

Howard W. Sams

**MODERN
DICTIONARY OF
ELECTRONICS**

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Howard W. Sams
**MODERN
DICTIONARY
of
ELECTRONICS**

compiled by Rudolf F. Graf



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PREFACE

No truly authoritative dictionary is the work of one person. Rather, it is the result of the efforts of many people. With the expansion of technologies, new words and phrases must be developed to permit effective communications of thoughts and ideas. The originators of the words give them their initial meanings, but their *exact* definitions change with technological advances and through actual usage by others.

The content of a dictionary is thus an analysis of words and their meanings, as determined by common usage and as researched and written by its authors and editors.

The emphasis of this dictionary is on the broad subject of electronics. Within this chosen field, it contains over 10,000 definitions of current terms, supported by over 350 illustrations. No effort has been spared to make it as comprehensive and authoritative as possible. Further, the definitions have been written in a modern and popular style to provide clear and concise explanations of the terms.

While this volume is as up-to-date as possible at the time of writing, the field of electronics is expanding so rapidly that new terms are constantly being developed, and old terms take on broader or more specialized meanings. It is the intention of the publishers to periodically issue revised editions of this dictionary; thus suggestions for new terms and definitions will be welcomed.

Acknowledgement and thanks are due several technical and engineering societies—notably the IRE, AIEE, and ASA—who generously aided in defining many terms during the initial compilation.

RUDOLF F. GRAF

October, 1961

HOW TO USE THIS DICTIONARY

This MODERN DICTIONARY OF ELECTRONICS follows the standards accepted by prominent lexicographers. All terms of more than one word are treated as one word. For example, "bridged-T network" appears between "bridge circuit" and "bridge duplex system." Abbreviations are also treated alphabetically; the initials "ARRL" follow the term "arrester" rather than appearing at the beginning of the A's.

For ease in quickly locating a specific term, both the first and the last terms which appear on each page are shown at the top.

Illustrations have been positioned with the terms they depict, and are clearly captioned so they can be immediately associated with the proper definition.

Moderate cross-referencing has been used as an aid in locating terms which you might look for in more than one place. For example, when looking up "Esaki diode" you'll be referred to "tunnel diode." However, occasionally you may look for a term and not find it. In such instances, always think of the term in its most logical form; i.e., you will find "acoustic resonator" in the A's and not in the R's. In other words, when looking up the definition for a specific type of device, such as a "dipole antenna," refer to the modifier "dipole" rather than to the subject "antenna."

A unique feature is the *Pronunciation Guide* beginning on page 361. This Guide shows syllabic division and pronunciations, based on accepted industry usage, for over 1,000 commonly mispronounced words. Because the language is in constant flux, pronunciations and spellings acceptable five years ago may be obsolete today. Witness the evolution of the word "ampere." Originally it was pronounced "AHMpair," the French pronunciation. In this country, accepted usage simplified the term to "AMpeer" (just as "Schmidt" became "Smith"). Today the accepted pronunciation is "AMper."

Since it follows the most authoritative standards of the industry, this dictionary will serve as an excellent guide on spelling, hyphenation, abbreviation, capitalization, etc.

It is hoped you will find MODERN DICTIONARY OF ELECTRONICS helpful, informative, and satisfactory in every way. Should you care to pass along any comments or suggestions which come to mind as a result of its use, we will be most happy to hear from you.

A handwritten signature in black ink, appearing to read "Howard W. Sams". The signature is written in a cursive style with a large initial 'H'.

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A

A-1. Abbreviation for angstrom unit, used in expressing wavelength of light. Its length is 10^{-8} centimeter. 2. Chemical symbol for argon, an inert gas used in some electron tubes. 3. Symbol for area of a plane surface.

A- (**A-minus** or **A-negative**)—Sometimes called **F-**. Negative terminal of an A-battery or negative polarity of other sources of filament voltage. Denotes the terminal to which the negative side of the filament-voltage source should be connected.

A+ (**A-plus** or **A-positive**)—Sometimes called **F+**. Positive terminal of an A-battery or positive polarity of other sources of filament voltage. The terminal to which the positive side of the filament voltage source should be connected.

A + B, A - B—The sum and difference signals of the two stereo channels; the **A + B** signal combines the signals of both channels in phase; the **A - B** signal combines them out of phase. By combining in suitable circuitry, **A + B** and **A - B** can be added to obtain 2 **A**, the signal from one channel; **A - B** can be subtracted from **A + B** to obtain 2 **B**, the signal from the other channel.

abac—See Alignment Chart.

abampere—Centimeter-gram-second electromagnetic unit of current. The current which, when flowing through a wire one centimeter long bent into an arc with a radius of one centimeter, produces a magnetic field intensity of one oersted. One abampere is equal to 10 amperes.

A-battery—Source of energy which heats the filaments of vacuum tubes in battery-operated equipment.

abc—Abbreviation for automatic bass compensation, a circuit used in some equipment to increase the amplitude of the bass notes to make them appear more natural at low volume settings.

abcoulomb—Centimeter-gram-second electromagnetic unit of electrical quantity. The quantity of electricity passing any point in an electrical circuit in one second when the current is one abampere. One abcoulomb is equal to 10 coulombs.

aberration—In lenses a defect that produces inexact focusing. Aberration may also occur in electron optical systems, causing a halo around the light spot.

abfarad—Centimeter-gram-second electromagnetic unit of capacitance. The capacitance of a capacitor when a charge of one abcoulomb produces a difference of potential of one abvolt between its plates. One abfarad is equal to 10^9 farads.

abhenry—Centimeter-gram-second electromagnetic unit of inductance. The inductance in a circuit in which an electromotive force of one abvolt is induced by a current changing at the rate of one abampere per second. One abhenry is equal to 10^9 henrys.

abmho—Centimeter-gram-second electromag-

netic unit of conductance. A conductor or circuit has a conductance of one abmho when a difference of potential of one abvolt between its terminals will cause a current of one abampere to flow through the conductor. One abmho is equal to 10^9 mho.

abnormal glow—In a glow tube, a current discharge of such magnitude that the cathode area is entirely surrounded by a glow. A further increase in current results in a rise in its density and a drop in voltage.

abnormal reflections—See Sporadic Reflections.

abohm—Centimeter-gram-second electromagnetic unit of resistance. The resistance of a conductor when, with an unvarying current of one abampere flowing through it, the potential difference between the ends of the conductor is one abvolt. One abohm is equal to 10^{-9} ohm.

abort—To cut short or break off (an action, operation, or procedure) with an aircraft, guided missile, or the like—especially because of equipment failure.

AB power pack—Assembly in a single unit of the A- and B-batteries of a battery-operated circuit. Also, a unit that supplies the necessary A and B voltages from an AC source of power.

abscissa—Horizontal, or X-, axis on a chart or graph.

absolute address—A specific register or location in the storage of a computer.

absolute altimeter—Electronic instrument which furnishes altitude data with regard to the surface of the earth or any other surface immediately below the instrument—as distinguished from an aneroid altimeter, the readings of which depend on air pressure.

absolute altitude—Altitude with respect to the earth's surface, as differentiated from the altitude with respect to sea level.

absolute efficiency—Ratio of the actual output of a transducer to that of a corresponding ideal transducer under similar conditions.

absolute humidity—Amount of water vapor present in a unit volume of atmosphere.

absolute maximum rating—Limiting values of operating and environmental conditions, applicable to any electron device of a specified type as defined by its published data, and not to be exceeded under the worst probable conditions. Those ratings beyond which the life and reliability of a device can be expected to decline.

absolute pressure—Pressure of a liquid or gas measured relative to a vacuum (zero pressure).

absolute system of units—Also called coherent system of units. System of units in which a small number are chosen as fundamental and from which all other units are derived—i.e. the abohm is a fundamental unit, the ohm a derivative.

absolute temperature—Temperature measured from absolute zero, a theoretical level defined as -273.2°C or -459.7°F or 0°K .

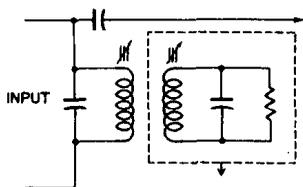
absolute units—A system of units based on physical principles, in which a small number of units are chosen as fundamental and all other units derived from them—i.e. abohm, abcoulomb, abhenry, etc.

absolute value—The numerical value of a number or symbol without reference to its algebraic sign. Thus, $|3|$ is the absolute value of $+3$ or -3 . An absolute value is signified by placing vertical lines on both sides of the number or symbol.

absolute zero—Lowest possible point on the scale of absolute temperature; the point at which all molecular activity ceases: Absolute zero is defined as -273.2°C , -459.7°F , or 0°K .

absorber—1. In a nuclear reactor, a substance that absorbs neutrons without reproducing them. Such a substance may be useful in control of a reactor or, if unavoidably present, may impair the neutron economy. 2. Any material or device which absorbs and dissipates radiated energy.

absorption—Dissipation of the energy of a radio or sound wave into other forms as a result of its interaction with matter.



Absorption circuit.

absorption circuit—A tuned circuit that dissipates energy taken from another circuit.

absorption coefficient—1. Measure of sound-absorbing characteristics of a unit area of a given material, compared with the sound-absorbing characteristics of an open space (total absorption) having the same area. 2. Ratio or loss of intensity caused by absorption, to the total original intensity of radiation.

absorption control—Control of a nuclear reactor by use of a neutron absorber. Adjustment is made by varying the effective amount of absorber in or near the core. The most common arrangement is to incorporate the absorber in rods which can be moved in or out to produce the desired effect.

absorption current—The current flowing into a capacitor following its initial charge, due to a gradual penetration of the electric stress into the dielectric. Also, the current which flows out of a capacitor following its initial discharge.

absorption frequency meter—See Absorption Wavemeter.

absorption loss—That part of transmission loss due to dissipation or conversion of

electrical energy into other forms (e.g., heat), either within the medium or attendant upon a reflection.

absorption marker—A sharp dip on a frequency-response curve due to the absorption of energy by a circuit sharply tuned to the frequency at which the dip occurs.

absorption modulation—Also called loss modulation. A system for amplitude-modulating the output of a radio transmitter by means of a variable-impedance device (such as a microphone or vacuum-tube circuit) inserted into or coupled to the output circuit.

absorption trap—A parallel-tuned circuit coupled either magnetically or capacitively to absorb and attenuate interfering signals.

absorption wave meter—Also called absorption frequency meter. An instrument for measuring frequency. Its operation depends on the use of a tuned electrical circuit or cavity loosely coupled to the source. Maximum energy will be absorbed at the resonant frequency, as indicated by a meter or other device. Frequency can then be determined by reference to a calibrated dial or chart.

A-B test—Direct comparison of two sounds by playing first one and then the other. May be done with two tape recorders playing identical tapes (or the same tape), two speakers playing alternately from the same tape recorder, or two amplifiers playing alternately through one speaker, etc.

abvolt—Centimeter-gram-second electromagnetic unit of potential difference. The potential difference between two points when one erg of work is required to transfer one abcoulomb of positive electricity from a lower to a higher potential. An abvolt is equal to 10^{-8} volt.

AC—Abbreviation for alternating current.

accelerating electrode—An electrode in a cathode-ray or other electronic tube to which a positive potential is applied to increase the velocity of electrons or ions toward the anode. A klystron tube does not have an anode but does have accelerating electrodes.

acceleration—The rate of change in velocity. Often expressed as a multiple of the acceleration of gravity ($g = 32.2 \text{ ft/sec}^2$).

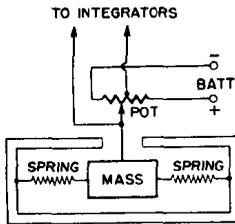
acceleration voltage—Potential between a cathode and anode or other accelerating element in a vacuum tube. Its value determines the average velocity of the electrons.

accelerator—A device for imparting a very high velocity to charged particles such as electrons or protons. Fast-moving particles of this type are used in research or in studying the structure of the atom itself.

accelerometer—An instrument or device, often mounted in an aircraft, guided missile, or the like; used to sense accelerative forces and convert them into corresponding electrical quantities usually for measuring, indicating or recording purposes.

accentuation—Also called pre-emphasis. The emphasizing of any certain band of frequen-

accentuator



Accelerometer.

cies, to the exclusion of all others, in an amplifier or electronic device. Applied particularly to the higher audio frequencies in frequency-modulated (FM) transmitters.

accentuator—Network or circuit used for pre-emphasis or increase in amplitude of a given band of frequencies, usually audio.

acceptance test—A test to demonstrate the degree of compliance of a purchaser's equipment with his requirements and specifications.

acceptor—Also called acceptor impurity. A substance with three electrons in the outer orbit of its atom. When added to a semiconductor crystal, such a substance provides one hole in the lattice structure of the crystal.

acceptor circuit—A circuit which offers minimum opposition to a given signal.

acceptor impurity—See Acceptor.

access time—Also called waiting time. The time interval, characteristic of a memory or storage device, between the instant the memory requests and the instant this information begins to be available in useful form.

accompanying audio (sound) channel—Also known as co-channel sound frequency. The RF carrier frequency which supplies the sound to accompany a television picture.

accumulator—In an electronic computer, a device which stores a number and which, on receipt of another number, adds the two and stores the sum. An accumulator may have properties such as shifting, sensing signals, clearing, complementing, and so forth.

accuracy—1. The maximum error in the measurement of a physical quantity in terms of the output of an instrument when referred to the individual instrument calibration. Usually given as a percentage of full scale. 2. The quality of freedom from mistake or error in an electronic computer—that is, of conformity to truth or to a rule.

accuracy rating of an instrument—The limit, usually expressed as a percentage of full-scale value, not exceeded by errors when the instrument is used under reference conditions.

AC/DC—Electronic equipment capable of operation from either an AC or DC primary power source.

AC/DC receiver—A radio receiver designed to operate directly from either an AC or a DC source.

AC erasing head—In magnetic recording, a device using alternating current to produce

acoustic absorptivity

the magnetic field necessary for removal of previously recorded information.

acetate—A basic chemical compound in the mixture used to coat recording discs.

acetate base—The transparent plastic film which forms the tough backing for acetate magnetic recording tape.

acetate disc—A mechanical recording disc, either solid or laminated, made mostly from cellulose nitrate lacquer plus a lubricant.

acetate tape—A sound-recording tape with a smooth, transparent acetate backing. One side is coated with an oxide capable of being magnetized.

AC generator—1. A rotating electrical machine that converts mechanical power into alternating current. Also known as an alternator. 2. A device, usually an oscillator, designed for the purpose of producing alternating current.

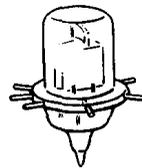
A-channel—One of two stereo channels (usually the left) to the microphones, speakers, or other equipment associated with this channel.

achromatic—1. In color television, a term meaning a shade of gray from black to white, or the absence of color (without color). 2. Black-and-white television, as distinguished from color television.

achromatic lens—A lens which has been corrected for chromatic aberration. Such a lens is capable of bringing all colors of light rays to approximately the same point of focus. This it does by combining a concave lens of flint glass with a convex lens of crown glass.

acclinic line—Also called isoclinic line. On a magnetic map, an imaginary line which connects points of equal magnetic inclination or dip.

AC magnetic biasing—In magnetic recording, the method used to remove random noise and/or previously recorded material from the wire or tape. This is done by introducing an alternating magnetic field at a substantially higher frequency than the highest frequency to be recorded.



Acorn tube.

acorn tube—A button- or acorn-shaped vacuum tube with no base, for UHF applications. Electrodes are brought out through the glass envelope on the side, top, and bottom.

acoustic—Also acoustical. Pertaining to sound or the science of sound.

acoustic absorptivity—The ratio of sound

energy absorbed by a surface to the sound energy arriving at the surface. Equal to 1 minus the reflectivity of the surface.

acoustical-electrical transducer—A device designed to transform sound energy into electrical energy and vice versa.

acoustical ohm—A measure of acoustic resistance, reactance, or impedance. One acoustical ohm is equal to a volume velocity of 1 cubic centimeter per second when produced by a sound pressure of 1 microbar.

acoustical reflectivity—See Sound-Reflection Coefficient.

acoustical transmittivity—See Sound-Transmission Coefficient.

acoustic delay line—A device which retards one or more signal vibrations by causing them to pass through a solid or liquid.

acoustic depth finder—See Fathometer.

acoustic elasticity—1. The compressibility of the air in a speaker enclosure as the cone moves backward. 2. The compressibility of any material through which sound is passed.

acoustic feedback—Also called acoustic regeneration. The mechanical coupling of a portion of the sound waves from the output of an audio-amplifying system to a preceding part or input circuit (such as the microphone) of the system. When excessive, acoustic feedback will produce a howling sound in the speaker.

acoustic filter—A sound-absorbing device that selectively suppresses certain audio frequencies while allowing others to pass.

acoustic generator—A transducer such as a speaker, headphones, or a bell, which converts electrical, mechanical, or other forms of energy into sound.

acoustic horn—Also called horn. A tube of varying cross section having different terminal areas which change the acoustic impedance to control the directivity of the sound pattern.

acoustic impedance—Total opposition of a medium to sound waves. Equal to the force per unit area on the surface of the medium, divided by the flux (volume velocity or linear velocity multiplied by area) through that surface. Expressed in ohms and equal to the mechanical impedance divided by the square of the surface area. One unit of acoustic impedance is equal to a volume velocity of one cubic centimeter per second produced by a pressure of 1 microbar. Acoustic impedance contains both acoustic resistance and acoustic reactance.

acoustic interferometer—An instrument for measuring the velocity or frequency of sound waves in a liquid or gas. This is done by observing the variations of sound pressure in a standing wave, established in the medium between a sound source and a reflector, as the reflector is moved or the frequency is varied.

acoustic labyrinth—Special speaker enclosure having partitions and passages to prevent cavity resonance and to reinforce bass response.

acoustic line—Mechanical equivalent of an electrical transmission line. Baffles, labyrinths, or resonators are placed at the rear of a speaker to help reproduce the very low audio frequencies.

acoustic memory—A computer memory using an acoustic delay line. The line employs a train of pulses in a medium such as mercury or quartz.

acoustic ohm—The unit of acoustic resistance, reactance, or impedance. One acoustic ohm is present when a sound pressure of 1 dyne per square centimeter produces a volume velocity of 1 cubic centimeter per second.

acoustic pickup—In nonelectrical phonographs, the method of reproducing the material on a record by linking the needle directly to a flexible diaphragm.

acoustic radiator—In an electroacoustic transducer, the part that initiates the radiation of sound vibration. A speaker cone or headphone diaphragm is an example.

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—That part of acoustic impedance due to the effective mass of the medium—that is, to the inertia and elasticity of the medium through which the sound travels. The imaginary component of acoustic impedance and expressed in acoustic ohms.

acoustic regeneration—See Acoustic Feedback.

acoustic resistance—That component of acoustic impedance responsible for the dissipation of energy due to friction between molecules of the air or other medium through which sound travels. Measured in acoustic ohms and analogous to electrical resistance.

acoustic resonance—An increase in sound intensity as reflected waves and direct waves which are in phase combine. May also be due to the natural vibration of air columns or solid bodies at a particular sound frequency.

acoustic resonator—An enclosure which intensifies those audio frequencies at which the enclosed air is set into natural vibration.

acoustics—1. Science of production, transmission, reception, and effects of sound. 2. In a room or other location, those characteristics which control reflections of sound waves and thus the sound reception in it.

acoustic shock—Physical pain, dizziness, and sometimes nausea brought on by hearing a loud, sudden sound.

acoustic system—Arrangement of components in devices designed to reproduce audio frequencies in a specified manner.

acoustic treatment—Use of certain sound-absorbing materials to control the amount of reverberation in a room, hall, or other enclosure.

acoustic wave

acoustic wave—A traveling vibration which may exist in either a gas, liquid, or solid.

acoustic wave filter—A device designed to separate sound waves of different frequencies. (Through electroacoustic transducers, such a filter may be associated with electric circuits.)

acoustoelectric effect—Generation of an electric current in a crystal by a traveling longitudinal sound wave.

AC plate resistance—Also called dynamic plate resistance. Internal resistance of a vacuum tube to the flow of alternating current. Expressed in ohms, the ratio of a small change in plate voltage to the resultant change in plate current, other voltages being held constant.

AC receiver—A radio receiver designed to operate from an AC source only.

AC resistance—Total resistance of a device in an AC circuit. (Also see High-Frequency Resistance.)

actinic—In radiation, the property of producing a chemical change, such as the photographic action of light.

actinium—A radioactive element discovered in pitchblende by the French chemist Debierne in 1899. Its atomic number is 89; its atomic weight, 227.

action area—In the rectifying junction of a metallic rectifier, that portion which carries the forward current.

activation—1. Making a substance artificially radioactive by placing it in an accelerator such as a cyclotron, or by bombarding it with neutrons. 2. To treat the cathode or target of an electron tube in order to create or increase its emission.

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

active element—A circuit or device which receives energy from a source other than the main input signal.

active filter—A device employing passive network elements and amplifiers. It is used for transmitting or rejecting signals in certain frequency ranges, or for controlling the relative output of signals as a function of frequency.

active guidance—See Active Homing.

active homing—Also called active guidance. A missile system using a radar system in the missile itself to provide target information and to guide itself to the target.

active line—A horizontal line which produces the TV picture, as opposed to the lines occurring during blanking (horizontal and vertical retrace).

active material—1. In the plates of a storage battery, lead oxide or some other active substance which reacts chemically to produce electrical energy. 2. The fluorescent material, such as calcium tungstate, used on the screen of a cathode-ray tube.

active mixer and modulator—A device requiring a source of electrical power and using nonlinear network elements to heter-

address computation

odyne or combine two or more electrical signals.

active sonar—See Sonar.

active transducer—A type of transducer in which its output waves depend on one or more sources of power, apart from the actuating waves.

activity—1. In a piezoelectric crystal, the magnitude of oscillation relative to the exciting voltage. 2. The intensity of a radioactive source.

actuator—In a servo system, the device which moves the load.



Adapter.

adapter—A fitting designed to change the terminal arrangement of a jack, plug, socket, or other receptacle, so that other than the original electrical connections are possible.

adaptive control system—A device the parameters of which are automatically adjusted to compensate for changes in the dynamics of the process to be controlled. An AFC circuit utilizing temperature-compensating capacitors to correct for temperature changes is an example.

Adcock antenna—A pair of vertical antennas separated by one-half wavelength or less and connected in phase opposition to produce a figure-8 directional pattern.

Adcock direction finder—A radio direction finder using one or more pairs of Adcock antennas for directional reception of vertically polarized radio waves.

Adcock radio range—A type of radio range utilizing four vertical antennas (Adcock antennas) placed at the corners of a square, with a fifth antenna in the center.

addend—A quantity which, when added to another quantity (called the augend), produces a result called the sum.

adder—1. A device which forms the sum of two or more numbers, or quantities, impressed on it. 2. In a color TV receiver, a circuit which amplifies the receiver primary signal coming from the matrix. Usually there is one adder circuit for each receiver primary channel.

additive—Sometimes referred to as the key. A number, series of numbers, or alphabetical intervals added to a code to put it in a cipher.

additive color—A system which combines two colored lights to form a third.

additron—An electrostatically focused, beam-switching tube used as a binary adder in high-speed digital computers.

address—An expression, usually numerical, which designates a specific location in a storage or memory device or other source or destination of information in a computer. (Also see Instruction Code.)

address computation—The process by which

address part

air gap

the address part of an instruction in a digital computer is produced or modified.

address part—In an electronic-computer instruction, a portion of an expression designating location. (*Also see* Instruction Code.)

add-subtract time—The time required by a digital computer to perform addition or subtraction. It does not include the time required to obtain the quantities from storage and put the result back into storage.

add time—The time required in a digital computer to perform addition. It does not include the time required to obtain the quantities from storage and put the result back into storage.

ADF—*See* Automatic Direction Finder.

a-display—Also called A-scan. A radar scope presentation in which time (distance or range) is one co-ordinate (usually horizontal) and the target appears displaced perpendicular to the time base.

adjacent- and alternate-channel selectivity—A measure of the ability of a receiver to differentiate between a desired signal and between signals which differ in frequency from the desired signal by the width of one channel or two channels, respectively.

adjacent audio (sound) channel—The RF carrier frequency which contains the sound modulation associated with the next lower-frequency television channel.

adjacent channel—That frequency band immediately above or below the one being considered.

adjacent-channel attenuation—*See* Selectance.

adjacent-channel interference—Undesired signals received on one communication channel from a transmitter operating on a channel immediately above or below.

adjustable resistor—A type of resistor in which the resistance can be changed mechanically, usually by moving a sliding contact.

admittance—The ease with which an alternating current flows in a circuit. The reciprocal of impedance and usually expressed in mhos.

advance ball—In mechanical recording, a rounded support (often sapphire) which is attached to a cutter and rides on the surface of the recording medium. Its purpose is to maintain a uniform mean depth of cut and to correct for small irregularities on the surface of the disc.

advance wire—An alloy of copper and nickel, used in the manufacture of electric heating units and some wirewound resistors.

aeolight—A glow lamp which employs a cold cathode and a mixture of inert gases and in which the intensity of illumination varies with the applied signal voltage. This lamp is used to produce a modulated light for motion-picture sound recordings.

aerial—*See* Antenna.

aerial cable—A cable installed on a pole line or similar overhead structure.

aerodynamics—The science of the motion of air and other gases. Also, the forces acting

on bodies when they move through such gases, or when such gases move against or around the bodies.

aerophare—*See* Radio Beacon.

AES—Abbreviation for Audio Engineering Society.

AF—*See* Audio Frequency.

AFC—*See* Automatic Frequency Control.

afterglow—Also called phosphorescence. The light that remains in a gas-discharge tube after the voltage has been removed, or on the phosphorescent screen of a cathode-ray tube after the exciting electron beam has been removed.

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

AGC—*See* Automatic Gain Control.

aging—Storing a permanent magnet, capacitor, rectifier, meter, or other device, sometimes with voltage applied, until its desired characteristics become essentially constant.

agonic line—An imaginary line on the earth's surface, all points of which have zero magnetic declination.

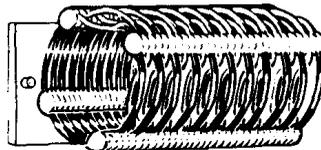
aided tracking—A system of tracking a target signal in bearing, elevation, or range (or any combination of these variables) in which manual correction of the tracking error automatically corrects the rate at which the tracking mechanism moves.

AIEE—*See* American Institute of Electrical Engineers.

airborne intercept radar—Short-range airborne radar employed by fighter and interceptor planes to track down their targets.

air capacitor—A capacitor in which air is the only dielectric material between its plates.

air column—The air space within a horn or acoustic chamber.



Air-core coil.

air-core coil—A number of turns of spiral wire in which no metal is used in the center.

air-core transformer—A transformer (usually RF) having two or more coils wound around a nonmetallic core. Transformers wound around a solid insulating substance or on an insulating coil form are included in this category.

aircraft flutter—Flickering in a TV picture as the signal is reflected from flying aircraft. The reflected signal arrives in or out of phase with the normal signal and thus strengthens or weakens the latter.

air gap—1. A nonmagnetic discontinuity in a ferromagnetic circuit. For example, the space between the poles of a magnet—although filled with brass, wood or any other

airport runway beacon

nonmagnetic material—is nevertheless called an air gap. This gap reduces the tendency toward saturation. 2. The air space between two magnetically or electrically related objects.

airport runway beacon—A radio-range beacon which defines one or more approaches to an airport.

airport surveillance radar—Radar equipment or a radar system used in air-traffic control. Used in conjunction with precision approach radar to scan the airspace for a distance of approximately thirty to sixty miles around an airport. It shows, on an indicator in the airport control tower, the location of all airborne aircraft below a certain altitude, as well as obstructions to flight within its range.

air-position indicator—Airborne computing system which presents a continuous indication of aircraft position on the basis of aircraft heading, airspeed, and elapsed time.

air-to-ground communication—Transmission of radio signals from an aircraft to stations or other locations on the earth's surface, as differentiated from ground-to-air, air-to-air, or ground-to-ground.

air-to-ground radio frequency—The frequency or band of frequencies agreed upon for transmission from an aircraft to an aeronautical ground station.

air-to-surface missile—A missile designed to be dropped from an aircraft. An internal homing device or the aircraft's radio guides it to a surface target.

Alexanderson alternator—An early mechanical generator used as a source of low-frequency power for transmission or induction heating. It is capable of generating frequencies as high as 200,000 cycles per second.

algebraic adder—A computer circuit which can form an algebraic sum.

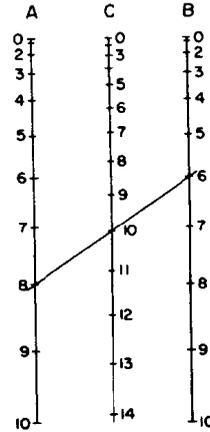
alignment—The process of adjusting components of a system for proper interrelationship. The term is applied especially to (1) the adjustment of tuned circuits in a receiver to obtain the desired frequency response, and (2) the synchronization of components in a system.

alignment chart—Also called nomograph or abac. Chart or diagram consisting of two or more lines on which equations can be solved graphically. This is done by laying a straight-edge on the two known values and reading the answer at the point where the straight-edge intersects the scale for the value sought.

alignment pin—1. A pin in the center of the base of a tube. A projecting rib on the pin assures that the tube is correctly inserted into its socket. 2. Any pin or device that will insure the correct mating of two components designed to be connected.

alignment tool—A special screwdriver or socket wrench used for adjusting trimmer or padder capacitors or cores in tuning inductances. It is usually constructed partly or entirely of nonmagnetic material. (*Also see Neutralizing Tool.*)

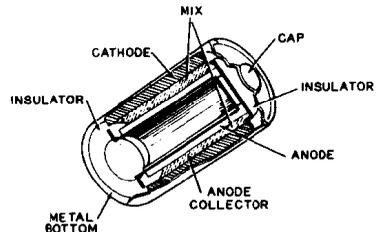
alloy-junction photocell



Alignment chart.

alive circuit—One which is energized.

alkaline cell—A secondary cell with an electrolyte consisting of an alkaline solution (usually potassium hydroxide).



Alkaline cell.

Allen screw—A screw having a hexagonal hole or socket in its head. Often used as a setscrew.

Allen wrench—A straight or bent hexagonal rod used to turn an Allen screw.

alligator clip—A spring-loaded metal clip with long, narrow meshing jaws, used for making temporary electrical connections.

alloy—A composition of two or more elements, of which at least one is a metal. It may be either a solid solution, a heterogeneous mixture, or a combination of both.

alloy-diffused transistor—A transistor with a diffused base and alloyed emitter.

alloy junction—A semiconductor junction in which a material such as indium (P-type dopant) is placed in contact with N-type germanium and heated. The indium melts and dissolves some of the germanium. Upon cooling, the germanium recrystallizes with some of the indium and is therefore a P type.

alloy-junction photocell—A photodiode in which an alloy junction is produced by alloying (mixing) an indium disc with a thin wafer of N-type germanium.

alloy-junction transistor—A semiconductor wafer of P- or N-type material with two dots containing P- or N-type impurities fused, or alloyed, into opposite sides of the wafer to provide emitter and base junctions. The base region comprises the original semiconductor wafer.

alloy process—A method of making semiconductor junctions by melting an acceptor or donor on the surface of the semiconductor and then letting it recrystallize.

all-pass network—A network designed to introduce phase shift or delay but not appreciable attenuation at any frequency.

all-wave antenna—A receiving antenna suitable for use over a wide range of frequencies.

all-wave receiver—A receiver capable of receiving stations on all the commonly used wavelengths in short-wave bands as well as in the broadcast band.

alnico—An alloy consisting mainly of ALuminum, NiCKel, and CObalt plus iron. Capable of very high flux density and magnetic retentivity. Used in permanent magnets for speakers, magnetrons, etc.

alpha—Emitter-to-collector current gain of a transistor connected as a common-base amplifier. For a junction transistor, alpha is less than unity, or 1.

alpha cutoff frequency—The frequency at which the current gain of a common-base transistor stage has decreased to 0.707 of its low-frequency value. Gives a rough indication of the useful frequency range of the device.

alpha particle—A small, electrically charged particle thrown off at a very high velocity by many radioactive materials including uranium and radium. Identical to the nucleus of a helium atom, it is made up of two neutrons and two protons. Its electrical charge is positive and is twice that of an electron.

alpha ray—A stream of fast-moving alpha particles which produce intense ionization in gases through which they pass, are easily absorbed by matter, and produce a glow on a fluorescent screen.

alternate channel—A channel located two channels above or below the reference channel.

alternate-channel interference—Interference caused in one communication channel by a transmitter operating in the channel after an adjacent channel. (*Also see* Second-Channel Interference.)

alternating current—Abbreviated AC. A flow of electricity which reaches maximum in one direction, decreases to zero, then reverses itself and reaches maximum in the opposite direction. The cycle is repeated continuously. The number of such cycles per second is the frequency. The average value of voltage during any cycle is zero.

alternating-current pulse—An alternating-current wave of brief duration.

alternation—One-half of a cycle—either when an alternating current goes positive and returns to zero, or when it goes negative and

returns to zero. Two alternations make one cycle.

alternator—A device for converting mechanical energy into electrical energy in the form of an alternating current.

altimeter—An instrument that indicates the altitude of an aircraft above a specific reference level, usually sea level or the ground below the aircraft. It may be similar to an aneroid barometer that utilizes the change of atmospheric pressure with altitude, or it may be electronic.

altitude—The vertical distance of an aircraft or other object above a given reference plane such as the ground or sea level.

alto-troposphere—A portion of the atmosphere about forty to sixty miles above the surface of the earth.

aluminized-screen picture tube—A cathode-ray picture tube which has a thin layer of aluminum deposited on the back of its fluorescent surface to improve the brilliance of the image and also prevent ion-spot formation.

AM—*See* Amplitude Modulation.

amateur—Also called a ham. A person licensed to operate radio transmitters as a hobby. Any amateur radio operator.

amateur bands—Certain radio frequencies assigned exclusively to radio amateurs. In the United States of America, the Federal Communications Commission (FCC) makes these assignments.

amateur station—A radio transmitting station operated by one or more licensed amateur operators.

amateur-station call letters—A group of numbers and letters assigned exclusively to a licensed amateur operator to identify his station.

ambient—Surrounding. (*Also see* Ambient Noise; Ambient Temperature.)

ambient noise—Acoustic noise in a room or other location. Usually measured with a sound-level meter. The term "room noise" commonly designates ambient noise at a telephone station.

ambient temperature—Temperature of air or liquid surrounding any electrical part or device. Usually refers to the effect of such temperature in aiding or retarding removal of heat by radiation and convection from the part or device in question.

American Institute of Electrical Engineers (AIEE)—A professional organization of scientists and engineers whose purpose is the advancement of the science of electrical engineering.

American Morse code—A system of dot-and-dash signals originated by Samuel F. B. Morse and still used to a limited extent for wire telegraphy in North America. It differs from the International Morse code used in radiotelegraph transmission.

American Radio Relay League (ARRL)—The largest organization of radio amateurs in the world.

American Standards Association (ASA)—