V

vacant code (telephone switching systems) A digit or a combination of digits that is unassigned. (COM) 312-1977w

vacant-code tone (telephone switching systems) A tone that indicates that an unassigned code has been dialed. (COM) 312-1977w

vacant number (telephone switching systems) An unassigned or unequipped directory number. (COM) 312-1977w

vacuum column In a tape drive, a cavity in which a low air pressure is maintained so as to attract a tape loop between the spool and the driving mechanism. (C) 610.10-1994w

vacuum envelope (electron tube) The airtight envelope that contains the electrodes. *See also:* electrode. (EEC/PE) [119]

vacuum-tube amplifier An amplifier employing electron tubes to effect the control of power from the local source. *See also:* amplifier. (AP/ANT) 145-1983s

vacuum-tube radio frequency generator *See:* radio-frequency generator, electron tube type.

vacuum-tube transmitter A radio transmitter in which electron tubes are utilized to convert the applied electric power into radio-frequency power. *See also:* radio transmitter. (AP/ANT) 145-1983s

vacuum valve A device for sealing and unsealing the passage between two parts of an evacuated system. *See also:* rectification. (EEC/PE) [119]

valance (illuminating engineering) A longitudinal shielding member mounted across the top of a window or along a wall, to conceal light sources, giving both upward and downward distributions. (EEC/IE) [126]

valance lighting (illuminating engineering) Lighting comprising light sources shielded by a panel parallel to the wall at the top of a window. (EEC/IE) [126]

valence band The range of energy states in the spectrum of a solid crystal in which lie the energies of the valence electrons that bind the crystal together. *See also:* semiconductor. (ED) 216-1960w

validated export license A license for which the exporter must submit an application requesting specific Bureau of Export Administration (BXA) approval. (C/SE) 1420.1b-1999

validated metric A metric whose values have been statistically associated with corresponding quality factor values. (C/SE) 1061-1998

validation (1) (programmable digital computer systems in safety systems of nuclear power generating stations) The test and evaluation of the integrated computer system to ensure compliance with the functional, performance, and interface requirements. 7432-1982w

(2) (software verification and validation) The process of evaluating software at the end of the software development process to ensure compliance with software requirements. (SE/C) 1012-1986s

(3) (test, measurement, and diagnostic equipment) That process in the production of a test program by which the correctness of the program is verified by running it on the automatic test equipment together with the unit under test. The process includes the identification of run-time errors, procedure errors, and other non-compiler errors, not uncovered by pure software methods. The process is generally performed with the customer or designated representative as a witness. (MIL) [2]

(4) The process of testing an application or system to ensure that it conforms to its specification. (C/PA) 14252-1996

(5) The process of evaluating a system or component during or at the end of the development process to determine whether a system or component satisfies specified requirements. (C/SE) 1233-1998

(6) The process of determining the degree to which a distributed simulation is an accurate representation of the real world from the perspective of the intended use(s) as defined by the requirements. Validation also refers to the process of determining the confidence that should be placed on this assessment. (C/DIS) 1278.4-1997

valid bid for service An originating or incoming call attempt for which the switching system receives the expected number of digits. *See also:* ineffective attempts. (COM/TA) 973-1990w

valid call Occurs if enough digits are received to complete the call through the office or to give the subscriber an appropriate tone or signal. (COM/TA) 973-1990w

valid compare A condition on output response when the precise state of the response is not important to the test, but the fact that the output is a valid state value is pertinent. (C/TT) 1450-1999

valid input A condition on input stimulus when the state of that stimulus will not affect the current test. In the simulator perspective, this condition is often identified as an unknown, or X, state. (C/TT) 1450-1999

validity check A consistency check that is based upon known limits relating to particular data. For example, a month may not be numbered greater than 12, and a week cannot have more than 168 hours. (C) 610.5-1990w

valley (pulse terminology) A portion of a pulse waveform between two specified peak magnitudes of the same polarity. *See also:* preshoot. (IM/WM&A) 194-1977w

valley point (tunnel-diode characteristic) The point on the forward current-voltage characteristic corresponding to the second-lowest positive (forward) voltage at which $di/dV = 0$. *See also:* peak point. (ED) 253-1963w, [46]

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

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

valuator A logical input device used to input a scalar value in a graphics system. A typical physical device is a control dial. (C) 610.6-1991w

(2) (A) An input device that provides a scalar value; for example, a thumb wheel or a potentiometer. **(B)** A logical input device used to input a scalar value in a graphics system. *Note:* A corresponding physical device is a control dial. (C) 610.10-1994

value (1) (automatic control) The quantitative measure of a signal or variable. *See also:* feedback control system. (IM) [120]

(2) (direct-current through test object) The arithmetic mean value. (PE/PSIM/PSR) 4-1978s, [6]

(3) (test direct voltages) The arithmetic mean value: that is, the integral of the voltage over a full period of the ripple divided by the period. *Note:* The maximum value of the test voltage may be taken approximately as the sum of the arithmetic mean value plus the ripple magnitude. (PE/PSIM) 4-1978s, [55]

(4) (alternating test voltage) The peak value divided by $(2)^{1/2}$. (PE/PSIM) [55]

(5) An arbitrarily complex information item that can be viewed as a characteristic or property of an object. (C/PA) 1328-1993w, 1224-1993w, 1327-1993w

(6) *See also:* OM attribute value; attribute value. (C/PA) 1328.2-1993w

(7) *See also:* data value. (C) 610.5-1990w

value-added network A communications network that provides enhanced services, such as character set conversion, protocol conversion, and message storing and forwarding. (C) 610.7-1995

value-added service A communications service utilizing communications common carrier networks for transmission and providing added data services with separate additional equipment. Such added service features may be store-and-forward switching, terminal interfacing and host interfacing.
(LM/COM) 168-1956w

value class A kind of class that represents instances that are pure values. The constituent instances of a value class do not come and go and cannot change state.
(C/SE) 1320.2-1998

value, desired *See:* ideal value.

value domain An expression of a specific and explicit representational value of some information about something of interest within the Intelligent Transportation Systems (ITS) domain. *Note:* An example of a value domain is numbers as applied to freeway lanes, which have Integer Type as their data type and a Valid Value Rule expressing the range 1–99.
(SCC32) 1489-1999

value, ideal *See:* ideal value.

value list constraint A kind of constraint that specifies the set of all acceptable instance values for a value class.
(C/SE) 1320.2-1998

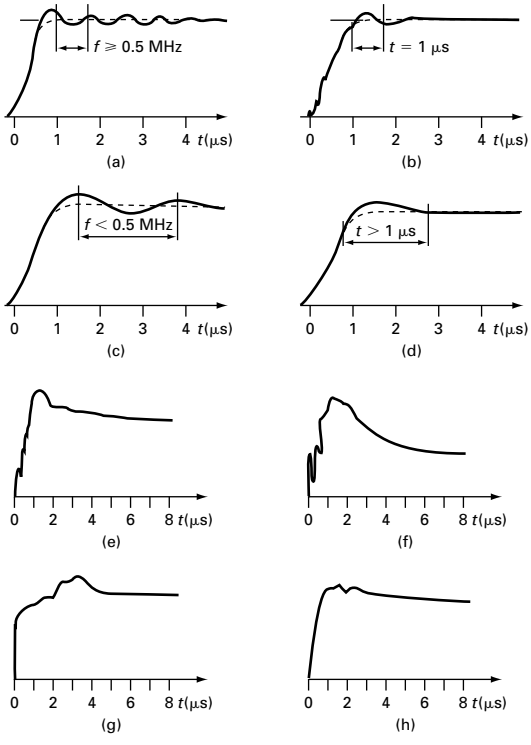
value, Munsell *See:* Munsell value.

value of the test current (high voltage testing) The value of the test current is normally defined by the crest value. With some test circuits, overshoot or oscillations may be present on the current. The appropriate apparatus standard should specify whether the value of the test current should be defined by the actual crest or by a smooth curve drawn through the oscillations. (PE/PSIM) 4-1978s

value of test voltage (1) (high voltage testing) The voltage value that is to be applied in a test. (PE/PSIM) 4-1978s
(2) (lightning impulse tests, general applicability) The value of the test voltage is, for a smooth lightning impulse, the crest value. With some test circuits, oscillations or an overshoot may occur at the crest of the impulse [see figure below, (a)–(d)]. If the frequency of such oscillations is not less than 0.5MHz or the duration of overshoot not over one μ, a mean curve should be drawn as in Fig (a) and (b) and, for the purpose of measurement, the maximum amplitude of this curve defines the value of the test voltage. Permissible amplitude limits for the oscillations of overshoot, on standard lightning impulses, are given in IEEE Std 4-1978. For other impulse shapes [see, for example, (e) and (h)], the appropriate apparatus standard should define the value of the test voltage, taking account of the type of test and of test object.
(PE/PSIM) 4-1978s
(3) The value of the test voltage is defined by its arithmetic mean value. (PE/PSIM) 4-1978s
(4) The value of the test voltage is defined by its peak value divided by

$$\sqrt{2}.$$

Note: The appropriate apparatus standards may require a measurement of the rms value of the test voltage instead of the peak value for cases where the rms value may be of importance. Such cases are, for instance, when thermal effects are under investigation. (PE/PSIM) 4-1978s



[Examples of lighting impulses with oscillations or overshoot. (a), (b)—The value of the test voltage is determined by a mean curve (broken line). (c), (d)—The value of the test voltage is determined by the crest value. (e), (f), (g), (h)—No general guidance can be given for the determination of the value of the test voltage.]

value of test voltage

value of the test voltage for alternating voltage The peak value divided by the square root of 2, or the rms value as defined by the appropriate apparatus standard.
(PE/PSIM) 4-1995

value of the test voltage for lightning impulse voltage The peak value when the impulse is without overshoot or oscillations. (PE/PSIM) 4-1995

value range constraint A kind of constraint that specifies the set of all acceptable instance values for a value class where the instance values are constrained by a lower and/or upper boundary. An example of the value range constraint is `Azimuth`, which is required to be between −180° to +180°. A range constraint only makes sense if there is a linear ordering specified. (C/SE) 1320.2-1998

values of spectral luminous efficiency for photopic vision (illuminating engineering) Values at 10-nm intervals were adopted by the International Commission on Illumination in 1924 and were adopted in 1933 by the International Committee for Weights and Measures as a basis for the establishment of photometric standards of types of sources differing from the primary standard in spectral distribution of radiant flux. These values are given in the second column of the accompanying table; the intermediate values given in the other columns have been interpolated. *Note:* These standard values of spectral luminous efficiency were determined by observations with a two-degree photometric field having a moderately high luminance, photometric evaluations based upon them consequently do not apply exactly to other conditions of observation. Watts weighted in accord with these standard values are often referred to as light-watts. (EEC/IE) [126]

values of spectral luminous efficiency for scotopic vision (illuminating engineering) Values at 10-nm intervals were provisionally adopted by the International Commission on Illumination in 1951. *Note:* These values of spectral luminous efficiency were determined by observation by young dark-adapted observers using extra-foveal vision at near-threshold luminance. (EEC/IE) [126]

value trace *See:* variable trace.

value, true *See:* true value.

`value` word A Forth word created by the defining word `value`. (A `value` word, when executed by itself, places a numeric value on the data stack, much like a `constant`. The numeric value of a `value` word is changed by preceding it with the Forth word `to`.). (C/BA) 1275-1994

valve A converter arm in a three-phase, six pulse bridge converter connection. (SUB/PE) 857-1996

valve action (electrochemical) The process involved in the operation of an electrochemical valve. *See also:* electrochemical valve. (EEC/PE) [119]

valve actuator (valve actuators) An electric, pneumatic, hydraulic, or electrohydraulic power-driven mechanism for positioning two-position or modulating valves, and dampers. Included are those components required to control valve action and to provide valve position output signals, as defined in the actuator specification. (PE/NP) 382-1985

valve actuator specification (valve actuators) A document to be provided to the valve actuator manufacturer which contains technical requirements for a specific application. (PE/NP) 382-1980s

valve arrester (1) (surge arresters) An arrester that includes a valve element. (SPD/PE) C62.1-1981s

(2) An arrester that includes one or more valve elements. (SPD/PE) C62.22-1997, C62.11-1999

valve base That assembly that mechanically supports, and electrically insulates the valves from ground. *Note:* A part of a valve that is clearly identifiable in a discrete form to be a valve base may not exist in all designs of valves. A valve base could be a separate platform, insulated from ground by post-type insulators, that carries a live-tank valve unit, or a steel framework insulated from ground by post-type insulators on which the various modules of a multiple valve unit are mounted, or a raised platform of insulating material that is integral to the valve structure and forms the base. (SUB/PE) 857-1996

valve base electronics (VBE) Electronic circuitry that directs gate pulses into the thyristor valve. (SUB/PE) 1303-1994

valve electronics (VE) Electronic circuitry associated with the thyristors and mounted at thyristor level potential. (SUB/PE) 1303-1994

valve element (1) A resistor that, because of its nonlinear current-voltage characteristic, limits the voltage across the arrester terminals during the flow of discharge current and contributes to the limitation of follow current at normal power-frequency voltage. (SPD/PE) C62.22-1997, C62.11-1999

(2) A resistor that, because of its nonlinear current-voltage characteristic, limits the voltage across the terminals of the surge-protective-device during the flow of discharge current and contributes to the limitation of follow current at normal power-frequency voltage. (SPD/PE) C62.62-2000

valve module The smallest assembly, comprising a number of thyristors and their immediate auxiliaries for firing and protection, voltage dividing components, and distributed or lumped valve reactors, from which the valve is built up and which exhibits the same electrical properties as the complete valve but can withstand only a portion of the full voltage blocking capability of the valve. (SUB/PE) 857-1996

valve point A camshaft (turbine input valve control mechanism) position at which point one of the turbine input valves is fully or near fully open and the next valve remains closed. (PE/PSE) 94-1991w

valve point loading An economic control strategy that dispatches generation based on minimizing production costs by considering the effects of turbine input valve points on incremental heat rate. (PE/PSE) 94-1991w

valve-point loading control (electric power system) A control means for making a unit operate in the more efficient portions of the range of the governor-controlled valves. (PE/PSE) 94-1991w

valve position limiter (control systems for steam turbine-generator units) (load limit) A device that acts on the speed/load-control system to prevent the control valve(s) from opening beyond a preset limit. (PE/EDPG) 122-1985s

valve protector A protective device that includes a valve element. (SPD/PE) C62.62-2000

valve ratio (electrochemical valve) The ratio of the impedance to current flowing from the valve metal to the compound or solution, to the impedance in the opposite direction. *See also:* electrochemical valve. (EEC/PE) [119]

valve-regulated battery (1) A battery in which the venting of the products of electrolysis is controlled by a reclosing pressure-sensitive valve. (PV) 1013-1990

(2) A battery that is sealed with the exception of a valve that opens to the atmosphere when the internal gas pressure exceeds the atmospheric pressure by a preselected amount. Valve-regulated batteries provide a means for recombination of internally generated oxygen. (PV) 1144-1996

valve-regulated lead-acid (VRLA) cell (1) A lead-acid cell that is sealed with the exception of a valve that opens to the atmosphere when the internal gas pressure in the cell exceeds atmospheric pressure by a pre-selected amount. (IA/PSE) 446-1995

(2) A lead-acid cell that is sealed with the exception of a valve that opens to the atmosphere when the internal gas pressure in the cell exceeds atmospheric pressure by a pre-selected amount. VRLA cells provide a means for recombination of internally generated oxygen and the suppression of hydrogen gas evolution to limit water consumption. (SCC29/SCC21) 485-1997, 937-2000

(3) A cell that is sealed with the exception of a valve that opens to the atmosphere when the internal gas pressure in the cell exceeds atmospheric pressure by a preselected amount. VRLA cells provide a means for recombination of internally generated oxygen and the suppression of hydrogen gas evolution to limit water consumption. (SB/PE/EDPG) 1188-1996, 1184-1994, 1189-1996

valve section An electrical assembly comprising a number of thyristor levels and other components that exhibits prorated electrical properties of a complete valve. (SUB/PE) 857-1996

Valve Stroke Complete travel of a valve from either fully open to fully closed position or vice-versa. (PE/NP) 1290-1996

valve tube *See:* kenotron.

valve-type arrester *See:* valve-type arrester.

Van Allen belts (communication satellite) The belts of charged particles (electrons and protons) trapped by the earth's (external) magnetic field and which surround the earth at altitudes from 1000 to 6000 kilometers. The paths of the particles are determined by the directions of the (external) lines of force of the earth's magnetic field. The particles migrate from the region above earth's equator toward the North Pole, then toward the South Pole, then return to the region above the equator. (COM) [19]

VAN *See:* value-added network.

V&V *See:* verification and validation.

vane (navigation aids) A device to indicate the direction from which the wind blows. (AES/GCS) 172-1983w

vane-type relay A type of alternating-current relay in which a light metal disc or vane moves in response to a change of the current in the controlling circuit or circuits. (EEC/PE) [119]

V antenna A V-shaped arrangement of two conductors, balanced-fed at the apex, with included angle, length, and apex height above the earth chosen so as to give the desired directive properties to the radiation pattern. (AP/ANT) 145-1993

vapor openings Openings through a tank shell or roof above the surface of the stored liquid. Such openings may be provided for tank breathing, tank gauging, fire fighting, or other operating purposes. (NFPA) [114]

vapor-safe electric equipment A unit so constructed that it may be operated without hazard to its surroundings in an atmosphere containing fuel, oil, alcohol, or other vapors that may occur in aircraft: that is, the unit is capable of so confining any sparks, flashes, or explosions of the combustible vapors within itself that ignition of the surrounding atmosphere is prevented. *Note:* This definition closely parallels that given for explosionproof: however, it is believed that the new term

is needed in order to avoid the connotation of compliance with Underwriter's standards that are now associated with explosionproof in the minds of most engineers who are familiar with the use of that term applied to industrial motors and control equipment. (EEC/PE) [119]

vaportight So enclosed that vapor will not enter the enclosure. (SWG/PE) C37.100-1992

vapor-tight luminaire (illuminating engineering) A luminaire designed and approved for installation in damp or wet locations. It is also described as "enclosed and gasketed." (EEC/IE) [126]

VAR *See:* visual-aural range.

var (electric power circuits) The unit of reactive power in the International System of Units (SI). The var is the reactive power at the two points of entry of a single-phase, two-wire circuit when the product of the root-mean-square value in amperes of the sinusoidal current by the root-mean-square value in volts of the sinusoidal voltage and by the sine of the angular phase difference by which the voltage leads the current is equal to one. (Std100) 270-1966w

varactor A two-terminal semiconductor device in which the electrical characteristic of primary interest is a voltage-dependent capacitance. (ED) [46]

var-aligned Alignment for the storage of a Forth variable. (C/BA) 1275-1994

varhour The unit of a quadrature-energy (quadergy) in the International System of Units (SI). The varhour is the quadrature energy that is considered to have flowed past the points of entry of a reactive circuit when a reactive power of one var has been maintained at the terminals of entry for one hour. (Std100) 270-1966w

varhour constant (metering) The registration, expressed in varhours, corresponding to one revolution of the rotor. (ELM) C12.1-1988

varhour meter (metering) An electricity meter that measures and registers the integral, with respect to time, of the reactive power of the circuit in which it is connected. The unit in which this intergral is measured is usually the kilovarhour. (ELM) C12.1-1988

variable (1) (electrical heating applications to melting furnaces and forehearths in the glass industry) A quantity or condition that is subject to change. (IA) 668-1987w
(2) (modeling and simulation) (software) A quantity or data item whose value can change; for example, the variable Current time. (C) 610.3-1989w, 610.12-1990
(3) In the shell command language, a named parameter. (C/PA) 9945-2-1993
(4) A quantity, the value of which is assigned at program runtime. (SCC20) 771-1998
(5) An instance whose identity is unknown at the time of writing. A variable is represented by an identifier that begins with an upper-case letter. (C/SE) 1320.2-1998

variable address *See:* indexed address.

variable-area track (electroacoustics) A sound track divided laterally into opaque and transparent areas, a sharp line of demarcation between these areas forming an oscillographic trace of the wave shape of the recorded signal. *See also:* phonograph pickup. (SP) [32]

variable assignment In the shell command language, a word consisting of the following parts

varname = value

When used in a context where assignment is defined to occur and at no other time, the value (representing a word or field) shall be assigned as the value of the variable denoted by *varname*. The *varname* and *value* parts meet the requirements for a name and a word, respectively, except that they are delimited by the embedded unquoted equals sign in addition to the delimiting described. In all cases, the variable shall be created if it did not already exist. If *value* is not specified, the variable shall be given a null value. An alternative form of variable assignment

symbol = value

(where *symbol* is a valid word delimited by an equals sign, but not a valid name) produces unspecified results. *Synonym:* assignment. (C/PA) 9945-2-1993

variable-block format A format that allows the number of words in successive blocks to vary. (IA/EEC) [61], [74]

variable carrier *See:* controlled carrier.

variable, complex *See:* complex variable.

variable-density track (electroacoustics) A sound track of constant width, usually but not necessarily of uniform light transmission on any instantaneous transverse axis, on which the average light transmission varies along the longitudinal axis in proportion to some characteristic of the applied signal. *See also:* phonograph pickup. (SP) [32]

variable, directly controlled *See:* directly controlled variable.

variable field One that varies with time. (Std100) 270-1966w

variable format A file organization in which logical records are of variable length. *Synonym:* V format. *Contrast:* fixed format. (C) 610.5-1990w

variable-frequency telemetering (electric power system) A type of telemetering in which the frequency of the alternating-voltage signal is varied as a function of the magnitude of the measured quantity. *See also:* telemetering. (PE/PSE) 94-1970w

variable, indirectly controlled *See:* indirectly controlled variable.

variable inductor *See:* continuously adjustable inductor.

variable, input *See:* input variable.

variable length Pertaining to a record or field that does not have a constant length, but whose length depends on the length of the specific data contained in it. *Contrast:* fixed length. *See also:* variable format. (C) 610.5-1990w

variable-length field A field whose length may vary according to data stored. *Contrast:* fixed-length field. *See also:* variable format. (C) 610.5-1990w

variable, manipulated *See:* manipulated variable.

variable modulation (navigation aids) (very high-frequency omnidirectional range) That modulation of the ground station radiation which produces a signal in the airborne receiver whose phase with respect to a radiated reference modulation corresponds to the bearing of the receiver. (AES/GCS) 172-1983w

variable-mu tube (remote-cutoff tube) (variable-μ tube) An electron tube in which the amplification factor varies in a predetermined way with control-grid voltage. (ED) 161-1971w

variable name data element A data element whose name can vary depending upon the particular data item represented; for example, a data element named "Population of *X* in *Y*," where *X* takes on the name of a city and *Y* represents a given year. (C) 610.5-1990w

variable operating cost Cost that varies or fluctuates with operating or use of plant. (PE/PSE) 858-1993w

variable, output *See:* output variable.

variable point (data management) (mathematics of computing) Pertaining to a numeration system in which the position of the radix point is indicated by a special character at that position. *Contrast:* fixed point; floating point. (C) 610.5-1990w, 1084-1986w

variable-reluctance microphone (magnetic microphone) A microphone that depends for its operation on variations in the reluctance of a magnetic circuit. *See also:* microphone. (EEC/PE) [119]

variable-reluctance pickup (magnetic pickup) A phonograph pickup that depends for its operation on the variation in the reluctance of a magnetic circuit. *See also:* phonograph pickup. (EEC/PE) [119]

variable-reluctance transducer An electroacoustic transducer that depends for its operation on the variation in the reluctance of a magnetic circuit. (SP) [32]

variable scope *See:* scope.

variable-speed axle generator An axle generator in which the speed of the generator varies directly with the speed of the car. *See also:* axle-generator system. (EEC/PE) [119]

variable speed constant frequency generator (VSCF) An ac generator designed to have a constant frequency output with a variable speed input. This may be accomplished with an induction generator having an ac/ac converter feedback circuit that excites the wound rotor at a frequency to produce a constant frequency output. This may also be accomplished by a synchronous generator whose variable output frequency is fed into a frequency changer that produces a constant output frequency. Basic frequency changers may be of the cycloconverter or dc link type. (IA/MT) 45-1998

variable-speed drive An electric drive so designed that the speed varies through a considerable range as a function of load. *See also:* electric drive. (IA/ICTL/IAC) [60]

variable speed motor (rotating machinery) A motor with a positively damped speed-torque characteristic which lends itself to controlled speed applications. (PE) [9]

variables, state *See:* state variables.

variable threshold transistor (metal-nitride-oxide field-effect transistor) An insulated-gate field-effect transistor (IGFET) whose threshold voltage can be varied electrically to predetermined levels. The memory metal-nitride-oxide semiconductor (MNOS) memory transistor is a specific example of this type. (ED) 581-1978w

variable-torque motor (A) A multispeed motor whose rated load torque at each speed is proportional to the speed. Thus the rated power of the motor is proportional to the square of the speed. **(B)** An adjustable-speed motor in which the specified torque increases with speed. It is common to provide a variable-torque adjustable-speed motor in which the torque varies as the square of the speed and hence the power output varies as the cube of the speed. *See also:* asynchronous machine. (PE) [9]

variable trace A record of the name and values of variables accessed or changed during the execution of a computer program. *Synonyms:* data trace; value trace. *See also:* execution trace; subroutine trace; retrospective trace; symbolic trace; data flow trace. (C) 610.12-1990

variable, ultimately controlled *See:* ultimately controlled variable.

variable-voltage transformer (power and distribution transformers) An autotransformer in which the output voltage can be changed (essentially from turn to turn) by means of a movable contact device sliding on the shunt winding turns. (PE/TR) C57.12.80-1978r

variant (1) In fault tolerance, a version of a program resulting from the application of software diversity. (C) 610.12-1990

(2) *See also:* dialect. (C) 610.13-1993w

variation (1) (navigation aids) The angle between the magnetic and geographical meridians at any place. (AES/GCS) 172-1983w

(2) *See also:* dialect. (C) 610.13-1993w

varindor An inductor whose inductance varies markedly with the current in the winding. (EEC/PE) [119]

variocoupler (radio practice) A transformer, the self-impedance of whose windings remains essentially constant while the mutual impedance between the windings is adjustable. (IM) [120]

variolosser A device whose loss can be controlled by a voltage or current. (EEC/PE) [119]

variometer A variable inductor in which the change of inductance is effected by changing the relative position of two or more coils. (PE/EM) 43-1974s

varioplex A telegraph switching system that establishes connections on a circuit-sharing basis between a multiplicity of telegraph transmitters in one locality and respective corresponding telegraph receivers in another locality over one or more intervening telegraph channels. Maximum usage of channel capacity is secured by momentarily storing the signals and allocating circuit time in rotation among those transmitters having intelligence in storage. *See also:* telegraphy. (EEC/PE) [119]

varistor (A) A two-terminal resistive element, composed of an electronic semiconductor and suitable contacts, that has a markedly nonlinear volt-ampere characteristic. **(B)** A two-terminal semiconductor device having a voltage-dependent nonlinear resistance. *Note:* Varistors may be divided into two groups, symmetrical and nonsymmetrical, based on the symmetry or lack of symmetry of the volt-ampere curve. *See also:* semiconductor. (ED) 216-1960

varistor capacitance (low voltage varistor surge arresters) Capacitance between the two terminals of the varistor measured at a specified frequency and bias. (PE) [8]

varistor resistance (low voltage varistor surge arresters) Static resistance of the varistor at a given operating point, described as the ratio of varistor voltage to varistor current. (PE) [8]

varistor voltage (low voltage varistor surge arresters) Voltage across the varistor measured at a given current. (PE) [8]

varmeter (reactive volt-ampere meter) An instrument for measuring reactive power. It is provided with a scale usually graduated in either vars, kilovars, or megavars. If the scale is graduated in kilovars or megavars, the instrument is usually designated as a kilovarmeter or megavarmeter. *See also:* instrument. (PE/EEC) [119]

varnish (rotating machinery) A liquid composition that is converted to a transparent or translucent solid film after application as a thin layer. (PE) [9]

varnished fabric (rotating machinery) A fabric or mat in which the elements and interstices have been essentially coated and filled with an impregnant such as a compound or varnish and that is relatively homogeneous in structure. *Synonym:* varnished mat. *See also:* rotor; stator. (PE) [9]

varnished mat *See:* varnished fabric.

varnished tubing A flexible tubular product made from braided cotton, rayon, nylon, glass, or other fibers, and coated, or impregnated and coated, with a continuous film or varnish, lacquer, a combination of varnish and lacquer, or other electrical insulating materials. (EEC/PE) [119]

varying duty (1) Operation at loads, and for intervals of time, both of which may be subject to wide variation. (NESC/NEC) [86]

(2) (rating of electric equipment) A requirement of service that demands operation at loads, and for periods of time, both of which may be subject to wide variation. *See also:* voltage regulator; asynchronous machine. (PE/IA/EI/TR/PKG) 96-1969w, C57.12.80-1978r, 333-1980w, C57.15-1968s

(3) A requirement of service that demands operation at intermittent current loading, and for periods of time, both of which may be subject to wide variation. (PE/TR) C57.16-1996

varying parameter *See:* linear varying parameter.

varying-speed motor A motor whose speed varies with the load, ordinarily decreasing when the load increases, such as a series-wound or repulsion motor. (IA/MT) 45-1998

varying-voltage control A form of armature-voltage control obtained by impressing on the armature of the motor a voltage that varies considerably with change in load, with a consequent change in speed, such as may be obtained from a differentially compound-wound generator or by means of resistance in the armature circuit. *See also:* control. (IA/IAC) [60]

vary off To make a device, control unit, or line unavailable for its normal intended use. *Contrast:* vary on. (C) 610.10-1994w

vary off-line To place a device in a state where it is not available for use by the system. *Contrast:* vary on-line. (C) 610.10-1994w

vary on To make a device, control unit, or line available for its normal intended use. *Contrast:* vary off. (C) 610.10-1994w

vary on-line To restore a device to a state where it is available for use by the system. *Contrast:* vary off-line. (C) 610.10-1994w

VASIS *See:* visual approach slope indicator system.

vault (1) A structurally solid enclosure above or below ground with access limited to personnel qualified to install, maintain, operate, or inspect the equipment or cable enclosed. The enclosure may have openings for ventilation, personnel access, cable entrance, and other openings required for operation of equipment in the vault. (NESC) C2-1997

(2) A non-automated (manual) library, i.e., a shelf. (C/SS) 1244.1-2000

vault-type transformer (power and distribution transformers) A transformer that is so constructed as to be suitable for occasional submerged operation in water under specified conditions of time and external pressure. (PE/TR) C57.12.80-1978r

VBA *See:* vibrating beam accelerometer.

V-band A radar-frequency band between 40 GHz and 75 GHz, usually in the International Telecommunication Union (ITU) allocated band 59–64 GHz. Included within the definition of millimeter-wave radar. *See also:* millimeter-wave radar. (AES) 686-1997

VBE *See:* valve base electronics.

V-beam radar A ground-based, three-dimensional radar system for the determination of range, bearing, and, uniquely, the height or elevation angle of the target. It uses two fan-shaped beams, one vertical and the other inclined, that rotate together in azimuth so as to give two responses from the target. The time difference between these responses, together with range, are used in determining the height of the target. (AES) 686-1997

V-channel metal-oxide semiconductor (VMOS) A type of n-channel metal-oxide semiconductor in which a V-shaped notch is used to increase the density. (C) 610.10-1994w

VCI *See:* virtual channel identifier.

VCO *See:* voltage-controlled oscillator.

VCP Vertical coupling plane. *See also:* coupling plane. (EMC) C63.16-1993

V curve (synchronous machines) The load characteristic giving the relationship between the armature current and the field current for constant values of load, power, and armature voltage. *See also:* asynchronous machine. (PE) [9]

VDD *See:* version description document.

VDM *See:* Vienna Development Method.

VDT *See:* video display terminal; visual display terminal.

VDU *See:* video display terminal; video display unit.

VE *See:* valve electronics.

vector (1) A mathematico-physical quantity that represents a vector quantity. (Std100) 270-1966w

(2) (data management) A quantity represented by an ordered set of numbers; for example, a one-dimensional array. (C) 610.5-1990w

(3) (computer graphics) A directed line segment. (C) 610.6-1991w

(4) A packet of data that is passed, by an interrupt handler, to a processor in response to an interrupt acknowledge. This data is typically used to identify to an operating system which interrupt subroutine handler should be dispatched in response to the asserted interrupt. (C/BA) 1014.1-1994w

(5) A one-dimensional array. (C/DA) 1076.3-1997, 1076.6-1999

(6) Every signal's stimuli/response to be applied/observed in the smallest integral "step" of a device test. Contains a collection of waveforms to be applied to the primary signals. *See also:* T0. (C/TT) 1450-1999

vector display device *See:* random-scan display device.

vector electrocardiogram (vectorcardiogram) (electrobiology) The 2-dimensional or 3-dimensional presentation of cardiac electric activity that results from displaying lead pairs against each other rather than against time. More strictly, it is a loop pattern taken from leads placed orthogonally. *See also:* electrocardiogram. (EMB) [47]

vector field The totality of vectors in a given region represented by a vector function $V(x,y,z)$ of the space coordinates x,y,z. (Std100) 270-1966w

vector font A scalable font that is stored as a series of geometric objects such as line or curve segments. *Synonym:* raster font. *See also:* outline font; bit map font. (C) 610.10-1994w

vector function A functional relationship that results in a vector. (Std100) 270-1966w

vector generator A component of the display processor hardware that generates directed line segments from end-point coordinates. (C) 610.6-1991w

vector graphics (1) The representation of an image by a collection of vectors. *Contrast:* raster graphics. *See also:* random-scan; random-scan display device. (C) 610.6-1991w

(2) *See also:* random-scan display device. (C) 610.10-1994w

vector norm The measure of the size of a vector, with the usual norm properties. *Notes:* 1. Vector norm of x is denoted by $\|x\|$. 2. Norm properties are:

$\|x\| > 0 \qquad$ for $x \neq 0$

$\|0\| = 0$

$\|\alpha x\| = |\alpha| \times \|x\|$

$\|x_1 + x_2\| \leq \|x_1\| + \|x_2\|$

(CS/PE/EDPG) [3]

vector operator del (∇) A differential operator defined as follows in terms of Cartesian coordinates:

$$\nabla = \mathbf{i}\frac{\partial}{\partial x} + \mathbf{j}\frac{\partial}{\partial y} + \mathbf{k}\frac{\partial}{\partial z}$$

(Std100) 270-1966w

Vector Parameter An instance of the class `IEEE1451_VectorParameter` or of a subclass thereof. (IM/ST) 1451.1-1999

vector processor *See:* array processor.

vector product (cross product) The vector product of vector A and a vector B is a vector C that has a magnitude obtained by multiplying the product of the magnitudes of A and B by the sine of the angle between them: the direction of C is that traveled by a right-hand screw turning about an axis perpendicular to the plane of A and B, in the sense in which A would move into B by a rotation of less than 180 degrees: it is assumed that A and B are drawn from the same point. The vector product of two vectors A and B may be indicated by using a small cross: $\mathrm{A} \times \mathrm{B}$. The direction of the vector product depends on the order in which the vectors are multiplied, so that $\mathrm{A} \times \mathrm{B} = -\mathrm{B} \times \mathrm{A}$. If the two vectors are given in terms of their rectangular components, then

$$\mathbf{A} \times \mathbf{B} = \begin{vmatrix} \mathbf{ijk} \\ A_xA_yA_z \\ B_xB_yB_z \end{vmatrix}$$

$$= \mathbf{i}(A_yB_z - A_zB_y) + \mathbf{j}(A_zB_x - A_xB_z) + \mathbf{k}(A_xB_y - A_yB_x)$$

Example: The linear velocity V of a particle in a rotating body is the vector product of the angular velocity ω and the radius vector r from any point on the axis to the point in question, or

$$\mathrm{V} = \omega \times \mathrm{r} = -\mathrm{r} \times \omega$$

(Std100) 270-1966w

vector quantity Any physical quantity whose specification involves both magnitude and direction and that obeys the parallelogram law of addition. (Std100) 270-1966w

vector radiative transport An attempt to incorporate the vector nature of electromagnetic waves into the energy conserving transport theory. *See also:* radiative transfer theory. (AP/PROP) 211-1997

Vector Series Parameter An instance of the class `IEEE1451_VectorSeriesParameter` or of a subclass thereof. (IM/ST) 1451.1-1999

vector, state *See:* state vector.

vector unit An arithmetic unit that operates on multiple data elements at the same time. *Contrast:* scalar unit. (C) 610.10-1994w

vehicle (1) (navigation aids) That in or on which a person or thing is being or may be carried. (AES/GCS) 172-1983w **(2)** A land conveyance assembly for carrying or transporting people or objects, capable of traversing a guideway, having structural integrity, and general mechanical completeness, but not necessarily designed for independent operation. (VT/RT) 1477-1998, 1473-1999, 1475-1999, 1474.1-1999, 1476-2000

vehicle-derived navigation data (navigation aids) Data obtained from measurements made at a vehicle. (AES/GCS) 172-1983w

vehicle maneuver effects Gyro output errors due to vehicle maneuvers. (AES/GYAC) 528-1984s

vehicle service table (VST) The answer of the onboard equipment (OBE) application layer in response to a received beacon service table (BST). The VST contains the identifier of applications supported by the OBE and profiles used for further point-to-point communication. (SCC32) 1455-1999

veiling brightness (illuminating engineering) A brightness superimposed on the retinal image which reduces its contrast. It is this veiling effect produced by bright sources or areas in the visual field which results in decreased visual performance and visibility. (EEC/IE) [126]

veiling reflections (1) (illuminating engineering) Regular reflections that are superimposed upon diffuse reflections from an object which partially or totally obscure the details to be seen by reducing the contrast. This sometimes is called reflected glare. *See also:* reflected glare. (EEC/IE) [126] **(2) (electric power systems in commercial buildings)** Reflected light from a task that reduces visibility because the light is reflected specularly from shiny details of the task, which brightens those details and reduces the contrast with the background. (IA/PSE) 241-1990r

Veitch chart *See:* Veitch diagram.

Veitch diagram A variation of the Karnaugh map in which the rows and columns are headed with combinations of the variables in a straight binary sequence. *Synonyms:* Veitch-Karnaugh diagram; Veitch chart. (C) 1084-1986w

Veitch-Karnaugh diagram *See:* Veitch diagram.

velocity correction A method of register control that takes the form of a gradual change in the relative velocity of the web. (IA/ICTL/IAC) [60]

velocity level in decibels of a sound Twenty times the logarithm to the base 10 of the ratio of the particle velocity of the sound to the reference particle velocity. The reference particle velocity shall be stated explicitly. *Note:* In many sound fields the particle velocity ratios are not proportional to the square root of corresponding power ratios and hence cannot be expressed in decibels in the strict sense: however, it is common practice to extend the use of the decibel to these cases. (SP/ACO) [32]

velocity microphone A microphone in which the electric output substantially corresponds to the instantaneous particle velocity in the impressed sound wave. *Note:* A velocity microphone is a gradient microphone of order one, and it is inherently bidirectional. *See also:* gradient microphone; microphone. (SP) [32]

velocity-modulated amplifier (velocity-variation amplifier) An amplifier that employs velocity modulation to amplify radio frequencies. *See also:* amplifier. (EEC/PE) [119]

velocity-modulated oscillator An electron-tube structure in which the velocity of an electron stream is varied (velocity-modulated) in passing through a resonant cavity called a buncher. Energy is extracted from the bunched electron stream at a higher energy level in passing through a second cavity resonator called the catcher. Oscillations are sustained by coupling energy from the catcher cavity back to the buncher cavity. *See also:* oscillatory circuit. (AP/ANT) 145-1983s

velocity-modulated tube An electron-beam tube in which the velocity of the electron stream is alternately increased and decreased with a period comparable with the total transit time. (ED) [45], [84]

velocity modulation (velocity variation) (of an electron beam) The modification of the velocity of an electron stream by the alternate acceleration and deceleration of the electrons with a period comparable with the transit time in the space concerned. *See also:* velocity-modulated tube; velocity-modulated oscillator. (ED) 161-1971w

velocity response The clutter filter frequency response defined by the ratio of power gain at a specific target Doppler frequency to the average power gain over all target Doppler frequencies of interest. *Note:* Applied to moving-target indication (MTI) radars. (AES) 686-1997

velocity, room air *See:* room air velocity.

velocity shock A mechanical shock resulting from a nonoscillatory change in velocity of an entire system. (SP) [32]

velocity sorting (electronics) Any process of selecting electrons according to their velocities. (ED) 161-1971w

velocity storage (accelerometer) The velocity information that is stored in the accelerometer as a result of its dynamics. (AES/GYAC) 528-1994, 530-1978r

velocity storage, normal *See:* normal velocity storage.

velocity storage, overrange *See:* overrange velocity storage.

velocity variation *See:* velocity modulation.

velocity-variation amplifier *See:* velocity-modulated amplifier.

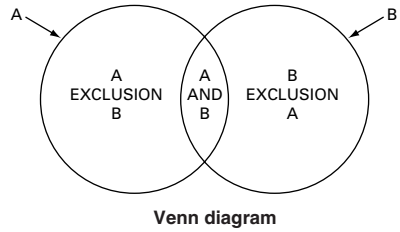
vendor A supplier of packaged software. (C/PA) 1387.2-1995

vendor-defined (1) Parameters that identify and particularize a specific vendor implementation. *Synonym:* vendor-dependent. (C/BA) 896.3-1993w, 896.4-1993w **(2)** An item, such as a nonstandard attribute, that is defined by the vendor that created (packaged) the software. (C/PA) 1387.2-1995

vendor-dependent (1) A term used to describe parameters that may vary between vendors supplying the same node or unit architectures. Although the CSR Architecture may constrain the definition of these fields, their format and definition is provided by the module vendor. Note that vendor-dependent fields may be standardized or left implementation-specific, depending on the vendor's needs. (C/MM) 1212-1991s **(2)** *See also:* vendor-defined. (C/BA) 896.4-1993w

vendor-supplied An item, such as a control file, that is supplied by the creator (packager) of the software. (C/PA) 1387.2-1995

Venn diagram A diagram in which sets are represented by closed regions. (See the corresponding figure.)



Venn diagram

(C) [20], [85], 1084-1986w

vent (1) (rotating machinery) An opening that will permit the flow of air. (PE) [9]

(2) (of a fuse) The means provided for the escape of the gases developed during circuit interruption. *Note:* In distribution oil cutouts, the vent may be an opening in the housing, or an accessory attachable to a vent opening in the housing with suitable means to prevent loss of oil. (SWG/PE) C37.100-1992, C37.40-1993

(3) An intentional opening for the escape of gases to the outside. (SPD/PE) C62.11-1999

vented battery A battery in which the products of electrolysis and evaporation are allowed to escape freely to the atmosphere. These batteries are commonly referred to as "flooded." (SCC29) 485-1997

vented cell (1) A cell in which the products of electrolysis and evaporation are allowed to escape to the atmosphere as they are generated. These cells are commonly referred to as "flooded." (PE/SB/EDPG) 1106-1995, 450-1995, 1184-1994, 1189-1996

(2) A cell in which the products of electrolysis and evaporation are allowed to escape to the atmosphere as they are generated. These batteries are commonly referred to as "flooded." (SCC21) 937-2000

(3) A cell design that is characterized by an excess of free electrolyte, and in which the products of electrolysis and evaporation can freely exit the cell through a vent. *Synonyms:* flooded cell; wet cell. (IA/PSE) 446-1995

(4) *See also:* vented battery. (PE/EDPG) 484-1996

vented fuse (or fuse unit) A fuse with provision for the escape of arc gases, liquids, or solid particles to the surrounding atmosphere during circuit interruption. (SWG/PE) C37.100-1992, C37.40-1993

vented power fuse (installations and equipment operating at over 600 volts, nominal) D A fuse with provision for the escape of arc gases, liquids, or solid particles to the surrounding atmosphere during circuit interruption. (NEC/NESC) [86]

vent finger *See:* duct spacer.

ventilated (power and distribution transformers) Provided with a means to permit circulation of the air sufficiently to remove an excess of heat, fumes, or vapors. (PE/EM/TR) C57.12.80-1978r, 86-1987w

ventilated dry-type transformer (dry-type general purpose distribution and power transformers) A dry-type transformer which is so constructed that the ambient air may circulate through its enclosure to cool the transformer core and windings. (PE/TR) C57.94-1982r, C57.12.80-1978r

ventilated enclosure (1) (metal-enclosed bus and calculating losses in isolated-phase bus) An enclosure so constructed as to provide for the circulation of external air through the enclosure to remove heat, fumes, or vapors. (SWG/PE) C37.23-1987r

(2) An enclosure provided with means to permit circulation of sufficient air to remove an excess of heat, fumes, or vapors. *Note:* For outdoor applications ventilating openings or louvres are usually filtered, screened, or restricted to limit the entrance of dust, dirt, or other foreign objects. (SWG/PE) C37.100-1992

ventilating and cooling loss (synchronous machines) Any power required to circulate the cooling medium through the machine and cooler (if used) by fans or pumps that are driven by external means (such as a separate motor) so that their power requirements are not included in the friction and windage loss. It does not include power required to force ventilating gas through any circuit external to the machine and cooler. (PE) [9], [84]

ventilating duct (rotating machinery) A passage provided in the interior of a magnetic core in order to facilitate circulation of air or other cooling agent. *Synonym:* cooling duct. (PE) [9], [84]

ventilating passage (rotating machinery) A passage provided for the flow of cooling medium. (PE) [9]

ventilating slot (rotating machinery) A slot provided for the passage of cooling medium. (PE) [9]

verbal-descriptive model *See:* narrative model.

verb phrase (A) A part of the label of a relationship that names the relationship in a way that a sentence can be formed by combining the first class name, the verb phrase, the cardinality expression, and the second class name or role name. A verb phrase is ideally stated in active voice. For example, the statement "*each project funds one or more tasks*" could be derived from a relationship showing "`project`" as the first class, "`task`" as the second class with a "one or more" cardinality, and "funds" as the verb phrase. **(B)** A phrase used to name a relationship, which consists of a verb and words that constitute the object of the phrase. (C/SE) 1320.2-1998

verge-punched card *See:* edge-punched card.

verification (1) (programmable digital computer systems in safety systems of nuclear power generating stations) The process of determining whether or not the product of each phase of the digital computer system development process fulfills all the requirements imposed by the previous phase. 7432-1982w

(2) (software verification and validation plans) The process of determining whether or not the products of a given phase of the software development cycle fulfill the requirements established during the previous phase. (C/SE) 1012-1986s

(3) (nuclear power quality assurance) The act of reviewing, inspecting, testing, checking, auditing, or otherwise determining and documenting whether items, processes, services, or documents conform to specified requirements. (PE/NP) [124]

(4) (A) (software) The process of evaluating a system or component to determine whether the products of a given development phase satisfy the conditions imposed at the start of that phase. **(B) (software)** Formal proof of program correctness. *See also:* proof of correctness. (C) 610.12-1990

(5) The process of evaluating a system or component to determine whether the system of a given development phase satisfies the conditions imposed at the start of that phase. (C/SE) 1233-1998

(6) Confirmation by examination (testing) with evidence that specified requirements have been met. (NI) N42.22-1995

(7) The process of determining that an implementation of a distributed simulation accurately represents the developer's conceptual description and specifications. (C/DIS) 1278.4-1997

verification and validation (V&V) The process of determining whether the requirements for a system or component are complete and correct, the products of each development phase fulfill the requirements or conditions imposed by the previous phase, and the final system or component complies with specified requirements. *See also:* independent verification and validation. (C/PE/NP) 610.12-1990, 7-4.3.2-1993

verification relay A monitoring relay restricted to functions pertaining to power-system conditions and not involving opening circuit breakers during fault condition. *Note:* Such a relay is sometimes referred to as a check or checking relay. (SWG/PE) C37.100-1992

verification system *See:* automated verification system.

verified frame A valid frame, addressed to the station, for which the information field has met the validity requirements. (C/LM) 8802-5-1998

verify To check, usually automatically, one typing or recording of data against another in order to minimize human and machine errors in the punching of tape or cards. (C) 162-1963w

vernier control A method for improving resolution. The amount of vernier control is expressed as either the percent of the total operating range or of the actual operating value, whichever is appropriate to the circuit in use. *See also:* feedback control system. (PE/ICTL/PSE) [54]

version (1) (A) An initial release or re-release of a computer software configuration item, associated with a complete compilation or recompilation of the computer software configuration item. **(B)** An initial release or complete re-release of a document, as opposed to a revision resulting from issuing change pages to a previous release. *See also:* version description document; configuration control. (C) 610.12-1990

(2) A unique identification of software based on the attributes of the software. Version differentiates software objects with the same value of the *tag* attribute. Versions of bundles or products have the same value of the *tag* attribute and will differ by the value of at least one of *revision*, *architecture*, *vendor_tag*, *location*, or *qualifier* attributes. The *location* and *qualifier* attributes only apply to software in installed_software software_collections. A fileset is considered a version of another fileset if they have the same fileset.tag and their respective products have the same *product.tag*. (C/PA) 1387.2-1995

(3) *See also:* dialect. (C) 610.13-1993w

version description document (VDD) A document that accompanies and identifies a given version of a system or component. Typical contents include an inventory of system or component parts, identification of changes incorporated into this version, and installation and operating information unique to the version described. (C) 610.12-1990

vertex *See:* node.

vertex plate (of a reflector antenna) A small auxiliary reflector placed in front of the main reflector near its vertex for the purpose of reducing the standing waves in the feed due to reflected waves from the main reflector. (AP/ANT) 145-1993

vertical amplifier (oscilloscopes) An amplifier for signals intended to produce vertical deflection. *See also:* oscillograph. (IM/HFIM) [40]

vertical antenna An antenna consisting of a vertically arranged conductor. *Synonym:* whip antenna. (T&D/PE) 539-1990

vertical-break switch A switch in which the travel of the blade is in a plane perpendicular to the plane of the mounting base. The blade in the closed position is parallel to the mounting base. (SWG/PE) C37.100-1992

vertical bushing A bushing intended to be mounted vertically or at an angle not exceeding 20° from the vertical. (PE/TR) C57.19.03-1996

vertical component of the electric field strength (measurement of power frequency electric and magnetic fields from ac power lines) The root-mean-square (rms) value of the component of the electric field along the vertical line passing through the point of measurement. This quantity is often used to characterize electric field induction effects in objects close to ground level. (T&D/PE) 539-1990, 644-1994

vertical deflection axis (oscilloscopes) The vertical trace obtained when there is a vertical deflection signal and no horizontal deflection signal. (IM) 311-1970w

vertical feed Pertaining to the motion of a punch card along a card feed path with the short edge first. *Contrast:* horizontal feed. (C) 610.10-1994w

vertical footcandles (VFC) Illuminance measured in a vertical plane. (RL) C136.10-1996

vertical, gravity *See:* mass-attraction vertical.

vertical gyro A two-degree-of-freedom gyro with provision for maintaining the spin axis vertical. In this gyro, output signals are produced by gimbal angular displacements that correspond to angular displacements of the case surrounding two nominally orthogonal, horizontal axes. (AES/GYAC) 528-1994

vertical-hold control (television) A synchronizing control that adjusts the free-running period of the vertical-deflection oscillator. (BT/AV) 201-1979w

vertical justification In text formatting, justification of text by adding small increments of vertical space between paragraphs and lines to create a well-spaced output page or a series of pages with equal top and bottom margins. (C) 610.2-1987

vertical linearity (oscilloscopes) The change in deflection factor of an oscilloscope as the display is positioned vertically within the graticule area. *See also:* compression; expansion. (IM) 311-1970w

vertically integrated microprocessor A microprocessor in which vertical microinstructions can be performed. *Contrast:* horizontally integrated microprocessor. (C) 610.10-1994w

vertically polarized field vector A linearly polarized field vector whose direction is vertical. (AP/ANT) 145-1993

vertically polarized plane wave A plane wave whose electric field vector is vertically polarized. (AP/ANT) 145-1993

vertically polarized wave (radio-wave propagation) A linearly polarized wave whose electric field vector is vertical. *Notes:* 1. See parallel polarization. 2. The term "vertical polarization" is commonly employed to characterize ground-wave propagation in the medium-frequency broadcast band; these waves, however, have a small component of electric field in the direction of propagation due to finite ground conductivity. (AP) 211-1977s

vertical machine (rotating machinery) A machine whose axis is rotation is approximately vertical. (PE) [9]

vertical magnetic recording *See:* perpendicular magnetic recording.

vertical microinstruction A microinstruction that specifies one of a sequence of operations needed to carry out a machine language instruction. *Note:* Vertical microinstructions are relatively short, 12 to 24 bits, and are called "vertical" because a sequence of such instruction, normally listed vertically on a page, are required to carry out a single machine language instruction. *Contrast:* diagonal microinstruction; horizontal microinstruction. (C) 610.12-1990, 610.10-1994w

vertical plane of a searchlight (illuminating engineering) The plane through the axis of the searchlight drum which contains the elevation angle. (EEC/IE) [126]

vertical polarization *See:* parallel polarization.

vertical reach switch A switch in which the stationary contact is supported by a structure separate from the hinge-mounting base. The blade in the closed position is perpendicular to the hinge-mounting base. (SWG/PE) C37.100-1992, C37.30-1971s

vertical recording A mechanical recording in which the groove modulation is in a direction perpendicular to the surface of the recording medium. (EEC/PE) [119]

vertical redundancy check A parity check performed on each character of a transmitted block of data as the block is received. *Note:* This method can use even or odd parity, and it may be used on non-ASCII characters. *See also:* longitudinal redundancy check. (C) 610.7-1995

vertical riser cable Cable designed for use in long vertical runs, as in tall buildings. (PE) [4]

vertical rod or shaft A component of a switch-operating mechanism designed to transmit motion from an operating handle or power operator to a switch offset bearing or bell crank. (SWG/PE) C37.100-1992, C37.30-1971s

vertical section (1) (metal-clad and station-type cubicle switchgear) (metal-enclosed interrupter switchgear) (metal-enclosed low-voltage power circuit-breaker switchgear) That portion of the switchgear assembly between two successive vertical delineations and may contain one or more circuit breakers, auxiliary compartments, and associated primary conductors. (SWG/PE) C37.20.1-1993r, C37.20.2-1993

(2) (nuclear power generating station) A portion of the motor control center normally containing one vertical bus assembly. (PE/NP) 649-1980s

(3) That portion of the switchgear assembly between two successive vertical delineations and may contain one or more switch compartments and associated primary conductors. (SWG/PE) C37.20.3-1996

(4) That portion of the switchgear assembly between two successive vertical delineations. It may contain one or more units. (SWG/PE) C37.100-1992

vertical switchboard A control switchboard composed only of vertical panels. *Note:* This type of switchboard may be enclosed or have an open rear. An enclosed vertical switchboard has an overall sheet-metal enclosure (not grille) covering back and ends of the entire assembly, access to which is usually provided by doors or removable covers. (SWG/PE) C37.100-1992, C37.21-1985r

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

vertical tabulation (A) On an impact printer or typewriter, movement of the imprint position to another writing line. **(B)** On a display device, movement of the cursor to another display line. *Contrast:* horizontal tabulation. (C) 610.10-1994

vertical tabulation character (VT) A format effector character that causes the print or display position to move to the corresponding position on the next of a series of predetermined lines. (C) 610.5-1990w

very fast front, short duration overvoltage A transient overvoltage in which a short duration, usually unidirectional, voltage is generated (often by GIS disconnect switch operation or when switching motors). High frequency oscillations are often superimposed on the unidirectional wave. (PE/C) 1313.1-1996

very fast front voltage shape This category has not been standardized at this time. (PE/C) 1313.1-1996

very fast transients (VFT) (1) Switching- or breakdown-induced transients with rise times of 3–10 ns that propagate as traveling waves throughout the GIS and cause overvoltage waveforms that vary as a function of position throughout a substation, and that couple to the external enclosure of SF_6-to-air terminations and can thereby cause external sparking between the enclosure and the support structure. (SUB/PE) C37.122.1-1993

(2) A class of transients generated internally within a gas-insluated substation (GIS) characterized by short duration and very high frequency. VFT is generated by the rapid collapse of voltage during breakdown of the insulating gas, either across the contacts of a switching device or line-to-ground during a fault. These transients can have rise times in the order of nanoseconds implying a frequency content extending to about 100 MHz. However, dominant oscillation frequencies, which are related to physical lengths of GIS bus are usually in the 20–40 MHz range. (PE/SUB) 80-2000

very fast transients overvoltage (VFTO) System overvoltages which result from generation of VFT. While VFT is one of the main constituents of VFTO, some lower frequency ($\cong$ 1 MHz) component may be present as a result of the discharge of lumped capacitance (voltage transformers). Typically, VFTO will not exceed 2.0 per unit although higher magnitudes are possible in specific instances. (PE/SUB) 80-2000

very high frequency (VHF) 30–300 MHz. *See also:* radio spectrum. (AP/PROP) 211-1997

very high-frequency omnidirectional range (VOR) (navigation aids) A navigation aid operating at VHF (very high frequency) and providing radial lines of position in any direction as determined by bearing selection within the receiving equipment; it emits a (variable) modulation whose phase, relative to a reference modulation, is different for each bearing of the receiving point from the station. (AES/GCS) 172-1983w

very-high-frequency radar A radar operating at frequencies between 30 MHz and 300 MHz, usually in one of the International Telecommunication Union (ITU) allocated bands 138–144 MHz or 216–225 MHz. (AES) 686-1997

very-high-speed integrated circuit (VHSIC) An integrated circuit designed to operate at extremely high speeds. (C) 610.10-1994w

very large scale integration (VLSI) (A) Pertaining to an integrated circuit containing between 2×104 and 106 transistors in its design. *See also:* ultra-large scale integration; medium scale integration; large scale integration; small scale integration. **(B)** Pertaining to an integrated circuit containing between 5000 and 106 elements. (C) 610.10-1994

very long instruction word (VLIW) An instruction word of uniform length, in excess of 128 bits. (C) 610.10-1994w

very low frequency (VLF) 3–30 kHz. *See also:* radio spectrum. (AP/PROP) 211-1997

very-low-frequency high-potential test An alternating-voltage high-potential test performed at a frequency equal to or less than 1 hertz. *See also:* asynchronous machine. (PE) [9]

very-low-frequency test A test made at a frequency considerably lower than the normal operating frequency. *Note:* In order to facilitate communication and comparison among investigators, this document recommends that the very low frequency used be 0.1 Hz + 25 percent. (PE/EM) 433-1974r

vessel A container such as a barrel, a drum, or a tank for holding fluids or other material. (NESC/IA/PC) 844-1991, [86]

vestigial lobe *See:* shoulder lobe.

vestigial sideband (data transmission) The transmitted portion of the sideband that has been largely suppressed by a transducer having a gradual cutoff in the neighborhood of the carrier frequency, the other sideband being transmitted without much suppression. (PE) 599-1985w

vestigial-sideband modulation A modulation process involving a prescribed partial suppression of one of the two sidebands. (Std100) 270-1964w

vestigial-sideband transmission (facsimile) That method of signal transmission in which one normal sideband and the corresponding vestigial sideband are utilized. *See also:* amplitude modulation; facsimile transmission. (COM) 168-1956w

vestigial-sideband transmitter A transmitter in which one sideband and a portion of the other are intentionally transmitted. *See also:* radio transmitter. (AP/ANT) 145-1983s

VHDL *See:* VHSIC Hardware Description Language.

VHF *See:* very high frequency.

VHSIC Hardware Description Language (VHDL) (1) A language format for a simulatable product description for digital systems. (ATLAS) 1226-1993s

(2) A standard language of the United States Department of Defense, used in the description, design and simulation of very high-speed integrated circuits (VHSIC) and computer logic systems; standardized by IEEE. (C) 610.13-1993w

VF *See:* voice frequency; forward bias.

VFC *See:* vertical footcandles.

V format *See:* variable format.

VFT *See:* very fast transients.

VHF radar *See:* very-high-frequency radar.

VHSIC *See:* very-high-speed integrated circuit.

via In Physical Design Exchange Format (PDEF), a physical connection between two different levels of interconnect, or between a level of interconnect and a physical or logical pin. (C/DA) 1481-1999

vial (liquid-scintillation counters) (liquid-scintillation counting) A glass or plastic sample container that meets the dimensional specifications of International Electrotechnical Commission (IEC) Pub 582-1977. (NI) N42.15-1990, N42.16-1986

via net loss (vnl) (data transmission) The net losses of trunks in the long distance switched telephone network of North America. The trunk is said to be in a via condition when it is an intermediate trunk in a longer switched connection. (PE) 599-1985w

vibrating beam accelerometer (VBA) (inertial sensors) A linear accelerometer whose proof mass is mechanically constrained by a force-sensitive beam resonator. The resultant oscillation frequency is a function of input acceleration. (AES/GYAC) 528-1994

vibrating bell A bell having a mechanism designed to strike repeatedly when and as long as actuated. *See also:* protective signaling. (EEC/PE) [119]

vibrating circuit (telegraph circuits) An auxiliary local timing circuit associated with the main line receiving relay for the purpose of assisting the operation of the relay when the definition of the incoming signals is indistinct. *See also:* telegraphy. (EEC/PE) [119]

vibrating-contact machine regulator A regulator that varies the excitation of an electric machine by changing the average time of engagement of vibrating contacts in the field circuit. (SWG/PE) C37.100-1992

vibrating probe (measurement of dc electric field strength) A device in which a plate is modulated below an aperture of a face plate in the electric field to be measured. *Note:* The meter responds to the oscillating displacement current from the induced charge on the vibrating plate by generating a negative feedback voltage on the face plate to null the signal from the vibrating plate. The electric-field strength is proportional to the feedback voltage. (T&D/PE) 539-1990, 1227-1990r

vibrating-reed relay A relay in which the application of an alternating or a self-interrupted voltage to the driving coil produces an alternating or pulsating magnetic field that causes a reed to vibrate and operate contacts. *See also:* relay. (EEC/REE) [87]

vibrating string accelerometer (VSA) A device that employs one or more vibrating strings whose natural frequencies are affected as a result of acceleration acting on one or more proof masses. (AES/GYAC) 528-1994

vibrating-type conveyor A conveyor consisting of a movable bed mounted at an angle to the horizontal, that vibrates in such a way that the material advances. *See also:* conveyor. (EEC/PE) [119]

vibration An oscillation wherein the quantity is a parameter that defines the motion of a mechanical system. *See also:* oscillation. (SP) [32]

vibration detection system (protective signaling) A system for the protection of vaults by the use of one or more detector buttons firmly fastened to the inner surface in order to pick up and convert vibration, caused by burglarious attack on the structure, to electric impulses in a protection circuit. *See also:* protective signaling. (EEC/PE) [119]

vibration meter An apparatus including a vibration pickup, calibrated amplifier, and output meter for the measurement of displacement, velocity, and acceleration of vibrations. *See also:* instrument. (EEC/PE) [119]

vibration relay A relay that responds to the magnitude and frequency of a mechanical vibration. (SWG/PE) C37.100-1992

vibration test (rotating machinery) A test taken on a machine to measure the vibration of any part of the machine under specified conditions. (PE) [9]

vibrato A family of tonal effects in music that depend upon periodic variations in one or more characteristics of the sound wave. *Note:* When the particular characteristics are known, the term vibrato should be modified accordingly, for example, frequency vibrato; amplitude vibrato; phase vibrato and so forth. (SP) [32]

vibrator (cable plowing) That device which induces the vibration in a vibratory plow. *See also:* vibratory plow. (T&D/PE) 590-1977w

vibratory isolation (cable plowing) Percentage reduction in force transmitted from vibration source to receiver by use of flexible mounting(s) (amount of isolation for a given unit varies with plow blade frequency). (T&D/PE) 590-1977w

vibratory plow (cable plowing) A plow utilizing induced periodic motion(s) of the blade in conjunction with drawbar pull for its movement through the soil. *Note:* Orbital and oscillating plows are types of vibratory plows that are commercially available. (T&D/PE) 590-1977w

vibropendulous error (accelerometer) A cross-coupling rectification error caused by angular motion of the pendulum in a pendulous accelerometer in response to a linear vibratory input. The error varies with frequency and is maximum when the vibratory acceleration is applied in a plane normal to the output axis and at 45° to the input axis. (AES/GYAC) 528-1994

vicenary (A) Pertaining to a selection in which there are 20 possible outcomes. **(B)** Pertaining to the numeration system with a radix of 20. (C) 1084-1986

video (1) (television) A term pertaining to the bandwidth and spectrum position of the signal resulting from television scanning. *Note:* In present usage, video means a bandwidth of the order of several megahertz, and a spectrum position that goes with a direct-current carrier. *See also:* signal wave. (PE/EEC) [119]

(2) Refers to the signal after envelope or phase detection, which in early radar was the displayed signal. Contains the relevant radar information after removal of the carrier frequency. (AES) 686-1997

video board *See:* graphics adapter.

video conferencing A form of teleconferencing that uses television to allow participants to see one another. *See also:* computer conferencing. (C) 610.2-1987

video disk An optical disk used to store visual images that are to appear on a display device. (C) 610.10-1994w

video display *See:* video display terminal.

video display device *See:* display device; video display terminal.

video display terminal (VDT) (1) A device for the presentation of information by controlled excitation of a CRT screen for visual observation designed for interactive use by an operator. (EMC) 1140-1994r

(2) The visual equipment used as a user interface. *See also:* user interface. (SUB/PE) C37.1-1994

(3) A terminal in which a CRT, liquid-crystal, or plasma display device is used for the visual presentation of data. *Synonyms:* video display unit; video terminal. (C) 610.10-1994w

video display unit *See:* video display terminal.

video filter (non-real time spectrum analyzer) (spectrum analyzer) A post detection low-pass filter. (IM) 748-1979w

video-frequency amplifier A device capable of amplifying such signals as comprise periodic visual presentation. *See also:* television. (COM) 167-1966w

video integration A method of utilizing the redundancy of repetitive video signals to improve the output signal-to-noise ratio, by summing successive signals. Also called post-detection integration or noncoherent integration. (AES) 686-1997

video look-up table *See:* color look-up table.

video mapping The electronic superposition of geographic or other data on a radar display. (AES) 686-1997

video mixing The formation of a graphical display image by the merging of two images, one from a display buffer and one from a video signal. (C) 610.6-1991w

video monitor *See:* video display terminal.

video RAM (VRAM) (A) A special type of RAM used to hold and transfer an image onto a display device. *See also:* image memory. **(B)** A dual-port semiconductor memory that is specially designed for raster display devices. *Note:* One port is connected directly to the processor; the other to the display device. (C) 610.10-1994

video stretching The increasing of the duration of a video pulse. (AES) 686-1997

video-telephone call (telephone switching systems) A call between stations equipped to provide video-telephone service. (COM) 312-1977w

video terminal *See:* video display terminal.

videotex A telecommunication system that allows users to interact with a computer by using a specially equipped television set and a keyboard to access remote data banks and to obtain consumer services such as electronic mail, teleordering, and bank services. (C) 610.2-1987, 610.6-1991w

video unit *See:* video display terminal.

vidicon A camera tube in which a charge-density pattern is formed by photoconduction and stored on that surface of the photoconductor that is scanned by an electron beam, usually of low-velocity electrons. *See also:* television. (BT/ED/AV) [34], [45]

Vienna Definition Language A metalanguage used to formally define the syntax and semantics of PL/1. (C) 610.13-1993w

Vienna Development Method (VDM) A specification language developed by IBM; widely used in Europe. (C) 610.13-1993w

view (A) (data management) A subset of a relational database, formed by applying relational operations to the base relations represented. *See also:* logical database. **(B) (data management)** A subset of a data model. *See also:* external schema. (C) 610.5-1990

(2) (A) A collection of subject domains, classes, relationships, responsibilities, properties, constraints, and notes assembled or created for a certain purpose and covering a certain scope. A view may cover the entire area being modeled or only a part of that area. **(B)** A collection of entities and assigned attributes (domains) assembled for some purpose. (C/SE) 1320.2-1998

view area (computer graphics) A rectangular region in a world coordinate system, containing a subset of the model. (C) 610.6-1991w

viewdata A form of videotex that allows users to access remote data banks via telephone and cable lines. *Contrast:* teletext. (C) 610.2-1987

view diagram A graphic representation of the underlying semantics of a view. (C/SE) 1320.2-1998

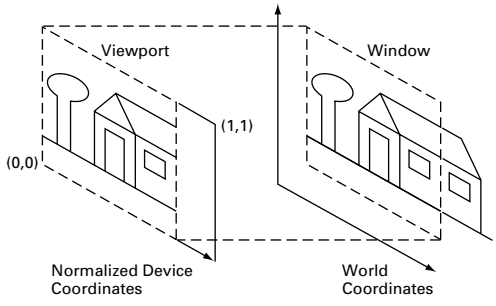
viewing area (oscilloscopes) The area of the phosphor screen of a cathode-ray tube that can be excited to emit light by the electron beam. *See also:* oscillograph. (IM) [39]

viewing operation *See:* viewing transformation.

viewing time (storage tubes) The time during which the storage tube is presenting a visible output corresponding to the stored information. *See also:* storage tube. (ED) 158-1962w

viewing time, maximum usable *See:* maximum usable viewing time.

viewing transformation (computer graphics) The process of mapping positions in world coordinates to positions in normalized device coordinates. (See the corresponding figure.) *Synonym:* normalization transformation; viewing operation.



viewing transformation

(C) 610.6-1991w

view integration (data management) The integration of two or more logical views into a single logical view. *Note:* This is generally done in the normalization stage of database design. (C) 610.5-1990w

view plane (computer graphics) A two-dimensional display surface onto which a three-dimensional image is projected. (C) 610.6-1991w

viewpoint statement A brief statement of the perspective of an IDEF0 model that is presented in the A-0 context diagram of the model. (C/SE) 1320.1-1998

viewport (computer graphics) A rectangular portion of a display surface onto which the contents of a display image are mapped. (C) 610.6-1991w

view surface The medium on which graphical display images appear. For example, plotter paper or the screen of a cathode ray tube display device. (C) 610.6-1991w

view volume (computer graphics) A region of a three-dimensional world coordinate system that is to be visible as the display image. (C) 610.6-1991w

vignette A self-contained portion or a scenario. (DIS/C) 1278.3-1996

virgin bar/coil A virgin bar/coil is a new, completely manufactured bar/coil with all armor tapes and coatings which, except for any semiconducting (or conducting) rubber coating, would have been installed in the stator core, but is now used in the thermal cycle tests. (PE/EM) 1310-1996

virgin medium (1) (data management) A data medium in or on which data have never been recorded. (C) 610.5-1990w

(2) A data medium on which neither marks of reference, nor user data, are or have ever been recorded; for example, paper that is unmarked, or magnetic tape that has never recorded information. *See also:* blank medium; empty medium. (C) 610.10-1994w

virtual address (1) (software) In a virtual storage system, the address assigned to an auxiliary storage location to allow that location to be accessed as though it were part of main storage. *Contrast:* real address. (C) 610.12-1990

(2) The address that a program uses to access a memory location or memory-mapped device register. (Depending on the presence or absence of memory mapping hardware in the system, and whether or not that mapping hardware is enabled, a virtual address may or may not be the same as the physical address that appears on an external bus.) (C/BA) 1275-1994

(3) In a virtual storage system, the address of a storage location. *See also:* physical address; direct reference address; address translator. (C) 610.10-1994w

virtual address space The set of all possible virtual addresses that a process can use to identify an instruction. (C) 610.10-1994w

virtual attribute (data management) An attribute that is derived from stored data by means of user-defined operations rather than being stored. (C) 610.5-1990w

Virtual Bridged Local Area Network (LAN) A Bridged LAN in which the existence of one or more VLAN-aware Bridges allows the definition, creation, and maintenance of VLANs. (C/LM) 802.1Q-1998

virtual cathode (electron tube) (potential-minimum surface) A region in the space charge where there is a potential minimum that, by reason of the space charge density, behaves as a source of electrons. (ED) [45], [84]

virtual channel A channel that behaves as a transducer from the point of view of the Network Capable Application Processor even though nothing outside of the Smart Transducer Interface Module is sensed or changed. Virtual channels are useful for setting or reading operating parameters of other channels. (IM/ST) 1451.2-1997

virtual channel identifier A label that is used to distinguish between the different virtual channels. A virtual channel is a logical association between entities that enables unidirec-

tional transfer of *segments* between the entities. In the context of this part of ISO/IEC 8802, the VCI label can be used to allow a transmitter to distinguish between different outgoing *protocol data units (PDUs),* and is used to allow a receiver to determine whether to receive an incoming segment as well as to distinguish between incoming PDUs. (LM/C) 8802-6-1994

virtual circuit (1) The generic concept of a logical connection. A virtual circuit may be implemented by means of a frame-switched service or a packet-switched service. (C/LM/COM) 802.9a-1995w, 8802-9-1996

(2) In networking, a circuit connecting a source and a sink that may be physically accomplished by using different circuit configurations during transmission of a message. *Note:* A virtual circuit looks like a permanent connection to the user. A switched virtual circuit requires call control and can be established and terminated by the user at will. *See also:* permanent virtual circuit; data circuit; switched virtual circuit; virtual data connection. (C) 610.7-1995

virtual circuit service *See:* connection-oriented service.

virtual data connection A data connection in which one or more of the data circuits are interconnected by a virtual circuit. (C) 610.7-1995

virtual disk *See:* RAM disk.

virtual duration (1) (surge arresters) (of a peak of a rectangular-wave current or voltage impulse) The time during which the amplitude of the wave is greater than 90 percent of its peak value. (PE/PSIM) [8], [84], 4-1978s

(2) (impulse) (of wave front) The virtual value of the duration of the wave front is as follows:

a) For voltage waves with a wave front duration of less than 30 microseconds, either full or chopped on the front, crest, or tail, 1.67 times the time it takes for the voltage to increase from 30% to 90% of its crest value.
b) For voltage waves with a wave front duration of the 30 microseconds or greater, the time it takes for the voltage to increase from actual zero to maximum crest value.
c) For current waves, 1.25 times the time it takes for the current to increase from 10% to 90% of crest value.

(SPD/PE) C62.62-2000

virtual duration of wavefront (of an impulse) The virtual value for the duration of the wavefront is as follows:

— For voltage waves with wavefront duration less than 30 μs, either full or chopped on the front, crest, or tail, 1.67 times the time for the voltage to increase from 30−90% of its crest value;
— For voltage waves with wavefront duration of 30 μs or more, the time taken by the voltage to increase from actual zero to maximum crest value;
— For current waves, 1.25 times the time for the current to increase from 10%−90% of crest value.

(SPD/PE) C62.11-1999

virtual field (data management) A field that appears to be but is not physically stored; rather, it is constructed or derived from existing data when its contents are requested by an application program. (C) 610.5-1990w

virtual filestore An abstract model for describing files and filestores, and the possible actions on them. (C/PA) 1238.1-1994w

virtual front time (T_1) (of a lightning impulse) The time interval between the instants when a smooth impulse is 30% and 90% of the peak value multiplied by 1.67. (PE/PSIM) 4-1995

virtual height (1) (data transmission) The apparent height of an ionized layer determined from the time interval between the transmitted signal and the ionospheric echo at vertical incidence, assuming that the velocity of propagation is the velocity of light over the entire path. (PE) 599-1985w

(2) The apparent height of reflection of a radio wave from an ionized layer. It is determined from the time interval between the transmitted pulse and the ionospheric echo at vertical incidence, assuming that the velocity of propagation is the velocity of light (in vacuum) over the entire path. (AP/PROP) 211-1997

virtual instant of chopping (voltage testing) The instant preceding point C on the figures (under virtual front time), by 0.3 times the (estimated) virtual time of voltage collapse during chopping. (PE/PSIM) [55]

virtual instrument software architecture (VISA) The general name given to the VPP (VXI Plug & Play) 4 Specification and its associated architecture. The architecture consists of two main VISA components: the VISA resource manager and the VISA instrument control resources. (SCC20) 1226-1998

virtual junction temperature The temperature of the active semiconductor element of a semiconductor device based on a simplified representation of the thermal and electrical behavior of the device. It is particularly applicable to multi-junction semiconductor devices. (IA) [12]

Virtual Local Area Network (VLAN) (1) A subset of the active topology of a Bridged Local Area Network. Associated with each VLAN is a VLAN Identifier (VID). (C/LM) 802.1Q-1998

(2) A Group to which each member Remote Bridge attaches by a single Virtual Port. *Note:* Such a Group comprises a single Subgroup. (C/LM) 802.1G-1996

Virtual LAN Port A Virtual Port by which a Remote Bridge attaches to a Virtual LAN. (C/LM) 802.1G-1996

virtual machine (software) A functional simulation of a computer and its associated devices. *See also:* simulation; computer. (C/SE) 729-1983s

virtual medical device (VMD) An abstract representation of a medical device system (or a patient care system) described in Medical Device Data Language-specific terminology. (EMB/MIB) 1073-1996

virtual memory *See:* virtual storage.

Virtual Mesh A Group to which each member Remote Bridge attaches by a set of Individual Virtual Ports, one for each other Remote Bridge in the Group. *Note:* Such a Group comprises $n \times (n-1)/2$ two-member Subgroups, where n is the number of Bridges in the Group. (C/LM) 802.1G-1996

virtual origin The intersection with the time axis of a straight line drawn as a tangent to the steepest portion of the impulse or response curve. (PE/PSIM) 4-1995

virtual peak value *See:* peak value.

virtual point picture character *See:* radix point character.

Virtual Port An abstraction of a Remote Bridge's point(s) of attachment to the non-LAN communications equipment of a single Group. A Virtual Port represents the capability for bidirectional communication with one, some, or all of the other Remote Bridges in that Group. *Note:* A Bridge can attach by two or more Virtual Ports to a single Group. (C/LM) 802.1G-1996

virtual rate of rise of the front (impulse voltage) The quotient of the peak value and the virtual front time. *Note:* The term peak value is to be understood as including the term virtual peak value unless otherwise stated. (PE/PSIM) [55]

virtual record A record that appears to be but is not physically stored; rather, it is constructed or derived from existing data when its contents are requested by an application program. (C) 610.5-1990w

virtual relation A relation that is not stored in a database in the form in which the user sees it, but is instead derived from base relations using user-defined operations. (C) 610.5-1990w

virtual resource (1) An abstract representation of a test capability, independent of its physical realization. (ATLAS) 1226-1993s

(2) An abstract representation of a UUT-directed, signal-oriented test capability. It is represented in ALTPI by instantiation of an Ada generic package with links to the test capability and path description objects. (ATLAS) 1226.2-1993w
(3) A notional test resource, the performance characteristics of which conform to a summary of related test requirements. (SCC20) 771-1998

virtual sequential access method (VSAM) An access method for direct or sequential access to data records on storage devices in which auxiliary storage can be addressed as though it were part of main storage. Pages of data are transferred as needed between auxiliary and main storage. *See also:* indexed sequential access method; basic sequential access method. (C) 610.5-1990w

virtual steepness of voltage during chopping (surge arresters) The quotient of the estimated voltage at the instant of chopping and the virtual time of voltage collapse. (PE/PSIM) [55], [84], [8]

virtual steepness of wavefront of an impulse (surge arresters) The slope of the line that determines the virtual-zero time. It is expressed in kilovolts per microsecond or kiloamperes per microsecond. (PE) [8], [84]

virtual storage (1) (software) A storage allocation technique in which auxiliary storage can be addressed as though it were part of main storage. Portions of a user's program and data are placed in auxiliary storage, and the operating system automatically swaps them in and out of main storage as needed. *Synonyms:* virtual memory; multilevel storage. *Contrast:* real storage. *See also:* virtual address; paging. (C) 610.12-1990
(2) The storage space that may be regarded as addressable main storage by the user of a computer system in which virtual addresses are mapped into real addresses. *Note:* The size of virtual storage is limited by the addressing scheme of the computer system and by the amount of auxiliary storage allocated to such use, but not by the actual number of main storage locations. (C) 610.10-1994w

virtual terminal A terminal that is defined as a standard on a network that can handle diverse terminals. (C) 610.7-1995

virtual time *See:* simulated times.

virtual time of voltage collapse during chopping 1.67 times the time interval between points C and D on the figures attached to the definition of virtual instant of chopping. (PE/PSIM) [55]

virtual time to chopping (impulse voltage) The time interval between the virtual origin and the virtual instant of chopping. (PE/PSIM) [55]

virtual time to half-value (T_2) The time interval between the virtual origin and the instant on the tail when the voltage has decreased to half of the peak value. (PE/PSIM) 4-1995

virtual total duration of a rectangular impulse current (high voltage testing) The virtual total duration of a rectangular impulse current is the time during which the amplitude of the impulse is greater than 10 percent of its peak value. If oscillations are present on the front, a mean curve should be drawn in order to determine the time at which the 10 percent value is reached. (PE/PSIM) 4-1978s

virtual zero point (1) (surge arresters) (of an impulse) The intersection with the zero axis of a straight line drawn through points on the front of the current wave at 10% and 90% crest value, or through points on the front of the voltage wave at 30% and 90% crest value. (PE/SPD) C62.1-1981s, C62.62-2000
(2) (of an impulse) The intersection with the time axis of a straight line drawn through points on the front of the current wave at 10% and 90% crest value or through points on the front of the voltage wave at 30% and 90% crest value. (SPD/PE) C62.22-1997, C62.11-1999

virtual zero time (surge arresters) (impulse voltage or current in a conductor) The point on a graph of voltage-time or current-time determined by the intersection with the zero voltage or current axis, of a straight line drawn through two points on the front of the wave: for full voltage waves and voltage waves chopped on the front, peak, or ail, the reference points shall be 30% of the peak value, and 82 for current waves the reference points shall be 10% and 90% of the peak value. *Synonym:* virtual origin. (PE) [8], [84]

viscous friction The component of friction that is due to the viscosity of a fluid medium, usually idealized as a force proportional to velocity, and that opposes motion. *See also:* feedback control system. (IA/IM/ICTL/APP/IAC) [69], [60], [120]

vise grip *See:* strand restraining clamp.

visibility (1) (meteorological) (illuminating engineering) A term that denotes the greatest distance that selected objects (visibility markers) or lights of moderate intensity of the order of 25 candles can be seen and identified under specified conditions of observation. The distance may be expressed in kilometers or miles in the USA until the metric system becomes more widely used. (IE/EEC) [126]
(2) (light-emitting diodes) The quality or state of being perceivable by the eye. In many outdoor applications, visibility is defined in terms of the distance at which an object can be just perceived by the eye. In indoor applications it usually is defined in terms of the contrast or size of a standard test object, observed under standardized viewing conditions, having the same threshold as the given object. *See also:* visual field. (IE/EEC) [126]
(3) (computer graphics) A segment attribute that determines if a display element is or is not to be displayed. (C) 610.6-1991w
(4) The specification, for a property, of "who can see it?"—i.e., whose methods can reference the property. Visibility is either private, protected, or public. (C/SE) 1320.2-1998

visibility factor (A) (pulsed radar) The ratio of single-pulse signal energy to noise power per unit bandwidth that provides stated probabilities of detection and false alarm on a display, measured in the intermediate-frequency portion of the receiver under conditions of optimum bandwidth and viewing environment. **(B) (continuous-wave radar)** The ratio of single-look signal energy to noise power per unit bandwidth using a filter matched to the time on target. The equivalent term for radar using automatic detection is detectability factor; for operation in a clutter environment a clutter visiblity factor is defined. (AES) [42]
(2) (A) (pulsed radar) The ratio of single-pulse signal energy to noise power per unit bandwidth that provides stated probability of detection for a given false alarm probability on a display, measured in the intermediate-frequency portion of the receiver under conditions of optimum bandwidth and viewing environment. **(B)** (continuous-wave radar) The ratio of single-look signal energy to noise power per unit bandwidth using a filter matched to the time on target. *Note:* The equivalent term for radar using automatic detection is detectability factor; for operation in clutter environment, a clutter visibility factor is defined. (AES) 686-1997

visibility level (illuminating engineering) A contrast multiplier to be applied to the visibility reference function to provide the luminance contrast required at different levels of task background luminance to achieve visibility for specified conditions relating to the task and observer. (EEC/IE) [126]

visibility performance criteria function (illuminating engineering) A function representing the luminance contrast required to achieve 99% visual certainty for the same task used for the visibility reference function, including the effects of dynamic presentation and uncertainty in task location. (EEC/IE) [126]

visibility reference function (illuminating engineering) A function representing a luminance contrast required at different levels of task background luminance to achieve visibility threshold for the visibility reference task consisting of a 4 min disk exposed for 1/5s. (EEC/IE) [126]

visible corona (1) (as applies to an air switch) A luminous discharge due to ionization of the air surrounding an air switch, caused by a voltage gradient exceeding a certain critical value. (SWG/PE) C37.34-1994

(2) A luminous discharge due to ionization of the air surrounding a device, caused by voltage gradient exceeding a certain critical value. (SWG/PE) C37.100-1992, C37.30-1971s

visible radiation (light) (laser maser) Electromagnetic radiation which can be detected by the human eye. It is commonly used to describe wavelengths which lie in the range between 0.4 μm and 0.7 μm. (LEO) 586-1980w

visible radiation emitting diode (light-emitting diodes) A semiconductor device containing a semiconductor junction in which visible light is nonthermally produced when a current flows as a result of an applied voltage. (ED) [127]

visible range For the case in which the field pattern of a continuous line source, L_λ wavelengths long, is expressed as a function of ψ ($\psi = L_\lambda \cos\theta$, the angle θ is measured from an axis coincident with the line source), that part of the infinite range of ψ that corresponds to a variation in the directional angle θ from π to 0 radians; that is, $-L_\lambda < \psi < L_\lambda$. *Notes:* 1. All values of ψ outside the visible range are said to be in the invisible range. 2. The formulation of the field pattern as a function of ψ is useful because the side lobes in the invisible range are a measure of the Q of the antenna. 3. This concept of a visible range can be extended to other antenna types. (AP/ANT) 145-1993

visible spectrum *See:* light.

visit To access the node of a tree during a traversal. (C) 610.5-1990w

visual A visual user interface control that provides a type indicating the specification for the color handling of a screen. A visual type may support multiple variations of depths and colormaps. Examples are monochrome, gray-scale, and several types of color. A visual is specified by a *depth* (for example, 8 b) and a *visual class* (for example, `Gray-Scale` or `PseudoColor`). A `Shell` widget or a `DrawArea` widget can have a nondefault visual. Other widgets use the visuals of their nearest shell or `DrawArea` ancestor. An application in which eligible widgets have nondefault visuals is termed a *multivisual* application. (C) 1295-1993w

visual acuity (illuminating engineering) A measure of the ability to distinguish fine details. Quantitatively, it is the reciprocal of the minimum angular separation in minutes of two lines of width subtending one minute of arc when the lines are just resolvable as separate. (EEC/IE) [126]

visual angle (illuminating engineering) The angle which an object or detail subtends at the point of observation. It usually is measured in minutes of arc. (EEC/IE) [126]

visual approach slope indicator system (VASIS) (illuminating engineering) The system of angle-of-approach lights accepted as a standard by the International Civil Aviation Organization, comprising two bars of lights located at each side of the runway near the threshold and showing red or white or a combination of both (pink) to the approaching pilot depending upon his position with respect to the glide path. (EEC/IE) [126]

visual-aural radio range *See:* visual-aural range.

visual-aural range (navigation aids) A special type of VHF (very high frequency) radio range which provides: 1) two reciprocal radio lines of position presented to the pilot visually on a course deviation indicator; and 2) two reciprocal radial lines of position presented to the pilot as interlocked and alternate A and N aural code signals. The aural lines of position are displaced 90° from the visual and either may be used to resolve the ambiguity of the other. (AES/GCS) 172-1983w

visual comfort probability (A) (illuminating engineering) The rating of a lighting system expressed as a percent of people who, when viewing from a specified location and in a specified direction, will be expected to find it acceptable in terms of discomfort glare. Visual Comfort Probability is related to Discomfort Glare Rating. *See also:* discomfort glare rating. **(B)** A rating of a lighting system expressed as a percentage of people who, if seated at the center of the rear of a room, will find the lighting visually acceptable in relation to the perceived glare. (EEC/IE/IA/PSE) [126], 241-1990

visual display terminal *See:* video display terminal.

visual display unit *See:* video display terminal.

visual field (illuminating engineering) The locus of objects or points in space which can be perceived when the head and eyes are kept fixed. Separate monocular fields for the two eyes may be specified or the combination of the two. (EEC/IE) [126]

visual inspection Qualitative observation of physical characteristics utilizing the unaided eye or with stipulated levels of magnification. (EEC/AWM) [105]

visual perception (illuminating engineering) The interpretation of impressions transmitted from the retina to the brain in terms of information about a physical world displayed before the eye. *Note:* Visual perception involves any one or more of the following: recognition of the presence of something (object, aperture or medium); identifying it; locating it in space; noting its relation to other things; identifying its movement, color, brightness or form. (EEC/IE) [126]

visual performance (illuminating engineering) The quantitative assessment of the performance of a task taking into consideration speed and accuracy. (EEC/IE) [126]

visual photometer (illuminating engineering) One in which the equality of brightness of two surfaces is established visually. *Note:* The two surfaces usually are viewed simultaneously side by side. This is satisfactory when the color difference between the test source and comparison source is small. However, when there is a color difference, a flicker photometer provides more precise measurements. In this type of photometer the two surfaces are viewed alternately at such a rate that the color sensations either nearly or completely blend and the flicker due to brightness difference is minimized by adjusting the comparison source. (EEC/IE) [126]

visual radio range (navigation aids) Any radio range (such as VOR [very high-frequency omnidirectional range]) whose primary function is to provide lines of position to be flown by visual reference to a course deviation indicator. (AES/GCS) 172-1983w

visual range (illuminating engineering) (of a light or object) The maximum distance at which that particular light (or object) can be seen and identified. (EEC/IE) [126]

visual scanner *See:* optical scanner.

visual signal device (protective signaling) A general term for pilot lights, annunciators, and other devices providing a visual indication of the condition supervised. *See also:* protective signaling. (EEC/PE) [119]

visual surround (illuminating engineering) Includes all portions of the visual field except the visual task. (EEC/IE) [126]

visual task (A) (illuminating engineering) Conventionally designates those details and objects which must be seen for the performance of a given activity, and includes the immediate background of the details or objects. *Note:* The term visual task as used is a misnomer because it refers to the visual display itself and not the task of extracting information from

it. The task of extracting information also has to be differentiated from the overall task performed by the observer. **(B)** Work that requires illumination in order for it to be accomplished. (EEC/IE/IA/PSE) [126], 241-1990

visual task evaluator (illuminating engineering) A contrast reducing instrument which permits obtaining a value of luminance contrast, called the equivalence contrast C of a standard visibility reference task giving the same visibility as that of a task whose contrast has been reduced to threshold when the background luminances are the same for the task and the reference task. *See also:* equivalent contrast. (EEC/IE) [126]

visual terminal *See:* video display terminal.

visual transmitter All parts of a television transmitter that handle picture signals, whether exclusively or not. *See also:* television. (AP/ANT) 145-1983s

visual transmitter power The peak power output during transmission of a standard television signal. *See also:* television. (EEC/PE) [119]

vital *See:* safety critical.

vital area An area that contains vital equipment. (PE/NP) 692-1997

vital circuit Any circuit the function of which affects the safety of train operation. (EEC/PE) [119]

vital equipment Any equipment, system, device, or material, the failure of which could directly or indirectly endanger the public health and safety by exposure to radiation. Equipment or systems that would be required to function to protect public health and safety following such failure, destruction, or release are also considered to be vital. (PE/NP) 692-1997

vital function A function in a safety-critical system that is required to be implemented in a fail-safe manner. *Note:* Vital functions are a subset of safety-critical functions. (VT/RT) 1483-2000, 1474.1-1999

vital services Services normally considered to be essential for the safety of the ship and its passengers and crew. These usually include propulsion, steering, navigation, fire fighting, emergency power, emergency lighting, electronics, and communications functions. The identification of all vital services in a particular vessel is generally specified by the government regulatory agencies. (IA/MT) 45-1998

vitreous silica (fiber optics) Glass consisting of almost pure silicon dioxide (SiO_2). *Synonym:* fused silica. *See also:* fused quartz. (Std100) 812-1984w

VLAN-aware A property of Bridges or end stations that recognizes and supports VLAN-tagged frames. (C/LM) 802.1Q-1998

VLAN-tagged frame A tagged frame whose tag header carries both VLAN identification and priority information. (C/LM) 802.1Q-1998

VLAN-unaware A property of Bridges or end stations that do not recognize VLAN-tagged frames. (C/LM) 802.1Q-1998

VLF *See:* very low frequency.

VLIW *See:* very long instruction word.

VLSI *See:* very large scale integration.

V_{max} input The maximum allowable input voltage rating at which a unit under test can operate to specifications. (PEL) 1515-2000

VMD *See:* virtual medical device.

VMEbus Refers to IEEE Std 1014-1987, which defines a 32-bit backplane bus. (C/MM) 1596.5-1993

V_{min} input The minimum allowable input voltage rating at which a unit under test can operate to specifications. (PEL) 1515-2000

VMOS *See:* V-channel metal-oxide semiconductor.

V-network An artificial mains network of specified disymmetric impedance used for two-wire mains operation and comprising resistors in V formation connected between each conductor and earth. *See also:* electromagnetic compatibility. (EMC) [53]

vnl *See:* via net loss.

V_{nom} input The stated or objective value of the input voltage, which may not be the actual value measured. The value should be between the minimum and maximum input value. (PEL) 1515-2000

V number *See:* normalized frequency.

vodas A system for preventing the over-all voice-frequency singing of a two-way telephone circuit by disabling one direction of transmission at all times. The name is derived from the initial letters of the expression voice-operated device antising. *See also:* voice-frequency telephony. (EEC/PE) [119]

vogad A voice-operated device is used to give a substantially constant volume output for a wide range of inputs. The name is derived from the initial letters of the expression voice-operated gain-adjusted device. *See also:* voice-frequency telephony. (EEC/PE) [119]

voice band (measuring longitudinal balance of telephone equipment operating in the voice band) That part of the audio-frequency range that is employed for the transmission of speech. For the purpose of IEEE Std 455-1985, the voice band extends from 50 hertz (Hz) to 4000 Hz. (COM/C/TA) 455-1985w, 610.7-1995

voice-band channel A channel that is suitable for transmission of speech, or analog data and has a maximum usable frequency range of 300–3400 cycles per second. *See also:* sub-voice-band channel; wideband channel. (C) 610.7-1995

voice channel (mobile communication) A transmission facility defined by the constraints of the human voice. For mobile-communication systems, a voice channel may be considered to have a range of approximately 250 to 3000 hertz; since the Rules and Regulations of the Federal Communications Commission do not authorize the use of modulating frequencies higher than 3000 hertz for radiotelephony or tone signaling on radio frequencies below 500 megahertz. *See also:* channel spacing. (VT) [37]

voice-coil actuator An access arm that moves the head in relation to a magnetic field produced by a coil of wire in the manner of a speaker voice coil. (C) 610.10-1994w

voice frequency (1) (data transmission) A frequency lying within that part of the audio range which is employed for the transmission of speech. *Note:* Voice frequencies used for commercial transmission of speech usually lie within the range 200 to 3500 Hz (hertz). (PE) 599-1985w
(2) The analog signal bandwidth of approximately 300–3400 Hz used in telephone circuits. (SUB/PE) 999-1992w

voice-frequency carrier telegraph (data transmission) A telegraph transmission system which provides several narrow-band individual channels in the voice-frequency range. (PE) 599-1985w

voice-frequency telephony (data transmission) That form of telephony in which the frequencies of the components of the transmitted electric waves are substantially the same as the frequencies of corresponding components of the actuating acoustical waves. (PE) 599-1985w

voice-grade A channel suitable for the transmission of speech, digital or analog data, or facsimile. (SUB/PE) 999-1992w

voice-grade channel (1) (data transmission) A channel suitable for the transmission of speech, digital or analog data, or facsimile, generally with a frequency range of about 300 to 3000 Hz (hertz). (PE) 599-1985w
(2) *See also:* voice-band channel. (C) 610.7-1995

voice-operated device A device that can be controlled by human speech commands. *See also:* speech synthesizer. (C) 610.10-1994w

voice processing Information processing in which the human voice is the data input. *See also:* office automation. (C) 610.2-1987

void volume ratio The volume of the void spaces between stones divided by the total volume occupied by the stones in a stone-filled collecting pit. (SUB/PE) 980-1994

volatile (electronic data processing) Pertaining to a storage device in which data cannot be retained without continuous power dissipation, for example, an acoustic delay line. *Note:* Storage devices or systems employing nonvolatile media may or may not retain data in the event of planned or or accidental power removal. (C/MIL) 162-1963w, [2]

volatile flammable liquid A flammable liquid having a flash point below 38°C (100°F) or whose temperature is above its flash point. (NESC/NEC) [86]

volatile storage A type of storage in which information cannot be retained without continuous power application. *Contrast:* nonvolatile storage. (C) 610.10-1994w

volcas A voice-operated device that switches loss out of the transmitting branch and inserts loss in the receiving branch under control of the subscriber's speech. The name is derived from the initial letters of the expression voice-operated loss control and suppressor. *See also:* voice-frequency telephony. (EEC/PE) [119]

volt (metric practice) (unit of electric potential difference and electromotive force) The difference of electric potential between two points of a conductor carrying a constant current of one ampere, when the power dissipated between these points is equal to one watt. (QUL) 268-1982s

volta effect *See:* contact potential.

voltage (1) (electromotive force) (general) (along a specified path in an electric field). The dot product line integral of the electric field strength along this path. *Notes:* 1. Voltage is a scalar and therefore has no spatial direction. 2. As here defined, voltage is synonymous with potential difference only in an electrostatic field. 3. In cases in which the choice of the specified path may make a significant difference, the path is taken in an equiphase surface unless otherwise noted. 4. It is often convenient to use an adjective with voltage, for example, phase voltage, electrode voltage, line voltage, etc. The basic definition of voltage applies and the meaning of adjectives should be understood or defined in each particular case. *See also:* reference voltage. (Std100) 270-1966w
(2) (A) (voltage of circuit not effectively grounded) The highest nominal voltage available between any two conductors of the circuit. *Note:* If one circuit is directly connected to and supplied from another circuit of higher voltage (as in the case of an autotransformer), both are considered to be of the higher voltage, unless the circuit of the lower voltage is effectively grounded, in which case its voltage is not determined by the circuit of the higher voltage. Direct connection implies electric connection as distinguished from connection merely through electromagnetic or electrostatic induction. **(B)** (voltage of a constant current circuit) The highest normal full-load voltage of the current. **(C)** (voltage of an effectively grounded circuit) The highest nominal voltage available between any conductor of the circuit and ground unless otherwise indicated. **(D)** The effective (rms) potential difference between any two conductors or between a conductor and ground. Voltages are expressed in nominal values unless otherwise indicated. The nominal voltage of a system or circuit is the value assigned to a system or circuit of a given voltage class for the purpose of convenient designation. The operating voltage of the system may vary above or below this value. (NESC) C2-1997
(3) (surge arresters) (electromotive force) The voltage between a part of an electric installation connected to a grounding system and points on the ground at an adequate distance (theoretically at an infinite distance) from any earth electrodes. (PE) [8], [84]
(4) (of a circuit) The greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned. Some systems, such as 3-phase 4-wire, single-phase 3-wire, and 3-wire direct-current may have various circuits of various voltages. (NESC/NEC) [86]

voltage amplification (1) An increase in signal voltage magnitude in transmission from one point to another or the process thereof. *See also:* amplifier. (Std100) 270-1966w
(2) (transducer) The scalar ratio of the signal output voltage to the signal input voltage. Warning: By incorrect extension of the term decibel, this ratio is sometimes expressed in decibels by multiplying its common logarithm by 20. It may be correctly expressed in decilogs. *Note:* If the input and.or output power consist of more than one component, such as multifrequency signal or noise, then the particular components used and their weighting must be specified. *See also:* transducer. (Std100) 270-1966w
(3) (magnetic amplifier) The ratio of differential output voltage to differential control voltage. (MAG) 107-1964w

voltage and power directional relay (power system device function numbers) A relay that permits or causes the connection of two circuits when the voltage difference between them exceeds a given value in a predetermined direction and causes these two circuits to be disconnected from each other when the power flowing between them exceeds a given value in the opposite direction. (SUB/PE) C37.2-1979s

voltage attenuation (1) (data transmission) An adjustable device for reducing the amplitude of a wave without introducing distortion. An adjustable passive network that reduces the power level of a signal without introducing appreciable distortion. (PE) 599-1985w
(2) (analog computer) A device for reducing the amplitude of a signal without introducing appreciable distortion. (C) 165-1977w

voltage at the instant of chopping The voltage at the instant of the initial discontinuity. (PE/PSIM) 4-1995

voltage balance relay A balance relay that operates by comparing the magnitudes of two voltage inputs. (SWG/PE) C37.100-1992

voltage buildup (rotating machinery) The inherent establishment of the excitation current and induced voltage of a generator. (PE) [9]

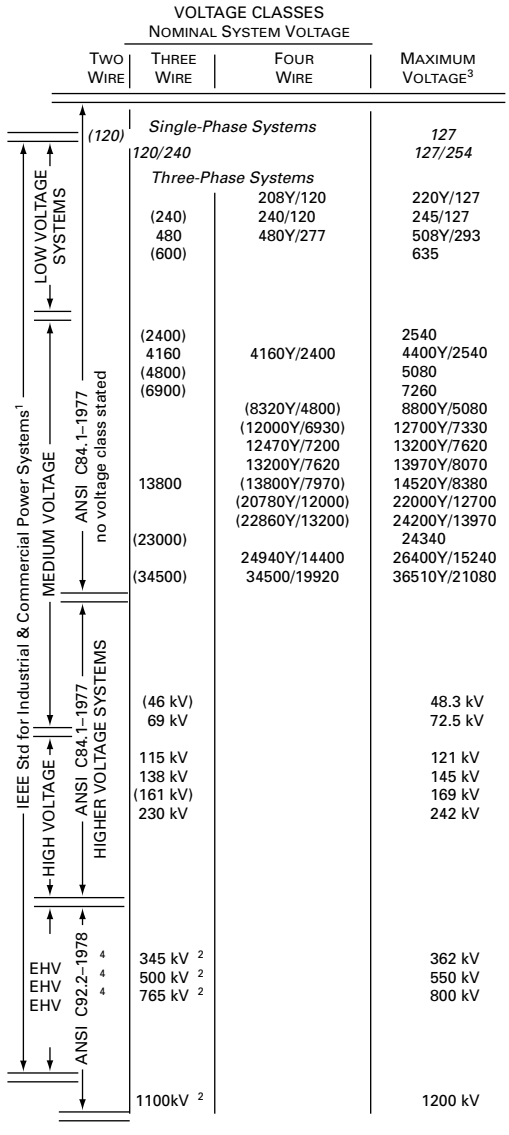
voltage circuit (1) (A) (ac high-voltage circuit breakers) That part of the synthetic test circuit from which the major part of the test voltage is obtained. **(B)** An input circuit to which is applied a voltage or a current that is a measure of primary voltage. (SWG/PE) C37.081-1981
(2) (instrument) That combination of conductors and windings of the instrument to which is applied the voltage of the circuit in which a given electrical quantity is to be measured, or a definite fraction of that voltage, or a voltage or current dependent upon it. *See also:* moving element; instrument; watthour meter. (EEC/AII) [102]
(3) That part of the synthetic test circuit from which the major part of the test voltage is obtained. (SWG/PE) C37.083-1999

voltage clamp (converter circuit elements) (self-commutated converters) A clamp that limits the peak voltage across a semiconductor device. (IA/SPC) 936-1987w

voltage clamping ratio (low voltage varistor surge arresters) A figure of merit measure of the varistor voltage clamping effectiveness as determined by the ratio of clamping voltage to rated root-mean-square (rms) voltage, or by the ratio of clamping voltage to rated direct-current (dc) voltage. (PE) [8]

voltage class *See:* medium-voltage power cable; control cable; low-level analog signal cable; low-level digital signal circuit cable; low-voltage power cable (s).

voltage classes Voltage classes are as shown in the corresponding figure.



[Preferred nominal voltages as shown without parentheses ( ).
1. Voltage class designations applicable to industrial and commercial power systems, adapted by IEEE Standards Board (LB 100A–April 23, 1975).
2. Typical nominal system voltage.
3. A comprehensive list of minimum and maximum voltage ranges is given in ANSI C84.1-1977.]

voltage classes

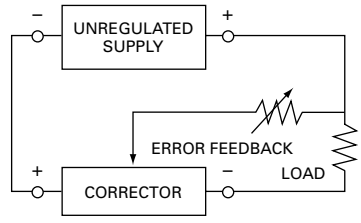
voltage class, rated nominal *See:* rated nominal voltage class.

voltage coefficient of capacitance (nonlinear capacitor) The derivative with respect to voltage of a capacitance characteristic, such as a differential capacitance characteristic or a reversible capacitance characteristic, at a point, divided by the capacitance at that point. *See also:* nonlinear capacitor.
(ED) [46]

voltage, common-mode *See:* common-mode voltage.

voltage-controlled oscillator (VCO) An oscillator whose frequency is a function of the voltage of a control signal.
(AES) 686-1997

voltage corrector (power supplies) An active source of regulated power placed in series with an unregulated supply to sense changes in the output voltage (or current): also to correct for the changes by automatically varying its own output in the opposite direction, thereby maintaining the total output voltage (or current) constant. (See the corresponding figure.)



Circuit used to sense output voltage changes.

voltage corrector
(AES/PE) [41], [78]

voltage/current (V/I) characteristic The relationship between the steady-state current of the static var compensator (SVC) and the voltage at its point of connection.
(PE/SUB) 1031-2000

voltage deviation (A) (self-commutated converters) (converters having ac output) (transient) The instantaneous difference between the actual instantaneous voltage and the corresponding value of the previously undisturbed wave form. *Note:* Voltage deviation amplitude is expressed in percent or per unit referred to the peak value of the previously undisturbed voltage. **(B) (electromagnetic site survey)** The ratio of the root-mean-squared envelope voltage to the average envelope of a signal expressed in decibels.
(IA/EMC/SPC) 936-1987, 473-1985

voltage dip *See:* sag.

voltage directional relay (power system device function numbers) A relay that operates when the voltage across an open circuit breaker or contactor exceeds a given value in a given direction. (SUB/PE) C37.2-1979s

voltage distortion Any deviation from the nominal sine waveform of the ac line voltage.
(IA/T&D/PE/PSE) 1100-1999, 1250-1995

voltage divider A network consisting of impedance elements connected in series, to which a voltage is applied, and from which one or more voltages can be obtained across any portion of the network. *Notes:* 1. Dividers may have parasitic impedances affecting the response. These impedances are, in general, the series inductance and the capacitance to ground and to neighboring structures at ground or at other potentials. 2. An adjustable voltage divider of the resistance type is frequently referred to as a potentiometer.
(PE/PSIM/EM) 4-1978s, 43-1974s, [55]

voltage doubler A voltage multiplier that separately rectifies each half cycle of the applied alternating voltage and adds the two rectified voltages to produce a direct voltage whose amplitude is approximately twice the peak amplitude of the applied alternating voltage. *See also:* rectifier.
(EEC/PE) [119]

voltage drop (1) The difference of voltages at the two terminals of a passive impedance. (PE) [9]
(2) (supply system) The difference between the voltages at the transmitting and receiving ends of a feeder, main, or service. *Note:* With alternating current, the voltages are not necessarily in phase and hence the voltage drop is not necessarily equal to the algebraic sum of the voltage drops along the several conductors. *See also:* alternating-current distribution.
(T&D/PE) [10]

voltage efficiency (specified electrochemical process) The ratio of the equilibrium reaction potential to the bath voltage.
(EEC/PE) [119]

voltage endurance (1) (rotating machinery) A characteristic of an insulation system, obtained by plotting voltage against time to failure, for a number of samples tested to destruction at each of several sustained voltages. Constant conditions of frequency, waveform, temperature, mechanical restraint, and ambient atmosphere are required. Ordinate scales of arithmetical or logarithmic voltage, and abscissa scales of multicycle logarithmic time, normally give approximately linear characteristics. *See also:* asynchronous machine. (PE) [9]

(2) The time-to-failure of the groundwall insulation under a high electrical stress. (DEI) 1043-1996

voltage endurance test (rotating machinery) A test designed to determine the effect of voltage on the useful life of electric equipment. When this test voltage exceeds the normal design voltage for the equipment, the test is voltage accelerated. When the test voltage is alternating and the frequency of alternation exceeds the normal voltage frequency for the equipment, the test is frequency accelerated. *See also:* asynchronous machine. (PE) [9]

voltage, equivalent test alternating *See:* equivalent test alternating voltage.

voltage, exciter-ceiling *See:* exciter-ceiling voltage.

voltage factor (electron tube) The magnitude of the ratio of the change in one electrode voltage to the change in another electrode voltage, under the conditions that a specified current remains unchanged and that all other electrode voltages are maintained constant. *See also:* ON period. (ED) [45], [84]

voltage/frequency function (self-commutated converters) (converters having ac output) The ratio of output voltage to the fundamental frequency of the output as a function of that frequency. (IA/SPC) 936-1987w

voltage generator (network analysis and signal-transmission system) A two-terminal circuit element with a terminal voltage substantially independent of the current through the element. *Note:* An ideal voltage generator has zero internal impedance. *See also:* network analysis; signal. (ED) 161-1971w

voltage gradient (overhead-power-line corona and radio noise) Corona work particularly emphasizes the property that the voltage gradient is equal to and is in the direction of the maximum space rate of change of the voltage at the specified point. The voltage gradient is obtained as a vector field by applying the operator ∇ to the scalar potential function, u. Thus, if $u = f(x, y, z)$,

$$\vec{E} = -\nabla u = -\text{grad } u = -\left(\vec{a}_x \frac{\partial u}{\partial x} + \vec{a}_y \frac{\partial u}{\partial y} + \vec{a}_z \frac{\partial u}{\partial z}\right)$$

Note: For alternating voltage, the voltage gradient is expressed as the peak value divided by the square root of two. For sinusoidal voltage, this is the rms value. *Synonyms:* potential gradient; field strength; gradient; electric field strength. (T&D/PE) 539-1990

voltage gradient stylus *See:* voltage pencil.

voltage imbalance (unbalance), polyphase systems The ratio of the negative or zero sequence component to the positive sequence component, usually expressed as a percentage. (SCC22) 1346-1998

voltage impulse A voltage pulse of sufficiently short duration to exhibit a frequency spectrum of substantially uniform amplitude in the frequency range of interest. As used in electromagnetic compatibility standard measurements, the voltage impulse has a uniform frequency spectrum over the frequency range 25 to 1000 megahertz. (EMC) 263-1965w

voltage influence (electric instruments) In instruments, other than indicating voltmeters, wattmeters, and varmeters, having voltage circuits, the percentage change (of full-scale value) in the indication of an instrument that is caused solely by a voltage departure from a specified reference voltage. *See also:* accuracy rating. (EEC/ERI/AII) [111], [102]

voltage-injection method (ac high-voltage circuit breakers) A synthetic test method in which the voltage circuit is applied to the test circuit breaker after power frequency current zero. (SWG/PE) C37.081-1981r, C37.100-1992

voltage jump (glow-discharge tubes) An abrupt change or discontinuity in tube voltage drop during operation. *Note:* This may occur either during life under constant operating conditions or as the current or temperature is varied over the operating range. *See also:* gas tube. (ED) 161-1971w

voltage level (data transmission) At any point in a transmission system, the ratio of the voltage existing at that point to an arbitrary value of voltage used as a reference. Specifically, in systems such as television systems, where wave shapes are not sinusoidal or symmetrical about a zero axis and where the arithmetical sum of the maximum positive and negative excursions of the wave is important in system performance, the voltage level is the ratio of the peak-to-peak voltage existing at any point in the transmission system to an arbitrary peak-to-peak voltage used as a reference. This ratio is usually expressed in dBV, signifying decibels referred to one V (volt) peak-to-peak. (PE) 599-1985w

voltage limit A control function that prevents a voltage from exceeding prescribed limits. Voltage limit values are usually expressed as percent of rated voltage. If the voltage-limit circuit permits the limit value to increase somewhat instead of being a single value, it is desirable to provide either a curve of the limit value of voltage as a function of some variable such as current or to give limit values at two or more conditions of operation. *See also:* feedback control system. (IA/ICTL/IAC) [60]

voltage-limiting-type SPD An SPD that has a high impedance when no surge is present, but will reduce it continuously with increased surge current and voltage. Common examples of components used as nonlinear devices are varistors and suppressor diodes. These SPDs are sometimes called "clamping-type" SPDs. (SPD/PE) C62.48-1995

voltage loss (current circuits) (electric instruments) In a current-measuring instrument, the value of the voltage between the terminals when the applied current corresponds to nominal end-scale deflection. In other instruments the voltage loss is the value of the voltage between the terminals at rated current. *Note:* By convention, when an external shunt is used, the voltage loss is taken at the potential terminals of the shunt. The overall voltage drop resulting may be somewhat higher owing to additional drop in shunt lugs and connections. *See also:* accuracy rating. (EEC/AII) [102]

voltage multiplier A rectifying circuit that produces a direct voltage whose amplitude is approximately equal to an integral multiple of the peak amplitude of the applied alternating voltage. *See also:* rectifier. (EEC/PE) [119]

voltage, nominal *See:* nominal system voltage.

voltage of a constant current circuit *See:* voltage.

voltage of an effectively grounded circuit *See:* voltage.

voltage of circuit not effectively grounded *See:* voltage.

voltage or current balance relay (power system device function numbers) A relay that operates on a given difference in voltage, or current input or output, of two circuits. (SUB/PE) C37.2-1979s

voltage overshoot (1) (arc-welding apparatus) The ratio of transient peak voltage substantially instantaneously following the removal of the short circuit to the normal steady-state voltage value. *See also:* voltage recovery time. (EEC/AWM) [91]

(2) (low voltage varistor surge arresters) The excess voltage above the clamping voltage of the device for a given current that occurs when current waves of less than 8μs virtual front duration are applied. This value may be expressed as a percent of the clamping voltage for an 8×20μs current wave. (PE) [8]

voltage overshoot, effective *See:* effective voltage overshoot.

voltage pattern *See:* radiation pattern.

voltage, peak working *See:* peak working voltage.

voltage pencil A stylus whose position is detected by voltage ratios measured on a resistive grid. *Synonym:* voltage gradient stylus. (C) 610.10-1994w

voltage phase-angle method (electric power system) (economic dispatch) Considers the actual measured phase-angle difference between the station bus and a reference bus in the determination of incremental transmission losses. (PE/PSE) 94-1970w

voltage-phase-balance protection A form of protection that disconnects or prevents the connection of the protected equipment when the voltage unbalance of the phases of a normally

balanced polyphase system exceed a predetermined amount. (SWG/PE) C37.100-1992

voltage probe A connecting device, usually consisting of a two-conductor shielded cable and frequency-compensating network, with a hand-held tip, for use with an oscilloscope to measure the amplitude and waveshape of a dc, ac, or composite signal. It should include a ground reference. The measurement bandwidth should be at least 10 times greater than the frequency of interest. The impedance should be at least 50 times greater than the node impedance under measurement. A low impedance probe should be used for measurement purposes. (PEL) 1515-2000

voltage protection level A parameter that characterizes the performance of the surge protective device in limiting the voltage across its terminals. This value shall be equal to or greater than the highest value measured in measured limiting voltage tests. (PE) C62.34-1996

voltage range (electrically propelled vehicle) Divided into five voltage ranges, as follows. first voltage range: 30 volts or less; second voltage range: over 30 volts to and including 175 volts; third voltage range: over 175 volts to and including 250 volts; fourth voltage range: over 250 volts to and including 660 volts; fifth voltage range: over 660 volts. (PE/EEC) [119]

voltage range multiplier (instrument multiplier) A particular type of series resistor or impedor that is used to extend the voltage range beyond some particular value for which the measurement device is already complete. It is a separate component installed external to the measurement device. (EEC/ERI) [111]

voltage, rated maximum *See:* rated maximum voltage.

voltage, rated maximum interrupting of main contacts *See:* rated maximum interrupting of main contacts voltage.

voltage, rated short-time of main contacts *See:* rated short-time of main contacts voltage.

voltage rating (1) (protection and coordination of industrial and commercial power systems) The root-mean-square (rms) alternating current (or the direct current) voltage at which the fuse is designed to operate. All low-voltage fuses will function on any lower voltage, but use on higher voltages than rated is hazardous. For high short-circuit currents, the magnitude of applied voltage will affect the arcing and clearing times and increase the clearing I^2t values. (IA/PSP) 242-1986r

(2) (surge arresters) The designated maximum permissible operating voltage between its terminals at which an arrester is designed to perform its duty cycle. It is the voltage rating specified on the nameplate. (PE/SPD) C62.1-1981s

(3) (household electric ranges) The voltage limits within which the range is intended to be used. *See also:* appliance outlet. (Std100) [84]

(4) (grounding transformer) (of a grounding transformer) The maximum "line-to-line" voltage at which it is designed to operate continuously from line to ground without damage to the grounding transformer. (PE/TR) C57.12.80-1978r

(5) (relay) The voltage at a specified frequency that may be sustained by the relay for an unlimited period without causing any of the prescribed limitations to be exceeded. (SWG/PE/PSR) C37.90-1978s, C37.100-1992

(6) The voltage specified on the nameplate. (SPD/PE) C62.62-2000

voltage rating, maximum *See:* maximum voltage rating.

voltage ratio (1) (capacitance potential device, in combination with its coupling capacitor or bushing) The overall ratio between the root-mean-square primary line-to-ground voltage and the root-mean-square secondary voltage. *Note:* It is not the turn ratio of the transformer used in the network. *See also:* outdoor coupling capacitor. (PE/EM) 43-1974s

(2) (power and distribution transformers) (of a transformer) The ratio of the rms terminal voltage of a higher voltage winding to the rms terminal voltage of a lower voltage winding, under specified conditions of the load. (PE/TR) C57.12.80-1978r

(3) (of a voltage divider) The factor by which the output voltage is multiplied to determine the measured value of the input voltage. (PE/PSIM) 4-1995

voltage recovery time (arc-welding apparatus) With a welding power supply delivering current through a short-circuiting resistor whose resistance is equivalent to the normal load at that setting on the power supply, and measurement being made when the short circuit is suddenly removed, the time measured in seconds between the instant the short circuit is removed and the instant when voltage has reached 95% of its steady-state value. *See also:* effective voltage overshoot; voltage overshoot. (EEC/AWM) [91]

voltage reduction A means of achieving a reduction of system demand and energy by reducing the customer supply voltage. (PE/PSE) 858-1993w

voltage reduction reserve (power operations) The operating reserve available through voltage reduction of a specified percentage. (PE/PSE) 858-1987s

voltage reference (power supplies) A separate, highly regulated voltage source used as a standard to which the output of the power supply is continuously referred. (AES) [41]

voltage-reference tube A gas tube in which the tube voltage drop is approximately constant over the operating range of current and relatively stable with time at fixed values of current and temperature. (ED) 161-1971w

voltage reflection coefficient The ratio of the complex number (phasor) representing the phase and magnitude of the electric field of the backward-traveling wave to that representing the forward-traveling wave at a cross section of a waveguide. The term is also used to denote the magnitude of this complex ratio. *See also:* waveguide. (AP/ANT) [35]

voltage regulating adjuster (excitation systems for synchronous machines) A device associated with a synchronous machine voltage regulator by which adjustment of the synchronous machine terminal voltage can be made. (PE/EDPG) 421.1-1986r

voltage regulating device A voltage sensitive device that is used on an automatically operated voltage regulator to control the voltage of the regulated circuit. (PE/TR) C57.15-1999

voltage-regulating relay (power and distribution transformers) A voltage-sensitive device that is used on an automatically operated voltage regulator to control the voltage of the regulated circuit. (PE/TR) C57.12.80-1978r

voltage-regulating transformer (step-voltage regulator) A voltage regulator in which the voltage and phase angle of the regulated circuit are controlled in steps by means of taps and without interrupting the load. *See also:* voltage regulator. (PE/TR) [57]

voltage-regulating transformer, two-core A voltage-regulating transformer consisting of two separate core and coil units in a single tank. *See also:* voltage regulator. (PE/TR) [57]

voltage-regulating transformer, two-core, excitation-regulating winding In some designs, the main unit will have one winding operating as an autotransformer that performs both functions listed under regulating winding and excitation winding. Such a winding is called the excitation-regulating winding. *See also:* voltage regulator. (PE/TR) [57]

voltage-regulating transformer, two-core, excitation winding The winding of the main unit that draws power from the system to operate the two-core transformer. *See also:* voltage regulator. (PE/TR) [57]

voltage-regulating transformer, two-core, excited winding The winding of the series unit that is excited from the regulating winding of the main unit. *See also:* voltage regulator. (PE/TR) [57]

voltage-regulating transformer, two-core, regulating winding The winding of the main unit in which taps are changed to control the voltage or phase angle of the regulated circuit through the series unit. *See also:* voltage regulator. (PE/TR) [57]

voltage-regulating transformer, two-core, series unit The core and coil unit that has one winding connected in series in the line circuit. *See also:* voltage regulator. (PE/TR) [57]

voltage-regulating transformer, two-core, series winding The winding of the series unit that is connected in series in the line circuit. *Note:* If the main unit of a two-core transformer is an autotransformer, both units will have a series winding. In such cases, one is referred to as the series winding of the autotransformer and the other, the series winding of the series unit. *See also:* voltage regulator. (PE/TR) [57]

voltage regulation (1) (constant-voltage transformer) The change in output (secondary) voltage which occurs when the load (at a specified power factor) is reduced from rated value to zero, with the primary impressed terminal voltage maintained constant. *Note:* In case of multi-winding transformers, the loads on all windings, at specified power factors, are to be reduced from rated kVA to zero simultaneously. The regulation may be expressed in per unit, or percent, on the base of the rated output (secondary) voltage at full load. (PE/TR) C57.12.80-1978r

(2) (outdoor coupling capacitor) The variation in voltage ratio and phase angle of the secondary voltage of the capacitance potential device as a function of primary line-to-ground voltage variation over a specified range, when energizing a constant, linear impedance burden. *See also:* outdoor coupling capacitor. (PE/EM) 43-1974s

(3) (A) (direct-current generator) The final change in voltage with constant field-rheostat setting when the specified load is reduced gradually to zero, expressed as a percent of rated-load voltage, the speed being kept constant. *Note:* In practice it is often desirable to specify the over-all regulation of the generator and its driving machine thus taking into account the speed regulation of the driving machine. **(B)** (induction frequency converter). The rise in secondary voltage when the rated load at rated power factor is reduced to zero, expressed in percent of rated secondary voltage, the primary voltage, primary frequency, and the speed being held constant. *See also:* asynchronous machine. (EEC/PE) [119]

(4) (synchronous generator) The rise in voltage with constant field current, when, with the synchronous generator operated at rated voltage and rated speed, the specified load at the specified power factor is reduced to zero, expressed as a percent of rated voltage. (PE) [9]

(5) (thyristor converter) The change in output voltage that occurs when the load current is reduced from its rated value to zero, or light transition load, with rated sinusoidal alternating voltage applied to the thyristor power converter with the transformer on its rated tap, but excluding the corrective action of any voltage regulating means. *Note:* The regulation may be expressed in volts or in percent of rated volts. (IA/IPC) 444-1973w

(6) The degree of control or stability of the rms voltage at the load. Often specified in relation to other parameters, such as input voltage changes, load changes, or temperature changes. (IA/PSE) 1100-1999

(7) (line regulator circuits) *See also:* pulse-width modulation; Zener diode.

voltage regulation curve (synchronous generator) (voltage regulation characteristic) The relationship between the armature winding voltage and the load on the generator under specified conditions and constant field current. (PE) [9]

voltage regulation of a constant-voltage transformer (power and distribution transformers) The change in output (secondary) voltage which occurs when the load (at a specified power factor) is reduced from rated value to zero, with the primary impressed terminal voltage maintained constant. *Note:* In case of multiwinding transformers, the loads of all windings, at specified power factors, are to be reduced from rated kVA to zero simultaneously. The regulation may be expressed in per unit, or percent, on the base of the rated output (secondary) voltage at full load. (PE/TR) C57.12.80-1978r

voltage regulator (1) (excitation systems for synchronous machines) A synchronous machine regulator that functions to maintain the terminal voltage of a synchronous machine at a predetermined value, or to vary it according to a predetermined plan. *Note:* Historical term, included for reference only. The preferred term is synchronous machine regulator. (PE/EDPG) 421.1-1986r

(2) (transformer type) An induction device having one or more windings in shunt with and excited from the primary circuits, and having one or more windings in series between the primary circuits and the regulated circuit, all suitably adapted and arranged for the control of the voltage, or of the phase angle, or of both, of the regulated circuit. (PE/TR) [57], C57.15-1986s

voltage regulator, continuously acting type (rotating machinery) A regulator that initiates a corrective action for a sustained infinitesimal change in the controlled variable. (PE) [9]

voltage regulator, direct-acting type (rotating machinery) A rheostatic-type regulator that directly controls the excitation of an exciter by varying the input to the exciter field circuits. (PE) [9]

voltage regulator, dynamic type (rotating machinery) A continuously acting regulator that does not require mechanical acceleration of parts to perform the regulating function. *Note:* Dynamic-type voltage regulators utilize magnetic amplifiers, rotating amplifiers, electron tubes, semiconductor elements, and/or other static components. (PE) [9]

voltage regulator, indirect-acting type (rotating machinery) A rheostatic-type regulator that controls the excitation of the exciter by acting on an intermediate device not considered part of the voltage regulator or exciter. (PE) [9]

voltage regulator, noncontinuously acting type (rotating machinery) A regulator that requires a sustained finite change in the controlled variable to initiate corrective action. (PE) [9]

voltage regulator, synchronous-machine (rotating machinery) A synchronous-machine regulator that functions to maintain the voltage of a synchronous machine at a predetermined value, or to vary it according to a predetermined plan. (PE) [9]

voltage-regulator tube A glow-discharge cold-cathode tube in which the voltage drop is approximately constant over the operating range of current, and that is designed to provide a regulated direct-voltage output. (ED) 161-1971w, [45]

voltage related to partial discharges (1) (A) (liquid-filled power transformers) The phase to ground alternating voltage whose value is expressed by its peak divided by the square root of two. **(B)** (partial discharge measurement in liquid-filled power transformers and shunt reactors) The phase to ground alternating voltage whose value is expressed by its peak divided by the square root of two. (PE/TR) C57.113-1988

(2) (dry-type transformers) Voltage within the terms of C57.124-1991 is the phase-to-ground alternating voltage for applied tests or terminal to terminal alternating voltage for induced voltage tests. Its value is expressed by its peak value divided by the square root of two. (PE/TR) C57.124-1991r

voltage relay (1) A relay that functions at a predetermined value of voltage. *Note:* It may be an overvoltage relay, an undervoltage relay, or a combination of both. *See also:* relay. (IA/ICTL/IAC) [60]

(2) A relay that responds to voltage. (SWG/PE) C37.100-1992

voltage response The ratio of the open-circuit output voltage to the applied sound pressure, measured by a laboratory standard microphone placed at a stated distance from the plane of the opening of the artificial voice. *Note:* The voltage response is usually measured as a function of frequency. *See also:* close-talking pressure-type microphones. (SP) 258-1965w

voltage response, exciter *See:* exciter voltage response.

voltage response ratio, excitation-system (rotating machinery) The numerical value that is obtained when the excitation-system voltage response in volts per second, measured over the first 1/2 second interval unless otherwise specified, is divided by the rated-load field voltage of the synchronous machine. *Note:* This response, if maintained constant, would develop, in 1/2 second, the same excitation voltage-time area as attained by the actual response. (PE) [9]

voltage response, synchronous-machine excitation-system The rate of increase or decrease of the excitation-system output voltage, determined from the synchronous machine excitation-system voltage-time response curve, that if maintained constant would develop the same excitation-system voltage-time areas as are obtained from the curve for a specified period. The starting point for determining the rate of voltage change shall be the initial value of the synchronous-machine excitation-system voltage-time response curve. (PE) [9]

voltage restraint A method of restraining the operation of a relay by means of a voltage input that opposes the typical response of the relay to other inputs. (SWG/PE) C37.100-1992

voltage sensing relay (A) A term correctly used to designate a special-purpose voltage-rated relay that is adjusted by means of a voltmeter across its terminals in order to secure pickup at a specified critical voltage without regard to coil or heater resistance and resulting energizing current at that voltage. **(B)** A term erroneously used to describe a general-purpose relay for which operational requirements are expressed in voltage. (PE/EM) 43-1974

voltage-sensitive preamplifier An amplifier, preceding the main amplifier, in which the amplitude of the output signal is proportional to the signal voltage appearing across the capacitance that exists at the input of the preamplifier. *See also:* charge-sensitive preamplifier. (NPS) 325-1996

voltage sensitivity *See:* voltage coefficient of capacitance; nonlinear capacitor.

voltage sets (polyphase circuit) The voltages at the terminals of entry to a polyphase circuit into a delimited region are usually considered to consist of two sets of voltages: the line-to-line voltages, and the line to-neutral voltages. If the phase conductors are identified in a properly chosen sequence, the voltages between the terminals of entry of successive pairs of phase conductors form the set of line-to-line voltages, equal in number to the number of phase conductors. The voltage from the successive terminals of entry of the phase conductors to the terminal of entry of the neutral conductor, if one exists, or to the true neutral point, form the set of line-to-neutral voltages, also equal in number to the number of phase conductors. In case of doubt, the set intended must be identified. In the absence of other information, stated or implied, the line-to-neutral-conductor set is understood. *Notes:* 1. Under abnormal conditions the voltage of the neutral conductor and of the true neutral point may not be the same. Therefore it may become necessary to designate which is intended when the line-to-neutral voltages are being specified. 2. The set of line-to-line voltages may be determined by taking the differences in pairs of the successive line-to-neutral voltages. The line-to-neutral voltages can be determined from the line-to-line voltages by an inverse process only when the voltage between the neutral conductor and the true neutral point is completely specified, or equivalent additional information is available. If instantaneous voltages are used, algebraic differences are taken, but if root-mean-square voltages are used, information regarding relative phase angles must be available, so that the voltages may be expressed in phasor form and the phasor differences taken. 3. This definition may be applied to a two-phase, four-wire or five-wire circuit. A two-phase, three-wire circuit should be treated as a special case. *See also:* network analysis. (Std100) 270-1966w

voltage shape A waveform of a voltage impulse that has been standardized to define insulation strength. The standardized voltage shapes are as follows: power-frequency short-duration, standard switching impulse, standard lightning impulse, very fast front, standard chopped wave impulse, and front-of-wave lightning impulse). (PE/C) 1313.1-1996

voltage spread The difference between maximum and minimum voltages. (IA/APP) [80]

voltage-stabilizing tube *See:* voltage-regulator tube.

voltage standing-wave ratio (VSWR) (mode in a waveguide) The ratio of the magnitude of the transverse electric field in a plane of maximum strength to the magnitude at the equivalent point in an adjacent plane of minimum field strength. *See also:* waveguide. (AP/ANT) [35]

voltage surge, internal *See:* internal voltage surge.

voltage surge suppressor (semiconductor rectifiers) A device used in the semiconductor rectifier to attenuate surge voltages of internal or external origin. Capacitors, resistors, nonlinear resistors, or combinations of these may be employed. Nonlinear resistors include electronic and semiconductor devices. *See also:* semiconductor rectifier stack. (IA) [62]

voltage switch (test switches for transformer-rated meters) A single-pole single-throw switch used to open or close a voltage circuit. (ELM) C12.9-1993

voltage-switching-type SPD An SPD that has a high impedance when no surge is present, but can have a sudden change in impedance to a low value in response to a voltage surge. Common examples of components used as nonlinear devices are spark gaps, gas tubes, and silicon-controlled rectifiers. These SPDs are sometimes called crowbar-type SPDs. (SPD/PE) C62.48-1995

voltage test *See:* controlled overvoltage test.

voltage/time curve for impulses of constant prospective shape (high voltage testing) The curve relating the disruptive discharge voltage of a test object to the time to chopping, which may occur on the front, at the crest or on the tail. The curve is obtained by applying impulse voltages of constant shape, but with different peak values. (PE/PSIM) 4-1978s

voltage/time curve for linearly rising impulses (high voltage testing) The voltage/time curve for impulses with fronts rising linearly is the curve relating the voltage at the instant of chopping to the rise time Tr. The curve is obtained by applying impulses with approximately linear fronts of different steepnesses. (PE/PSIM) 4-1978s

voltage-time product (pulse transformers) The time integral of a voltage pulse applied to a transformer winding. (PEL/ET) 390-1987r

voltage-time product rating (pulse transformers) (of a transformer winding) Considered as being a constant and is the maximum voltage-time product of a voltage pulse that can be applied to the winding before a specified level of core saturation-region effects is reached. The level of core saturation-region effects is determined by observing either the shape of the output voltage pulse for a specified degradation (for example, a maximum tilt [droop]), or the shape of the exciting current pulse for a specified departure from linearity (for example, deviation from a linear ramp by a given percentage). (PEL/ET) 390-1987r

voltage-time response, synchronous-machine excitation-system The output voltage of the excitation system, expressed as a function of time, following the application of prescribed inputs under specified conditions. (PE) [9]

voltage-time response, synchronous-machine voltage-regulator The voltage output of the synchronous-machine voltage regulator expressed as a function of time following the application of prescribed inputs under specified conditions. (PE) [9]

voltage to ground (1) For grounded circuits, the voltage between the given conductor and that point or conductor of the circuit that is grounded; for ungrounded circuits, the greatest voltage between the given conductor and any other conductor of the circuit. (NESC/NEC) [86]

(2) (A) (of a grounded circuit) The highest nominal voltage available between any conductor of the circuit and that point or conductor of the circuit that is grounded. **(B)** (of an ungrounded circuit) The highest nominal voltage available between any two conductors of the circuit concerned. (NESC) C2-1997

(3) (power and distribution transformers) The voltage between any live conductor of a circuit and the earth. *Note:* Where safety considerations are involved, the voltage to ground which may occur in an ungrounded circuit is usually the highest voltage normally existing between the conductors of the circuit, but in special circumstances, higher voltages may occur. (PE/SPD/TR) 32-1972r, C57.16-1996, C57.12.80-1978r

voltage to ground of a conductor (A) (of a grounded circuit) The nominal voltage between such conductor and that point or conductor of the circuit that is grounded. **(B)** (of an ungrounded circuit) The highest nominal voltage between such conductor and any other conductor of the circuit concerned. (NESC) C2-1997

voltage to luminaire factor (illuminating engineering) The fractional loss of task illuminance due to improper voltage at the luminaire. (EEC/IE) [126]

voltage, touch *See:* touch voltage.

voltage transformer (VT) (1) (instrument transformers) (power and distribution transformers) An instrument transformer intended to have its primary winding connected in shunt with a power supply circuit, the voltage of which is to be measured or controlled. (PE/TR) C57.12.80-1978r

(2) (metering) An instrument transformer designed for use in the measurement or control of voltage. *Note:* Its primary winding is connected across the supply circuit. *See also:* instrument transformer. (ELM) C12.1-1982s

(3) An instrument transformer intended to have its primary connected in shunt with the voltage to be measured or controlled. (PE/TR) [57]

(4) An instrument transformer intended to have its primary winding connected in shunt with the voltage to be measured or controlled. (PE/TR) C57.13-1993

voltage transient suppression (thyristor) Reduction of the effects of voltage transients on controller components by reducing the voltage or energy of the transients to tolerable levels. (IA/IPC) 428-1981w

voltage, transverse mode *See:* transverse-mode voltage.

voltage-tunable magnetron (microwave tubes) A magnetron in which the resonant circuit is heavily loaded (QL = 1 to 10) and in which the supply of electrons to the interaction space is restricted whereby the frequency of oscillation becomes proportional to the plate voltage. *See also:* magnetron. (ED) [45]

voltage-type telemeter A telemeter that employs the magnitude of a single voltage as the translating means. (SWG/PE/SUB) C37.100-1992, C37.1-1994

voltage winding for regulating equipment (power and distribution transformers) (or transformer) The winding (or transformer) which supplies voltage within close limits of accuracy to instruments, such as contact-making voltmeters. (PE/TR) C57.12.80-1978r

voltage-withstand test (1) (insulation materials) The application of a voltage higher than the rated voltage for a specified time for the purpose of determining the adequacy against breakdown of insulation materials and spacing under normal conditions. *See also:* dielectric tests. (EEC/PE) [119]

(2) (rotating machinery) *See also:* overvoltage test; asynchronous machine.

voltage-withstand tests Tests made to determine the ability of insulating materials and spacings to withstand specified overvoltages for a specified time without flashover or puncture. (ELM) C12.1-1981

voltameter *See:* coulometer; instrument.

volt-ammeter An instrument having circuits so designed that the magnitude either of voltage or of current can be measured on a scale calibrated in terms of each of these quantities. *See also:* instrument. (EEC/PE) [119]

voltampere The unit of apparent power in the International System of Units (SI). The voltampere is the apparent power at the points of entry of a single-phase, two-wire system when the product of the root-mean-square value in amperes of the current by the root-mean-square value in volts of the voltage is equal to one. (Std100) 270-1966w

voltampere loss *See:* apparent-power loss.

voltampere meter An instrument for measuring the apparent power in an alternating-current circuit. It is provided with a scale graduated in volt-amperes or in kilovolt-amperes. *See also:* instrument. (EEC/PE) [119]

volt efficiency (storage battery) (storage cell) The ratio of the average voltage during the discharge to the average voltage during the recharge. *See also:* charge; electrochemistry. (PE/EEC) [119]

voltmeter An instrument for measuring the magnitude of electric potential difference. It is provided with a scale, usually graduated in either volts, millivolts, or kilovolts. If the scale is graduated in millivolts or kilovolts the instrument is usually designated as a millivoltmeter or a kilovoltmeter. *See also:* instrument. (EEC/PE) [119]

voltmeter-ammeter The combination in a single case, but with separate circuits, of a voltmeter and an ammeter. *See also:* instrument. (EEC/PE) [119]

volts per hertz relay A relay whose pickup is a function of the ratio of voltage to frequency. (SWG/PE) C37.100-1992

volt-time area The area under a curve plotted with voltage versus time with areas of positive and negative polarities added algebraically. The volt-time area that is generally of concern consists of the net accumulated volt-time area that occurs during a certain number of power frequency cycles of the ground potential rise (GPR). The area is a function of the magnitude and decay rate of the dc offset. (PE/PSC) 367-1996

volt-time curve (1) (surge arresters) (impulses with fronts rising linearly) The curve relating the disruptive-discharge voltage of a test object to the virtual time to chopping. The curve is obtained by applying voltages that increase at different rates in approximately linear manner. (PE) [8], [84]

(2) (standard impulses) A curve relating the peak value of the impulse causing disruptive discharge of a test object to the virtual time to chopping. The curve is obtained by applying standard impulse voltages of different peak values. (PE) [8], [84]

volume (1) (information transfer) One collection of data commencing with a Volume ID and containing a number of bytes specified in the volume size of the volume director. (C/MM) 949-1985w

(2) (volume measurements of electrical speech and program waves) The magnitude of a complex audio-frequency wave in an electrical circuit as measured on a standard volume indicator. (BT/AV) 152-1953s

(3) (data transmission) In general, volume is the intensity or loudness of sound. In a telephone or other audio-frequency circuit, a measure of the power corresponding to an audio-frequency wave at that point [expressed in decibels (dB)]. (PE) 599-1985w

(4) (electric circuits) The magnitude of a complex audio-frequency wave as measured on a standard volume indicator. *Notes:* 1. Volume is expressed in volume units (vu). 2. The term volume is used loosely to signify either the intensity of a sound or the magnitude of an audiofrequency wave. (SP) 151-1965w

(5) (International System of Units (SI)) The SI unit of volume is the cubic meter. This unit, or one of the regularly formed multiples such as the cubic centimeter, is preferred for all applications. The special name liter has been approved for the cubic decimeter, but use of this unit is restricted to the measurement of liquids and gases. No prefix other than milli- should be used with liter. *See also:* units and letter symbols. (QUL) 268-1982s

(6) (A) (data management) A portion of data that, together with it's data carrier, can be handled as a unit. *Synonym:* physical volume. **(B) (data management)** A data carrier that is mounted and demounted as a unit; for example, a disk pack or a reel of magnetic tape. (C) 610.5-1990
(7) (A) A data carrier that is mounted and demounted as a unit; for example, a spool of magnetic tape, or a disk pack. **(B)** A storage medium, together with its data carrier, that can be handled conveniently as a unit; for example, a reel of magnetic tape or a disk pack. **(C)** The portion of a single unit of storage that is accessible to a single read/write head. (C) 610.10-1994

volume density of magnetic pole strength At any point of the medium in a magnetic field, the negative of the divergence of the magnetic polarization vector there. (Std100) 270-1966w

volume equivalent (complete telephone connection, including the terminating telephone sets) A measure of the loudness of speech reproduced over it. The volume equivalent of a complete telephone connection is expressed numerically in terms of the trunk loss of a working reference system when the latter is adjusted to give equal loudness. *Note:* For engineering purposes, the volume equivalent is divided into volume losses assignable to: 1) the station set, subscriber line, and battery-supply circuit that are on the transmitting end 2) the station set, subscriber line, and battery supply that are on the receiving end 3) the trunk and 4) interaction effects arising at the trunk terminals. (EEC/PE) [119]

volume fraction The ratio of the volume of inclusions to the total volume (inclusions plus host material). (AP/PROP) 211-1997

volume header *See:* beginning-of-volume label.

volume indicator (standard volume indicator) A standardized instrument having specified electric and dynamic characteristics and read in a prescribed manner, for indicating the volume of a complex electric wave such as that corresponding to speech or music. *Notes:* 1. The reading in volume units is equal to the number of decibels above a reference volume. The sensitivity is adjusted so that the reference volume or zero volume unit is indicated when the instrument is connected across a 600-ohm resistor in which there is dissipated a power of 1 milliwatt at 1000 hertz. 2. Specifications for a volume indicator are given in American National Standard Volume Measurements of Electrical Speech and Program Waves, C16.5. *See also:* volume unit; instrument. (COM/SP/TA) 269-1971w, [50], [32]

volume label *See:* beginning-of-volume label; end-of-volume label.

volume lifetime (semiconductor) The average time interval between the generation and recombination of minority carriers in a homogeneous semiconductor. *See also:* semiconductor device; semiconductor. (ED) 216-1960w

volume limiter A device that automatically limits the output volume of speech or music to a predetermined maximum value. *See also:* peak limiter. (EEC/PE) [119]

volume-limiting amplifier An amplifier containing an automatic device that functions when the input volume exceeds a predetermined level and so reduces the gain that the output volume is thereafter maintained substantially constant notwithstanding further increase in the input volume. *Note:* The normal gain of the amplifier is restored when the input volume returns below the predetermined limiting level. *See also:* amplifier. (AP/ANT) 145-1983s

volume mixing ratio The ratio defined by $N(z)/N(\text{air})$ where $N(z)$ is the number density (number of molecules per unit volume) of a particular species and $N(\text{air})$ is the number density of air. (AP/PROP) 211-1997

volume range (1) (transmission system) The difference, expressed in decibels between the maximum and minimum volumes that can be satisfactorily handled by the system. (EEC/PE) [119]
(2) (complex audio-frequency signal) The difference, expressed in decibels, beween the maximum and minimum volumes occurring over a specified period of time. (EEC/PE) [119]

volume resistivity The reciprocal of volume conductivity, measured in siemens per centimeter, which is a steady-state parameter. (PE) 402-1974w

volume scattering Scattering from inhomogeneities distributed throughout a volume. The inhomogeneities can be discrete particles or structures or continuous spatial variations of refractive index. (AP/PROP) 211-1997

volumetric radar A surveillance radar with coverage extending over a significant sector in two angular coordinates. (AES) 686-1997

volume unit The unit in which the standard volume indicator is calibrated. *Note:* One volume unit equals one decibel for a sine wave but volume units should not be used to express results of measurements of complex waves made with devices having characteristics differing from those of the standard volume indicator. *See also:* volume indicator. (SP) 151-1965w

Von Neumann architecture A computer architecture characterized by a processor, memory and input-output devices interconnected with a single bus, thus allowing a single path to main storage for instructions and data. *Note:* This is the classic architecture and the basis for most modern computers. *Synonym:* control flow architecture. *Contrast:* Harvard class architecture; tagged architecture. (C) 610.10-1994w

VOR *See:* very high-frequency omnidirectional range.

vortac (navigation aids) A designation applied to certain navigation stations (primarily in the United States) in which both VOR (very high-frequency omnidirectional range) and tacan (tactical air navigation) are used; the distance function in tacan is used with VOR to provide VOR/DME (rho theta) navigation. (AES/GCS) 172-1983w

voter *See:* voting circuit.

voting circuit A logic circuit whose result is true only if the number of its inputs in the true state exceeds a predetermined amount. *Synonym:* voter. (C) 610.10-1994w

voting computer A fault tolerant computer with three or more processing elements, all computing the same operation, the final output of which is produced by the majority of the elements. (C) 610.10-1994w

vowel articulation The percent articulation obtained when the speech units considered are vowels (usually combined with consonants into meaningless syllables). *See also:* articulation (percent articulation) and intelligibility (percent intelligibility); volume equivalent. (SP) [32]

voxel The smallest three-dimensional element of a display space whose characteristics are independently assigned. *Note:* This term is derived from the term "volume element." *See also:* pixel. (C) 610.6-1991w

VRAM *See:* video RAM.

Vref *See:* reference voltage.

VRLA cell *See:* valve-regulated lead-acid (VRLA) cell.

VSA *See:* vibrating string accelerometer.

VSAM *See:* virtual sequential access method.

VSB arbitration bus The second of the two sub-buses defined in the VSB specification. It allows arbiter modules and/or requester modules to coordinate the use of the DTB by VSB masters. The VSB defines two arbitration methods—a serial arbitration method and a parallel arbitration method. (C/MM) 1096-1988w

VSB backplane An assembly that includes a printed circuit (pc) board and 96-pin connectors. The backplane buses the 64 pins on the two outer rows of the VSB connectors, providing the signal paths needed for VSB operation. (C/MM) 1096-1988w

VSB bus cycle A sequence of level transitions on the signal lines of the DTB that results in the transfer of an address and (in most cases) data between the active master and selected

slaves. The protocols of the VSB are fully asynchronous. The active master asserts a strobe signal indicating that a cycle is in progress. The responding slave acknowledges the master's signal. However, the responding slave can delay its acknowledgment for as long as it needs. The DTB cycle is generally divided into three phases: an address broadcast, zero or more data transfers, and then cycle termination. (C/MM) 1096-1988w

V-series (ITU-TSS) A CCITT family of recommendations describing the connection of digital equipment to the analog public telephone network. (C) 610.7-1995, 610.10-1994w

VSWR *See:* voltage standing-wave ratio.

VT *See:* vertical tabulation character; voltage transformer.

V_{term} Terminator source voltage to be maintained under all load conditions. (C/BA) 896.2-1991w

V-terminal voltage Terminal voltage measured with a V network between each mains conductor and earth. *See also:* electromagnetic compatibility. (EMC/INT) [53], [70]

V2F A transaction that is originated at the VME64 (the Bridge acts as a VME64 slave), and has its destination at the Futurebus+ (the Bridge acts as a Futurebus+ master). (C/BA) 1014.1-1994w

vu (volume measurements of electrical speech and program waves) (pronounced "vee-you" and customarily written with lower case letters.) A quantitative expression for volume in an electric circuit. *Notes:* 1. The volume in vu is numerically equal to the number of decibels (dB) which expresses the ratio of the magnitude of the waves to the magnitude of reference volume. 2. The term vu should not be used to express results of measurements of complex waves made with devices having characteristics differing from those of the standard volume indicator. *See also:* standard volume indicator. (BT/AV) 152-1953s

vulnerability (surge testing for equipment connected to low-voltage ac power circuits) The characteristic of a device for being damaged by an external influence, such as a surge. (SPD/PE) C62.45-1992r

VXIbus VMEbus extensions for instrumentation. (C/MM) 1155-1992

VXIbus instrument A message-based device that supports the VXIbus instrument protocols. (C/MM) 1155-1992

VXIbus subsystem A central timing module referred to as Slot 0, with up to 12 additional adjacent VXIbus modules. The VXIbus subsystem bus defines the lines on the P2 and P3 connectors. (C/MM) 1155-1992