

ELECTRONICS AND NUCLEONICS DICTIONARY

*An illustrated dictionary giving up-to-date definitions,
abbreviations, and synonyms for over 13,000 terms
used in television, radio, medical electronics,
industrial electronics, space electronics,
military electronics, avionics,
radar, nuclear science, and
nuclear engineering*

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PREFACE

Concise and accurate definitions of over 13,000 electronic and nucleonic terms, made even clearer by 450 carefully chosen illustrations, are presented here for everyday use by engineers, technical writers, advertising copy writers, technicians, students, and stenographers working in these fields. Synonyms are identified and cross-referenced to the term that has become generic through common usage or through standardization by IRE, AIEE, ASA, and other engineering organizations.

Although this book is actually the second edition of *Electronics Dictionary*, very few of the 6,400 definitions in that volume could be used verbatim. As the electronics industry matured and expanded in the past 15 years, familiar old terms took on new meanings. Hundreds of new terms evolved in this same period, including asroc, astron, cifax, cozi, delrac, dovap, iraser, laddic, lodar, miran, ordir, padar, pyrotron, rabal, snivet, spherodop, tonlar, tridop, triductor, tunnel diode, and twistor.

The terminology of nucleonics is now interlocked with that of electronics, making it impossible to achieve a logical separation of terms. The new title, *Electronics and Nucleonics Dictionary*, reflects the interrelation of these two fields, which are defined as follows:

electronics The science that deals with electron devices, including electron tubes, magnetic amplifiers, transistors, and other devices that do the work of tubes.

nucleonics The science that deals with the release and utilization of energy from the nuclei of atoms.

A consistent policy has been followed throughout on spelling and hyphenation of controversial words, compound terms, and abbreviations, to reflect current usage and trends. This dictionary can therefore be adopted as a style manual with the assurance that it embodies the rules followed by the majority of writers and publishers in these fields today. When used in this manner on the desk of each writer, editor, and stenographer, the book pays for itself over and over again in time saved through elimination of style arguments and reduction of editing and correction costs.

The first *Electronics Dictionary* was adopted as the style guide by Electronics magazine and by many government, military, and commercial organizations. It also served as the guide for reports at the first Bikini atom bomb tests.

A compound term starts out as two words, takes on a hyphen next, then becomes one word, as in push button, push-button, and pushbutton. Usage governs the transition from one form to another. Much time was devoted to determination of the form that best represents current usage for each such term, using as guides the latest Government Printing Office Style Manual, McGraw-Hill Book Company styles, recent issues of technical publications, and other up-to-date references.

Acronyms such as conelrad, loran, sarah, and radar have been made entirely lower-case for consistency, as also have practically all abbreviations. For compound terms like direct current, the same abbreviation is used for both noun and adjective forms.

A definition is given only once, to keep down the size of the *Dictionary*. Synonyms are listed in their own alphabetical order, followed by the generic or more common term, in italics, after which the definition will be found. Compound terms are alphabetized as if all the words were run together, ignoring hyphens and spaces.

An accurate compilation of the language of electronics and nucleonics would be impossible without the help of a great many individuals and organizations. The collections of definitions prepared by engineering societies and government organizations proved invaluable as references for phrasing many of the definitions. Particular thanks are extended to The Institute of Radio Engineers for permission to use definitions and illustrations, to National Radio Institute for lending original drawings for illustrations, and to The American Society of Mechanical Engineers for permission to extract and condense terms from their publication, *Glossary of Terms in Nuclear Science and Technology*. Credit for illustrations also goes to Aerovox Corporation, Allied Radio Corporation, Bell Telephone Laboratories, Central Scientific Company, General Electric Company, National Bureau of Standards, Philco Corporation, RCA Review, United States Navy, Westinghouse Electric Corporation, Weston Instruments, and to the authors of McGraw-Hill books from which illustrations were taken. Finally, to Marjorie Appert goes appreciation for three long years of typing, retyping, editing, and cross-checking definitions—a process that eventually consumed a total of 65,000 four by six cards and several dozen typewriter ribbons.

A dictionary is a growing thing, never quite complete no matter how much time is spent in its compilation. The authors would therefore appreciate receiving corrections and new definitions as they come to the attention of the users of this book. If enough new terms are received between editions, it is hoped to make them available as published addendas. The authors can be addressed in care of McGraw-Hill Book Company.

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ELECTRONICS AND NUCLEONICS

DICTIONARY

A

A Abbreviation for *angstrom*.

A— [A minus] The negative terminal of an A battery or other source of filament voltage for an electron tube, or the tube filament terminal to which this source should be connected. Also called F—.

A+ [A plus] The positive terminal of an A battery or other source of filament voltage for an electron tube, or the tube filament terminal to which this source should be connected. Also called F+.

A and R display An A display, any portion of which may be expanded. Also called A and R scan.

A and R scan A and R display.

A and R scope A radar indicator that provides an A and R display on the screen of a cathode-ray tube.

ab- A prefix used to identify cgs electromagnetic units, as in abampere, abcoulomb, abfarad, abhenry, abmho, abohm, and abvolt.

abac *Nomograph*.

abampere The cgs electromagnetic unit of current. One abampere is equal to 10 amperes.

A battery The battery that supplies power for filaments or heaters of electron tubes in battery-operated equipment.

abc Abbreviation for *automatic brightness control*.

abcoulomb The cgs electromagnetic unit of electricity. An abcoulomb is the quantity of electricity that passes a point in an electric circuit in 1 second when the current is 1 abampere. One abcoulomb is equal to 10 coulombs.

aberration An image defect that occurs when an optical lens or mirror does not bring all light rays to the same focus, or when an electron lens does not bring the electron beam to the same sharp focus at all points on the screen of a cathode-ray tube.

abfarad The cgs electromagnetic unit of capacitance. A capacitor has a capacitance of 1 abfarad when a charge of 1 abcoulomb produces a voltage of 1 abvolt between the terminals. One abfarad is equal to 10^9 farads.

abhenry The cgs electromagnetic unit of inductance. A coil has an inductance of 1 abhenry when 1 abvolt is induced across its terminals by a current changing at the rate of 1 abampere per second. One abhenry is equal to 10^{-9} henry.

abmho The cgs electromagnetic unit of conductance. A conductor has a conductance of 1 abmho when 1 abvolt between its terminals will cause a current of 1 abampere to flow through the conductor. One abmho is equal to 10^9 mhos.

abnormal glow discharge A glow discharge characterized by the fact that the voltage drop increases as the current increases. It occurs when the current is increased beyond the point at which the cathode of the gas tube is completely covered with glow.

abnormal reflection A sharply defined reflection of radio waves from an ionized layer of the ionosphere, occurring at frequencies higher than the critical or penetration frequency of the layer. Also called sporadic reflection.

abohm The cgs electromagnetic unit of resistance. A conductor has a resistance of 1 abohm when 1 abvolt across its terminals will cause a current of 1 abampere to flow. One abohm is equal to 10^{-9} ohm.

A-bomb *Atomic bomb*.

abort A failure of a missile to achieve its objective, or a missile that so fails.

AB power pack A packaged power source that provides the required A (filament) and B (anode) supply voltages for an electron-tube circuit. It may be a combina-

tion of individual batteries or a rectifier unit operating from an a-c power line.

abscissa The horizontal distance from a point on a graph to the zero reference line. The units of this distance are indicated on a scale at the bottom or top of the graph.

absolute address An address assigned to a particular storage location in a computer. Also called specific address.

absolute altimeter An altimeter that registers the absolute altitude of an aircraft above the earth or sea over which the aircraft is flying. The frequency-modulated altimeter and the radar altimeter are the commonest examples in current use.

absolute altitude The height or altitude of an aircraft above the surface or terrain over which it is flying.

absolute cutoff frequency The lowest frequency at which a waveguide will propagate energy without attenuation.

absolute delay The predetermined time interval between the transmission of two synchronized radio, radar, or loran signals from the same station or from different stations.

absolute drift The amount of inherent unbalance in a magnetic amplifier, measured in terms of the watts, amperes, or ampere-turns of input signal required for rebalancing.

absolute efficiency The ratio of the output of a transducer under specified conditions to the output of a corresponding ideal transducer.

absolute humidity The mass of water vapor per unit volume in the atmosphere at a given temperature.

absolute pressure pickup An instrument that compares an unknown source of pressure with zero pressure (a vacuum) and translates this information into an electrical quantity such as a change in inductance, resistance, or voltage.

absolute temperature scale A temperature scale in which zero is the absolute zero of temperature, -273.16°C or -459.69°F . The most commonly used scale is the Kelvin scale, which uses centigrade degrees; here absolute zero is 0°K , water freezes at 273.16°K and boils at 373.16°K . The less-used Rankine scale is based on Fahrenheit degrees; here water freezes at 491.69°R and boils at 671.69°R .

absolute unit A unit defined in terms of fundamental units of mass, length, time, and charge, such as the centimeter-gram-second electromagnetic and electrostatic

units and the meter-kilogram-second-ampere electromagnetic units.

absolute value The numerical value of a number without regard to sign. Vertical lines on each side of a symbol specify that its absolute value is intended. Thus, the absolute value of Z is written $|Z|$.

absolute zero The lowest temperature that can exist, corresponding to a complete absence of molecular motion. Absolute zero is approximately -273.16°C or -459.69°F .

absorbed dose *Dose*.

absorbed dose rate The dose per unit of time, measured in rads per unit time.

absorber 1. A material or device that takes up and dissipates radiated energy. It may be used to shield an object from that energy, prevent reflection of the energy, determine the nature of the radiation, or selectively transmit one or more components of the radiation. Examples are acoustic absorbers and microwave absorbers. 2. In a nuclear reactor, a material that absorbs neutrons without reproducing them.

absorber control Control of a nuclear reactor by a material that absorbs neutrons, such as a movable cadmium or boron rod.

absorptance The ratio of the radiant energy absorbed in a body of material to the incident radiant energy.

absorptiometer An instrument for determining the concentration of substances by their absorption of nearly monochromatic radiation at a wavelength selected by filters or by a simple radiation-dispersing system.

absorption The dissipation of energy by radiation passing through a medium. Thus, some electromagnetic energy is lost when radio waves travel through the atmosphere. Acoustic energy is lost when sound waves pass through an object. The kinetic energy of a nuclear particle is reduced when it passes through a body of matter. In another nuclear example of absorption, a particle is absorbed by a nucleus in the medium, with a different type of particle sometimes being emitted as a result.

absorption band A region of the absorption spectrum of a material in which the amount of absorption passes through a maximum.

absorption circuit A series resonant circuit used to absorb power at an unwanted signal frequency. The circuit provides a low impedance to ground at this frequency.

absorption coefficient The fraction of the intensity of a radiation that is absorbed by a unit thickness of a particular substance.

absorption control Control of a nuclear

reactor by a neutron absorber such as cadmium or boron steel.

absorption cross section The sum of the cross sections for all neutron reactions with an atom except elastic and inelastic collisions.

absorption current The component of dielectric current that is proportional to the rate of accumulation of electric charges within the dielectric.

absorption curve A graph in which intensity of transmitted radiation is plotted as a function of material thickness. Also called transmission curve.

absorption discontinuity A discontinuity in the absorption coefficient of a substance for a particular type of radiation. Also called absorption edge and absorption limit.

absorption edge *Absorption discontinuity.*

absorption frequency meter *Absorption wavemeter.*

absorption limit *Absorption discontinuity.*

absorption loss 1. That part of the transmission loss which is converted into heat when radiated energy is transmitted or reflected by a material. 2. Power loss in a transmission circuit caused by coupling to an adjacent circuit.

absorption mesh A filter used in a waveguide to absorb electromagnetic energy at undesired frequencies.

absorption modulation A system of amplitude modulation in which a variable-impedance device is inserted in or coupled to the output circuit of the transmitter, to absorb carrier power in accordance with the intelligence to be transmitted. In one system the modulator tubes control the absorption of the transmission line directly by means of stub connections, to achieve the same result. Also called loss modulation.

absorption peak Abnormally high attenuation at a particular frequency as a result of absorption loss.

absorption spectrum The spectrum obtained when continuous radiation is passed through an absorbing medium before entering a spectroscope. The resulting recorded spectrum shows dark lines at wavelengths corresponding to maximum absorption.

absorption trap A parallel-tuned circuit used to absorb and thereby attenuate interfering signals.

absorption wavemeter A wavemeter consisting of a calibrated tuned circuit and a resonance indicator. When lightly coupled to a signal source and tuned to resonance,

maximum energy is absorbed from the source. The unknown wavelength or frequency is then read on the calibrated tuning dial. With waveguides, a cavity-type resonant circuit is used. Also called absorption frequency meter. When a vacuum-tube oscillator is a part of the resonance indicator, the instrument is usually called a grid-dip meter.

absorptive attenuator A waveguide section containing dissipative material that gives a desired transmission loss.

AB test A method of comparing two sound systems by switching inputs so the same recording is heard in rapid succession over one system and then the other.

abundance ratio The ratio of the number of atoms of various isotopes in a mixture.

abvolt The cgs electromagnetic unit of voltage. A voltage of 1 abvolt exists between two points when 1 erg of work is required to transfer 1 abcoulomb of positive electricity from the point of lower potential to the point of higher potential. One abvolt is equal to 10^{-8} volt.

a-c Abbreviation for *alternating current*.

accelerating anode *Accelerating electrode.*

accelerating chamber An evacuated glass, metal, or ceramic envelope in which charged particles are accelerated.

accelerating electrode An electrode used in cathode-ray tubes and other electron tubes to increase the velocity of the electrons that constitute the space current or form a beam. Such an electrode is operated at a high positive potential with respect to the cathode. Also called accelerating anode and accelerator.

accelerating tube A tubular accelerating chamber. It may be toroidal as in a betatron, or in the form of a long cylinder as in a linear accelerator.

acceleration The rate at which the velocity of a body changes.

acceleration effect The difference between the output value of a device without acceleration and the output value measured during a specified steady-state acceleration in a specified axis at any one input value.

acceleration space The region just outside of the output aperture of the electron gun in an electron tube, in which electrons are accelerated to a desired higher velocity.

accelerator 1. A device that accelerates charged particles to high velocities so they have high kinetic energy. It can be used for electrons, protons, deuterons, and

helium ions. Also called particle accelerator. Examples include the betatron, cyclotron, linear accelerator, synchrocyclotron, synchrotron, and Van de Graaff electrostatic accelerator. 2. *Accelerating electrode*.

accelerometer A device for measuring the acceleration of a moving body and translating it into a corresponding electrical quantity.

accentuation *Preemphasis*.

acceptance angle The solid angle within which all received light reaches the cathode of a phototube in its housing.

acceptor An impurity element that increases the number of holes in a semiconductor crystal such as germanium and silicon. Current flow is then due essentially to transfer of holes. Since these holes are equivalent to positive charges, the resulting alloy is called a p-type semiconductor. Aluminum, gallium, and indium are examples of acceptors. Also called acceptor impurity.

acceptor circuit 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. Used in series with a signal path to pass the desired frequency.

acceptor impurity *Acceptor*.

acceptor level An intermediate level close to the normal band in the energy-level diagram of an extrinsic semiconductor. It is empty at absolute zero. At other temperatures some electrons corresponding to the normal band can acquire energies corresponding to this intermediate level.

accessory A part, subassembly, or assembly that contributes to the effectiveness of a piece of equipment without changing its basic function. An accessory may be used for testing, adjusting, calibrating, recording, or other purposes.

access time The read time or the write time in a computer.

accidental coincidence Coincidence due to the chance occurrence of unrelated counts in separate radiation detectors. Also called chance coincidence and random coincidence.

accidental coincidence correction The correction made in coincidence counting to offset the chance occurrence of unrelated signals within the resolving time of the apparatus.

accidental jamming Jamming due to transmission of radio or radar signals by friendly equipment.

a-c coupling A coupling arrangement that will not pass direct current or a d-c component of a signal.

accumulating stimulus A current that is increased gradually, so it is less effective than if suddenly increased to final intensity. Used in electrophysiology.

accumulator 1. A computer device that stores a number and, on receipt of another number, adds it to the number already stored and stores the sum. In another version, stored integers can be increased by unity or by an arbitrary integer. An accumulator can be reset either to zero or to an arbitrary integer. Also called counter. 2. British term for *storage battery*.

accuracy 1. The quality of being free from errors. 2. The extent to which the indications of an instrument approach the true values of the quantities measured.

accurate range marker An adjustable range calibrator used on some radar ppi displays. By turning a control, a bright range circle of variable diameter is made to run through an observed target. A counter geared to the control then indicates directly the range to the target.

a-c/d-c receiver A radio receiver designed to operate from either an a-c or d-c power line. Also called universal receiver.

a-c dump The removal of all a-c power from a computer intentionally, accidentally, or conditionally. It usually results in the removal of all power.

a-c erase Use of alternating current to energize an erasing head.

a-c erasing head A magnetic head that uses alternating current to produce the gradually decreasing magnetic field necessary for erasing recorded signals.

acetate *Cellulose acetate*.

acetate base A transparent backing film for magnetic recording tape and motion-picture film, made from cellulose acetate. Also called safety base.

acetate disk A mechanical recording disk, either solid or laminated, made of various acetate and cellulose nitrate compounds.

a-c generator A rotating electric machine that converts mechanical power into a-c electric power.

achromatic 1. Without color. 2. Capable of transmitting light without breaking it up into constituent colors.

achromatic antenna An antenna whose characteristics are uniform in a specified frequency band.

achromatic color A shade of gray.

achromatic lens A lens combination that

gives correction for chromatic aberration. It usually consists of a convex lens of crown glass and a concave lens of flint glass, designed so one lens corrects for the errors of the other. The combination brings all colors of light rays nearer to the same focus point.

achromatic locus An area on a chromaticity diagram that contains all points representing acceptable reference white standards. Also called achromatic region.

achromatic point A point on a chromaticity diagram that represents an acceptable reference white standard.

achromatic region *Achromatic locus.*

achromatic stimulus A visual stimulus that gives the sensation of white light, having no hue.

a-c interruption Intermittent operation of a metallic rectifier in which the a-c input circuit of the rectifier is opened.

acclitic line *Isoclinic line.*

a-c magnetic biasing Magnetic biasing with alternating current, usually well above the signal frequency range, in magnetic recording.

acorn tube A uhf vacuum tube resembling an acorn in shape and size. Leads come out directly through the sides of the tube. Small electrodes give low interelectrode capacitances, and close electrode spacings give low electron transit time.

acoustic Containing, producing, arising from, actuated by, related to, or associated with sound. The adjective acoustic is used (rather than acoustical) when the term being qualified designates something that has the properties, dimensions, or physical characteristics associated with sound waves.

acoustic absorption coefficient *Sound absorption coefficient.*

acoustic absorption loss Energy lost by conversion into heat or other forms when sound passes through or is reflected by a medium.

acoustic absorptivity *Sound absorption coefficient.*

acoustical Containing, producing, arising from, actuated by, related to, or associated with sound. The adjective acoustical is used (rather than acoustic) when the term being qualified does not explicitly designate something that has the properties, dimensions, or physical characteristics associated with sound waves.

acoustical attenuation constant The real part of the acoustical propagation constant. The commonly used unit is the neper per section or per unit distance.

acoustical ohm A unit of acoustic resistance, acoustic reactance, or acoustic impedance. The magnitude is 1 acoustical ohm when a sound pressure of 1 dyne per sq cm (1 microbar) produces a volume velocity of 1 cu cm per second.

acoustical phase constant The imaginary part of the acoustical propagation constant. The commonly used unit is the radian per section or per unit distance.

acoustical propagation constant A rating for a sound medium. It is the natural logarithm of the complex ratio of particle velocities, volume velocities, or pressures at two points in the path of a sound wave. The ratio is determined by dividing the value at the point nearer the sound source by the value at the more remote point. The real part of this constant is the acoustical attenuation constant, and the imaginary part is the acoustical phase constant.

acoustical reciprocity theorem A theorem applying to an acoustic system. The theorem states that a simple sound source at point A in a region will produce the same sound pressure at another point B as would have been produced at A had the source been located at B.

acoustic burglar alarm A burglar alarm that is responsive to sounds produced by an intruder. Microphones concealed in the rooms to be protected are connected to audio amplifiers that trip an alarm when sounds exceed a predetermined normal level. Also called acoustic intrusion detector.

acoustic clarifier A system of cones loosely attached to the baffle of a loudspeaker, designed to vibrate and absorb energy during sudden loud sounds in order to suppress these sounds.

acoustic compensator A device for matching acoustical path lengths in binaural or stereophonic audio equipment.

acoustic compliance The reciprocal of acoustic stiffness.

acoustic delay line A device capable of transmitting and delaying sound pulses by recirculating them in a liquid or solid medium. For computers the pulses are usually in binary form. Also called sonic delay line.

acoustic depth finder *Fathometer.*

acoustic dispersion The separation of a complex sound wave into its frequency components. It is usually caused by variation of the wave velocity of the medium with frequency. The rate of change of the

velocity with frequency is a measure of the dispersion.

acoustic dissipation element An element used to dissipate some or all of the acoustic energy reaching it.

acoustic feedback The feedback 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 aid or reinforce the input. When feedback is excessive, a howling sound is heard from the loudspeaker. Also called acoustic regeneration.

acoustic filter A sound-absorbing device that selectively suppresses certain audio frequencies.

acoustic generator A transducer that converts electrical, mechanical, or other forms of energy into sound. Buzzers, headphones, and loudspeakers are examples.

acoustic homing Homing on sound sources. Used in torpedoes to home on sounds made by the propellers of an enemy ship or submarine.

acoustic horn *Horn.*

acoustic impedance The sound pressure on a unit area of surface divided by the sound flux through that surface, expressed in acoustical ohms. The real component of acoustic impedance is acoustic resistance, and the imaginary component is acoustic reactance. The two types of acoustic reactance are acoustic compliance and acoustic inertance.

acoustic inertance *Acoustic mass.*

acoustic interferometer An instrument for measuring the velocity of sound waves in a liquid or gas. Variations of sound pressure are observed in the medium between a sound source and a reflector, as the reflector is moved or the frequency is varied. Interference between direct and reflected waves produces standing waves that are related to the velocity of sound in the medium.

acoustic intrusion detector *Acoustic burglar alarm.*

acoustic labyrinth A loudspeaker baffle consisting of a long absorbent-walled duct folded into the volume of a cabinet, with a loudspeaker mounted at one end. The other end is open to the air in front of or underneath the cabinet. Used to reinforce bass response and prevent cavity resonance.

acoustic lens An array of obstacles that refracts sound waves in the same way that an optical lens refracts light waves. The dimensions of the obstacles are small com-

pared to the wavelengths of the sounds being focused.

acoustic mass The quantity that, when multiplied by 2π times the frequency, gives the acoustic reactance associated with the kinetic energy of a medium. The unit is the gram per centimeter to the fourth power. Also called acoustic inertance.

acoustic memory A computer memory that uses an acoustic delay line in which a train of pulses travels through a medium such as mercury or quartz.

acoustic mine An underwater mine that is detonated by sound waves, such as from a ship's propeller or engines. Also called sonic mine.

acoustic mirage The distortion of a sound wavefront by a large temperature gradient in air or water, creating the illusion of two sound sources.

acoustic pickup A pickup that transforms phonograph-record groove modulations directly into sound, as in early phonographs. The phonograph needle is mechanically linked to a flexible diaphragm. Also called sound box and mechanical reproducer.

acoustic radiator A vibrating surface that produces sound waves, such as a loudspeaker cone and a headphone diaphragm.

acoustic radiometer 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.

acoustic reactance The imaginary component of acoustic impedance. The unit is the acoustical ohm.

acoustic reflection coefficient *Sound reflection coefficient.*

acoustic reflectivity *Sound reflection coefficient.*

acoustic refraction A bending of sound waves when passing obliquely from one medium to another in which the velocity of sound is different, as from warm water to cool water in the ocean or from warm air to cool air.

acoustic regeneration *Acoustic feedback.*

acoustic resistance The real component of acoustic impedance. The unit is the acoustical ohm.

acoustic resonator A resonator in the form of an enclosure that exhibits resonance at a particular frequency of acoustic energy.

acoustics 1. The science that deals with the production, transmission, and effects of

sound, including its absorption, reflection, refraction, diffraction, and interference. 2. The properties of a room or location that control reflections of sound waves and therefore determine the character of sounds heard in that location.

acoustic scattering The irregular and diffuse reflection, refraction, or diffraction of sound in many directions.

acoustic shock Dizziness, physical pain, and sometimes also nausea produced by a sudden loud sound.

acoustic stiffness The quantity that, when divided by 2π times the frequency, gives the acoustic reactance associated with the potential energy of a sound medium. The unit is the dyne per centimeter to the fifth power. The reciprocal of acoustic stiffness is acoustic compliance.

acoustic transmission coefficient Sound transmission coefficient.

acoustic transmission system An assembly of elements adapted for the transmission of sound.

acoustic transmittivity Sound transmission coefficient.

acoustic treatment The use of sound-absorbing materials to give a room a desired degree of freedom from echo and reverberation.

acoustic velocity Velocity of sound.

a-c power supply A power supply that provides one or more a-c output voltages, such as an a-c generator, dynamotor, inverter, or transformer.

acquisition and tracking radar A radar set that locks onto a strong signal, tracks the object emitting the signal, and feeds position data directly and continuously to gun or missile control systems.

acquisition radar A radar set that detects an approaching target and feeds approximate position data to a fire-control or missile-guidance radar, which takes over the function of tracking the target.

a-c receiver A radio receiver designed to operate only from an a-c power line.

a-c resistance High-frequency resistance.

acrylic resin A glasslike thermoplastic resin made by polymerizing esters of acrylic or methacrylic acid. Widely used for transparent parts. Trademark names include Lucite and Plexiglas.

a-c tachogenerator An a-c generator whose output voltage and output frequency are proportional to rotational speed.

actinides A name proposed for the series of elements having atomic numbers 89 through 102.

actinium [symbol Ac] A radioactive element. Atomic number is 89.

actinium series The series of nuclides resulting from the decay of U^{235} , including actinium A, B, C, C', C'', D, K, and X. Mass numbers of all members are given by $4n + 3$, where n is an integer. The sequence is also known as the $4n + 3$ series or the actinouranium series.

actinometer An instrument that measures the intensity of radiation by determining the amount of fluorescence produced by that radiation.

actinon [symbol An] The common name for $3.92s$ Em^{219} , a member of the actinium series. Actinon is an isotope of radon.

actinouranium [symbol AcU] A common name for uranium isotope U^{235} , the natural parent of the actinium series.

actinouranium series Actinium series.

action current A brief and very small electric current flowing in a nerve during a nervous impulse.

action potential The instantaneous value of the voltage between excited and resting portions of an excitable living structure.

action spike The greatest in magnitude and briefest in duration of the characteristic negative waves in an action potential.

activated water Water having ions, atoms, radicals, or molecules that are temporarily in a chemically reactive state because of exposure to ionizing radiation.

activation 1. The process of treating the cathode or target of an electron tube to create or increase its emission. Also called sensitization. 2. The process of inducing radioactivity by bombardment with neutrons or other types of radiation.

activation analysis A method of chemical analysis in which the material being analyzed is bombarded with nuclear particles and the resulting characteristic radionuclides are detected.

activation cross section The cross section for the formation of a specified radionuclide, generally by a neutron-induced reaction.

activation energy The excess energy required for a particular nuclear process. An example is the energy needed by an electron to reach the conduction band in a semiconductor.

activator 1. An impurity atom that increases the luminescence of a solid material, such as copper in zinc sulfide and thallium in potassium chloride. 2. An impurity atom used to activate the target of a camera tube. Also called sensitizer.

active 1. *Fissionable*. 2. *Radioactive*.

active air defense Air defense concerned with combatant action taken to prevent or interfere with a hostile attack by aircraft or guided missiles. It includes electronic countermeasures, air-to-air guided missiles, and surface-to-air guided missiles.

active area The portion of the rectifying junction of a metallic rectifier that carries forward current.

active deposit A radioactive decay product deposited on a surface.

active electric network An electric network or circuit containing one or more sources of energy.

active electronic countermeasures Electronic countermeasures involving actions of such nature that their use in jamming or otherwise disrupting enemy radio, radar, or sonar transmissions is detectable by the enemy.

active filter A filter used for smoothing data. The time delay and/or phase lag introduced by such a low-pass filter is canceled by use of an identical reciprocal filter in the feedback circuit of the associated amplifier.

active homing Homing in which the missile contains both the source of energy for illuminating the target and the receiver for energy reflected from the target.

active jamming Intentional radiation or reradiation of electromagnetic energy in such a way as to impair use of a specific band of frequencies.

active line A horizontal line that carries picture information in television, as opposed to retrace lines that are blanked out during horizontal and vertical retrace.

active material 1. A fluorescent material used in screens for cathode-ray tubes. Examples include calcium tungstate, zinc phosphate, and zinc silicate. 2. The lead oxide or other energy-storing material used in the plates of a storage battery.

active network A network whose output is dependent on a source of power other than that associated with the input signal.

active product A radioactive decay product of a radionuclide.

active sonar Underwater sonar equipment that generates bursts of ultrasonic sound and picks up echoes reflected from submarines, fish, and other objects within range.

active transducer A transducer containing one or more sources of power that contribute to its output.

active water homing Homing on the trail

of radioactive sea water left by a nuclear-powered submarine.

activity 1. The intensity of a radioactive source. It can be expressed as the number of atoms disintegrating in unit time or as the number of scintillations or other effects observed per unit time. One unit of activity is the curie, equal to 3.7×10^{10} disintegrations per second. 2. A measure of the amplitude of vibration of a crystal unit, generally expressed as the rectified grid current of the oscillator circuit in which the crystal is used. 3. Short form of *radioactivity*.

activity dip A decrease in the value of crystal activity, other than a band-break, that occurs over a small temperature interval. It is usually the result of loose coupling to other modes of vibration or the result of variations in the mounting system.

a-c transmission A mode of television transmission in which a fixed setting of the controls makes any instantaneous value of signal correspond to the same value of brightness for only a short time.

actual frequency The measured frequency of a crystal-controlled oscillator, as distinguished from the nominal frequency value that is marked on the crystal unit.

actuating signal The reference input minus the primary feedback in a control system.

actuating transfer function The transfer function that relates a feedback control loop actuating signal to the corresponding loop input signal.

AcU Symbol for *actinouranium*.

acute angle An angle numerically smaller than a right angle, hence less than 90° .

acute exposure Exposure to occasional large doses of nuclear radiation.

a-c voltage *Alternating voltage*.

a-c welder A welding machine utilizing alternating current for welding purposes.

acyclic Following no regularly repeated cycles of variations.

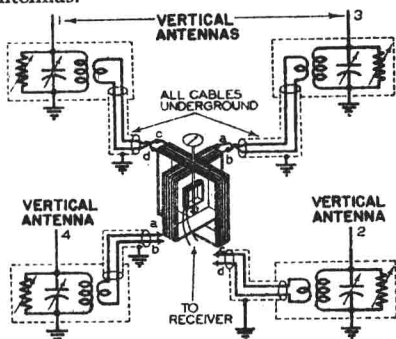
acyclic machine *Homopolar generator*.

adapter A device used to make electric or mechanical connections between items not originally intended for use together.

Adcock antenna A directional antenna consisting of two vertical wires spaced one half-wavelength apart or less, connected in phase opposition to give a figure-of-eight radiation pattern.

Adcock direction finder A radio direction

finder utilizing one or more pairs of Adcock antennas.



Adcock direction finder.

Adcock radio range An A-N radio range that uses Adcock antennas arranged at the four corners of a square on the ground. The vertical antennas at one set of opposite corners transmit the letter A in international Morse code and the other two antennas transmit the letter N.

adder 1. A circuit in which two or more signals are combined to give an output signal amplitude that is proportional to the sum of the input signal amplitudes. In a color television receiver, the adder combines the chrominance and luminance signals. 2. A computer device that can form the sum of two or more numbers or quantities.

additive color system A system that adds two colors to form a third.

additive primaries Sources of color or light which, by additive mixture in varying proportions, can be made to match a large range of colors. The three additive primaries used are red, green, and blue.

additron A form of beam-switching tube used as a binary adder in digital computers.

address A numerical or other expression that designates a particular location in a storage device or other source or destination of information in a computer.

adf Abbreviation for *automatic direction finder*.

adhesion Bond strength.

adiabatic Occurring without change in heat content.

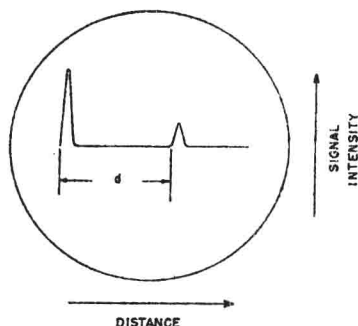
adiactinic Not transmitting photochemically active rays.

adion An ion that has been adsorbed on a surface and cannot move out of it.

A display A radarscope display in which targets appear as vertical deflections from a line representing a time base. Target dis-

ADJUSTABLE VOLTAGE DIVIDER

tance is proportional to the horizontal position of the deflection from one end of the time base, and target echo signal intensity is proportional to the amplitude of the



A display, with transmitted pulse at left. Distance d to echo pulse gives range of target.

vertical deflection. On some scopes the display is rotated 90° , so the time base is vertical and the signal pips increase from left to right horizontally. Also called A scan.

adjacent channel The channel immediately above or below the channel under consideration.

adjacent-channel attenuation Selectance.

adjacent-channel interference Interference caused by a transmitter operating in an adjacent channel. It is recognized as a peculiar garbled sound heard along with the desired program when the sidebands of the adjacent-channel transmitter beat with the carrier signal of the desired station. Also called monkey chatter, sideband interference, and sideband splash.

adjacent-channel selectivity The ability of a receiver to reject signals on channels adjacent to that of the desired station.

adjacent sound carrier The r-f carrier that carries the sound modulation for the television channel immediately below that to which the receiver is tuned.

adjacent video carrier The r-f carrier that carries the picture modulation for the television channel immediately above the channel to which the receiver is tuned.

adjustable resistor A wirewound resistor having a sliding contact whose positions can be changed by loosening a locking screw. Extra sliders can be added if desired. Used chiefly as a voltage divider.

adjustable transformer Variable transformer.

adjustable voltage divider A wirewound resistor having one or more movable terminals that can be slid along the length of

the exposed resistance wire until the desired voltage values are obtained.

adjusted decibel [abbreviated dba] A unit used to show the relationship between the interfering effect of a noise frequency, or band of noise frequencies, and a reference noise power level of -85 dbm. This unit replaces dbm, which was based on a reference noise level of -90 dbm.

admittance [symbol Y] A measure of how readily alternating current will flow in a circuit. Admittance is the reciprocal of impedance, and is expressed in mhos. The real part of admittance is conductance, and the imaginary part is susceptance.

adp crystal Abbreviation for *ammonium dihydrogen phosphate crystal*.

adp microphone A crystal microphone using an ammonium dihydrogen phosphate crystal having piezoelectric properties.

Advance Trademark of Driver-Harris Co. for an alloy of copper and nickel, used in the construction of electric instruments.

advance ball A rounded support, often sapphire, that rides ahead of or alongside the cutting stylus when making a mechanical recording such as a phonograph record. The ball maintains a uniform depth of cut regardless of irregularities in the surface of the disk.

advantage factor The ratio of radiation dosage received at two points in a nuclear reactor during a specified time interval. The first point is one at which an enhanced effect is obtained, so the ratio is greater than 1.

AEC Abbreviation for *Atomic Energy Commission*.

aeolight A glow discharge lamp employing a cold cathode and a mixture of inert gases. The intensity of illumination varies with the applied signal voltage. Used to produce a modulated light for motion-picture sound recording.

aerial British term for *antenna*.

aerial torpedo A missile guided through the air to its target by remote control, as a glide bomb.

Aerobee A high-altitude research rocket.

aerograph A meteorograph carried aloft by a balloon, kite, or airplane. Also called *aerometeorograph*.

aerometeorograph *Aerograph*.

aeronautical mile A unit of length equal to 6,080 feet or 1.15155 miles, the same length as a nautical mile. Also called *air mile*.

aerophone *Radio beacon*.

aew radar Abbreviation for *airborne early-warning radar*.

a-f Abbreviation for *audio frequency*.

afc Abbreviation for *automatic frequency control*.

a-f noise Any electric disturbance, in the audio-frequency range, that is introduced from a source extraneous to the signal.

afterglow *Phosphorescence*.

afterheat Heat resulting from residual activity after a nuclear reactor has been shut down.

after pulse A spurious pulse induced in a multiplier phototube by a previous pulse.

agc Abbreviation for *automatic gain control*.

aggregate recoil The ejection, from the surface of a sample, of a cluster of atoms attached to one that is recoiling as the result of alpha-particle emission.

aging 1. Allowing a permanent magnet, capacitor, meter, or other device to remain in storage for a period of time, sometimes with voltage applied, until the characteristics of the device become essentially constant. 2. Changes in the characteristics of a device during use.

aided tracking A radar antenna control system in which a constant rate of motion of the tracking mechanism is maintained by a d-c motor and selsyn system so an equivalent constant rate of movement of a target in bearing, elevation, distance, or any combination of these variables can be followed. An operator adjusts the rate of motion from time to time with a potentiometer in the d-c motor circuit, as required to compensate for target speed and course changes.

AIEE Abbreviation for *American Institute of Electrical Engineers*.

a-i radar Abbreviation for *airborne intercept radar*.

airborne beacon *Radar safety beacon*.

airborne early-warning radar [abbreviated *aew radar*] An early-warning radar carried by aircraft. The radar signals are relayed from the aircraft to surface stations, or their significance is reported by radio.

airborne intercept radar [abbreviated *a-i radar*] Airborne radar used for detecting and tracking other aircraft at night or in clouds. It may also include computers that provide fire-control data. Also called *aircraft intercept radar*.

airborne moving-target indicator A moving-target indicator system for airborne radar operating close to the ground, where moving targets are obscured by ground clutter and both the ground and the target

are moving with respect to the radar in the airplane.

airborne radar A self-contained radar installed in aircraft. It may provide information about ground landmarks, ships at sea, shoreline contours, other aircraft, storm clouds, or weather fronts.

air capacitor A capacitor having only air as the dielectric material between its plates.

air cell A cell in which depolarization at the positive electrode is accomplished chemically by reduction of the oxygen in the air.

air column The air space within a horn or acoustic chamber for a loudspeaker.

aircom [AIR COMMunication] An Air Force system for furnishing communication requirements of future space and missile programs.

air conduction The process by which sound is conducted to the inner ear through the air in the outer ear canal.

air-cooled tube An electron tube in which the generated heat is dissipated to the surrounding air directly, through metal heat-radiating fins, or with the aid of channels or chimneys that increase air flow.

air-core coil A coil wound on a fiber, plastic, or other nonmagnetic form, with no iron in its vicinity.

air-core transformer A transformer having two or more coils wound on a fiber or other nonmagnetic form, and having no iron in its magnetic circuits. Usually designed for use as an r-f transformer, i-f transformer, antenna coil, or oscillator coil.

aircraft A vehicle designed to travel through the air when given lift by its own buoyancy or by dynamic reaction of air particles with its surfaces.

aircraft controller A person who controls the movements of aircraft, including guided missiles, by means of radio communication or electronic devices.

aircraft db rating A rating in decibels assigned to each type of aircraft to indicate its approximate radar cross-section or echo area. Used primarily with a radar coverage indicator.

aircraft flutter Sudden, flickering changes in the contrast of a television picture, caused by reflection of the television signal from an aircraft flying somewhere over the direct path between transmitter and receiver. The reflected signal alternately reinforces and cancels the normal signal at the receiving antenna. Also called airplane flutter.

aircraft instrument A mechanical, electric,

or electronic device used aboard an aircraft for indicating engine performance, aircraft performance, or navigation data.

aircraft intercept radar *Airborne intercept radar.*

air defense controller An aircraft controller responsible for controlling and vectoring friendly aircraft during air defense and coordinating the operations of anti-aircraft artillery.

air dose The x-ray dose in roentgens at a point in free air, including only the radiation of the primary beam and that scattered from surrounding air.

air equivalent A thickness of material having the same stopping power as air for nuclear particles. Applied chiefly to materials used for walls and electrodes of ionization chambers.

air-equivalent ionization chamber *Air-wall ionization chamber.*

airframe The complete structure of an aircraft or guided missile, including the framework and skin but not the engines.

air gap 1. A short gap or equivalent filler of nonmagnetic material across the core of a choke, transformer, or other magnetic device. The gap prevents the core from being saturated by direct current or permits required mechanical movement of coils or an armature. 2. A spark gap consisting of two conducting electrodes separated by air.

air-gap crystal unit A crystal unit in which the electrodes are separate metallic plates rigidly spaced apart by an amount slightly greater than the thickness of the quartz plate.

air intercept radar An airborne radar that searches for, acquires, and tracks a target to provide data needed for control of an air-to-air guided missile.

air log A distance-measuring device used in certain guided missiles to control range.

air mile *Aeronautical mile.*

air monitor A device for detecting and measuring airborne radioactivity for warning and control purposes.

air navigation The science or action of plotting and directing from within an aircraft its movement through the air from one place to another. Also called *avigation*.

air navigation aid A radar beacon, radio range, or other system, instrument, or device used in air navigation.

airplane A heavier-than-air craft supported by the dynamic reaction of air flowing over fixed or rotating plane surfaces, including piston-driven and jet airplanes, gliders,

helicopters, gyroplanes, and winged guided missiles.

airplane dial A round radio receiver dial having a pointer rotating over a scale to indicate the frequency of the station to which the receiver is tuned.

airplane flutter *Aircraft flutter.*

airplane insulator A streamlined insulator once used for radio antennas on aircraft.

airport A defined area on land or water, including any buildings and installations, normally used for the takeoff and landing of aircraft.

air-portable Readily carried in aircraft with only minor or no dismantling and re-assembly.

airport surface detection equipment A short-range ground radar used to show the positions of all aircraft and vehicles on the surface of an airport. Runways, taxiways, and ramps also show clearly on the radar screen. Also called taxi radar.

airport surveillance radar A radar located on or near an airport to provide an indication of the bearing and distance of each aircraft within the terminal area. It is used by itself for air traffic control, and is used with precision approach radar to form a ground-controlled approach system. Also called surveillance radar element.

air-position indicator An airborne computing system that presents a continuous indication of aircraft position on the basis of aircraft heading, airspeed, and elapsed time. Position is indicated in latitude and longitude values or other coordinates. True heading and air mileage flown are also shown.

air sounding Measuring atmospheric pressure, humidity, and other characteristics of the atmosphere with instruments carried aloft.

airspeed The speed of an aircraft, measured along its longitudinal axis relative to the air through which it moves.

airspeed computer A computer used to determine true airspeed from indicated airspeed, temperature, and pressure data.

airspeed indicator A flight instrument that shows the approximate speed of an aircraft relative to the air through which it flies.

air-to-air guided missile A guided missile designed to be fired at an airborne target from an airborne aircraft. Examples include Falcon, Sidewinder, and Sparrow.

air-to-surface guided missile A guided missile designed to be fired at a surface

vessel from an airborne aircraft. Examples include Bullpup, Dove, and Rascal.

air traffic control A service operated by appropriate authority to promote the safe, orderly, and expeditious flow of air traffic.

air-wall ionization chamber An ionization chamber in which the materials of the wall and electrodes are selected to produce ionization essentially equivalent to that in a free-air ionization chamber. Also called air-equivalent ionization chamber.

air warning system A system for warning of hostile aircraft approaching a defended area. An air warning system may include radar and communication facilities.

ajax A frequency-dispersal type of radar.

alabamine Former name for *astatine*.

Alamogordo bomb The first atomic bomb, detonated July 16, 1945, at Alamogordo, New Mexico. Also called Trinity bomb.

alarm signal The international radiotelegraph alarm signal, transmitted on 500 kc as twelve 4-second dashes 1 second apart, to actuate automatic devices that sound an alarm indicating that a distress message is about to be broadcast.

albedo The reflection factor of a surface for neutrons.

Alexanderson alternator A high-speed a-c generator used in the early days of radio to generate r-f energy for transmission. Improved versions today generate a-c power for low-frequency induction heating.

Alford loop A multielement antenna having approximately equal in-phase currents uniformly distributed along each of its peripheral elements. The radiation pattern is very nearly circular in the plane of polarization.

Alford slotted tubular antenna A horizontally polarized antenna consisting of a metal cylinder having a full-length slot. Currents flow in horizontal circles, simulating the operation of a vertical stack of in-phase loop antennas. Originally developed for f-m broadcasting.

alice [ALaska Integrated Communications Exchange] A network of radio stations, generally using scatter propagation equipment, used to link early-warning radar stations. Also called White Alice.

align To adjust two or more sections of a circuit or system so their functions are properly synchronized. Trimmers, padders, or variable inductances in tuned circuits are adjusted to give a desired response for fixed-tuned equipment or to provide tracking for tunable equipment. Search radar

antenna orientation is aligned to coincide with ppi sweep.

aligned-grid tube A multigrid vacuum tube in which at least two of the grids are aligned one behind the other to give such effects as beam formation or noise suppression.

aligning plug The plug in the center of the base of an octal, loktal, or other tube, having a single vertical projecting rib that prevents the tube from being inserted incorrectly in its socket.

aligning tool A small screwdriver, socket wrench, or special tool constructed partly or entirely of nonmagnetic materials, used to align tuned circuits.

alignment The process of aligning.

alignment chart *Nomograph.*

alive *Energized.*

alkali metal An alkali-producing metal such as lithium, cesium, or sodium, having photoelectric characteristics. Used in phototubes and camera tubes.

alkaline storage battery A storage battery in which the electrolyte consists of an alkaline solution, usually potassium hydroxide.

Allen screw A screw having a hexagonal hole in the head.

Allen wrench A wrench made from a straight or bent hexagonal rod, used to turn an Allen screw.

alligator clip A long, narrow spring clip with meshing jaws, used with test leads to make temporary connections quickly.



Alligator clip for test lead.

allocate To assign storage locations to the main routines and subroutines in a computer, thereby fixing the absolute values of any symbolic addresses.

allochromatic Having photoelectric properties due to microscopic particles occurring naturally in a crystal or resulting from exposure to certain forms of radiation.

allowed band A band containing a group of energy levels that electrons may occupy in a given material, such as a conduction band and a valence band.

allowed transition The most probable type of transition between two states of a quantum-mechanical system.

alloy A material having metallic properties and consisting of two or more elements, of which at least one is a metal.

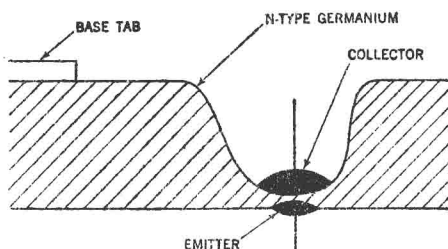
alloy-diffused transistor A transistor in

which diffusion and alloy techniques are combined in a different manner than for a diffused-alloy transistor.

alloy junction A junction produced by alloying one or more impurity metals to a semiconductor. A small button of impurity metal is placed at each desired location on the semiconductor wafer, heated to its melting point, and cooled rapidly. The impurity metal alloys with the semiconductor material to form a p or n region, depending on the impurity used.

alloy-junction photocell A photodiode in which an alloy junction is produced by alloying an indium disk into a thin wafer of n-type germanium.

alloy-junction transistor A transistor having an alloy junction. Also called fused-junction transistor.



Alloy-junction transistor construction.

all-pass network A network designed to introduce phase shift or delay without introducing appreciable attenuation at any frequency.

all-wave antenna A radio receiving antenna so constructed that it responds reasonably well to a wide range of frequencies, including the short-wave bands as well as the broadcast band.

all-wave receiver A radio receiver capable of being tuned from about 535 kc to at least 20 mc. Some all-wave receivers go above 100 mc and thus cover the f-m band also.

alnico [ALuminum NICKel CObalt] An alloy consisting chiefly of iron, aluminum, nickel, and cobalt, having high retentivity. Used to make permanent magnets, as required in loudspeakers, magnetrons, and other devices requiring strong magnetic fields. Not a trademark. Usually used with an alloy number; thus, alnico V gives stronger permanent magnets than earlier alnico alloys.

alpha [Greek letter α] 1. Symbol for the current amplification factor of a transistor in a grounded-base circuit. It is the ratio