

## GLOSSARY

The following definitions were adapted with permission from these sources :

1. United States of America Standards Institute, standard definitions.
2. United States of America Standards Institute, definitions proposed by Subcommittee x3.5 on Terminology and Glossary.
3. IBM Data Processing Glossary (form No. C20-1699-0).
4. *Automation: Its Anatomy and Physiology* by John Rose. Published by Oliver and Boyd, Edinburgh and London, 1967.

**ACCESS.** The process of obtaining data from or placing data in storage.<sup>4</sup>

**ACCESS TIME.** Time required to read out or write in data from a data storage system.<sup>4</sup>

**ADDRESS.** A label, name or number identifying the location where data are stored.<sup>4</sup>

**ALGOL.** A computer language designed mainly for programming scientific applications.

**ALGORITHM.** A fixed step-by-step procedure for solving problems.<sup>4</sup>

**ANALOG.** Pertaining to representation of data by means of continuously variable physical quantities. (Contrast with 'Digital').<sup>1</sup>

**ANALOG COMPUTER.** (1) A computer in which analog representation of data is mainly used. (2) A computer that operates on analog data by performing physical processes on these data. (Contrast with 'Digital computer').<sup>2</sup>

**ANALYST.** A person who defines problems and develops algorithms and procedures for their solution.<sup>2</sup>

**APPLICATION PROGRAM.** The working programs in a system may be classed as Application Programs and Supervisory Programs. The Application Programs are the main data-processing programs for that application. The Supervisory Programs control the components of the machine and schedule their work.

**BATCH PROCESSING.** A systems approach to processing where a number of similar input items are grouped for processing during the same machine run.<sup>3</sup>

**BINARY.** A system in which combinations of only two digits repre-

sent any number or quantity of units, i.e. a number representation system with a base of two.<sup>4</sup>

Decimal code	Binary code
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
10	1010

**BIT.** A coined word from *binary digit*; this is one of the whole numbers, 0 or 1, in a single position, in the binary scale of notation.<sup>4</sup>

**BIT RATE.** The speed at which bits are transmitted, usually expressed in bits per second.<sup>3</sup>

**BLOCK DIAGRAM.** A diagram of a system, instrument or computer, in which the principal parts are represented by suitably associated geometrical figures to show both the basic functions and functional relationship between the parts. (Contrast with 'Flow-chart').<sup>2</sup>

**BROADBAND.** Communication channel having a bandwidth greater than a voice-grade channel, and therefore capable of higher-speed data transmission.<sup>3</sup>

**CHARACTER.** A letter, digit, punctuation mark, or other sign used in the representation of information. Each character is uniquely represented by a group of bits.

**CHARACTER SET.** An agreed set of characters from which selections are made to denote data; the total number of a set is fixed, e.g. a 48-character set may contain the 26 letters of the alphabet, 10 numerals and 12 special characters.<sup>4</sup>

**COBOL.** A computer language designed mainly for programming commercial applications.

**CONSOLE.** That part of a computer used for communication between the operator or maintenance engineer and the computer.<sup>1</sup>

**CORE STORAGE.** The main or internal memory of a computer; it is usually expressed in terms of k (1,000), e.g. a 10k machine has 10,000 characters of core storage.<sup>4</sup>

**CYBERNETICS.** The study of control and communication in man and the machine (Wiener).

**DATA BANK.** A comprehensive collection of libraries of data. For example, one line of an invoice may form an item, a complete invoice may form a record, a complete set of such records may form a file, the collection of inventory control files may form a library, and the libraries used by an organization are known as its data bank. (Synonymous with 'Data base'.)<sup>2</sup>

**DATA BASE.** (See 'Data bank'.)<sup>2</sup>

**DATA PROCESSING.** The execution of a systematic sequence of operations performed upon data. (Synonymous with 'Information processing'.)<sup>2</sup>

**DATA STORAGE.** A device which accepts and retains units of information and which will produce them, unaltered, on command.

**DEBUG.** To remove all malfunctions or mistakes from a device, or, more usually, from a program.<sup>4</sup>

**DIGITAL COMPUTER.** (1) A computer in which discrete representation of data is mainly used. (2) A computer that operates on discrete data by performing arithmetic and logic processes on these data. (Contrast with 'analog computer'.)<sup>2</sup>

**DIGITAL DATA.** Data represented in discrete, discontinuous form, as contrasted with analog data represented in continuous form. Digital data is usually represented by means of coded characters, for example, numbers, signs, symbols, etc.<sup>2</sup>

**DIGITIZE.** To render a continuous or analog representation of a variable into a discrete or digital form.<sup>4</sup>

**DISK STORAGE.** A storage device that uses magnetic recording on flat rotating discs.<sup>3</sup>

**DISPLAY UNIT.** A device that provides a visual representation of data.<sup>3</sup>

**DUPLEXING.** The use of duplicate computers, files or circuitry, so that in the event of one component failing an alternative one can enable the system to carry on its work.

**ERROR-CORRECTING CODE.** A code in which each acceptable expression conforms to specific rules of construction that also define one or more equivalent non-acceptable expressions, so that if certain errors occur in an acceptable expression, the result will be one of its equivalents, and thus the error can be corrected.<sup>1</sup>

**ERROR-DETECTING CODE.** A code in which each expression conforms to specific rules of construction, so that if certain errors occur in an expression, the resulting expression will not conform

to the rules of construction, and thus the presence of the errors is detected. (Synonymous with 'Self-checking code'.)<sup>1</sup>

**FACSIMILE (FAX).** A system for the transmission of images. The image is scanned at the transmitter, reconstructed at the receiving station, and duplicated on some form of paper.<sup>3</sup>

**FAIL SOFTLY.** When a piece of equipment fails, the programs let the system fall back to a degraded mode of operation rather than let it fail catastrophically and give no response to its users.

**FALLBACK PROCEDURES.** When the equipment develops a fault the programs operate in such a way as to circumvent this fault. This may or may not give a degraded service. Procedures necessary for fallback may include those to switch over to an alternative computer or file, to change file addresses, to send output to a typewriter instead of a printer, and so on.

**FEEDBACK.** A means of automatic control in which the actual state of a process is measured and used to obtain a quantity that modifies the input in order to initiate the activity of the control system.<sup>4</sup>

**FILE.** A collection of related records treated as a unit. For example, one line of an invoice may form an item, a complete invoice may form a record, a complete set of such records may form a file, the collection of inventory control files may form a library, and the libraries used by an organization are known as its data bank.<sup>2</sup>

**FILE ADDRESSING.** A data or a file record have a key which uniquely identifies those data. Given this key, the programs must locate the address of a file record associated with these data. There is a variety of techniques for converting such a key into a machine file address.

**FILE PACKING DENSITY.** A ratio of amount of space (in words or characters) on a file, available for storing data to the total amount of data that are stored in the file.

**FILE RECONSTRUCTION PROCEDURES.** There is a remote possibility that vital data on the files will be accidentally destroyed by an equipment failure, or a program or operator error. The means of reconstructing the file must be devised should such an unfortunate circumstance occur. Vital data must be dumped onto tape or some other media, and programs must be written so that the file may be reconstructed from these data if necessary.

**FORTRAN.** A computer language designed mainly for programming scientific applications.

**HARDWARE.** The electrical, electronic, magnetic and mechanical devices or components of a computer.<sup>4</sup>



**HEURISTIC.** Trial-and-error method of tackling a problem, as opposed to the algorithmic approach.<sup>4</sup>

**INFORMATION RETRIEVAL.** A branch of computer sciences relating to the techniques for storing and searching large or specific quantities of information.<sup>4</sup>

**INFORMATION SYSTEM.** The network of all communication methods within an organization.<sup>4</sup>

**INFORMATION THEORY.** The mathematical theory concerned with channels, rates of transfer, noise, etc., relating to information.<sup>4</sup>

**INPUT.** Information which a control system's elements receive from outside.<sup>4</sup>

**INSTABILITY.** A condition of a feedback control system in which large sustained oscillations of the controlled variable occur, so that the latter is no longer controlled by input instructions.<sup>4</sup>

**INSTRUCTION.** A coded program step that tells the computer what to do for a single operation in a program.<sup>4</sup>

**INTELLIGENCE.** The developed capability of a device to perform functions that are normally associated with human intelligence, such as learning or reasoning.<sup>4</sup>

**INTELLIGENCE (ARTIFICIAL).** The study of computer and related techniques to supplement the intellectual capabilities of man.<sup>4</sup>

**INTERFACE.** The point of contact between different systems or parts of the same system; it may involve codes, speeds, sizes and formats.<sup>4</sup>

**MACHINE LANGUAGE.** Information recorded in a form directly understood by the computer.<sup>4</sup>

**MAGNETIC CORE.** A data storage device based on the use of a highly magnetic, low-loss material, capable of assuming two or more discrete states of magnetization.<sup>4</sup>

**MAGNETIC DRUM.** A data storage device using magnetized spots on a magnetic rotating drum; permits quasi-random medium-speed access to any part of its surface.<sup>4</sup>

**MAGNETIC INK CHARACTER RECOGNITION.** (See 'MICR'.)

**MAGNETIC TAPE.** A device for storing digital or analog data in the form of magnetized areas on a tape of plastic coated with magnetic iron oxide.<sup>4</sup>

**MASTER AND SLAVE COMPUTERS.** Where two or more computers are working jointly, one of these is sometimes a master computer and the others are slaves. The master can interrupt the slaves and send data to them when it needs to. When data pass from the slaves to the master it will be at the master's request.

**MEAN TIME TO FAILURE.** The average length of time for which the system, or a component of the system, works without fault.

**MEAN TIME TO REPAIR.** When the system, or a component of the system, develops a fault, this is the average time taken to correct the fault.

**MEMORY PROTECTION.** This is a hardware device which prevents a program from entering areas of memory that are beyond certain boundaries. It is useful in a multi-programmed system. Different programs in that system will be confined within different boundaries, and thus cannot do damage to each other.

**MICR.** Magnetic ink character recognition. The machine recognition of characters printed with magnetic ink. (Contrast with 'OCR').<sup>1</sup>

**MICROSECOND.** One-millionth of a second ( $\mu$ s).<sup>4</sup>

**MILLISECOND.** One-thousandth of a second (ms).<sup>4</sup>

**MODULAR.** The ability to increase a system in small steps (modules).<sup>4</sup>

**NANOSECOND.** One thousand-millionth of a second (ns).<sup>4</sup>

**NUMERICAL CONTROL.** A means of controlling machine tools through servo-mechanisms and control circuitry, so that the motions of the tool will respond to digital coded instructions on tape.<sup>4</sup>

**OCR.** Optical character recognition. Machine identification of printed characters through use of light-sensitive devices. (Contrast with 'MICR'.)

**ON LINE.** An on-line system may be defined as one in which the input data enter the computer directly from their point of origin and/or output data are transmitted directly to where they are used. The intermediate stages such as punching data into cards or paper tape, writing magnetic tape, or off-line printing, are largely avoided.

**OUTPUT.** Information which a control system transmits as a result of its input.<sup>4</sup>

**PARALLEL.** Simultaneous processing of the individual parts of a whole, such as bits on characters.<sup>4</sup>

**PARAMETER.** A variable corresponding to a given condition; an arbitrary constant as distinguished from a fixed constant.<sup>4</sup>

**PERIPHERAL EQUIPMENT.** Ancillary devices under the control of the central processor, e.g., magnetic tape units, printers or card readers.<sup>4</sup>

**PL/I.** A computer language designed for programming both scientific and commercial applications.

**PROCESS CONTROL.** Pertaining to systems whose purpose is to provide automation of continuous operations. This is contrasted with numerical control, which provides automation of discrete operations.<sup>3</sup>

**PROCESSOR.** (1) In hardware, a data processor. (2) In software, a computer program that includes the compiling, assembling, translating, and related functions for a specific programming language, for example, COBOL processor, FORTRAN processor.<sup>1</sup>

**PROGRAM.** A set of coded instructions to direct a computer to perform a desired operation or solve a predefined problem.<sup>4</sup>

**PROGRAM TAPE.** A magnetic or punched paper tape which contains the sequence of instructions required for solving a problem on a digital computer and coded in language which may be read by the computer.<sup>4</sup>

**PUNCH CARD.** Thin cards on which digits are represented by holes in selected locations for storing data.<sup>4</sup>

**PUNCHED TAPE.** A paper or plastic tape in which holes are punched to serve as a digital storage device.<sup>4</sup>

**PUNCHED CARD.** (1) A card punched with a pattern of holes to represent data. (2) A card as in (1) before being punched.<sup>1</sup>

**RANDOM ACCESS.** Access to data storage in which the position from which information is to be obtained is not dependent on the location of the previous information, e.g. as on magnetic drums, disks, or cores.<sup>4</sup>

**RANDOM-ACCESS FILES.** These are storage media holding a large amount of information in such a way that any item may be read or written at random with a short access time, i.e., usually less than one second. Example of random-access files are disk storages, drums, and magnetic strip files.

**REAL TIME.** A real-time computer system may be defined as one that controls an environment by receiving data, processing them and returning the results sufficiently quickly to affect the functioning of the environment at that time.

**REASONABLENESS CHECKS.** Tests made on information reaching a system or being outputted from it to ensure that the data in question lie within a given reasonable range.

**RESPONSE TIME.** This is the time the system takes to react to a given input. If a message is keyed into a terminal by an operator and the reply from the computer, when it comes, is typed at the same terminal, response times may be defined as the time interval between the operator pressing the last key and the terminal typing the first letter of the reply. For different types of terminal, response

time may be defined similarly. It is the interval between an event and the system's response to the event.

**SEEK.** A mechanical movement involved in locating a record in a random-access file. This may, for example, be the movement of an arm and head mechanism that is necessary before a read instruction can be given to read data in a certain location on the file.

**SELF-CHECKING NUMBERS.** Numbers which contain redundant information so that an error in them, caused, for example, by noise on a transmission line, may be detected. A number may, for example, contain two additional digits which are produced from the other digits in the number by means of an arithmetical process. If these two digits are not correct it will indicate that the number has in some way been garbled. The two additional digits may be checked by the computer as a safeguard against this.

**SERIAL ACCESS.** (1) Pertaining to the sequential or consecutive transmission of data to or from storage. (2) Pertaining to the process of obtaining data from, or placing data into, storage where the time required for such access is dependent upon the location of the data most recently obtained or placed in storage. (Contrast with 'Random access'.)<sup>2</sup>

**SYSTEM.** An assembly of components united by some form of regulated interaction to form an organized whole. Also a collation of operations and procedures, men and machines by which an industrial or business activity is carried on. In the realm of computers a system is defined as an organization of hardware, software and people for cooperative operation to complete a set of tasks for desired purposes.<sup>4</sup>

**SYSTEMS ANALYSIS.** The organized step-by-step study of the detailed procedure for collection, manipulation and evaluation of data about an organization, for the purpose of determining what must be accomplished and the best method of accomplishing it in order to improve control of a system.

**SOFTWARE.** General-purpose programs used to extend the capabilities of computers, including compilers, assemblers, monitors, executive routines, etc.<sup>4</sup>

**SUPERVISORY PROGRAMS.** Those computer programs designed to coordinate service and augment the machine components of the system, and coordinate and service Application Programs. They handle work scheduling, input/output operations, error actions, and other functions.

**TELEPROCESSING.** A form of information handling in which a data processing system utilizes telecommunication facilities.

**TERMINALS.** The means by which data are entered into the system and by which the decisions of the system are communicated to the environment it affects. A wide variety of terminal devices have been built, including teleprinters, special keyboards, light displays, cathode tubes, thermocouples, pressure gauges and other instrumentation, radar units, telephones, and so on.

**TIME SHARING.** Participation in available computer time by multiple users, via terminals. Characteristically, the response time is such that the computer seems dedicated to each user.<sup>3</sup>

**WORD.** A set of characters or bits which is handled by the computer circuits as a unit; word lengths are fixed or variable, depending on the computer.<sup>4</sup>

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