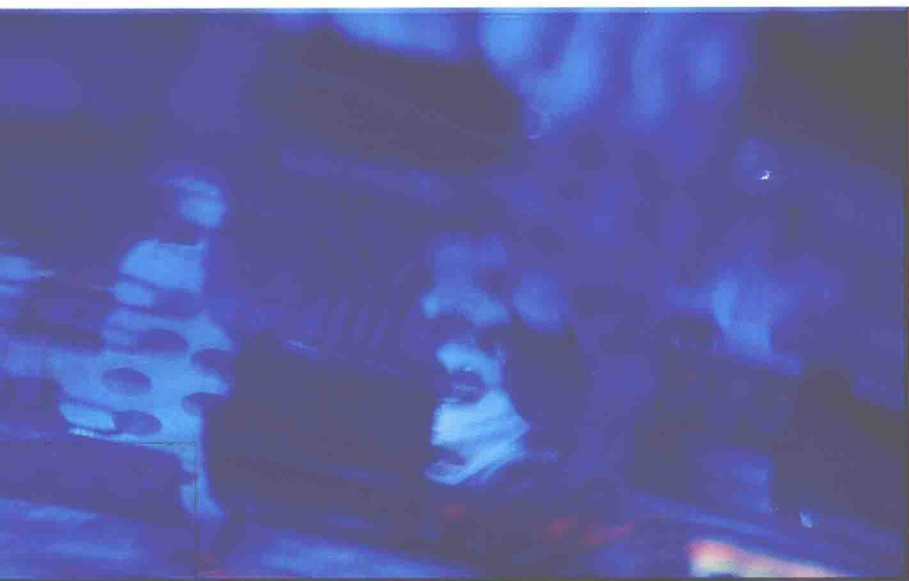


McGRAW-HILL

DICTIONARY OF ELECTRICAL & COMPUTER ENGINEERING



MORE THAN 18,000 ESSENTIAL TERMS

**COVERS EVERY DISCIPLINE OF
ELECTRICAL & COMPUTER ENGINEERING**

PROVIDES SYNONYMS, ACRONYMS, AND ABBREVIATIONS

McGraw-Hill

**Dictionary of
Electrical and
Computer
Engineering**

McGraw-Hill

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Preface

The *McGraw-Hill Dictionary of Electrical and Computer Engineering* provides a compendium of more than 18,000 terms that are central to these fields as well as related fields. In addition to computer science, electronics, electricity, and electrical engineering, coverage includes terminology in control systems, engineering acoustics, systems engineering, and communications.

The definitions are drawn from the *McGraw-Hill Dictionary of Scientific and Technical Terms*, Sixth Edition (2003). Each one is classified according to the field with which it is primarily associated. The pronunciation of each term is provided along with synonyms, acronyms, and abbreviations where appropriate. A guide to the use of the *Dictionary* is included, explaining the alphabetical organization of terms, the format of the book, cross referencing, and how synonyms, variant spellings, abbreviations, and similar information are handled. A pronunciation key is also provided to assist the reader. An extensive appendix provides conversion tables for commonly used scientific and technical units as well as charts, a “family tree” of programming languages, and listings of useful mathematical, engineering, and scientific data, laws, and equations.

It is the editors' hope that this dictionary will serve the needs of scientists, engineers, specialists in information technology, students, teachers, librarians, and writers for high-quality information, and that it will contribute to scientific literacy and communication.

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How to Use the Dictionary

ALPHABETIZATION. The terms in the *McGraw-Hill Dictionary of Electrical and Computer Engineering* are alphabetized on a letter-by-letter basis; word spacing, hyphen, comma, and solidus in a term are ignored in the sequencing. For example, an ordering of terms would be:

absolute-value computer
absolute vector
accuracy control system
ac/dc receiver

airborne radar
air capacitor

FORMAT. The basic format for a defining entry provides the term in boldface, the field in small capitals, and the single definition in lightface:

term [FIELD] Definition.

A field may be followed by multiple definitions, each introduced by a boldface number:

term [FIELD] **1.** Definition. **2.** Definition. **3.** Definition.

A term may have definitions in two or more fields:

term [COMMUN] Definition. [COMPUT SCI] Definition.

A simple cross-reference entry appears as:

term See another term.

A cross reference may also appear in combination with definitions:

term [COMMUN] Definition. [COMPUT SCI] See another term.

CROSS REFERENCING. A cross-reference entry directs the user to the defining entry. For example, the user looking up “chroma band-pass amplifier” finds:

chroma band-pass amplifier See burst amplifier.

The user then turns to the “B” terms for the definition. Cross references are also made from variant spellings, acronyms, abbreviations, and symbols.

ACK See acknowledge character.

A-O-I gate See AND-OR-INVERT gate.

bps See bit per second.

chip See microchip.

ALSO KNOWN AS . . . , etc. A definition may conclude with a mention of a synonym of the term, a variant spelling, an abbreviation for the term, or other such information, introduced by “Also known as . . . ,” “Also spelled . . . ,” “Abbreviated . . . ,” “Symbolized . . . ,” “Derived from” When a term has more than one definition, the positioning of any of these phrases conveys the extent of applicability. For example:

term [COMPUT SCI] **1.** Definition. Also known as synonym. **2.** Definition. Symbolized T.

In the above arrangement, “Also known as . . . ” applies only to the first definition; “Symbolized . . . ” applies only to the second definition.

term [COMMUN] **1.** Definition. **2.** Definition. [COMPUT SCI] Definition. Also known as synonym.

In the above arrangement, “Also known as . . . ” applies only to the second field.

term [COMMUN] Also known as synonym. **1.** Definition. **2.** Definition. [COMPUT SCI] Definition.

In the above arrangement, “Also known as . . . ” applies only to both definitions in the first field.

term Also known as synonym. [COMMUN] **1.** Definition. **2.** Definition. [COMPUT SCI] Definition.

In the above arrangement, “Also known as . . . ” applies to all definitions in both fields.

Fields and Their Scope

[COMMUN] **communications**—The science and technology by which information is collected from an originating source; converted into a form suitable for transmission; transmitted over a pathway such as a satellite channel, underwater acoustic channel, telephone cable, or fiber-optic link; and reconverted into a form suitable for interpretation by a receiver.

[COMPUT SCI] **computer science**—The study of computing, including computer hardware, software, programming, networking, database systems, information technology, interactive systems, and security.

[CONT SYS] **control systems**—The study of those systems in which one or more outputs are forced to change in a desired manner as time progresses.

[ELEC] **electricity**—The science of physical phenomena involving electric charges and their effects when at rest and when in motion.

[ELECTROMAG] **electromagnetism**—The branch of physics dealing with the observations and laws relating electricity to magnetism, and with magnetism produced by an electric current.

[ELECTR] **electronics**—The technological area involving the manipulation of voltages and electric currents through the use of various devices for the purpose of performing some useful action with the currents and voltages; this field is generally divided into analog electronics, in which the signals to be manipulated take the form of continuous currents or voltages, and digital electronics, in which signals are represented by a finite set of states.

[ENG] **engineering**—The science by which the properties of matter and the sources of power in nature are made useful to humans in structures, machines, and products.

[ENG ACOUS] **engineering acoustics**—The field of acoustics that deals with the production, detection, and control of sound by electrical devices, including the study, design, and construction of such things as microphones, loudspeakers, sound recorders and reproducers, and public address systems.

[GEOPHYS] **geophysics**—The branch of geology in which the principles and practices of physics are used to study the earth and its environment, that is, earth, air, and (by extension) space.

[MATER] **materials**—A multidisciplinary field concerned with the properties and uses of materials in terms of composition, structure, and processing.

[MATH] **mathematics**—The deductive study of shape, quantity, and dependence; the two main areas are applied mathematics and pure mathematics, the former arising from the study of physical phenomena, the latter involving the intrinsic study of mathematical structures.

[NAV] **navigation**—The science or art of directing the movement of a craft, such as a ship, small marine craft, underwater vehicle, land vehicle, aircraft, missile, or spacecraft, from one place to another with the assistance of onboard equipment, objects, or devices, or of systems external to the craft.

[OPTICS] **optics**—The study of phenomena associated with the generation, transmission, and detection of electromagnetic radiation in the spectral range extending from the long-wave edge of the x-ray region to the short-wave edge of the radio region; and the science of light.

[PHYS] **physics**—The science concerned with those aspects of nature which can be understood in terms of elementary principles and laws.

[SOLID STATE] **solid-state physics**—The branch of physics centering on the physical properties of solid materials; it is usually concerned with the properties of crystalline materials only, but it is sometimes extended to include the properties of glasses or polymers.

[STAT] **statistics**—The science dealing with the collection, analysis, interpretation, and presentation of masses of numerical data.

[SYS ENG] **systems engineering**—The branch of engineering dealing with the design of a complex interconnection of many elements (a system) to maximize an agreed-upon measure of system performance.

Pronunciation Key

Vowels

a	as in bat , that
ā	as in bait , crate
ä	as in bother , father
e	as in bet , net
ē	as in beet , treat
i	as in bit , skit
ī	as in bite , light
ō	as in boat , note
ó	as in bought , taut
û	as in book , pull
ü	as in boot , pool
ə	as in but , sofa
aʊ	as in crowd , power
oi	as in boil , spoil
yə	as in formula , spectacular
yü	as in fuel , mule

Semivowels/Semiconsonants

w	as in wind , twin
y	as in yet , onion

Stress (Accent)

ˈ	precedes syllable with primary stress
ˌ	precedes syllable with secondary stress
ː	precedes syllable with variable or indeterminate primary/secondary stress

Consonants

b	as in bib , dribble
ch	as in charge , stretch
d	as in dog , bad
f	as in fix , safe
g	as in good , signal
h	as in hand , behind
j	as in joint , digit
k	as in cast , brick
ƙ	as in Bach (used rarely)
l	as in loud , bell
m	as in mild , summer
n	as in new , dent
<u>n</u>	indicates nasalization of preceding vowel
ŋ	as in ring , single
p	as in pier , slip
r	as in red , scar
s	as in sign , post
sh	as in sugar , shoe
t	as in timid , cat
th	as in thin , breath
<u>th</u>	as in then , breathe
v	as in veil , weave
z	as in zoo , cruise
zh	as in beige , treasure

Syllabication

·	Indicates syllable boundary when following syllable is unstressed
---	---

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a See ampere.

A See ampere.

aΩ See abohm.

(aΩ)⁻¹ See abmho.

A+ See A positive.

aA See abampere.

aA/cm² See abampere per square centimeter.

A AND NOT B gate See AND NOT gate. { 'ā an nōt 'bē ,gāt }

abampere [ELEC] The unit of electric current in the electromagnetic centimeter-gram-second system; 1 abampere equals 10 amperes in the absolute meter-kilogram-second-ampere system. Abbreviated aA. Also known as Bi; biot. { ab'am-pēr }

abampere per square centimeter [ELEC] The unit of current density in the electromagnetic centimeter-gram-second system. Abbreviated aA/cm². { ab'am-pēr pār 'skwer 'sen-tā ,mēd-ər }

A battery [ELECTR] The battery that supplies power for filaments or heaters of electron tubes in battery-operated equipment. { 'ā ,bat-ə-rē }

abbreviated dialing [COMMUN] A feature which requires less than the usual number of dialing operations to connect two or more subscribers. { ə'brē-vē-ād-əd 'dī-līŋ }

ABC See automatic brightness control.

abcoulobomb [ELEC] The unit of electric charge in the electromagnetic centimeter-gram-second system, equal to 10 coulombs. Abbreviated aC. { ab'kü-lōm }

abcoulobomb centimeter [ELEC] In the electromagnetic centimeter-gram-second system of units, the unit of electric dipole moment. Abbreviated aCm. { ab'kü-lōm 'sen-tā ,mēd-ər }

abcoulobomb per cubic centimeter [ELEC] The electromagnetic centimeter-gram-second unit of volume density of charge. Abbreviated aC/cm³. { ab'kü-lōm pār 'kyū-bik 'sen-tā ,mēd-ər }

abcoulobomb per square centimeter [ELEC] The electromagnetic centimeter-gram-second unit of surface density of charge, electric polarization, and displacement. Abbreviated aC/cm². { ab'kü-lōm pār skwer 'sen-tā ,mēd-ər }

abeam See on the beam. { ə'bēm }

abend [COMPUT SCI] An unplanned program termination that occurs when a computer is directed to execute an instruction or to process information that it cannot recognize. Also known as blow up; bomb; crash. { 'ab-end }

abfarad [ELEC] A unit of capacitance in the electromagnetic centimeter-gram-second system equal to 10⁹ farads. Abbreviated aF. { ab'far-ad }

abhenry [ELEC] A unit of inductance in the electromagnetic centimeter-gram-second system of units which is equal to 10⁻⁹ henry. Abbreviated aH. { ab'hen-rē }

able [COMPUT SCI] A name for the hexadecimal digit whose decimal equivalent is 10. { 'ā-bəl }

abmho [ELEC] A unit of conductance in the electromagnetic centimeter-gram-second system of units equal to 10⁹ mhos. Abbreviated (aΩ)⁻¹. Also known as absiemens (aS). { 'ab,mō }

Abney level See clinometer. { 'ab-nē 'lev-əl }

abnormal glow discharge [ELECTR] A discharge of electricity in a gas tube at currents somewhat higher than those of an ordinary glow discharge, at which point the glow covers the entire cathode and the voltage drop decreases with increasing current. { ab'nōr-məl ,glō 'dis-chārij }

abnormal propagation [COMMUN] Phenomena of unstable or changing atmospheric or ionospheric conditions acting upon transmitted radio waves, preventing such waves from following their normal path, thereby causing difficulties and disruptions of communications. { ab'nōr-məl ,prəp-ə'gā-shən }

abnormal statement [COMPUT SCI] An element of a FORTRAN V (UNIVAC) program which specifies that certain function subroutines must be called every time they are referred to. { ab'nōr-məl 'stāt-mənt }

abohm [ELEC] The unit of electrical resistance in the centimeter-gram-second system; 1 abohm equals 10⁻⁹ ohm in the meter-kilogram-second system. Abbreviated aΩ. { ə'bōm }

abohm centimeter [ELEC] The centimeter-gram-second unit of resistivity. Abbreviated aΩcm. { ə'bōm 'sen-tā ,mēd-ər }

abort [COMPUT SCI] To terminate a procedure, such as the running of a computer program or the printing of a document, while it is still in progress. { ə'bōrt }

abort branch [CONT SYS] A branching instruction in the program controlling a robot that causes a test to be performed on whether the tool-center point is properly positioned, and to reposition it if it drifts out of the acceptable range. { ə'bōrt ,branch }

AB power pack

AB power pack [ELEC] 1. Assembly in a single unit of the A battery and B battery for a battery-operated vacuum-tube circuit. 2. Unit that supplies the necessary A and B direct-current voltages from an alternating-current source of power. { ă'bē 'paŭ-ər, pak }

abrupt junction [ELECTR] A pn junction in which the concentration of impurities changes suddenly from acceptors to donors. { ə'brəpt 'jəŋk-shən }

abs [COMPUT SCI] A special function occurring in ALGOL, which yields the absolute value, or modulus, of its argument.

absiemens See abmho. { əb'sē-mən-z }

absolute address [COMPUT SCI] The numerical identification of each storage location which is wired permanently into a computer by the manufacturer. { 'ab-sə,lüt ə'dres }

absolute addressing [COMPUT SCI] The identification of storage locations in a computer program by their physical addresses. { 'ab-sə,lüt ə'dres-ɪŋ }

absolute category rating mean opinion score [COMMUN] Methodology for subjectively testing audio quality where participants are presented with sound samples, one at a time, and are asked to grade them on a 5-point scale. For the NRSC FM IBOC tests, the MOS scale used was 5 = excellent, 4 = good, 3 = fair, 2 = poor, 1 = bad. Abbreviated ACR-MOS. { 'ab-sə,lüt kad-ə,gôr-ē rād-ɪŋ mēn ə'pɪn-jən, skôr }

absolute cell reference [COMPUT SCI] A cell reference used in a formula in a spreadsheet program that does not change when the formula is copied or moved. { 'ab-sə,lüt 'sel,ref-rəns }

absolute code [COMPUT SCI] A code used when the addresses in a program are to be written in machine language exactly as they will appear when the instructions are executed by the control circuits. { 'ab-sə,lüt 'kôd }

absolute efficiency [ENG ACOUS] The ratio of the power output of an electroacoustic transducer, under specified conditions, to the power output of an ideal electroacoustic transducer. { 'ab-sə,lüt ə'fɪʃ-ən-sē }

absolute electrometer [ELEC] A very precise type of attracted disk electrometer in which the attraction between two disks is balanced against the force of gravity. { 'ab-sə,lüt ə,lek'trām-əd-ər }

absolute gain of an antenna [ELECTROMAG] Gain in a given direction when the reference antenna is an isotropic antenna isolated in space. Also known as isotropic gain of an antenna. { 'ab-sə,lüt, gān əv ən an'ten-ə }

absolute index of refraction See index of refraction. { 'ab-sə,lüt 'ɪn,deks əv rɪ'frak-shən }

absolute instruction [COMPUT SCI] A computer instruction in its final form, in which it can be executed. { 'ab-sə,lüt ɪn'strək-shən }

absolute programming [COMPUT SCI] Programming with the use of absolute code. { 'ab-sə,lüt 'prô-gram-ɪŋ }

absolute refractive constant See index of refraction. { 'ab-sə,lüt rɪ'frak-tɪv 'kân-stənt }

absolute-value computer [COMPUT SCI] A computer that processes the values of the variables rather than their increments. { 'ab-sə,lüt 'val-yü kəm'pyüt-ər }

absolute vector [COMPUT SCI] In computer graphics, a vector whose end points are given in absolute coordinates. { 'ab-sə,lüt 'vek-tər }

absorbed charge [ELEC] Charge on a capacitor which arises only gradually when the potential difference across the capacitor is maintained, due to gradual orientation of permanent dipolar molecules. { əb'sôrbd 'çàrj }

absorber [ELECTR] A material or device that takes up and dissipates radiated energy; may be used to shield an object from the energy, prevent reflection of the energy, determine the nature of the radiation, or selectively transmit one or more components of the radiation. { əb'sôr-bər }

absorber control See absorption control. { əb'sôr-bər kən'trôl }

absorption [ELEC] The property of a dielectric in a capacitor which causes a small charging current to flow after the plates have been brought up to the final potential, and a small discharging current to flow after the plates have been short-circuited, allowed to stand for a few minutes, and short-circuited again. Also known as dielectric soak. [ELECTROMAG] Taking up of energy from radiation by the medium through which the radiation is passing. { əb'sôrp-shən }

absorption circuit [ELECTR] A series-resonant circuit used to absorb power at an unwanted signal frequency by providing a low impedance to ground at this frequency. { əb'sôrp-shən 'sər-kət }

absorption control See absorption modulation. { əb'sôrp-shən kən'trôl }

absorption current [ELEC] The component of a dielectric current that is proportional to the rate of accumulation of electric charges within the dielectric. { əb'sôrp-shən 'kər-ənt }

absorption fading [COMMUN] Slow type of fading, primarily caused by variations in the absorption rate along the radio path. { əb'sôrp-shən 'fād-ɪŋ }

absorption loss [COMMUN] That part of the transmission loss due to the dissipation or conversion of either sound energy or electromagnetic energy into other forms of energy, either within the medium or attendant upon a reflection. { əb'sôrp-shən, lôs }

absorption meter [ENG] An instrument designed to measure the amount of light transmitted through a transparent substance, using a photocell or other light detector. { əb'sôrp-shən 'mēd-ər }

absorption modulation [ELECTR] A system of amplitude modulation in which a variable-impedance device is inserted in or coupled to the output circuit of the transmitter. Also known as absorption control; loss modulation. { əb'sôrp-shən mäd-yü'lā-shən }

absorption wavemeter [ELECTR] A frequency- or wavelength-measuring instrument consisting of

a calibrated tunable circuit and a resonance indicator. { 'əb'sɔrp-shən 'wāv,mēd-ər }

abstract automata theory [COMPUT SCI] The mathematical theory which characterizes automata by three sets: input signals, internal states, and output signals; and two functions: input functions and output functions. { 'əbz-trakt ɔ'tam-ə-tə 'thē-ə-rē }

abstract data type [COMPUT SCI] A mathematical model which may be used to capture the essentials of a problem domain in order to translate it into a computer program; examples include queues, lists, stacks, trees, graphs, and sets. Abbreviated ADT. { 'əbz-trakt 'dad-ə,tīp }

abvolt [ELEC] The unit of electromotive force in the electromagnetic centimeter-gram-second system; 1 abvolt equals 10^{-8} volt in the absolute meter-kilogram-second system. Abbreviated aV. { 'əb,vɔlt }

abvolt per centimeter [ELEC] In the electromagnetic centimeter-gram-second system of units, the unit of electric field strength. Abbreviated aV/cm. { 'əb,vɔlt pər 'sen-tə,mēd-ər }

abwatt [ELEC] The unit of electrical power in the centimeter-gram-second system; 1 abwatt equals 1 watt in the absolute meter-kilogram-second system. { 'əb,wät }

ac See alternating current.

ac See abcoulob.

ACAS See airborne collision avoidance system.

accelerated graphics port [COMPUT SCI] A personal computer graphics bus that transfers data at a greater rate than a PCI bus. { 'ak,sel-ə,rād-əd 'graf-iks ,pɔrt }

accelerated test [ELEC] A test of the serviceability of an electric cable in use for some time by applying twice the voltage normally carried. { 'ak'sel-ə,rād-əd 'test }

accelerating electrode [ELECTR] An electrode used in cathode-ray tubes and other electron tubes to increase the velocity of the electrons that contribute the space current or form a beam. { 'ak'sel-ə,rād-ɪŋ i'lek,trɔd }

accelerating potential [ELECTR] The energy potential in electron-beam equipment that imparts additional speed and energy to the electrons. { 'ak'sel-ə,rād-ɪŋ pə'ten-shəl }

accelerating relay [ELEC] Any relay that is used to assist in starting a motor or increasing its speed. { 'ak'sel-ə,rād-ɪŋ i'rē,lā }

acceleration-error constant [CONT SYS] The ratio of the acceleration of a controlled variable of a servomechanism to the actuating error when the actuating error is constant. { 'ak,sel-ə'rā-shən 'er-ər 'kən-stənt }

acceleration switch [ELEC] A switch that opens or closes in the presence of acceleration that exceeds a certain value. { 'ak,sel-ə'rā-shən ,swɪtʃ }

acceleration time [COMPUT SCI] The time required for a magnetic tape transport or any other mechanical device to attain its operating speed. { 'ak,sel-ə'rā-shən ,tīm }

acceleration tolerance [ENG] The degree to which personnel or equipment withstands acceleration. { 'ak,sel-ə'rā-shən 'tāl-ə-rəns }

acceleration voltage [ELECTR] The voltage between a cathode and accelerating electrode of an electron tube. { 'ak,sel-ə'rā-shən 'vɔl-taj }

accentuation [ELECTR] The enhancement of signal amplitudes in selected frequency bands with respect to other signals. { 'ak,sen-cha'wā-shən }

accentuator [ELECTR] A circuit that provides for the first part of a process for increasing the strength of certain audio frequencies with respect to others, to help these frequencies override noise or to reduce distortion. Also known as accentuator circuit. { 'ak'sen-cha,wād-ər }

accentuator circuit See accentuator. { 'ak'sen-cha,wād-ər 'sər-kət }

accept [COMPUT SCI] A data transmission statement which is used in FORTRAN when the computer is in conversational mode, and which enables the programmer to input, through the teletypewriter, data the programmer wishes stored in memory. { 'ak'sept }

acceptor [SOLID STATE] An impurity element that increase the number of holes in a semiconductor crystal such as germanium or silicon; aluminum, gallium, and indium are examples. Also known as acceptor impurity; acceptor material. { 'ak'sep-tər }

acceptor circuit [ELECTR] A series-resonant circuit that has a low impedance at the frequency to which it is tuned and a higher impedance at all other frequencies. { 'ak'sep-tər 'sər-kət }

acceptor impurity See acceptor. { 'ak'sep-tər ɪm 'pyūr-ə-dē }

acceptor material See acceptor. { 'ak'sep-tər mə 'tɪr-ē-əl }

access [COMPUT SCI] The reading of data from storage or the writing of data into storage. { 'ak ,ses }

access arm [COMPUT SCI] The mechanical device which positions the read/write head on a magnetic storage unit. { 'ak,ses ,ärm }

access code [COMMUN] 1. Numeric identification for internetwork or facility switching. 2. The preliminary digits that a user must dial to be connected through an automatic PBX to the serving switching center. [COMPUT SCI] A sequence of characters which a user must enter into a terminal in order to use a computer system. { 'ak,ses ,kɔd }

access control [COMPUT SCI] A restriction on the operations that a user of a computer system may perform on files and other resources of the system. { 'ak,ses kən'trɒl }

access-control list [COMPUT SCI] A column of an access matrix, containing the access rights of various users of a computer system to a given file or other resource of the system. { 'ak,ses kən'trɒl ,lɪst }

access-control mechanism See reference monitor. { 'ak,ses kən'trɒl /me-kə-ni-zəm }

access-control register [COMPUT SCI] A storage device which controls the word-by-word transmission over a given channel. { 'ak,ses kən'trɒl ,rɛj-ə-stər }

access-control words

access-control words [COMPUT SCI] Permanently wired instructions channeling transmitted words into reserved locations. { 'ak,ses kən'trɒl ,wɜ:dz }

access gap *See* memory gap. { 'ak,ses ,gap }

access line [COMMUN] Four-wire circuit between a subscriber or a local PBX to the serving switching center. { 'ak,ses ,lɪn }

access management [COMPUT SCI] The use of techniques to allow various components of a computer's operating system to be used only by authorized personnel. { 'ak,ses ,mæn-ij-mənt }

access matrix [COMPUT SCI] A method of representing discretionary authorization information, with rows representing subjects or users of the system, columns corresponding to objects or resources of the system, and cells (intersections of rows and columns) composed of allowable operations that a subject may apply to an object. { 'ak,ses ,mā-trɪks }

access mechanism [COMPUT SCI] The mechanism of positioning reading or writing heads onto the required tracks of a magnetic disk. { 'ak,ses 'mek-ə,nɪz-əm }

access method [COMMUN] The procedures required to obtain access to a communications network. [COMPUT SCI] A set of programming routines which links programs and the data that these programs transfer into and out of memory. { 'ak,ses ,meth-əd }

access mode [COMPUT SCI] A programming clause in COBOL which is required when using a random-access device so that a specific record may be read out of or written into a mass storage bin. { 'ak,ses ,mɒd }

access privileges [COMPUT SCI] The extent to which a user of a computer in a network is allowed to use and read, write to, and execute files in other computers in the network. { 'ak ,ses ,prɪv-ə-laj-əs }

access protocol [COMMUN] A set of rules observed by all nodes in a local-area network so that one node can get the attention of another and its data packet can be transferred, and so that no two data packets can be simultaneously transmitted over the same medium. { 'ak,ses ,prɒd-ə,kɒl }

access provider *See* service provider. { 'ak,ses prə,vɪd-ər }

access time [COMPUT SCI] The time period required for reading out or writing into the computer memory. { 'ak,ses ,tɪm }

access type [COMPUT SCI] One of the allowable operations that a given user of a computer system governed by access controls may perform on a file or other resource of the system, such as own, read, write, or execute. { 'ak,ses ,tɪp }

aCcm *See* abcoulob centimeter.

aC/cm² *See* abcoulob per square centimeter.

aC/cm³ *See* abcoulob per cubic centimeter.

accommodation [CONT SYS] Any alteration in a robot's motion in response to the robot's environment; it may be active or passive. { ə,kəm-ə'də-shən }

accommodation time [ELECTR] The time from the production of the first electron to the production of a steady electric discharge in a gas. { ə,kəm-ə'də-shən ,tɪm }

accordion cable [ELECTR] A flat, multiconductor cable prefolded into a zigzag shape and used to make connections to movable equipment such as a chassis mounted on pullout slides. { ə'kɔ:rd-ē-ən 'kā-bəl }

accounting package [COMPUT SCI] A set of special routines that allow collection of information about the usage level of various components of a computer system by each production program. { ə'kaunt-ɪŋ 'pæk-ɪj }

accumulator [COMPUT SCI] A specific register, in the arithmetic unit of a computer, in which the result of an arithmetic or logical operation is formed; here numbers are added or subtracted, and certain operations such as sensing, shifting, and complementing are performed. Also known as accumulator register; counter. [ELECTR] *See* storage battery. { ə'kyü-myə,läd-ər }

accumulator battery *See* storage battery. { ə'kyü-myə,läd-ər 'bad-ə-rē }

accumulator jump instruction [COMPUT SCI] An instruction which programs a computer to ignore the previously established program sequence depending on the status of the accumulator. Also known as accumulator transfer instruction. { ə'kyü-myə,läd-ər ,jʌmp in'stræk-shən }

accumulator register *See* accumulator. { ə'kyü-myə,läd-ər 'rej-ə-stər }

accumulator shift instruction [COMPUT SCI] A computer instruction which causes the word in a register to be displaced a specified number of bit positions to the left or right. { ə'kyü-myə,läd-ər 'shift in'stræk-shən }

accumulator transfer instruction *See* accumulator jump instruction. { ə'kyü-myə,läd-ər 'trans-fər in'stræk-shən }

accuracy control system [COMPUT SCI] Any method which attempts error detection and control, such as random sampling and squaring. { 'ak-yə-rə-sē kən'trɒl ,sɪs-təm }

ac/dc motor *See* universal motor. { ,ä-sē,dē-sē 'mɒt-ər }

ac/dc receiver [ELECTR] A radio receiver designed to operate from either an alternating- or direct-current power line. Also known as universal receiver. { ,ä-sē,dē-sē rɪ'sɛv-ər }

ACK *See* acknowledge character.

acknowledge character [COMPUT SCI] A signal that a receiving station transmits in order to indicate that a block of information has been received and that its validity has been checked. Also known as acknowledgement. Abbreviated ACK. { ək'nä-lɪj 'kar-ək-tər }

acknowledgement *See* acknowledge character. { ək'nä-lɪj-mənt }

aΩcm *See* abohm centimeter.

acorn tube [ELECTR] An ultra-high-frequency electron tube resembling an acorn in shape and size. { 'ä,körn ,tüb }

acoustic amplifier [ELECTR] A device that amplifies mechanical vibrations directly at audio and

- ultrasonic frequencies. Also known as acoustoelectric amplifier. { ʔ'küs-tik 'am-plä,fi-ər }
- acoustic array** [ENG ACOUS] A sound-transmitting or sound-receiving system whose elements are arranged to give desired directional characteristics. { ʔ'küs-tik 'a'ra }
- acoustic bridge** [ELECTR] A device, based on the principle of the electrical Wheatstone bridge, used for analysis of deafness. { ʔ'küs-tik 'bri:j }
- acoustic center** [ENG ACOUS] The center of the spherical sound waves radiating outward from an acoustic transducer. { ʔ'küs-tik 'sen-tər }
- acoustic clarifier** [ENG ACOUS] System of cones loosely attached to the baffle of a loudspeaker and designed to vibrate and absorb energy during sudden loud sounds to suppress these sounds. { ʔ'küs-tik 'klar-ə,fi-ər }
- acoustic convolver** See convolver. { ʔ'küs-tik kən 'völ-v-ər }
- acoustic coupler** [ENG ACOUS] A device used between the modem of a computer terminal and a standard telephone line to permit transmission of digital data in either direction without making direct connections. { ʔ'küs-tik 'kəp-lər }
- acoustic delay** [ENG ACOUS] A delay which is deliberately introduced in sound reproduction by having the sound travel a certain distance along a pipe before conversion into electric signals. { ʔ'küs-tik di'lā }
- acoustic delay line** [ELECTR] A device in which acoustic signals are propagated in a medium to make use of the sonic propagation time to obtain a time delay for the signals. Also known as sonic delay line. { ʔ'küs-tik di'lā ,līn }
- acoustic detector** [ELECTR] The stage in a receiver at which demodulation of a modulated radio wave into its audio component takes place. { ʔ'küs-tik di'tek-tər }
- acoustic feedback** [ENG ACOUS] The reverberation of sound waves from a loudspeaker to a preceding part of an audio system, such as to the microphone, in such a manner as to reinforce, and distort, the original input. Also known as acoustic regeneration. { ʔ'küs-tik 'fēd ,bək }
- acoustic filter** See filter. { ʔ'küs-tik 'fil-tər }
- acoustic generator** [ENG ACOUS] A transducer which converts electrical, mechanical, or other forms of energy into sound. { ʔ'küs-tik 'jen-ə ,rād-ər }
- acoustic hologram** [ENG] The phase interference pattern, formed by acoustic beams, that is used in acoustical holography; when light is made to interact with this pattern, it forms an image of an object placed in one of the beams. { ʔ'küs-tik 'həl-ə,gram }
- acoustic horn** See horn. { ʔ'küs-tik 'hörn }
- acoustic jamming** [ENG ACOUS] The deliberate radiation or reradiation of mechanical or electroacoustic signals with the objectives of obliterating or obscuring signals which the enemy is attempting to receive and of deterring enemy weapons systems. { ʔ'küs-tik 'jam-ŋ }
- acoustic labyrinth** [ENG ACOUS] Special baffle arrangement used with a loudspeaker to prevent cavity resonance and to reinforce bass response. { ʔ'küs-tik 'lab-ə,rinth }
- acoustic line** [ENG ACOUS] The acoustic equivalent of an electrical transmission line, involving baffles, labyrinths, or resonators placed at the rear of a loudspeaker and arranged to help reproduce the very low audio frequencies. { ʔ'küs-tik 'līn }
- acoustic radiator** [ENG ACOUS] A vibrating surface that produces sound waves, such as a loudspeaker cone or a headphone diaphragm. { ʔ'küs-tik 'rād-ē,əd-ər }
- acoustic radiometer** [ENG] An instrument for measuring sound intensity by determining the unidirectional steady-state pressure caused by the reflection or absorption of a sound wave at a boundary. { ʔ'küs-tik ,rād-ə'ä-məd-ər }
- acoustic ratio** [ENG ACOUS] The ratio of the intensity of sound radiated directly from a source to the intensity of sound reverberating from the walls of an enclosure, at a given point in the enclosure. { ʔ'küs-tik 'rä-shō }
- acoustic receiver** [ELECTR] The complete equipment required for receiving modulated radio waves and converting them into sound. { ʔ'küs-tik rä'sēv-ər }
- acoustic reflex enclosure** [ENG ACOUS] A loudspeaker cabinet designed with a port to allow a low-frequency contribution from the rear of the speaker cone to be radiated forward. { ʔ'küs-tik 'rē,fleks in,klo-zhər }
- acoustic regeneration** See acoustic feedback. { ʔ'küs-tik rē,jen-ə'rä-shən }
- acoustic seal** [ENG ACOUS] A joint between two parts to provide acoustical coupling with low losses of energy, such as between an earphone and the human ear. { ʔ'küs-tik 'sēl }
- acoustic spectrometer** [ENG ACOUS] An instrument that measures the intensities of the various frequency components of a complex sound wave. Also known as audio spectrometer. { ʔ'küs-tik spek'träm-əd-ər }
- acoustic transducer** [ENG ACOUS] A device that converts acoustic energy to electrical or mechanical energy, such as a microphone or phonograph pickup. { ʔ'küs-tik tranz'dü-sər }
- acoustic transformer** [ENG ACOUS] A device, such as a horn or megaphone, for increasing the efficiency of sound radiation. { ʔ'küs-tik tranz 'fór-mər }
- acoustic-wave amplifier** [ELECTR] An amplifier in which the charge carriers in a semiconductor are coupled to an acoustic wave that is propagated in a piezoelectric material, to produce amplification. { ʔ'küs-tik wāv 'am-plä,fi-ər }
- acoustoelectric amplifier** See acoustic amplifier. { ʔ'küs-tō-ə'lek-trik 'am-plä,fi-ər }
- acoustoelectric effect** [ELECTR] 1. The development of a direct-current voltage in a semiconductor or metal by an acoustic wave traveling parallel to the surface of the material. Also known as electroacoustic effect. 2. The amplification of a sound wave propagating in a piezoelectric semiconductor subject to a steady electric field that is strong enough that the resulting electron

drift velocity exceeds the speed of sound. { ʔ,küs-tō-ʔ'lek-trik i,fekt }

acoustoelectronics [ENG ACOUS] The branch of electronics that involves use of acoustic waves at microwave frequencies (above 500 megahertz), traveling on or in piezoelectric or other solid substrates. Also known as pretersonics. { ʔ,küs-tō-ʔ'lek'trän-iks }

acoustooptical cell [ELEC] An electric-to-optical transducer in which an acoustic or ultrasonic electric input signal modulates or otherwise acts on a beam of light. { ʔ,küs-tō'öp-tä-käl 'sel }

acoustooptic interaction [OPTICS] A way to influence the propagation characteristics of an optical wave by applying a low-frequency acoustical field to the medium through which the wave passes. { ʔ,küs-tō'öp-tik ,in-tä'rak-shən }

acoustooptic modulator [OPTICS] A device utilizing acoustooptic interaction ultrasonically to vary the amplitude or the phase of a light beam. Also known as Bragg cell. { ʔ,küs-tō'öp-tik 'mädyä,läd-ər }

acoustooptics [OPTICS] The science that deals with interactions between acoustic waves and light. { ʔ,küs-tō'öp-tiks }

acquire [ELECTR] 1. Of acquisition radars, the process of detecting the presence and location of a target in sufficient detail to permit identification. 2. Of tracking radars, the process of positioning a radar beam so that a target is in that beam to permit the effective employment of weapons. Also known as target acquisition. { ʔ'kwīr }

acquisition [ELECTR] Also known as target acquisition. 1. Of acquisition radars, the process of detecting and locating a target so as to permit reliable tracking and possible identification of it or other determinations about it. 2. Of precision tracking radars, the detecting and tracking of a target designated to it by another radar or other initial data source to support continued intended action. [ENG] The process of pointing an antenna or a telescope so that it is properly oriented to allow gathering of tracking and telemetry data from a satellite or space probe. { ʔk-wä'zish-ən }

acquisition and tracking radar [ENG] A radar set capable of locking onto a received signal and tracking the object emitting the signal; the radar may be airborne or on the ground. { ʔk-wä'zish-ən ʔn 'trak-ɪŋ ,rā,där }

acquisition tone [COMPUT SCI] An audible tone that verifies entry into a computer. { ʔk-wä'zish-ən ,tön }

ACR-MOS See absolute category rating mean opinion score.

ACSR See aluminum cable steel-reinforced.

actinodielectric [ELEC] Of a substance, exhibiting an increase in electrical conductivity when electromagnetic radiation is incident upon it. { ʔk-tä-nō,dī-ʔ'lek-trik }

actinoelectricity [ELEC] The electromotive force produced in a substance by electromag-

netic radiation incident upon it. { ʔk-tä-nō-ı ,lek'tris-ʔ-dē }

action entries [COMPUT SCI] The lower right-hand portion of a decision table, indicating which of the various possible actions result from each of the various possible conditions. { ʔ'ak-shən ,en-trēz }

action period [ELECTR] The period of time during which data in a Williams tube storage device can be read or new data can be written into this storage. { ʔ'ak-shən ,pīr-ē-əd }

action portion [COMPUT SCI] The lower portion of a decision table, comprising the action stub and action entries. { ʔ'ak-shən ,pōr-shən }

action stub [COMPUT SCI] The lower left-hand portion of a decision table, consisting of a single column listing the various possible actions (transformations to be done on data and materials). { ʔ'ak-shən ,stäb }

activate [ELEC] To make a cell or battery operative by addition of a liquid. [ELECTR] To treat the filament, cathode, or target of a vacuum tube to increase electron emission. { ʔ'ak-tä,vät }

activated cathode [ELECTR] A thermionic cathode consisting of a tungsten filament to which thorium has been added, and then brought to the surface, by a process such as heating in the absence of an electric field in order to increase thermionic emission. { ʔ'ak-tä,väd-ad 'kath,öd }

activation [ELEC] The process of adding liquid to a manufactured cell or battery to make it operative. [ELECTR] The process of treating the cathode or target of an electron tube to increase its emission. Also known as sensitization. { ʔ'ak-tä'vä-shən }

activation record [COMPUT SCI] A variable part of a program module, such as data and control information, that may vary with different instances of execution. { ʔ'ak-tä'vä-shən 'rek-örd }

active accommodation [CONT SYS] The alteration of preprogrammed robotic motions by the integrated effects of sensors, controllers, and the robotic motion itself. { ʔ'ak-tiv ,äk-m-ʔ'dä-shən }

active area [ELECTR] The area of a metallic rectifier that acts as the rectifying junction and conducts current in the forward direction. { ʔ'ak-tiv 'er-ē-ə }

active array [ELECTROMAG] A radar antenna composed of many radiating elements, each of which contains an amplifier, generally solid state in nature, for the final amplification of the signal transmitted; when the elements are also phased controlled for electronic beam steering, the term active phased array is used. { ʔ'ak-tiv ʔ'rā }

active balance [COMMUN] Summation of all return currents, in telephone repeater operation, at a terminal network balanced against the impedance of the local circuit or drop. { ʔ'ak-tiv 'bal-əns }