

# J

**Jack** an electrical plug and socket assembly used for easy general purpose connection.

**JFET** Junction Field Effect Transistor. (see p. 54) Synonymous with FET.

**Job** all of the necessary programs, data and documentation for a complete run of a program.

**Josephson Junction** the joint or meeting point of a superconductor and an introduced very thin insulator or slice of insulating material. Due to the superconductive properties of the material a current can actually flow across this junction until an external voltage is applied.

Depending upon the value of the insulating layer and the voltage applied either alternating current (AC) or direct current (DC) can tranverse the insulating barrier. ♢ SUPERCONDUCTIVITY.

**Josephson memory** an array of memory cells constructed from Josephson Junctions. The memory array is held in a magnetic field at conditions close to absolute zero degrees of temperature. In these conditions the presence of a magnetic field destroys the superconductivity effect; its absence restores the effect. The resulting voltage changes can be sensed at each memory cell as data or absence of data, hence binary information. ♢ JOSEPHSON JUNCTION, ABSOLUTE ZERO.

**Joystick** a control lever or multiple switch which can be rotated through 360°, with mechanical advantage, to make or break a series of electrical connections. Has practical applications where a particular value or performance characteristic has to be reacted to in an interactive mode or in a closed loop, or servo controlled system. For example, driving a vehicle under varying conditions.

**Jump** an operation used to control the transfer of operations from one location in a program to another location. ♢ BRANCH.

**Jumper** a direct connection between two points in a printed circuit, points which were not part of the original circuit. Generally used to improvise a change to the circuit. Known as a 'patch' in programming terms.

**Junction** the boundary between two dissimilar materials or

materials having dissimilar properties. For example the point on which positive and negative charge carrying regions meet in a BIPOLAR transistor.

**Justify** to align the first or last significant digit of a number by shifting the field left or right in memory.  $\diamond$  SHIFT.

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# K

**K** Kilo. Commonly taken to mean 1000. In fact this is an approximation. To be strictly accurate K is  $2^{10}$ , or 1024. K is used to describe the memory capacity of a computer, e.g. 32 Kb, or 32,000 BYTES of memory. The exact memory size represented by 32 Kb is 32,768 bytes of memory.

**Karnaugh map** a particular form of truth table, or an array of values which represent the logic states of inputs and outputs for a given logic gate. The table contains only binary values which represent either the false state (logical 0) or the true state (logical 1) for the particular combination of inputs for a specific logic gate. See LOGIC CIRCUITS in the appendix for a fuller description.

**Key** a button which can be depressed on any peripheral device, most commonly a keyboard. A key can also be a legend in a program or a very important element in a program.

**Keyboard** the device that forms a part of an input device, as in the case of a video display unit (VDU), or is itself an input device, as in the case of a Teletype Unit (TTY).

**Keypunch** a machine that converts the depression of keys on a keyboard to punch holes in a punch card or paper tape to represent the appropriate code.

**Kilo** ◇ K.

**KISS** Keep It Simple, Stupid. An exhortation to programmers in particular. The underlying advice is very relevant. Several small and simple programs are generally easier to write, test and amend than one large, complex program.

# L

**Label** a name for a software constant, a program or a software routine.

**Ladder network** a simple software language used in conjunction with PROGRAMMABLE LOGIC CONTROLLERS (PLC), PROGRAMMABLE CONTROLLERS (PC) or sequential controllers. It deals with sequencing, timing of events, and duration.

**Language** a systematic and formally structured means of communicating instructions and data to a computer. Languages may be user oriented 'English like', i.e. high level languages such as COBOL, BASIC and FORTRAN. They may also be much closer to the way the computer works, i.e. low level languages, such as Basic Assembler (BAL).

**Large Scale Integration** ◇ LSI.

**Laser** an acronym for Light Amplification by Stimulated Emission of Radiation. A laser is the source of a narrow and intense beam of radiation. Many different types of laser and laser materials exist; the principle of the laser is that the atoms comprising the laser material change energy levels in response to an external stimulus or electromagnetic radiation, which causes the laser material to emit radiation. The beam produced can be either continuous, or pulsed, depending upon the laser material. Laser materials include gas, ruby and diodes. The beam is visible in the ultraviolet and infrared regions of the spectrum.

**Laser printer** a printer which employs a laser beam to describe characters on specially sensitised paper. Normally used where the quality of output printing is more important than cost. Especially useful in the printing and graphic arts industries. ◇ COM.

**Latch** a single unit of solid-state memory, which does not form part of an ARRAY, is often called a latch. Historically they were called bistable circuits or FLIP-FLOPS. Used to hold a circuit open in position until the circuit needs to change.

**Latency** the term for an inherent delay in a system caused by the time taken for memory, disk, etc. to respond to a request. Well organised programs aim to reduce latency by a wide variety of sophisticated addressing and timing techniques.

**Layout** the result of logical flowcharting and planning of input and output documents for a program or system.

**LCD** Liquid-Crystal Display. A display utilising liquid-crystal technology. It comprises two clear glass wafers, sandwiching between them a liquid crystal solution. The liquid crystal is an organic liquid whose crystals align themselves under the influence of an electric field. Thus a measured charge can cause liquid crystals to align themselves in the form of pre-arranged alphabetic or numeric characters. Liquid crystal is more sensitive to temperature than most display devices. As such it is limited in application to relatively bland environments.

**Leads** wires used to make connections between circuits, or a power source and circuit. Usually only for temporary use.

**Leakage** current finding its own path in a circuit rather than following the fabricated circuit. Usually taken to mean current loss.

**LED** Light Emitting Diodes. Semiconductor devices that create a low level of light; LEDs have a low power consumption and long life and as such are ideal for use as a display. However, in well lit environments or outdoors they can be difficult to see. Thus for outdoor use in particular the choice of display technology can be difficult. ◇ LCD.

**Library** a central organisation of complete programs written for a particular computer, normally held on disk.

**LIFO** Last in First out. A method of storing data in a stack or table and retrieving first the last item stored. ◇ FIFO.

**Light Emitting Diodes** ◇ LED.

**Light Emitting Display** a display which utilises light emitting diodes.

**Light Pen** a pencil shaped device containing a photoelectric cell at its tip. Generally used in conjunction with a video display unit having a sensitised screen surface. Touching the display area of specific data on the face of the screen with the tip of the light pen causes the central processor, or intelligent terminal to decipher the address of the data concerned. If keys on the keyboard are depressed at the same time that the light pen identifies the data a transaction can be processed immediately. In practice this can reduce the number of screen handling programs but often slows down the operation of the system, from the operator's standpoint.

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**Limit Switches** an electro-mechanical device used to cut off power to a circuit when tripped. Used to limit travel, or to engage secondary devices or operations.

**Limits and fits** systems of tolerances of size employed to ensure interchangeability of parts. Many different systems exist, often directed at a particular type of component, e.g. screw threads.

**Line** a conductor; a line which transmits energy.

**Line printer** a computer output device in which characters are printed in a horizontal line before the paper carriage moves the paper up to begin printing the next line. The print chain or transport which contains several sets of the characters moves continuously across the paper. The hammers which hit each character against the paper are selected by software. Speeds of line printers can exceed 1,000 lines of printing per minute. Other technologies such as dot matrix, thermal and ink jet all qualify for the description of line printer.

**Line transformer** a transformer providing a selection of different voltage and current levels by means of tapping the coil at different positions. ◇ TRANSFORMER, TAPPING.

**Linear** referring to two variables that have a direct relationship. More specifically in microelectronics it is applied to outputs varying in a direct relationship to an input.

**Linear Actuator** ◇ ACTUATOR.

**Link** a single-bit register used primarily to hold the 'carry' bit during arithmetic operations. Also used to define the channel or circuit which connects other channels or circuits to each other.

**Linker** Link edit. The software forming part of the operating system which combines together all subroutines, programs and routines from library, utilities and so on to form a single cohesive program for a specific task. In this way numerous small programs can be linked together to produce a larger and more sophisticated program.

**Liquid Crystal Display** ◇ LCD.

**Listing** a computer print out.

**Listing paper** standard computer paper, lined for print alignment, sprocket punched for drive.

**Literal** a value in a computer program whose name describes it

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literally; e.g. the constant named ONE could also have a value of 1.

**Lo** Low. ⇨ HI: HIGH.

**Load** to load is to 'copy the contents of'. Synonymous with move. When used in a hardware context, 'load' has its usual electrical meaning. Load and Go means to load a source program and have it immediately translated in machine code and then run, without any intervention.

**Load life** the time, normally in hours, which a device may operate to pre-defined specifications. These specifications pertain to output characteristics, levels of performance and specific power dissipation.

**Lock out** generally used in software. A software device for inhibiting a particular operation or preventing access if pre-defined limits have been exceeded.

**Log** all data pertinent to a minute by minute diary of a system's activities is recorded on a console printer. The print out is referred to as the log. Such information as program name, start and stop times, peripheral identification and halt/fault data is recorded.

**Logic** the mathematical treatment of formal logic in which a system of symbols is used to represent quantities and relationships (e.g. AND, OR). In applications software it is more generally taken to mean the rules applying to a particular program.

**Logic analyser** a piece of equipment which can store digital signals from all inputs or from a prototype device it is testing. These signals can be displayed for analysis which enables hardware and software debugging to take place on the same device. ⇨ DEVELOPMENT SYSTEM.

**Logic card** a basic element of a hardware system where the relevant components and circuits are contained on a single printed circuit board, or card. The pcb is mounted in a rack as one of a number of cards which comprise the whole system. Separation of logic in this way facilitates fault finding and correction.

**Logic drawings (diagram)** a diagrammatic representation of mathematical logic. Used to lay out logic gates on paper before circuit diagrams are drawn. ⇨ LOGIC CIRCUITS in appendix for examples.

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**Logic element** a circuit consisting of a gate, or a flip-flop circuit.

**Logical circuit** a circuit consisting of interconnected gates or circuits. A switching circuit.

**Logical one: logical zero** in binary notation logical one is taken to mean a logical statement is 'true', logical zero to mean 'false'.

**Look ahead** a feature of software or of a central processing unit in which a program is scanned for priority tasks. In this way it is possible to override an interrupt request until it is convenient to accept it.

**Looping** a repetition of instructions until a final condition is determined. Sometimes the word is used interchangeably with iteration.

**Low level language** a programming language that is very close to the way that the computer actually works. Machine level language and object code (binary codes) are the lowest level languages. The normal usable low level language is Basic Assembler (BAL). The use of such low level language generally ensures a more efficient use of memory than with higher level languages but also requires a more skilled or more highly trained programmer to use the language.

**Low threshold** TTL compatible MOS logic which switches at 2V to 3V.

**LSI** Large-scale integration. This term is generally applied to integrated circuits containing from 100 to 5000 logic gates or 1000 to 16,000 memory bits. Like many definitions of size or quantity in computers and electronics the usage of the term is imprecise. Different fabricators have their own, differing definitions but this is the generally accepted version.

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