polarizer, optical *See:* optical polarizer.

polarizing fiber (interferometric fiber optic gyro) A single-mode fiber that maintains one and only one polarization state as the beam propagates through its length by suppressing its orthogonal state. (AES/GYAC) 528-1994

polar mode *See:* resolver.

polar navigation (navigation aids) Navigation in polar regions where unique considerations and techniques are applied. (AES/GCS) 172-1983w

polar operation (data transmission) Circuit operation in which mark and space transitions are represented by a current reversal. (PE) 599-1985w

polar orbit (communication satellite) An inclined orbit with an inclination of 90°. The plane of a polar orbit contains the polar axis of the primary body. (COM) [19]

polar regions (navigation aid terms) The regions near the geographic poles. Definite limits for these regions are not recognized. (AES/GCS) 172-1983w

polar relay A relay in which the direction of movement of the armature depends upon the direction of the current in the circuit controlling the armature. *See also:* neutral relay; electromagnetic relay; polarized relay. (EEC/PE) [119]

pole (1) (illuminating engineering) A standard support generally used where overhead lighting distribution circuits are employed. (EEC/IE) [126]

(2) (electric power or communication) A column of wood or steel, or some other material, supporting overhead conductors, usually by means of arms or brackets. *See also:* pole shoe; field pole; tower. (T&D/PE) [10]

(3) (pole unit) (of a switching device or fuse) That portion of the device associated exclusively with one electrically separated conducting path of the main circuit of the device. *Notes:* 1. Those portions that provide a means for mounting and operating all poles together are excluded from the definition of a pole. 2. A switching device or fuse is called single-pole if it has only one pole. If it has more than one pole, it may be called multipole (two-pole, three-pole, etc.) and provided, in the case of a switching device, that the poles are or can be coupled in such a manner as to operate together. (SWG/PE) C37.100-1992

(4) The complex frequency where a Laplace transform is infinite. Combined with residues, this is a convenient mathematical notation for the impedance or transfer function of a passive circuit, such as a resistor/inductor/capacitor (RLC) circuit, since poles above this frequency can be ignored in calculations without significant loss of accuracy. (C/DA) 1481-1999

(5) *See also:* stick. (PE/T&D) 516-1995

pole body (rotating machinery) The part of a field pole around which the field winding is fitted. *See also:* asynchronous machine. (PE) [9]

pole-body insulation (rotating machinery) Insulation between the pole body and the field coil. *See also:* asynchronous machine. (PE) [9]

pole bolt (rotating machinery) A bolt used to fasten a pole to the spider. (PE) [9]

pole-cell insulation (rotating machinery) (salient pole) Insulation that constitutes the liner between the field pole coil and the salient pole body. *See also:* rotor. (PE) [9]

pole-changing winding (rotating machinery) A winding so designed that the number of poles can be changed by simple changes in the coil connections at the winding terminals. *See also:* rotor; stator. (PE) [9]

pole disagreement relay A protective relay designed to monitor currents in the three poles of a device, such as a circuit breaker, to verify the integrity of the electrical continuity of all its phases. (SWG/PE) C37.100-1992

pole end plate (rotating machinery) A plate or structure at each end of a laminated pole to maintain axial pressure on the laminations. *See also:* asynchronous machine. (PE) [9]

pole face (rotating machinery) The surface of the pole shoe or nonsalient pole forming one boundary of the air gap. *See also:* asynchronous machine; direct-current commutating machine. (PE) [9]

pole-face bevel (rotating machinery) The portion of the pole shoe that is beveled so as to increase the length of the radial air gap. *See also:* asynchronous machine. (PE) [9]

pole face, relay *See:* relay pole face.

pole-face shaping (rotating machinery) The contour of the pole shoe that is shaped other than by being beveled, so as to produce nonuniform radial length of the air gap. *See also:* rotor; stator. (PE) [9]

pole fixture A structure installed in lieu of a single pole to increase the strength of a pole line or to provide better support for attachments than would be provided by a single pole. Examples are A fixtures, H fixtures, etc. *See also:* open-wire pole line. (EEC/PE) [119]

pole guy A tension member having one end securely anchored and the other end attached to a pole or other structure that it supports against overturning. *See also:* tower. (T&D/PE) [10]

pole line A series of poles arranged to support conductors above the surface of the ground, and the structures and conductors supported thereon. *See also:* open-wire pole line. (EEC/PE) [119]

pole, offset marker *See:* offset marker pole.

pole piece A piece or an assembly of pieces of ferromagnetic material forming one end of a magnet and so shaped as to appreciably control the distribution of the magnetic flux in the adjacent medium. (Std100) 270-1966w

pole pitch (rotating machinery) The peripheral distance between corresponding points on two consecutive poles; also expressed as a number of slot positions. *See also:* stator; armature; rotor. (PE) [9]

pole, plumb marker *See:* plumb marker pole.

pole shoe The portion of a field pole facing the armature that serves to shape the air gap and control its reluctance. *Note:* For round-rotor fields, the effective pole shoe includes the teeth that hold the field coils and wedges in place. *See also:* stator; rotor; field pole. (PE) [9]

pole slipping (rotating machinery) The process of the secondary member of a synchronous machine slipping one pole pitch with respect to the primary magnetic flux. (PE) [9]

pole steps Devices attached to the side of a pole, conveniently spaced to provide a means for climbing the pole. *See also:* tower. (T&D/PE) [10]

pole strap *See:* positioning strap.

pole tip (rotating machinery) The leading or trailing extremity of the pole shoe. *See also:* stator; rotor. (PE) [9]

pole-top cover *See:* insulator cover.

pole-type regulator A regulator that is designed for mounting on a pole or similar structure. (PE/TR) C57.15-1999

pole-type transformer (power and distribution transformers) A transformer which is suitable for mounting on a pole or similar structure. (PE/TR) C57.12.80-1978r

pole-unit mechanism (of a switching device) That part of the mechanism that actuates the moving contacts of one pole. (SWG/PE) C37.100-1992

pole-zero cancellation (1) The pole-zero adjustment on the shaping amplifier adjusts the zero location of the pole-zero network to cancel exactly the preamplifier output pole and thus provide single-pole (i.e., no under or overshoot) response of the signal pulse at the amplifier output. This operation converts the long-tailed preamplifier pulse to a short-tailed pulse suitable for signal optimization and subsequent pulse-height analysis. Proper pole-zero cancellation is an absolute necessity to prevent spectral degradation at moderate (2000 s^{-1}) rates. (NI) N42.14-1991

(2) A technique used to cancel out the effects of a singularity in an amplifier's transfer function in order to effect a mono-

tonic return of signal pulses to the baseline. (NPS/NID) 759-1984r

policies (safety systems equipment in nuclear power generating stations) Management directives that describe the organization, principles, plans, or courses of action. (PE/NP) 600-1983w

poling (1) The process by which a direct-current electric field exceeding the coercive field is applied to a multidomain ferroelectric to produce a net remanent polarization. *See also:* remanent polarization; ferroelectric domain; polarization. (UFFC) [21], 180-1986w

(2) (general) The adjustment of polarity. Specifically, in wire line practice, it signifies the use of transpositions between transposition sections of open wire or between lengths of cable to cause the residual crosstalk couplings in individual sections or lengths to oppose one another. *See also:* open-wire pole line. (EEC/PE) [119]

polishing (electroplating) The smoothing of a metal surface by means of abrasive particles attached by adhesive to the surface of wheels or belts. *See also:* electroplating. (EEC/PE) [119]

Polish notation *See:* prefix notation.

poll (data transmission) A flexible, systematic method, centrally controlled for permitting stations on a multipoint circuit to transmit without contending for the line. (PE) 599-1985w

poll/final bit A bit set by the BCC to "1" to solicit a response from a DCC. The P/F bit is set to "1" by the DCC to indicate that the final frame of the message has been transmitted. (EMB/MIB) 1073.3.1-1994

poll function check Accomplished when analog function is performed with all remotes. A check of master and remote station equipment by exercising a predefined component or capability. *See also:* analog function check. (SUB/PE) C37.1-1994

polling (1) (supervisory control, data acquisition, and automatic control) (data request) The process by which a data acquisition system selectively requests data from one or more of its remote terminals. A remote terminal may be requested to respond with all, or a selected portion of, the data available. (SWG/PE/SUB) C37.100-1992, C37.1-1994

(2) A technique for sharing a multiple-access transmission medium, where devices cannot transmit until they have received implicit or explicit permission. *See also:* centralized polling; distributed polling. (C) 610.7-1995

(3) A scheduling scheme whereby the local process periodically checks until the prespecified events (*e.g.*, read, write) have occurred. (C) 1003.5-1999

(4) (supervisory control, data acquisition, and automatic control) (data request) *See also:* supervisory control.

polling supervisory system (station control and data acquisition) A system in which the master interrogates each remote to ascertain if there has been a change since the last interrogation. Upon detection of a change the master may request data immediately. (PE/SUB) C37.100-1992, C37.1-1994

polychlorinated biphenyl (liquid-filled power transformers) Any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances that contains such substance $\geq$50 parts per million (ppm) dry weight basis. Examples: PCB liquids and nonliquids. (LM/C) 802.2-1985s

polychlorinated biphenyl article (liquid-filled power transformers) Any manufactured article, other than a PCB container that contains PCBs and whose surface(s) has been in direct contact with PCBs. Examples: PCB large high- and low-voltage capacitors; PCB transformer; PCB cooler motor. (LM/C) 802.2-1985s

polychlorinated biphenyl article container (liquid-filled power transformers) Any package, can bottle, bag, barrel, drum, tank, or other device used to contain PCB articles or PCB equipment, and whose surface(s) has not been in direct contact with PCBs. Examples: Shipping or storage cartons for capacitors. (LM/C) 802.2-1985s

polychlorinated biphenyl container (liquid-filled power transformers) Any package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs or PCB articles and whose surface(s) has been in direct contact with PCBs. Examples: Bottle, barrel, drum, or box. (LM/C) 802.2-1985s

polychlorinated biphenyl contaminated electrical equipment (liquid-filled power transformers) Any electrical equipment, including but not limited to transformers (including those used in railway locomotives and self-propelled cars), capacitors, circuit breakers, reclosers, voltage regulators, switches (including sectionalizers and motor starters), bushings, electromagnets, and cable, that contain 50 parts per million (ppm) or greater PCBs but less than 500 ppm PCB. Oil-filled electrical equipment other than circuit breakers, reclosers, and cable whose PCB concentration is unknown must be assumed to be PCB-contaminated electrical equipment. Examples: Some oil-filled units; some retrofilled units. (LM/C) 802.2-1985s

polychlorinated biphenyl equipment (liquid-filled power transformers) Any manufactured item, other than a PCB container, that contains a PCB article or other PCB equipment. Examples: Microwave oven, power-factor-corrected lighting ballast. (LM/C) 802.2-1985s

polychlorinated biphenyl item (liquid-filled power transformers) Any PCB article, PCB article container, PCB container, or PCB equipment that deliberately or unintentionally contains or has a part of it any PCB or PCBs at a concentration of 50 parts per million (ppm) or greater. Examples: PCB askarel contaminated transformer (mineral) oil, or coolants retrofilled to transformer formerly cooled with askarel. (LM/C) 802.2-1985s

polychlorinated biphenyl storage for disposal (liquid-filled power transformers) The facilities meet the following criteria:

a) Adequate roof and walls to prevent rain water from reaching the stored PCBs and PCB items.
b) An adequate floor that has continuous curbing with a minimum 6 inches high curb. The floor and curbing provide a containment volume equal to at least two times the internal volume of the largest PCB article or PCB container stored therein or 25% of the total internal volume of all PCB articles or PCB containers stored therein, whichever is greater.
c) No drain valves, floor drains, expansion joints, sewer lines, or other openings that would permit liquids to flow from the curbed area.
d) Floors and curbing constructed of continuous smooth and impervious materials, such as Portland cement, concrete, or steel, to prevent or minimize penetration of PCBs.
e) Not located at a site that is below the 100-year flood water elevation.

(LM/C) 802.2-1985s

polychlorinated biphenyl transformer Any transformer that contains 500 parts per million (ppm) PCB or greater. Examples: PCB askarel-insulated units; some oil-filled units; some retrofilled units. (LM/C) 802.2-1985s

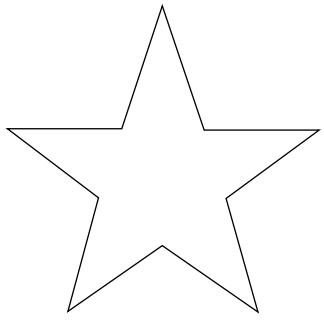
polycrystalline silicon A silicon layer that contains a multiplicity of crystals. This is the common form of silicon that is employed for transistor gates and interconnections on the surface of dielectric layers in MOS circuits. (ED) 1005-1998

Polyforth A dialect of FORTH. (C) 610.13-1993w

polygon A display element that consists of an area enclosed by a sequence of straight lines. (C) 610.6-1991w

polygon fill *See:* fill.

polyline A display element that consists of a set of connected lines.

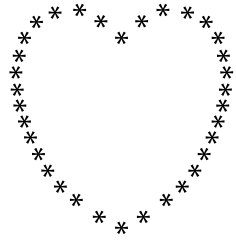


polyline

(C) 610.6-1991w

polyline attribute A characteristic of the line segments that make up a polyline. For example, color index, line type, line width. (C) 610.6-1991w

polymarker A display element that consists of a set of locations, each of which is indicated by a marker.



polymarker

(C) 610.6-1991w

polymarker attribute A characteristic of the markers that make up a polymarker. For example, color index, marker size, marker type. (C) 610.6-1991w

Polymorphic Programming Language An interactive, extensible language containing facilities for defining new data types and operators. (C) 610.13-1993w

polyphase (as applied to a relay) A descriptive term indicating that the relay is responsive to polyphase alternating electrical input quantities. *Note:* A multiple-unit relay with individual units responsive to single-phase electrical inputs is not a polyphase relay even though the several single-phase units constitute a polyphase set. (SWG/PE) C37.100-1992

polyphase ac fields (1) Fields whose space components may not be in phase. These fields will be produced by polyphase power lines. The field at any point can be described by the field ellipse—that is, by the magnitude and direction of the semimajor axis and the magnitude and direction of its semiminor axis. *Note:* Such fields are sometimes referred to as being elliptically polarized. Certain power line geometries can produce circularly polarized fields. For polyphase power lines, the electric field at large distances ($\geq$15 m) away from the outer phases (conductors) can frequently be considered a single-phase field because the minor axis of the electric field ellipse is only a fraction ($<$10%) of the major axis when measured at a height of 1 m above ground level. *See also:* electric field strength. (T&D/PE) 644-1994

(2) Fields whose space components may not be in time phase with each other. These fields will be the transversal fields produced by polyphase power lines. The field at any point can be described by the field ellipse; i.e., the magnitude and direction of the major semi-axis and the magnitude and direction of the minor semi-axis. The magnitude of the field strength is the magnitude of the major semi-axis. *Note:* For polyphase power lines, the electric field at a distance of 15 m or more away from the outer phases (conductors) can frequently be considered a single-phase field because the minor axis of the electric-field ellipse is only a fraction (less than 10%) of the major axis when measured at a height of 1 m. Similar remarks apply for the magnetic field. *See also:* ac electric field strength. (T&D/PE) 539-1990

polyphase circuit An alternating-current circuit consisting of more than two intentionally interrelated conductors that enter (or leave) a delimited region at more than two terminals of entry and that are intended to be so energized that in the steady state the alternating voltages between successive pairs of terminals of entry of the phase conductors, selected in a systematic chosen sequence, have:

a) the same period,
b) definitely related and usually equal amplitudes, and
c) definite and usually equal phase differences. If a neutral conductor exists, it is intended also that the voltages from the successive phase conductors to the neutral conductor be equal in amplitude and equally displaced in phase.

Note: For all polyphase circuits in common use except the two-phase three-wire circuit, it is intended that the voltage amplitudes and the phase differences of the systematically chosen voltages between phase conductors be equal. For a two-phase three-wire circuit it is intended that voltages between two successive pairs of terminals be equal and have a phase difference of p.2 radians, but that the voltage between the third pair of terminals have an amplitude $(2)^{1.2}$ times as great as the other two, and a phase difference from each of the other two of 3 p.4 radians. *See also:* zig-zag connection of polyphase circuits. (Std100) 270-1966w

polyphase code A pulse compression waveform in which a long pulse is subdivided into many subpulses and the phase of each subpulse is chosen with a quantization less than π radians. The Frank polyphase code is an example in which the phases are selected so as to obtain a discrete version of the continuous analog linear frequency-modulation waveform. (AES) 686-1997

polyphase machine (rotating machinery) A machine that generates or utilizes polyphase alternating-current power. These are usually three-phase machines with three voltages displaced 120 electrical degrees with respect to each other. *See also:* asynchronous machine. (PE) [9]

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

polyphase symmetrical set (1) (polyphase voltages) A symmetrical set of polyphase voltages in which the angular phase difference between successive members of the set is not zero, π radians, or a multiple thereof. The equations of symmetrical set of polyphase voltages represent a polyphase symmetrical set of polyphase voltages if k/m is not zero, 1/2, or a multiple thereof. (The symmetrical set of voltages represented by the equations of symmetrical set of polyphase voltages may be said to have polyphase symmetry if k/m is not zero, 1/2, or a multiple of 1/2). *Note:* This definition may be applied to a two-phase four-wire or five-wire circuit if m is considered to be 4 instead of 2. It is not applicable to a two-phase three-wire circuit. (Std100) 270-1966w

(2) (polyphase currents) This definition is obtained from the corresponding definitions for voltage by substituting the word current for voltage, the symbol I for E, and β for α wherever they appear. The subscripts are unaltered. (Std100) 270-1966w

polyphase synchronous generator A generator whose field circuits are arranged so that two or more symmetrical alternating electromotive forces with definite phase relationships are produced at the terminals. Polyphase synchronous generators are usually two-phase, producing two electromotive forces displaced 90 electrical degrees apart, or three-phase, producing three electromotive forces displaced 120 electrical degrees apart. (Polyphase generators used for marine services are generally three phase.) (IA/MT) 45-1998

polyplastic A synonym for polyethylene-coated, nylon-reinforced hose, usually considered to be nonconductive. (In

terms of this guide, the hose is used to carry water.) (T&D/PE) 957-1995

polyplexer Equipment combining the functions of duplexing and lobe switching. (AES/RS) 686-1990

poly-sol Plastic additive used in some washing applications to break down surface adhesion. (T&D/PE) 957-1987s

polyvinyl chloride An insulator in cable coatings and coaxial cable foam compositions. (C) 610.7-1995

pondage (power operations) Hydroreserve and limited storage capacity that provides only daily or weekly regulation of streamflow. (PE/PSE) 858-1987s

pondage station A hydroelectric generating station with storage sufficient only for daily or weekend regulation of flow. *See also:* generating station. (T&D/PE) [10]

p-on-n solar cells (photovoltaic power system) Photovoltaic energy-conversion cells in which a base of n-type silicon (having fixed positive holes in a silicon lattice and electrons that are free to move) is overlaid with a surface layer of p-type silicon (having fixed electrons in a silicon lattice and positive holes that are free to move). (AES) [41]

pool cathode A cathode at which the principal source of electron emission is a cathode spot on a metallic pool electrode. (ED) [45]

pool-cathode mercury-arc converter A frequency converter using a mercury-arc pool-type discharge device. (IA) 54-1955w, 169-1955w

pool rectifier A gas-filled rectifier with a pool cathode, usually mercury. (ED) [45], [84]

pool tube A gas tube with a pool cathode. *See also:* electronic controller. (ED) [45]

POP *See:* point of presence.

pop *See:* pull.

populate *See:* load.

population (1) (data management) The number of records in a file or database. (C) 610.5-1990w

(2) (utility power systems) Transformers that have given common specific characteristics. (PE/TR) C57.117-1986r

population, conceptual *See:* conceptual population.

population inversion (laser maser) A nonequilibrium condition of a system of weakly interacting particles (electronics, atoms, molecules, or ions) which exists when more than one-half of the particles occupy the higher of two energy states. (LEO) 586-1980w

pop-up menu (1) A menu that is brought into view as a result of a selection action other than choosing a menu-bar label. *Contrast:* pull-down menu. (PE/NP) 1289-1998

(2) A menu that appears outside of menu bar when requested, usually as the result of pressing BMenu or KMenu. (C) 1295-1993w

pores (electroplating) Micro discontinuities in a metal coating that extend through to the base metal or underlying coating. *See also:* electroplating. (LEO) 586-1980w

Port A Port Object. Context may indicate that the Port Object is of a specific class. (IM/ST) 1451.1-1999

port (1) (electronic devices or networks) A place of access to a device or network where energy may be supplied or withdrawn or where the device or network variables may be observed or measured. *Notes:* 1. In any particular case, the ports are determined by the way the device is used and not by its structure alone. 2. The terminal pair is a special case of a port. 3. In the case of a waveguide or transmission line, a port is characterized by a specified mode of propagation and a specified reference plane. 4. At each place of access, a separate port is assigned to each significant independent mode of propagation. 5. In frequency changing systems, a separate port is also assigned to each significant independent frequency response. *See also:* network analysis; optoelectronic device; waveguide. (ED/IM/HFIM) [46], [45], [40]

(2) (rotating machinery) An opening for the intake or discharge of ventilating air. (PE) [9]

(3) (rotating machinery) (for a waveguide component) A means of access characterized by a specified reference plane and a specified propagating mode in a waveguide which permits power to be coupled into or out of a waveguide component. *Note:* At low frequencies the port is synonymous with a terminal pair. 2. To each propagating mode at a specified reference plane there corresponds a distinct port. (MTT) 146-1980w

(4) (broadband local area networks) An electrical interface that has defined operating boundaries. The specific references within IEEE Std 802.7-1989 assume ports to be 75 Ω transmission line interfaces that have an associated connector to which the signals pass. (LM/C) 802.7-1989r

(5) A source or destination of data transferred by a Data Transfer class command into and/or out of an S-module. A port may be an on-module memory, on-module interface, a peripheral attached to a module, or some other mechanism to/from which data is passed.Within IEEE Std 1149.5-1995, a port is defined by a module address, a port ID meaningful to the MTM-Bus interface logic of that module, and the semantics and structure of packets by which data can be conveyed to and/or from that port. This latter often entails some description of the application to/from which data are passed. A port is selected/accessed/addressed via a Data Transfer class command. (TT/C) 1149.5-1995

(6) The physical interconnection point or an access point for a communication link. (C) 610.7-1995

(7) An input or output connection between a peripheral device and a computer. *See also:* parallel port; serial port; mouse port; input-output port. (C) 610.10-1994w

(8) A physical layer entity in a node that connects to either a cable or backplane and provides one end of a physical connection with another node. (C/MM) 1394-1995

(9) A signal interface provided by token ring stations, passive concentrator lobes, active concentrator lobes, or concentrator trunks that is generally terminated at a media interface connector (MIC). Ports may or may not provide physical containment of channels. *See also:* Bridge Port. (C/LM/C/LM) 802.1G-1996, 8802-5-1998

(10) An interface point connecting a communications channel and a device. (PE/SUB) 1379-1997

(11) A segment or Inter-Repeater Link (IRL) interface of a repeater unit. (C/LM) 802.3-1998

(12) A conceptual point at which a cell or a hierarchical design unit makes its interface available to higher levels in the design hierarchy. (C/DA) 1481-1999

(13) An abstraction of an access point to network communications. (IM/ST) 1451.1-1999

(14) The part of the physical layer (PHY) that allows connection to one other node. (C/MM) 1394a-2000

(15) A physical entity that allows import or export of one or more cartridges from a library. (C/SS) 1244.1-2000

(16) *See also:* link interface. (C/BA) 1355-1995

(17) *See also:* Bridge Port. (C/LM) 802.1G-1996

portability (1) (software) The ease with which a system or component can be transferred from one hardware or software environment to another. *Synonym:* transportability. *See also:* machine independent. (C) 610.12-1990

(2) (application software) The ease with which application software and data can be transferred from one application platform to another. (C/PA) 14252-1996

(3) The capability of being moved between differing environments without losing the ability to be applied or processed. (ATLAS) 1232-1995

(4) The capability of being read and/or interpreted by multiple systems. (SCC20) 1232.1-1997

(5) The ease with which software can be transferred from one system or environment to another. A relative measure of effort, inversely proportional to the level of modification required for software to be transferred from one system or environment to another. (SCC20) 1226-1998

portable (x-ray) X-ray equipment designed to be hand-carried. (NEC/NESC) [86]

portable appliance An appliance which is actually moved or can easily be moved from one place to another in normal use. For the purpose of this article, the following major appliances other than built-in are considered portable if cord-connected; refrigerators, gas range equipment, clothes washers, dishwashers without booster heaters, or other similar appliances. *See also:* appliance. (NESC/NEC) [86]

portable battery A storage battery designed for convenient transportation. *See also:* battery. (EEC/PE) [119]

portable character set The set of characters described in 2.4 that is supported on all conforming systems. This term is contrasted against the smaller *portable filename character set*. (C/PA) 9945-2-1993

portable character string A sequence of characters from the portable character set. Within software definition files of exported catalogs, all such strings shall be encoded using IRV. (C/PA) 1387.2-1995

portable computer A personal computer that is designed and configured to permit transportation as a piece of handheld luggage. *Note:* U.S. Federal regulations limit use of the term "portable" to objects weighing no more than 21 pounds. *See also:* notebook computer; transportable computer; hand-held computer; laptop computer. (C) 610.2-1987, 610.10-1994w

portable concentric mine cable A double-conductor cable with one conductor located at the center and with the other conductor strands located concentric to the center conductor with rubber or synthetic insulation between conductors and over the outer conductor. *See also:* mine feeder circuit. (EEC/PE) [119]

portable filename character set The set of characters from which portable filenames are constructed. For a filename to be portable across conforming implementations it shall consist only of the following characters:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

0 1 2 3 4 5 6 7 8 9 . _ -

The last three characters are the period, underscore, and hyphen characters, respectively. The hyphen shall not be used as the first character of a portable filename. Upper- and lowercase letters shall retain their unique identities between conforming implementations. In the case of a portable pathname, the slash character may also be used. (C/PA) 9945-1-1996, 9945-2-1993, 1003.5-1999

portable identifier character set The set of characters from which portable identifiers are constructed. This set shall consist only of the following characters:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

0 1 2 3 4 5 6 7 8 9 . _ ( ) -

(C/PA) 2003-1997

portable lighting (illuminating engineering) Lighting involving equipment designed for manual portability. (EEC/IE) [126]

portable luminaire (illuminating engineering) A lighting unit which is not permanently fixed in place. (EEC/IE) [126]

portable mine blower A motor-driven blower to provide secondary ventilation into spaces inadequately ventilated by the main ventilating system and with the air directed to such spaces through a duct. (EEC/PE) [119]

portable mine cable An extra-flexible cable, used for connecting mobile or stationary equipment in mines to a source of electric energy when permanent wiring is prohibited or impracticable. *See also:* mine feeder circuit. (EEC/PE) [119]

portable mining-type rectifier transformer A rectifier transformer that is suitable for transporting on skids or wheels in the restrictive areas of mines. *See also:* rectifier transformer. (Std100) C57.18-1964w

portable parallel duplex mine cable A double or triple-conductor cable with conductors laid side by side without twisting, with rubber or synthetic insulation between conductors and around the whole. The third conductor, when present, is a safety ground wire. *See also:* mine feeder circuit. (EEC/PE) [119]

portable pathname character set The set of characters from which portable pathnames are constructed. The set contains all the characters of the portable filename set, plus the character slash (/). (C) 1003.5-1999

portable platforms A platform temporarily installed on a pole or tower. The platforms are available in various lengths and materials. They may be fixed or may pivot. The platform may have an anchorage point for a positioning strap. (T&D/PE) 1307-1996

portable shunt (direct-current instrument shunts) An instrument shunt with insulating base which may be laid on, or fastened to, any flat surface. It may be used also for switchboard applications where the current is relatively low and connection bars are not used. (PE/PSIM) 316-1971w

portable standard watthour meter A portable meter, principally used as a standard for testing other meters. It is usually provided with several current and voltage ranges and with a readout indicating revolutions and fractions of a revolution of the rotor. *Note:* Electronic portable standards not using a rotor may have a readout indicating equivalent revolutions and fractions of revolutions, or other units such as percentage registration. (ELM) C12.1-1982s

portable station (1) (mobile communication) A mobile station designed to be carried by or on a person. Personal or pocket stations are special classes of portable stations. *See also:* mobile communication system. (VT) [37]

(2) A type of station that may be moved from location to location, but that only uses network communications while at a fixed location. (C/LM) 8802-11-1999

portable traffic control light (illuminating engineering) A signalling light designed for manual portability that produces a controllable distinctive signal for purposes of directing aircraft operations in the vicinity of an aerodrome. (EEC/IE) [126]

portable transmitter A transmitter that can be carried on a person and may or may not be operated while in motion. *Notes:* 1. This has been called a transportable transmitter, but the designation portable is preferred. 2. This includes the class of so-called walkie-talkies, handy-talkies, and personal transmitters. *See also:* radio transmission; transportable transmitter; radio transmitter. (AP/BT/ANT) 145-1983s, 182A-1964w

portable X- or gamma-radiation survey instrument (radiation survey instruments) An instrument with a self-contained energy source (for example, batteries) designed to measure exposure rate while being carried. Such instruments may also have the capability to measure integral exposure, but instruments with the capability of measuring integral exposure only are specifically are specifically excluded from this definition. (NI) N13.4-1971w

portal The logical point at which medium access control (MAC) service data units (MSDUs) from a non-IEEE 802.11 local area network (LAN) enter the distribution system (DS) of an extended service set (ESS). (C/LM) 8802-11-1999

port difference (hybrid) A port that yields an output proportional to the difference of the electric field quantities existing at two other ports of the hybrid. *See also:* waveguide. (IM/HFIM) [40]

PORT ID packet The first DATA packet transferred in a Data Transfer class message. This packet contains the identifier (Port Identifier) by which means a port is selected for the remainder of the message. (TT/C) 1149.5-1995

Port Object Any Object whose class is `IEEE1451_SubscriberPort` or a subclass thereof or a subclass of `IEEE1451_BasePort`. (IM/ST) 1451.1-1999

port protection system A computer security mechanism used to protect dial-up communication lines from unauthorized use, often requiring special passwords or using call-back procedures. *Synonym:* secure modem. (C) 610.7-1995

portrait image *See:* cine-oriented image.

portrait orientation A page orientation of a display surface having greater height than width. *Note:* Derived from portraits of people, which are usually vertical in format. *Contrast:* landscape orientation. (C) 610.10-1994w

port signal (data transmission) The signal used to telemeter the real time occurrence of polarity reversals of a power voltage or current. The signal may be a pulse train, a square voltage wave, a frequency shift keying (FSK) tone or an FSK carrier wave. Use is generally for frequency or phase-angle telemetering. (PE) 599-1985w

port sum (hybrid) A port that yields an output proportional to the sum of the electric-field quantities existing at two other ports of the hybrid. *See also:* waveguide. (IM/HFIM) [40]

port-to-port time The elapsed time between the application of a stimulus to an input interface and the appearance of the response at an output interface. *See also:* think time; response time; turnaround time. (C) 610.12-1990

Port Transfer Error A port-specific error indicating some failure with relation to transmission of command or data to/from a currently selected port. (TT/C) 1149.5-1995

Port Transfer Error (PTE) bit A bit in the Bus Error register of all S-modules. An S-module sets this bit to indicate that the port selected by the command in the current message has reported a Data Transfer Port Error. Such errors will be found defined in the port documentation of specific S-modules. The acronym stands for "Port Transfer Error". (TT/C) 1149.5-1995

POSH *See:* permutation on subject headings; permutation on subject headings index.

position (1) (FASTBUS acquisition and control) The location of a module in a crate. The position number corresponds to the geographical address. (NID) 960-1993

(2) (navigation) (navigation aids) The location of a point with respect to a specified or implied coordinate system. (AES/GCS) 172-1983w

(3) (A) (within a string) The ordinal position of one element of a string relative to another. **(B) (within an attribute)** The ordinal position of one value relative to another. (C/PA) 1328-1993, 1224-1993, 1327-1993

(4) (navigation aids) (navigation) *See also:* digit place. (C) 1084-1986w

(5) (navigation aids) (navigation) *See also:* punch position; sign position.

positional crosstalk (multibeam cathode-ray tubes) The variation in the path followed by an one electron beam as the result of a change impressed on any other beam in the tube. (ED) 161-1971w

positional notation (A) A number representation that makes use of an ordered set of digits, such that the value contributed by each digit depends on its position as well as on the digit value. *Note:* The Roman numeral system for example, does not use positional notation. *Synonym:* positional representation. *See also:* binary system; binary numeration system; decimal system; decimal numeration system; biquinary numeration system; Gray code. **(B)** One of the schemes for representing numbers, characterized by the arrangement of digits in sequence, with the understanding that successive digits are to be interpreted as coefficients of successive powers of an integer called the base (or radix) of the number system. *Notes:* 1. In the binary number system the successive digits are interpreted as coefficients of the successive powers of the base two, just as in the decimal number system they relate to successive powers of the base ten. 2. In the ordinary number systems each digit is a character that stands for zero or for a positive integer smaller than the base. 3. The names of the number systems with bases from 2 to 20 are: binary, ternary, quaternary, quinary, senary, septenary, octonary (also octal), novenary, decimal, unidecimal, duodecimal, terdenary, quaterdenary, quindenary, sexadecimal (also hexadecimal), septendecimal, octodenary, novendenary, and vicenary. The sexagenary number system has the base 60. The commonly used alternative of saying base-3, base-4, etc., in place of ternary, quaternary, etc., has the advantage of uniformity and clarity. 4. In the most common form of positional notation, the expression $\pm a_n a_{n-1} \ldots a_2 a_1 a_0 \cdot a_{-1} a_{-2} \ldots a_{-m}$ is an abbreviation for the sum

$$\pm \sum_{i=-m}^{n} a_i r^i$$

where the point separates the positive powers from the negative powers, the a_i are integers ($0 \leq a_i < r$) called digits, and r is an integer, greater than one, called the base (or radix). *See also:* radix; base. **(C)** A number-representation system having the property that each number is represented by a sequence of characters such that successive characters of the sequence represent integral coefficients of accumulated products of a sequence of integers (or reciprocals of integers) and such that the sum of these products, each multiplied by its coefficient, equals the number. Each occurrence of a given character represents the same coefficient value. *Note:* The biquinary system is an example of (C). **(D)** A number-representation system such that if the representations are arranged vertically in order of magnitude with digits of like significance in the same column, then each column of digits consists of recurring identical cycles (for numbers sufficiently large in absolute value) whose length is an integral multiple of the cycle length in the column containing the next-less-significant digits. *Note:* (B), (C), and (D) are not mutually exclusive. The biquinary system is an example of (C) and (D); whereas the Gray code system is an example of (D) only. The binary and decimal systems are examples of (B), (C), and (D). (C) 162-1963, [20], 270-1966

positional parameter In the shell command language, a parameter denoted by a single digit or one or more digits in curly braces. (C/PA) 9945-2-1993

positional representation *See:* positional notation.

positional response (close-talking pressure-type microphone) The response-frequency measurements conducted with the principal axis of a microphone collinear with the axis of the artificial voice and the combination of microphone and artificial voice placed at various angles to the horizontal plane. *Note:* Variations in positional response of carbon microphones may be due to gravitational forces. (SP) 258-1965w

positional servomechanism (1) In an analog computer, a servomechanism in which a mechanical shaft is positioned, usually in the angle of rotation, in accordance with one or more input signals. *Note:* Frequently, the shaft is positioned (excluding transient motion) in a manner linearly related to the value of the input signal. *See also:* repeater servomechanism; servomechanism. (C) 610.10-1994w

(2) A servomechanism in which a mechanical shaft is positioned, usually in the angle of rotation, in accordance with one or more input signals. *Note:* Frequently, the shaft is positioned (excluding transient motion) in a manner linearly related to the value of the input signal. However, the term also applies to any servomechanism in which a loop input signal generated by a transmitting transducer can be compared to a loop feedback signal generated by a compatible or identical receiving transducer to produce a loop error signal that, when reduced to zero by movement of the receiving transducer, results in a shaft position related in a prescribed and repeatable manner to the position of the transmitting transducer. *See also:* repeater servomechanism; electronic analog computer. (C) 165-1977w

position changing mechanism (power system device function numbers) A mechanism that is used for moving a main device from one position to another in an equipment; as, for example, shifting a removable circuit breaker unit to and from

the connected, disconnected, and test positions. (SUB/PE) C37.2-1979s

position-control system A control system that attempts to establish and.or maintain an exact correspondence between the reference input and the directly controlled variable, namely physical position. *See also:* feedback control system. (IA/ICTL/IAC) [60]

position index, P (illuminating engineering) A factor which represents the relative average luminance for a sensation at the borderline between comfort and discomfort (BCD), for a source located anywhere within the visual field. (EEC/IE) [126]

position indicating device (designator) A mechanical device that indicates, at the location the switch-operating mechanism, whether the contacts of the switch are in the open or closed position. (SWG/PE) C37.30-1992s

position indicator (elevators) A device that indicates the position of the elevator car in the hoistway. It is called a hall position indicator when placed at a landing or a car position indicator when placed in the car. *See also:* control. (PE/EEC) [119]

position influence (electric instruments) The change in the indication of an instrument that is caused solely by a position departure from the normal operating position. *Note:* Unless otherwise specified, the maximum change in the recorded value caused solely by an inclination in the most unfavorable direction from the normal operating position. *See also:* accuracy rating. (EEC/ERI/EMI/AII) [111], [112], [102]

positioning control system (1) (automatic control) A control system in which there is a predetermined relation between the actuating signal and the position of a final controlling element. *Note:* In a "proportional-position control system" there is a continuous linear relation between the value of the actuating signal and the position of a final controlling element. (PE/EDPG) [3]

(2) (numerically controlled machines) A system in which the controlled motion is required only to reach a given end point, with no path control during the transition from one end point to the next. (IA) [61]

positioning device system A system of equipment or hardware that, when used with its line-worker's body belt or full body harness, allows a worker to be supported on an elevated vertical surface, such as a pole or tower, and work with both hands free. (NESC) C2-1997

positioning strap A strap with snaphook(s) to connect to the D-rings of a line-worker's body belt or full body harness. Used as a positioning device (also known as pole strap or safety strap). (NESC/T&D/PE) C2-1997, 1307-1996

positioning time *See:* seek time.

position lights (illuminating engineering) The aircraft aeronautical lights which form the basic or internationally recognized navigation light system. *Note:* The system is composed of a red light showing from dead ahead to 110 degrees to the left, a green light showing from dead ahead to 110 degrees to the right, and a white light showing to the rear through 140 degrees. (EEC/IE) [126]

position light signal A fixed signal in which the indications are given by the position of two or more lights. (EEC/PE) [119]

position of the effective short (microwave switching tubes) The distance between a specified reference plane and the apparent short-circuit of the fired tube in its mount. *See also:* gas tube. (ED) 161-1971w

position readout (numerically controlled machines) Display of absolute position as derived from a position transducer. (IA) [61]

position seating A control scheme that uses the limit switch as the primary control for operation of a VAM. The limit switch controls the VAM by interrupting power to the motor contactor when the valve actuator has completed a predetermined number of revolutions. (PE/NP) 1290-1996

position-sensitive detector (1) A detector in which the centroid of the area of impact of ionizing radiation (at the surface of the detector) can be measured in one or two dimensions. (NPS) 300-1988r

(2) A detector in which the centroid of the area of impact of ionizing radiation can be determined from the signals issuing from its terminals. Depending on the design, position sensing can be in one or more dimensions. (NPS) 325-1996

position sensor or position transducer (numerically controlled machines) A device for measuring a position and converting this measurement into a form convenient for transmission. (IA) [61]

position stopping A control function that provides for stopping the driven equipment at a preselected position. *See also:* electric controller. (IA/ICTL/IAC) [60]

position switch (power system device function numbers) A switch that makes or breaks contact when the main device or piece of apparatus which has no device function number reaches a given position. (SUB/PE) C37.2-1979s

position-type telemeter *See:* ratio-type telemeter.

positive Pertaining to a voltage or charge that is associated with a deficiency of electrons. *Contrast:* negative. (C) 610.10-1994w

positive after-potential (electrobiology) Relatively prolonged positivity that follows the negative after-potential. *See also:* contact potential. (EMB) [47]

positive column (gas tube) The luminous glow, often striated, in a glow-discharge cold-cathode tube between the Faraday dark space and the anode. *See also:* gas tube. (ED) [45]

positive conductor A conductor connected to the positive terminal of a source of supply. *See also:* center of distribution. (T&D/PE) [10]

positive creep effect (semiconductor rectifiers) The gradual increase in reverse current with time, that may occur when a direct-current reverse voltage is applied to a semiconductor rectifier cell. *See also:* rectification. (IA) [12]

positive electrode (A) (primary cell) The cathode when the cell is discharging. The positive terminal is connected to the positive electrode. *See also:* electrolytic cell. **(B) (metallic rectifier)** The electrode to which the forward current flows within the metallic rectifying cell. *See also:* rectification. (PE/EEC) [119]

positive feedback (regeneration) (data transmission) The process by which a part of the power in the output circuit of an amplifying device reacts upon the input circuit in such a manner as to reinforce the initial power, thereby increasing the amplification. (PE) 599-1985w

positive glow A bright blue discharge appearing as a luminous sheet adhering closely and uniformly to the electrode. Positive glow appears at electric field strengths above those required for burst corona and onset streamers. The corona current of positive glow is essentially pulseless. *See also:* burst corona. (T&D/PE) 539-1990

positive grid *See:* retarding-field (positive-grid) oscillator.

positive-grid oscillator tube (Barkhausen tube) A triode operating under oscillating conditions such that the quiescent voltage of the grid is more positive than that of either of the other electrodes. (ED) [45]

positive logic An electronic logic system where the voltage representing one, active, or true has a more positive value than the voltage representing zero, inactive, or false. It is normally used in industrial and commercial control switching systems for safety reasons. (IM/ST) 1451.2-1997

positive logic convention The representation of the 1-state and the 0-state by the high (H) and low (L) levels, respectively. (GSD) 91-1984r

positive matrix (positive) A matrix with a surface like that which is to be ultimately produced by electroforming. (PE/EEC) [119]

positive modulation (in an amplitude-modulation television system) That form of modulation in which an increase in

brightness corresponds to an increase in transmitted power. *See also:* television. (EEC/PE) [119]

positive nonconducting period (rectifier element) The nonconducting part of an alternating-voltage cycle during which the anode has a positive potential with respect to the cathode. *See also:* power rectifier; rectification. (IA) [62]

positive noninterfering and successive fire-alarm system A manual fire-alarm system employing stations and circuits such that, in the event of simultaneous operation of several stations, one of the operated stations will take control of the circuit, transmit its full signal, and then release the circuit for successive transmission by other stations that are held inoperative until they gain circuit control. *See also:* protective signaling. (EEC/PE) [119]

positive onset streamers Streamers occurring at electric field strengths at and slightly above the corona inception voltage gradient. These appear as bright blue "brushes" increasing in length to several inches as the voltage gradient is increased. The associated current pulses are of appreciable magnitude, short duration (in the range of hundreds of nanoseconds), and low repetition rate (less than 1 kHz). *Note:* Occurrence of burst corona and positive onset streamers requires the same range of electric field strength. (T&D/PE) 539-1990

positive-phase-sequence reactance (rotating machinery) The quotient of the reactive fundamental component of the positive-sequence primary voltage due to the sinusoidal positive-sequence primary current of rated frequency, and the value of this current, the machine running at rated speed. *See also:* asynchronous machine. (PE) [9]

positive-phase-sequence relay A relay that responds to the positive-phase-sequence component of a polyphase input quantity. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

positive-phase-sequence resistance (rotating machinery) The quotient of the in-phase component of positive-sequence primary voltage corresponding to direct load losses in the primary winding and stray load losses due to sinusoidal positive-sequence primary current, and the value of this current, the machine running at rated speed. (PE) [9]

positive-phase-sequence symmetrical components (of an unsymmetrical set of polyphase voltages or currents of m phases) The set of symmetrical components that have the first phase sequence. That is, the angular phase lag from the first member of the set to the second, from every other member of the set to the succeeding one, and from the last member to the first, is equal to the characteristic angular phase difference, or $2\pi/m$ radians. The members of this set will reach their positive maxima uniformly in their designated order. The positive-phase-sequence symmetrical components for a three-phase set of unbalanced sinusoidal voltages ($m = 3$), having the primitive period, are represented by the equations

$$e_{a1} = (2)^{1/2}E_{a1}\cos(\omega t + \alpha_{a1})$$

$$e_{b1} = (2)^{1/2}E_{a1}\cos\left(\omega t + \alpha_{a1} - \frac{2\pi}{3}\right)$$

$$e_{c1} = (2)^{1/2}E_{a1}\cos\left(\omega t + \alpha_{a1} - \frac{4\pi}{3}\right)$$

derived from the equation of symmetrical components of a set of polyphase (alternating) voltages. Since in this case $r = 1$ for every component (of 1st harmonic) the third subscript is omitted. Then k is 1 for 1st sequence and s takes on the algebraic values 1, 2, and 3 corresponding to phases a, b, and c. The sequence of maxima occurs in the order a, b, c. *See also:* network analysis. (Std100) 270-1966w

positive plate (storage cell) The grid and active material from which current flows to the external circuit when the battery is discharging. *See also:* battery. (EEC/PE) [119]

positive-polarity lightning stroke A stroke resulting from a positively charged cloud that lowers positive charge to the earth. *See also:* direct-stroke protection. (T&D/PE) [10]

positive prebreakdown streamers Streamers occurring at electric field strengths above those required for onset streamers and positive glow. The discharge appears as a light blue filament with branching extending far into the gap. The associated current pulses have high magnitude, short duration (in the range of hundreds of nanoseconds), and low repetition rate (in the range of a few kilohertz). *Note:* When appearing as multiple discharges, these streamers are usually referred to as a "plume." When the plume occurs between an electrode and an airborne particle (snow, rain, aerosols, etc.) coming into near proximity or impacting on the electrode, it is referred to as an "impingement plume." When the plume occurs due to the disintegration of water drops resting on the electrode surface, it is referred to as a "spray plume." (T&D/PE) 539-1990

positive-sequence impedance The quotient of that component of positive-sequence rated-frequency voltage, assumed to be sinusoidal, that is due to the positive-sequence component of current, divided by the positive-sequence component of current. *See also:* asynchronous machine. (PE) [9]

positive-sequence resistance That value of resistance that, when multiplied by the square of the fundamental positive-sequence rated-frequency component of armature current and by the number of phases, is equal to the sum of the copper loss in the armature and the load loss resulting from that current, when the machine is operating at rated speed. Positive-sequence resistance is normally that corresponding to rated armature current. *Note:* Inasmuch as the load loss may not vary as the square of the current, the positive-sequence resistance applies accurately only near the current for which it was determined. (EEC/PE) [119]

positive shielding angle The shielding angle formed when the shield wire is located above and inside of the area occupied by the outermost conductors. *See also:* shielding angle; negative shielding angle. (SUB/PE) 998-1996

positive terminal (batteries) The terminal from which the positive electric charge flows through the external circuit to the negative terminal when the cell discharges. *Note:* The flow of electrons in the external circuit is to the positive terminal and from the negative terminal. *See also:* battery. (EEC/PE) [119]

POSIX Portable Operating Systems Interface. A family of standards, which define a standard operating system interface, plus the environment to support application portability at the source code level. (C/PA) 1003.23-1998

POSIX character A value of the type `POSIX_Character`. An array of POSIX characters, of type `POSIX_String` is called a ***POSIX** string*. (C) 1003.5-1999

POSIX Conformance Document (PCD) The conformance docuent required by a POSIX standard. (C/PA) 13210-1994, 2003.1-1992

POSIX Conformance Test Procedure (PCTP) The non-software procedures possibly used in conjunction with other test methods to measure conformance. (C/PA) 13210-1994, 2003.1-1992

POSIX Conformance Test Suite (PCTS) The collection of software possibly used in conjunction with other test methods to measure conformance. (C/PA) 13210-1994, 2003.1-1992

POSIX I/O The input/output operations defined by IEEE Std 1003.5-1992 and IEEE Std 1003.5b-1995. (C/PA) 1003.5-1992r, 1003.5b-1995

POSIX process A conceptual object, having an associated address space, one or more threads of control executing within that address space, a collection of system resources required for execution, and certain other attributes. A POSIX process is said to perform an action if any of the conceptual threads of control within it performs the action. A process is created by another process with procedures `POSIX_Process_Primitives.Start_Process`, `POSIX_Process_Primitives.Start_Process_Search`, or the function `POSIX_Unsafe_Process_Primitives.Fork`. The process that issues `Start_Process`, `Start_Process_Search`, or `Fork` is known as the parent process. The newly created process is the child process. (C) 1003.5-1999

POSIX SP *See:* POSIX Standardized Profile.

POSIX Standardized Profile (POSIX SP) A standardized profile that specifies the application of certain POSIX base standards in support of a class of applications and does not require any departure from the structure defined by the reference model for POSIX systems in this guide. (C/PA) 14252-1996

post (waveguide) A cylindrical rod placed in a transverse plane of the waveguide and behaving substantially as a shunt susceptance. *See also:* waveguide. (AP/ANT) [35]

post-accelerating (deflection) electrode (intensifier electrode) An electrode to which a potential is applied to produce post-acceleration. *See also:* electrode. (PE/PSR) C37.90-1978s

post acceleration (electron-beam tubes) Acceleration of the beam electrons after deflection. (ED) 161-1971w

postal telephone and telegraph Common carriers that are owned by the government and in which the government is the sole monopoly supplier of communication facilities. (C) 610.7-1995

postamble (1) In networking, a sequence of bits appended after the last bit of the frame check sequence. *See also:* preamble; abnormal preamble. (C) 610.7-1995

(2) A sequence of bits recorded at the end of each block on a magnetic medium for the purpose of synchronization when reading backward. *Contrast:* preamble. (C) 610.10-1994w

(3) In 10BROAD36, the bit pattern appended after the last bit of the Frame Check Sequence by the Medium Attachment Unit (MAU); the Broadband End-of-Frame Delimiter (BEOFD). (C/LM) 802.3-1998

postamble breakpoint *See:* epilog breakpoint.

post-arc current The current that flows through the arc gap of a circuit breaker immediately after current zero, and that has a substantially lower magnitude than the test current. (SWG/PE) C37.100-1992

post-condition A condition that is guaranteed to be true after a successful property request. (C/SE) 1320.2-1998

post-deflection acceleration *See:* post acceleration.

postdialing delay (1) The time interval between the end of dialing and a physical connection that ensures completion or correct call disposition, insofar as these are under switch control. For example, the time from seizure of a ringing circuit until the actual start of ringing (or audible ringing) is not included in postdialing delay. This interval excludes the timing period sometimes required to detect the end of dialing. The originating system delay objective excludes the outpulsing interval. The terminating system delay objective excludes the interval between seizure of a ringing circuit and the start of called-party alerting and excludes the interval between the start of called-party alerting and the initiation of the audible ring signal to the caller. (COM/TA) 973-1990w

(2) In an automatic telecommunications system that time interval between the receipt of the last called address digit from the calling station and the application of ringing to the called station. (COM) 312-1977w

post disconnect timing A timing interval (normally about 12 s in length), initiated when the called party goes on-hook, in which the established connection remains in place as long as the calling party continues to remain off-hook. (AMR/SCC31) 1390-1995, 1390.3-1999, 1390.2-1999

posted transaction A transaction in which the request and response are performed within different transactions. (C/BA) 1014.1-1994w

post emphasis *See:* de-emphasis.

post equalization *See:* de-emphasis.

post-fault (event) A qualifying term that refers to an interval beginning with the clearing of a fault. (SWG/PE) C37.100-1992

postfix notation (mathematics of computing) A method of forming mathematical expressions in which each operator is preceded by its operands. For example, A added to B and the result multiplied by C is expressed as AB + CX. *Synonyms:* suffix notation; reverse Polish notation. *Contrast:* infix notation; prefix notation. (C) 1084-1986w

post insulator (composite insulators) Intended to be loaded in tension, bending, or compression. The most common types are a horizontal line post where the post projects nearly horizontally from a pole and is loaded in flexure by the conductor, and a station post insulator used as a bus support in an outdoor substation. (T&D/PE) 987-1985w

postmortem dump (1) A dump that is produced upon abnormal termination of a computer program. *See also:* static dump; selective dump; memory dump; dynamic dump; snapshot dump; change dump. (C) 610.12-1990

(2) A static dump used for debugging purposes that is performed at the end of a machine run. (C) [85]

postorder traversal The process of traversing a binary tree in a recursive fashion as follows: the left subtree is traversed, then the right tree is traversed, then the root is visited. *Synonym:* endorder traversal. *Contrast:* preorder traversal; inorder traversal. *See also:* converse postorder traversal. (C) 610.5-1990w

postprocessor (1) (software) A computer program or routine that carries out some final processing step after the completion of the primary process; for example, a routine that reformats data for output. *Contrast:* preprocessor. (C) 610.12-1990

(2) (numerically controlled machines) A set of computer instructions that transform tool centerline data into machine motion commands using the proper tape code and format required by a specific machine control system. Instructions such as feedrate calculations, spindle-speed calculations, and auxiliary-function commands may be included. (IA) [61]

post puller An electric vehicle having a powered drum handling wire rope used to pull mine props, after coal has been removed, for the recovery of the timber. (EEC/PE) [119]

Postscript A page description language used in many laser printers. (C) 610.13-1993w

post, waveguide *See:* waveguide post.

POT *See:* point on tangent.

potential diagram (electrode-optical system) A diagram showing the equipotential curves in a plane of symmetry of an electron-optical system. *See also:* electron optics. (ED) [45], [84]

potential energy The work required to bring the system from an arbitrarily chosen reference configuration to the given configuration without change in other energy of the system. (Std100) 270-1966w

potential false-proceed operation The existence of a condition of vehicle or roadway apparatus in an automatic train control or cab-signal installation under which a false-proceed operation would have occurred had a vehicle approached or entered a section where normally a restrictive operation would occur. (EEC/PE) [119]

potential gradient (1) A vector of which the direction is normal to the equipotential surface, in the direction of decreasing potential, and of which the magnitude gives the rate of variation of the potential. (Std100) [84]

(2) *See also:* voltage gradient. (T&D/PE) 539-1990

potential hydro energy (power operations) (electric power supply) The possible aggregate energy obtainable over a specified period by practical use of the available stream flow and river gradient. (PE/PSE) 858-1987s, 346-1973w

potentially blocking operation An operation that is not allowed within a protected action, because it may be required to block the calling task. Certain operations are defined by the Ada language to be potentially blocking. (C) 1003.5-1999

potential master (1) A potential master is a module that is capable of participating in the control acquisition process and taking full control of the bus. A potential master may be in any of these states:

a) entrant;
b) free bystander;

c) inhibited bystander;
d) competitor;
e) withholder;
f) master elect;
g) master;
h) recompeting master.

(C/MM) 896.1-1987s

(2) A module capable of acquiring control of the bus through the control acquisition process. (C/BA) 896.4-1993w

potential profile A plot of potential as a function of distance along a specified path. (PE/PSIM) 81-1983

potential slave A module that is capable of being addressed by and is able to carry out transactions with the master. (C/MM) 896.1-1987s

potential source-rectifier exciter (1) (excitation systems for synchronous machines) An exciter whose energy is derived from a stationary alternating-current (ac) potential source and converted to direct current by rectifiers. The exciter includes the power potential transformers and power rectifiers which may be either noncontrolled or controlled, including gate circuitry. It is exclusive of input control elements. The source of ac power may come from the machine terminals or from a station auxiliary bus or a separate winding within the synchronous machine. (PE/EDPG) 421.1-1986r

(2) (synchronous machines) An exciter whose energy is derived from a stationary alternating current potential source and converted to direct current by rectifiers. *Note:* (1) The exciter includes the power potential transformers, where used, and power rectifiers which may be either noncontrolled or controlled, including gate circuitry. (2) It is exclusive of input control elements. (PE/EDPG) 421-1972s

potential transformer (1) (voltage transformer) An instrument transformer that is intended to have its primary winding connected in shunt with a power-supply circuit, the voltage of which is to be measured or controlled. *See also:* instrument transformer. (ELM) C12.1-1982s

(2) (power and distribution transformers) *See also:* fused-type voltage transformer; cascade-type voltage transformer; double-secondary voltage transformer; insulated-neutral terminal type voltage transformer; voltage transformer; rated secondary voltage; thermal burden rating of a voltage transformer; rated voltage. (PE/TR) C57.12.80-1978r

potential transformer, cascade-type A single high-voltage line-terminal potential transformer with the primary winding distributed on several cores with the cores electromagnetically coupled by coupling windings and the secondary winding on the core at the neutral end of the high-voltage winding. Each core is insulated from the other cores and is maintained at a fixed potential with respect to ground and the line-to-ground voltage. *See also:* instrument transformer. (PE/TR) C57.13-1978s

potential transformer, double-secondary One that has two secondary windings on the same magnetic circuit insulated from each other and the primary. Either or both of the secondary windings may be used for measurement or control. *See also:* instrument transformer. (PE/TR) C57.13-1978s

potential transformer, fused-type One that is provided with the means for mounting a fuse, or fuses, as an integral part of the transformer in series with the primary winding. *See also:* instrument transformer. (PE/TR) C57.13-1978s

potential transformer, grounded-neutral terminal type One that has the neutral end of the high-voltage winding connected to the case or mounting base. *See also:* instrument transformer. (PE/TR) C57.13-1978s

potential transformer, insulated-neutral terminal type One that has the neutral end of the high-voltage winding insulated from the case or base and connected to a terminal that provides insulation for a lower-voltage insulation class than required for the rated insulation class of the transformer. *See also:* instrument transformer. (PE/TR) C57.13-1978s

potential transformer, single-high-voltage line terminal One that has the line end of the primary winding connected to a terminal insulated from ground for the rated insulation class. The neutral end of the winding may be (1) insulated from ground but for a lower insulation class than the line end (insulated neutral) or (2) connected to the case or base (grounded neutral). *See also:* instrument transformer. (PE/TR) C57.13-1978s

potential transformer, two-high-voltage line terminals One that has both ends of the high-voltage winding connected to separate terminals that are insulated from each other, and from other parts of the transformer, for the rated insulation class of the transformer. *See also:* instrument transformer. (PE/TR) C57.13-1978s

potentiometer (1) (measurement techniques) An instrument for measuring an unknown electromotive force or potential difference by balancing it, wholly or in part, by a known potential difference produced by the flow of known currents in a network of circuits of known electrical constants. *See also:* instrument. (EEC/PE) [119]

(2) (analog computer) A resistive element with two end terminals and a movable contact. *See also:* attenuator. (C) 165-1977w

(3) A resistor with an adjustable sliding contact that functions as an adjustable voltage divider. *See also:* function potentiometer; servo potentiometer; parameter potentiometer. (C) 610.10-1994w, 165-1977w

potentiometer, follow-up *See:* follow-up potentiometer.

potentiometer, function *See:* function potentiometer.

potentiometer granularity (analog computer) The physical inability of a potentiometer to produce an output voltage that varies in other than discrete steps, due either to contacting individual turns of wire in a wire-would potentiometer or to discrete irregularities of the resistance element of composition or film potentiometers. (C) 165-1977w, 166-1977w

potentiometer, grounded *See:* grounded potentiometer.

potentiometer, linear *See:* linear potentiometer.

potentiometer, manual *See:* manual potentiometer.

potentiometer, multiplier *See:* multiplier potentiometer.

potentiometer, parameter *See:* parameter potentiometer.

potentiometer, servo *See:* servo potentiometer.

potentiometer set In an analog computer, a computer-control state that supplies the same operating potentiometer loading as under computing conditions and thus allows correct potentiometer adjustment. (C) 610.10-1994w, 165-1977w, 166-1977w

potentiometer, sine-cosine *See:* sine-cosine potentiometer.

potentiometer, tapered *See:* tapered potentiometer.

potentiometer, tapped *See:* tapped potentiometer.

potentiometer, ungrounded *See:* ungrounded potentiometer.

pothead A device that seals the end of a cable and provides insulated egress for the conductor or conductors. (PE/TR) [107], [108], 48-1975s

pothead body The part of a pothead that joins the entrance fitting to the insulator or to the insulator lid. *See also:* transformer; pothead. (PE/TR) [107], 48-1975s, [108]

pothead bracket or mounting plate The part of the pothead used to attach the pothead to the supporting structure. *See also:* transformer; pothead. (PE) 48-1975s

pothead bracket or mounting-plate insulator An insulator used to insulate the pothead from the supporting structure for the purpose of controlling cable sheath currents. *See also:* pothead; transformer. (PE) 48-1975s

pothead entrance fitting A fitting used to seal or attach the cable sheath, armor, or other coverings to the pothead. *See also:* pothead; transformer. (PE) 48-1975s

pothead insulator An insulator used to insulate and protect each conductor passing through the pothead. *See also:* pothead; transformer. (PE/TR) [107], [108], 48-1975s

pothead insulator lid The part of a multi-conductor pothead used to join two or more insulators to the body. *See also:* transformer; pothead. (PE/TR) [107], [108], 48-1975s

pothead mounting plate The part of the pothead used to attach the pothead to the supporting structure. *See also:* transformer. (PE/TR) [107], [108]

pothead mounting-plate insulator An insulator used to insulate the pothead from the supporting structure for the purpose of controlling cable sheath currents. *See also:* transformer. (PE/TR) [107], [108]

pothead sheath insulator An insulator used to insulate an electrically conductive cable sheath or armor from the metallic parts of the pothead in contact with the supporting structure for the purpose of controlling cable sheath currents. *See also:* pothead. (PE) 48-1975s

Potier reactance (rotating machinery) An equivalent reactance used in place of the primary leakage reactance to calculate the excitation on load by means of the Potier method. *Note:* It takes into account the additional leakage of the excitation winding on load and in the overexcited region; it is greater than the real value of the primary leakage reactance. It is useful for the calculation of excitation of the machine at other loads and power factors. The height of a Potier reactance triangle determines the reactance drop, and the reactance X_P is equal to the reactance drop divided by the current. The value of Potier reactance is that obtained from the no-load normal-frequency saturation curve: and normally with the excitation for rated voltage and current at zero power factor (overexcited), and at rated frequency. Approximate values of Potier reactance may be obtained from test load excitations at loads differing from rated load, and at power factors other than zero.The excitation results in the range from zero power factor overexcited to unity power factor are close enough to the test values for most practical applications. (PE) [9]

Potter horn A circular horn with one or more abrupt changes in diameter that excites two or more waveguide modes in order to produce a specified aperture illumination. (AP/ANT) 145-1993

potting (encapsulation) The sealing of components and associated conductors in a filter assembly with an insulating, thermally conductive material to exclude contaminants. (EMC) C63.13-1991

potty seat *See:* insulator lifter.

Poulsen arc (also Poulsen singing arc or signing arc) A type of arc-gap transmitting circuit that uses a resistance-capacitance (rc) circuit to tune the arc. This technique substantially reduces the bandwidth used by the arc-gap transmitter. (EMC) 140-1990r

poured joint (power cable joints) A joint insulated by the means of a hot or cold poured insulating medium which solidifies. (PE/IC) 404-1986s

powder *See:* explosives.

power (Φ) (1) (laser maser) The time rate at which energy is emitted, transferred, or received; usually expressed in watts (or in joules per second). (LEO) 586-1980w

(2) (used as an adjective) A general term used by reason of specific physical or electrical characteristics to denote application or restriction, or both, to generating stations, switching stations, or substations. (PE/SWG-OLD) C37.100-1992, C37.40-1993

(3) The rate of generating, transferring, or using energy. (PE/PSE) 858-1993w

(4) (fiber optics) *See also:* irradiance; radiant intensity; radiant power. 812-1984w

power—active The time average of the instantaneous power over one period of the wave. *Note:* For sinusoidal quantities in a two-wire circuit, it is the product of the voltage, the current, and the cosine of the phase angle between them. For nonsinusoidal quantities, it is the sum of all the harmonic components, each determined as above. In a polyphase circuit, it is the sum of the active powers of the individual phases. (ELM) C12.1-1988

power, active *See:* active power.

power amplification (1) The ratio of the power level at the output terminals of an amplifier to that at the input terminals. Also called power gain. *See also:* power gain; amplifier. (AP/ANT) 145-1983s

(2) (magnetic amplifier) The product of the voltage amplification and the current amplification. (MAG) 107-1964w

power—apparent For sinusoidal quantities in either single-phase or polyphase circuits, apparent power is the square root of the sum of the squares of the active and reactive powers. *Note:* This is, in general, not true for nonsinusoidal quantities. (ELM) C12.1-1988

power, apparent *See:* apparent power.

power, auxiliary *See:* auxiliary power.

power, available *See:* available power.

power, average phasor *See:* average phasor power.

power budget The minimum optical power available to overcome the sum of attenuation plus power penalties of the optical path between the transmitter and receiver calculated as the difference between the transmitter launch power (min) and the receive power (min). (C/LM) 802.3-1998

power cable Cable used to supply power to plant auxiliary system devices. The classifications for power cable are: low voltage and medium voltage. (PE/IC) 1185-1994

power capacitor An assembly of dielectric and electrodes in a container (case), with terminals brought out, that is intended to introduce capacitance into an electric power circuit. (T&D/PE) 18-1992

power capacity (waveguide) The maximum power which can be carried by the waveguide under a specified set of environmental and circuit conditions with a desired safety factor. (MTT) 146-1980w

power, carrier-frequency, peak pulse *See:* peak pulse power, carrier-frequency.

power-circuit limit switch A limit switch the contacts of which are connected into the power circuit. *See also:* switch. (IA/ICTL/IAC) [60]

power circuit protector (low-voltage ac power circuit protectors) An assembly consisting of a modified low-voltage power circuit breaker, which has no direct-acting tripping devices, with a current-limiting fuse in series with the load terminals of each pole. (SWG/PE) C37.100-1992, C37.29-1981r

power-closed car door or gate (elevators) A door or gate that is closed by a car-door or gate power closer or by a door or gate power operator. *See also:* elevator. (PE/EEC) [119]

power coefficient (attenuator) (characteristic insertion loss) Temporary and reversible variation in decibels when input power is varied from 20 dB below full rated power or lower to full rated power after steady-state condition has been reached. (IM/HFIM) 474-1973w

power, commercial *See:* commercial power.

power conditioning subsystem (PCS) (terrestrial photovoltaic power systems) The subsystem that converts the dc power from the array subsystem to dc or ac power that is compatible with system requirements. *See also:* array control. (PV) 928-1986r

power connection The connection between the heating cable and incoming power. (IA/PC) 515.1-1995

power control center (power operations) The location where power system operators monitor, analyze, or control power systems using digital or analog teleprocessing systems. (PE/PSE) 858-1987s

power correction capacitor Device that provides a capacitive load to offset the demand for lagging reactive power. (PE/EDPG) 1020-1988r

power dBm level Decibels relative to one milliwatt. This is the customary unit worldwide for measurement of telecommunications signal power. Zero dBm equals one milliwatt. (COM/TA) 1007-1991r

power density (*S*) (1) (control of system electromagnetic compatibility) (of an electromagnetic wave) Emitted power per unit cross-sectional area normal to the direction of propagation. (EMC) C63.12-1987

(2) (of a traveling wave) The time average of the Poynting vector. *Synonym:* power flux density. *See also:* spectral power density; spectral power flux density. (AP/PROP) 211-1997

(3) Power per unit area normal to the direction of propagation, usually expressed in units of watts per square meter (W/m^2) or, for convenience, units such as milliwatts per square centimeter (mW/cm^2) or microwatts per square centimeter ($\mu W/cm^2$). For plane waves, power density, electric field strength (E), and magnetic field strength (H) are related by the impedance of free space, i.e., 377 Ω. In particular,

$$S = \frac{E^2}{377} = 377\,H^2$$

where E and H are expressed in units of V/m and A/m, respectively, and S in units of W/m^2. Although many survey instruments indicate power density units, the actual quantities measured are E or E^2 or H or H^2. (NIR) C95.1-1999

(4) (fiber optics) *See also:* irradiance. 812-1984w

power-density spectrum A plot of power density per unit frequency as a function of frequency. (EMC) [53]

power detection That form of detection in which the power output of the detecting device is used to supply a substantial amount of power directly to a device such as a loudspeaker or recorder. *See also:* detection. (EEC/PE) [119]

power dissipation (light-emitting diodes) The time average product of current times voltage of the device. (ED) [127]

power distribution, underground cables *See:* cable bedding; aluminum-covered steel wire; cable separator; base ambient temperature.

power disturbance Any deviation from the nominal value (or from some selected thresholds based on load tolerance) of the input ac power characteristics. (IA/PSE) 1100-1999

power disturbance monitor Instrumentation developed specifically to capture power disturbances for the analysis of voltage and current measurements. (IA/PSE) 1100-1999

power divider (waveguide) A device for producing a desired distribution of power at a branch point. *See also:* waveguide. (AP/ANT) [35], [84]

power, effective radiated *See:* effective radiated power.

power elevator An elevator utilizing energy other than gravitational or manual to move the car. *See also:* elevator. (EEC/PE) [119]

power, emergency *See:* emergency power.

power factor (1) (electrical heating systems) The ratio of the circuit power (watts) to the circuit voltamperes. (IA/PC) 844-1991

(2) (converter characteristics) (self-commutated converters) (total) The ratio of the total active power in watts to the total apparent power in voltamperes (the product of root-mean-square [rms] voltage and rms current) on the ac (alternating current) side of the converter. *Note:* This definition includes the effect of harmonic components of current and voltage, as well as the effect of phase displacement between current and voltage. (IA/SPC) 936-1987w

(3) (harmonic control and reactive compensation of static power converters) (total) The ratio of the total power input in watts to the total voltampere input to the converter. *Notes:* 1. This definition includes the effect of harmonic components of current and voltage, the effect of phase displacement between current and voltage, and the exciting current of the transformer. Voltamperes are the product of root-mean-square (rms) voltage and rms current. 2. The power factor is determined at the ac line terminals of the converter. (IA/SPC) 519-1981s

(4) The ratio of total watts to the total root-mean-square (RMS) voltamperes.

$$F_P = \frac{\Sigma \text{ Watts per Phase}}{\Sigma \text{ RMS Voltamperes per Phase}} = \frac{\text{Active Power}}{\text{Apparent Power}}$$

Note: If the voltages have the same waveform as the corresponding currents, power factor becomes the same as phasor power factor. If the voltages and currents are sinusoidal and, for polyphase circuits, form symmetrical sets, $F_P = \cos(\alpha - \beta)$. *See also:* asynchronous machine. (PE/AES) [9], 270-1966w, [84], [41]

(5) (rectifier or rectifier unit) (thyristor converter) The ratio of the total watts input (total power input in watts) to the total voltampere input to the rectifier, rectifier unit or converter. *Notes:* 1. This definition includes the effect of harmonic components of current and voltage, the effect of phase displacement between the current and voltage, and the exciting current of the transformer. Voltampere is the product of root- mean square volts and root-mean-square amperes. 2. It is determined at the alternating-current line terminals of the thyristor converter or rectifier unit. *See also:* power rectifier; rectification. (IA/IPC) 444-1973w

(6) (rotating machinery) (dielectric) The cosine of the dielectric phase angle or the sine of the dielectric loss angle. (PE) [9]

(7) (insulation) (outdoor apparatus bushings) The ratio of the power dissipated in the insulation, in watts, to the product of the effective voltage and current in voltamperes, when tested under a sinusoidal voltage and prescribed conditions. *Note:* The insulation power factor is equal to the cosine of the phase angle between the voltage and the resulting current when both the voltage and current are sinusoidal. (PE/TR) 21-1976, C57.19.03-1996, C57.12.80-1978r

(8) (metering) The ratio of the active power to the apparent power. (ELM) C12.1-1988

(9) (thyristor) The ratio of the total watts to the total voltamperes. *Note:* This definition includes the effect of harmonic components of current and voltage, and the effect of phase displacement between current and voltage. (IA/IPC) 428-1981w

(10) (hydroelectric power plants) Ratio of real to total apparent power (kW/kVA) expressed as a decimal or percent. (PE/EDPG) 1020-1988r

(11) (dielectric) The cosine of the phase angle between a sinusoidal voltage applied across a dielectric (or combinations of dielectrics) and the resulting current through the dielectric system. (PE/PSIM) 62-1995

power factor adjustment clause (power operations) A clause in a rate schedule that provides for an adjustment in the billing if the customer's power factor varies from a specified reference. (PE/PSE) 858-1987s

power-factor angle The angle whose cosine is the power factor. *See also:* asynchronous machine. (PE) [9]

power factor, arithmetic *See:* arithmetic power factor.

power factor, coil Q *See:* coil *Q*.

power-factor-corrected mercury-lamp ballast A ballast of the multiple-supply type that has a power-factor-correcting device, such as a capacitor, so that the input current is at a power factor in excess of that of an otherwise comparable low-power-factor ballast design, but less than 90%, when the ballast is operated with center rated voltage impressed upon its input terminals and with a connected load, consisting of the appropriate reference lamp(s), operated in the position for which the ballast is designed. The minimum input power factor of such a ballast should be specifically stated. (EEC/LB) [97]

power factor, dielectric *See:* dielectric power factor.

power factor, displacement (1) (thyristor) The ratio of the active power of the fundamental wave, in watts, to the apparent power of the fundamental wave in voltamperes. This is the cosine of the phase angle by which the fundamental current lags the fundamental voltage. This is the power factor

as seen in utility metering by watthour and varhour meters assuming that the ac voltages are sinusoidal. (IA/IPC) 428-1981w

(2) (converter characteristics) (self-commutated converters) The displacement component of power factor; the ratio of the active power of the fundamental wave, in watts, to the apparent power of the fundamental wave, in volt-amperes. It is also equal to cosf1, the cosine of the phase displacement angle between the fundamental component of the voltage and current on the ac (alternating current) side of a converter. (IA/SPC) 936-1987w

(3) (A) The displacement component of power factor. **(B)** The ratio of the active power of the fundamental wave, in watts, to the apparent power of the fundamental wave, in volt-amperes. (IA/PSE) 1100-1999

power-factor influence (electric instruments) The change in the recorded value that is caused solely by a power-factor departure from a specified reference power factor maintaining constant power (or vars) at rated voltage, and not exceeding 120% of rated current. It is to be expressed as a percentage of the full-scale value. (EEC/ERI/AII) [111], [102]

power-factor meter A direct-reading instrument for measuring power factor. It is provided with a scale graduated in power factor. *See also:* instrument. (EEC/PE) [119]

power factor relay (power system device function numbers) A relay that operates when the power factor in an alternating-current (ac) circuit rises above or falls below a predetermined value. (SUB/PE) C37.2-1979s

power-factor tip-up (rotating-machinery stator-coil insulation) The difference between the power-factors measured at two different designated voltages applied to an insulation system, other conditions being constant. *Notes:* 1. Used mainly as a measure of discharges, and hence of voids, within the system at the higher voltage. 2. The incremental change in power factor divided by incremental change in voltage applied to an insulation system. 3. Tip-up tests may be made using dissipation factor (tan δ) instead of power factor. In this case the tip-up is often identified as Δ tan δ or delta tan delta. *See also:* asynchronous machine. (EM/PE) 286-1975w

power-factor tip-up test (rotating machinery) A test applied to insulation to determine the power-factor tip-up. *See also:* asynchronous machine. (PE) [9]

power factor, total *See:* total power factor.

power-factor-voltage characteristic (rotating machinery stator-coil insulation) The relation between the magnitude of the applied test voltage and the measured power factor of the insulation. *Note:* The characteristic is usually shown as a curve of power factor plotted against test voltage. *See also:* asynchronous machine. (EM/PE) 286-1975w

power-fail circuit A logic circuit that protects an operating program if primary power fails by informing the computer when power failure is imminent, initiating a routine that saves all volatile data. After power has been restored, the circuit initiates a routine that restores the data and restarts computer operations. (C) 610.10-1994w

power failure (emergency and standby power) Any variation in electric power supply that causes unacceptable performance of the user's equipment. (IA/PSE) 446-1995

power failure recovery A sequence of events that provides orderly control of system shutdown during a temporary power failure and start-up after power is restored. (C/MM) 1296-1987s

power feeder A feeder supplying principally a power or heating load. *See also:* feeder.

power-flow angle The angle (ϕ) between the direction of the power-flow vector and the direction of the propagation vector. (UFFC) 1037-1992w

power-flow vector Vector-characterizing energy propagation caused by a wave and giving magnitude and direction of power per unit-area propagating in the wave (i.e., analogous to Poynting vector). (UFFC) 1037-1992w

power flux density *See:* power density.

power frequency (1) The value of frequency used in the electrical power system, such as 50 Hz or 60 Hz. (EMC) C63.13-1991

(2) The frequency at which a device or system is designed to operate. (SWG/PE) C37.34-1994, C37.100-1992

power-frequency current-interrupting rating (surge arresters) (of an expulsion arrester) A designation of the range of the symmetrical root-mean-square fault currents of the system for which the arrester is designed to operate. An expulsion arrester is given a maximum current-interrupting rating and may also have a minimum current-interrupting rating. (PE/SPD) C62.1-1981s

power-frequency dew withstand voltage The rms voltage that can be applied to an insulator or a device, completely covered with condensed moisture, under specified conditions for a specified time without causing flashover or puncture. (SWG/PE) C37.40-1993

power-frequency dry withstand voltage The rms voltage that can be applied to a dry device under specified conditions for a specified time without causing flashover or puncture. (SWG/PE) C37.40-1993

power-frequency overvoltage A root-mean-square voltage in excess of the maximum (highest) system voltage that lasts longer than one cycle. (SPD/PE) C62.62-2000

power-frequency recovery voltage The power-frequency rms voltage that occurs across the terminals of an ac circuit-interrupting device after the interruption of the current and after the high-frequency transients have subsided. (SWG/PE) C37.40-1993

power-frequency sparkover voltage (1) The rms value of the lowest power-frequency sinusoidal voltage that will cause sparkover when applied across the terminals of an arrester. (SPD/PE) C62.11-1999

(2) The root-mean-square value of the lowest power-frequency sinusoidal voltage that will cause sparkover when applied across the terminals of a surge-protective device. (SPD/PE) C62.62-2000

power-frequency wet withstand voltage The rms voltage that can be applied to a wetted device under specified conditions for a specified time without causing flashover or puncture. (SWG/PE) C37.40-1993

power-frequency withstand voltage A specified root-mean-square test voltage, at a power frequency that will not cause a disruptive discharge. (SPD/PE) C62.62-2000, C62.11-1999

power fuse A fuse consisting of an assembly of a fuse support and a fuse unit or fuseholder that may or may not include the refill unit or fuse link. *Note:* The power fuse is identified by the following characteristics:

a) Dielectric withstand basic impulse insulation level (BIL) strengths at power levels
b) Application primarily in stations and substations
c) Mechanical construction basically adapted to station and substation mountings

(SWG/PE) C37.40-1993, C37.100-1992

power fuse unit (installations and equipment operating at over 600 volts, nominal) A vented, nonvented or controlled vented fuse unit in which the arc is extinguished by being drawn through solid material, granular material, or liquid, either alone or aided by a spring. (NEC/NESC) [86]

power gain (1) (data transmission) The ratio of the signal power that a transducer delivers to its load to the signal power absorbed by its input circuit. *Notes:* 1. Power gain is usually expressed in decibels. 2. If more than one component is involved in the input or output, the particular components used are specified. 3. If the output signal power is at a frequency other than the input signal power, the gain is a conversion gain. (PE) 599-1985w

(2) (two-port linear transducer) At a specified frequency, the ratio of:

a) the signal power that the transducer delivers to a specified load; to
b) the signal power delivered to its input port.

Note: The power gain is not defined unless the input impedance of the transducer has a positive real part.
(ED) 161-1971w

(3) *See also:* partial gain. (AP/ANT) 145-1993

power gap The part of the bypass gap that carries the fault current after sparkover of the bypass gap.
(T&D/PE) 824-1994

power influence (telephone loop performance) The power of a longitudinal signal induced in a telephone circuit by an electromagnetic field emanating from a conductor or conductors of a power system. In common usage, power influence is synonymous with longitudinal noise. (COM/TA) 820-1984r

power, instantaneous *See:* instantaneous power.

power inverter A component for converting dc power into ac power. (IA/MT) 45-1998

power klystron (microwave tubes) A klystron, usually an amplifier, with two or more cavities uncoupled except by the beam, designed primarily for power amplification or generation. (ED) [45]

power knock out A function, derived from friction brakes being applied above a low preset level on any truck, that removes propulsion power on every vehicle in the train.
(VT) 1475-1999

power-law index profile (fiber optics) A class of graded index profiles characterized by the following equations:

$$n(r) = n_1(1 - 2\Delta(r/a)^g)^{1/2} \quad r = a$$

$$n(r) = n_2 = n_1(1 - 2\Delta)^{1/2} \quad r = a$$

where

$$\Delta = \frac{n_1^2 - n_2^2}{2n_1^2}$$

where $n(r)$ is the refractive index as a function of radius, n_1 is the refractive index on axis, n_2 is the refractive index of the homogeneous cladding, a is the core radius, and g is a parameter that defines the shape of the profile. *Notes:* 1. α is often used in place of g. Hence, this is sometimes called an alpha profile. 2. For this class of profiles, multimode distortion is smallest when g takes a particular value depending on the material used. For most materials, this optimum value is around 2. When g increases without limit, the profile tends to a step index profile. *See also:* graded index profile; step index profile; profile parameter; mode volume.
(Std100) 812-1984w

power level (data transmission) The magnitude of power averaged over a specified interval of time. *Note:* Power level may be expressed in units in which the power itself is measured or in decibels indicating the ratio to a reference power. This ratio is usually expressed either in decibels, referred to one mW (milliwatt), abbreviated dBm, or in decibels referred to one W (watt), abbreviated dBW. (PE) 599-1985w

power level at DSX Power in dBm of an all-ones signal measured at a digital signal crossconnect (DSX). *See also:* dBDSX. (COM/TA) 1007-1991r

power-line carrier (1) (overhead-power-line corona and radio noise) The use of RF energy, generally below 600 kHz, to transmit information, using power lines to guide the information transmission. (T&D/PE) 539-1990

(2) (protective relaying of utility-consumer interconnections) A high-frequency signal superimposed on the normal voltage on a power circuit. It is customarily coupled to the power line by means of a coupling capacitor. A tuning device provides series resonance at the carrier frequency. Prevention of shorting of the carrier signal by a fault external to the protected line is ordinarily provided by a line trap.
(PE/PSR) C37.95-1973s

(3) The use of radio frequency energy to transmit information over transmission lines whose primary purpose is the transmission of power. (SUB/PE) 999-1992w

power-line-conducted radio noise Radio noise produced by equipment operation, which exists on the power line of the equipment and is measurable under specified conditions. *Note:* It may enter a receptor, such as ITE, by direct coupling or by subsequent radiation from some circuit element.
(EMC) C63.4-1991

power loss (A) (data transmission) From a circuit, in the sense that it is converted to another form of power not useful for the purpose at hand (for example I^2R loss). A physical quantity measured in watts in the International System of Units (SI) and having the dimensions of power. For a given R, it will vary with the current in R. **(B) (data transmission)** Defined as the ratio of two powers. If P_o is the output power and P_i is the input power of a transducer or network under specified conditions, P_o/P_i is a dimensionless quantity that would be unity if $P_o = P_i$. **(C) (data transmission)** (Logarithmic). Loss may also be defined as the logarithm, or a quantity directly proportional to the logarithm of a power ratio, such as P_o/P_i. Thus if loss $= 10\log_{10}(P_o/P_i)$, the loss is zero when $P_o = P_i$. This is the standard for measuring loss in decibels. *Notes:* 1. In cases (B) and (C), the loss for a given linear system is the same whatever may be the power levels. Thus (B) and (C) give characteristics of the system, and do not depend, as (A) does, on the value of the current or other dependent quantity. 2. If more than one component is involved in the input or output, the particular components used must be specified. This ratio is usually expressed in decibels. 3. If the output signal power is at a frequency other than the input signal power, the loss is a conversion loss. **(D) (data transmission)** (Electric instrument) (watt loss). In the circuit of a current-or-voltage- measuring instrument, the active power at its terminals for end-scale indication. *Note:* For other than current or voltage- measuring instruments, for example, wattmeters, the power loss of any circuit is expressed at a stated value of current or of voltage. (PE) 599-1985

power monitor A functional module that monitors the status of the primary power source to the system, and signals when that power has strayed outside the limits required for reliable system operation. Since most systems are powered by an ac source, the power monitor is typically designed to detect drop-out or brown-out conditions on ac lines.
(C/BA) 1014-1987

power, nonfirm *See:* nonfirm power.

power, nonreactive *See:* nonreactive power.

power of ten *See:* decade.

power-on retention time The retention time with the memory biased in the on condition in a nonoperating (that is, unclocked, deselected) mode. (ED) 641-1987w

power-operated door or gate (elevators) A hoistway door and/or a car door or gate that is opened and closed by a door or gate power operator. *See also:* hoistway. (EEC/PE) [119]

power operation Operation by other than hand power.
(SWG/PE) C37.100-1992

power outage Complete absence of power at the point of use.
(IA/PSE) 446-1995

power outlet An enclosed assembly which may include receptacles, circuit breakers, fuseholders, fused switches, buses and watt-hour meter mounting means; intended to supply and control power to mobile homes, recreational vehicles or boats, or to serve as a means for distributing power required to operate mobile or temporarily installed equipment.
(NESC/NEC) [86]

power output (hydraulic turbines) The electrical output of the turbine generator unit as measured at the generator terminals.
(PE/EDPG) 125-1977s

power output, instantaneous *See:* instantaneous power output.

power pack A unit for converting power from an alternating-current or direct-current supply into alternating-current or direct-current power at voltages suitable for supplying an electronic device. (EEC/PE) [119]

power, partial discharge *See:* partial discharge power.

power pattern *See:* radiation pattern.

power, phase control *See:* phase control power.

power, phasor *See:* phasor power.

power pool (power operations) Term referring to a group of power systems operating as an interconnected system and pooling their resources. (PE/PSE) 858-1987s

power primary detector (electric power system) A power-measuring device for producing an output proportional to power input. *See also:* speed-governing system. (PE/PSE) 94-1970w

power quality The concept of powering and grounding electronic equipment in a manner that is suitable to the operation of that equipment and compatible with the premise wiring system and other connected equipment. (IA/PSE) 1100-1999

power quantities (two-phase circuit) (single-phase three-wire circuit) The definitions of the power quantities for a single-phase circuit of more than two wires and of a two-phase circuit are essentially the same as those expressions involve m, the number of phases or phase conductors, the numeral 2 should be used for single-phase, three-wire systems, and the numeral 4 for two-phase, four-wire and five-wire systems. *See also:* polyphase symmetrical set. (Std100) 270-1966w

power rating (waveguide attenuator) The maximum power that, if applied under specified conditions of environment and duration, will not produce a permanent change that causes any performance characteristics to be outside of specifications. This includes characteristic insertion loss and standing-wave ratio. *See also:* waveguide. (IM/HFIM) [40]

power rating or voltage rating (coaxial transmission line) (line and connectors) That value of transmitted power or voltage that permits satisfactory operation of the line assembly and provides an adequate safety factor below the point where injury or appreciably shortened life will occur. *See also:* transmission line. (EEC/REWS) [92]

power—reactive For sinusoidal quantities in a two-wire circuit, reactive power is the product of the voltage, the current, and the sine of the phase angle between them. For nonsinusoidal quantities, it is the sum of all the harmonic components, each determined as above. In a polyphase circuit, it is the sum of the reactive powers of the individual phases. (ELM) C12.1-1988

power, reactive *See:* reactive power.

power rectifier A rectifier unit in which the direction of average energy flow is from the alternating-current circuit to the direct-current circuit. (IA) [62]

power rectifier transformer (power and distribution transformers) A rectifier transformer connected to mercury-arc or semiconductor rectifiers for electrochemical service, steel processing applications, electric furnace applications, mining applications, transportation applications, and direct-current transmissions. (PE/TR) C57.12.80-1978r

power reflectance* **(1)** (of a radome) At a given point on a radome, the ratio of the power flux density that is internally reflected from the radome to that incident on the radome from an internal radiating source. (AP/ANT) 145-1993
(2) *See also:* power reflection coefficient. (AP/PROP) 211-1997

* Deprecated.

power reflection coefficient The squared magnitude of the Fresnel reflection coefficient. *Synonym:* power reflection factor. (AP/PROP) 211-1997

power reflection factor *See:* power reflection coefficient.

power relay A relay that responds to a suitable product of voltage and current in an electric circuit. *See also:* active-power relay; reactive power relay. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

power_reset An initialization event triggered by the restoration of primary power. On a backplane bus, a power_reset event is generally triggered by one or several specialized signals driven by the shared power supply. (C/MM) 1212-1991s

power response (close-talking pressure-type microphone) The ratio of the power delivered by a microphone to its load, to the applied sound pressure as measured by a Laboratory Standard Microphone placed at a stated distance from the plane of the opening of the artificial voice. *Note:* The power response is usually measured as a function of frequency in decibels (dB) above 1 milliwatt per newton per square centimeter [mW/(N/m^2)] or 1 milliwatt per 10 microbars [mW/10μbar]. *See also:* close-talking pressure-type microphones. (SP) 258-1965w

power selsyn (synchros or selsyns) An inductive type of positioning system having two or more similar mechanically independent slip-ring machines with corresponding slip rings of all machines connected together and the stators fed from a common power source. *See also:* synchro system. (PE) [9]

power sensitivity error The maximum deviation from linearity over each power range of either the electrothermic unit or the electrothermic power meter. Expressed in percent. (IM) 544-1975w

power service protector An assembly consisting of a modified low-voltage power circuit breaker, which has no direct-acting tripping devices, with a current-limiting fuse connected in series with the load terminals of each pole. (SWG/PE) C37.100-1992

power, signal electronics *See:* signal electronics power.

powers of units (International System of Units (SI)) An exponent attached to a symbol containing a prefix indicates that the multiple or submultiple of the unit (the unit with its prefix) is raised to the power expressed by the exponent. For example:

$1\ \mathrm{cm^3} = (10^{-2}\ \mathrm{m})^3 = 10^{-6}\ \mathrm{m^3}$

$1\ \mathrm{ns^{-1}} = (10^{-9}\ \mathrm{s})^{-1} = 10^{9}\ \mathrm{s^{-1}}$

$1\ \mathrm{mm^2/s} = (10^{-3}\ \mathrm{m})^2/\mathrm{s} = 10^{-6}\ \mathrm{m^2/s}$

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

power source isolation Absence of a direct-current circuit (path) between the power source and the system power supply outputs. (PE/EDPG) [1]

power sources The electrical and mechanical equipment and their interconnections necessary to generate or convert power. (PE/NP) 603-1998

power spectral density (PSD) (1) (seismic qualification of Class 1E equipment for nuclear power generating stations) The mean squared amplitude per unit frequency of a waveform. PSD is expressed in g^2/Hz versus frequency for acceleration waveforms. (PE/NP) 344-1987r
(2) The Fourier transform of the autocorrelation function of a time series of data. For a stationary ergodic time series, the PSD is equal to the expected value of the magnitude squared of the Fourier transform of the data. The PSD expresses the noise variance in an accelerometer's output as a function of positive and negative frequencies, usually in g^2/Hz, and is calculated as the ensemble or frequency average of the magnitude squared of the fast Fourier transform (FFT) of the data. The one-sided PSD plots twice the PSD value versus positive frequency f, since for a real time series the two-sided PSD values are equal for f and $-f$. The velocity random walk coefficient is calculated from the two-sided PSD acceleration white noise level (half the one-sided PSD level). (AES/GYAC) 1293-1998

power station battery (1) A battery that is a separate source of energy for communication equipment in power stations. (COM)
(2) (control) A battery that is a separate source of energy for the control of power apparatus in a power station. *See also:* battery. (PE) 599-1985w

power storage That portion of the water stored in a reservoir available for generating electric power. *See also:* generating station. (T&D/PE) [10]

power supply A unit that converts voltage from one level to another, usually regulating the output. *Note:* Typically used to convert an AC voltage to a DC voltage. *See also:* converter. (C) 610.10-1994w

power-supply assembly The conductors, including the grounding conductors, insulated from one another, the connectors, attachment plug caps, and all other fittings, grommets, or devices installed for the purpose of delivering energy from the source of electrical supply to the distribution panel within the recreational vehicle. (NESC/NEC) [86]

power supply circuit (relay system) An input circuit to a relay system that supplies power for the functioning of the relay system. (PE/PSR) C37.90.1-1989r

power supply, direct-current *See:* direct-current power supply.

power supply, direct-current regulated *See:* direct-current regulated power supply.

power supply, uninterruptible *See:* uninterruptible power supply.

power-supply voltage range (transmitter performance) The range of voltages over which there is not significant degradation in the transmitter or receiver performance. *See also:* audio-frequency distortion. (VT) [37]

power switchboard (1) A type of switchboard including primary power-circuit switching and interrupting devices together with their interconnections. *Note:* Knife switches, fuses, and air circuit breakers are the commonly used switching and interrupting devices. (SWG/PE) C37.100-1992
(2) A switchgear and control assembly that receives energy from the main generating plant and distributes directly or indirectly to all equipment supplied by the generating plant. (IA/MT) 45-1998

power system (1) (generating stations electric power system) The electric power sources, conductors, and equipment required to supply electric power. (PE/EDPG) 505-1977r
(2) (electric) The generation resources and/or transmission facilities operated as an entity to meet load and/or interchange commitments. (PE/PSE) 94-1991w
(3) The generation resources and/or transmission facilities operated under common management or supervision to meet load and interchange commitments. (PE/PSE) 858-1993w

power system, emergency *See:* emergency power system.

power system stabilizer (1) (excitation systems for synchronous machines) An element or group of elements that provide an additional input to the regulator to improve power system performance. *Note:* A number of different quantities may be used as input to the power system stabilizer, such as, shaft speed, frequency, synchronous machine electrical power, etc. (PE/EDPG) 421.1-1986r
(2) (excitation systems) Used to provide damping at power system frequencies associated with local and intertie modes of oscillation. (PE/EDPG) 421.4-1990
(3) (excitation systems) (synchronous machines) An element or group of elements that provide an additional input to the regulator to improve the dynamic performance of the power system. *Note:* A number of different quantities may be used as input to the power system stabilizer, such as shaft speed, frequency, synchronous machine electrical power, and others. (PE/EDPG) 421.2-1990, 421-1972s

power system, standby *See:* standby power system.

power-temperature coefficient The change in power required to hold the bolometer element at the desired operating resistance per unit change in ambient temperature. *Note:* This quantity is expressed in microwatts per degree Celsius. (IM) 470-1972w

power termination connection The termination applied to the end of a heating cable where the power is supplied. (IA) 515-1997

power test method A test that determines the power dissipation characteristics of a damper by the measurement of the force and velocity imparted to the test span at the point of attachment to the shaker. (T&D/PE) 664-1993

power transfer relay A relay so connected to the normal power supply that the failure of such power supply causes the load to be transferred to another power supply. (EEC/PE) [119]

power transformer (power and distribution transformers) A transformer that transfers electric energy in any part of the circuit between the generator and the distribution primary circuits. (PE/TR) C57.12.80-1978r

power transmittance of a radome In a given direction, the ratio of the power flux density emerging from a radome with an internal source to the power flux density that would be obtained if the radome were removed. (AP/ANT) 145-1993

power type relay A term for a relay designed to have heavy-duty contacts usually rated 15 A or higher. Sometimes called a contactor. (PE/EM) 43-1974s

power up/down protection *See:* inadvertent write protection.

power, utility *See:* commercial power.

power vector (A) (single-phase two-wire circuit) At the two terminals of entry of a single-phase two-wire circuit into a delimited region, a vector whose magnitude is equal to the apparent power, and the three rectangular components of which are, respectively, the active power, the reactive power, and the distortion power at the same two terminals of entry. Mathematically, the vector power U is given by

$$\mathrm{U} = \mathrm{i}P + \mathrm{j}Q + \mathrm{k}D$$

where i, j, and k are unit vectors along the three perpendicular axes, respectively. P, Q, and D are the active power, reactive power, and distortion power, respectively. The direction cosines of the angles between the vector power U and the three rectangular axes are

$$\cos\phi = \frac{P}{\mathrm{U}}$$

$$\cos\Psi = \frac{Q}{\mathrm{U}}$$

$$\cos\theta = \frac{D}{\mathrm{U}}$$

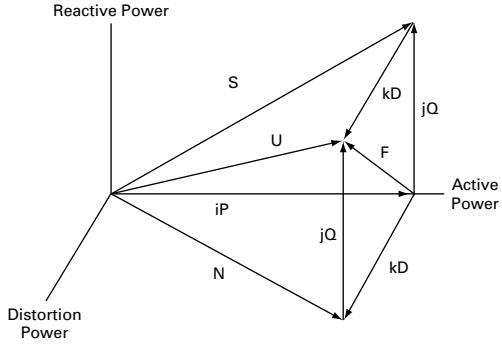
The magnitude of the vector power is the apparent power, or

$$\mathrm{U} = (P^2 + Q^2 + D^2)^{\frac{1}{2}}$$

$$= \left(\sum_{r=1}^{r=\infty} \sum_{q=1}^{q=\infty} E_r{}^2 I_q{}^2 \right)^{\frac{1}{2}}$$

where the symbols are those of the preceding definitions. The geometric power diagram shows the relationships among the different types of power. Active power, reactive power, and distortion power are represented in the directions of the three rectangular axes. The diagram corresponds to a case in which all three are positive. Since the sign of D is not definitely determined, D may be drawn in either direction along the axis. The position of U is thus also ambiguous, as it may occupy either of two positions, for D positive or negative. When the sign of D has been assumed, the vector positions of the fictitious power F and the nonreactive power N are determined. They have been shown in the corresponding figure, with the assumption that D has the same sign as P. Vector power is expressed in voltamperes when the voltage is in volts and the current in amperes. *Notes:* 1. The vector power becomes a plane vector having the same magnitude as the phasor power if the voltage and the current have the same wave form. This condition is fulfilled as a special case when the voltage and current are sinusoidal and of the same period. 2. The term vector power as defined in the 1941 edition of the American Standard Definitions of Electrical Terms has now been called phasor power and the present definition of vector power is new. *See also:* network analysis. **(B) (polyphase circuit)** At the terminals of entry of a polyphase circuit, a vector of which the three rectangular components are, respectively, the active power, the reactive power, and the distortion power at the

same terminals of entry. In determining the components, the reference terminals for voltage measurement are taken as the neutral terminal of entry, if one exists, otherwise as the true neutral point. The vector power is also the (vector) sum of the vector powers for the individual terminals of entry. The vector power for each terminal of entry is determined by considering each phase conductor and the common reference point as a single-phase circuit, as described for distortion power. The sign given to the distortion power in determining the vector power for each single-phase circuit is the same as that of the total active power. The magnitude of the vector power is the apparent power. If the voltages have the same waveform as the corresponding currents, the magnitude of the vector power is equal to the amplitude of the phasor power. Vector power is expressed in voltamperes when the voltages are in volts and the currents in amperes. *See also:* network analysis.



power vector

(Std100) 270-1966

power winding (saturable reactor) A winding to which is supplied the power to be controlled. Commonly the functions of the output and power windings are accomplished by the same winding, which is then termed the output winding. *See also:* magnetic amplifier. (PE/EEC) [119]

Poynting vector (1) If there is a flow of electromagnetic energy into or out of a closed region, the rate of flow of this energy is, at any instant, proportional to the surface integral of the vector product of the electric field strength and the magnetizing force. This vector product is called Poynting's vector. If the electric field strength is E and the magnetizing force is H, then Poynting's vector is given by

$$U = E \times H \text{ and } U = E \times H/4\pi$$

in rationalized and unrationalized systems, respectively. Poynting's vector is often assumed to be the local surface density of energy flow per unit time. (Std100) 270-1966w

(2) *See also:* time-averaged Poynting vector; instantaneous Poynting vector. (AP/PROP) 211-1997

Poynting vector, instantaneous [$\vec{P}(t,\vec{r})$] *See:* instantaneous Poynting vector.

Poynting vector, time-averaged *See:* time-averaged Poynting vector.

PPCSN *See:* private packet/frame and circuit switching network.

***p*-percent disruptive discharge voltage (V_p)** The prospective value of the test voltage that has a *p*-percent probability of producing a disruptive discharge. (PE/PSIM) 4-1995

PPI *See:* plan-position indicator.

***p-p* junction (semiconductor)** A region of transition between two regions having different properties in *p*-type semiconducting material. *See also:* semiconductor device. (PE/EEC) [119]

ppm *See:* parts per million.

PPM *See:* periodic permanent-magnet focusing; pulse position modulation.

PPMV *See:* parts per million by volume.

PPMW *See:* parts per million by weight.

PPS *See:* preferred power supply.

PPSN *See:* private packet/frame switching network.

PR *See:* physical record.

PRA *See:* pendulous reference axis.

practical reference pulse waveform (pulse measurement) A reference pulse waveform which is derived from a pulse which is produced by a device or apparatus. (IM/WM&A) 181-1977w

practical stability *See:* finite-time stability.

practice Recommended approach, employed to prescribe a disciplined, uniform approach to the software life cycle. (C/SE) 730.1-1995

practices (software quality assurance) Requirements employed to prescribe a disciplined uniform approach to the software development process. *See also:* conventions; standards. (C) 610.12-1990

pragma A generic term used to define a construct with no predefined language semantics that influences how a synthesis tool will synthesize VHDL code into an equivalent hardware representation. (C/DA) 1076.6-1999

preallocation The reservation of resources in a system for a particular use. Preallocation does not imply that the resources are immediately allocated to that use, but merely indicates that they are guaranteed to be available in bounded time when needed. (C/PA) 9945-1-1996

preamble (1) In networking, a sequence of bits at the start of each new transmission to allow synchronization of clocks and other physical layer circuitry at other stations. *See also:* postamble; abnormal preamble. (C) 610.7-1995

(2) A sequence of bits recorded at the beginning of each block on a magnetic tape for the purpose of synchronization. *Contrast:* postamble. (C) 610.10-1994w

preamble breakpoint *See:* prolog breakpoint.

preamplifier (1) An amplifier connected to a low-level signal source to present suitable input and output impedances and provide gain so that the signal may be further processed without appreciable degradation in the signal-to-noise ratio. *Notes:* 1. A preamplifier may include provision for equalizing and.or mixing. 2. Further processing frequently includes further amplification in a main amplifier. *See also:* amplifier. (SP) 151-1965w

(2) The input section of an amplifier chain, usually located as close to the detector element as possible. (NPS) 325-1996

preamplifier, pulsed optical feedback *See:* pulsed optical feedback preamplifier.

pre-arbitrated (PA) access function The *access control function* in this part of ISO/IEC 8802 that uses assigned *offsets* in *Pre-Arbitrated (PA) slots* for the transfer of *isochronous service octets.* (LM/C) 8802-6-1994

pre-arbitrated (PA) segment A multiuser *segment* transferred using *Pre-Arbitrated Access (PA) functions.* The payload of the *PA segment* contains *isochronous service octets* from zero or more *Isochronous Service Users* (*ISU*s). (LM/C) 8802-6-1994

pre-arbitrated (PA) slot A *slot* that is dedicated by the *Head of Bus function* for transfer of *isochronous service octets* in the payload of a *PA segment.* (LM/C) 8802-6-1994

pre-arcing time *See:* melting time.

preassigned multiple access (communication satellite) A method of providing multiple access in which the satellite channels are preassigned at both ends of the path. (COM) [19]

precedence call (telephone switching systems) A call on which the calling party has elected to use one of several levels of priority available to him. (COM) 312-1977w

precedented system A system for which design examples exist within its class, so as to provide guidance for establishing the design architecture, engineering and technical plans, specifications, or low risk alternatives. (C/SE) 1220-1998

precession (1) (navigation aid terms) The change in the direction of the axis of rotation of a spinning body, as a gyroscope, when acted upon by a torque. (AES/GCS) 172-1983w

(2) (gyros) A rotation of the spin axis produced by a torque, *T,* applied about an axis mutually perpendicular to the spin axis and the axis of the resulting rotation. A constant precession rate, ω, is related to rotor angular momentum, *H,* and applied torque, *T,* by the equation $T = H\omega$. (AES/GYAC) 528-1994

precipitation clutter Unwanted echoes from rain, snow, hail, sleet and other hydrometeorological particles. (AES) 686-1997

precipitation intensity (overhead power lines) The rate of precipitation, usually expressed in millimeters per hour (mm/h). Since precipitation intensity in general is not constant, an average over some time period shorter than one h our is most useful, unless instantaneous intensity is measured. *Note:* Rain gauge measurements can provide an indication of intensity except for light rain, where the quantization error is large. (T&D/PE) 539-1990

precipitation scatter Electromagnetic scattering caused by precipitating rain, hail, or snow particles. (AP/PROP) 211-1997

precision (1) (mathematics of computing) (software) (data management) The degree of exactness or discrimination with which a quantity is stated; for example, a precision of 2 decimal places versus a precision of 5 decimal places. *Contrast:* accuracy. *See also:* multiple precision; triple precision; double precision; single precision. (C) 610.5-1990w, 610.12-1990, 1084-1986w

(2) (A) (monitoring radioactivity in effluents) The degree of agreement of repeated measurements of the same property expressed in terms of dispersion of test results about the mean result obtained by repetitive testing of a homogeneous sample under specified conditions. The precision of a method is expressed quantitatively as the standard deviation computed from the results of a series of controlled determinations. **(B) (general)** The quality of being exactly or sharply defined or stated. A measure of the precision of a representation is the number of distinguishable alternatives from which it was selected, which is sometimes indicated by the number of significant digits it contains. *See also:* double precision; accuracy. (C) 162-1963, 165-1977

(3) (measurement process) The quality of coherence or repeatability of measurement data, customarily expressed in terms of the standard deviation of the extended set of measurement results from a well-defined (adequately specified) measurement process in a state of statistical control. The standard deviation of the conceptual population is approximated by the standard deviation of an extended set of actual measurements. *See also:* reproducibility; accuracy. (AES/RS) 686-1982s, [42]

(4) (pulse measurement) The degree of mutual agreement between the results of independent measurements of a pulse characteristic, property, or attribute yielded by repeated application of a pulse measurement process. (IM/WM&A) 181-1977w

(5) (analog computer) Exactly or sharply defined or stated. A measure of the precision of a representation is the number of distinguishable alternatives from which it was selected, which is sometimes indicated by the number of significant digits it contains. *See also:* accuracy. (C) 165-1977w

(6) (metric practice) The degree of mutual agreement between individual measurements, namely repeatability and reproducibility. *See also:* accuracy. (QUL) 268-1982s

(7) (measuring and test equipment) (nuclear power generating station) The quality of an instrument scale or readout being exactly or sharply defined or stated. (PE/NP) 498-1985s

(8) (plutonium monitoring) (radiological monitoring instrumentation) The degree of agreement of repeated measurements of the same property, expressed quantitatively as the standard deviation computed from the results of the series of measurements. (NI) N320-1979r, N317-1980r, N42.12-1994

(9) (airborne radioactivity monitoring) The degree of agreement of repeated measurements of the same parameter. (NI) N42.17B-1989r, N42.20-1995

(10) The repeatability of measurement data, customarily expressed in terms of standard deviation. (ELM) C12.1-1988

(11) The discrepancy among individual measurements. (PE/PSIM) 4-1995

(12) The degree of exactness or discrimination with which a quantity is stated. *Note:* The result of a calculation may have more precision than it has accuracy; for example, the true value of pi to six significant digits is 3.14159; the value of 3.14162 is precise to six digits but only five digits are accurate. *See also:* accuracy. (C) 610.10-1994w

(13) A concept employed to describe dispersion of measurements with respect to a measure of location or central tendency (ANSI N15.5-1982). A measurement with small random uncertainties is said to have high precision. (NI) N42.23-1995

(14) The degree of mutual agreement between individual measurements, namely their repeatability and reproducibility. *See also:* accuracy. (SCC14) SI 10-1997

precision-approach radar (PAR) (navigation aid terms) A radar system located on an airfield for observation of the position of an aircraft with respect to an approach path and specifically intended to provide guidance to the aircraft during the approach. (AES/GCS) 686-1997, 172-1983w

precision connector (waveguide or transmission line) A connector that has the property of making connections with a high degree of repeatability without introducing significant reflections, loss or leakage. *See also:* auxiliary device to an instrument. (IM/HFIM) [40]

precision device (packaging machinery) A device that will operate within prescribed limits and will consistently repeat operations within those limits. (IA/PKG) 333-1980w

precision statistic An estimator of precision calculated from a finite sample of data using a specified formula. (NI) N42.23-1995

precision wound (rotating machinery) A coil wound so that maximum nesting of the conductors occurs, usually with all crossovers at one end, with conductor aligned and positioned with respect to each adjacent conductor. *See also:* rotor; stator. (PE) [9]

precompiler (software) A computer program or routine that processes source code and generates equivalent code that is acceptable to a compiler. For example, a routine that converts structured FORTRAN to ANSI-standard FORTRAN. *See also:* preprocessor. (C) 610.12-1990

precondition A condition that is required to be true before making a property request. (C/SE) 1320.2-1998

preconditioning A control-function that provides for manually or automatically establishing a desired condition prior to normal operation of the system. *See also:* feedback control system. (IA/ICTL/IAC) [60]

preconditioning time The interval of time required by channel equipment (e.g., modems) to ready the channel for data transmission. (SUB/PE) 999-1992w

precursor *See:* undershoot.

predicted failure rate For the stated conditions of use, and taking into account the design of an item, the failure rate computed from the observed, assessed, or extrapolated failure rates of its parts. *Note:* Engineering and statistical assumptions shall be stated, as well as the bases used for the computation (observed or assessed). (R) [29]

predicted mean active maintenance time The mean active maintenance time of an item calculated by taking into account the reliability characteristics and the mean active maintenance time of all of its parts and other relevant factors according to the stated conditions. *Notes:* 1. Maintenance policy, statistical assumptions and computing methods shall be stated. 2. The source of the data shall be stated. (R) [29]

predicted mean life (non-repaired items) For the stated conditions of use, and taking into account the design of an item, the mean life computed from the observed, assessed or extrapolated mean life of its parts. *Note:* Engineering and statistical assumptions shall be stated, as well as the bases used for the computation (observed or assessed). (R) [29]

predicted reliability For the stated conditions of use, and taking into account the design of an item, the reliability computed from the observed, assessed, or extrapolated reliabilities of its parts. *Note:* Engineering and statistical assumptions shall be stated, as well as the bases used for the computation (observed or assessed). (R) [29], 1413-1998

predictive alarming (alarm monitoring and reporting systems for fossil-fueled power generating stations) A method of alerting the operator to a potential problem in time for him to respond and initiate corrective action to mitigate the problem. (PE/EDPG) 676-1986w

predictive assessment The process of using a predictive metric(s) to predict the value of another metric. (C/SE) 1061-1992s

predictive coding (image processing and pattern recognition) An image compression technique that uses the gray levels of preceding pixels to predict the gray level of the current pixel, so that only the difference between the predicted and measured value needs to be encoded. (C) 610.4-1990w

predictive maintenance The practice of conducting diagnostic tests and inspections during normal equipment operations in order to detect incipient weaknesses or impending failures. (IA/PSE) 902-1998

predictive metric A metric applied during development and used to predict the values of a software quality factor. (C/SE) 1061-1998

predictive metric value A numerical target related to a quality factor to be met during system development. This is an intermediate requirement that is an early indicator of final system performance. For example, design or code errors may be early predictors of final system reliability. (C/SE) 1061-1998

predictive model (modeling and simulation) A model in which the values of future states can be predicted or are hypothesized; for example, a model that predicts weather patterns based on the current value of temperature, humidity, wind speed, and so on at various locations. (C) 610.3-1989w

predissociation A process by which a molecule that has absorbed energy dissociates before it has had an opportunity to lose energy by radiation. (ED) 161-1971w

predistortion (system) (pre-emphasis) (transmitter performance) A process that is designed to emphasize or de-emphasize the magnitude of some frequency components with respect to the magnitude of others. *See also:* pre-emphasis. (VT) [37]

pre-emphasis (A) (pre-equalization) (General). A process in a system designed to emphasize the magnitude of some frequency components with respect to the magnitude of others, to reduce adverse effects, such as noise, in subsequent parts of the system. *Note:* After transmitting the pre-emphasized signal through the noisy part of the system, de-emphasis may be applied to restore the original signal with a minimum loss of signal-to-noise ratio. **(B) (pre-equalization)** (Modulating systems) (recording). An arbitrary change in the frequency response of a recording system from its basic response (such as constant velocity or amplitude) for the purpose of improvement in signal-to-noise ratio, or the reduction of distortion. (PE) 599-1985

pre-emphasis network A network inserted in a system in order to emphasize one range of frequencies with respect to another. *See also:* network analysis. (AP/ANT) 145-1983s

preempted thread A running thread whose execution is suspended due to another thread becoming runnable at a higher priority. (C/PA) 9945-1-1996

preempted process A running process whose execution is suspended due to another process becoming runnable at a higher priority. (C/PA) 1003.1b-1993s

preemption (1) (telephone switching systems) On a precedence call, the disconnection and subsequent reuse of part of an established connection of lower priority if all the relevant circuits are busy. (COM) 312-1977w

(2) Process in which the current bus master relinquishes the bus because another module has requested it. In some systems any module may cause preemption; in some systems only a module with a higher priority request may cause preemption. (C/BA) 896.3-1993w

(3) The release of the bus by the current bus master due to the request of another module. Note that in some systems, preemption occurs when the current bus master relinquishes the bus because another module has requested it. In some systems, any module may cause preemption; in some systems, only a module with a higher priority request may cause preemption. (C/BA) 896.4-1993w

(4) The release of the bus by the current bus master due to the request of another module. *Note:* In some systems, any module may cause preemption; in others, only a module with a higher priority request may cause preemption. (C/BA) 10857-1994

preemptive control (test, measurement, and diagnostic equipment) An action or function which, by reason of preestablished priority, is able to seize or interrupt the process in progress and cause to be performed a process of higher priority. (MIL) [2]

pre-fault (event) A qualifying term that refers to an interval ending with the inception of a fault. (SWG/PE) C37.100-1992

preference (channel supervisory control) (power-system communication) An assembly of devices arranged to prevent the transmission of any signals over a channel other than supervisory control signals when supervisory control signals are being transmitted. (Std100) [123]

preference level (speech quality measurements) The signal-to-noise ratio (S.N) of the speech reference signal when it is isopreferent to the speech test signal. 297-1969w

preferred (electric power system) (generating stations electric power system) That equipment and system configuration selected to supply the power system loads under normal conditions. (PE/EDPG) 505-1977r

preferred basic impulse insulation level (insulation strength) A basic impulse insulation level that has been adopted as a preferred American National Standard voltage value. *See also:* basic impulse insulation level. (EEC/LB) [100]

preferred current ratings (of distribution fuse links) A series of distribution fuse-link ratings so chosen from a series of preferred numbers that a specified degree of coordination may be obtained between adjacent sizes. (SWG/PE) C37.40-1993

preferred insulations system classification (electric installations on shipboard) The preferred insulation system classifications are classes A, B, F, H, C, or 105, 130, 155, 180, or greater than 220, and as designated by the equipment standard. (IA/MT) 45-1983s

preferred power supply (PPS) That power supply from the transmission system to the Class 1E distribution system that is preferred to furnish electric power under accident and post-accident conditions. (PE/NP) 308-1991, 765-1995

preferred values The preferred values for the parameters listed for various tests are preferred in the sense that their use promotes uniformity. However, specific applications may require values other than the listed preferred values. (PE) C62.34-1996

prefetching In a pipelined process, to fetch the next instruction, or instruction part, before the processing unit requires it, resulting in a performance improvement by eliminating the lag between completion of one instruction and the availability of the next. (C) 610.10-1994w

prefix code (telephone switching systems) One or more digits preceding the national or international number to implement direct distance dialing. (COM) 312-1977w

prefixes and symbols (International System of Units (SI)) Used to form names and symbols of the decimal mutiples and submultiples of the SI units:

Prefix	Abbreviation	Factor
tera- (megamega-	T (MM*)	10^{12}
giga- (kilomega-*)	G (kM*)	10^{9}
mega-	M	10^{6}
myria-		10^{4}
kilo-	k	10^{3}
hecto-	h	10^{2}
deka-		10
deci-	d	10^{-1}
centi-	c	10^{-2}
milli-	m	10^{-3}
decimilli-	dm	10^{-4}
micro-	μ	10^{-6}
nano- (millimicro-*)	n (mμ*)	10^{-9}
pico- (micromicro-*)	p (μμ*)	10^{-12}

*Deprecated.

These prefixes or their symbols are directly attached to names or symbols of units, forming multiples and submultiples of the units. In strict terms these must be called "multiples and submultiples of SI units," particularly in discussing the coherence of the system. In common parlance, the base units and derived units, along with their multiples and submultiples, are all called SI units. *See also:* units and letter symbols.

prefix multipliers The prefixes listed in the following table, when applied to the name of a unit, serve to form the designation of a unit greater or smaller than the original by the factor indicated.

Multiplication Factor	Prefix	Symbol
1 000 000 000 000 000 000 = 10^{18}	exa	E
1 000 000 000 000 000 = 10^{15}	peta	P
1 000 000 000 000 = 10^{12}	tera	T
1 000 000 000 = 10^{9}	giga	G
1 000 000 = 10^{6}	mega	M
1 000 = 10^{3}	kilo	k
100 = 10^{2}	hecto*	h
10 = 10^{1}	deka*	da
0.1 = 10^{-1}	deci*	d
0.01 = 10^{-2}	centi	c
0.001 = 10^{-3}	milli	m
0.000 001 = 10^{-6}	micro	μ
0.000 000 001 = 10^{-9}	nano	n
0.000 000 000 001 = 10^{-12}	pico	p
0.000 000 000 000 001 = 10^{-15}	femto	f
0.000 000 000 000 000 001 = 10^{-18}	atto	a

*Deprecated.

270-1966w

prefix notation (mathematics of computing) A parenthesis-free method of forming mathematical expressions devised by the Polish logician Jan Lukasiewicz, in which each operator is immediately followed by its operands. For example, A added to B and the result multiplied by C is expressed as X + ABC. *Synonyms:* parenthesis-free notation; Lukasiewicz notation; Polish notation. *Contrast:* postfix notation; infix notation. (C) 1084-1986w

preform (fiber optics) A glass structure from which an optical fiber waveguide may be drawn. *See also:* ion exchange technique; chemical vapor deposition technique; optical blank. (Std100) 812-1984w

preformed coil or coil side (rotating machinery) An element of a preformed winding, composed of conductor strands, usually insulated and sometimes transposed, cooling ducts in some designs, turn insulation where number of turns exceeds one, and coil insulation. *See also:* rotor; stator. (PE) [9]

preformed winding A winding consisting of coils which are given their shape before being assembled in the machine. (PE) [9]

P register A special-purpose instruction address register that holds the address of the next instruction to be fetched or executed. (C) 610.10-1994w

preheat (switch start) fluorescent lamp (illuminating engineering) A fluorescent lamp designed for operation in a circuit requiring a manual or automatic starting switch to preheat the electrodes in order to start the arc. (EEC/IE) [126]

preheating time (mercury-arc valve) The time required for all parts of the valve to attain operating temperature. (ED) [45], [84]

preheating time cathode (electron tube) The minimum period of time during which the heater voltage should be applied before the application of other electrod voltages. *See also:* heater current. (ED) [45]

preheat-starting (fluorescent lamps) (switch-starting systems) The designation given to those systems in which hot-cathode electric discharge lamps are started from preheated cathodes through the use of a starting switch, either manual or automatic in its operation. *Note:* The starting switch, when closed, connects the two cathodes in series in the ballast circuit so that current flows to heat the cathodes to emission temperature. When the switch is opened, a voltage surge is produced that initiates the discharge. Only the arc current flows through the cathodes after the lamp is in operation. *See also:* fluorescent lamp. (EEC/IE) [126]

preliminary design (A) (software) The process of analyzing design alternatives and defining the architecture, components, interfaces, and timing and sizing estimates for a system or component. *See also:* detailed design. **(B) (software)** The result of the process in definition "A." (C) 610.12-1990

preliminary design review (A) A review conducted to evaluate the progress, technical adequacy, and risk resolution of the selected design approach for one or more configuration items; to determine each design's compatibility with the requirements for the configuration item; to evaluate the degree of definition and assess the technical risk associated with the selected manufacturing methods and processes; to establish the existence and compatibility of the physical and functional interfaces among the configuration items and other items of equipment, facilities, software and personnel; and, as applicable, to evaluate the preliminary operational and support documents. *See also:* critical design review; system design review. **(B)** A review, as in definition "A" of any hardware or software component. (C) 610.12-1990

preliminary relay contacts Contacts that open or close in advance of other contacts when the relay is operating. (EEC/REE) [87]

premises wiring (system) That interior and exterior wiring, including power, lighting, control, and signal circuit wiring together with all of its associated hardware, fittings, and wiring devices, both permanently and temporarily installed, which extends from the load end of the service drop, or load end of the service lateral conductors to the outlet(s). Such wiring does not include wiring internal to appliances, fixtures, motors, controllers, motor control centers, and similar equipment. (NEC/NESC) [86]

premolded A joint that is factory molded in the shape which it will take when installed. Installation is performed by sliding the joint over the cable. The use of heat is not a part of the installation procedure. (PE/IC) 404-1993

pre-molded joint (power cable joints) A joint made of premolded components assembled in the field. (PE/IC) 404-1986s

preoperational system test (Class 1E power systems and equipment) A test to confirm that all individual component parts of a system function as a system and the system functions as designed. A preoperational test is performed following significant modifications or additions made to the facility at later dates. (PE/NP) 415-1986w

preoperational testing All testing required for system components prior to energizing or operating the major system component. (PE/EDPG) 1248-1998

preorder traversal The process of traversing a binary tree in a recursive fashion as follows: the root is visited, then the left subtree is traversed, then the right subtree is traversed. *Con-*

trast: inorder traversal; postorder traversal. *See also:* converse preorder traversal. (C) 610.5-1990w

PREP *See:* PRogrammed Electronics Patterns.

preparatory function (numerically controlled machines) A command changing the mode of operation of the control such as from positioning to contouring or calling for a fixed cycle of the machine.

prepatch panel *See:* problem board.

prepend To append to the beginning. For example, a Media Access Control (MAC) frame is prepended with a preamble and appended with a frame check sequence (FCS). (C/LM) 802.3-1998

preprocessing An operation performed before a primary process; for example, in pattern recognition, processing in which patterns are simplified to make classification easier. (C) 610.4-1990w

preprocessor (1) (software) A computer program or routine that carries out some processing step prior to the primary process; for example, a precompiler or other routine that reformats code or data for processing. *Contrast:* postprocessor. *See also:* D-TRAN; LYRIC; PDEL. (C) 610.12-1990, 610.13-1993w

(2) A device that effects preparatory computation or organization. (C) 610.10-1994w

pre-read head A read head that is placed before another read head and is used to read data before the same data are read by the other read head. (C) 610.10-1994w

prerecorded data medium A data medium on which certain preliminary items are preset; the remaining items are entered during subsequent operations. (C) 610.10-1994w

preregister operation (elevators) Operation in which signals to stop are registered in advance by buttons in the car and at the landings. At the proper point in the car travel, the operator in the car is notified by a signal, visual, audible, or otherwise, to initiate the stop, after which the landing stop is automatic. *See also:* control. (EEC/PE) [119]

prerequisite The specification in a software object that implies it shall not be installed until after some other software object is installed, and configured until after the other software object is configured. (C/PA) 1387.2-1995

pre-rip (cable plowing) A process using a plow blade to loosen the earth prior to plowing and installing the cable, flexible tube, etc. (T&D/PE) 590-1977w

prescribed surface (sound measurements) A hypothetical surface surrounding the machine on which sound measurements are made. (PE/EM) 85-1973w

prescriptive model A model used to convey the required behavior or properties of a proposed system; for example, a scale model or written specification used to convey to a computer supplier the physical and performance characteristics of a required computer. *Contrast:* descriptive model. (C) 610.3-1989w

preselector (A) A device placed ahead of a frequency converter or other device, that passes signals of desired frequencies and reduces others. **(B)** In automatic switching, a device that performs its selecting operation before seizing an idle trunk. (EEC/PE) [119]

presence tests (test, measurement, and diagnostic equipment) Actions which verify the presence or absence of signals or characteristics. Such signals or characteristics are those which are not tolerance critical to operation of the item. (MIL) [2]

present When describing an argument to a function call, the case where a pointer to an actual object of the type specified in the declaration is supplied by the caller (as opposed to a null pointer). (C/PA) 1238.1-1994w

presentation address (1) An unambiguous name that is used to identify a set of presentation service access points. Loosely, it is the network address of an OSI service. (C/PA) 1328.2-1993w, 1224.2-1993w, 1326.2-1993w, 1327.2-1993w

(2) A name unambiguous within the OSI environment that is used to identify a set of presentation service access points. (C/PA) 1238.1-1994w

present average demand An average value occurring during a current demand interval or subinterval (e.g., watts or voltamperes). (AMR/SCC31) 1377-1997

presentation graphics The use of a computer to produce high quality, high resolution graphical output. *Contrast:* information graphics. (C) 610.2-1987

presentation layer (1) (Layer 6) The layer of the ISO Reference Model that frees the application processes from concern with differences in data representation. (DIS/C) 1278.2-1995

(2) The sixth layer of the seven-layer OSI model; responsible for general user services related to the representation of user data. *Note:* This layer provides compression, encryption, character and file conversion on messages from the application layer. *See also:* application layer; data link layer; physical layer; network layer; sublayer; transport layer; session layer; client layer; entity layer; logical link control sublayer; medium access control sublayer. (C) 610.7-1995

preset To establish an initial condition, such as the control values of a loop. (C/C) [20], [85]

preset guidance (navigation aid terms) Guidance in which a predetermined path is set into the guidance mechanism of a craft and is not altered after launching. (AES/GCS) 172-1983w

preset speed A control function that establishes the desired operating speed of a drive before initiating the speed change. *See also:* electric drive. (IA/ICTL/IAC/APP) [60], [75]

preshoot (pulse terminology) A distortion which precedes a major transition. *Note:* Colloquial term which qualitatively describes a type of distortion. (IM/WM&A) 194-1977w

press To push and hold a mouse button. (C) 1295-1993w

pressing (disk recording) A pressing is a record produced in a record-molding press from a master or stamper. *See also:* phonograph pickup. (SP) [32]

pressure (solderless) connector A device that establishes a connection between two or more conductors or between one or more conductors and a terminal by means of mechanical pressure and without the use of solder. (NESC/NEC) [86]

pressure altimeter (navigation aid terms) An altimeter that measures and indicates altitude above a datum plane by means of an aneroid which responds to the change in atmospheric pressure with height. (AES/GCS) 172-1983w

pressure barrier seal (nuclear power generating station) Consists of an aperture seal and an electrical conductor seal. (PE/IM/NP) 380-1975w, [76]

pressure cable An oil-impregnated paper-insulated cable in which positive gauge pressure is maintained on the insulation under all operating conditions. (T&D/PE) [10]

pressure coefficient *See:* environmental coefficient.

pressure connector (packaging machinery) A conductor terminal applied with pressure so as to make the connection mechanically and electrically secure. (IA/PKG) 333-1980w

pressure-containing terminal box (rotating machinery) A terminal box so designed that the products of an electric breakdown within the box are completely contained inside the box. (PE) [9]

pressure controller (control systems for steam turbine-generator units) Includes only those components and control elements that generate one or more signal(s) for the control mechanism in response to pressure set point and pressure feedback signals for the purpose of controlling pressure. (PE/EDPG) 122-1985s

pressure control system (control systems for steam turbine-generator units) A system that controls the pressure at a sensing point in a designated location. Typically, it includes the pressure-sensing element, the controller, the control

mechanism, and the controlled valve(s).
(PE/EDPG) 122-1985s

pressure-gradient microphone A microphone in which the electric output substantially corresponds to a component of the gradient (space derivative) of the sound pressure. *Note:* Pressure-gradient microphones may be of any order; for example, zero, first, second, etc. Thus, a pressure microphone is a gradient microphone of zero order. The rms response to plane waves is proportional to $\cos^n\theta$, where θ is the angle of incidence and n is the order of the gradient. Because of the finite dimensions of all gradient microphones, however, the response characteristic and the directional characteristic, respectively, are only approximations of the derivative of the sound pressure and of the directional formula noted.
(T&D/PE) 539-1990

pressure-lubricated bearing (rotating machinery) A bearing in which a continuous flow of lubricant is forced into the space between the journal and the bearing. *See also:* bearing.
(PE) [9]

pressure microphone A microphone in which the electric output substantially corresponds to the instantaneous sound pressure of the impressed sound waves. *Note:* A pressure microphone is a gradient microphone of zero order and is nondirectional when its dimensions are small compared to a wavelength. *See also:* microphone.
(T&D/PE/EEC) 539-1990, [119]

pressure reference changer (control systems for steam turbine-generator units) A device for producing the pressure reference signal to the pressure controller in response to a manual or automatic adjustment. (PE/EDPG) 122-1985s

pressure relay A relay that responds to liquid or gas pressure.
(SWG/PE) C37.100-1992

pressure-relief device (arresters) A means for relieving internal pressure in an arrester and preventing explosive shattering of the housing, following prolonged passage of follow current or internal flashover of the arrester. (PE) [8]

pressure-relief terminal box (rotating machinery) A terminal box so designed that the products of an electric breakdown within the box are relieved through a pressure-relief diaphragm. (PE) [9]

pressure-relief test (arresters) A test made to ascertain that an arrester failure will not cause explosive shattering of the housing. (PE) [8]

pressure retaining boundary (nuclear power generating station) The pressure retaining boundary includes those surfaces of the aperture seal, the conductor feed-through plate, the conductor seal (or seals), and the conductor (or conductors) which are exposed to the containment environment.
(PE/NP) 380-1975w

pressure-sensitive keyboard *See:* membrane keyboard.

pressure switch (1) A switch in which actuation of the contacts is effected at a predetermined liquid or gas pressure.
(IA/ICTL/IAC) [60], [84]

(2) (power system device function numbers) A switch which operates on given values, or on a given rate of change, of pressure. (PE/SUB) C37.2-1979s

pressure system (protective signaling) A system for protecting a vault by maintaining a predetermined differential in air pressure between the inside and outside of the vault. Equalization of pressure resulting from opening the vault or cutting through the structure initiates an alarm condition in the protection circuit. *See also:* protective signaling.
(EEC/PE) [119]

pressure-type pothead A pressure-type pothead is a pothead intended for use on positive-pressure cable systems. *See also:* single-pressure-zone potheads; multipressure-zone pothead.
(PE) 48-1975s

pressure-type termination A Class 1C termination intended for use on positive pressure cable systems.

— Single pressure zone termination: A pressure-type termination intended to operate with one pressure zone.

— Multipressure zone termination: A pressure-type termination intended to operate with two or more pressure zones.
(PE/IC) 48-1996

pressure wire connector A device that establishes the connection between two or more conductors or between one or more conductors and a terminal by means of mechanical pressure and without the use of solder. (EEC/PE) [119]

pressurized (rotating machinery) Applied to a sealed machine in which the internal coolant is kept at a higher pressure than the surrounding medium. (PE) [9]

prestartup testing All testing required prior to rotating the generating unit under power (hydraulic or electrical) which is unique to the unit and not associated with system testing.
(PE/EDPG) 1248-1998

prestore To store data that are required by a computer program or routine before the program or routine is entered.
(C) 610.12-1990

prestressed-concrete structures Concrete structures that include metal tendons that are tensioned and anchored either before or after curing of the concrete. (NESC) C2-1997

prestrike The initiation of current between the contacts during a closing operation before the contacts have mechanically touched. (SWG/PE) C37.100-1992, C37.083-1999

prestrike current (lightning) The current that flows in a lightning stroke prior to the return stroke current. *See also:* direct-stroke protection. (T&D/PE) [10]

presumptive address *See:* base address.

presumptive instruction A computer instruction that is not an effective instruction until it has been modified in a prescribed manner. (C) 610.10-1994w

pretersonic Ultrasonic and with frequency higher than 500 megahertz. (UFFC) [122]

pre-tested iteration *See:* WHILE.

pretransmit-receive tube A gas-filled radio-frequency switching tube used to protect the transmit-receive tube from excessively high power and the receiver from frequencies other than the fundamental. *See also:* gas tube.
(ED) 161-1971w

prettyprinting The use of indentation, blank lines, and other visual cues to show the logical structure of a program.
(C) 610.12-1990

preventive autotransformer An autotransformer (or center-tapped reactor) used in load tap changing and regulating transformers, or step-voltage regulators to limit the circulating current when operating on a position in which two adjacent taps are bridged, or during the change of taps between adjacent position.
(PE/TR) C57.131-1995, C57.12.80-1978r

preventive maintenance (1) (test, measurement, and diagnostic equipment) Tests, measurement, replacements, adjustments, repairs and similar activities, carried out with the intention of preventing faults or malfunctions from occurring during subsequent operation. Preventive maintenance is designed to keep equipment and programs in proper operating condition and is performed on a scheduled basis.
(MIL) [2]

(2) The maintenance carried out at predetermined intervals or corresponding to prescribed criteria, and intended to reduce the probability of failure or the performance degradation of an item. (R) [29]

(3) (software) Maintenance performed for the purpose of preventing problems before they occur. (C) 610.12-1990

(4) Maintenance performed specifically to prevent faults from occurring. (C) 610.10-1994w

(5) The practice of conducting routine inspections, tests, and servicing so that impending troubles can be detected and reduced or eliminated. (IA/PSE) 902-1998

(6) A procedure in which the system is periodically checked and/or reconditioned to prevent or reduce the probability of failure or deterioration in subsequent service.
(PE/NP) 933-1999

previously developed software Software that has been produced prior to or independent of the project for which the Plan is prepared, including software that is obtained or purchased from outside sources. (C/SE) 1228-1994

PRF *See:* pulse-repetition frequency.

PRI *See:* pulse-repetition interval.

Primacord *See:* explosives.

primaries (color) (television) The colors of constant chromaticity and variable amount that, when mixed in proper proportions, are used to produce or specify other colors. *Note:* Primaries need not be physically realizable. (BT/AV) 201-1979w

primary (1) (supervisory control, data acquisition, and automatic control) An equipment or subsystem that normally contributes to system operation. *See also:* backup. (SWG/PE/SUB) C37.100-1992, C37.1-1994

(2) (instrument transformers) The winding intended for connection to the circuit to be measured or controlled. (PE/TR) [57], C57.13-1993

(3) The part of a machine having windings that are connected to the power supply line (for a motor or transformer) or to the load (for a generator). (PE/EM) [9]

(4) (A) First to operate; for example, primary arcing contacts, primary detector. **(B)** First in preference; for example, primary protection. **(C)** Referring to the main circuit as contrasted to auxiliary or control circuits; for example, primary disconnecting devices. **(D)** Referring to the energy input side of transformers, or the conditions (voltages) usually encountered at this location; for example, primary unit substation. (SWG/PE) C37.100-1992

primary address (FASTBUS acquisition and control) An address assigned to a device by means of which a master is able to establish contact with the device or a subdivision of the device. Primary address types are logical, geographical and broadcast addresses. (NID) 960-1993

primary address cycle The portion of a FASTBUS operation in which a master addresses a slave on the address/data (AD) lines. The address type is specified by the EG and MS control lines. It begins with the master asserting the address sync (AS) line and terminates with the master receiving an address acknowledgment on the AK line. Logical, geographical or broadcast addresses are asserted during primary address cycles. (NID) 960-1993

primary arcing contacts (of a switching device) The contacts on which the initial arc is drawn and the final current, except for the arc-shunting-resistor current, is interrupted after the main contacts have parted. (SWG/PE) C37.100-1992

primary backplane bus A backplane bus that provides the main communications path among a cluster of modules. (C/BA) 14536-1995

primary battery *See:* primary cell; battery; electrochemistry.

primary bus The collection of signals that provides the system with the basic mechanism for exchanging data between boards. (C/BA) 896.9-1994w, 896.3-1993Gw

primary calibration (monitoring radioactivity in effluents) The determination of the electronic system accuracy when the detector is exposed in a known geometry to radiation from sources of known energies and activity levels traceable to the National Bureau of Standards (NBS). (NI) N42.18-1980r

primary cell A cell that produces electric current by electrochemical reactions without regard to the reversibility of those reactions. Some primary cells are reversible to a limited extent. *See also:* electrochemistry. (EEC/PE) [119]

primary center (1) (telephone switching systems) A toll office to which toll centers and toll points may be connected. Primary centers are classified as Class 3 offices. *See also:* office class. (COM) 312-1977w

(2) Class 3 office in the North American hierarchical routing plan; a control center connecting toll centers of the telephone system together. *See also:* regional center; sectional center; toll center; end office. (C) 610.7-1995

primary circuit The circuit on the input side of the regulator. (PE/TR) C57.15-1999

primary coating (fiber optics) The material in intimate contact with the cladding surface, applied to preserve the integrity of that surface. *See also:* cladding. (Std100) 812-1984w

primary-color unit (television) The area within a color cell occupied by one primary color. *See also:* television. (ED) 161-1971w

primary current ratio (electroplating) The ratio of the current densities produced on two specified parts of an electrode in the absence of polarization. It is equal to the reciprocal of the ratio of the effective resistances from the anode to the two specified parts of the cathode. *See also:* electroplating. (EEC/PE) [119]

primary data element A data element within a record that represents the subject of that record; for example, the data element "name" in a record containing "name," "city of birth," and "date of birth." *Contrast:* attribute data element. (C) 610.5-1990w

primary detecting element (automatic control) That portion of the feedback elements that first either utilizes or transforms energy from the controlled medium to produce a signal that is a function of the value of the directly controlled variable. (PE/EDPG) [3]

primary detector (1) (power systems) That portion of the measurement device which either utilizes or transforms energy from the controlled medium to produce a measurable effect which is a function of change in the value of the controlled variable. (PE/PSE) 94-1970w

(2) (or sensing element or initial element) The first system element or group of elements that responds quantitatively to the measurand and performs the initial measurement operation. A primary detector performs the initial conversion or control of measurement energy and does not include transformers, amplifiers, shunts, resistors, etc., when these are used as auxiliary means. *Synonyms:* sensing element; initial element. (SWG/PE) C37.100-1992

primary disconnecting devices (of a switchgear assembly) Self-coupling separable contacts provided to connect and disconnect the main circuits between the removable element and the housing. (SWG/PE) C37.100-1992

primary distribution feeder A feeder operating at primary voltage supplying a distribution circuit. *Note:* A primary feeder is usually considered as that portion of the primary conductors between the substation or point of supply and the center of distribution. (IA/CEM) [58]

primary distribution mains The conductors that feed from the center of distribution to direct primary loads or to transformers that feed secondary circuits. *See also:* center of distribution. (IA/CEM) [58]

primary distribution system A system of alternating-current distribution for supplying the primaries of distribution for supplying the primaries of distribution transformers from the generating station or substation distribution buses. *See also:* alternating-current distribution; center of distribution. (IA/CEM) [58]

primary distribution trunk line A line acting as a main source of supply to a distribution system. *See also:* center of distribution. (IA/CEM) [58]

primary electric shock An electric shock sufficiently severe to cause direct physiological harm. (T&D/PE) 539-1990

primary electron (thermionics) An electron in a primary emission. *See also:* electron emission. (ED) [45], [84]

primary fault The initial breakdown of the insulation of a conductor, usually followed by a flow of power current. *See also:* center of distribution. (IA/CEM) [58]

primary flow (carriers) A current flow that is responsible for the major properties of the device. (Std100) 102-1957w

primary grid emission (thermionic) Current produced by electrons or ions thermionically emitted from a grid. *See also:* electron emission. (ED) [45]

primary ground electrode A ground electrode specifically designed or adapted for discharging the ground fault current into the ground, often in a specific discharge pattern, as required (or implicitly called for) by the grounding system design. (PE/SUB) 80-2000

primary input (1) A node in a circuit in which the tester can apply stimulus. (SCC20) 1445-1998

(2) The point where a logic signal arrives at the boundary of the design as currently known to an electric design automation (EDA) application. For a complete integrated circuit design, for example, this point is the metal pad of an input or bidirectional pad cell. (C/DA) 1481-1999

primary key (1) (A) In sorting and searching, the key that is given the highest priority within a group of related keys. For example, after sorting, the values in the primary key will be in the given order, independent of the values of the other fields. *Synonyms:* major key; prime key. *Contrast:* secondary key. **(B)** In a relation, a specific minimal set of attributes that functionally determines all other attributes in the relation, and thus uniquely differentiates one entity from another. *Note:* More than one set of attributes with this property may exist. Each such set is known as a candidate key, but only one is chosen as the primary key. *See also:* alternate key; candidate key. (C) 610.5-1990

(2) The candidate key selected as the unique identifier of an entity. (C/SE) 1320.2-1998

primary line of sight (illuminating engineering) The line connecting the point of observation and the point of fixation. In terms of a single eye, it is the line connecting the point of fixation and the center of the entrance pupil. (EEC/IE) [126]

primary line-to-ground voltage (coupling capacitors and capacitance potential devices) Refers to the high-tension root-mean-square line-to-ground voltage of the phase to which the coupling capacitors or potential device, in combination with its coupling capacitor or bushing, is connected. *See also:* rated primary line-to-ground voltage. 31-1944w

primary_message The part of the interface event message carried by the DMA mechanism itself. The primary_message may point to message_extensions. (C/MM) 1212.1-1993

primary network A network supplying the primaries of transformers whose secondaries may be independent or connected to a secondary network. *See also:* center of distribution. (IA/CEM) [58]

primary oil containment A tank or enclosure designed for continuous containment of oil for operating or storage purposes. (SUB/PE) 980-1994

primary outage An outage occurrence within a related multiple outage event that occurs as a direct consequence of the initiating incident and is not dependent on any other outage occurrence. *Note:* A primary outage of a component or a unit may be caused by a fault on equipment within the unit or component or repair of a component within the unit. *See also:* related multiple outage event. (PE/PSE) 859-1987w

primary output (1) A node in a circuit in which the tester can observe a response. (SCC20) 1445-1998

(2) The point where a logic signal leaves the design as currently known to an electric design automation (EDA) application. For a complete integrated circuit design, for example, this point is the metal pad of an output or bidirectional pad cell. (C/DA) 1481-1999

primary output patterns (POPAT) A set of unique responses at the node in which a fault or a group of faults are detected. (SCC20) 1445-1998

primary overcurrent protective device of apparatus (nuclear power generating station) A device or apparatus which normally performs the function of circuit interruption. (PE/NP) 317-1976s

primary packet (1) A packet made up of whole quadlets that contains a transaction code in the first quadlet. Any packet that is not an acknowledge or a PHY packet. (C/MM) 1394-1995

(2) Any packet that is not an acknowledge or a physical layer (PHY) packet. A primary packet is an integral number of quadlets and contains a transaction code in the first quadlet. (C/MM) 1394a-2000

primary protection (as applied to a relay system) First-choice relay protection in contrast with backup relay protection. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

primary radar (1) A radar system, subsystem, or mode of operation in which the return signals are the echoes obtained by reflection from the target. Since this is the normal method of radar operation, the word *primary* is omitted unless necessary to distinguish it from *secondary*. *See also:* secondary radar. (AES/GCS) 172-1983w

(2) A radar system in which the return signals are the echoes obtained by reflection from the target. Since this is the normal method of radar operation, the word *primary* is omitted unless necessary to distinguish it from *secondary*. *See also:* secondary radar. (AES) 686-1997

primary radiator The radiating element of a reflector or lens antenna that is coupled to the transmitter or receiver directly, or through a feed line. *Note:* For some applications, an array of radiating elements is employed. (AP/ANT) 145-1993

primary reactor starter A starter that includes a reactor connected in series with the primary winding of an induction motor to furnish reduced voltage for starting. It includes the necessary switching mechanism for cutting out the reactor and connecting the motor to the line. *See also:* starter. (IA/ICTL/IAC/APP) [60], [75]

primary representation The form in which the service supplies an attribute value to the client. (C/PA) 1328-1993w, 1327-1993w, 1224-19931w

primary resistor starter A starter that includes a resistor connected in series with the primary winding of an induction motor to furnish reduced voltage for staring. It includes the necessary switching mechanism for cutting out the resistor and connecting the motor to the line. *See also:* starter. (IA/ICTL/IAC) [60]

primary ring In a dual ring, this is the ring over which application data (LLC frames) are exchanged during normal operation. MAC1, which transmits the application data, is attached to the primary ring. When a dual ring station is in either WRAPA or WRAPB, MAC1 is switched to remain in the operational section of the wrapped ring. The primary ring uses the links ARx and BTx in each dual ring station. (LM/C) 802.5c-1991r

primary section of the core The section of the core of a ferroresonant transformer on which the primary winding is wound. (PEL) 449-1998

primary service area (radio broadcast transmitter) The area within which reception is not normally subject to objectionable interference or fading. *See also:* radio transmitter. (EEC/PE) [119]

primary shock A shock of such a magnitude that it may produce direct physiological harm. The results of primary shock are fibrillation, respiratory tetanus, and muscle contraction. (T&D/PE) 1048-1990, 524a-1993r

primary signal A signal at the interface between the physical device and the physical tester. Any and all information meant for test is defined on these signals; test translators need process these signals only. (C/TT) 1450-1999

primary socket identifier (PSID) A socket number identifying a particular endpoint on the primary device. (C/MM) 1284.4-2000

primary space allocation (data management) The amount of space that is reserved for a particular file when it is initially defined. *Contrast:* secondary space allocation. (C) 610.5-1990w

primary standard (luminous standards) (illuminating engineering) A light source by which the unit of light is established and from which the values of other standards are derived. This order of standard also is designated as the national

standard. *Note:* A satisfactory primary (national) standard must be reproducible from specifications. Primary (national) standards usually are found in national physical laboratories, such as the National Bureau of Standards. *See also:* candela. (IE/EEC) [126]

primary state The state on a node that is initialized by a power_reset. For example, the CSRs defined by IEEE Std 1212-1991, CSR Architecture, are part of the node's primary state. (C/MM) 1212-1991s

primary station (1) The station that, at any given instant, has the right to select and to transmit information to a secondary station and the responsibility to insure information transfer. *See also:* secondary station. (C) 610.7-1995

(2) As defined by the infrared link access protocol (IrLAP), the station on the data link that assumes responsibility for the organization of data flow and for unrecoverable data link error conditions. It issues commands to the secondary stations and gives them permission to transmit. (EMB/MIB) 1073.3.2-2000

primary storage *See:* main storage.

primary supply voltage (mobile communication) The voltage range over which a radio transmitter, a radio receiver, or selective signaling equipment is designed to operate without degradation in performance. *See also:* mobile communication system. (VT) [37]

primary switchgear connections *See:* main switchgear connections.

primary transmission feeder A feeder connected to a primary transmission circuit. *See also:* center of distribution. (T&D/PE) [10]

primary unit substation (1) (power and distribution transformers) A substation in which the low-voltage section is rated above 1000 V. (PE/TR) C57.12.80-1978r

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

primary voltage rating of a general-purpose specialty transformer (power and distribution transformers) The input circuit voltage for which the primary winding is designed, and to which operating and performance characteristics are referred. (PE/TR) C57.12.80-1978r

primary winding (1) (power and distribution transformers) The winding on the energy input side. (PE/TR) C57.12.80-1978r

(2) (voltage regulators) The shunt winding. *See also:* voltage regulator. (PE/TR) C57.15-1968s

(3) (rotating machinery) (motor or generator) The winding carrying the current and voltage of incoming power (for a motor) or power output (for a generator). The choice of what constitutes a primary circuit is arbitrary for certain machines having bilateral power flow. In a synchronous or direct-current machine, this is more commonly called the armature winding. *See also:* armature. (PE) [9]

(4) (instrument transformers) The winding intended for connection to the circuit to be measured or controlled. (PE/TR) C57.13-1993, [57]

(5) The winding of the ferroresonant transformer to which the input voltage is applied. (PEL) 449-1998

primary window A window in which the main interaction between the user and an object or application takes place (also known as main window). (C) 1295-1993w

primary zone The part of a relay's protected zone where the relay operates with no intentional time delay. (PE/PSR) C37.113-1999

prime (charge-storage tubes) To charge storage elements to a potential suitable for writing. *Note:* This is a form of erasing. *See also:* television; charge-storage tube. (ED) 161-1971w

prime attribute An attribute that forms all or part of the primary key of a relation. *Contrast:* nonprime attribute. (C) 610.5-1990w

prime key *See:* primary key.

prime meridian (navigation aid terms) The meridiam of longitude 0°, almost universally considered as Greenwich, England. (AES/GCS) 172-1983w

prime mover (emergency and standby power) The machine used to develop mechanical horsepower to drive an emergency or standby generator to produce electrical power. (IA/PSE) 446-1995

prime power (1) The maximum potential power (chemical, mechanical, or hydraulic) constantly available for transformation into electric power. *See also:* generating station. (T&D/PE) [10]

(2) The source of supply of electrical energy that is normally available and used continuously day and night, usually supplied by an electric utility company, but sometimes supplied by base-loaded user-owned generation. (IA/PSE) 446-1995

prime source In the event that several vendors offer pin-for-pin compatible components, the prime source is the vendor who introduced the component type. (TT/C) 1149.1-1990

priming rate (charge-storage tubes) The time rate of priming a storage element, line, or area from one specified level to another. Note the distinction between this and "priming speed." *See also:* charge-storage tube. (ED) 158-1962w

priming speed (charge-storage tubes) The lineal scanning rate of the beam across the storage surface in priming. Note the distinction between this and "priming rate." *See also:* charge-storage tube. (ED) 158-1962w, 161-1971w

primitive (1) (software reliability) Data relating to the development or use of software that is used in developing measures or quantitative descriptions of software. Primitives are directly measurable or countable, or may be given a constant value or condition for a specific measure. Examples include: error, failure, fault, time, time interval, date, number of noncommentary source code statements, edges, and nodes. (C/SE) 982.2-1988, 982.1-1988

(2) The lowest level for which data is collected. (C/SE) 1045-1992

(3) A basic or fundamental unit, often referring to the lowest level of machine instruction or the lowest unit of a language. (C) 610.10-1994w

(4) (local area networks) A definition of a service provided by a sublayer to the sublayer immediately above. Primitives may be initiated by either the upper or lower sublayer. (C) 8802-12-1998

(5) A mechanism for communicating between the entities of different layers of the medical information bus (MIB) communications standard (e.g., between the Physical layer and Data Link layer entities). A primitive may request a particular service, provide indication of a request, provide a response to an indication, or provide confirmation of a response. (EMB/MIB) 1073.4.1-2000

(6) *See also:* display element. (C) 610.6-1991w

primitive attribute A characteristic that applies to a display element. For example, color, line style, character size. (C) 610.6-1991w

primitive Boolean function A Boolean expression having the property that all other Boolean expressions can be constructed using it alone. (C) 1084-1986w

primitive data structure A data structure that can be directly operated upon by machine-level instructions. Examples include integer, real, character, logical, and pointer. *Contrast:* nonprimitive data structure. (C) 610.5-1990w

primitive period *See:* period.

primitive service A service that accesses or manipulates defined elements of AI-ESTATE–conformant models (e.g., get, put, create, delete). (SCC20) 1232.2-1998

primitive type *See:* atomic type.

principal axis (1) (close-talking pressure-type microphone) The axis of a microphone normal to the plate of the principal acoustic entrance of a microphone, and that passes through the center of the entrance. *See also:* close-talking pressure-type microphones. (SP) 258-1965w

(2) (transducer used for sound emission or reception) A reference direction used in describing the directional characteristics of the transducer. It is usually an axis of structural

symmetry, or the direction of maximum response, but if one of these does not coincide with the reference direction, it must be described explicitly. (SP) [32]

principal axis of compliance (accelerometer) (gyros) An axis along which an applied force results in a displacement along that axis only. The acceleration-squared error due to anisoelasticity is zero when acceleration is along a principal axis of compliance. (AES/GYAC) 528-1994

principal branch (main branch) A branch involved in the major transfer of energy from one side of the converter to the other. (IA/ID/SPC) 995-1987w, 936-1987w

principal characteristics *See:* principal voltage-current characteristic.

principal-city office (telephone switching systems) An intermediate office that has the screening and routing capabilities to accept traffic to all end office within one or more numbering-plan areas. (COM) 312-1977w

principal current (1) (self-commutated converters) (circuit properties) (of a converter switching element or branch) The on-state current of the semiconductor devices in a switching element or branch flowing between its principal terminals. *Note:* The principal current is often referred to as the "current" of the switching element or branch. (IA/SPC) 936-1987w

(2) (thyristor) A generic term for the current through the collector junction. *Note:* It is the current though both main terminals. (IA/IPC) 428-1981w

principal E-plane (1) For a linearly polarized antenna, the plane containing the electric field vector and the direction of maximum radiation. (AP/ANT) 145-1993

(2) (linearly polarized antenna) The plane containing the electric field vector and the direction of maximum radiation. *See also:* radiation; antenna. (AP/ANT) [35]

principal half-power beamwidths For a pattern whose major lobe has a half-power contour that is essentially elliptical, the half-power beamwidths in the two pattern cuts that contain the major and minor axes of the ellipse, respectively. (AP/ANT) 145-1993

principal H-plane *See:* principal H-plane.

principal power (thyristor) The power which is consumed in the load circuit plus the losses in the power circuit elements including switching losses. (IA/IPC) 428-1981w

principal restraint (accelerometer) The means by which a measurable force or torque is generated to oppose the force or torque produced by an acceleration along or about an input axis. (AES/GYAC) 528-1984s

principal terminal (self-commutated converters) (converter circuit elements) A terminal (of a device or circuit element) through which passes the current transmitting the power that is controlled by the device or circuit element. The term is used for distinction from control terminals, monitoring signal terminals, etc. *Note:* Examples of principal terminals are the anode and cathode of thyristor or diode devices, the collector and emitter of bipolar transistor devices, and the source and drain of field-effect transistor devices. (IA/SPC) 936-1987w, 995-1987

principal voltage (thyristor) The voltage between the main terminals. *Notes:* 1. In the case of reverse blocking and reverse conducting thyristors, the principal voltage is called positive when the anode potential is higher than the cathode potential, and called negative when the anode potential is lower than the cathode potential. 2. For bidirectional thyristors, the principal voltage is called positive when the potential of main terminal 2 is higher than the potential of main terminal 1. (IA/IPC) 428-1981w

principal voltage-current characteristic (thyristor) The function, usually represented graphically, relating the principal voltage to the principal current with gate current, where applicable, as a parameter. *Synonym:* principal characteristics. (IA/ED) 223-1966w, [46], [12]

printable character (1) A character in the range 0x21 through 0x7E or the range 0xA1 through 0xFE. (C/BA) 1275-1994

(2) One of the characters included in the print character classification of the LC_CTYPE category in the current locale. (C/PA) 9945-2-1993

print bar *See:* type bar.

print chain In a chain printer, a revolving carrier on which the type slugs of an impact printer are mounted. *Synonym:* print train. (C) 610.10-1994w

print contrast ratio In optical character recognition, the ratio obtained by subtracting the reflectance at an inspection area from the maximum reflectance found within a specified distance from that area, and dividing the result by that maximum reflectance. *Contrast:* print contrast signal. (C) 610.2-1987

print contrast signal In optical character recognition, a measure of the contrast between a printed character and the paper on which the character is printed. *Contrast:* print contrast ratio. (C) 610.2-1987

print control character A control character for print operations such as line spacing, page ejection, or carriage return. (C) 610.5-1990w

print controller The parts within a printer that perform the processing required to generate an image. *Contrast:* print engine. (C) 610.10-1994w

print data set A data set in which data that is to be printed are stored. (C) 610.5-1990w

print drum In a drum printer, a rotating cylinder that presents characters at more than one printing position. (C) 610.10-1994w

printed card form The layout or format of the printed matter on a card; the printed matter usually describes the purpose of the card and designates the precise location of card fields. (C) 610.10-1994w

printed circuit (1) (soldered connections) A pattern comprising printed wiring formed in a predetermined design in, or attached to, the surface or surfaces of a common base. (EEC/AWM) [105]

(2) A circuit in which the conducting wires are "printed" as conductive strips on an insulating board. *Synonym:* etched circuit. *See also:* printed circuit board. (C) 610.10-1994w

printed circuit antenna An antenna of some desired shape bonded onto a dielectric substrate. *Note:* The microstrip antenna is a notable example. *See also:* microstrip antenna. (AP/ANT) 145-1993

printed-circuit assembly A printed-circuit board on which separately manufactured component parts have been added. (EEC/AWM) [105]

printed circuit board A circuit board onto which the pattern of copper foil connecting the components has been etched or printed. *Note:* The term "card" is often used synonymously with "printed circuit board." *Synonym:* printed circuit card. *Contrast:* wire-wrapped board. *See also:* plugboard. (C) 610.10-1994w

(2) (A) A board for mounting of components on which most connections are made by printed circuitry. **(B)** A board having printed circuits on both sides. **(C)** A board having printed circuits on one side only. (Std100) [123]

printed circuit card *See:* printed circuit board.

printed wiring (soldered connections) A portion of a printed circuit comprising a conductor pattern for the purpose of providing point-to-point electric connection only. (EEC/AWM) [105]

printed wiring board (PWB) (1) A generic form that includes other interconnection boards. (C/BA) 1101.3-1993

(2) A generic term that includes any interconnection board. (C/BA) 1101.4-1993

(3) Any interconnection board. (C/BA) 1101.7-1995

print element An interchangeable unit employed in element printers that contains a complete set of type slugs. By changing the print element, one can change the character font, size,

and density. Examples include "daisy wheels," "golf balls," and "thimbles." *Synonym:* type element. (C) 610.10-1994w

print engine (1) The mechanism within a printer that actually transforms the desired image to the paper. *Contrast:* print controller. (C) 610.10-1994w
(2) That set of electrical and mechanical mechanisms that move the print media or paper and marks that paper. (C/MM) 1284.1-1997

printer (1) (teletypewriter) (teleprinter) A printing telegraph instrument having a signal-actuated mechanism for automatically printing received messages. It may have a keyboard similar to that of a typewriter for sending messages. The term receiving-only is applied to a printer having no keyboard. *See also:* telegraphy. (COM) [49]
(2) An output device that produces a hard copy record of data mainly in the form of discrete graphic characters belonging to one or more predetermined character sets. *See also:* graphic printer; character-at-a-time printer; teleprinter; line printer; color printer; high-speed printer; serial printer; page printer; continuous-stream printer; character printer; impact printer; bidirectional printer; nonimpact printer. (C) 610.10-1994w
(3) An intelligent device that includes, as a primary function, the ability to convert an electrically transmitted or stored image into a physical image formed by colorant on some medium (such as paper). (C/MM) 1284.1-1997

printer driver An application software component that allows the computer system to control and communicate with a particular printer without concern for the printer's hardware characteristics. (C) 610.10-1994w

printer font A font that resides in or is intended for a printer. *Note:* Can be internal, downloaded, or on a font cartridge. *Contrast:* screen font. *See also:* online font; internal font. (C) 610.10-1994w

printer interface control unit (PICU) The set of electronics that interfaces external communications ports, common peripheral interfaces (such as font cards or disk drives), the logical units, and the marking engine. It is the function of the printer interface control unit to coordinate and sequence all the functions and operations of the printer. (C/MM) 1284.1-1997

printer language The human language used for the American National Standard Code for Information Interchange (ASCII) strings within all command and response messages, other than those to be printed or those to be displayed on the local or remote consoles (e.g., English, French, German). (C/MM) 1284.1-1997

print formatter *See:* text formatter.

print formatting *See:* text formatting.

print head (A) A head within a printer that mechanically controls the creation of an image on paper. **(B)** A term commonly applied to that component in a dot-matrix printer that is responsible for forming characters using a pattern of dots. (C) 610.10-1994

printing That set of operations implemented by the printer that results in an image rendered as marks on the selected media. (C/MM) 1284.1-1997

printing demand meter An integrated demand meter that prints on a paper tape the demand for each demand interval and indicates the time during which the demand occurred. *See also:* electricity meter. (EEC/PE) [119]

printing line The writing line on a printer. *See also:* printing position. (C) 610.10-1994w

printing position (A) One character position in a printing line. **(B)** The location of the printer head. (C) 610.10-1994

printing recorder (protective signaling) An electromechanical recording device that accepts electric signal impulses from transmitting circuits and converts them to a printed record of the signal received. *See also:* protective signaling. (EEC/PE) [119]

print media That consumable upon which the marking engine marks so as to form a text and/or pictorial image, typically paper. (C/MM) 1284.1-1997

printout (1) (test, measurement, and diagnostic equipment) The output of a device which is printed on some type of printer. (MIL) [2]
(2) Computer output printed on paper. *See also:* playback. (C) 610.10-1994w

print record A record in a print data set. (C) 610.5-1990w

print server On a network, a server that is dedicated to queuing and sending printer output from the networked computers to a shared printer. *See also:* database server; file server; disk server; mail server; network server; terminal server. (C) 610.7-1995

print through An undesired transfer of a recorded signal from one part of a magnetic medium to another part when these parts are brought into close proximity. (C/SP) 610.10-1994w, [32]

print train In a train printer, a track in which the type slugs are engaged. *See also:* print chain. (C) 610.10-1994w

print wheel In a wheel printer, a rotating disk that presents the characters of a character set at a single printing position. *Synonym:* type wheel. (C) 610.10-1994w

print wire One of a set of wires that is used in a dot-matrix printer to transfer ink to the paper. (C) 610.10-1994w

priority (1) (computer graphics) A segment attribute that determines which of several overlapping segments is closer to the viewer. (C) 610.6-1991w
(2) (software) The level of importance assigned to an item. (C) 610.12-1990
(3) (multiprocessor architecture) A bus request protocol in which the module with the highest arbitration number acquires the bus. (C/MM) 896.1-1987s
(4) A nonnegative integer associated with processes or threads, whose value is constrained to a range defined by the applicable scheduling policy. Numerically higher values represent higher priorities. (C/PA) 9945-1-1996
(5) A rank order of status, activities, or tasks. Priority is particularly important when resources are limited. (C/SE) 1362-1998
(6) (use in primitives) A parameter used to convey the priority required or desired. (C/LM/CC) 8802-2-1998
(7) The general term for an integer-valued attribute of processes, tasks, messages, and asynchronous I/O operations, whose value is used in selecting among entities of the same kind. Numerically higher values represent higher priorities and are given preference for selection over lower priorities. The *priority of an Ada task* is an integer that indicates a degree of urgency and is the basis for resolving competing demands of tasks for resources. Unless otherwise specified, whenever tasks compete for processors or other implementation-defined resources, the resources are allocated to the task with the highest priority value. The *base priority* of a task is the priority with which it was created, or to which it was later set by `Dynamic_Priorities.Set_Priority`. At all times, a task also has an *active priority*, which generally reflects its base priority as well as any priority it inherits from other sources. *Priority inheritance* is the process by which the priority of a task or other entity (*e.g.*, a protected object is used in the evaluation of the active priority of another task. At any time, the active priority of a task is the maximum of all the priorities the task is inheriting at that instant. (C) 1003.5-1999

priority-based scheduling Scheduling in which the selection of a running thread is determined by the priority of the runnable threads. (C/PA) 9945-1-1996

priority inheritance This occurs when a lower priority message at the head of the queue uses the priority of a higher priority message that is blocked. (C/BA) 896.3-1993w

priority interrupt An interrupt performed to permit execution of a process that has a higher priority than the process currently executing. (C) 610.12-1990

priority interrupt bus One of the four buses provided by the backplane. The priority interrupt bus allows interrupter modules to send interrupt requests to interrupt-handler modules. (C/BA) 1014-1987

priority inversion Condition that can occur when a higher priority activity arrives while a lower priority activity is using the shared resource, and the higher priority activity cannot preempt the lower priority activity. (C/BA) 896.3-1993w

priority queue A list to which items may be appended to or retrieved from any position, depending on some property of the item being added or removed. *Note:* This data structure is misnamed in that it contradicts the definition of "queue." (C) 610.5-1990w

priority resolution A mechanism that allows a local device and its link partner to resolve to a single mode of operation given a set of prioritized rules governing resolution. (C/LM) 802.3-1998

Priority Resolution Table The look-up table used by Auto-Negotiation to select the network connection type where more than one common network ability exists (100BASE-TX, 100BASE-T4, 10BASE-T, etc.). The priority resolution table defines the relative hierarchy of connection types from the highest common denominator to the lowest common denominator. (C/LM) 802.3-1998

priority string (power-system communication) A series connection of logic circuits such that inputs are accommodated in accordance with their position in the string, one end of the string corresponding to the highest priority. *See also:* digital. (Std100) [123]

priority-tagged frame A tagged frame whose tag header carries priority information, but carries no VLAN identification information. *See also:* VLAN-tagged frame; untagged frame. (C/LM) 802.1Q-1998

privacy The service used to prevent the content of messages from being read by other than the intended recipients. (C/LM) 8802-11-1999

privacy mode (local area networks) A mode in which an end node receives only those packets specifically addressed to it. (C) 8802-12-1998

privacy protection The establishment of appropriate administrative, technical, and physical safeguards to ensure the security and confidentiality of data records and to protect both security and confidentiality against any anticipated threats or hazards that could result in substantial harm, embarrassment, inconvenience, or unfairness to any individual about whom such information is maintained. (C/SE) J-STD-016-1995

privacy system (radio transmission) A system designed to make unauthorized reception difficult. *See also:* radio transmission. (EEC/PE) [119]

private (1) A design feature intended solely for use by the component manufacturer. (TT/C) 1149.1-1990
(2) A responsibility that is visible only to the class or the receiving instance of the class (available only within methods of the class). *Contrast:* protected; public. *See also:* hidden. (C/SE) 1320.2-1998

private automatic branch exchange (1) (telephone switching systems) (data transmission) A private branch exchange that is automatic. (COM/PE) 312-1977w, 599-1985w
(2) *See also:* private branch exchange. (C) 610.7-1995

private automatic exchange (1) (telephone switching systems) (data transmission) A private nonbranch exchange that is automatic. (COM/PE) 312-1977w, 599-1985w
(2) A telephone exchange that provides private telephone service to an organization and does not allow calls to be transmitted to or from the public telephone network. (C) 610.7-1995

private branch exchange (1) (telephone switching systems) (data transmission) A private telecommunications exchange that includes access to a public telecommunications exchange. (COM/PE) 312-1977w, 599-1985w
(2) A telephone exchange on the user's premises, providing a switching facility for telephones on extension lines within the premises and access to the public telephone network. *Synonym:* private automatic branch exchange. (C) 610.7-1995

private branch exchange hunting (telephone switching systems) An arrangement for searching over a group of trunks at the central office, any one of which would provide a connection to the desired private branch exchange. (COM) 312-1977w

private-branch-exchange trunk (telephone switching systems) A line used as a trunk between a private branch exchange and the central office that serves it. (COM) 312-1977w

private circuit switching network (PCSN) A private network that only provides circuit switching functions, except that it may be able to transport packetized "user-to-user" information passed over the signalling channel. (LM/C/COM) 8802-9-1996

private data Data, associated with a package, that is used by the methods of that package but is not intended for use by other software. (C/BA) 1275-1994

private exchange A telephone exchange serving a single organization and having no means for connection with a public telephone exchange. (EEC/COM/CON) [28], [48]

private line (1) (data transmission) (private wire) A channel or circuit furnished to a subscriber for the subscriber's exclusive use. (PE) 599-1985w
(2) *See also:* leased line. (C) 610.7-1995

private line service A service in which the customer leases a circuit, not connected to the public switched telephone network, for the customer's exclusive use. (C) 610.7-1995

private line telegraph network (data transmission) A system of points interconnected by leased telegraph channels and providing hard-copy or five-track punched paper tape, or both, at both sending and receiving points. (PE) 599-1985w

private line telephone network (data transmission) A series of points interconnected by leased voice-grade telephone lines, with switching facilities or exchange operated by the customer. (PE) 599-1985w

private network A network established and operated by a private organization in which the customer leases circuits and, sometimes, switching capacity for the customer's use. *Contrast:* public data network. *See also:* software defined network. (C) 610.7-1995

private non-branch exchange (telephone switching systems) A series of points interconnected by leased voice-grade telephone lines, with switching facilities or exchange operated by the customer. (Std100) [123]

private object The internal representation of the language-independent model of an object in a service, and thus unspecified. (C/PA) 1328-1993w, 1238.1-1994w, 1327-1993w, 1224-1993w

private OM object The internal representation of the language-independent model of an OM object in a service, and thus unspecified. (C/PA) 1327.2-1993w, 1224.2-1993w, 1328.2-1993w, 1326.2-1993w

private packet/frame and circuit switching network (PPCSN) A private switching network that provides both circuit and packet/frame switching functions (i.e., all the functions of both PCSNs and PPSNs). (LM/C/COM) 8802-9-1996

private packet/frame switching network (PPSN) A private network that only provides packet/frame switching functions. (LM/C/COM) 8802-9-1996

private page A memory page that has been reserved for the exclusive use of a particular agency or function. Access credentials may be required to reference the page. (SCC32) 1455-1999

private residence A separate dwelling or a separate apartment in a multiple dwelling that is occupied only by the members of a single family unit. (EEC/PE) [119]

private residence elevator A power passenger electric elevator, installed in a private residence, and that has a rated load not in excess of 700 pounds, a rated speed not in excess of 50 feet per minute, a net inside platform area not in excess of 12 square feet, and a rise not in excess of 50 feet. *See also:* elevator. (EEC/PE) [119]

private-residence inclined lift A power passenger lift, installed on a stairway in a private residence, for raising and lowering persons from one floor to another. *See also:* elevator. (EEC/PE) [119]

private switching network (PSN) A private network that provides switching functions (circuit and/or packet/frame switching). It is operated by the user and located on user premises to cover the communications needs in the user's domain. The term private-switching network includes both the private circuit-switching network and the private packet-switching network. (LM/C/COM) 8802-9-1996

private telecommunication exchange (telephone switching systems) A telecommunications exchange for a single organization. (COM) 312-1977w

private telephone network A telephone network set up solely to meet the requirements of the particular organization. (COM/TA) 823-1989w

private type A data type whose structure and possible values are defined but are not revealed to the user of the type. *See also:* information hiding. (C) 610.12-1990

privileged An instruction (or register) that can only be executed (or accessed) when the processor is in supervisor mode (PSR.S = 1). *See also:* supervisor mode. (C/MM) 1754-1994

privileged instruction (software) A computer instruction that can be executed only by a supervisory program. (C) 610.12-1990

privileged state *See:* supervisor state.

probabilistic model *See:* stochastic model.

probabilistic risk assessment (PRA) A calculation of the probability and consequences of various known and postulated accidents. (PE/NP) 933-1999

probability density function (1) (A) (control of system electromagnetic compatibility) The first derivative of the probability distribution function; it represents the probability of obtaining a given value. **(B)** The derivative of the distribution function $P(x)$. (EMC) C63.12-1987

(2) (overhead power lines) The derivative of the probability distribution function $P(x)$. *Note:* An expression giving the probability of a discrete random variable x as a function of x or, for continuous random variables, the probability in an elemental range dx. The total probability is unity or 100%, so that the probability density function represents the proportion of probabilities for particular values of x. (T&D/PE) 539-1990

(3) Pertaining to a real random variable x, the derivative with respect to an arbitrary value X of the variable x, of the probability distribution function of X, if a derivative exists. *Note:* The mathematical expression for this function is

$$g(X) = \frac{d}{dX}[f(X)] = \frac{d}{dX}[P(x \leq X)]$$

(CS/PE/EDPG) [3]

probability distribution (nuclear power generating station) The mathematical function that relates the probability of an event to an elapsed time or to a number of trials. (PE/NP) 352-1975s

probability distribution function (1) (control of system electromagnetic compatibility) ***[P(x)]*** The function of x whose value is the probability that the amplitude is greater than, or equal to, x. *Notes:* 1. The probability distribution function is a nondecreasing function ranging from zero to unity. C63.12-1984

(2) (reliability analysis of nuclear power generating station safety systems) The mathematical function that gives $(X < x)$ where X is a random variable and x is a particular value of X. (PE/NP) 352-1987r

(3) (overhead power lines) ***[P(x)]*** The probability that a parameter is less than or equal to a given value x. *Notes:* 1. The distribution function $P(x)$ for a random variable x is the total frequency of occurrence of members with particular random-variable values less than or equal to x. The total frequency of occurrence of all values of x is unity or 100%, so that the distribution function is the proportion of members bearing values less than or equal to x. Similarly, for n particular values of the random variable, $x_1, x_2, \ldots x_n$, the distribution function $P(x_1, x_2, \ldots x_n)$ is the frequency of values less than or equal to x_1 for the first values, x_2 for the second, and so on. 2. The terms "cumulative probability distribution" and, very often, simply "distribution" are used to denote the probability distribution function. (T&D/PE) 539-1990

(4) Pertaining to a real random variable x, the function of an arbitrary value X - X of this variable, whose value is the probability, P, that the random variable is less than or equal to X. *Note:* The mathematical expression for this function is $f(X) = P(x \leq X)$. (CS/PE/EDPG) [3]

probability of failure indices The probability of a component failing to respond to a command, or responding when it should not = number of failures to respond as intended/exposure operations. (PE/PSE) 859-1987w

probability of failure to close on command Probability of failure to close on command = number of failures to close/number of commands to close. (PE/PSE) 859-1987w

probability of failure to open on command Probability of failure to open on command = number of failures to open/number of commands to open. *Note:* This index can be calculated separately for commands to open under fault and without fault. (PE/PSE) 859-1987w

probability of failure to operate on command Probability of failure to operate on command = number of failures to operate/number of commands to operate. (PE/PSE) 859-1987w

probability of occurrence The asymptotic value of the frequency of occurrence of the event. (T&D/PE) 539-1990

probability paper A graph paper with the grid along the ordinate specially ruled so that the distribution function of a specified distribution can be plotted as a straight line against the variable on the abscissa. These specially ruled grids are available for the normal, binomial, Poisson, lognormal, and Weibull distributions, respectively. (T&D/PE) 539-1990

probe (1) (gas) (potential) An auxiliary electrode of small dimensions compared with the gas volume, that is placed in a gas tube to determine the space potential. (ED) [45], [84]

(2) A tester instrument used to observe the state of a node. (SCC20) 1445-1998

probeable node Any node that is physically accessible to a tester probe. (SCC20) 1445-1998

probe address The address of a device that is known when the associated FCode program begins execution. (C/BA) 1275-1994

pro beam system Tunnel lighting system or luminaires having a light distribution that is greater in the direction of travel. (RL) C136.27-1996

probe coil A coil (air or magnetic material core) used to sense an alternating magnetic field. (COM/TA) 1027-1996

probe loading The effect of a probe on a network, for example, on a slotted line, the loading represented by a shunt admittance or a discontinuity described by a reflection coefficient. *See also:* measurement system. (IM/HFIM) [40]

probe pickup, residual *See:* residual probe pickup.

probe window The period of time during a pattern when a probe can capture activity on a node. (SCC20) 1445-1998

probing A fault diagnostic technique that incorporates the use of a portable device (hand-held or robotic) to monitor or capture unit under test (UUT) response data. The location of the

probe placement is determined by the circuit response and the circuit topology. (SCC20) 1445-1998

problem *See:* benchmark problem.

problem board In an analog computer, a removable frame of receptacles for patch cords and plugs that offers a means for interconnecting the inputs and outputs of computing elements. *See also:* patch board; patch panel. (C) 610.10-1994w, 165-1977w

problem check (analog computer) One or more tests used to assist in obtaining the correct machine solution to a problem. Static check consists of one or more tests of computing elements, their interconnections, or both, performed under static conditions. Dynamic check consists of one or more tests of computing elements, their interconnections, or both, performed under dynamic conditions. Rate test is a test that verifies that the time constants of the integrators are those selected. This term also refers to the computer-control state that implements the rate test previously described. Dynamic problem check is any dynamic check used to ascertain the correct performance of some or all of the computer components. *See also:* computer-control state. (C) 165-1977w

Problem Descriptor System (PDS/MaGen) A programming language useful in a wide variety of operations research applications, and designed to facilitate the generation of matrices and reports for mathematical programming systems. (C) 610.13-1993w

problem domain A set of similar problems that occur in an environment and lend themselves to common solutions. (C/SE) 1362-1998

problem-oriented language (1) (computers) A programming language designed for the convenient expression of a given class of problems. (MIL/C) [2], [85], [20]
(2) (software) A programming language designed for the solution of a given class of problems. Examples are list processing languages, information retrieval languages, simulation languages. (C) 610.12-1990, 610.13-1993w

problem state In the operation of a computer system, a state in which programs other than the supervisory program can execute. *Synonyms:* user state; slave state. *Contrast:* supervisor state. (C) 610.12-1990

problem variable *See:* scale factor.

procedural cohesion (software) A type of cohesion in which the tasks performed by a software module all contribute to a given program procedure, such as an iteration or decision process. *Contrast:* temporal cohesion; logical cohesion; sequential cohesion; coincidental cohesion; functional cohesion; communicational cohesion. (C) 610.12-1990

procedural interface (PI) The set of C functions used by an application and a delay and power calculation module (DPCM) to exchange information and determine the timing calculation for a design. (C/DA) 1481-1999

procedural interface function One of the C functions that comprise the DPCS procedural interface. (C/DA) 1481-1999

procedural language (1) (software) A programming language in which the user states a specific set of instructions that the computer must perform in a given sequence. All widely-used programming languages are of this type. *Synonym:* procedure-oriented language. *Contrast:* nonprocedural language. *See also:* algebraic language; list processing language; logic programming language; algorithmic language. (C) 610.12-1990
(2) A computer language in which the user states a specific set of instructions that the computer must perform in a given sequence. Examples include BASIC, COBOL, FORTRAN, and Pascal. *Synonym:* procedure-oriented language. *Contrast:* nonprocedural language. (C) 610.13-1993w

procedural programming language (software unit testing) A computer programming language used to express the sequence of operations to be performed by a computer (for example, COBOL). *See also:* nonprocedural programming language. (C/SE) 1008-1987r

procedure (1) (computers) The course of action taken for the solution of a problem. (C) [20], [85]
(2) (nuclear power quality assurance) A document that specifies or describes how an activity is to be performed. (PE/NP) [124]
(3) (A) (software) A course of action to be taken to perform a given task. **(B) (software)** A written description of a course of action as in definition "A;" for example, a documented test procedure. **(C) (software)** A portion of a computer program that is named and that performs a specific action. (C) 610.12-1990
(4) (software user documentation) Ordered series of instructions that a user follows to do one or more tasks. (C/SE) 1063-1987r
(5) (scheme programming language) A parameterized program fragment, called a subroutine or function in some programming languages. (C/MM) 1178-1990r

procedure-oriented language (1) (computers) A programming language designed for the convenient expression of procedures used in the solution of a wide class of problems. (MIL/C) [2], [20], [85]
(2) (software) *See also:* procedural language. (C) 610.12-1990

process (1) (automatic control) The collective functions performed in and by the equipment in which a variable is to be controlled. *Synonym:* controlled system. (PE/EDPG) [3]
(2) (A) (software) A sequence of steps performed for a given purpose; for example, the software development process. **(B) (software)** An executable unit managed by an operating system scheduler. *See also:* job; task. **(C) (software)** To perform operations on data. (C) 610.12-1990
(3) An address space and one or more threads of control that execute within that address space, and their required system resources. (C/PA) 14252-1996
(4) A sequence of tasks, actions, or activities, including the transition criteria for progressing from one to the next, that bring about a result. (C/SE) 1220-1994s
(5) An address space and the single thread of control that executes within that address space, and its required system resources. A process is created by another process issuing the POSIX.1 *fork*() function. The process that issues *fork*() is known as the parent process, and the new process created by the *fork*() is known as the child process. The attributes of processes required by POSIX.2 form a subset of those in POSIX.1. (C/PA) 9945-2-1993
(6) An address space with one or more threads executing within that address space, and the required system resources for those threads. A process is created by another process issuing the *fork*() function. The process that issues *fork*() is known as the parent process, and the new process created by the *fork*() is known as the child process. Many of the system resources defined by this part of ISO/IEC 9945 are shared among all of the threads within a process. These include the process ID; the parent process ID; the process group ID; the session membership; the real, effective and saved-set user ID; the real, effective and saved-set group ID; the supplementary group IDs; the current working directory; the root directory; the file mode creation mask; and file descriptors. (C/PA) 9945-1-1996
(7) An address space, and the program (including any Ada tasks contained within the program) executing within that address space, and its required system resources. A process is created by another process with procedures `POSIX_Process_Primitives.Start_Process`, `POSIX_Process_Primitives.Start_Process_Search`, or the function `POSIX_Unsafe_Process_Primitives.Fork`. The process that issues `Start_Process`, `Start_Process_Search`, or `Fork` is known as the parent process, and the newly created process is the child process. (C/PA) 1003.5-1992r
(8) An address space, a single thread of control that executes within that address space, and its required system resources. On a system that implements threads, a process is redefined to consist of an address space with one or more threads ex-

ecuting within that address space and their required system resources. *Note:* The term process is used in contrast to "system process," or the OSI usage of the term "application process."
(C/PA) 1327.2-1993w, 1224.2-1993w, 1326.2-1993w, 1328.2-1993w

(9) An organized set of activities performed for a given purpose; for example, the software development process.
(C/SE) J-STD-016-1995

(10) A unit of activity characterized by a single sequential thread of execution, a current state, and an associated set of system resources. (C/MM) 855-1990

(11) Sequence of operations performed in and by the equipment in which a variable is to be controlled.
(SCC20) 1226-1998

(12) (A) A set of interrelated activities, which transforms inputs into outputs. *Note:* The term "activities" covers use of resources. **(B)** A series of actions bringing about a result.
(C/SE) 1490-1998

(13) Consists of all execution within a single distinct address space supported by the operating system of a computer.
(IM/ST) 1451.1-1999

(14) *See also:* POSIX process. (C) 1003.5-1999

Process A function that must be performed in the software life cycle. A Process is composed of Activities.
(C/SE) 1074-1995s

process architect The person or group that has primary responsibility for creating and maintaining the software life cycle process (SLCP). *See also:* software life cycle process.
(C/SE) 1074-1997

processable scored card A scored card including at least one separable part that can be processed after separation. *See also:* stub card. (C) 610.10-1994w

Process and Experiment Automation Realtime Language (PEARL) A general-purpose, high-order language designed to meet the requirements of real-time programming in process and experiment automation. (C) 610.13-1993w

Process Architect The person or group that manages the implementation of the Standard in an organization.
(C/SE) 1074.1-1995

process bound *See:* compute-bound.

process control (1) (electric pipe heating systems) The use of electric pipe heating systems to increase or maintain, or both, the temperature of fluids (or processes) in mechanical piping systems including pipes, pumps, tanks, instrumentation in nuclear power generating stations. (PE/EDPG) 622A-1984r

(2) (automatic control) Control imposed upon physical or chemical changes in a material. *See also:* feedback control system. (PE/EDPG) [3]

(3) (electric heat tracing systems) The use of electric heat tracing systems to increase or maintain, or both, the temperature of fluids (or processes) in mechanical piping systems including pipes, pumps, valves, tanks, instrumentation, etc, in power generating stations. (PE/EDPG) 622B-1988r

(4) Automatic control in which a computer is used to regulate continuous operations such as chemical processes, military operations, or manufacturing operations. *See also:* numerical control. (C) 610.2-1987

process equipment (automatic control) Apparatus with which physical or chemical changes in a material are produced. *Synonym:* plant. (PE/EDPG) [3]

process group (1) A collection of processes that permits the signaling of related processes. Each process in the system is a member of a process group that is identified by a process group ID. A newly created process joins the process group of its creator. (C/PA) 9945-1-1996, 9945-2-1993

(2) A collection of processes that permits the signaling of related processes. Each process in the system is a member of a process group that is identified by its process group ID. A newly created process joins the process group of its creator.
(C) 1003.5-1999

process group ID (1) The unique identifier representing a process group during its lifetime. A process group ID is a positive integer that can be contained in a *pid_t*. It shall not be reused by the system until the process group lifetime ends.
(C/PA) 9945-1-1996, 9945-2-1993

(2) A unique value identifying a process group during its lifetime. A process group ID shall not be reused by the system until the process group lifetime ends. (C) 1003.5-1999

process group leader (1) A process whose process ID is the same as its process group ID.
(C/PA) 9945-1-1996, 9945-2-1993

(2) The unique process, within a process group, that created the process group. (C) 1003.5-1999

process group lifetime (1) A period of time that begins when a process group is created and ends when the last remaining process in the group leaves the group, due either to the end of the last process's process lifetime or to the last remaining process calling the *setsid*() or *setpgid*() functions.
(C/PA) 9945-1-1996

(2) A period of time that begins when a process group is created and ends when the last remaining process in the group leaves the group, due either to the end of the process lifetime of the last process or to the last remaining process calling the `Set_Process_Group_ID` procedure. (C) 1003.5-1999

process ID (1) The unique identifier representing a process. A process ID is a positive integer that can be contained in a *pid_t*. A process ID shall not be reused by the system until the process lifetime ends. In addition, if there exists a process group whose process group ID is equal to that process ID, the process ID shall not be reused by the system until the process group lifetime ends. A process that is not a system process shall not have a process ID of 1.
(C/PA) 9945-1-1996, 9945-2-1993

(2) A unique value identifying a process during its lifetime. The process ID is a value of the type `Process_ID` defined in the package `POSIX_-Process_Identification`. A process ID shall not be reused by the system until the process lifetime ends. In addition, if a process group exists where the process ID of the process group leader is equal to that process ID, that process ID shall not be reused by the system until the process group lifetime ends. An implementation shall reserve a value of process ID for use by system processes. A process that is not a system process shall not have this process ID.
(C) 1003.5-1999

processing *See:* multiprocessing; parallel processing; data processing; information processing.

processing cycle A single, complete execution of data processing that is periodically repeated. *Synonym:* data processing cycle. *See also:* daily cycle; monthly cycle; weekly cycle; annual cycle. (C) 610.2-1987

processing unit A functional unit that consists of one or more processors and their storage. *See also:* central processing unit.
(C) 610.10-1994w

process lifetime (1) The period of time that begins when a process is created and ends when its process ID is returned to the system. After a process is created with a *fork*() function, it is considered active. At least one thread of control and the address space exist until it terminates. It then enters an inactive state where certain resources may be returned to the system, although some resources, such as the process ID, are still in use. When another process executes a *wait*() or *waitpid*() function for an inactive process, the remaining resources are returned to the system. The last resource to be returned to the system is the process ID. At this time, the lifetime of the process ends. (C/PA) 9945-1-1996

(2) A period of time that begins when a process is created and ends when its process ID is returned to the system. After a process is created, it is considered active. Its threads of control and address space exist until it terminates. It then enters an inactive state where certain resources may be returned to the system, although some resources, such as the process ID, are still in use. When another process executes a

`Wait_For_Child_Process` procedure for an inactive process, the remaining resources are returned to the system. The last resource to be returned to the system is the process ID. At this time, the lifetime of the process ends. (C) 1003.5-1999

process list An ordered set of runnable processes that all have the same ordinal value for their priority. The ordering of processes on the list is determined by a scheduling policy or policies. The set of process lists includes all runnable processes in the system. (C/PA) 1003.1b-1993s

process management The direction, control, and coordination or work performed to develop a product or perform a service. Example is quality assurance. (C) 610.12-1990

process metric A metric used to measure characteristics of the methods, techniques, and tools employed in developing, implementing, and maintaining the software system. (C/SE) 1061-1998

process model A model of the processes performed by a system; for example, a model that represents the software development process as a sequence of phases. *Contrast:* structural model. (C) 610.3-1989w

processor (1) (A) (computers) (hardware). A data processor. **(B) (computers)** (pascal computer programming language). A system or mechanism that accepts a program as input, prepares it for execution, and executes the process so defined with data to produce results. *Note:* A processor may consist of an interpreter, a compiler and run-time system, or other mechanism, together with an associated host computing machine and operating system, or other mechanism for achieving the same effect. A compiler in itself, for example, does not constitute a processor. (Std100/SUB/PE) 812-1984, C37.1-1994

(2) (software) A computer program that includes the compiling, assembling, translating, and related functions for a specific programming language, for example, Cobol processor, Fortran processor. *See also:* multiprocessor. (C) [20], [85]

(3) The combination of the IU, FPU, and CP (if present). (C/MM) 1754-1994

(4) (A) A device that interprets and executes instructions, consisting of at least an instruction control unit and an arithmetic unit. *See also:* coprocessor; preprocessor. **(B)** A device that contains a central processing unit. (C) 610.10-1994

Processor A main system processor unit that executes operating system code and manages system resources. It is usually constrained on the number of CSRs it can devote to the functions of a given I/O Unit. (C/MM) 1212.1-1993

processor architecture The system-visible interfaces to a central processor, including its instruction set, stack and register structures, and trap and interrupt-handling methods. (C) 610.10-1994w

process-oriented simulation A simulation in which the process is considered more important than the outcome; for example, a model of a radar system in which the objective is to replicate exactly the radar's operation, and duplication of its results is a lesser concern. *Contrast:* outcome-oriented simulation. (C) 610.3-1989w

processor interface (PI) (FASTBUS acquisition and control) The interface device between a processor and a FASTBUS segment. (NID) 960-1993

processor storage *See:* internal storage.

process standard A standard that deals with the series of actions or operations used in making or achieving a product. (C) 610.12-1990

process step Any task performed in the development, implementation, or maintenance of software (for example, identifying the software components of a system as part of the design). (C/SE) 1061-1992s

processtag (microprocessor operating systems parameter types) A "tag" returned by one function for use by another. Its contents may not be examined or changed. Its form is system dependent. A processtag is only valid within a given process and should not be passed between processes. (C/MM) 855-1985s

process-to-process communication The transfer of data between processes. (C) 1003.5-1999

procurement document (nuclear power quality assurance) Purchase requisitions, purchase orders, drawings, contracts, specifications, or instructions used to define requirements for purchase. (PE/NP) [124]

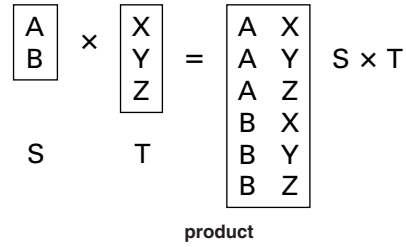
procurement documents (nuclear power generating station) Those documents such as specifications, contracts, letters of intent, work orders, purchase orders or proposals and their acceptance which authorize the seller to perform services or supply equipment, material or facilities to the purchaser. *Note:* This term applies specifically to the subject matter of IEEE Std 467-1980. (PE/NP) 467-1980w

producer (1) The node on a ringlet that transmits a send packet to the consumer and deletes the echo packet that is returned. (C/MM) 1596-1992

(2) A unit that adds a message to a DMA queue. (C/MM) 1212.1-1993

product (1) (mathematics of computing) The result of a multiplication operation. (C) 1084-1986w

(2) (data management) A relational operator that builds a relation from two specified relations consisting of all possible concatenated pairs of tuples, one from each of the two original relations. (See the corresponding figure.)



product

(C) 610.5-1990w

(3) An element of the physical or system architecture, specification tree, or system breakdown structure that is a subordinate element to the system and is comprised of two or more subsystems. It represents a major consumer product (e.g., automobile, airplane) of a system or a major life-cycle process product (e.g., simulator, building, robot) related to a life-cycle process that supports a product or group of products. (C/SE) 1220-1994s

(4) A software object used to define a set of related software. Filesets are contained within products. (C/PA) 1387.2-1995

(5) Any output of the software development Activities (e.g., document, code, or model). *See also:* Activity. (C/SE) 1074-1997

product analysis The process of evaluating a product by manual or automated means to determine if the product has certain characteristics. (C) 610.12-1990

product and process data package The evolving output of the systems engineering process that documents hardware designs, software designs with their associated documentation, and life-cycle processes. (C/SE) 1220-1994s

product baseline In configuration management, the initial approved technical documentation (including, for software, the source code listing) defining a configuration item during the production, operation, maintenance, and logistic support of its life cycle. *Contrast:* developmental configuration; functional baseline; allocated baseline. *See also:* product configuration identification. (C) 610.12-1990

product certification *See:* certification.

product characteristic An observable attribute of a product. This includes functional, physical, and performance characteristics (e.g., gain and bandwidth of an amplifier). (SCC20) 1226-1998

product code *See:* bar code; universal product code.

product configuration identification The current approved or conditionally approved technical documentation defining a configuration item during the production, operation, maintenance, and logistic support phases of its life cycle. It prescribes all necessary physical or form, fit and function characteristics of a configuration item, the selected functional characteristics designated for production acceptance testing, and the production acceptance tests. *Contrast:* functional configuration identification; allocated configuration identification. *See also:* product baseline. (C) 610.12-1990

Product Data Exchange Specification A computer graphics standard that provides a method for representing and exchanging complete information among computer graphics systems, without requiring human interpretation. It was developed by an international team led by the National Institute of Standards and Technology (formerly National Bureau of Standards). *See also:* Initial Graphics Exchange Specification. (C) 610.6-1991w

Product Data Exchange using STEP A specification for representing product data using ISO/DIS 10303 STEP. (ATLAS) 1226-1993s

product engineering The technical processes to define, design, and construct or assemble a product. (C) 610.12-1990

production (routine) (power cable joints) Tests made on joint components or subassemblies during production for the purpose of quality control. (PE/IC) 404-1986s

production library (software) A software library containing software approved for current operational use. *Contrast:* software repository; system library; software development library; master library. (C) 610.12-1990

production tests (1) Those tests made to check the quality and uniformity of the workmanship and materials used in the manufacture of switchgear or its components. (SWG/PE) C37.100-1992, C37.81-1989r

(2) (routine) (power cable joints) Tests made on joint components or sub-assemblies during production for the purpose of quality control. (PE/IC) 404-1986s

(3) Tests made for quality control by the manufacturer on every device or representative samples, or on parts or materials as required to verify during production that the product meets the design specifications and applicable standards. *Note:* Certain quality assurance tests on identified critical parts of repetitive high-production devices may be tested on a planned statistical sampling basis. *Synonym:* routine tests (SWG/PE/SWG-OLD) C37.20.1-1993r, C37.20.4-1996, C37.21-1985r, C37.20.2-1993, C37.20.3-1996, C37.20.6-1997

(4) (circuit breakers) Those tests made to check the quality and uniformity of the workmanship and materials used in the manufacture of gas-insulated equipment. (SUB/PE) C37.122-1983s

(5) Those tests made to check the quality and uniformity of workmanship and materials used in the manufacturing of generator circuit breakers. (SWG/PE) C37.013-1997

(6) *See also:* routine tests. (SPD/PE) C62.11-1999

productivity ratio The relationship of an output primitive to its corresponding input primitive. (C/SE) 1045-1992

product line A collection of systems that are potentially derivable from a single domain architecture. (C/SE) 1517-1999

product management The definition, coordination, and control of the characteristics of a product during its development cycle. Example is configuration management. (C) 610.12-1990

product metric A metric used to measure the characteristics of any intermediate or final product of the software development process. (C/SE) 1061-1998

product modulator A modulator whose modulated output is substantially equal to the product of the carrier and the modulating wave. *Note:* The term implies a device in which intermodulation between components of the modulating wave does not occur. *See also:* modulation. (EEC/PE) [119]

product relay A relay that operates in response to a suitable product of two alternating electrical input quantities. (SWG/PE) C37.100-1992

product sensitivity The ratio of Hall voltage to the product of control current and magnetic flux density at any point on the product sensitivity characteristic curve of a Hall generator. (MAG) 296-1969w

product specification (A) A document that specifies the design that production copies of a system or component must implement. *Note:* For software, this document describes the as-built version of the software. *See also:* design description. **(B)** A document that describes the characteristics of a planned or existing product for consideration by potential customers or users. (C) 610.12-1990

product specification file (PSF) The input file used to define the structure and attributes of software objects and related files to be packaged by the `swpackage` utility. (C/PA) 1387.2-1995

product standard A standard that defines what constitutes completeness and acceptability of items that are used or produced, formally or informally, during the software engineering process. (C) 610.12-1990

product support The providing of information, assistance, and training to install and make software operational in its intended environment and to distribute improved capabilities to users. (C) 610.12-1990

product verification The process of verification of the traceability of a calibration standard of a manufacturer by NIST. This is achieved by the submission of a source from a manufacturer to NIST for verification of the value certified by the manufacturer. The reported value is compared to the NIST value, and if appropriate, a report of traceability is issued. (NI) N42.22-1995

professional projector The professional projector is a type using 35- or 70-millimeter film which has a minimum width of 1 3/8 inches and has on each edge 5.4 perforations per inch, or a type using carbon arc, Xenon, or other light source equipment which develops hazardous gases, dust or radiation. (NESC/NEC) [86]

professional standard (software) A standard that identifies a profession as a discipline and distinguishes it from other professions. (C) 610.12-1990

PROFILE A computer language used to match, score, and retrieve statistical data. (C) 610.13-1993w

profile (1) (overhead power lines) A diagram showing the variation of a quantity or parameter with location. (T&D/PE) 539-1990

(2) (overhead power lines) *See also:* step index profile; power-law index profile; graded index profile; index profile; parabolic profile. 812-1984w

(3) A set of one or more base standards and, where applicable, the identification of chosen classes, subsets, options, and parameters of those base standards that are necessary for accomplishing a particular function. (C/PA) 14252-1996

(4) The thickness of the module. (C/BA/C/BA) 1101.4-1993, 1101.3-1993

(5) The maximum thickness of the module. (C/BA) 1101.7-1995

(6) A set of one or more base standards, and, where applicable, the identification of chosen classes, subsets, options, and parameters of those base standards, necessary for accomplishing a particular function. In this standard that function is to provide communication services appropriate for DIS simulation applications. (DIS/C) 1278.2-1995

(7) *See also:* application environment profile. (C/BA) 896.2-1991w

(8) A unique numeric identifier that indicates a set of communications parameter values to be used in establishing a physical session. (SCC32) 1455-1999

Profile A module The assembled unit, containing a Futurebus+ interface and one or more nodes complying with Profile A, that is inserted into a compatible Profile A slot. Profile A

modules may operate in systems complying with other profiles if the system meets Profile A physical requirements and if modules support a compatible transaction set when sharing data. (C/BA) 896.2-1991w

Profile A system The assembly of hardware elements made up of, at a minimum, the Profile A compliant backplane and subrack, power supply, fans, etc. Modules complying with other profiles may operate compatibly with Profile A systems and modules if they meet Profile A physical requirements and if their features constitute an identity or a superset of those implemented in a Profile A system as per Tables 59 and 60. (C/BA) 896.2-1991w

Profile B module The assembled plug-in unit, containing a Futurebus+ interface and one or two nodes complying with Profile B, which is inserted into a compatible Futurebus+ slot. Profile B modules may operate compatibly in systems complying with other profiles if the system meets Profile B mechanical requirements, and if non-Profile B nodes properly subset their transaction set when addressing Profile B modules, as specified in this profile. (C/BA) 896.2-1991w

Profile B system The assembly of hardware elements made up of, at a minimum, the Profile B compliant backplane and card cage, power supply, air mover, and a bridge to the rest of the system or to another bus. Modules complying with other profiles may operate compatibly with Profile B systems and modules if they meet Profile B mechanical requirements, and if their features constitute an identity or a superset of those mandated in this profile. (C/BA) 896.2-1991w

profile dispersion (A) (fiber optics) In an optical waveguide, that dispersion attributable to the variation of refractive index contrast with wavelength, where contrast refers to the difference between the maximum refractive index in the core and the refractive index of the homogeneous cladding. Profile dispersion is usually characterized by the profile dispersion parameter, defined by the following entry. **(B) (fiber optics)** In an optical waveguide, that dispersion attributable to the variation of refractive index profile with wavelength. The profile variation has two contributors:

1) variation in refractive index contrast, and
2) variation in profile parameter.

See also: distortion; refractive index profile; dispersion. (Std100) 812-1984

profile dispersion parameter (fiber optics)

$$P(\lambda) = \frac{n_1}{N_1}\frac{\lambda}{\Delta}\frac{d\Delta}{d\lambda}$$

where n_1, N_1 are, respectively, the refractive and group indices of the core, and

$$n_1\sqrt{1 - 2\Delta}$$

is the refractive index of the homogeneous cladding, $N_1 = n_1 - \lambda(dn_1/d\lambda)$, and Δ is the refractive index constant. Sometimes it is defined with the factor (-2) in the numerator. *See also:* dispersion. (Std100) 812-1984w

Profile F module The assembled unit, containing a Futurebus+ interface and one or two nodes complying with Profile F, which is inserted into a compatible Futurebus+ slot. Profile F modules may operate compatibly in systems complying with other profiles if the system meets Profile F mechanical requirements, and if non-Profile F nodes properly subset their transaction set when addressing Profile F modules, as specified in this profile. (C/BA) 896.2-1991w

Profile F system The assembly of hardware elements made up of, at a minimum, the Profile F compliant backplane and card cage, power supply, and an air mover. Modules complying with other profiles may operate compatibly with Profile F systems and modules if they meet Profile F mechanical requirements, and if their features constitute an identity or a superset of those mandated in this profile. (C/BA) 896.2-1991w

profile parameter (fiber optics) The shape-defining parameter, g, for a power-law index profile. *See also:* refractive index profile; power-law index profile. (Std100) 812-1984w

Profile S module The assembled unit, containing a Futurebus+ interface and one or two nodes complying with Profile S, which is inserted into a compatible Futurebus+ slot. (C/BA) 896.10-1997

Profile S system The assembly of hardware elements made up of, at a minimum, the Profile S compliant backplane, card cage, and a power supply. Modules complying with other profiles may operate compatibly with Profile S systems and modules if they meet Profile S mechanical requirements, and if their features constitute an identity or a superset of those mandated in this profile. (C/BA) 896.10-1997

prognosis (test, measurement, and diagnostic equipment) The use of test data in the evaluation of a system or equipment for potential or impending malfunctions. (MIL) [2]

program (1) (general) A sequence of signals transmitted for entertainment or information. (SP) 151-1965w
(2) (A) (electronic computation) A plan for solving a problem. **(B) (electronic computation)** Loosely, a routine. **(C) (electronic computation)** To devise a plan for solving a problem. **(D) (electronic computation)** Loosely, to write a routine. *See also:* communication; source program; object program; target program; computer program; programmed acceleration. (ED/ED/C) 581-1978, 641-1987, 162-1963
(3) (telephone switching systems) A set of instructions arranged in a predetermined sequence to direct the performance of a planned action or actions. (COM) 312-1977w
(4) (semiconductor memory) The inputs that when true enable programming, or writing into, a programmable read only memory (PROM). (TT/C) 662-1980s
(5) (software) To write a computer program. (C) 610.12-1990
(6) A prepared sequence of instructions to the system to accomplish a defined task. The term *program* in POSIX.2 encompasses applications written in the Shell Command Language, complex utility input languages (for example, awk, lex, sed, etc.), and high-level languages. (C/PA) 9945-2-1993
(7) The process of incorporating digital data onto an integrated circuit. (C) 610.10-1994w
(8) A collection of processes working together to accomplish a common task. (C/MM) 855-1990
(9) The operation of injecting electrons onto the floating gate of the memory cell. (ED) 1005-1998
(10) A set of partitions, which can execute in parallel with one another, possibly in a separate address space and possibly on a separate computer. (C) 1003.5-1999

program amplifier *See:* line amplifier.

program architecture (software) The structure and relationships among the components of a computer program. The program architecture may also include the program's interface with its operational environment. *See also:* computer program; component. (C/SE) 729-1983s

program attention key *See:* attention key.

program block (software) In problem-oriented languages, a computer program subdivision that serves to group related statements, delimit routines, specify storage allocation, delineate the applicability of labels, or segment paths of the computer program for other purposes. *See also:* computer program; label; segment; routine. (C/SE) 729-1983s

program correctness *See:* correctness.

program counter (1) A register in the processing unit that contains the address of the next instruction to be executed. *Synonym:* instruction address register. (C) 610.10-1994w
(2) *See also:* instruction counter. (C) 610.12-1990

program data set A data set in which user programs are stored. (C) 610.5-1990w

program definition language *See:* program design language.

program design language (1) (software) A specification language with special constructs and, sometimes, verification

protocols, used to develop, analyze, and document a program design. *See also:* hardware design language. (C) 610.12-1990

(2) (software) *See also:* design language.

(3) A specification language with special constructs and verification protocols, used to develop, analyze, and document a program design. *Contrast:* hardware design language. (C) 610.13-1993w

program disturb The corruption of data in one location caused by the programming of data at another location. (ED) 1005-1998

program editor A text editor user to enter, alter, and view source code for computer programs. Such an editor may have features that make it sensitive to the syntax of the source language on which it operates. *Contrast:* document editor. (C) 610.2-1987

program-erase cycle The event of writing a memory cell from the programmed state to the erased state and back to the programmed state. *Note:* This event may be used as a unit of measurement for endurance. Within a sequence, program-erase cycles are indistinguishable from erase-program cycles. *See also:* erase-program cycle. (ED) 1005-1998

program evaluation and review technique (PERT) (1) A variation of the critical path method in which minimum, maximum, and most likely times are used to estimate the mean and standard deviation of each activity item; these values are used to compute estimated path times and to find the critical path; and the critical path values are used to find the standard deviation of the completion time for the whole project. (C) 610.2-1987

(2) A diagrammatic method for establishing program goals and tracking. (PE/NP) 933-1999

program extension (software) An enhancement made to existing software to increase the scope of its capabilities. *See also:* software; enhancement. (C/SE) 729-1983s

program flowchart *See:* flowchart.

program instruction A computer instruction in a source program. *Note:* A program instruction is distinguished from a computer instruction that results from assembly, compilation, or other interpretation process. (C) 610.12-1990

program instrumentation (A) (software) Probes, such as instructions or assertions, inserted into a computer program to facilitate execution monitoring, proof of correctness, resource monitoring, or other activities. **(B) (software)** The process of preparing and inserting probes into a computer program. *See also:* computer program; execution; instruction; proof of correctness; assertion. (C/SE) 729-1983

program level The magnitude of program in an audio system expressed in volume units. (SP) 151-1965w

program library *See:* software library.

program listing A printout or other human readable display of the source and, sometimes, object statements that make up a computer program. (C) 610.12-1990

program loading Placing executable instructions into the memory of a computer where they can be executed. (C) 610.10-1994w

programmable (1) (programmable instrumentation) That characteristic of a device that makes it capable of accepting data to alter the state of its internal circuitry to perform a specific task(s). (IM/AIN) 488.1-1987r

(2) Pertaining to a device such as a circuit or a keyboard that can accept instructions that alter its basic functions. *Contrast:* hardwired. *See also:* user-programmable computer; microprogrammable computer. (C) 610.10-1994w

programmable array logic A programmable, two-level logic device in which the input decode (AND array) logic is programmable, but the output (OR array) is fixed. *Contrast:* programmable logic array. (C) 610.10-1994w

programmable breakpoint A breakpoint that automatically invokes a previously specified debugging process when initiated. *See also:* prolog breakpoint; dynamic breakpoint; data breakpoint; epilog breakpoint; code breakpoint; static breakpoint. (C) 610.12-1990

programmable connection A connection in which information is sent over data type circuits. *See also:* RJ-11; permissive connection. (C) 610.7-1995

programmable controller Solid state control system with programming capability that performs functions similar to a relay logic system. (PE/EDPG) 1020-1988r

programmable digital computer (programmable digital computer systems in safety systems of nuclear power generating stations) A device that can store instructions and is capable of the execution of a systematic sequence of operations performed on data that is controlled by internally stored instructions. 7432-1982w

programmable equipment (supervisory control, data acquisition, and automatic control) A remote or master station having one or more of its operations specified by a program contained in a memory device. (SWG/PE/SUB) C37.100-1992, C37.1-1994

programmable function key *See:* user-definable key.

programmable logic array A general-purpose integrated circuit that consists of an array of gates that can be programmed to perform various functions. *Contrast:* programmable array logic. *See also:* field programmable logic array. (C) 610.10-1994w

programmable measuring apparatus (programmable instrumentation) A measuring apparatus that performs specified operations on command from the system and may transmit the results of the measurement(s) to the system. (IM/AIN) 488.1-1987r

programmable read-only memory A type of read-only memory whose contents can be initialized, or burned, only once, and cannot thereafter be altered. *See also:* erasable programmable read-only memory; PROM burner; electrically erasable programmable read-only memory. (C) 610.10-1994w

programmable stimuli (test, measurement, and diagnostic equipment) Stimuli that can be controlled in accordance with instructions from a programming device. (MIL) [2]

programmable terminal *See:* intelligent terminal.

program margin The minimum measured difference between the programmed states and the sensing level for the array. (ED) 1005-1998

programmed acceleration A controlled velocity increase to the programmed rate. (IA/EEC) [61], [74]

programmed check A check procedure designed by the programmer and implemented specifically as a part of his program. *See also:* check problem; mathematical check. (C) [20], [85]

programmed control A control system in which the operations are determined by a predetermined input program from cards, tape, plug boards, cams, etc. *See also:* feedback control system. (IA/ICTL/IAC) [60]

programmed deceleration (numerically controlled machines) A controlled velocity decrease to a fixed percent of the programmed rate. (IA) [61]

PRogrammed Electronics Patterns (PREP) A programming language for use in designing integrated circuits. *Note:* PREP is conceptually similar to APT, except that it involves description of two-dimensional figures. (C) 610.13-1993w

Programmed Inquiry, Learning Or Teaching (PILOT) A programming language designed for writing computer-aided instruction applications; PILOT is simple and well-suited to support an interactive "question and answer" type of system. (C) 610.13-1993w

programmed input-output A method for transferring data between an interface and memory in which the program polls the input-output device to see if data is available. *Contrast:* direct memory access. *See also:* direct memory transfer. (C) 610.10-1994w

programmed instruction A self-instructional method using materials that lead the student through a systematic sequence

of steps to a predetermined learning objective. (C) 610.2-1987

programmer (1) (A) (test, measurement, and diagnostic equipment) A device having the function of controlling the timing and sequencing operations. **(B) (test, measurement, and diagnostic equipment)** A person who prepares sequences of instructions for a programmable machine. (MIL) [2]

(2) An arrangement of operating elements or devices that initiates, and often controls, one or a series of operations in a given sequence. (SWG/PE) C37.100-1992

programmer-comparator (A) (test, measurement, and diagnostic equipment) A device that reads commands and data from a sequential program usually on tape or cards. **(B) (test, measurement, and diagnostic equipment)** A device that sets up delays, switching, and stimuli, and performs measurements as directed by the program. **(C) (test, measurement, and diagnostic equipment)** A device that compares the results of each measurement with fixed programmed tolerance limits to arrive at a decision. Often numerous other operations, such as branching on no-go or other conditions, are included. (MIL) [2]

programmer manual A document that provides the information necessary to develop or modify software for a given computer system. Typically described are the equipment configuration, operational characteristics, programming features, input/output features, and compilation or assembly features of the computer system. *See also:* diagnostic manual; installation manual; user manual; operator manual; support manual. (C) 610.12-1990

Programmer's Hierarchical Interactive Graphics System A computer graphics standard that provides a complete graphics system designed for interactive three-dimensional applications using complex data structures and modeling. It was developed by the American National Standards Institute (ANSI). (C) 610.6-1991w

programming (1) (electronic computation) The ordered listing of a sequence of events designed to accomplish a given task. *See also:* multiprogramming; automatic programming; linear programming. (MIL/IA) [2], [84], [61]

(2) (power supplies) The control of any power-supply functions, such as output voltage or current, by means of an external or remotely located variable control element. Control elements may be variable resistances, conductances, or variable voltage or current sources. (AES) [41]

programming (write) algorithm Typically for flash memories or ultraviolet-erasable programmable read-only memories (UV-EPROMs), the specified timed sequence of signals and levels necessary to cause the device to program. (ED) 1005-1998

programming delay D A relay whose function is to establish or detect electrical sequences. (SWG/PE) C37.100-1981s

PROgramming in LOGic (PROLOG) A declarative programming language that uses precise rules, in the form of a rule and fact set model, to reach solutions to problem descriptions. *Note:* Used in artificial intelligence applications for building expert systems. (C) 610.13-1993w

programming language A computer language used to express computer programs. *Contrast:* design language; query language; specification language; test language. *See also:* high-order language; machine language; common language; assembly language; general-purpose programming language. (C) 610.13-1993w, 610.12-1990

Programming Language/1 (PL/1) A programming language that is suitable for processing numerical, scientific, and business applications and that is standardized by ANSI. *See also:* LPL; ALPHA; FORMAC; block-structured language; IITRAN. (C) 610.13-1993w

programming language API specification The interface between applications and application platforms traditionally associated with programming language specifications, such as program control, math functions, string manipulation, etc. (C/PA) 14252-1996

programming language binding specification For a language-independent specification, a document that specifies, in terms of a particular programming language, the behavior that the language-independent specification specifies in language-independent terms. It may also specify additional behavior that is relevant to the usage of the particular programming language. (C/PA) 1328-1993w, 1224-1993w, 1326.1-1993w, 1224.1-1993w, 1327-1993w

Programming Language/Data Base (PL/DB) A dialect of PL/1 designed specifically for processing databases and including normal executable statements for arithmetic, conditional, and loop control and supports hierarchical data structures. (C) 610.13-1993w

Programming LANguage for Interactive Teaching (PLANIT) An instructional system consisting of a user language that supports the development of computer programs for preparing, editing, and presenting subject matters suitable for interactive presentations. (C) 610.13-1993w

programming, linear *See:* linear programming.

programming linearity (power supplies) The linearity of a programming function refers to the correspondence between incremental changes in the input signal (resistance, voltage, or current) and the consequent incremental changes in power-supply output. *Note:* Direct programming functions are inherently linear for the bridge regulator and are accurate to within a percentage equal to the supply's regulating ability. (AES) [41]

programming, nonlinear *See:* nonlinear programming.

programming, quadratic *See:* quadratic programming.

programming relay A relay whose function is to establish or detect electrical sequences. (SWG/PE/PSR) C37.100-1992, C37.90-1978s

programming speed (power supplies) Describes the time requires to change the output voltage of a power supply from one value to another. The output voltage must change across the load and because the supply's filter capacitor forms a resistance-capacitance network with the load and internal source resistance, programming speed can only be described as a function of load. Programming speed is the same as the recovery-time specification for current-regulated operation; it is not related to the recovery-time specification for voltage-regulated operation. (AES) [41]

programming support environment (software) An integrated collection of software tools accessed via a single command language to provide programming support capabilities throughout the software life cycle. The environment typically includes tools for specifying, designing, editing, compiling, loading, testing, configuration management, and project management. Sometimes called integrated programming support environment. *See also:* scaffolding. (C) 610.12-1990

programming system A set of programming languages and the support software (editors, compilers, linkers, etc.) necessary for using these languages with a given computer system. (C) 610.12-1990

program mutation (A) (software) A computer program that has been purposely altered from the intended version to evaluate the ability of test cases to detect the alteration. *See also:* mutation testing. **(B) (software)** The process of creating an altered program as in definition "A." (C) 610.12-1990

program network chart A diagram that shows the relationship between two or more computer programs. (C) 610.12-1990

program production time That part of system production time during which a computer program is successfully executed. (C) 610.10-1994w

program protection (software) The application of internal or external controls to preclude any unauthorized access or modification to a computer program. *See also:* modification; computer program. (C/SE) 729-1983s

program register *See:* instruction address register.

program-sensitive fault (1) (computers) A fault that appears in response to some particular sequence of program steps. (C) [20], [85]

(2) (software) A fault that causes a failure when some particular sequence of program steps is executed. *Contrast:* data-sensitive fault. (C) 610.12-1990

program specification (software) Any specification for a computer. program. *Synonym:* design specification. *See also:* requirements specification; performance specification; functional specification; design specification. (C/SE) 729-1983s

program status word (PSW) (A) A computer word that contains information specifying the current status of a computer program. The information may include error indicators, the address of the next instruction to be executed, currently enabled interrupts, and so on. **(B)** A special-purpose register that contains a program status word as in (A). (C) 610.12-1990

program stop (numerically controlled machines) A miscellaneous function command to stop the spindle, coolant, and feed after completion of other commands in the block. It is necessary for the operator to push a button in order to continue with the remainder of the program. (IA) [61], [84]

program support library *See:* software development library.

program structure diagram *See:* structure chart.

program synthesis (software) The use of software tools to aid in the transformation of a program specification into a program that realizes that specification. (C) 610.12-1990

program test time That part of system production time during which a computer program is tested. (C) 610.10-1994w

program tracking (communication satellite) A technique for tracking a satellite by pointing a high-gain antenna toward the satellite that employs a computer program for antenna pointing; known orbital parameters are used as an input to the computer program. (COM) [19]

program validation *See:* computer program validation; validation.

progressive grading (telephone switching systems) A grading in which the outlets of different grading groups are connected together in such a way that the number of grading groups connected to each outlet is larger for later choice outlets. (COM) 312-1977w

progressive scanning* *See:* sequential scanning.

* Deprecated.

project (1) (unique identification in power plants) A single- or multiple-unit power plant or major independent related facility. A project is composed of systems and structures and may be defined to include the design, construction, operation, and related activities associated with the project during its life cycle. (PE/EDPG) 803-1983r

(2) A subsystem that is subject to maintenance activity. (C/SE) 1219-1998

(3) A temporary endeavor undertaken to create a unique product or service. (C/SE) 1490-1998

(4) (unique identification in power plants) *See also:* projection. (C) 610.5-1990w

project agreement A document or set of documents baselined by the acquirer and the supplier that specifies the conditions under which the project will be conducted. A project agreement may include items such as the scope, objectives, assumptions, management interfaces, risks, staffing plan, resource requirements, price, schedule, resource and budget allocations, project deliverables, and acceptance criteria for the project deliverables. Documents in a project agreement may include some or all of the following: a contract, a statement of work, user requirements, system engineering specifications, software requirements specifications, a software project management plan, supporting process plans, a business plan, a project charter, or a memo of understanding. (C/SE) 1058-1998

project deliverable (1) A work product to be delivered to the acquirer. Quantities, delivery dates, and delivery locations are specified in a project agreement. Project deliverables may include the following: operational requirements, functional specifications, design documentation, source code, object code, test results, installation instructions, training aids, user's manuals, product development tools, and maintenance documentation. Project deliverables may be self-contained or may be part of a larger system's deliverables. (C/SE) 1058-1998

(2) The work product(s) to be delivered to the customer. The quantities, delivery dates, and delivery locations are specified in the project agreement. (C/SE) 1058.1-1987s

projected peak point (tunnel-diode characteristic) The point on the forward current-voltage characteristic where the current is equal to the peak-point current and where the voltage is greater than the valley-point voltage. *See also:* peak point. (ED) [46]

projected peak-point voltage (tunnel-diode characteristic) The voltage at which the projected peak point occurs. *See also:* peak point. (ED) [46]

project environment An environment that defines the objectives, success criteria, project milestones, and associated management priorities that govern the systems engineering activities in support of product development. (C/SE) 1220-1998

project evaluation and review technique* *See:* program evaluation and review technique.

* Deprecated.

project file (software) A central repository of material pertinent to a project. Contents typically include memos, plans, technical reports, and related items. *Synonym:* project notebook. (C) 610.12-1990

project function An activity that spans the entire duration of a software project. Examples of project functions include project management, configuration management, quality assurance, and verification and validation. (C/SE) 1058.1-1987s

projection (1) (data management) A relational operator that extracts specified attributes from a relation and results in a relation containing only those attributes. *Synonym:* project. *See also:* product; join; selection; intersection; union; difference.

Name	Homeroom
Mary	26A
Joe	43
Harry	27
Michael	25
Susan	25
Mickey	41

Projection of Relation *Students* in Fig to entity/attribute matrix on Attributes NAME and HOMEROOM

projection

(C) 610.5-1990w

(2) (computer graphics) The transformation of an *N*-dimensional image into an image in less than *N* dimensions. For example, a shadow cast by the sun is a two-dimensional projection of a person or object existing in three dimensions. *See also:* perspective projection; parallel projection; stereoscopic projection. (C) 610.6-1991w

projection/join normal form *See:* fifth normal form.

projection tube A cathode-ray tube specifically designed for use with an optical system to produce a projected image. (ED) [45]

project library *See:* software development library.

project life cycle A collection of generally sequential project phases whose name and number are determined by the control needs of the organization or organizations involved in the project. (C/SE) 1490-1998

project notebook *See:* project file.

projector (illuminating engineering) A lighting unit which, by means of mirrors and lenses, concentrates the light to a limited solid angle so as to obtain a high value of luminous intensity. (EEC/IE) [126]

project plan (software) A document that describes the technical and management approach to be followed for a project. The plan typically describes the work to be done, the resources required, the methods to be used, the procedures to be followed, the schedules to be met, and the way that the project will be organized. For example, a software development plan. (C) 610.12-1990

PROLOG *See:* PROgramming in LOGic.

prolog breakpoint (software) A breakpoint that is initiated upon entry into a program or routine. *Synonym:* preamble breakpoint. *Contrast:* epilog breakpoint. *See also:* dynamic breakpoint; code breakpoint; static breakpoint; programmable breakpoint; data breakpoint. (C) 610.12-1990

PROM Programmable read-only memory. A form of nonvolatile memory that is supplied with null contents and is loaded with its contents in the laboratory or in the field. Once programmed, its contents cannot be changed. (C/BA) 14536-1995

PROM burner *See:* PROM programmer.

promiscuous mode (local area networks) A mode in which a repeater port or an end node receives all message traffic transmitted on the network. (C) 8802-12-1998

PROM programmer A device used to program PROM devices and to reprogram EPROM, using electrical pulses. *Synonym:* PROM burner. (C) 610.10-1994w

prompt (A) (computer graphics) (software) A symbol or message displayed by a computer system requesting input from the user of the system. **(B) (software) (computer graphics)** To display a symbol or message as in definition "A." (C) 610.6-1991, 610.12-1990

proof (1) (packaging machinery) (used as a suffix) So constructed, protected, or treated that its successful operation is not interfered with when subjected to the specified material or condition. (SWG/IA/PKG) 333-1980w

(2) (suffix) An apparatus is designated as dustproof, splashproof, etc., when so constructed, protected, or treated that its successful operation is not interfered with when subjected to the specified material or condition. (T&D/PE/TR) 18-1992, C57.12.80-1978r

(3) (used as a suffix) So constructed, protected, or treated that successful operation is not interfered with when the device is subjected to the specified material or condition. *Note:* Explosionproof requires that the fuse shall not be injured and flame shall not be transmitted to the outside of the fuse for all current interruptions within the rating of the fuse. (SWG/PE/SWG-OLD) C37.40-1993, C37.100-1992

proof mass (accelerometer) The effective mass whose inertia transforms an acceleration along, or about, an input axis into a force or torque. The effective mass takes into consideration flotation and contributing parts of the suspension. (AES/GYAC) 528-1994

proof of correctness (A) (software) A formal technique used to prove mathematically that a computer program satisfies its specified requirements. *See also:* total correctness; formal specification; assertion; partial correctness; inductive assertion method. **(B) (software)** A proof that results from applying the technique in definition "A." (C) 610.12-1990

proof of performance The report submitted to the regulatory body which includes field strength measurements and other information to show that the measured radiation pattern meets the conditions specified in the station license. (T&D/PE) 1260-1996

proof test (1) (evaluation of thermal capability) (thermal classification of electric equipment and electrical insulation) A means of evaluation in which an arbitrary fixed level of a diagnostic factor is applied periodically. In this case, the number of failures among multiple test specimens (rather than the magnitude of the diagnostic factor) defines the end-point of the test. *See also:* diagnostic factor. (EI) 1-1986r

(2) (rotating machinery) (withstand test) A "fail" or "no fail" test of the insulation system of a rotating machine made to demonstrate whether the electrical strength of the insulation is above a predetermined minimum value. (PE/EM) 95-1977r

proof testing That test used to qualify equipment for a particular application or to a particular requirement. (SWG/PE) C37.100-1992, C37.81-1989r

proof-test load (composite insulators) The routine mechanical load that is applied to an insulator at the time of its manufacture. (T&D/PE) 987-1985w

propagated error An error that occurs in a GIVEN operation and is passed along to a later operation. *Contrast:* inherited error. (C) 1084-1986w

propagated potential (biological) A change of potential involving depolarization progressing along excitable tissue. (EMB) [47]

propagating mode (1) (waveguide) A waveguide mode such that the variation of phase along the direction of the guide is not negligible. (MTT) 146-1980w

(2) Refers to a mode where the imaginary part of the propagation constant is much greater than the real part, (i.e., the mode is not cut-off as in a metallic wave guide). (AP/PROP) 211-1997

propagation (data transmission) (electrical practice) The travel of waves through or along a medium. (PE) 599-1985w

propagation constant (γ) (1) (fiber optics) For an electromagnetic field mode varying sinusoidally with time at a given frequency, the logarithmic rate of change, with respect to distance in a given direction, of the complex amplitude of any field component. *Note:* The propagation constant is a complex quantity. (Std100) 812-1984w

(2) (A) (transmission lines and transducers) (per unit length of a uniform line). The natural logarithm of the ratio of the phasor current at a point of the line, to the phasor current at a second point, at unit distance from the first point along the line in the direction of transmission, when the line is infinite in length or is terminated in its characteristic impedance. **(B) (transmission lines and transducers)** (per section of a periodic line). The natural logarithm of the ratio of the phasor current entering a section, to the phasor current leaving the same section, when the periodic line is infinite in length or is terminated in its iterative impedance. **(C) (transmission lines and transducers)** (of an electric transducer). The natural logarithm of the ratio of the phasor current entering the transducer, to the phasor current leaving the transducer, when the transducer is terminated in its iterative impedance. (Std100) 270-1966

(3) (overhead power lines) The complex quantity of a traveling plane wave at a given frequency whose real part is the attenuation constant in nepers per unit length and whose imaginary part is the phase constant in radians per unit length. (T&D/PE/MTT) 539-1990, 146-1980w

(4) The image transfer constant for a symmetrical transducer. (CAS) [13]

(5) (planar transmission lines) A complex parameter having the dimension of inverse length, which characterizes the variation of the field magnitude and phase of a mode in the direction of propagation. The real part is denoted as the attenuation constant and the imaginary part as the phase constant. (MTT) 1004-1987w

(6) The complex scalar γ in expressions for one-dimensional wave propagation using the exponential factor $\exp(-\gamma z)$.

$$\gamma = jk = \alpha + j\beta$$

where scalar quantity α is the attenuation, scalar quantity β is the phase constant, and k is the wave number. *See also:* plane wave propagation factor; propagation vector. (AP/PROP) 211-1997

propagation delay (1) (power generation) (sequential events recording systems) The time interval between the appearance of a signal at any circuit input and the appearance of the associated signal at that circuit output. (PE/EDPG) [1]

(2) In networking, the delay time between when a signal enters a channel and when it is received. *See also:* time delay. (C) 610.7-1995

(3) (A) The amount of time between when a signal is impressed on the input of a circuit and when it is received or detected at the output. **(B)** The time delay between when a signal is input to a device and a resultant action occurs on its output. *Synonym:* latency. (C) 610.10-1994

(4) The time required for energy to propagate between two specified points, determined by multiplying the group velocity of the wave by the distance between the two points projected onto the direction of propagation. (AP/PROP) 211-1997

propagation factor (radio-wave propagation) For a time-harmonic wave propagating from one point to another, the ratio of the complex electric field strength at the second point to that value which would exist at the second point if propagation took place in a vacuum. (AP) 211-1977s

propagation loss The total reduction in radiant power surface density. The propagation loss for any path traversed by a point on a wave front is the sum of the spreading loss and the attenuation loss for that path. *See also:* radio transmission. (Std100) 270-1966w

propagation mode (1) (laser maser) (in a periodic beamguide) A form of propagation characterized by identical field distributions over cross-sections of the beam at positions separated by one period of the guide. (LEO) 586-1980w

(2) (overhead-power-line corona and radio noise) A concept for treating propagation of electromagnetic noise along a set of overhead power-line conductors. Modal waves form a complete set of noninteracting components into which the propagated wave may be separated. *Note:* For a three-phase horizontal single-circuit transmission line with one conductor per phase and without ground wires, the following modes are defined: Mode 1—The transmission path is between the center phase and the outside phases. It has the lowest attenuation and the lowest surge impedance. Mode 2—The transmission path is between outside phases. It has an intermediate attenuation and an intermediate surge impedance. Mode 3—The transmission path is along all three phases and returning through ground. It has the highest attenuation and the highest surge impedance. (T&D/PE) 539-1990

propagation model An empirical or mathematical expression used to compute propagation path loss. *See also:* electromagnetic compatibility. [53]

propagation ratio (radio-wave propagation) For a time-harmonic wave propagating from one point to another, the ratio of the complex field strength at the second point to that at the first point. (AP) 211-1977s

propagation sort *See:* bubble sort.

propagation vector (1) Vector-characterizing phase progression of a wave in direction normal to lines of constant phase with magnitude proportional to the reciprocal of the wavelength. (UFFC) 1037-1992w

(2) The complex vector k in expressions for wave propagation using the exponential factor $\exp[-j(\vec{k} \cdot \vec{r})]$ is:

$$\vec{k} = \vec{\beta} - j\vec{\alpha}$$

where

$\vec{\beta}$ = the phase vector
$\vec{\alpha}$ = the attenuation vector
$\vec{r}$ = a position vector

(AP/PROP) 211-1997

propagation vector in physical media The complex vector $\overline{\gamma}$ in plane wave solutions of the form $e^{-\gamma \cdot r}$ for an e^{jwt} time variation and $\overline{r}$ the position vector. *See also:* attenuation vector in physical media; wave vector in physical media; phase vector in physical media. (AP/ANT) 145-1983s

propeller turbine A reaction turbine with fixed or variable pitch propeller-type blades. (PE/EDPG) 1020-1988r

propeller-type blower (rotating machinery) An axial-flow fan with air-foil-shaped blades. *See also:* fan. (PE) [9]

prop-encoded-array The primitive data type, consisting of a sequence of bytes, used to represent a property value. (C/BA) 1275-1994

proper ferroelectric (primary ferroelectric terms) A ferroelectric in which the polarization is the primary order parameter. (UFFC) 180-1986w

proper mode A mode of propagation that can be excited by a physical source. (AP/PROP) 211-1997

proper operation The functioning of the train control or cab signaling system to create or continue a condition of the vehicle apparatus that corresponds with the condition of the track of the controlling section when the vehicle apparatus is in operative relation with the track elements of the system. (EEC/PE) [119]

property (1) A kind of responsibility that is an inherent or distinctive characteristic or trait that manifests some aspect of an object's knowledge or behavior. Three kinds of property are defined: attributes, participant properties due to relationships, and operations. (C/SE) 1320.2-1998

(2) A documenting characteristic of an entity type used to group and differentiate individual entities. *Note:* An example of a property is "Stop." This property might be associated with the entity types "ROUTE.BUS" and "ROUTE.TRAVELER." (SCC32) 1489-1999

property encoding A specific data format, defined by this standard, that is used to represent various types of information within a prop-encoded-array. (C/BA) 1275-1994

property name A text string used to specify, or name, a particular property. (C/BA) 1275-1994

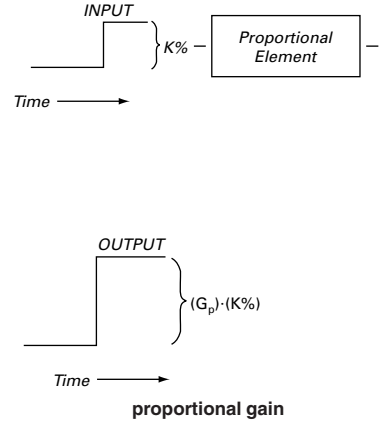
property value The data portion of a property, stored in property encoding format. (C/BA) 1275-1994

proportional amplifier An amplifier in which the output is a single value and an approximately linear function of the input over its operating range. *See also:* feedback control system. (IA/ICTL/IAC) [60]

proportional control action A control mode designed to provide a linear relationship between the controller output and input, assuming both are within normal range. *See also:* proportional control action. (PE/PSE) 94-1991w

proportional counter tube A radiation-counter tube designed to operate in the proportional region. (C) 165-1977w

proportional gain (hydraulic turbines) The proportional gain G_p of a proportional element is the ratio of the element's percent output to its percent input. A linear relationship is assumed.



proportional gain (PE/EDPG) 125-1977s

proportionally *See:* linearity.

proportional plus derivative control *See:* control action, proportional plus derivative.

proportional plus integral control *See:* proportional plus integral control action.

proportional plus integral control action Control action in which the output is proportional to a linear combination of the input and the time integral of the input. *Note:* In the practical embodiment of proportional plus integral action the relation between output and input, neglecting high frequency terms, is

$$\frac{Y}{X} = \pm P \frac{\frac{I}{s} + 1}{\frac{bI}{s} + 1} \quad 0 \le b \ll 1$$

where
b = proportional gain/static gain
I = integral action rate
P = proportional gain
s = complex variable
X = input transform
Y = output transform

Synonym: P.I. (CS/PE/EDPG) [3]

proportional plus integral plus derivative control *See:* proportional plus integral plus derivative control action.

proportional plus integral plus derivative control action Control action in which the output is proportional to a linear combination of the input, the time integral of input and the time rate-of-change of input. *Note:* In the practical embodiment of proportional plus integral plus derivative control action the relationship of output and input, neglecting high frequency terms, is

$$\frac{Y}{X} = \pm P \frac{1 + sD}{1 + sD/a} \quad a > 1$$

where
a = derivative action gain
b = proportional gain/static gain
D = derivative action time constant
I = integral action rate
P = proportional gain
s = complex variable
X = input transform
Y = output transform

Synonym: P.I.D. (CS/PE/EDPG) [3]

proportional region (radiation counter tubes) The range of operating voltage for a counter tube in which the gas amplification is greater than unity and is independent of the amount of primary ionization. *Notes:* 1. In this region the pulse size from a counter tube is proportional to the number of ions produced as a result of the initial ionizing event. 2. The proportional region depends on the type and energy of the radiation. (ED) 161-1971w

proportional spacing Text formatting and output that takes into account the width of each character, rather than allocating the same amount of horizontal space to characters of all widths. (C) 610.2-1987

proportionate mortality ratio An index used in occupational epidemiological studies that expresses the proportion of deaths from a single cause. It is not a mortality rate and, therefore, does not necessarily indicate a risk value. Rather, it indicates within a group the relative importance of specific causes of death. (T&D/PE) 539-1990

proprietary system (protective signaling) A local system sounding and/or recording alarm and supervisory signals at a control center located within the protected premises, the control center being under the supervision of employees of the proprietor of the protected premises. *Note:* According to the United States Underwriters' rules, a proprietary system must be a recording system. *See also:* protective signaling. (EEC/PE) [119]

propulsion-control transfer switch Apparatus in the engine room for transfer of control from engine room to bridge and vice versa. *Note:* Engine-room control is provided on all ships. Bridge control with a transfer switch is optional and is used principally on small vessels such as tugs or ferries, usually with a direct-current propulsion system. (EEC/PE) [119]

propulsion set-up switch Apparatus providing ready means to set up for operation under varying conditions where practicable; for example, cutout of one or more generators when multiple units are provided. *See also:* electric propulsion system. (EEC/PE) [119]

propulsion system The system of motors, drive mechanisms, controls, and other devices that propels or retards a vehicle. (VT) 1475-1999

prorated section A complete, suitably housed part of an arrester, comprising all necessary components, including gaseous medium, in such a proportion as to accurately represent, for a particular test, the characteristics of a complete arrester. (SPD/PE) C62.11-1999

prorated unit (arresters) A completely housed prorated section of an arrester that may be connected in series with other prorated units to construct an arrester of higher voltage rating. (PE) [8]

prospective characteristics of a test voltage causing disruptive discharge The characteristics of a test voltage that would have been obtained if no disruptive discharge had occurred. (PE/PSIM) 4-1995

prospective current (1) (ac high-voltage circuit breakers) The current that would flow if it were not influenced by the circuit breaker. (SWG/PE) C37.081-1981r
(2) (surge arresters) (available current) The root-mean-square symmetrical short-circuit current that would flow at a given point in a circuit if the arrester(s) at that point were replaced by links of zero impedance. (PE) [8], [84]

prospective current of a circuit *See:* available current.

prospective crest value *See:* prospective peak value.

prospective peak value (surge arresters) (of a chopped impulse) The peak (crest) value of the full-wave impulse voltage from which a chopped impulse voltage is derived. *Synonym:* prospective crest value. (PE) [8]

prospective peak value of test voltage (switching impulse testing) The voltage that would be obtained if no disruptive discharge occurred before the crest. 332-1972w

prospective short-circuit current *See:* available short-circuit current.

prospective (available) short-circuit current (at a given point in a circuit) The maximum current that the power system can deliver through a given circuit point to any negligible impedance short circuit applied at the given point, or at any other point that will cause the highest current to flow through the given point. *Notes:* 1. This value can be in terms of either symmetrical or asymmetrical, peak, or rms current, as specified. 2. In some resonant circuits, the maximum available short-circuit current may occur when the short-circuit is placed at some other point than the given one where the available current is measured. (SWG/PE) C37.40-1993

prospective study An epidemiological study of a group exposed to some factor over time to determine if this factor is associated with the development of a particular disease, as compared to a nonexposed control group. (T&D/PE) 539-1990

protected A responsibility that is visible only to the class or the receiving instance of the class (available only within methods of the class or its subclasses). *Contrast:* private; public. *See also:* hidden. (C/SE) 1320.2-1998

protected area (PA) A controlled-access area encompassed by physical barriers. (PE/NP) 692-1997

protected enclosure (electric installations on shipboard) An enclosure in which all openings are protected with wire screen, expanded metal, or perforated covers. A common from of specifications for "protected enclosure" is: "The

openings should not exceed 1/2 sq. in. in area and should be of such shape as not to permit the passage of a rod larger than 1/2 in. in diameter, except where the distance of exposed live parts from the guard is more than 4 in. the openings may be 3/4 sq. in. in area and must be of such shape as not to permit the passage of a rod larger than 3/4 in. in diameter."
(IA/MT) 45-1983s

protected field On a display device, a display field in which a user cannot enter, modify or erase data. *Contrast:* unprotected field. (C) 610.10-1994w

protected location (1) (computers) A storage location reserved for special purposes in which data cannot be stored without undergoing a screening procedure to establish suitability for storage therein. (C) [20], [85]
(2) A location whose contents are protected against accidental alteration, improper alteration, or unathorized access.
(C) 610.10-1994w

protected machine *See:* guarded machine.

protected outdoor transformer A transformer that is not of weatherproof construction but that is suitable for outdoor use if it is so installed as to be protected from rain or immersion in water. *See also:* transformer. (PE/TR) [57]

protected storage A type of storage in which data cannot be modified by an application program except under specified conditions. (C) 610.10-1994w

protected zone *See:* cone of protection.

protection (1) The process of observing a system, and automatically initiating an action to mitigate the consequences of an operating condition that has deviated from the established acceptable performance criteria. (PE/EM) 1129-1992r
(2) (software) An arrangement for restricting access to or use of all, or part, of a computer system. *See also:* storage protection; computer system. (C/SE) 729-1983s

protection character A character used to replace a suppressed zero in order to avoid error or false statements; for example, in the string "$********50.03" the asterisk is the protection character. (C) 610.5-1990w

protection exception (software) An exception that occurs when a program attempts to write into a protected area in storage. *See also:* overflow exception; addressing exception; underflow exception; operation exception; data exception.
(C) 610.12-1990

protections Limitations imposed on the radiated signal for certain azimuths. *Note:* These limitations generally are set so that interference does not occur to stations in that direction.
(T&D/PE) 1260-1996

protection system (1) (protection systems) The electrical and mechanical devices (from measured process variables to protective action system input terminals) involved in generating those signals associated with the protective functions. These signals include those that actuate reactor trip and actuate engineered safety features (for example, containment isolation, core spray, safety injection, pressure reduction, and air cleaning). (PE/NP) 279-1971w
(2) The part of the sense and command features involved in generating those signals used primarily for the reactor trip system and engineered safety features. (PE/NP) 603-1998

protective action (1) (protection systems) The initiation of a signal or operation of equipment within the safety system for the purpose of accomplishing a protective function in response to a generating station condition having reached a limit specified in the design basis. *Notes:* 1. Protective action at the channel level is the initiation of a signal by a single channel when the sensed variable(s) reaches a specified limit. 2. Protective action at the system level is the operation of sufficient actuated equipment including the appropriate auxiliary supporting features to accomplish a protective function. Examples of protective actions at the system level are: rapid insertion of control rods, closing of containment isolation valves, and operation of safety injection and core spray.
(PE/NP) 279-1971w
(2) The initiation of a signal within the sense and command features or the operation of equipment within the execute features for the purpose of accomplishing a safety function.
(PE/NP) 603-1998

protective action set point (nuclear power generating station) The reference value to which the measured variable is compared for the initiation of protective action.
(PE/NP) 380-1975w

protective action system (1) (Class 1E power systems for nuclear power generating stations) The electrical and mechanical equipment (from the protection system output to and including the actuated equipment-to-process coupling) that performs a protective action when it receives a signal from the protective system. *Note:* Examples of protective action systems are: control rods and their trip mechanisms; isolation valves, their operators and their contactors; and emergency service water pumps and associated valves, their motors and circuit breakers. In some instances protective actions may be performed by protective action system equipment that responds directly to the process conditions (for example, check valves, self-actuating relief valves).
(PE/NP) 603-1978, 308-1980s
(2) (nuclear power generating station) An arrangement of equipment that performs a protective action when it receives a signal from the protection system. (PE/NP) 279-1971w

protective buffer An optional single word buffer in a slave that always contains a copy of the most recent data asserted or received by the slave. (NID) 960-1993

protective covering (power cable joints) A field-applied material to provide environmental protection over the joint or housing, or both. (PE/IC) 404-1986s

protective device A bypass gap, varistor, or other device that limits the voltage on the capacitor segment to a predetermined level when overcurrent flows through the series capacitor (that is, during system faults, system swings, or other abnormal events), and that is capable of carrying capacitor discharge, system fault, and load current for the specified duration. (T&D/PE) 824-1994

protective function (1) (nuclear power generating station) Any one of the functions necessary to mitigate the consequences of a design basis event (for example, reduce power, isolate containment, or cool the core). *Note:* A protective function is a design basis objective that must be accomplished; a successfully completed protective action at the system level, including the sensing of one or more variables, will accomplish the protective function. However, the design may be such that a given protective function may be accomplished by any one of several protective actions at the system level.
(PE/NP) 379-1977s
(2) (nuclear power generating station) The completion of those protective actions at the system level required to maintain plant conditions within the allowable limits established for a design basis event (for example, reduce power, isolate containment, or cool the core).
(PE/NP) 603-1978, 308-1980s
(3) (nuclear power generating station) The sensing of one or more variables associated with a particular generating station condition, the signal processing and the initiation and completion of the protective action at values of the variables established in the design bases.
(PE/NP) 279-1971w, 379-1977s

protective gap A gap placed between live parts and ground to limit the maximum overvoltage that may otherwise occur.
(SWG/PE/T&D) C37.100-1992, 516-1995

protective level of the bypass gap The maximum instantaneous voltage (including tolerance) appearing across the capacitor immediately before or during operation of the bypass gap.
(T&D/PE) 824-1994

protective level of the varistor The maximum instantaneous voltage appearing across the capacitor at a specified current through the varistor. (T&D/PE) 824-1994

protective lighting (illuminating engineering) A system intended to facilitate the nighttime policing of industrial and other properties. (EEC/IE) [126]

protective margin (PM) The value of the protective ratio (PR), minus one, expressed in percent. PM = (PR − 1) · 100. (C/PE) 1313.1-1996, [8]

protective power gap (series capacitor) A bypass gap that limits the voltage on the capacitor segment to a predetermined level when system fault occurs on the line, and that is capable of carrying capacitor discharge, system fault, and load currents for specified durations. (T&D/PE) [26]

protective ratio (1) (surge arresters) The ratio of the insulation withstand characteristics of the protected equipment to the arrester protective level, expressed as a multiple of the latter figure. (PE) [8]

(2) The ratio of the insulation strength of the protected equipment to the overvoltages appearing across the insulation. (PE/C) 1313.1-1996

protective relay (1) (power operations) A device whose function is to detect defective lines or apparatus or other power system conditions of an abnormal or dangerous nature and to initiate appropriate control action. (PE/PSE) 858-1987s

(2) A relay whose function is to detect defective lines or apparatus or other power system conditions of an abnormal or dangerous nature and to initiate appropriate control circuit action. *Note:* A protective relay may be classified according to its input quantities, operating principle, or performance characteristics. (SWG/PE/PSR) C37.98-1977s, C37.90-1978s, C37.100-1992

protective screen (burglar-alarm system) A lightweight barrier of either solid strip or lattice construction, carrying electric protection circuits, and barring access through a normal opening to protected premises. *See also:* protective signaling. (EEC/PE) [119]

protective signaling Protective signaling comprises the initiation, transmission, and reception of signals involved in the detection and prevention of property loss or damage due to fire, burglary, robbery, and other destructive conditions, and in the supervision of persons and of equipment concerned with such detection and prevention. (EEC/PE) [119]

protective switchgear (thyristor converter) The ac circuit devices and the dc circuit devices that may be used in the thyristor converter unit to clear fault conditions. (IA/IPC) 444-1973w

protective system (1) (Class 1E power systems for nuclear power generating stations) The electrical and mechanical devices (from measured process variables to protective action system input terminals) involved in generating those signals associated with the protective functions. These signals include those that initiate reactor trip, engineered safety features (for example, containment isolation, core spray, safety injection, pressure reduction, and air cleaning) and auxiliary supporting features. (PE/NP) 308-1980s

(2) (nuclear power generating station safety systems) The part of the sense and command features involved in generating those signals used primarily for the reactor trip system and engineered safety features. 379-1988s

protective system false operation rate Protective system false operation rate = number of false operations/exposure time. (PE/PSE) 859-1987w

protect notch *See:* write-protect notch.

protector joint A split sleeve that fits over a conductor compression joint used to protect the joint from bending or damage if the joint must pass through travelers. The joint protector usually has split rubber collars at each end to protect the conductor from damage where it exits at each end of the sleeve. (T&D/PE) 524-1992r

protector tube (1) (surge arresters) An expulsion arrester used primarily for the protection of line ard switch insulation. (PE) 28-1974, [8]

(2) (electron-tube type) A glow-discharge cold-cathode tube that employs a low-voltage breakdown between two or more electrodes to protect circuits against overvoltage. (ED) [45]

PROTEUS A computer language used in signal processing. (C) 610.13-1993w

protocol (1) (supervisory control, data acquisition, and automatic control) A strict procedure required to initiate and maintain communication. (SWG/SUB/PE) 999-1992w, C37.1-1994, C37.100-1992

(2) A formal set of conventions governing the format and relative timing of message exchange between two communications terminals. *See also:* control procedure. (LM/COM) 168-1956w

(3) (software) A set of conventions that govern the interaction of processes, devices, and other components within a system. (C) 610.12-1990

(4) (STEbus) The signaling rules used to convey information or commands between boards connected to the bus. (C/MM) 1000-1987r

(5) (MULTIBUS II) The set of signaling rules used to convey information between agents. (C/MM) 1296-1987s

(6) A set of semantic and syntactic rules that determine the behavior of entities that interact. (C/PA) 14252-1996

(7) A set of rules and formats (semantic and syntactic) that determines the communication behavior of simulation applications. (DIS/C) 1278.1-1995, 1278.2-1995

(8) A set of conventions or rules that govern the interactions of processes or applications within a computer system or network. (ATLAS) 1232-1995

(9) (A) A formal set of conventions governing the format and relative timing of message exchange in a computer system. **(B)** A set of semantic and syntactic rules that determine the behavior of functional units in achieving meaningful communication. (C) 610.7-1995, 610.10-1994

(10) A set of semantic and syntactic rules for exchanging information. (C) 1003.5-1999

protocol access A protocol that is adopted at a specified reference point between a user and a network to enable the user to employ the services and/or facilities of that network. (C) 610.7-1995

protocol control information (computer graphics) Information exchanged between entities to coordinate their joint operation. (LM/C) 8802-6-1994

protocol converter A dedicated device that translates the protocol native to an end-user device into a different protocol, allowing communication with another end-user device. *Note:* A protocol converter converts the message formats so both systems are compatible. (C) 610.7-1995

protocol data unit (PDU) (1) Information that is delivered as a unit between peer entities of a *local area network (LAN)* or a *metropolitan area network (MAN)* and that contains control information, address information, and may contain user data. (LM/C) 8802-6-1994

(2) A block of data that is exchanged between two devices using a protocol. (C) 610.7-1995

(3) Information delivered as a unit between peer entities that may contain control information, address information, and data. (C/MM) 1394-1995

(4) A unit of data specified in a protocol and consisting of protocol information and, possibly, user data. (C/LM) 802.10g-1995

(5) A Distributed Interactive Simulation (DIS) data message that is passed on a network between simulation applications according to a defined protocol. (DIS/C) 1278.1-1995, 1278.2-1995, 1278.4-1997

(6) Information delivered as a unit between peer entities that contains control information and, optionally, data. (C/LM) 8802-5-1998

(7) The sequence of contiguous octets delivered as a unit to the MAC sub-layer or received as a unit from the MAC sublayer. A valid LLC PDU is at least 3 octets in length, and contains two address fields and a control field. A PDU may

or may not include an information field in addition. (C/LM/CC) 8802-2-1998

(8) Information delivered as a unit between peer entities that contains control information and, optionally, data. (EMB/MIB) 1073.3.2-2000

protocol engine A component of the DNI implementation model that is a conceptual machine that implements a particular communications protocol profile. (C) 1003.5-1999

protocol entity (1) An entity that provides one or more service access points for use by higher-level entities. (C) 610.7-1995

(2) An entity that follows a set of rules and formats (semantic and syntactic) that determines the communication behavior of other entities. (C/LM) 802.10g-1995

protocol error counter (PEC) A counter contained by a network station to keep track of protocol errors such as invalid frames. (EMB/MIB) 1073.3.1-1994

protocol event In the DNI implementation model, an event that is generated by a protocol engine and queued for attention by the event handler. (C) 1003.5-1999

protocol implementation conformance statement (PICS) **(1)** A statement of which capabilities and options have been implemented for a given Open Systems Interconnection (OSI) protocol. (C/LM) 8802-5-1998, 610.7-1995

(2) (local area networks) A statement of which capabilities and options have been implemented for a given interconnection protocol. (C) 8802-12-1998

protocol independent interface An interface that enables the application to be insulated from the specifics of the underlying protocol stack which provides the communication services. Protocol independent interfaces allow the application to be written so that it can be ported to various protocol stacks. (C) 1003.5-1999

protocol profile A set of one or more protocol definitions and, where applicable, the identification of chosen classes, subsets, option and parameters of those definitions, necessary for accomplishing a particular function. A protocol profile can be thought of as a vertical slice through a layered set of communications protocols. (C) 1003.5-1999

protocol stack (1) The hierarchy of protocols used in a computer network architecture. (C) 610.7-1995

(2) An instantiation of a set of protocols. (C/LM) 802.10a-1999

protocol suite A defined set of complementary protocols within the communication service profile. (DIS/C) 1278.2-1995

protocol type (PTYPE) A field in the RDE PDU information field that describes the protocol function of the PDU. (C/LM/CC) 8802-2-1998

proton microscope A device similar to the electron microscope but in which the charged particles are protons. *See also:* electron optics. (ED) [45], [84]

proton range (solar cells) The maximum distance traversed through a material by a proton of a given energy. (AES/SS) 307-1969w

prototype (1) (modeling and simulation) (software) A preliminary type, form, or instance of a system that serves as a model for later stages or for the final, complete version of the system. (C) 610.3-1989w, 610.12-1990

(2) An experimental model, either functional or nonfunctional, of the system or part of the system. A prototype is used to get feedback from users for improving and specifying a complex human interface, for feasibility studies, or for identifying requirements. (C/SE) 1233-1998

prototype standard A concrete embodiment of a physical quantity having arbitrarily assigned magnitude, or a replica of such embodiment. *Note:* As an illustration of the distinction between prototype standard and unit, the length of the United States Prototype Meter Bar is not exactly one meter. (Std100) 270-1966w

prototype transformer A transformer manufactured primarily to obtain engineering data or evaluate manufacturing or design feasibility. Prototypes may be pre-production units or units typical of current designs manufactured for test purposes to obtain data to comply with changes in industry standards or for other reasons. (PE/TR) C57.134-2000

prototyping (software) A hardware and software development technique in which a preliminary version of part or all of the hardware or software is developed to permit user feedback, determine feasibility, or investigate timing or other issues in support of the development process. *See also:* rapid prototyping. (C) 610.12-1990

proximal (distal) point (pulse terminology) A magnitude referenced point at the intersection of a waveform and a proximal (distal) line. *See also:* waveform epoch. (IM/WM&A) 194-1977w

proximal stimuli (illuminating engineering) The distribution of illuminance on the retina constitutes the proximal stimulus. (EEC/IE) [126]

proximity-coupled dipole array antenna An array antenna consisting of a series of coplanar dipoles, loosely coupled to the electromagnetic field of a balanced transmission line, the coupling being a function of the proximity and orientation of the dipole with respect to the transmission line. (AP/ANT) 145-1993

proximity discharge *See:* proximity ESD.

proximity effect (electric circuits and lines) The phenomenon of non-uniform current distribution over the cross section of a conductor caused by the time variation of the current in a neighboring conductor. *See also:* induction heating. (IA) 54-1955w, 270-1966w

proximity-effect error (navigation systems) (navigation aid terms) An error in determination of system performance caused by improper use of measurements made in the near field of the antenna system. (AES/GCS) 172-1983w

proximity-effect ratio (power distribution, underground cables) The quotient obtained by dividing the alternating-current resistance of a cable conductor subject to proximity effect, by the alternating-current resistance of an identical conductor free of proximity effect. (PE) [4]

proximity ESD *See:* indirect ESD event.

proximity influence The percentage change in indication caused solely by the fields produced from two edgewise instruments mounted in the closest possible proximity, one on each side (or above and below for horizontal-scale instruments). *Note:* Proximity influence of alternating-current instruments on either alternating-current or direct-current types is determined by energizing two instruments, one on each side of the test instrument (or above and below) at 90% of end-scale value (in phase with the current in the instrument under test, if the latter is alternating current). The current in the two outside instruments only shall be reversed. For rating purposes, the proximity influence shall be taken as one-half the difference in the readings in percentage of full scale. In direct-current permanent-magnet moving-coil instruments the field produced by the current in the instrument is small compared with the field from the permanent magnet. The proximity influence on either an alternating-current or direct-current test instrument will be the difference in reading, expressed as a percentage of full-scale value, of the instrument under test mounted alone on the panel, compared with the reading when two direct-current instruments are mounted in closest possible proximity, each with current applied to give 90% end-scale deflection. All three instruments shall be of the same manufacture and size. *See also:* accuracy rating. (EEC/AII) [102]

proximity switch A device that reacts to the proximity of an actuating means without physical contact or connection therewith. *See also:* switch. (IA/ICTL/IAC/APP) [60], [75]

proxy install A proxy install uses an alternate root directory as the target path. (C/PA) 1387.2-1995

PSC *See:* physical signaling components.

P scan *See:* plan-position indicator.

P-scope A cathode-ray oscilloscope arranged to present a P-display. (AES/RS) 686-1990

PSDN *See:* packet-switched data network.

pseudo code (1) (software) A combination of programming language constructs and natural language used to express a computer program design. For example: IF the data arrives faster than expected,THEN reject every third input.ELSE process all data received.ENDIF. (C) 610.12-1990

(2) (test, measurement, and diagnostic equipment) An arbitrary code, independent of the hardware of a computer, which has the same general form as actual computer code but which must be translated into actual computer code if it is to direct the computer. (MIL) [2]

(3) A combination of programming language constructs and natural language used to express a computer program design. For example:

IF the data arrives faster than expected

THEN reject every third input

ELSE process all data received

ENDIF

(C) 610.13-1993w

pseudo-coning (inertial sensors) (strapdown inertial system) A system error created when the system computer attempts to cancel a steady coning input term which in actuality does not exist. Because of certain coupling errors in the gyro, a rate input about only one axis can produce outputs on both axes of the gyro. If the coupling error, for example, is angular acceleration sensitivity, the two outputs produced will have the same form as if a true coning motion was applied to the gyro. (AES/GYAC) 528-1984s

pseudo-instruction (1) (test, measurement, and diagnostic equipment) An instruction which resembles the instructions acceptable to the computer but which must be translated into actual computer instructions in order to control the computer. (MIL) [2]

(2) (software) A source language instruction that provides information or direction to the assembler or compiler and is not translated into a target language instruction. For example, an instruction specifying the desired format of source code listings. *Synonyms:* pseudo operation; pragma; pseudo-op. (C) 610.12-1990

pseudolatitude (navigation aid terms) A latitude in a coordinate system which has been arbitrarily displaced from the earth's conventional latitude system so as to move the meridian convergence zone (polar region) away from the place of intended operation. (AES/GCS) 172-1983w

pseudolongitude (navigation aid terms) A longitude in a coordinate system which has been arbitrarily dosplace from the earth's conventional longitude system so as to move the meridian convergence zone (polar region) away from the place of intended operation. (AES/GCS) 172-1983w

pseudonoise sequence (communication satellite) A binary sequence with a very desirable transorthogonal auto-correlation property. In space communications commonly used for synchronization and ranging. Syn: PN sequence. (COM) [19]

pseudo-op *See:* pseudo-instruction.

pseudo operation *See:* pseudo-instruction.

pseudo-random Pertaining to the approximation of true, statistical randomness. (C) 1084-1986w

pseudo-random number Any member of a sequence of numbers sufficiently close to a random number sequence to permit its use in calculations formally requiring random numbers. (C) 1084-1986w

pseudo-random number sequence (1) A sequence of numbers, determined by some defined arithmetic process, that is satisfactorily random for a given purpose, such as by satisfying one or more of the standard statistical tests for randomness. Such a sequence may approximate any one of several statistical distributions, such as uniform distribution or normal Gaussian distribution. (C/C) [20], [85]

(2) (mathematics of computing) A sequence of numbers, determined by some defined arithmetic process, that is sufficiently close to a random number sequence to permit its use in calculations formally requiring a random number sequence. (C) 1084-1986w

pseudo-random test signal A signal consisting of a bit sequence that approximates a random signal. (COM/TA) 1007-1991r

pseudo signal A signal other than that at the interface between the device and the tester. This includes internal signals, derived signals, and any other signals that may be required by tools other than test translators to generate tests or test constructs. (C/TT) 1450-1999

pseudoternary coding A means of digital signaling in which three signal levels are used to encode binary data. (C) 610.10-1994w

PSF *See:* product specification file.

PSK *See:* phase-shift keying.

PSN *See:* public switched network; private switching network.

PSPDN *See:* packet switched public data network.

PSS *See:* physical source statements.

PSTN *See:* public switched telephone network.

PSW *See:* program status word.

psychometric chroma (illuminating engineering) A correlate of perceived chroma defined in terms of CIELUV or CIELAB. Equal scale intervals correspond approximately to equal differences in perceived chroma. (EEC/IE) [126]

psychometric hue-angle (illuminating engineering) A correlate of hue defined in terms of CIELUV or CIELAB. (EEC/IE) [126]

psychometric lightness (illuminating engineering) A correlate of lightness defined in terms of CIELUV or CIELAB. Equal scale intervals correspond approximately to equal differences in (perceived) lightness. (EEC/IE) [126]

psychometric saturation (illuminating engineering) A correlate of saturation defined in terms of CIELUV. Equal scale intervals correspond approximately to equal differences of (perceived) saturation. *Note:* Psychometric saturation cannot be calculated in terms of CIELAB. (EEC/IE) [126]

psychophysics Study of correlations between stimulus parameters and detection or perception of stimuli. (T&D/PE) 539-1990

PTE *See:* Port Transfer Error.

PTM *See:* pulse-time modulation.

PTT *See:* postal telephone and telegraph.

PTYPE *See:* protocol type.

p-type crystal rectifier A crystal rectifier in which forward current flows when the semiconductor is positive with respect to the metal. *See also:* rectifier. (EEC/PE) [119]

p-type semiconductor *See:* semiconductor, *p*-type.

public (1) A design feature, documented in the component data sheet, that may be used by purchasers of the component. (TT/C) 1149.1-1990

(2) A responsibility that is not hidden, i.e., visible to any requester (available to all without restriction). *Contrast:* private; protected. (C/SE) 1320.2-1998

Publication Contents The publisher-defined contents of a publication. (IM/ST) 1451.1-1999

Publication Domain A Domain for a specific publication. *See also:* Domain. (IM/ST) 1451.1-1999

Publication Key A publisher-defined identifier specifying the form and contents of a publication in a publish-subscribe communication. (IM/ST) 1451.1-1999

Publication Topic A configurable identifier for the name of a publication in a publish-subscribe communication. Specifically a value having datatype `PublicationTopic`. For a Publisher port, the operation `GetPublicationTopic` returns a value, `publication_topic`, that has the same value as Publication Topic. (IM/ST) 1451.1-1999

public-address system A system designed to pick up and amplify sounds for an assembly of people. (EEC/PE) [119]

public circuit-switched network A public data network using circuit-switching techniques. (C) 610.7-1995

public data network A network established and operated by communications common carriers or telecommunications administrations for the specific purpose of providing low error-rate data transmission services to the public. *Synonym:* public data transmission service. *Contrast:* private network. *See also:* public switched network; public packet switching network; public circuit-switched network. (C) 610.7-1995

public data transmission service *See:* public data network.

public key system An encryption system using a combination of a public encryption key and a private decryption key to provide message security or authentication. *See also:* electronic signatures. (C) 610.7-1995

public object The representation by the client of an object in a particular language binding. (C/PA) 1328-1993w, 1224-1993w, 1327-1993w, 1238.1-1994w

public OM object The representation by the client of an object in a particular programming language binding. (C/PA) 1327.2-1993w, 1326.2-1993w, 1328.2-1993w, 1224.2-1993'

public packet switching network A public data network that uses packet switching techniques. (C) 610.7-1995

public page A memory page that may be used by any agency or application. No access credentials are associated with such a page. (SCC32) 1455-1999

public specifications Specifications that are available, without restriction, to anyone for implementation, sublicensing, and distribution (i.e., sale) of that implementation. (C/PA) 14252-1996

public switched network A public data network in which dedicated communications paths are established for customers. (C) 610.7-1995

public switched telephone network (PSTN) (1) A telephone network in which connections are established as and when required and that is supplied, operated, and controlled by one or more telecommunications operating companies to provide telephone service that is available to the public. (COM/TA) 823-1989w

(2) Commonly called the switched telephone network. (AMR) 1390-1995

(3) A network of a complete public telephone system, including telephones, lines and exchanges. (C) 610.7-1995

public telecommunications exchange (telephone switching systems) A telecommunications exchange that serves the public. (COM) 312-1977w

public telephone network A network of public telephone system. *See also:* public switched telephone network. (C) 610.7-1995

public telephone station (pay station) A station available for use by the public, generally on the payment of a fee that is deposited in a coin collector or is paid to an attendant. *See also:* telephone station. (EEC/PE) [119]

Public Transducer A Parameter or other class instance that is the public interface or abstraction of one or more physical transducers supported by an NCAP. (IM/ST) 1451.1-1999

Publisher object Any object that posts publications onto the network via an Object of class `IEEE1451_BasePublisherPort` or a subclass thereof. (IM/ST) 1451.1-1999

Publisher Port An instance of the class `IEEE1451_PublisherPort` or of a subclass thereof. (IM/ST) 1451.1-1999

publish-subscribe communication A communication pattern where one or more objects, publishers, communicate information on a specific topic to one or more subscriber objects interested in that topic without the necessity of any of these objects knowing the identity of any other object. In an IEEE 1451.1 system, the pattern is established via the Publication Topic, Publication Key, and Publication Domain of the publication. (IM/ST) 1451.1-1999

puck (computer graphics) An input device, used as a locator, consisting of a hand-held control box with crosshairs that can be moved over a data tablet containing an image such that the user can identify a point in the image. *Note:* This term is sometimes used to refer to a mouse. (C) 610.6-1991w, 610.10-1994w

pull (data management) To retrieve data from a stack. *Synonym:* pop. *Contrast:* push. (C) 610.5-1990w

pull blade (cable plowing) A plow blade used to pull direct burial conductors into position by means of a suitable pulling grip attachment at the heel of the blade. (T&D/PE) 590-1977w

pull box A box with a blank cover that is inserted in one or more runs of raceway to facilitate pulling in the conductors, and may also serve the purpose of distributing the conductors. *See also:* cabinet. (EEC/PE) [119]

pull-down menu A menu that is brought into view by selecting a menu-bar label. *Contrast:* pop-up menu. (PE/NP) 1289-1998

puller *See:* bullwheel puller.

puller, bullwheel *See:* bullwheel puller.

puller, drum *See:* drum puller.

puller, reel *See:* reel puller.

puller, two drum, three drum *See:* two-drum, three-drum puller.

pulley (1) (rotating machinery) (sheave) A shaft-mounted wheel used to transmit power by means of a belt, chain, band, etc. *See also:* rotor. (PE) [9]

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

pull function* *See:* dragging.

* Deprecated.

pulling eye A device that may be fastened to the conductor or conductors of a cable or formed by or fastened to the wire armor and to which a hook or rope may be directly attached in order to pull the cable into or from a duct. *Note:* Pulling eyes are sometimes equipped, like test caps, with facilities for oil feed or vacuum treatment. (T&D/PE) [10]

pulling figure (oscillators) The difference between the maximum and minimum values of the oscillator frequency when the phase angle of the load-impedance reflection coefficient varies through 360 degrees, while the absolute value of this coefficient is constant and equal to a specified value, usually 0.20. (Voltage standing-wave ratio 1.5.) *See also:* oscillatory circuit; waveguide. (ED) 161-1971w

pulling into synchronism (rotating machinery) The process of synchronizing by changing from asynchronous speed to synchronous. (PE) [9]

pulling iron An anchor secured in the wall, ceiling, or floor of a manhole or vault to attach rigging used to pull cable. (NESC) C2-1997

pulling line (conductor stringing equipment) A high strength line, normally synthetic fiber rope or wire rope, used to pull the conductor. However, on reconstruction jobs where a conductor is being replaced, the old conductor often serves as the pulling line for the new conductor. In such cases, the old conductor must be closely examined for any damage prior to the pulling operation. *Synonyms:* hard line; light line; sock line; pulling rope; bull line. (T&D/PE) 524a-1993r, 1048-1990, 524-1992r

pulling out of synchronism (rotating machines) The process of losing synchronism by changing from synchronous speed to a lower asynchronous speed (for a motor) or higher asynchronous speed (for a generator). (PE) [9]

pulling rope *See:* pulling line.

pulling tension The longitudinal force exerted on a cable during installation. (NESC) C2-1997

pulling vehicle (conductor stringing equipment) Any piece of mobile ground equipment capable of pulling pilot lines, pulling lines, or conductors. However, helicopters may be considered as a pulling vehicle when utilized for the same purpose. (T&D/PE) 524a-1993r, 524-1992r

pull-in test (synchronous machines) A test taken on a machine that is pulling into synchronism from a specified slip. (PE) [9]

pull-in time (acquisition time) (communication satellite) The time required for achieving synchronization in a phase-lock loop. (COM) [25]

pull-in torque (synchronous motor) The maximum constant torque under which the motor will pull its connected inertia load into synchronism, at rated voltage and frequency, when its field excitation is applied. *Note:* The speed to which a motor will bring its load depends on the power required to drive it and whether the motor can pull the load into step from this speed depends on the inertia of the revolving parts, so that the pull-in torque cannot be determined without having the Wk^2 as well as the torque of the load. (PE) [9]

pull or transfer box A box without a distribution panel, within which one or more corresponding electric circuits are connected or branched. (T&D/PE) [10]

pull-out test (rotating machinery) A test to determine the conditions under which an alternating-current machine develops maximum torque while running at specified voltage and frequency. *See also:* asynchronous machine. (PE) [9]

pull-out torque The maximum sustained torque that a synchronous motor will develop at synchronous speed with rated voltage applied at rated frequency and with normal excitation. (IA/MT) 45-1998

pull rope A rope, attached to the cable, that is used to pull the cable through the conduit system. *Synonym:* bull rope. (PE/IC) 1185-1994

pull setting *See:* sag section.

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

pull-up torque (alternating-current motor) The minimum torque developed by the motor during the period of acceleration from rest to the speed at which breakdown torque occurs with rated voltage applied at rated frequency. (PE) [9]

pulsating function A periodic function whose average value over a period is not zero. For example, $f(t) = A + B \sin \omega t$ is a pulsating function where neither A nor B is zero. (Std100) 270-1966w

pulse (1) (impulse) (data transmission) A brief excursion of a quantity from normal. (PE) 599-1985w

(2) (automatic control) A variation of a signal whose value is normally constant; this variation is characterized by a rise and a decay, and has a finite duration. (PE/EDPG) [3]

(3) (pulse terminology) A wave that departs from a first nominal state, attains a second nominal state, and ultimately returns to the first nominal state. Throughout the remainder of this document the term pulse is included in the term wave. (IM/WM&A) 194-1977w

(4) A wave that departs from an initial level for a limited duration of time and ultimately returns to the original level. *Note:* In demand metering, the term "pulse" is also applied to a sudden change of voltage or current produced, for example, by the closing or opening of a contact. (ELM) C12.1-1988

(5) A variation in the value of a magnitude which is short in relation to the time schedule of interest, the final value being the same as the initial value. *Note:* In digital logic circuits, a pulse is usually a voltage. *See also:* recovery time; strobe. (C) 610.7-1995, 610.10-1994w

(6) (relaying) A brief excursion of a quantity from its initial level. (SWG/PE) C37.100-1992

pulse accumulator (or register) (of a telemeter system) A device that accepts and stores pulses and makes them available for readout on demand. (SWG/PE) C37.100-1992

pulse advance (pulse terminology) (delay) The occurrence in time of one pulse waveform before (after) another pulse waveform. (IM/WM&A) 194-1977w

pulse advance interval (pulse terminology) (delay interval) The interval by which, unless otherwise specified, the pulse start time of one pulse waveform preceded (follows), unless otherwise specified, the pulse start time of another pulse waveform. (IM/WM&A) 194-1977w

pulse amplifier (pulse techniques) An amplifier designed specifically for the amplification of electric pulses. *See also:* pulse. (NPS) 175-1960w

pulse amplifier or relay A device used to change the amplitude or waveform of a pulse for retransmission to another pulse device. (ELM) C12.1-1988

pulse amplitude, A_M (1) (pulse transformers) That quantity determined by the intersection of a line passing through the points on the leading edge where the instantaneous value reaches 10% and 90% of A_M and a straight line that is the best least-squares fit to the pulse in the pulse-top region (usually this is fitted visually rather than numerically). For pulses deviating greatly from the ideal trapezoidal pulse shape, a number of successive approximations may be necessary to determine A_M. *Note:* The pulse amplitude A_M may be arrived at by applying the following procedure.

1) Visually or numerically determine the best straight line fit to the pulse in the pulse-top region and extend this straight line into the leading-edge region.
2) An initial estimate of A_M is the first intersection of the pulse (in the late leading-edge or early pulse-top regions) with the straight line fitted to the pulse top.
3) Using the estimate of A_M calculate 0.1 A_M and 0.9 A_M and draw a straight line through these two points of the pulse-leading edge.
4) The intersection of the leading-edge straight line and the pulse-top straight line gives an improved estimate of A_M.
5) Repeat steps 3 and 4 until the estimate of A_M does not change. The converged estimate is the pulse amplitude A_M. (PEL/ET) 390-1987r

(2) The algebraic difference between the top magnitude and the base magnitude. (IM/WM&A) 194-1977w

(3) A general term indicating the magnitude of a pulse measured with respect to the normally constant value unless otherwise stated. (ED) [127]

pulse amplitude modulation (PAM) (1) (data transmission) (pulse terminology) Modulation in which the modulating wave is caused to amplitude modulate a pulse carrier. (IM/AP/WM&A/ANT) 194-1977w, 145-1983s

(2) A form of pulse modulation in which the amplitude of a pulse carrier is varied. (C) 610.7-1995

pulse amplitude, peak *See:* peak pulse amplitude.

pulse amplitude, root-mean-square *See:* root-mean-square (effective) pulse amplitude.

pulse average time (light-emitting diodes) The time interval between the instants at which the instantaneous pulse amplitude first and last reaches a specified fraction of the peak pulse amplitude, namely, 50%. (ED) [127]

pulse bandwidth (pulse terminology) The smallest continuous frequency interval outside of which the amplitude (of the spectrum) does not exceed a prescribed fraction of the amplitude at a specified frequency. Caution: This definition permits the spectrum amplitude to be less than the prescribed amplitude within the interval. *Notes:* 1. Unless otherwise stated, the specified frequency is that at which the spectrum has its maximum amplitude. 2. This term should really be pulse spectrum bandwidth because it is the spectrum and not the pulse itself that has a bandwidth. However, usage has caused the contraction and for that reason the term has been accepted. *See also:* signal. (IM/WM&A) 194-1977w

pulse base (pulse waveform) (pulse techniques) That major segment having the lesser displacement in amplitude from the baseline, excluding major transitions. *See also:* pulse. (IM/HFIM) [40]

pulse, bidirectional *See:* bidirectional pulse.

pulse broadening (fiber optics) An increase in pulse duration. *Note:* Pulse broadening may be specified by the impulse re-

sponse, the root-mean-square pulse broadening, or the full-duration-half-maximum pulse broadening. *See also:* root-mean-square pulse broadening; impulse response; full width (duration) half maximum. (Std100) 812-1984w

pulse burst (1) (pulse terminology) A finite sequence of pulse waveforms. (IM/WM&A) 194-1977w

(2) A sequence of closely spaced pulses. *Note:* Pulse bursts are usually generated coherently and batch-processed for Doppler resolution, and often have a total burst duration much less than the radar echo delay time. (AES) 686-1997

pulse burst base envelope (pulse terminology) Unless otherwise specified, the waveform defined by a cubic natural spline with knots at (A) that point of intersection of the pulse burst top envelope and the pulse burst waveform which precedes the first pulse waveform in a pulse burst, (B) each point of intersection of the base center line and the baseline between adjacent pulse waveforms in a pulse burst, and (C) that point of intersection of the pulse burst top envelope and the pulse burst waveform which follows the last pulse waveform in a pulse burst. *See also:* knot. (IM/WM&A) 194-1977w

pulse burst time-related definitions (A) (pulse terminology) (pulse burst duration) The interval between the pulse start time of the first pulse waveform and the pulse stop time of the last pulse waveform in a pulse burst. **(B) (pulse terminology)** (pulse burst separation) The interval between the pulse stop time of the last pulse waveform in a pulse burst and the pulse start time of the first pulse waveform of the immediately following pulse burst. **(C) (pulse terminology)** (pulse burst repetition period) The interval between the pulse start time of the first pulse waveform in a pulse burst and the pulse start time of the first pulse waveform in the immediately following pulse burst in a sequence of periodic pulse bursts. **(D) (pulse terminology)** (pulse burst reception frequency) The reciprocal of burst repetition period. (IM/WM&A) 194-1977

pulse burst top envelope (pulse terminology) Unless otherwise specified, the waveform defined by a cubic natural spline with knots at: the first transition mesial point of the first pulse waveform in a pulse burst; each point of intersection of the top centerline and the topline of each pulse waveform in a pulse burst; and the last transition mesial point of the last pulse waveform in a pulse burst. *See also:* knot. (IM/WM&A) 194-1977w

pulse capacity (metering) The number of pulses per demand interval that a pulse receiver can accept and register without loss. (ELM) C12.1-1988

pulse capture (accelerometer) (gyros) A technique that uses discrete quanta of torque-time (force-time) area to generate a restoring torque (force). (AES/GYAC) 528-1994

pulse carrier (1) A carrier consisting of a series of pulses. *Note:* Usually, pulse carriers are employed as subcarriers. *See also:* carrier. (IM/AP/WM&A/ANT) 194-1977w, 145-1983s

(2) A series of identical pulses intended for modulation. (C) 610.7-1995

pulse, carrier-frequency *See:* carrier-frequency pulse.

pulse code (A) A pulse train modulated so as to represent information. **(B)** Loosely, a code consisting of pulses, such as Morse code, Baudot code, binary code. *See also:* pulse. (IM/WM&A/HFIM) 194-1977, [40]

pulse code modulation (1) (data transmission) The type of pulse modulation where the magnitude of the signal is sampled and each sample is approximated to a nearest reference level (this process is called quantizing). Then a code, which represents the reference level, is transmitted to the distant location. The figure above is an example of one form of PCM which has eight reference levels. It can be seen that a straight binary code would require a group of three pulses to be transmitted for each sample. The main advantage of PCM is the fact that at the receiving end only the presence or absence of a pulse must be detected. (Std100) [123]

(2) (pulse terminology) A modulation process involving the conversion of a waveform from analog to digital form by means of coding. *Notes:* 1. This is a generic term, and additional specification is required for a specific purpose. 2. The term is commonly used to signify that form of pulse modulation in which a code is used to represent quantized values of instantaneous samples of the signal wave. (IM/WM&A) 194-1977w, 270-1964w

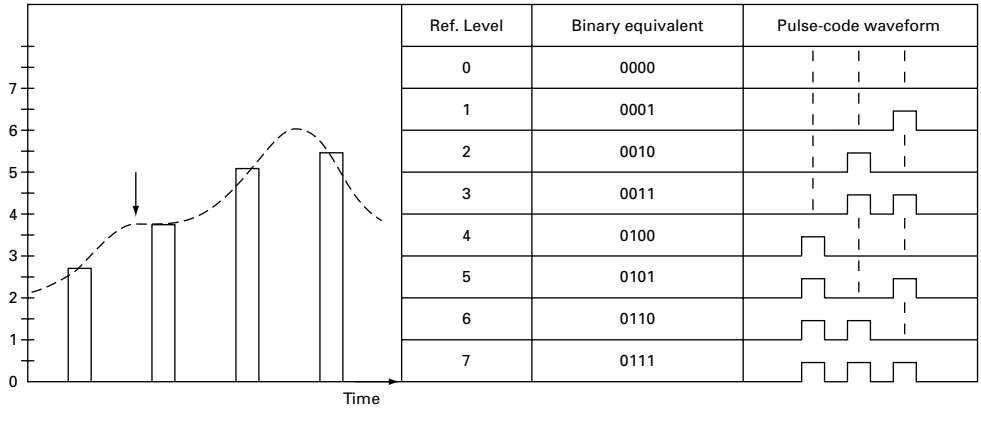
(3) A modulation technique in which an analog signal is converted to a bit stream for transmission. (C) 610.7-1995

pulse coder (navigation aid terms) A device for varying one or more of the characteristics of a pulse or of a pulse train so as to transmit information. (AES/RS/GCS) 686-1990, 172-1983w

pulse coincidence (noncoincidence) (pulse terminology) The occurrence (lack of occurrence) of two or more pulse waveforms in different waveforms either essentially simultaneously or for a specified interval. (IM/WM&A) 194-1977w

pulse coincidence (noncoincidence) duration (pulse terminology) The interval between specified points on two or more pulse waveforms in different waveforms during which pulse coincidence (noncoincidence) exists. (IM/WM&A) 194-1977w

pulse compression A method for obtaining the resolution of a short pulse with the energy of a long pulse of width T by internally modulating the phase or frequency of a long pulse so as to increase its bandwidth $B >> 1/T$, and using a



A form of pulse code modulation

pulse code modulation

matched filter (also called a pulse compression filter) on reception to compress the pulse of width T to a width of approximately $1/B$. Used to obtain high range resolution when peak-power limited. *See also:* chirp; coded pulse; Costas code. (AES) 686-1997

pulse control (rotating electric machinery) Means by which the voltage applied to a machine circuit departs from being essentially constant if unidirectional, or from being essentially sinusoidal if alternating. Pulse-control devices include, but are not limited to, choppers, inverters, and rectifiers. (PE/EM) 11-1980r

pulse corner (pulse waveform feature) A continuous pulse waveform feature of specified extent which includes a region of maximum curvature or a point of discontinuity in the waveform slope. (PE/PSR) [6]

pulse corrector (telephone switching systems) Equipment to reestablish, within predetermined limits, the make/break ratio of dial pulses. (COM) 312-1977w

pulse count (control of system electromagnetic compatibility) The number of pulses in some specified time interval. C63.12-1984

pulse-count deviation (metering) The difference between the number of recorded pulses and the number of pulses supplied to the input of terminals of a pulse recorder (true count), expressed as a percentage of the true count. Pulse-count deviation is applicable to each data channel of a pulse recorder. (ELM) C12.1-1988

pulse counter (pulse techniques) A device that indicates or records the total number of pulses that it has received during a time interval. *See also:* pulse. (NPS) 398-1972r

pulsed-Doppler radar A Doppler radar that uses pulsed transmissions. *Synonym:* pulse-Doppler radar. (AES/GCS) 686-1997, 172-1983w

pulse decay time (1) (germanium gamma-ray detectors) (x-ray energy spectrometers) The interval between the instants at which the instantaneous value last reaches specified upper and lower limits, namely, 90% and 10% of the peak pulse value unless otherwise stated. (In the case of a step function applied to an amplifier that has simple capacitance-resistance to resistance-capacitance (CR-RC) shaping, the decay time is given by $t_d = 3.36CR$.) (NPS/NID) 325-1986s, 301-1976s, 759-1984r

(2) (t_f) (pulse fall time) (light-emitting diodes) The interval between the instants at which the instantaneous amplitude last reaches specified upper and lower limits, namely, 90% and 10% of the peak pulse amplitude unless otherwise stated. *See also:* pulse. (NPS/BT/ED/AV/NID) 325-1971w, [34], 300-1982s, [127], 301-1976s

(3) (data transmission) The interval of time required for the trailing edge of a pulse to decay from 90% to 10% of the peak-pulse amplitude. (PE) 599-1985w

(4) (laser maser) The time duration of a laser pulse; usually measured as the time interval between the half-power points on the leading and trailing edges of the pulse. (LEO) 586-1980w

(5) (radar) *See also:* pulse width. (AES/RS) 686-1982s

pulse decoder (navigation aid terms) A device for extracting information from a pulse-coded signal. *Synonym:* constant-delay discriminator. (AES/RS/GCS) 686-1990, 172-1983w

pulse delay (transducer) The interval of time between a specified point on the input pulse and a specified point on the related output pulse. *Notes:* 1. This is a general term which applies to the pulse delay in any transducer, such as receiver, transmitter, amplifier, oscillator, etcetera. 2. Specifications may require illustrations. *See also:* transducer. (IM/PE/WM&A) 194-1977w, 599-1985w

pulse delay time (light-emitting diodes) The interval between the instants at which the instantaneous amplitudes of the input pulse and output pulses first reach a specified fraction of their peak pulse amplitudes, namely, 10%. (ED) [127]

pulse delay, transducer *See:* pulse delay.

pulse delay, transmitter *See:* pulse delay.

pulse density violation A violation that occurs if a signal contains more than a specified number of zeros, or the density of ones is less than specified. (COM/TA) 1007-1991r

pulse device (for electricity metering) The functional unit for initiating, transmitting, retransmitting, or receiving electric pulses, representing finite quantities, such as energy, normally transmitted from some form of electricity meter to a receiver unit. (ELM) C12.1-1988

pulse distortion (pulse techniques) The unwanted deviation of a pulse waveform from a reference waveform. *Note:* Some specific forms of pulse distortion have specific names. They include, but are not exclusive to, the following: overshoot, ringing, preshoot, tilt (droop), rounding (undershoot and dribble-up), glitch, bump, spike, and backswing. For further explanation of the forms of pulse distortion, see the following illustrations and IEEE Standard 194 (1977). *See also:* pulse. (IM/WM&A) 194-1977w

pulsed laser (laser maser) A laser that delivers its energy in the form of a single pulse or train of pulses. The duration of a pulse ≤ 0.25 s. (LEO) 586-1980w

pulse-Doppler radar *See:* pulsed-Doppler radar.

pulsed optical feedback preamplifier An integrating preamplifier in which the charge that accumulates on the feedback capacitor is periodically reset by a pulse of light incident on a photosensitive element, such as the gate of the n-p junction of the input FET. (NPS) 325-1996

pulsed oscillator An oscillator that is made to operate during recurrent intervals by self-generated or externally applied pulses. *See also:* oscillatory circuit. (AP/ANT) 145-1983s

pulsed-oscillator starting time The interval between the leading-edge pulse time of the pulse at the oscillator control terminals and the leading-edge pulse time of the related output pulse. (IM/WM&A) 194-1977w

pulse droop (television) A distortion of an otherwise essentially flat-topped rectangular pulse characterized by a decline of the pulse top. *See also:* television. (IM/WM&A) 194-1977w

pulse duration (1) (fiber optics) The time between a specified reference point on the first transition of a pulse waveform and a similarly specified point on the last transition. The time between the 10%, 50%, or 1/e points is commonly used, as is the root-mean-square (rms) pulse duration. *See also:* root-mean-square pulse duration. (Std100) 812-1984w

(2) (loosely) The duration of a rectangular pulse whose energy and peak power equal those of the pulse in question. *Note:* When determining the peak power, any transients of relatively short duration are frequently ignored. *See also:* phase modulation; pulse. (AP/PE/ANT) 145-1983s, 599-1985w

(3) (laser maser) The time duration of a laser pulse; usually measured as the time interval between the half-power points on the leading and trailing edges of the pulse. (LEO) 586-1980w

(4) (radiation counters) (telecommunications) (television) The time interval between the first and last instants at which the instantaneous amplitude reaches a stated fraction of the peak pulse amplitude. *See also:* signal; pulse. (BT/NPS/PE/AV) [34], 398-1972r, 599-1985w

(5) (pulse terminology) The duration between pulse start time and pulse stop time. *See also:* waveform epoch. (IM/WM&A) 194-1977w

(6) (charged-particle detectors) (of an amplifier output pulse) The width of a pulse measured between the first and last transitions at designated levels. (NPS) 300-1988r

(7) (pulse transformers) (90%) (t_p) The time interval between the instants at which the instantaneous value reaches 90% of A_M on the leading edge and 90% of A_T on the trailing edge. *Notes:* 1. Often the input pulse tilt (droop) is only a few percentages, and in those cases pulse duration may be considered as the time interval between the first and last instants at which the instantaneous value reaches 90% of A_M. 2. Pulse duration may be specified at a value other than 90% A_M and A_T in special cases. (PEL/ET) 390-1987r

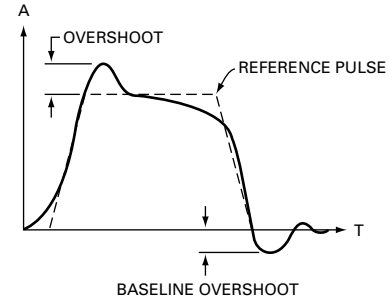
(8) (at the baseline) The width of a pulse measured close to the baseline, typically at 1% of the peak height (t.01). (NPS) 325-1996

(9) *See also:* pulse width. (AES) 686-1997

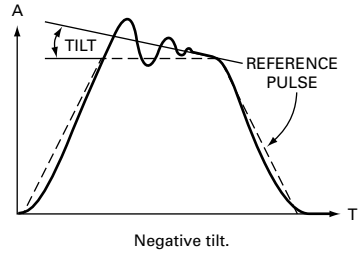
pulse-duration discriminator A circuit in which the output is a function of the deviation of the input pulse duration from a reference. (AES/RS) 686-1990

pulse-duration distribution (electromagnetic site survey) The fraction of pulse duration at level vithat exceeds time *T*. *See also:* average crossing rate. (EMC) 473-1985r

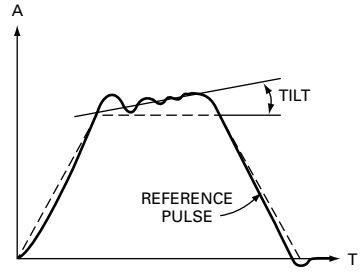
pulse-duration modulation (1) (pulse terminology) Pulse-time modulation in which the value of each instantaneous sample of the modulating wave is caused to modulate the duration of a pulse. *Notes:* 1. The deprecated terms pulsew-



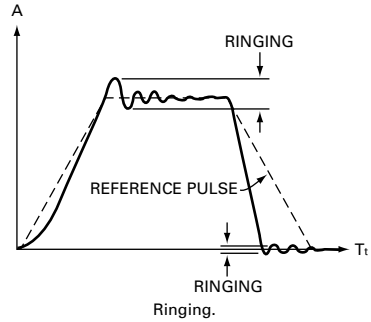
Overshoot.



Negative tilt.

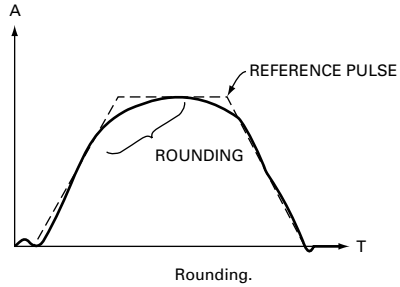


Positive tilt.

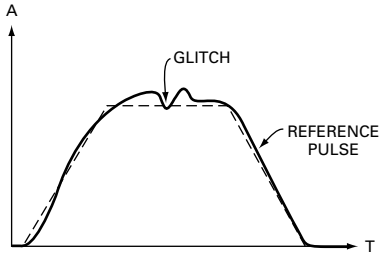


Ringing.

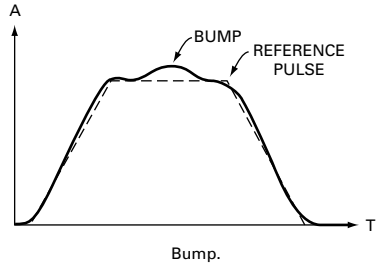
distortion, short-time waveform



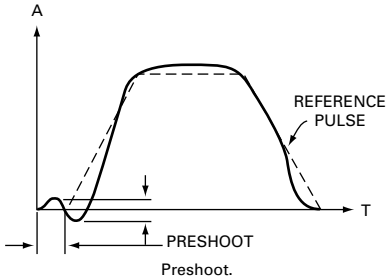
Rounding.



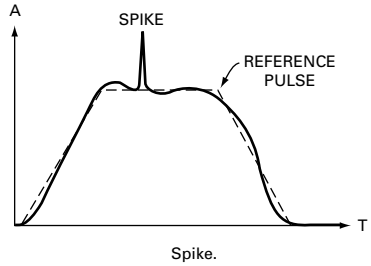
Glitch.



Bump.



Preshoot.



Spike.

idth modulation and pulse-length modulation also have been used to designate this system of modulation. 2. In pulse-duration modulation, the modulating wave may vary the time of occurrence of the leading edge, the trailing edge, or both edges of the pulse.
(IM/AP/WM&A/ANT) 194-1977w, 145-1983s

(2) *See also:* pulse-width modulation.

pulse-duration-modulation torquing (accelerometer) (gyros) A torquing mechanization that provides current to a sensor torquer of fixed amplitude but variable pulse duration proportional to input. The duration may be quantized to enable digital interpretation and readout. (AES/GYAC) 528-1994

pulse-duration telemetering (electric power system) (pulse-width modulation) A type of telemetering in which the duration of each transmitted pulse is varied as a function of the magnitude of the measured quantity. *See also:* telemetering.
(PE/PSE) 94-1970w

pulse-duration time (t_p) (light-emitting diodes) The time interval between the first and last instants at which the instantaneous amplitude reaches a stated fraction of the peak pulse amplitude, namely, 90%. (ED) [127]

pulse duty factor (light-emitting diodes) The ratio of the average pulse duration to the average pulse spacing. *Note:* This is equivalent to the product of the average pulse duration and the pulse-repetition rate. (IM/WM&A) 194-1977w

pulse energy (pulse terminology) The energy transferred or transformed by a pulse(s). Unless otherwise specified by a mathematical adjective, the total energy over a specified interval is assumed. *See also:* mathematical adjectives.
(IM/WM&A) 194-1977w

pulse expander/pulse compressor An expander device spreads the input energy from a relatively narrow pulse over a relatively large interval of time. The compressor acts as a matched conjugate filter that recompresses the energy spread by the expander into a relatively small interval of time (mainlobe) accompanied by a certain level of time sidelobes.
(UFFC) 1037-1992w

pulse fall time (A) (photomultipliers for scintillation counting) The interval between the instants at which the instantaneous amplitude last reaches specified upper and lower limits, namely, 90% and 10% of the peak pulse amplitude unless otherwise stated. **(B) (charged-particle detectors)** The interval between the instants at which the instantaneous value last reaches specified upper and lower limits, namely, 90% and 10% of the peak pulse value unless otherwise stated. (In the case of a step function applied to an amplifier that has simple capacitance-resistance to resistance-capacitance (CR-RC) shaping, the fall time is given by $t_f = 3.36$ CR.)
(NPS) 398-1972, 300-1982

pulse-forming line A passive electric circuit in a radar modulator whose propagation delay determines the length of the modulation pulse. (AES) 686-1997

pulse frequency modulation (data transmission) (pulse terminology) A form of pulse-time modulation in which the pulse-repetition rate is the characteristic varied. *Note:* A more precise term for pulse-frequency modulation would be "pulse-repetition-rate modulation."
(IM/PE/WM&A) 194-1977w, 599-1985w

pulse frequency modulation telemetry (communication satellite) A telemetry system where the information is coded according to subcarrier frequency, pulse duration and pulse repetition rate. Often used for satellite telemetry.
(COM) [24]

pulse, Gaussian *See:* Gaussian pulse.

pulse-height analyzer (1) (radiation counters) An instrument capable of indicating the number or rate of occurrence of pulses falling within each of one or more specified amplitude ranges. *See also:* pulse. (NPS) 398-1972r

(2) (radiation counters) A circuit that produces an output signal if it receives an input pulse whose amplitude falls between upper and lower assigned values. (NI) N42.15-1990

pulse-height analyzer, multichannel A circuit that accepts all input pulses and assigns each pulse to a memory location corresponding to its amplitude. (NI) N42.15-1990

pulse-height discriminator (1) (liquid-scintillation counting) A circuit that produces an output signal if it receives an input pulse whose amplitude exceeds an assigned value.
(NI) N42.15-1980s

(2) (pulse techniques) A circuit that produces a specified output pulse if and only if it receives an input pulse whose amplitude exceeds an assigned value. *See also:* pulse.
(NPS) 175-1960w

(3) A circuit that responds to pulses above a designated amplitude and generates a pulse to feed into a counting circuit but that does not respond to lower amplitude pulses.
(NI/NPS) 309-1999

pulse height radiation *See:* pulse-height resolution.

pulse-height resolution The measured FWHM, after ambient background subtraction, of a gamma-ray peak distribution, expressed as a percentage of the pulse height corresponding to the centroid of the distribution. (NI) N42.12-1994

pulse-height resolution constant, electron (photomultipliers) The product of the square of the electron (photomultiplier) pulse-height resolution expressed as the fractional full width at half maximum (FWHM/A_1), and the mean number of electrons per pulse from the photocathode. *See also:* phototube.
(NPS) 175-1960w

pulse-height resolution, electron (photomultipliers) A measure of the smallest change in the number of electrons in a pulse from the photocathode that can be discerned as a change in height of the output pulse. Quanitatively, it is the fractional standard deviation (σ/A_1) of the pulse-height distribution curve for output pulses resulting from a specified number of electrons per pulse from the photocathode. *Note:* The fractional full width at half maximum of the pulse-height distribution curve (FWHM/A_1) is frequently used as a measure of this resolution, where A_1 is the pulse height corresponding to the maximum of the distribution curve. *See also:* pulse.
(NPS) 398-1972r

pulse-height selector (pulse techniques) A circuit that produces a specified output pulse when and only when it receives an input pulse whose amplitude lies between two assigned values. *See also:* pulse. (NPS) 175-1960w

pulse initiator (metering) Any device, mechanical or electrical, used with a meter to initiate pulses, the number of which are proportional to the quantity being measured. It may include an external amplifier or auxiliary relay or both.
(ELM) C12.1-1988

pulse-initiator coupling ratio (metering) The number of revolutions of the pulse-initiating shaft for each output pulse.
(ELM) C12.1-1988

pulse-initiator gear ratio (metering) The ratio of meter rotor revolutions to revolutions of the pulse-initiating shaft.
(ELM) C12.1-1988

pulse-initiator output constant (metering) The value of the measured quantity for each outgoing pulse of a pulse initiator, expressed in kilowatt hours per pulse, kilovarhours per pulse, or other suitable units. (ELM) C12.1-1988

pulse-initiator output ratio (metering) The number of revolutions of the meter rotor per output pulse of the pulse initiator. (ELM) C12.1-1988

pulse-initiator ratio (metering) The ratio of revolutions of the first gear of the pulse initiator to revolutions of the pulse-initiating shaft. (ELM) C12.1-1988

pulse-initiator shaft reduction (metering) The ratio of revolutions of the meter rotor to the revolutions of the first gear of the pulse initiator. (ELM) C12.1-1988

pulse interleaving A process in which pulses from two or more sources are combined in time-division multiplex for transmission over a common path. (IM/WM&A) 194-1977w

pulse interrogation The triggering of a transponder by a pulse or pulse mode. *Note:* Interrogations by means of pulse modes

may be employed to trigger a particular transponder or group of transponders. (IM/WM&A) 194-1977w

pulse interval *See:* pulse spacing.

pulse-interval modulation A form of pulse-time modulation in which the pulse spacing is varied. (IM/WM&A) 194-1977w

pulse jitter A relatively small variation of the pulse spacing in a pulse train. *Note:* The jitter may be random or systematic, depending on its origin, and is generally not coherent with any pulse modulation imposed. (IM/WM&A) 194-1977w

pulse length (fiber optics) Often erroneously used as a synonym for pulse duration. (Std100) 812-1984w

pulse-length modulation *See:* pulse-duration modulation.

pulse measurement The assignment of a number and a unit of measurement to a characteristic, property, or attribute of a pulse wherein the number and unit assigned indicate the magnitude of the characteristic which is associated with the pulse. Typically, this assignment is accomplished by comparison of a transform of the pulse, its pulse waveform, with a scale or reference which is calibrated in the unit of measurement. *See also:* method of pulse measurement. (IM/WM&A) 181-1977w

pulse measurement process A realization of a method of pulse measurement in terms of specific devices, apparatus, instruments, auxiliary equipment, conditions, operators, and observers. *See also:* method of pulse measurement. (IM/WM&A) 181-1977w

pulse mode (A) A finite sequence of pulses in a prearranged pattern used for selecting and isolating a communication channel. **(B)** The prearranged pattern. (IM/WM&A) 194-1977

pulse mode, spurious *See:* spurious pulse mode.

pulse modulated field An electromagnetic field produced by the amplitude modulation of a continuous wave carrier by one or more pulses. (NIR) C95.1-1999

pulse modulation (1) (continuous-wave) Modulation of one or more characteristics of a pulse carrier. *Note:* In this sense, the term is used to describe methods of transmitting information on a pulse carrier. (IT) [7]

(2) The encoding of information by varying the basic characteristics of a sequence of pulses, such as width, duration, amplitude, phase or the number of pulses. *See also:* pulse amplitude modulation; pulse code modulation; pulse position modulation. (C) 610.7-1995, 610.10-1994w

pulse modulation, width *See:* pulse-duration modulation.

pulse modulator A device that applies pulses to the element in which modulation takes place. *See also:* modulation. (AP/ANT) 145-1983s

pulse number (1) (circuit properties) (self-commutated converters) (of a group of principal branches or of a complete converter) The number of nonsimultaneous commutations from one principal branch to another during one cycle of operation, considering the group or the complete converter, respectively. (IA/SPC) 936-1987w

(2) The total number of successive nonsimultaneous commutations occurring within the converter circuit during each cycle when operating without phase control. It is also equal to the order of the principal harmonic in the direct voltage, that is, the number of pulses present in the dc output voltage in one cycle of the supply voltage. (IA/SPC) 519-1992

pulse operation The method of operation in which the energy is delivered in pulses. *Note:* Pulse operation is usually described in terms of the pulse shape, the pulse duration, and the pulse-recurrence frequency. *See also:* pulse. (PE) 599-1985w

pulse packet The volume of space occupied by a single radar pulse. The dimensions of this volume are determined by the angular width of the beam, the duration of the pulse, and the distance from the antenna. (AES/RS) 686-1990

pulse-pair resolution (photomultipliers) The time interval between two equal-amplitude delta-function optical pulses such that the valley between the two corresponding anode pulses falls to fifty percent of the peak amplitude. (NPS) 398-1972r

pulse period (1) (measuring the performance of tone address signaling systems) When sending a sequence of signals, the time interval from the start of one signal present condition to the start of the next signal present condition. *Synonym:* cycle time. (COM/TA) 752-1986w

(2) (dial-pulse address signaling systems) (telephony) The time from the start of one break interval of a dial pulse in a train until the start of the next break interval. Milliseconds is the preferred unit of time to express the duration of the pulse period. (COM/TA) 753-1983w

pulse permeability (magnetic core testing) The value of amplitude permeability when the rate of change of induction (that is, the exciting voltage) is held substantially constant over a period of time during each cycle. The frequency, amplitude, duration of the exciting voltage, and the time interval for which the permeability is measured must be stated

$$\mu_\pi = \frac{1}{\mu_0}\frac{\Delta B}{\Delta H}$$

where

μ_π = pulse permeability, relative
ΔB = change in induction during the stated time interval
ΔH = associated change in magnetic field strength.

Note: When pulse permeability is to be related to a specific circuit condition, a second subscript may be used; for example, $\mu_{\pi a}$ would represent the relative amplitude permeability determined under pulsed excitation. (MAG) 393-1977s

pulse pileup Occurrence of two successive pulses closely associated in time but from separate decays such that they contribute to each other's pulse height and shape. Usually, the system processes the two inputs as a composite single pulse, which is stored in a spectral channel different from that at which either of the component pulses would have been stored. Pulse pileup is a function of the square of the counting rate and of the amplifier pulse width. *Synonym:* random summing. (NI) N42.14-1991

pulse position modulation (PPM) (1) (data transmission) (pulse-phase modulation) Pulse-time modulation in which the value of each instantaneous sample of a modulating wave is caused to modulate the position in time of a pulse. (AP/PE/ANT) 145-1983s, 599-1985w

(2) A form of pulse modulation in which the position in time of a pulse is varied, without modifying the pulse duration, to convey information. (C) 610.7-1995

pulse power (pulse terminology) The power transferred or transformed by a pulse(s). Unless otherwise specified by a mathematical adjective average power over a specified interval is assumed. *See also:* mathematical adjectives. (IM/WM&A) 194-1977w

pulse power, carrier-frequency peak *See:* peak pulse power, carrier-frequency.

pulse quadrant (pulse waveform feature) One of the four continuous and contiguous waveform features of specified extent that include a region of maximum curvature or a point of discontinuity in the waveform slope. (PE/PSR) [6]

pulse, radio-frequency *See:* radio-frequency pulse.

pulse rate (watthour meter) The number of pulses per demand interval at which a pulse device is nominally rated. *See also:* pulse-repetition frequency; auxiliary device to an instrument. (ELM) C12.1-1982s

pulse rate—maximum The number of pulses per second at which a pulse device is nominally rated. (ELM) C12.1-1988

pulse rate telemetering (electric power system) A type of telemetering in which the number of unidirectional pulses per unit time is varied as a function of the magnitude of the

measured quantity. *See also:* telemetering. (PE/PSE) 94-1970w

pulse ratio (dial-pulse address signaling systems) (telephony) The percentage of the total dial-pulse period during which the circuit is in each of the two interval states. This ratio is customarily expressed as % break (preferred) of % make. (COM/TA) 753-1983w

pulse rebalance *See:* pulse capture.

pulse receiver (metering) The unit that receives and registers the pulses. It may include a periodic resetting mechanism, so that a reading proportional to demand may be obtained. (ELM) C12.1-1988

pulse recorder (metering) A device that receives and records pulses over a given demand interval. *Note:* It may record pulses in a machine-translatable form on magnetic tape, paper tape, or other suitable media. (ELM) C12.1-1988

pulse-recorder channel (metering) A means of conveying information. It consists of an individual input, output, and intervening circuitry required to record pulse data on the recording media. (ELM) C12.1-1988

pulse regeneration (data transmission) The process of restoring a series of pulses to their original timing, form, and relative magnitude. (PE) 599-1985w

pulse relay—totalizing A device used to receive and totalize pulses from two or more sources for proportional transmission to another totalizing relay or to a receiver. (ELM) C12.1-1988

pulse repeater (transponder) A device used for receiving pulses from one circuit and transmitting corresponding pulses into another circuit. It may also change the frequency and waveforms of the pulses and perform other functions. *See also:* pulse; repeater. (AP/ANT) 145-1983s

pulse-repetition frequency (PRF) (1) High prf = more than 1 Hz. (LEO) 586-1980w **(2)** The number of pulses per unit time of a periodic pulse train or the reciprocal of the pulse period. *Note:* This term also includes the average number of pulses per unit time of aperiodic pulse trains where the periods are of random duration. *See also:* pulse. (IM/HFIM) [40] **(3)** The number of pulses per unit of time, usually per second. *Synonym:* pulse-repetition rate. (AES) 686-1997

pulse-repetition frequency stagger The technique of varying the time between pulses of a pulse radar. This is useful in compensating for blind speeds in pulsed moving-target indication (MTI) radars. (AES) 686-1997

pulse-repetition interval (PRI) The time duration between successive pulses. *Note:* PRI is the reciprocal of the pulse-repetition frequency (PRF). *Synonym:* pulse-repetition period. (AES) 686-1997

pulse-repetition period *See:* pulse-repetition interval.

pulse-repetition rate *See:* pulse-repetition frequency.

pulse reply The transmission of a pulse or pulse mode by a transponder as the result of an interrogation. (IM/WM&A) 194-1977w

pulse response characteristics (pulse response curve) The relationship between the indication of a quasi-peak voltmeter and the repetition rate of regularly repeated pulses of constant amplitude. *See also:* electromagnetic compatibility. (EMC/INT) [53], [70]

pulse rise time (1) (germanium gamma-ray detectors) (charged-particle detectors) (x-ray energy spectrometers) The interval between the instants at which the instantaneous value first reaches specified lower and upper limits, namely, 10% and 90% of the peak pulse value unless otherwise specified. (In the case of a step function applied to an RC (resistance-capacitance) low-pass filter, the rise time is given by t_r = 2.2 RC. In the case of a step function applied to an amplifier that has simple CR-RC (capacitance-resistance to resistance-capacitance) shaping, that is, one high-pass and one low-pass RC filter of equal time constants, the rise time is given by t_r = 0.57 RC). (NPS/NID) 325-1986s, 759-1984r, 301-1976s, 300-1982s **(2) (data transmission)** The interval between the instants at which the instantaneous amplitude first reaches specified lower and upper limits, namely 10% and 90% of the peak-pulse amplitude unless otherwise stated. (PE) 599-1985w

pulse scaler (pulse techniques) A device that produces an output signal whenever a prescribed number of input pulses has been received. It frequently includes indicating devices for interpolation. *See also:* pulse. (NPS) 175-1960w

pulse separation (pulse terminology) The interval between the trailing-edge pulse time of one pulse and the leading-edge pulse time of the succeeding pulse. *See also:* leading-edge pulse time; trailing-edge pulse time; pulse. (IM/WM&A) 194-1977w

pulses, equalizing *See:* equalizing pulses.

pulse shape (A) (pulse terminology) For descriptive purposes a pulse waveform may be imprecisely described by any of the adjectives, or combinations thereof, in descriptive adjectives, major (minor); polarity related adjectives; geometrical adjectives; and functional adjectives, exponential. **(B) (pulse terminology)** For tutorial purposes a hypothetical pulse waveform may be precisely defined by the further addition of the adjective ideal. *See also:* descriptive adjectives. **(C) (pulse terminology)** For measurement or comparison purposes a pulse waveform may be precisely defined by the further addition of the adjective reference. *See also:* descriptive adjectives. (IM/WM&A) 194-1977

pulse shaper (pulse techniques) Any transducer used for changing one or more characteristics of a pulse. *Note:* This term includes pulse regenerators. *See also:* pulse. (IM/WM&A) 194-1977w

pulse shaping Intentionally changing the shape of a pulse. (IM/WM&A) 194-1977w

pulse spacing (pulse interval) The interval between the corresponding pulse times of two consecutive pulses. *Note:* The term pulse interval is deprecated because it may be taken to mean the duration of the pulse instead of the space or interval from one pulse to the next. Neither term means the space between pulses. (IM/WM&A) 194-1977w

pulse spacing distribution (electromagnetic site survey) The fraction of pulse spacing time at level v_1 that exceeds time T. *See also:* average crossing rate. (EMC) 473-1985r

pulse spectrum (signal-transmission system) The frequency distribution of the sinusoidal components of the pulse in relative amplitude and in relative phase. *See also:* signal. (IM/WM&A) 194-1977w

pulse speed (telephony) (dial-pulse address signaling systems) The number of dial pulses occurring per unit of time per unit of time. Pulses per second (pls/s) is the preferred unit to express pulse speed. (COM/TA) 753-1983w

pulse spike (automatic control) An unwanted pulse of relatively short duration, superimposed on the main pulse. *See also:* spike. (PE/EDPG) [3]

pulse start time (pulse terminology) The instant specified by a magnitude referenced point on the first transition of a pulse waveform. Unless otherwise specified, the pulse start time is at the mesial point on the first transition. *See also:* waveform epoch; pulse stop time. (IM/WM&A) 194-1977w

pulse stop time (pulse terminology) The instant specified by a magnitude referenced point on the last transition of a pulse waveform. Unless otherwise specified, the pulse stop time is at the mesial point on the last transition. *See also:* waveform epoch; pulse start time. (IM/WM&A) 194-1977w

pulse storage time (light-emitting diodes) The interval between the instants at which the instantaneous amplitudes of the input and output pulses last reach a specified fraction of their peak pulse amplitudes, namely, 90 percent. (ED) [127]

pulse stretcher (spectrum analyzer) A pulse shaper that produces an output whose duration is greater than that of the input pulse and whose amplitude is proportional to that of the peak amplitude of that input pulse. (NPS/IM) 398-1972r, 748-1979w

pulse string *See:* pulse train.

pulse stuffing A method in which pulses are inserted into a stream of pulses to achieve synchronization between two digital communications systems. (C) 610.7-1995

pulse techniques *See:* burst.

pulse tilt A distortion in an otherwise essentially flat-topped rectangular pulse characterized by either a decline or a rise of the pulse top. *See also:* television. (IM/BT/WM&A/AV) 194-1977w, [34]

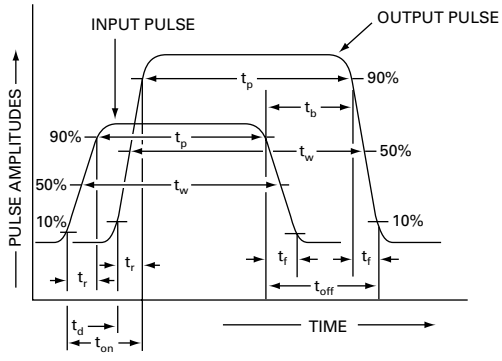
pulse time, leading edge *See:* leading-edge pulse time.

pulse time, mean *See:* mean pulse time.

pulse-time modulation (PTM) (pulse terminology) (data transmission) Modulation in which the value of instantaneous samples of the modulating wave are caused to modulate the time of occurrence of some characteristic of a pulse carrier. *Note:* Pulse-duration modulation, pulse-position modulation, and pulse-interval modulation, are particular forms of pulse-time modulation. (IM/PE/AP/WM&A/ANT) 194-1977w, 599-1985w, 145-1983s

pulse-time reference points (A) (pulse terminology) (top center point). A specified time referenced point or magnitude referenced point on a pulse waveform top. If no point is specified, the top center point is the time referenced point at the intersection of a pulse waveform and the top center line. *See also:* waveform epoch. **(B) (pulse terminology)** [first (last) base point]. Unless otherwise specified, the first (last) datum point in a pulse epoch. *See also:* pulse train time-related definitions; waveform epoch. (IM/WM&A) 194-1977

pulse time symbology See figure below.



pulse-time symbology

pulse-time, trailing-edge *See:* trailing-edge pulse time.

pulse timing of video pulses (television) The determination of an occurrence of a pulse or a specified portion thereof at a particular time. *See also:* time of rise of video pulses; television; pulse width of video pulses. (BT) 207-1950w

pulse top (1) (pulse transformers) That portion of the pulse occurring between the time of intersection of straight-line segments used to determine A_T and A_T. (PEL/ET) 390-1987r

(2) That major segment of a pulse waveform having the greater displacement in amplitude from the baseline. *See also:* pulse. (IM/HFIM) [40]

pulse trailing edge The major transition towards the pulse baseline occuring before a reference time. *See also:* pulse. (IM/HFIM) [40]

pulse train (1) (dial-pulse address signaling systems) (telephony) In dial-pulse signaling, a series of contiguous pulses of undetermined length. (COM/TA) 753-1983w

(2) (pulse terminology) A continuous repetitive sequence of pulse waveforms. (IM/WM&A) 194-1977w

(3) (thyristor) A gate signal applied during the desired conducting interval, or parts thereof, made up of a train of pulses of predetermined duration, amplitude, and frequency. (IA/IPC) 428-1981w

(4) (signal-transmission system) A sequence of pulses. *See also:* signal; pulse. (BT/IE/PE/IA/ICTL/AV/EDPG/IAC) [34], 270-1966w, [43], [3], [60]

(5) A series of pulses with similar characteristics. *Synonym:* pulse string. (C) 610.7-1995

(6) A sequence of pulses at the pulse repetition frequency used to accomplish a function such as moving-target indication (MTI) or increased effective signal-to-noise ratio. *Note:* A pulse train of duration less than the radar echo delay time is usually referred to as a pulse burst. *See also:* pulse burst. (AES) 686-1997

pulse train, periodic *See:* periodic pulse train.

pulse-train spectrum (pulse-train frequency-spectrum) The frequency distribution of the sinusoidal components of the pulse train in amplitude and in phase angle. (IM/WM&A) 194-1977w

pulse train time-related definitions (A) (pulse terminology) (pulse repetition period) The interval between the pulse start time of a first pulse waveform and the pulse start time of the immediately following pulse waveform in a periodic pulse train. **(B) (pulse terminology)** (pulse repetition frequency) The reciprocal of pulse repetition period. **(C) (pulse terminology)** (pulse separation) The interval between the pulse stop time of a first pulse waveform and the pulse start time of the immediately following pulse waveform in a pulse train. **(D) (pulse terminology)** (duty factor) Unless otherwise specified, the ratio of the pulse waveform duration to the pulse repetition period of a periodic pulse train. **(E) (pulse terminology)** (on-off ratio) Unless otherwise specified, the ratio of the pulse waveform duration to the pulse separation of a periodic pulse train. **(F) (pulse terminology)** (base center line) The time reference line at the average of the pulse stop time of a first pulse waveform and the pulse start time of the immediately following pulse waveform in a pulse train. **(G) (pulse terminology)** (base center point) A specified time referenced point or magnitude referenced point on a pulse train waveform base. If no point is specified, the base center point is the time referenced point at the intersection of a pulse train waveform base and a base center line. **(H) (pulse terminology)** (pulse train epoch) The span of time in a pulse train for which waveform data are known or knowable and which extends from a first base center point to the immediately following base center point. (IM/WM&A) 194-1977

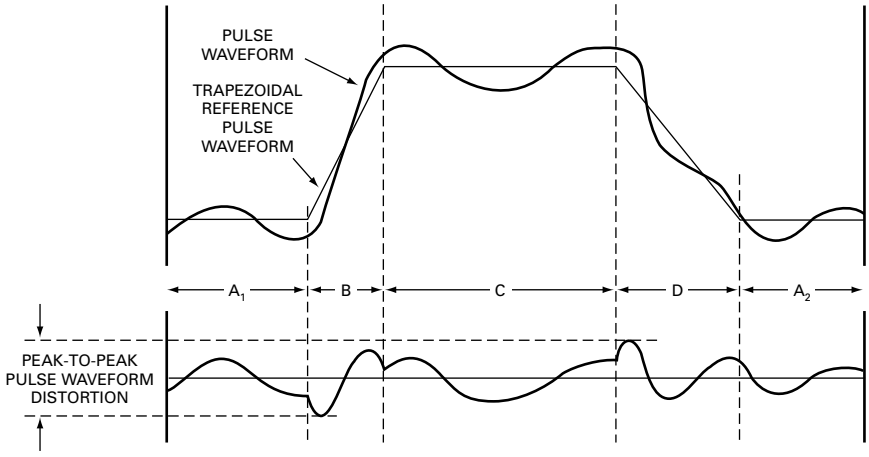
pulse-train top (base) envelope (pulse terminology) Unless otherwise specified, the waveform defined by a cubic natural spline with knots at each point of intersection of the top center line and topline (the base center line and the baseline) of each (between adjacent) pulse waveforms(s) in a pulse train. (IM/WM&A) 194-1977w

pulse train, unidirectional *See:* unidirectional pulse train.

pulse transmitter (1) A pulse-modulated transmitter whose peak power-output capabilities are usually large with respect to average power-output rating. *See also:* radio transmitter; pulse. (AP/ANT) 145-1983s

(2) (power system device function numbers) Used to generate and transmit pulses over a telemetering or pilot-wire circuit to the remote indicating or receiving device. (SUB/PE) C37.2-1979s

pulse turn-off time (light-emitting diodes) The arithmetic sum of the pulse storage time, and the pulse decay time of the output pulse. (ED) [127]



EXTENT OF DATA INCLUDED IN PULSEWAVEFORM FEATURE DISTORTION:
A_1 AND A_2 - PULSE BASE DISTORTION
B - FIRST TRANSITION DISTORTION
C - PULSE TOP DISTORTION
D - LAST TRANSITION DISTORTION

Pulse waveform distortion and pulse waveform feature distortion.

pulse waveform distortion

pulse turn-on time (light-emitting diodes) The arithmetic sum of the pulse delay time, and the pulse rise time of the output pulse. (ED) [127]

pulse-type telemeter A telemeter that employs characteristics of intermittent electric signals other than their frequency, as the translating means. *Note:* These pulses may be utilized in any desired manner to obtain the final indications, such as periodically counting the total number of pulses; or measuring their "on" time, their "off" time, or both. (SWG/PE/SUB) C37.100-1992, C37.1-1994

pulse waveform distortion (pulse terminology) The algebraic difference in magnitude between all corresponding points in time of a pulse waveform and a reference pulse waveform. Unless otherwise specified by a mathematical adjective, peak-to-peak pulse waveform distortion is assumed. *See also:* mathematical adjectives; pulse waveform feature distortion. (IM/WM&A) 194-1977w

pulse waveform feature distortion (pulse terminology) The algebraic difference in magnitude between all corresponding points in time of a pulse waveform and a reference pulse waveform feature. Unless otherwise specified by a mathematical adjective, peak-to-peak pulse waveform feature distortion is assumed. *See also:* mathematical adjectives. (IM/WM&A) 194-1977w

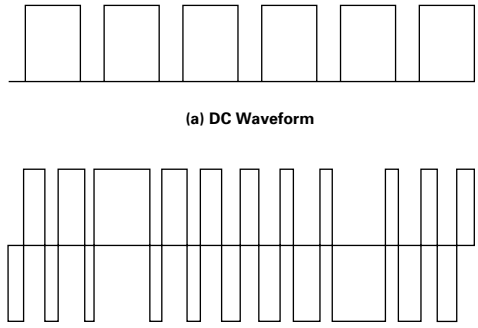
pulse width The time interval between the points on the leading and trailing edges at which the instantaneous value bears a specified relation to the maximum instantaneous value of the pulse, usually the time interval between the half-power points of the pulse. *Synonym:* pulse duration. (AES) 686-1997

pulse-width at half maximum, $T_{0.5}$ (germanium gamma-ray detectors) (of an amplifier output pulse) The time interval between the 50% of maximum amplitude points of a pulse. (NPS) 325-1986s

pulse width discriminator (PWD) A device that passes only those video pulses whose duration falls within specified limits. (AES) 686-1997

pulse-width modulation (self-commutated converters) (converter characteristics) Pulse-time modulation in which the value of each instantaneous sample of the modulating wave is caused to modulate the duration of a pulse. The modulating frequency may be fixed or variable. Examples of waveforms produced by PWM are shown in the corresponding figure. *See also:* pulse-duration modulation.

Waveforms Produced by Pulse-Width Modulation



(a) DC Waveform

(b) AC Waveform

Pulse-Width Modulation

(IA/SPC) 936-1987w

(2) A form of pulse modulation in which the duration of the pulse carrier is varied. (C) 610.7-1995

pulse-width-modulation torquing *See:* pulse-duration-modulation torquing.

pulse width of video pulses (television) The duration of a pulse measured at a specified level. *See also:* pulse timing of video pulses. (BT) 207-1950w

pulse width timing check A timing check that specifies the minimum time a signal shall remain in a specified state once it has transitioned to that state. (C/DA) 1481-1999

pulsing (telephone switching systems) The signaling over the communication path of signals representing one or more digits required to set up a call. (COM) 312-1977w

pulsing circuit (peaking circuit) A circuit designed to provide abrupt changes in voltage or current of some characteristic pattern. *See also:* electronic controller. (IA/ICTL/IAC) [60]

pulsing transformer Supplies pulses of voltage or current. *See also:* electronic controller. (IA/ICTL/IAC) [60]

pump (parametric device) The source of alternating-current power that causes the nonlinear reactor to behave as a time-varying reactance. *See also:* parametric device. (ED) [46]

pump-back test (rotating machinery) (electrical back-to-back test) A test in which two identical machines are me-

chanically coupled together, and they are both connected electrically to a power system. The total losses of both machines are taken as the power input drawn from the system. *See also:* asynchronous machine; direct-current commutating machine. (PE) [9]

pumped figure of merit (parametric amplifier) (nonlinear, active, and nonreciprocal waveguide components) The ratio of the half-amplitude fundamental Fourier component of pumped elastance to the series resistance of the varactor diode. This quantity, designated as $m_1\omega_c$, has the dimensions of angular frequency and describes the noise, gain, and impedance characteristics of parametric amplifiers. The parameter m_1 is the normalized fundamental component of elastance and ω_c is the total angular cutoff frequency. (MTT) 457-1982w

pumped-storage hydro capability (power operations) The capability supplied by hydroelectric sources under specified water conditions using a reservoir that is alternately filled by pumping and depleted by generating. (PE/PSE) 858-1987s

pumped storage station (power operations) A hydroelectric generating station at which electrical energy is normally generated during periods of relatively high system demand by utilizing water that has been pumped into a storage reservoir usually during periods of relatively low system demand. (PE/PSE) 858-1987s, 346-1973w

pumped tube An electron tube that is continuously connected to evacuating equipment during operation. *Note:* This term is used chiefly for pool-cathode tubes. (ED) [45]

pump efficiency (laser maser) The ratio of the power or energy absorbed from the pump to the power or energy available from the pump source. (LEO) 586-1980w

pump-free control *See:* antipump device.

pump-free device *See:* antipump device.

pumping The unintentional cyclical tripping and closing of a network protector. (PE/TR) C57.12.44-1994

pumping load (power operations) Totals of loads caused by pumping in pumped-storage stations within the system. (PE/PSE) 858-1987s

pump runout A pump flow condition in which the pump is operating beyond its design point due to a reduction in the system head. As a result, the pump motor's brake-horsepower and full load current demand may be increased. (PE/NP) 741-1997

punch (A) A device for making holes in some data medium such as a card or paper tape. *See also:* card punch; card reproducing punch; spot punch; calculating punch. **(B)** A perforation created by a device as in definition (A). *See also:* zone punch; eleven punch; numeric punch; twelve punch; digit punch. **(C)** To make a perforation as in definition (B). *See also:* gang punch; overpunch. (C) 610.10-1994

punch card A card into which hole patterns can be punched such that the patterns can be used to store or represent information. *Note:* This term is often used in place of "punched card" a standard-sized punch card has twelve rows of 80 columns. *Synonym:* Hollerith card. *See also:* edge-punched card; control card; data card; scored card; binder-hole card; laced card; edge-notched card; interpreted card; trailer card; edge-coated card; binary card; header card; aperture card; check card; twelve-row punch card; short card. (C) 610.10-1994w

punched card (1) A card on which a pattern of holes or cuts is used to represent data. (MIL/C) [2], [20]
(2) A card punched with hole patterns such that the patterns store or represent information. *See also:* punch card. (C) 610.10-1994w

punched card holder *See:* card hopper.

punched card machine *See:* card reader.

punched card reader *See:* card reader.

punched paper tape *See:* perforated tape.

punched tape (computers) A tape on which a pattern of holes or cuts is used to represent data. (MIL/C) [2], [20], [85]

punched tape handler (test, measurement, and diagnostic equipment) A device that handles punched tape and usually consists of a tape transport and punched tape reader with associated electrical and electronic equipments. Most units provide for tape to be wound and stored in reels; however, some units provide for the tape to be stored loosely in closed bins. (MIL) [2]

punched tape reader (1) (test, measurement, and diagnostic equipment) A device capable of converting information from punched tape, where it has been stored in the form of a series of holes, into a series of electrical impulses. (MIL) [2]
(2) An input unit that senses the hole patterns in a perforated tape, transforming the hole patterns into electrical signals representing data. (C) 610.10-1994w

punching (rotating machinery) A lamination made from sheet material using a punch and die. *See also:* rotor; stator. (PE) [9]

punching station The place in a punch where a card or paper tape is punched. (C) 610.10-1994w

punch position (computers) A site on a punched tape or card where holes are to be punched. (MIL/C) [2], [20], [85]

punch tape A tape in which hole patterns can be punched such that the patterns can be used to store or represent information. (C) 610.10-1994w

punch-through voltage (x-ray energy spectrometers) (of a semiconductor radiation detector) The voltage at which a junction detector becomes fully depleted. *See also:* depletion voltage. (NPS/NID) 759-1984r

puncture (1) (voltage testing) A disruptive discharge through the body of a solid dielectric. (PE/PSIM) [55]
(2) A disruptive discharge through solid insulation. (PE/PSIM) 4-1995
(3) (A) A disruptive discharge through the body of a solid dielectric. **(B)** A disruptive discharge through solid insulation. **(C)** Term used to denote when a disruptive discharge occurs through a solid dielectric and produces permanent loss of dielectric strength; in a liquid or gaseous dielectric, the loss may be only temporary. (SPD/PE) C62.11-1999

puncture voltage (surge arresters) The voltage at which the test specimen is electrically punctured. (T&D/PE) [10], [8]

pupil (1) (laser maser) The variable aperture in the iris through which light travels toward the interior of the eye. (LEO) 586-1980w
(2) (pupillary aperture) (illuminating engineering) The opening in the iris which admits light into the eye. (EEC/IE) [126]

purchaser (1) (nuclear power quality assurance) The organization responsible for establishment of procurement requirements and for issuance, administration, or both, of procurement documents. (PE/NP) [124]
(2) (rotating electric machinery) The organization placing the contract for the machinery or its repair; often called the "user." (PE/EM) 11-1980r
(3) An entity that contractually acts as the customer. (VT) 1475-1999

pure alphabetic Pertaining to data that contains only the letters of the alphabet (AaBbCcDdEeFfGgHh. . .). *Contrast:* pure numeric; pure alphanumeric. (C) 610.5-1990w

pure alphanumeric (data management) Pertaining to data that contains only the letters of the alphabet (AaBbCcDdEeFfGgHh. . .) and the numerals (1234567890). *Contrast:* pure alphabetic; pure numeric. (C) 610.5-1990w

pure binary *See:* binary.

pure binary numeration system *See:* binary numeration system.

pure numeric Pertaining to data that contains only the numerals (1234567890). *Contrast:* pure alphanumeric; pure alphabetic. (C) 610.5-1990w

purged Pertaining to a record that has been physically deleted from a file. *See also:* active; logically deleted; inactive. (C) 610.2-1987

purge instruction A purge (cache-control) instruction changes a line to the uncached state, invalidating the old cache line without copying dirty data back to memory. (C/MM) 1596-1992

purging A ring state that occurs when the active monitor has detected a ring error and is returning the ring to an operational state by transmitting purge frames. (C/LM) 8802-5-1998

pure tone (1) (overhead power lines) A sound wave, the instantaneous sound pressure of which is a simple sinusoidal function of time. (T&D/PE) 539-1990
(2) (overhead power lines) *See also:* simple tone. (SP) [32]

purification of electrolyte The treatment of a suitable volume of the electrolyte by which the dissolved impurities are removed in order to keep their content in the electrolyte within desired limits. *See also:* electrorefining. (EEC/PE) [119]

purity *See:* excitation purity.

Purkinje phenomenon (illuminating engineering) The reduction in subjective brightness of a red light relative to that of a blue light when the luminances are reduced in the same proportion without changing the respective spectral distributions. In passing from photopic to scotopic vision, the curve of spectral luminous efficiency changes, the wavelength of maximum efficiency being displaced toward the shorter wavelengths. (EEC/IE) [126]

purple boundary (television) (illuminating engineering) The straight line drawn between the ends of the spectrum locus on a chromaticity diagram. (BT/IE/EEC/AV) 201-1979w, [126]

purported name A construct that is syntactically a name but that has not (yet) been shown to be a valid name. (C/PA) 1328.2-1993w, 1224.2-1993w, 1326.2-1993w, 1327.2-1993w

purpose statement A brief statement of the reason for an IDEF0 model's existence that is presented in the A-0 context diagram of the model. (C/SE) 1320.1-1998

push (data management) To append data onto a stack. *Contrast:* pull. (C) 610.5-1990w

push a button The act of moving the pointer to a button widget and then selecting the button. (C) 1295-1993w

push brace A supporting member, usually of timber, placed between a pole or other structural part of a line and the ground or a fixed object. *See also:* tower. (T&D/PE) [10]

push button A visual user interface control containing a button, labeled with text, graphics, or both, that represents the action initiated when a user selects it. (C) 1295-1993w

pushbutton Part of an electric device, consisting of a button that must be pressed to effect an operation. *See also:* switch. (IA/ICTL/IAC) [60], [84]

pushbutton dial (telephone switching systems) A type of calling device used in automatic switching that has an activator per digit that generates distinctive pulsing. (COM) 312-1977w

pushbutton station A unit assembly of one or more externally operable pushbutton switches, sometimes including other pilot devices such as indicating lights or selector switches, in a suitable enclosure. *See also:* switch. (IA/ICTL/IAC) [60]

pushbutton switch (pushbutton) A master switch, usually mounted behind an opening in a cover or panel, and having an operating plunger or button extending forward in the opening. Operation of the switch is normally obtained by pressure of the finger against the end of the button. *See also:* switch. (EEC/PE) [119]

pushbutton switching A reperforator switching system in which selection of the outgoing channel is initiated by an operator. (COM) [49]

pushdown list (1) (computers) A list that is constructed and maintained so that the next item to be retrieved is the most recently stored item in the list, that is, last in, first out. *See also:* pushup list. (C) [20], [85]
(2) (data management) *See also:* stack. (C) 610.5-1990w

push-down stack *See:* stack.

pushdown storage (1) (software) A storage device that handles data in such a way that the next item to be retrieved is the most recently stored item still in the storage device, that is, last-in-first-out (LIFO). *See also:* stack; data. (C/SE) 729-1983s
(2) A type of storage in which data are ordered in such a way that the next data item to be retrieved is the most recently stored item. *Note:* Commonly characterized as "last-in-first-out," or LIFO. *Synonym:* stack storage. (C) 610.10-1994w
(3) (software) *See also:* stack. (C) 610.5-1990w

pushing figure (oscillators) The change of oscillator frequency with a specified change in current, excluding thermal effects. *See also:* electronic tuning sensitivity; oscillatory circuit; television. (ED) 161-1971w

push-pull amplifier circuit *See:* balanced amplifier.

push-pull circuit A circuit containing two like elements that operate in 180-degree phase relationship to produce additive output components of the desired wave, with cancellation of certain unwanted products. *Note:* Push-pull amplifiers and push-pull oscillators are examples. *See also:* amplifier. (Std100) [123]

push-pull currents Balanced currents. *See also:* waveguide. (MTT) 146-1980w

push-pull microphone A microphone that makes use of two like microphone elements actuated by the same sound waves and operating 180 degrees out of phase. *See also:* microphone. (EEC/PE) [119]

push-pull operation The operation of two similar electron devices or of an equivalent double-unit device, in a circuit such that equal quantities in phase opposition are applied to the input electrodes, and the two outputs are combined in phase. (ED) [45]

push-pull oscillator A balanced oscillator employing two similar tubes in phase opposition. *See also:* oscillatory circuit; balanced oscillator. (AP/ANT) 145-1983s

push-pull voltages Balanced voltages. *See also:* waveguide. (MTT) 146-1980w

push-push circuit A circuit employing two similar tubes with grids connected in phase opposition and plates in parallel to a common load, and usually used as a frequency multiplier to emphasize even-order harmonics. (AP/ANT) 145-1983s

push-push currents Currents flowing in the two conductors of a balanced line that, at every point along the line, are equal in magnitude and in the same direction. *See also:* waveguide. (MTT) 146-1980w

push-push voltages Voltages (relative to ground) on the two conductors of a balanced line that, at every point along the line, are equal in magnitude and have the same polarity. *See also:* waveguide. (MTT) 146-1980w

push-to-type operation That form of telegraph operation, employing a one-way reversible circuit, in which the operator must keep a switch operated in order to send from his station. It is generally used in radio transmission where the same frequency is employed for transmission and reception. *See also:* telegraphy. (EEC/PE) [119]

pushup list (1) (computers) A list that is constructed and maintained so that the next item to be retrieved and removed is the oldest item still in the list, that is, first in, first out. *See also:* pushdown list. (C) [20], [85]
(2) (data management) *See also:* queue. (C) 610.5-1990w

pushup storage (1) A type of storage in which data are ordered in such a way that the next data item to be retrieved is the item that was stored first. *Note:* Commonly characterized as

first-in-first-out, or FIFO order. *See also:* stack. (C) 610.10-1994w

(2) *See also:* queue. (C) 610.5-1990w

put To place an item into a set of items as in inserting a record into a file, or in representing a numerical value as a series of decimal digits. *Contrast:* get. (C) 610.5-1990w

PV array *See:* photovoltaic array.

PV array subfield *See:* photovoltaic array subfield.

PVC (1) (cable systems in power generating stations) Conduit fabricated from polyvinyl chloride. (PE/SUB/EDPG) 422-1977, 525-1992r

(2) *See also:* polyvinyl chloride; permanent virtual circuit. (C) 610.7-1995

PV cell *See:* photovoltaic cell.

PV effect *See:* photovoltaic effect.

PV module *See:* photovoltaic module.

PV panel *See:* photovoltaic panel.

PV power system *See:* photovoltaic power system.

PV receiver *See:* photovoltaic receiver.

PV system-utility interface *See:* photovoltaic system-utility interface.

PVV *See:* path variability value.

PWB *See:* printed wiring board.

PWM *See:* pulse-width modulation.

pyramidal horn antenna A horn antenna, the sides of which form a pyramid. (AP/ANT) [35], 145-1993

pyroconductivity Electric conductivity that develops with rising temperature, and notably upon fusion, in solids that are practically nonconductive at atmospheric temperatures. (EEC/PE) [119]

pyroelectric effect (primary ferroelectric terms) The appearance of an electric charge at the surface of a polar material when uniform heating or cooling changes the polarization. If the polar material is electroded and an external resistance is connected between the electrodes, the current that flows is a pyroelectric current. All pyroelectrics are polar; ferroelectrics are a subgroup of the polar materials and, therefore, they are both pyroelectric and piezoelectric. The differ from the more general pyroelectrics principally by the reversibility or reorientability of their spontaneous polarization P_s. *Note:* Due to the existence of free charge, the pyroelectric charge may be rapidly compensated. (UFFC) 180-1986w

pyrolysate A product of thermal decomposition. (PE/EM) 1129-1992r

pyrolysis Irreversible chemical decomposition caused by heat, usually without oxidation. (DEI) 1221-1993w

pyrometer A thermometer of any kind usable at relatively high temperatures (above 500 degrees Celsius). *See also:* electric thermometer. (EEC/PE) [119]