B

Back up a term used to denote skilled resources when applied to a computer system supplier. When applied to the process of computing it refers to the taking of a copy or copies of programs or data, for archival purposes or for security. Back up can also be applied to a second or further computer systems on which programs and data may be processed in an emergency.

Background a term used in connection with computer operating systems. It implies that there are programs with varying levels of priority. The lower priority levels are run in background, i.e. in the computer's spare time or unused memory locations. The more important, higher priority jobs are run in foreground. An operating system with this level of sophistication is more typically to be found in mainframe and minicomputers, since it normally occupies a large amount of memory.

Background processing the automatic execution of lower priority computer programs when higher priority programs are not monopolising the computer system.

Background program the program with lower priority. Background programs normally execute from batched input. The real time tasks take the higher priorities.

Backing storage ◊ AUXILIARY STORAGE.

Backplane a term describing the connections and wiring units which enable the various modules of a microcomputer system to interconnect and communicate.

Backslash/slash the American term for the English oblique symbol, the solidus. (/,\), used for many different purposes in the grammar of programming languages.

BAL ◊ BASIC ASSEMBLER LANGUAGE.

Balance the arithmetic task of adding groups of numbers so that they may be correlated. Balancing is a common process used in editing data in computer systems, to ensure that all important data is present and that only valid data is processed by the computer system.

Bank switching the concept of switching from one section of

directly addressable memory to another. Bank switching takes place under program control.

Bar chart a display used to illustrate the progress of activities in project management, for example. The chart employs a bar or lines to denote the point in time a particular activity may have reached.

Bar code a method of identification for data recognition purposes. Used widely in computer systems in retailing. The code, which varies with a number of conventions, comprises a number of lines of varying thickness. The lines are used to describe a product, within the definitions of a particular convention. The codes are read by a scanning device which a computer system then accepts as input.

Barrier effect an active component such as a TRANSISTOR can exist in more than one state. The transistor can perform as a resistor or an amplifier. A phenomenon which facilitates this transformation is a resistive barrier, or a high resistance zone in the transistor, which can be created or removed by applying very precise levels of voltage to the transistor.

Base the immediate region in a bipolar transistor, between the emitter and collector regions, to which electrodes are attached. ◊'BIPOLAR'.

Base number the number which forms the basis for the particular mathematical system a computer or circuit may be using. Base number systems in common use in computer systems are

Binary	base 2
Octal	base 8
Decimal	base 10
Hexadecimal	base 16

BASIC Beginners All-purpose Symbolic Instruction Code: (N.B. in common with many other computer related acronyms, more than one definition can be encountered, for example 'Beginners Algebraic, etc.)

A high level programming language. One of the easiest to learn languages. It is used in most small computers. BASIC runs efficiently in most computers and requires less memory than many other languages. BASIC is also used as a conversational language, where

the grammar of the language prompts the programmer to respond in a specific manner.

Basic Assembler Language (BAL) a low level computer programming language, used by expert computer programmers for efficient use of the computer's memory. An ASSEMBLER program converts the BAL program into machine-readable BINARY code.

Batch processing the term describing a computer task where each step is taken sequentially for a group of transactions. For example, in a payroll system all the time cards and personnel and rate changes would be punched up as a batch before being entered into the computer for processing. Thereafter there could be several other batch tasks such as file update, error listings, batch totalling, payroll calculation, payslip printing, credit transfer or cheque printing. By contrast, in an on-line system each transaction is handled separately and completely.

Battery back up a technique to protect the contents of RAM (Random Access Memory) even when power has been lost for a while, in which the battery assumes the task of supplying power to the circuit for a limited period. Usually measured in minutes or hours rather than days.

Baud a unit of rate of serial data transmission roughly equivalent to bits per second.

Baud rate the signal transmission rate measured in bits per second. It is used as a measure of serial data flow between computers, communication equipment and peripheral devices.

Baudot the baudot code is similar in concept to ASCII. It assigns codes to letters of the alphabet, numbers and punctuation marks. Baudot code uses only 5 bits for 32 possible combinations and does not have a unique code assignment for each character. Two codes are used for case shifting (letters and figures) which allow a total of 60 different characters to be represented. ASCII and EBCDIC are much more widely used codes because they are more extensive and easier to use. See appendix for CODES.

BCD Binary Coded Decimal. A system of representing numerical values where each decimal digit is replaced by its binary equivalent.

It uses the base 2 and codes each decimal digit into a 4 bit word. For example:

Decimal Number	*Binary Number*
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
10	1010
11	1011
12	1100
13	1101
14	1110
15	1111

See appendix for CODES

Benchmark a standard or point of reference used to measure performance or value. Datum is the engineering equivalent.

Benchmark tests tests used in measurement of system performance under typical conditions. A group of programs can run on several computers for the purposes of comparing speed, throughput, ease of conversion and overall performance. There are several different conventions for evaluating the results of benchmark tests but they are generally only applied to the very large installations since the costs involved can be prohibitive.

Best straight line when calibrating an instrument, a TRANSDUCER or a SENSOR, the range of output values plotted against input appears as two curves, one for the upper limit of tolerance, and one for the lower. The best straight line plotted between these two curves is defined as the nominal performance for the instrument being calibrated.

Bidirectional a BUS structure in which a single conductor is used to transmit data or signals in either direction, usually used for data transmission between a peripheral unit and a central processing unit or memory.

Binary a system of numbers using 2 as a base whereas the

decimal system uses 10 as a base. The binary system requires only two symbols: 0 and 1. ◊ BCD: BINARY CODED DECIMAL.

Binary Coded Decimal ◊BCD

Binary digit ◊BIT.

Bipolar having two poles, positive and negative. When applied to TRANSISTORS it refers to the type of transistor construction which has two positive regions (p-regions, the emitter and collector), one on either side of a negative region (n-region, the base). The opposite construction is also employed where two negative regions sandwich a positive region. These are known as pnp and npn transistors, respectively.

Depending upon the voltage applied the central region will become resistive, thus preventing the flow of current, or become conductive, thus permitting the flow of current. In this way a bipolar transistor can be used as an amplifier or a switch. The bipolar transistor principle is widely used for memory technologies.

Bistable a TRANSISTOR circuit designed to divide a value by two. It exists in a BINARY state, either as a zero value or a one. A FLIP-FLOP circuit is bistable.

Bit binary digit. A single binary digit may be a logic 1 or 0. In microprocessing terms the logic states are represented by voltage levels; the voltage being considered either on or off when it falls outside preset values. These values vary with the technology, e.g. TTL, CMOS, etc.

Bit parallel a method of simultaneously moving all bits in a group over separate wires.

Bit serial a method of sequentially moving a grouping of bits one at a time over a single wire.

Bit test instructions special low level programming instructions to examine the status of any main memory bit. The instruction can test, set or reset a memory bit. These instructions are for setting flags, or signposts for data, and for monitoring and controlling on-off functions such as switches, relays, valves and indicator lamps. Not present in all systems. More commonly found in industrial microcomputer systems.

Bits per second ◊BPS.

Black box any piece of equipment, usually electronic, which is

considered only as a functional item, thus only the input and output are evaluated. In practice this approach is generally followed with regard to electronic products. Most people are not interested in the workings of a TV set or washing machine provided it functions. A flight recorder is the archetypal black box.

Black-out the loss of performance in a device immediately following a SPIKE or abnormal transient signal.

Block diagram a functional representation or diagram of a system, instrument or computer. Intended to diagramatically illustrate rather than specify function.

Board a commonly used term to describe a printed circuit board. ◊PCB.

Bonded metallic components connected in a circuit to provide the impression, electrically, that they are physically bonded, and thus at a common voltage.

Boolean algebra a notation which uses an algebraic method for describing logic states. Named after the 19th Century English mathematician, George Boole who originally developed his system to describe true or false mathematical statements in such a manner that they could not contain any ambiguity nor be misinterpreted.

Boolean algebra has been adopted by logic circuit designers and is now used to describe the logic states which make up the logic gates used in a computer's Arithmetic and Logic Unit. See appendix for LOGIC CIRCUITS.

Bootstrap a technique or device designed to initiate itself, e.g. a program whose first few instructions are sufficient to bring the rest of itself into the computer from an input device. Can be used either as a noun or a verb to describe the device or the process.

Bootstrap loader this device is used where there is no loader in main memory. It will load into memory any sequential series of BYTES, usually unchecked. It may be keyed into the computer but is more normally stored in Read Only Memory (ROM). The bootstrap loader must be as small as possible in case it has to be input manually.

Box an enclosure or case for an industrial or inherently safe system.

bps bits per second. In serial transmission, the speed with which a device or channel transmits a character in bits. ◊BIT

Branch a logical decision point in a system, or a program instruction. Refers to the capability of a computer to modify the function of a program sequence and depends on the content of the data at a particular instant. A means of departing from the main program out to a subroutine, based on a decision presented by the software. (Synonymous with JUMP.)

Breadboard the initial design model, usually of a circuit. This is normally the very first phase of design for an electronic circuit or system, aimed at proving principles and function, not appearance. The term is not used with reference to software except where software is an integral part of the hardware.

Breakpoint a point in a program where the program expects some external event to happen. For example, it might expect an operator to key in his personal code or an authority before it will proceed to the next step. ◊CHECKPOINT.

British Standards Institute ◊BSI

BSI British Standards Institute, the body responsible for defining standards throughout British industry.

Bubble Memory one of the newer technologies offering a much higher density than conventional memories. There are several different types of bubble memory but the general principle involves the recognition of magnetic bubbles in a non-volatile storage medium. As the presence or absence of bubbles can be recognised as a binary value and as external fields can manipulate this data, bubble memories can replace the more conventional technologies. The specific principle behind bubble memories is based on the phenomenon that if a thin slice is cut from a crystal of certain ferromagnetic materials the observable magnetic patterns, or domains, on the surface of that strip form wavy lines, having alternating directions of magnetisation. The sum of the volume of domains magnetised in one direction equals the sum of the volume of domains magnetised in the opposite direction.

If this crystal slice is then subjected to a magnetic field of increasing strength the domains begin to change in shape until, at a precise point, they reform into perfect cylinders, or bubbles. If the magnetic field continues to increase in strength, at a certain point the bubbles will dissipate.

Thus within certain predefined limits magnetic bubbles exist, to a known magnetic strength. Outside these limits they do not exist;

hence they can be interpreted as binary digits.

Buffer a circuit connected between other circuit elements to prevent interactions and provide additional drive capability. Also a storage device to compensate for differences in speeds of peripheral devices or events being monitored by the computer.

Bug a jargon term used to describe an error or fault in either the hardware or software of a system. 'Gremlin' was its predecessor in World War II engineering jargon.

Bureau a company which offers a service whereby customers may pay for the use of time on a computer. The bureau may also offer programs and operating personnel as part of the service. The service is generally thought of as 'buying computer time'.

Burn-in testing and running of a product, system or component through the range of its operating environment to ensure that an early failure does not occur. In effect the manufacturer is simulating the use of the product by subjecting it to a series of tests.

Bus a collection of wires carrying parallel binary data. Several bus users (modules, e.g. memory) can send or receive data along the bus. In general only one 'sender' and one 'receiver' are active at any one instant. Buses facilitate the transfer of data between memory, input/output services and the central processing unit of the computer.

Bus driver an integrated circuit which is added to the data bus system to give the correct 'drive power' to the computer's central processing unit when several memories are connected to the data bus.

Bus multiplexing the concept of transferring data and/or instructions on the same line or wire at different times, under system control.

Bus system a network of paths inside a computer which facilitates data flow.

Bypass a path around one or more elements of a circuit.

Byte a usable unit of data: 8 consecutive BITS treated as an entity. Byte and character are often used synonymously. This is not necessarily accurate since alphabetic characters generally occupy more storage space than numeric characters.