

# Dictionary of Electrical, Electronics and Computer Abbreviations

Phil Brown

TEng, MIGTechE, MIED



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Editor: *Electronics News*

Former Editor: *Whats New in Electronics*

Butterworths

London Boston Durban Singapore Sydney Toronto Wellington

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# Preface

Abbreviations can communicate information and provide understanding of complex ideas succinctly and swiftly. Their derivation, however, can be from numerous sources, brought about by the curtailment of principles during general usage or by the 'coining' of labels at the initial or conceptual stage.

Though the principles of abbreviations might appear simple to those who use them, their derivation can be haphazard because there are no specific rules or laws governing the production of acronyms or abbreviations – either they are born or they evolve. For example, the 'dual-in-line' concept has been logically curtailed to DIL, so that items are referred to as 'DIL sockets'; but when the housings or packages employed in the DIL system are used they are not referred to as 'DILP items' (dual-in-line packages) as one might expect but are termed 'DIP items'. Therefore, guesswork when employing or trying to understand abbreviations can lead to misunderstanding in communication.

The material for this book has been drawn from a number of subject areas, including: electrical, electronics, computers, telecommunications, fibre optics, microcomputers/microprocessors, audio, video, information technology, avionics, military, data processing, instrumentation, units, measurement, standards, services, organizations, associations and companies.

The mix has been selected to provide a comprehensive and broad view of 'electronics' and all that is associated with it, and as there is now generally an overlapping of disciplines (e.g. fibre-optic terms in data processing, computers within electronics) this dictionary can assist as an *aide-mémoire* when reading specification sheets and other technical publications, and when keeping up-to-date with institution journals and trade magazines.

Cross-references have been provided in the form of abbreviations within parentheses. For example, the entry for CCD, charge-coupled device, provides three cross-references: charge-transfer device (CTD), metal-oxide semiconductor (MOS), and

capacitor (C,6). To broaden further the explanation, if required, referral to entries CTD, MOS and C part 6 (C is a multiple entry with nine parts) is advised. The system of prefixes and units used in the *Système International d'Unités* has been followed throughout this book. For further clarification, if required, the reader is referred to the entry SI,1.

For the engineer or technician this dictionary will serve as a memory jogger which involves them to use the cross-references to obtain a greater understanding of the subject. Whilst for sales and purchasing personnel, use as a reference companion to keep abreast of commonly-used terms is recommended as the most rewarding and time-saving employment of this book.

If further information is required the following publications are recommended:

*Dictionary of Audio, Radio and Video* by R. S. Roberts

*Dictionary of Data Processing* (2nd ed) by Jeff Maynard

*Dictionary of Electronics* by S. W. Amos

*Dictionary of Electrical Engineering* (2nd ed) by K. G. Jackson,  
revised by R. Feinberg

*Dictionary of Telecommunications* by S. J. Aires

*Electronics Engineer's Reference Book* (5th ed)

by F. Mazda

P.R.B.  
Shooters Hill

**a** Atto. A decimal prefix commonly used in association with a base unit in Le Système International d'Unités (SI) system of units, indicating a multiplication factor of  $10^{-18}$  of that unit. For example, one attosecond, as, is equal to 0.000 000 000 000 000 001 of a second.

**A** Ampere. The SI unit of electric current, named after the French scientist André-Marie Ampere (1775–1836). It is the electric current (I) which, when flowing in two infinitely-long parallel conductors, with their centres 1 metre (m) apart in a vacuum, causes each conductor to experience a force of  $2 \times 10^{-7}$  newtons per metre length of conductor.

**Å** Ångstrom. A unit of length equal to  $10^{-10}$  m. It is often used to express the wavelengths of very-high-frequency signals such as light.

**AA** One of the letter designations given to the most commonly-used sizes of 1.5-volt (V,1) batteries. Originally of North American nomenclature, this type of letter description is gaining increasing popularity over the International Electrotechnical Commission (IEC) letter/number system as it is able to simplify the selection of batteries. See battery-size cross-reference guide, Appendix.

**AAA** Another of the letter designations given to the most commonly-used sizes of 1.5-volt (V,1) batteries. See AA above.

**AB** (1) AB pack. A term used in the USA to describe a complete portable power source for electron tubes, comprising the A battery supplying the heater power and the B battery supplying the anode circuit power.

(2) Automated Bibliography. A history and description of a number of books, a list of documents pertaining to a given author or an annotated catalogue of documents held in a computer file.

**ABA** American Bankers' Association. An association that promotes aids for its members. An example is ABA coding; numbers that assist computerized cheque clearance.

**ABC** Automatic Brightness Control. A circuit used to adjust automatically the average luminance (brightness) level of a display to compensate for changes in ambient light level.

**ABCA** America, Britain, Canada and Australia Standard. Representatives of the four governments participate in the meetings of this body to agree on standards, especially those applying to military suppliers and industry.

**ABEND** ABnormal END. An irregular or freakish termination to a job or computer operation following either an error condition or an intervention by the operator.

**ABL** Atlas BASIC Language. A computer language designed for use on an Atlas computer.

**ABS** Acrylonite Butadine Styrene. A mouldable plastics compound that provides a rigid, tough and scratch-proof material.

**AC** (1) Alternating Current. An electric current (I) that has its direction in a circuit (CCT) reversed with a frequency (see Hz) that is independent of circuit constants. Alternating currents are normally represented by a sine wave, as shown in Figure A.1.

(2) ACcumulator. See ACC.

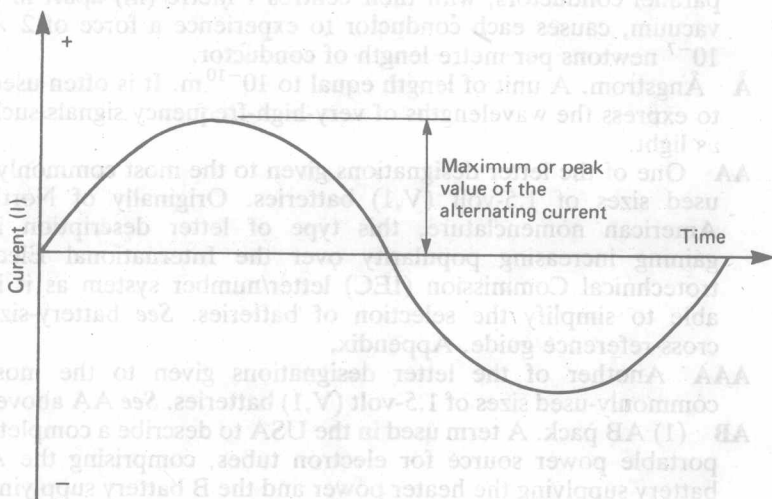


Figure A.1 One complete cycle of an alternating current (AC,1)

**ACARD** Advisory Council for Applied Research and Development. A body in the UK that provides the government with advice concerning research and development (R & D) policies, as well as publishing reports.

**ACC** ACCumulator. (a) A secondary cell having a reversible chemical action and charged by passing a current (I) through it. Direction and rate of chemical action are determined by the value of the external voltage (V). (b) A register of the arithmetic/logic unit (ALU) of a central processor unit (CPU) used as intermediate storage during the formation of algebraic sums, or for other intermediate logical and arithmetic operations.

**ACE** Automatic Computing Engine. A name given to one of the earliest computers.

**ACIA** Asynchronous Communications Interface Adaptor. A device that provides the data formatting and control to interface serial asynchronous data communications information to bus organized systems (i.e. between a microprocessor and a modulator/demodulator (MODEM)).

**ACK** ACKnowledge. A character code indicating a positive acknowledgement that a message has been received correctly, or that a receiver is ready to receive data.

**ACM** Association for Computing Machinery. A professional and technical society whose activities, publications and conferences are designed to aid computing advancement. The aid is with specific regard to machinery and system design, language and program development, plus other related activities.

**ACOMPLIS** A COMPUterized London Information Service. Held on a computer, this is an information service run by the Greater London Council's Library Department.

**ACRE** Automatic Call-Recording Equipment. An invention of British Telecom (BT) which dispenses with the need for operator written 'tickets' detailing calls they handle. ACRE records the details automatically on magnetic tape for subsequent processing by BT's computer-based telephone billing system.

**ACTP** Advanced Computer Technology Project. Funded by government in the UK, this is a project for research into and development of advanced computer techniques for industry.

**ACU** Automatic Calling Unit. A dialling device that permits a business machine to dial calls automatically over a communications network.

**A/D** Analogue-to-Digital. (a) The process of converting between an analogue and a digital signal. (b) A circuit used to convert information into digital form from an analogue input. Such a circuit is used in digital voltmeters and similar devices. See ADC, analogue-to-digital converter.

**ADAPSO** Association of DATA Processing Service Organisations. A data processing (DP,1) organization that also includes



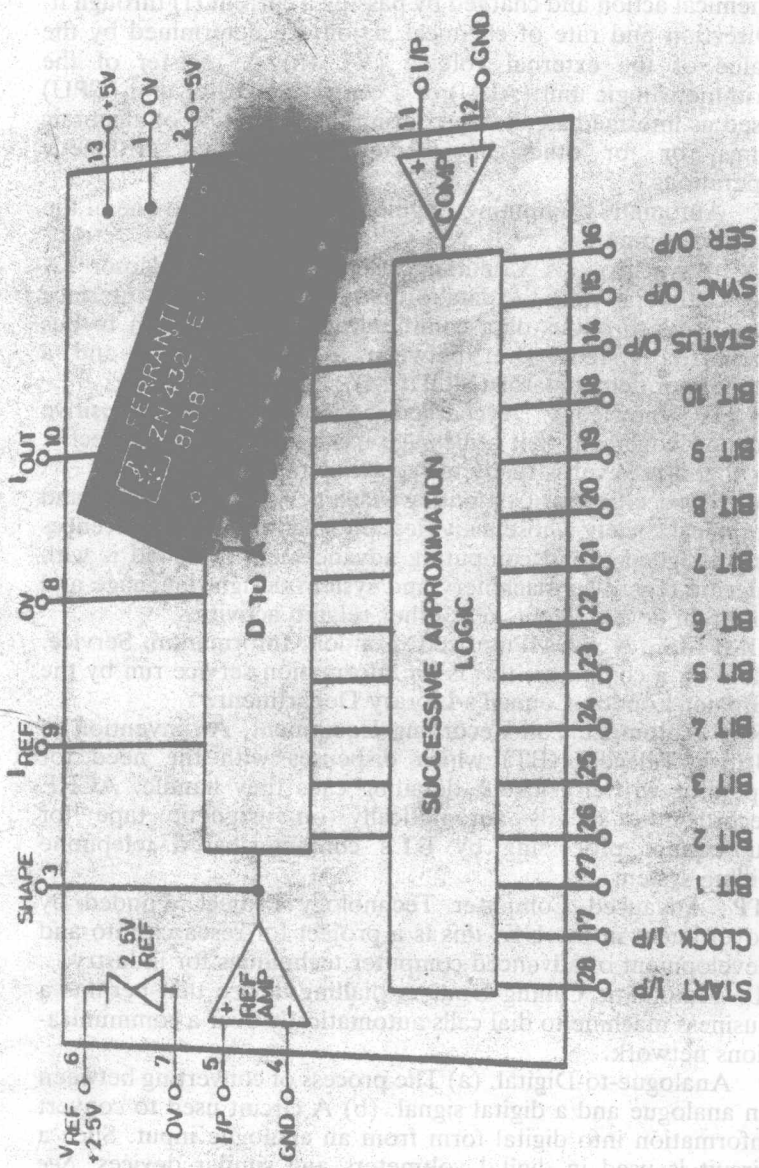


Figure A.2 Ten-bit analogue-to-digital converter(ADC) in a 28-pin package (courtesy Ferranti Electronics Ltd.)

a software development and marketing group.

**ADC(A/DC)** Analogue-to-Digital Converter. A device or circuit that changes analogue input voltages to their equivalent digital (binary or binary-coded decimal) values for acceptance by the memory of a digital processor. An 8-bit ADC generates an 8-bit word; a 12-bit ADC generates a 12-bit word. The encoding becomes more precise as more bits are used.

ADCs fall into three main groups, (a) integrating converters, (b) director flash converters and (c) feedback converters with internal self-checking digital-to-analogue converters (DAC) as shown in *Figure A.2*.

**ADCCP** Advanced Data Communications Control Procedures. A version of synchronous data link control (SDLC) standards produced by the American National Standards Institute (ANSI).

**ADCON** Address CONstant. A value or expression used to calculate the real or virtual storage (VS) address of a memory.

**ADF** Automatic Direction Finder. Typically an ADF consists of two crossed ferrite-core loops projecting 25 mm from the skin of an aircraft with an electronic goniometer generating a direct-reading display of bearing to the selected transmitter. For preference they are tuned to inland non-directional beacons (NDB), which exhibit a sharp reduction in signal strength when directly overhead.

**ADLC** Advanced Data Link Controller. Data that is transmitted and received in a synchronous serial form in a data communications system is converted into parallel form, analysed and stored by this equipment, so that data link management can be accomplished.

**ADP** (1) Automatic Data Processing. (a) Equipment such as electronic accounting machines and electronic data processing (DP,1) units or systems. (b) Data processing (DP,1) performed by a system of electronic or electrical machines interconnected and interfacing so as to reduce to a minimum the need for human assistance or intervention.

(2) Automatic Die Positioner. An item of production equipment that automatically selects and aligns good dies on a silicon wafer. The dies are collected by an automatic mechanical probe and bonded to the substrate of a chip (CHIP) package.

**ADPE** Automatic Data Processing Equipment. Machinery employed to perform automatic data processing (ADP,1(b)) functions.

**ADPS** Automatic Data Processing System. A system employed to perform automatic data processing (ADP,1(b)) functions.

**ADRS** Automatic Document Request Service. Provided by the

British Library Automated Information Service (BLAISE), this service permits subscribers at an on-line terminal to ask for the loan of, or copies of, documents from the British Library Lending Division.

**ADU** Automatic Dialling Unit. A device capable of automatically generating telephone dialling digitizer signals.

**AECMA** Association Européenne des Constructeurs de Material Aerospacial. Concerned with aerospace matters, this association prepares draft standards that are subject to normal European Committee for Standardisation (CEN) procedures before becoming adopted as European Standards.

**AF** Audio Frequency. Any frequency that can be detected by a normal human ear. This audible range extends from about 20 to 20 000 Hz. In a communication system intelligible speech can be obtained if a frequency range from about 300 to 3400 Hz is reproduced; any frequency in this range is called a voice frequency (VF).

**AFC** Automatic Frequency Control. A device that automatically maintains the frequency of an alternating voltage within specified limits. Error-operated, the device normally consists of two parts, a frequency discriminator that compares actual with desired frequencies, and a reactor controlled by the discriminator in such a way as to correct any frequency error. *See Figure A.3.*

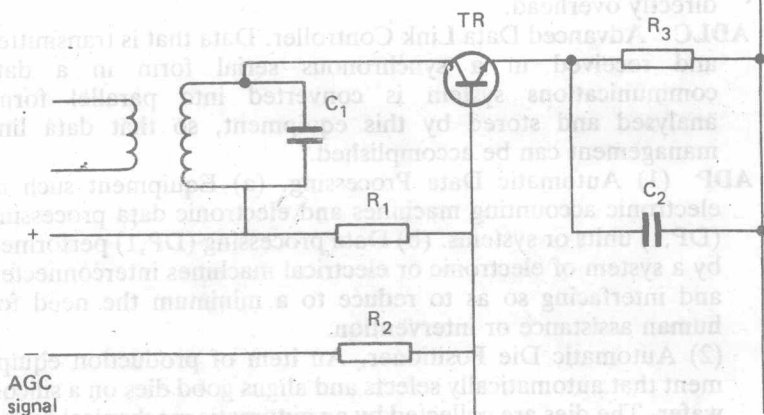


Figure A.3 Automatic frequency control (AFC) undertaken by a typical intermediate frequency (IF<sub>1</sub>) stage

**AFIPS** American Federation of Information Processing Studies. An association of various USA data processing (DP<sub>1</sub>) groups, institutes, societies and organizations. Formerly 'AFID'.

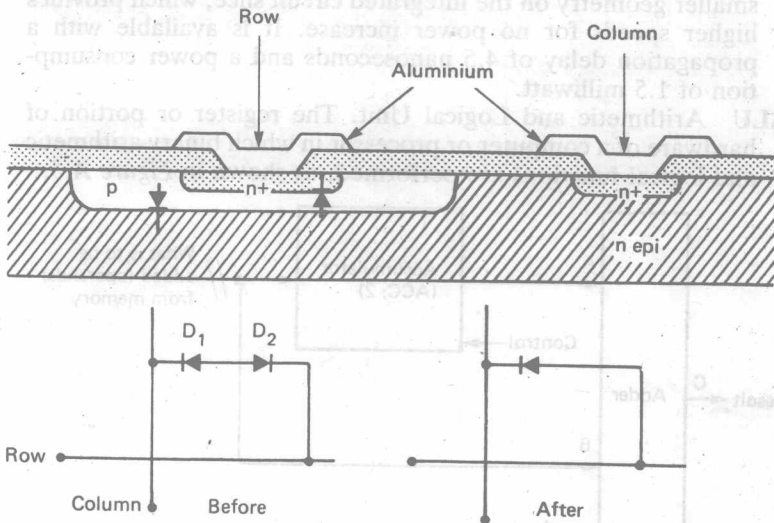
**AFNOR** Association Française de NORMALisation. A standards authority in France that is a member of the International Standards Organisation (ISO).

**AFSK** Audio Frequency-Shift Keying. A system employed in telecommunications that uses audio frequency (AF) tones to modulate a carrier wave in order to convey a digital signal.

**Ag** Argentum. Silver. A white precious metal that is an excellent electrical conductor. Atomic number, 47; atomic weight 107.880.

**AGC** Automatic Gain Control. (a) A device that maintains the output volume of a radio receiver at a constant level, despite fluctuations in the input signal. An AGC is usually applied to amplifiers. (b) The process of maintaining the output volume of a radio receiver at a constant level.

**AIM** Avalanche-Induced Migration. An irreversible process employed in the programming of a programmable read-only memory (PROM), based on aluminium migration through silicon to short circuit a diffused junction. *See Figure A.4.*



*Figure A.4* The basic structure of an avalanche-induced migration (AIM) cell

**AIO** Action Information Organization. An operations room on a warship that takes inputs from aircraft communications, radar, sonar, computerized gun and missile controls and internal communications. Such information is displayed on consoles so that necessary human or computer intervention can be made, for instance to take evasive action when under attack.

**AKWIC** Author and Key Word In Context. An index that lists available computer programs or documents tabulated in alphabetical order of the most informative or significant word in the title of the information, along with the writer or programmer of the particular item of data.

**ALGOL** (1) ALGO<sup>r</sup>ithmic Language. A computer language by which numerical **procedures** may be precisely presented to a computer.

(2) ALGe<sup>b</sup>raic Orientated Language. The international procedural computer programming language used especially for scientific applications.

**ALOFT** Airborne Light Optical Fibre Technology. A system used for the economic analysis of fibre optics technology in the American A-7 aircraft.

**ALPHAMERIC** A contraction of 'alphanumeric'.

**ALS TTL** Advanced Lower power Schottkey Transistor-Transistor Logic. A recent addition to the transistor-transistor logic (TTL) range of devices, the ALSTTL employs improved integrated circuit (IC) construction techniques, permitting smaller geometry on the integrated circuit slice, which provides higher speeds for no power increase. It is available with a propagation delay of 4.5 nanoseconds and a power consumption of 1.5 milliwatt.

**ALU** Arithmetic and Logical Unit. The register or portion of hardware of a computer or processor in which binary arithmetic and logical functions are performed, as shown in Figure A.5.

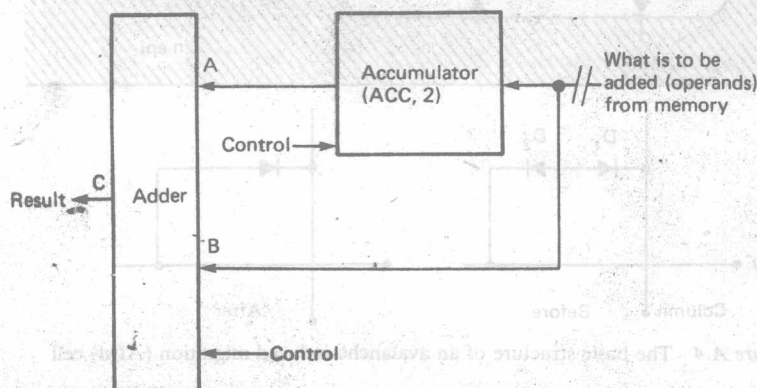


Figure A.5 One particular type of arithmetic and logical unit (ALU)

**AM** Amplitude Modulation. (a) A modulation in which the peak values, positive and negative, of an alternating current (AC) or wave are varied above and below their unmodulated values by

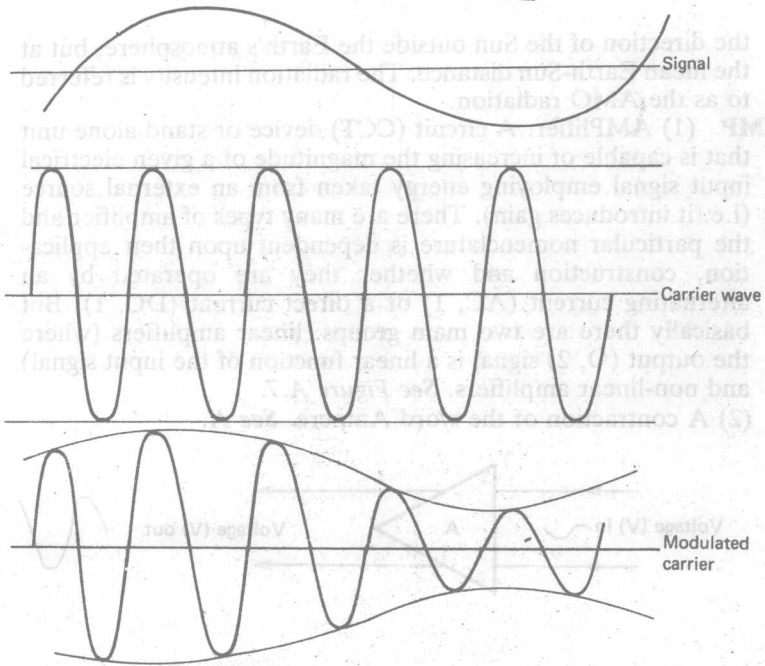


Figure A.6 Amplitude modulation (AM, (a))

an amount proportional to the peak value of the signal wave and at the frequency of the modulating signal, as shown in Figure A.6. (b) Also refers to a radio receiver or part of a radio receiver that detects amplitude-modulated signals only.

**AM1** Air Mass ONE. A term used in connection with solar cells. When the Sun is directly overhead, the length of its path through the atmosphere is at its shortest; thus the optical air mass is considered unity and the radiation is described as AM1.

**AMACUS** Automated Microfilm Aperture Card Update System. A system employing aperture cards, consisting of an 80-column punched card with a  $35 \times 45$  mm frame of microfilm inserted, as its main form of storing information.

**AMBIT** Algebraic Manipulation BIT. A particular computer programming language used for algebraic symbol manipulation.

**AM/FM** Amplitude Modulated/Frequency Modulated. Usually refers to a radio receiver that detects both amplitude modulated (AM) and frequency modulated (FM) signals.

**AMO** Air Mass ZERO. Also known as the 'solar constant', AMO is generally used in relation to solar energy cells. It can be described as the radiant power per unit area perpendicular to

the direction of the Sun outside the Earth's atmosphere, but at the mean Earth-Sun distance. The radiation intensity is referred to as the AMO radiation.

**AMP** (1) **AMPlifier**. A circuit (CCT) device or stand alone unit that is capable of increasing the magnitude of a given electrical input signal employing energy taken from an external source (i.e. it introduces gain). There are many types of amplifier and the particular nomenclature is dependent upon their application, construction and whether they are operated by an alternating current (AC, 1) or a direct current (DC, 1). But basically there are two main groups: linear amplifiers (where the output (O, 2) signal is a linear function of the input signal) and non-linear amplifiers. See Figure A.7.

(2) A contraction of the word Ampere. See A.

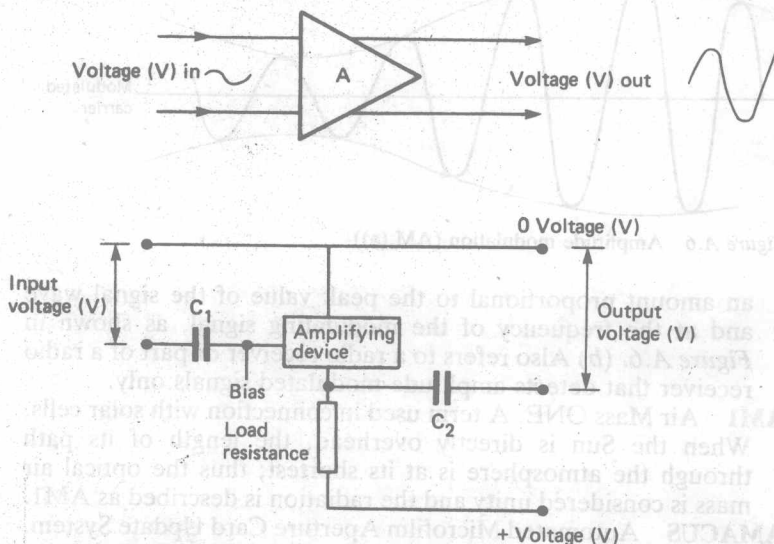




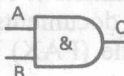
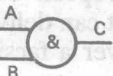
Figure A.7 Schematic diagram of an amplifier (AMP) and a typical amplifier circuit (CCT)

**AMSAT** The Radio AMateur SATellite Corporation. A corporation formed in the USA in 1969 to co-ordinate a range of American and international amateur space projects. See OSCAR.

**AND** A logic function, operation, circuit or gate. (a) A logical function or operation defined by a specific rule that if two statements, A and B, are true (1), then C is also true (1); if not, then C is false (0). Truth is usually expressed by the value 1,



while 0 is used to indicate a false state, as shown in *Figure A.8*.  
 (b) A physical circuit that performs the AND function. (c) A gate that performs the AND function.  
**ANL** Automatic Noise Limiter. A circuit employed in radio transmitter/receivers, now extensively used in citizen band (CB) transceivers to reduce noise or interference such as that caused by motor-car ignition systems.  
**ANSI** American National Standards Institute. An organization that establishes standards and organizes committees of computer users and manufacturers. It develops and publishes industrial standards in the fields of computing and information handling that are accepted world wide. Formerly USASI.

MIL-STD-806B	BS 3939 ANSI Y.32.14-1973 IEC 117	Old BS 3939	Sometimes used symbol	Truth table		
				A	B	C
				0	0	0
				0	1	0
				1	0	0
				1	1	1

*Figure A.8* The AND gate. In practice the MIL-STD-806B symbol is the one most likely to be met, although the other logic symbols may be encountered.

**A-O** Acousto-Optic. A term that refers to the interaction of optical and acoustic waves.

**APD** Avalanche PhotoDiode. A photo-detecting diode sensitive to light energy. It increases its electrical conductivity by increasing the number of electrons in its conduction band through absorbing photons of energy, the interaction of electrons, and an applied bias voltage.

**APL** Algorithmic/Procedural Language. A programming language with an extensive set of operations and data structures that are used to implement what is considered by many to be the most flexible, powerful and concise language in existence. It was invented by Kenneth Iverson and is also known as 'A Programming Language'.

**APT** Automatically Programmed Tools. A system for the computer-assisted programming of numerically controlled (N/C) machine tools, draughting machines and similar equipment.

**AQL** Acceptable Quality Level. Batches of components or parts are inspected and laboratory tested by many manufacturers to a



specific percentage value. If more than that percentage fail to meet the AQL, the whole batch is rejected.

**ARPA** Advanced Research Projects Agency. An agency of the US Department of Defense, which supports its own resource-sharing computer network (ARPANET).

**ARPANET** Advanced Research Projects Agency NETwork. A large packet-switching network that employs exchanges linked by high-speed data-transmission facilities, developed by the US Department of Defense.

**ARQ** Automatic ReQuest for repetition. An automatic system that provides error correction by making use of a code and a construction such that any false signal initiates a repetition of the transmission of the character incorrectly received. Also known as 'automatic error correction'.

**ARTEMIS** Automatic Retrieval of Test through European Multipurpose Information Services. Currently under evaluation by the European Commission, ARTEMIS is planned to be a system that can deliver documents, supplying articles of text on demand over a facsimile (FAX) or digitized text-transmission system.

**ARU** Audio Response Unit. A device that can connect a computer system to a telephone and thereby provide a voice response to any enquiries received.

**ASA** American Standards Association. A US association responsible for the establishment of standards; formerly known as the United States of America Standards Association.

**ASC** Automatic Sequence Control. A management feature found in computer programs.

**ASCC** Automatic Sequence Controlled Calculator. An early computer constructed by Howard Aiken at Harvard University in 1937.

**ASCII** American Standard Code for Information Interchange. Usually pronounced *ask-ee*. This is an 8-bit information code for data transfer used with most computer and data terminals. It has been adopted by the American Standards Association (ASA) to achieve compatibility between data devices and other pieces of equipment.

**ASP** Attached Support Processor. A term used to describe multiple computers, usually two, connected via channel-to-channel adaptors, employed to increase efficiency in processing many short duration tasks.

**ASR** Automatic Send-Receive set. A combination teletypewriter (TTY), transmitter and receiver having the capability to transmit from either a keyboard or paper tape.

**ASW** Anti-Submarine Warfare. A typical acoustic processing