IBM

Data Processing Glossary

The specialized language of data processing, like language in general, is constantly changing. Whether a word is coined or borrowed from our everyday vocabulary, it is subject to variation in its meaning from place to place, from year to year, and from person to person. When this happens to a significant part of the vocabulary, communication fails and confusion reigns. To avert such confusion, a comprehensive, up-to-date glossary of data processing terms is indispensable.

This edition of the IBM Data Processing Glossary is intended to fill the need for a complete collection of definitions for terms that are currently used in data processing. The glossary defines terms used in IBM publications describing computing systems, programming languages, operating systems, and devices. It also includes definitions developed by the American National Standards Institute (ANSI) and the International Organization for Standardization (ISO). Terms used in the COBOL, FORTRAN, and PL/I languages are defined in Appendixes A, B, and C. Terms that are defined in nontechnical dictionaries and have no special meaning in data processing are not included.

In the interest of clarity and consistency of style, the glossary uses the same arrangement, organization, and cross-referencing of entries as the American National Standard Vocabulary for Information Processing.

Arrangement of Entries

Entries are arranged in the same order as in Webster's Third New International Dictionary, 1966 edition, published in Springfield, Massachusetts by the G. & C. Merriam Company. The glossary uses an alphabetical collating sequence; special characters and spaces between words are ignored.

Organization of Entries

The entry for each term consists of a single- or multiple-word term and a commentary. A commentary includes one or more items (definitions or references), organized as follows:

1. An *item number*, if the commentary contains two or more items.

2. A *usage label*, indicating the area of application of the term; for example, "In programming,..." or "Under the Disk Operating System,..."

3. A *descriptive phrase*, stating the basic meaning of the term; it is assumed to be preceded by the phrase, "(the term) is defined as...". The part of speech being defined is indicated by the opening

words of the descriptive phrase: "to..." indicates a verb, "pertaining to..." indicates a modifier, and any other wording indicates a noun.

4. *Annotative sentences*, providing additional or explanatory information.

5. The *abbreviation*, if applicable.

6. *References*, directing the reader to other entries or items in the glossary. Terms shown in italics are defined elsewhere in the glossary.

References

The following reference symbols are used in this glossary:

Contrast with. This refers to an opposed or substantively different term.

Same as. This deprecates the term and refers to the preferred term, which is defined.

See. This refers to multiple-word terms that have the same last word.

See also. This refers to related terms that have a similar, but not synonymous, meaning.

Synonymous with. This reference lists terms that have the same meaning and have been deprecated with "Same as..." references to the defined term.

IBM is grateful to the American National Standards Institute (ANSI) for permission to reprint its definitions from the American National Standard Vocabulary for Information Processing (Copyright © 1970 by American National Standards Institute, Incorporated), which was prepared by Subcommittee X3K5 on Terminology and Glossary of American National Standards Committee X3.

ANSI definitions are preceded by an asterisk. An asterisk to the left of the term indicates that the entire entry is reprinted from the American National Standard Vocabulary for Information Processing; where definitions from other sources are included in the entry, ANSI definitions are identified by an asterisk to the left of the item number. The symbol "(SC1)" at the beginning of a definition indicates that it has been discussed and agreed upon at meetings of the International Organization for Standardization Technical Committee 97/Subcommittee 1, and has also been approved by ANSI and included in the American National Standard Vocabulary for Information Processing.

A

ABEND. Abnormal end of task.

abnormal end of task. Termination of a task prior to its completion because of an error condition that cannot be resolved by recovery facilities while the task is executing. Abbreviated ABEND.

* **absolute address.** (1) An address that is permanently assigned by the machine designer to a storage location. (2) A pattern of characters that identifies a unique storage location without further modification. (3) Synonymous with machine address, specific address.

* **absolute coding.** Coding that uses machine instructions with absolute addresses. Synonymous with specific coding.

absolute data. In a program for a CRT display device, values that specify the actual coordinates on a screen. Contrast with *relative data*.

* **absolute error.** (1) The amount of error expressed in the same units as the quantity containing the error. (2) Loosely, the absolute value of the error, that is, the magnitude of the error without regard for its algebraic sign.

absolute expression. In assembler language, an assembly-time expression whose value is not affected by program relocation. An absolute expression can represent an absolute address.

absolute order. In a program for a CRT display device, a display order that causes the device to interpret the data bytes following the order as actual coordinates, rather than as incremental data. Contrast with *relative order*.

absolute term. A term whose value is not affected by relocation.

* **abstract symbol.** In optical character recognition, a symbol whose form does not suggest its meaning and use. These should be defined for each specific set of applications.

acceleration time. The elapsed time between the interpretation of a read or write instruction and the beginning of a transfer of data between an auxiliary storage device and main storage; for example, the time required for a tape drive to reach the speed at which data can be read or written.

accepting. The process by which a terminal obtains a message transmitted to it from the computer. Contrast with *entering*. See also *receiving, sending*.

accepting station. A destination station that accepts a message.

access. (1) The manner in which files or data sets are referred to by the computer. (2) * See *direct access, immediate access store, random access, remote access, serial access*.

* **access arm.** A part of a disk storage unit that is used to hold one or more reading and writing heads.

access line. A line that continuously connects a remote station to a switching center (exchange). A telephone number is associated with the access line.

access mechanism. A group of access arms that move together as a unit.

access method. A technique for moving data between main storage and input/output devices. See also *access method routines, basic access method, basic direct access method, basic indexed sequential access method, basic partitioned access method, basic sequential access method, basic telecommunications access method, queued indexed sequential access method, queued sequential also access method, queued telecommunications access method, telecommunications access method*.

access method routines. Routines that move data between main storage and input/output devices.

access time. (1) * The time interval between the instant at which data are called for from a storage device and the instant delivery begins. (2) * The time interval between the instant at which data are requested to be stored and the instant at which storage is started. (3) See also *seek time*.

* **accounting machine.** (1) A keyboard-actuated machine that prepares accounting records. (2) A machine that reads data from external storage media, such as cards or tapes, and automatically produces accounting records or tabulations, usually on continuous forms.

* **accumulator.** A register in which the result of an arithmetic or logic operation is formed.

* **accuracy.** The degree of freedom from error, that is, the degree of conformity to truth or to a rule. Accuracy is contrasted with precision; for example, four-place numerals are less precise than six-place numerals; nevertheless, a properly computed four-place numeral might be more accurate than an improperly computed six-place numeral.

* accuracy control character. A control character used to indicate whether the data with which it is associated are in error, or are to be disregarded, or cannot be represented on a particular device. Synonymous with error control character.

AC/DC ringing. A method of telephone ringing that uses alternating current to operate a ringer and direct current to actuate a relay which stops the ringing when the called party answers.

* ACK. The *acknowledge character*.

acknowledgement. The transmission by a receiver of acknowledge characters as an affirmative response to a sender.

* acknowledge character. A communication control character transmitted by a receiver as an affirmative response to a sender. An acknowledge character may also be used as an accuracy control character. Abbreviated ACK.

* acoustic delay line. A delay line whose operation is based on the time of propagation of sound waves in a given medium. Synonymous with sonic delay line.

* acoustic memory. Same as *acoustic storage*.

* acoustic storage. A storage device consisting of acoustic delay lines. Synonymous with acoustic memory.

active line. A line that is currently available for transmission of data.

active page. In OS/VS and VM/370, a page in real storage that can be addressed.

active page queue. In OS/VS, a queue of pages in real storage that are currently assigned to tasks. Pages on this queue are eligible for placement on the available page queue. See also *available page queue, hold page queue*.

active program. Any program that is loaded and ready to be executed.

active station. A station that is currently eligible for entering or accepting messages.

activity. The percentage of records in a file that are processed in a run. See also *volatility*.

activity loading. A method of storing records on a file in which the most frequently processed records can be located with the least number of reads.

activity ratio. The ratio of the number of records in a file that are in use to the total number of records in that file.

actual address. Same as *absolute address*.

ACU. *Automatic calling unit*.

adapter. See *channel-to-channel adapter, line adapter*.

* adapting. See *self-adapting*.

ADC. See *analog-to-digital converter*.

* add. See *boolean add, false add, logical add*.

* adder. (1) A device whose output is a representation of the sum of the quantities represented by its inputs. (2) See *half-adder*.

* adder-subtractor. A device whose output is a representation of either the arithmetic sum or difference, or both, of the quantities represented by its inputs.

address. (1) * An identification, as represented by a name, label, or number, for a register, location in storage, or any other data source or destination such as the location of a station in a communication network. (2) * Loosely, any part of an instruction that specifies the location of an operand for the instruction. (3) * See *absolute address, base address, direct address, effective address, four-address, four-plus-one address, immediate address, indexed address, indirect address, instruction address, multiaddress, n-level address, one-address, one-plus-one address, relative address, single-address, specific address, symbolic address, three-address, three-plus-one address, two-address, two-plus-one address*. (4) Contrast with *location*.

address constant. A value, or an expression representing a value, used in the calculation of storage addresses.

addressee. The intended recipient of a message.

* address format. (1) The arrangement of the address parts of an instruction. The expression "plus-one" is frequently used to indicate that one of the addresses specifies the location of the next instruction to be executed, such as one-plus-one, two-plus-one, three-plus-one, four-plus-one. (2) The arrangement of the parts of a single address, such as those required for identifying channel, module, track, etc., in a disk system.

addressing. (1) The assignment of addresses to the instructions of a program. (2) In communications, the means whereby the originator or control station selects the unit to which it is going to send a message.

addressing characters. Identifying characters sent by the computer over a line that cause a particular station (or component) to accept a message sent by the computer.

address modification. The process of changing the address part of a machine instruction.

* address part. A part of an instruction word that specifies the address of an operand, instruction, or result. Contrast with *instruction address*.

address reference. Same as *address (2)*.

* address register. A register in which an address is stored.

address space. The complete range of addresses that is available to a programmer. See also *virtual address space*.

address stop. A capability to specify at the system console an address which when encountered causes a halt in processing.

address translation. (1) The process of changing the address of an item of data or an instruction to the address in main storage at which it is to be loaded or relocated. (2) In virtual storage systems, the process of changing the address of an item of data or an instruction from its virtual storage address to its real storage address. See also *dynamic address translation*.

add time. The time required for one addition, not including the time required to get and return the quantities from storage.

* adjacency. In character recognition, a condition in which the character spacing reference lines of two consecutively printed characters printed on the same line are separated by less than a specified distance.

* administrative data processing. Same as *business data processing*.

Administrative Terminal System. A system in which terminals are connected by two-way communication lines to a computer under control of a program that allows a typist to type text into the computer, correct and revise text, and have the computer type out the corrected draft. Abbreviated ATS.

* ADP. *Automatic data processing*.

ADU. *Automatic dialing unit*.

aerial cable. A communications cable connected to poles or similar overhead structures.

aggregate. In communications, a transmitted carrier signal that consists of the 12 single sidebands being sent over the transmission circuit.

airline reservation system. An online application in which a computing system is used to keep track of seat inventories, flight schedules, and other information required to run an airline. The reservation system is designed to maintain up-to-date data files and to respond, within seconds or less, to inquiries from ticket agents at locations remote from the computing system.

* ALGOL. ALGOrithmic Language. A language primarily used to express computer programs by algorithms.

* algorithm. (SC1) A prescribed set of well-defined rules or processes for the solution of a problem in a finite number of steps, for example, a full statement of an arithmetic procedure for evaluating sin x to a stated precision. Contrast with *heuristic*.

* algorithmic language. A language designed for expressing algorithms.

alias. (1) * An alternate label. For example, a label and one or more aliases may be used to refer to the same data element or point in a computer program. (2) An alternate name for a member of a partitioned data set. (3) In pulse code modulation telecommunication links, a spurious signal resulting from beats between the signal frequencies and the sampling frequency.

alignment. See *boundary alignment*.

allocate. To assign a resource for use in performing a specific task.

* allocation. See *storage allocation, dynamic storage allocation*.

allocation of data sets. The process of assigning auxiliary storage space to a data set. See also *dynamic data set definition*.

* alphabet. (1) An ordered set of all the letters and associated marks used in a language. (2) An ordered set of symbols used in a language, for example, the Morse code alphabet, the 128 characters of the ASCII alphabet.

alphabetic character. A letter or other symbol, excuding digits, used in a language.

* **alphabetic code.** (SC1) A code whose code set consists only of letters and associated special characters.

alphabetic shift. A control for selecting the alphabetic character set in an alphameric keyboard printer.

* **alphabetic string.** A character string consisting solely of letters from the same alphabet.

* **alphabetic word.** (1) A word consisting solely of letters. (2) A word consisting of characters from the same alphabet.

* **alphameric.** Same as *alphanumeric*.

alphameric characters. In programming, usually the characters A through Z, digits 0 through 9, and #, $, and @.

* **alphanumeric.** Pertaining to a character set that contains letters, digits, and usually other characters, such as punctuation marks. Synonymous with alphameric.

* **alphanumeric character set.** A character set that contains letters, digits, and usually, other characters.

* **alphanumeric code.** (SC1) A code whose code set consists of letters, digits, and associated special characters.

alteration switch. A manual switch on the computer console or a program-simulated switch that can be set on or off to control coded machine instructions.

alternate path retry. A facility that allows an I/O operation that has developed an error to be retried on another channel assigned to the device performing the I/O operation. It also provides the capability to establish other paths to an online or offline device. Abbreviated APR.

alternate routing. A secondary or backup communications path; used if normal routing is not possible.

alternate track. On a direct access device, a track designated to contain data in place of a defective primary track.

ALU. Arithmetic and logic unit. See *arithmetic unit*.

AM. *Amplitude modulation.*

ambient noise. Acoustic noise existing in a room or other location.

American National Standard control characters. Control characters defined by American National Standard FORTRAN, ANSI X3.9-1966. Synonymous with ASCII control character, FORTRAN control character.

American National Standard labels. Magnetic tape labels that conform to the conventions established by the American National Standards Institute. Synonymous with ASCII label. Abbreviated ANL.

American National Standards Institute. An organization sponsored by the Business Equipment Manufacturers Association (BEMA) for the purpose of establishing voluntary industry standards. Abbreviated ANSI.

amplifier. A device that, by enabling a received wave to control a local source of power, is capable of delivering an enlarged reproduction of the essential characteristics of the wave. See also *repeater*.

amplitude. The size or magnitude of a voltage or current waveform.

amplitude modulation. Variation of a carrier signal's strength (amplitude), as a function of an information signal. Abbreviated AM.

* **analog.** (1) (SC1) Pertaining to representation by means of continuously variable physical quantities. (2) Contrast with *digital*. (3) See *network analog*.

analog channel. A channel on which the information transmitted can take any value between the limits defined by the channel. Voice-grade channels are analog channels.

* **analog computer.** (1) (SC1) 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*.

analog data. Data represented in a continuous form, as contrasted with digital data represented in a discrete (discontinuous) form. Analog data are usually represented by means of physical variables, such as voltage, resistance, and rotation.

analog-to-digital converter. An electromechanical device that senses an electrical signal and converts it to a proportional representation in digital form. Abbreviated ADC.

* **analyst.** (SC1) A person who defines problems and develops algorithms and procedures for their solution.

* **analyzer.** See *differential analyzer, digital differential analyzer, network analyzer.*

  ancillary equipment. Same as *auxiliary equipment.*

* **AND.** A logic operator having the property that if P is a statement, Q is a statement, R is a statement,..., then the AND of P, Q, R,... is true if all statements are true, false if any statement is false. P AND Q is often represented by P•Q, PQ, P∧Q. Synonymous with logical multiply.

* **AND gate.** A gate that implements the logic "AND" operator.

  annunciator. A visual or audible signaling device, operated by relays, that indicates conditions of associated circuits.

  ANSI. *American National Standards Institute.*

  answerback. The response of a terminal to remote control signals. See also *handshaking.*

  answering. A procedure by which a called party completes a connection (for switched lines).

  answer lamp. A telephone switchboard lamp that lights when a connecting plug is inserted into a calling jack, goes out when the called telephone answers, and lights when the call is completed.

  APAR. Authorized program analysis report. A request for correction of a problem caused by a defect in a current unaltered release of a program. A PTF or corrected code is issued to the customer and the correction is incorporated into subsequent releases of the program.

* **aperture.** (1) An opening in a data medium or device such as a card or magnetic core; for example, the aperture in an aperture card combining a microfilm with a punched card, or a multiple aperture core. (2) A part of a mask that permits retention of the corresponding portions of data. (3) See *multiple aperture core.*

  APL. A programming language. A problem solving language designed for use at remote terminals; it offers special capabilities for handling arrays and for performing mathematical functions.

  appendage. See *I/O appendage.*

  application program. A program written for or by a user that applies to his own work.

  APR. *Alternate path retry.*

* **arbitrary sequence computer.** (SC1). A computer in which each instruction determines explicitly the location of the next instruction to be executed.

* **area.** See *clear area, input area, output area.*

  area code. A three-digit number identifying one of 152 geographic areas of the USA and Canada to permit direct distance dialing on the telephone system. See also *direct distance dialing, numbering plan.*

  area exchange. An area set up for administrative reasons for telephone service covered on a single rate basis, usually a single city or large division, town, or village. See also *operating area.*

* **argument.** An independent variable, for example, in looking up a quantity in a table, the number, or any of the numbers, that identifies the location of the desired value.

  arithmetic and logic unit. See *arithmetic unit.*

* **arithmetic check.** Same as *mathematical check.*

  arithmetic expression. A conditional assembly expression that is a combination of arithmetic terms, arithmetic operators, and paired parentheses.

  arithmetic operation. Any of the fundamental operations of arithmetic, for example, the binary operations of addition, subtraction, multiplication, and division, and the monadic operations of negation and absolute value.

  arithmetic operator. (1) In assembler programming, an operator that can be used in an absolute or relocatable expression, or in an arithmetic expression to indicate the actions to be performed on the terms in the expression. The arithmetic operators allowed are: +, -, *, /. (2) See *binary operator, unary operator.*

  arithmetic relation. Two arithmetic expressions separated by a relational operator.

* **arithmetic shift.** (1) A shift that does not affect the sign position. (2) A shift that is equivalent to the multiplication of a number by a positive or negative integral power of the radix.

  arithmetic term. A term that can be used only in an arithmetic expression.

* **arithmetic unit.** The unit of a computing system that contains the circuits that perform arithmetic operations.

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* **arm.** See *access arm.*

ARQ. *Automatic request for repetition.*

array. (1) * An arrangement of elements in one or more dimensions. (2) In assembler programming, a series of one or more values represented by a SET symbol.

* **artificial intelligence.** The capability of a device to perform functions that are normally associated with human intelligence, such as reasoning, learning, and self-improvement. Related to *machine learning.*

* **artificial language.** A language based on a set of prescribed rules that are established prior to its usage. Contrast with *natural language.*

ASA. American Standards Association; a former name of the American National Standards Institute.

ASA control characters. See *American National Standard control characters.*

ASA label. See *American National Standard label.*

* **ASCII (American National Standard Code for Information Interchange, X3.4-1968).** The standard code, using a coded character set consisting of 7-bit coded characters (8 bits including parity check), used for information interchange among data processing systems, communications systems, and associated equipment. The ASCII set consists of control characters and graphic characters. Synonymous with USASCII.

ASCII control characters. Same as *American National Standard control characters.*

ASCII label. Same as *American National Standard label.*

ASP. Asymmetric multiprocessing system. An extention to the IBM System/360 Operating System that provides increased automation of computer operations for large scale data processing installations.

ASR. *Automatic send/receive.*

* **assemble.** To prepare a machine language program from a symbolic language program by substituting absolute operation codes for symbolic operation codes and absolute or relocatable addresses for symbolic addresses.

* **assembler.** A computer program that assembles.

assembler language. A source language that includes symbolic machine language statements in which there is a one-to-one correspondence with the instruction formats and data formats of the computer.

assembly. The output of an assembler.

assembly time. The time at which an assembler translates the symbolic machine language statements into their object code form (machine instructions). See also *pre-assembly time.*

* **associative storage.** A storage device in which storage locations are identified by their contents, not by names or positions. Synonymous with content-addressed storage. Contrast with *parallel search storage.*

"A" switchboard. A manual telephone switchboard in a local central office, used primarily to receive subscribers' calls and to complete connections either directly or through some other switching equipment.

asynchronous. Without regular time relationship; unexpected or unpredictable with respect to the execution of a program's instructions.

* **asynchronous computer.** (SC1) A computer in which each event or the performance of each operation starts as a result of a signal generated by the completion of the previous event or operation, or by the availability of the parts of the computer required by the next event or operation. Contrast with *synchronous computer.*

asynchronous transmission. Transmission in which each information character is individually synchronized (usually by the use of start elements and stop elements).

ATS. *Administrative Terminal System.*

attach. (1) To create a task and present it to the supervisor. (2) A macro instruction that causes the control program to create a new task and indicates the entry point in the program to be given control when the new task becomes active.

attended operation. A communications data set application in which individuals are required at both stations to establish the connection and transfer the data sets from talk (voice) mode to data mode. Contrast with *unattended operation.*

attention interruption. An interruption of instruction execution caused by a remote terminal user hitting the attention key. See also *simulated attention.*

attention key. A function key on terminals that causes an interruption of execution by the central processing unit.

attenuation. A decrease in magnitude of current, voltage, or power of a signal in transmission between points. It may be expressed in decibels or nepers.

attenuation equalizer. Same as *equalizer*.

attenuator. Same as *pad*.

attribute. A characteristic; for example, attributes of data include record length, record format, data set name, associated device type and volume identification, use, and creation date.

A-type address constant. In the assembler language, an address constant used for branching within a module or for retrieving data. See also *V-type address constant*.

audio communication line. A line attached to an audio response unit such as the IBM 7770 Audio Response Unit. An audio communication line is always a switched line.

audio frequencies. Frequencies that can be heard by the human ear (approximately 15 hertz to 20,000 hertz).

audio response unit. An output device, such as the IBM 7770 Audio Response Unit, that provides a spoken response to digital inquiries from a telephone or other device. The response is composed from a prerecorded vocabulary of words and can be transmitted over communication lines to the location from which the inquiry originated.

audio terminal. A device associated with an audio response unit (ARU), at which keyed or dialed data is entered for transmission to the computer; an audio response is produced by the ARU.

authorized state. A condition in which a problem program has access to resources that would otherwise not be available.

auto-abstract. (1) The material abstracted from a document by machine methods. (2) To select keywords from a document by machine methods.

auto-answer. A machine feature that allows a transmission control unit or a station to automatically respond to a call that it receives over a switched line. See also *unattended operation*.

auto call. A machine feature that allows a transmission control unit or a station to automatically initiate a call over a switched line.

AUTODIN. AUTOmatic DIgital Network; the data-handling portion of the military communications system.

auto-index. To prepare an index by a machine method.

* **automated data medium.** Same as *machine-readable medium*.

* **automatic.** (SC1) Pertaining to a process or device that, under specified conditions, functions without intervention by a human operator.

automatic calling. See *auto call*.

automatic calling unit. A dialing device supplied by the communications common carrier, that permits a business machine to automatically dial calls over the communication networks. See also *automatic dialing unit*. Abbreviated ACU.

* **automatic carriage.** A control mechanism for a typewriter or other listing device that can automatically control the feeding, spacing, skipping, and ejecting of paper or preprinted forms.

automatic carrier. The unit that carries the type element on SELECTRIC ® devices.

* **automatic check.** A check performed by equipment built in specifically for checking purposes. Synonymous with built-in check, hardware check. Contrast with *programmed check*.

* **automatic coding.** The machine-assisted preparation of machine language routines.

* **automatic control engineering.** (SC1) That branch of science and technology which deals with the design and use of automatic control devices and systems.

* **automatic data processing.** (1) (SC1) Data processing largely performed by automatic means. (2) (SC1) By extension, the discipline which deals with methods and techniques related to data processing performed by automatic means. (3) Pertaining to data processing equipment such as electrical accounting machines and electronic data processing equipment. Abbreviated ADP.

automatic dialing unit. A device capable of automatically generating dialing digits. See also *automatic calling unit*. Abbreviated ADU.

automatic library call. The process whereby control sections are processed by the linkage editor or loader to resolve references to members of partitioned data sets.

automatic message-switching center. A location at which messages are automatically routed according to information in them.

automatic polling. See *auto poll*.

automatic priority group. In OS/VS2, a group of tasks at a single priority level that are dispatched according to a special algorithm that attempts to provide optimum use of CPU and I/O resources by these tasks. See also *dynamic dispatching*.

* **automatic programming.** The process of using a computer to perform some stages of the work involved in preparing a computer program.

automatic request for repetition. A system employing an error-detecting code and so arranged that a signal detected as being in error automatically initiates a request for retransmission. Abbreviated ARQ.

automatic restart. A restart that takes place during the current run, that is, without resubmitting the job. An automatic restart can occur within a job step or at the beginning of a job step. Contrast with *deferred restart*.

automatic send/receive. A teletypewriter unit with keyboard, printer, paper tape, reader/transmitter, and paper tape punch. This combination of units may be used online or offline and, in some cases, online and offline concurrently. Abbreviated ASR.

automatic skip. On an IBM 3270 Display Station, a feature that, after entry of a character into the last character position of an unprotected display field, repositions the cursor to the first character position of the next unprotected display field.

automatic upshift. On an IBM 3270 Display Station, a feature that actuates the SHIFT or NUMERIC key on the keyboard when the cursor enters a display field that can contain only numeric characters.

automatic volume recognition. A feature that allows the operator to mount labeled volumes on available I/O devices before the volumes are needed by a job step. Abbreviated AVR.

automatic volume switching. A facility that provides access to a sequential data set that extends across two or more volumes, and to concatenated data sets stored on different volumes.

* **automation.** (1) (SC1) The implementation of processes by automatic means. (2) The theory, art, or technique of making a process more automatic. (3) The investigation, design, development, and application of methods of rendering processes automatic, self-moving, or self-controlling. (4) (SC1) The conversion of a procedure, a process, or equipment to automatic operation.

auto poll. A machine feature of a transmission control unit that permits it to handle negative responses to polling without interrupting the central processing unit.

auxiliary equipment. Equipment not under direct control of the central processing unit. Synonymous with ancillary equipment.

* **auxiliary operation.** An offline operation performed by equipment not under control of the central processing unit.

auxiliary storage. (1) Data storage other than main storage; for example, storage on magnetic tape or direct access devices. Synonymous with external storage, secondary storage. (2) * A storage that supplements another storage. Contrast with *main storage*.

availability. The degree to which a system or resource is ready when needed to process data.

available frame count. In OS/VS2 and VM/370, a count of page frames that are ready for reassignment.

available page queue. In OS/VS and VM/370, a queue of the pages whose real storage is currently available for allocation to any task. See also *active page queue, hold page queue*.

* **available time.** Time other than maintenance time. Available time consists of idle time and operating time. Operating time consists of development time, production time, and makeup time. Contrast with *maintenance time*.

available unit queue. Under TCAM, a queue in main storage to which all buffer units are assigned initially (that is, prior to assignment to TCAM lines and application programs requiring buffers).

AVR. *Automatic volume recognition.*

B

B. *Bel.*

Bi. *Input blocking factor.*

Bo. *Output blocking factor.*

babble. The aggregate crosstalk from a large number of interfering channels.

background. (1) In multiprogramming, the environment in which low-priority programs are executed. (2) Under TSO, the environment in which jobs submitted through the SUBMIT command or SYSIN are executed. One job step at a time is assigned to a region of main storage, and remains in main storage to completion. Contrast with *foreground.*

background job. (1) A low-priority job, usually a batched or noninteractive job. (2) Under TSO, a job entered through the SUBMIT command or through SYSIN. Contrast with *foreground job.*

* **background processing.** The automatic execution of lower-priority computer programs when higher-priority programs are not using the system resources. Contrast with *foreground processing.*

background program. (1) In multiprogramming, the program with the lowest priority. Background programs execute from batched or stacked job input. (2) Under TSO, a program executed in a region of main storage that is not swapped. Contrast with *foreground program.*

background reader. A system task started by the operator to process foreground-initiated background jobs.

background region. A region to which a background job is assigned.

* **backspace.** (1) To move back the reading or display position according to a prescribed format. Contrast with *space* (4).

* **backspace character.** A format effector that causes the location of the printing or display position to be moved backward one printing or display space. Abbreviated BS.

backup copy. A copy of a file or data set that is kept for reference in case the original file or data set is destroyed.

backward reference. A facility of the job control language that allows the user to copy information or refer to DD statements that appear earlier in the job.

balanced (to ground). The state of impedance on a two-wire line when the impedance to ground as measured from one wire is equal to the impedance to ground as measured from the other wire. Contrast with *unbalanced (to ground).*

balancing network. Lumped circuit elements (inductances, capacitances, and resistances) connected so as to simulate the impedance of a uniform cable or open-wire circuit over a band of frequencies.

band. (1) * A group of circular recording tracks on a storage device such as a drum or disk. (2) A range of frequency between two defined limits.

bandwidth. The difference, expressed in hertz, between the two limiting frequencies of a band.

bank. (1) An aggregation of similar devices (transformers, lamps, etc.) connected to each other and used in cooperation. In automatic switching, a bank is an assemblage of fixed contacts used to establish electrical connections. (2) * See *data bank.*

* **base.** (1) A reference value. (2) A number that is multiplied by itself as many times as indicated by an exponent. (3) Same as *radix.* (4) See *floating-point base.*

* **base address.** A given address from which an absolute address is derived by combination with a relative address.

baseband. In the process of modulation, the frequency band occupied by the aggregate of the transmitted signals when first used to modulate a carrier.

base group. A number of carrier channels forming a channel bank which will be further modulated to a final frequency band.

base register. A register that contains the base address.

BASIC. An algebra-like language used for problem solving by engineers, scientists and others who may not be professional programmers.

basic access method. Any access method in which each input/output statement causes a corresponding machine input/output operation to occur. Contrast with *queued access method.*

basic control (BC) mode. A mode in which the features of a System/360 computing system and additional System/370 features, such as new machine instructions, are operational on a

System/370 computing system. See also *extended control (EC) mode.*

basic direct access method. An access method used to directly retrieve or update particular blocks of a data set on a direct access device. Abbreviated BDAM.

basic indexed sequential access method. An access method used in one form to directly retrieve or update particular blocks of a data set on a direct access device, using an index to locate the data set. The index is stored in direct access storage along with the data set. Other forms of this method can be used to store or retrieve, in a continuous sequence, blocks of the same data set. Abbreviated BISAM.

Basic Operating System/360. A disk resident system designed to provide operating system capabilities for 8K and larger System/360 configurations. Abbreviated BOS/360.

basic partitioned access method. An access method that can be applied to create program libraries, in direct access storage, for convenient storage and retrieval of programs. Abbreviated BPAM.

basic sequential access method. An access method for storing or retrieving data blocks in a continuous sequence, using either a sequential access or a direct access device. Abbreviated BSAM.

basic telecommunications access method. An access method that permits read/write communications with remote devices. Abbreviated BTAM.

batch processing. (1) * Pertaining to the technique of executing a set of computer programs such that each is completed before the next program of the set is started. (2) * Pertaining to the sequential input of computer programs or data. (3) * Loosely, the execution of computer programs serially. (4) Under TSO, the processing of one job step in a region, so called because jobs are submitted in a group or batch. (5) See also *stacked job processing.*

batched job. (1) A job that is grouped with other jobs as input to a computing system. (2) A job whose job control statements are grouped with job control statements of other jobs as input to a computing system. Synonymous with stacked job.

battery. In communications, a source of direct current, or the current itself. The source is not necessarily a storage device.

* **baud.** A unit of signaling speed equal to the number of discrete conditions or signal events per second. For example, one baud equals one-half dot cycle

per second in Morse code, one bit per second in a train of binary signals, and one 3-bit value per second in a train of signals each of which can assume one of eight different states.

baudot code. A code for the transmission of data in which five equal-length bits represent one character. This code is used in some teletypewriter machines where one start element and one stop element are added. Depending on the system, the stop element may be 1, 1.42, or 2 unit intervals in duration.

BC mode. *Basic control mode.*

BCC. *Block check character.*

* **BCD.** *Binary coded decimal notation.*

BDAM. *Basic direct access method.*

beam deflection. On a CRT display device, the process of changing the orientation of the electron beam.

* **beginning-of-tape marker.** A marker on a magnetic tape used to indicate the beginning of the permissible recording area, for example, a photo-reflective strip, a transparent section of tape.

* **BEL.** The *bell character.*

bel. 10 decibels. Abbreviated B.

* **bell character.** A communication control character intended for use when there is a need to call for human attention. It may activate an alarm or other attention devices. Abreviated BEL.

bellfast. A leased teletypewriter switching system formerly marketed by AT & T.

bell idles. A special code group (1000) transmitted between Bell System 301B data sets during periods of nonactivity.

benchmark. A point of reference from which measurements can be made.

* **benchmark problem.** A problem used to evaluate the performance of hardware or software or both.

BEX. *Broadband exchange.*

bias. (1) * The amount by which the average of a set of values departs from a reference value. (2) * See *ordering bias.* (3) In teletypewriter applications, the uniform shifting of the beginning of all marking pulses from their proper positions in relation to the beginning of the start pulse.

bias distortion. See *distortion.*

bid. In the contention form of invitation or selection, an attempt by the computer or a station to seize control of a line so that it can transmit data.

* **bidirectional flow.** (SC1) In flowcharting, flow that can be extended over the same flowline in either direction.

* **binary.** (1) Pertaining to a characteristic or property involving a selection, choice, or condition in which there are two possibilities. (2) Pertaining to the number representation system with a radix of two. (3) See *Chinese binary, column binary, row binary.*

* **binary card.** A card containing data in column binary or row binary form.

* **binary cell.** A storage cell of one binary digit capacity, for example, a single bit register.

binary code. (1) * A code that makes use of exactly two distinct characters, usually 0 and 1. (2) See also *gray code.*

binary-coded decimal character code. A set of 64 characters, each represented by six bits. See also *extended binary-coded decimal interchange code.*

* **binary-coded decimal notation.** A positional notation in which the individual decimal digits expressing a number in decimal notation are each represented by a binary numeral, for example, the number twenty-three is represented by 0010 0011 in the 8-4-2-1 type of binary-coded decimal notation and by 10111 in binary notation. Abbreviated BCD.

* **binary digit.** (1) In binary notation, either of the characters 0 or 1. (2) See *equivalent binary digits.* Abbreviated bit.

* **binary element.** A constituent element of data that may take either of two values or states.

* **binary incremental representation.** (SC1) Incremental representation in which the value of an increment is rounded to one of the two values of plus or minus one quantum and is represented by one binary digit.

* **binary notation.** Fixed radix notation where the radix is two. For example, in binary notation the numeral 110.01 represents the number 1 x 2 squared plus 1 x 2 to the first power plus 1 x 2 to the minus 2 power, that is, six and a quarter.

* **binary number.** Loosely, a binary numeral.

* **binary numeral.** A binary representation of a number. For example, '101' is a binary numeral and 'V' is the equivalent Roman numeral.

binary operator. An arithmetic operator having two terms. The binary operators that can be used in absolute or relocatable expressions and arithmetic expressions are: addition (+), subtraction(-), multiplication (*), and division (/). Contrast with *unary operator.*

* **binary search.** A dichotomizing search in which the number of items of the set is divided into two equal parts at each step of the process. Appropriate adjustments are usually made for dividing an odd number of items.

binary synchronous communication. Communication using binary synchronous transmission. Abbreviated BSC.

binary synchronous transmission. Data transmission in which synchronization of characters is controlled by timing signals generated at the sending and receiving stations. Contrast with *start-stop transmission.*

binary-to decimal-conversion. Conversion of a binary number to the equivalent decimal number, that is, a base two number to a base ten number.

bind. To assign a value to a symbol, parameter, or variable.

* **bionics.** A branch of technology relating the functions, characteristics, and phenomena of living systems to the development of hardware systems.

bipolar transmission. Same as *polar transmission.*

* **biquinary code.** A mixed radix notation in which each decimal digit to be represented is considered as a sum of two digits of which the first is zero or one with significance five and the second is 0, 1, 2, 3 or 4 with significance one.

BISAM. *Basic indexed sequential access method.*

* **bistable.** Pertaining to a device capable of assuming either one of two stable states.

* **bit.** (1) A binary digit. (2) Same as *Shannon.* (3) See *check bit, information bits, parity bit, sign bit.*

bit density. A measure of the number of bits recorded per unit of length or area.

bit rate. The speed at which bits are transmitted, usually expressed in bits per second. See also *baud.*

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bit stream. A binary signal without regard to grouping by character.

* bit string. A string of binary digits in which the position of each binary digit is considered as an independent unit.

blank. (1) * A part of a medium in which no characters are recorded. (2) On a CRT display device, to turn off the electron beam so that no glow is produced on the face of the screen.

* blank character. Same as *space character*.

blank coil. A tape (for perforation) with only the feed holes punched.

blank deleter. A device that eliminates the receiving of blanks in perforated paper tape.

BLDL table. A list of partitioned data set directory entries for frequently used modules. The entries are specified at IPL time and remain resident in main storage to reduce the time required to access and load the associated modules.

blind. To make a device nonreceptive to unwanted data, through recognition of field definition characters in the received data. See also *lockout, polling, selection*.

block. (1) * A set of things, such as words, characters, or digits, handled as a unit. (2) * A collection of contiguous records recorded as a unit. Blocks are separated by block gaps and each block may contain one or more records. (3) * A group of bits, or n-ary digits, transmitted as a unit. An encoding procedure is generally applied to the group of bits or n-ary digits for error-control purposes. (4) * A group of contiguous characters recorded as a unit. (5) To record data in a block. (6) * See *input block*.

* block cancel character. A cancel character used to indicate that the preceding portion of the block is to be disregarded. Synonymous with block ignore character.

block check character. In longitudiual redundancy checking and cyclic redundancy checking a character that is transmitted by the sender after each mesage block and is compared with a block check character computed by the receiver to determine if the transmission was successful. Abbreviated BCC.

* 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 the

functional relationships among the parts. Contrast with *flowchart*.

* block gap. An area on a data medium used to indicate the end of a block or record. Synonymous with interblock gap.

* block ignore character. Same as *block cancel character*.

blocking. Combining two or more records into one block.

blocking factor. The number of logical records combined into one physical record or block. See also *input blocking factor, output blocking factor*.

* block length. A measure of the size of a block, usually specified in units such as records, words, computer words, or characters.

block loading. Bringing the control sections of a load module into adjoining positions of main storage.

block multiplexer channel. A multiplexer channel that interleaves blocks of data. See also *byte multiplexer channel*. Contrast with *selector channel*.

block prefix. An optional, variable length field that may precede unblocked records or blocks of records recorded in ASCII on magnetic tapes.

block sort. A sort that separates a file into segments, using the highest-order portion of the key, orders the segments separately, and then joins them.

* block transfer. The process of transmitting one or more blocks of data where the data are organized in such blocks.

book. A group of source statements written in the assembler or COBOL language.

book message. A message to be sent to two or more destinations.

* boolean. (1) Pertaining to the processes used in the algebra formulated by George Boole. (2) Pertaining to the operations of formal logic.

* boolean ADD. Same as *OR*.

* boolean operator. A logic operator each of whose operands and whose result have one of two values. See *dyadic boolean operator, monadic boolean operator*.

* bootstrap. A technique or device designed to bring itself into a desired state by means of its own

action, for example, a machine routine whose first few instructions are sufficient to bring the rest of itself into the computer from an input device. Contrast with *initial program loader (IPL)*.

* **borrow.** An arithmetically negative carry.

BOS/360. *Basic Operating System/360.*

boundary. (1) * See *character boundary*. (2) See *integral boundary*.

boundary alignment. The positioning in main storage of a fixed-length field, such as a halfword or doubleword, on an integral boundary for that unit of information.

BPAM. *Basic partitioned access method.*

bpi. Bits per inch.

bps. Bits per second. In serial transmission, the instantaneous bit speed with which a device or channel transmits a character.

BPS/360. *IBM System/360 Basic Programming Support.*

* **branch.** (1) A set of instructions that are executed between two successive decision instructions. (2) To select a branch as in (1). (3) A direct path joining two nodes of a network or graph. (4) Loosely, a conditional jump.

branch cable. A cable that diverges from a main cable to reach some secondary point.

* **branchpoint.** A place in a routine where a branch is selected.

break. (1) To interrupt the sending end and take control of the circuit at the receiving end. (2) See *receive interruption*.

* **breakpoint.** A place in a routine specified by an instruction, instruction digit, or other condition, where the routine may be interrupted by external intervention or by a monitor routine.

bridge tap. An unterminated length of line attached somewhere between the extremities of a communications line. Bridge taps are undesirable. Contrast with *terminated line*.

broadband. A communication channel having a bandwidth greater than a voice-grade channel, and therefore capable of higher-speed data transmission.

broadband exchange. A public switched communication system of Western Union, featuring

various bandwidth full duplex connections. Abbreviated BEX.

broadcast. The simultaneous dissemination of information to a number of stations.

broadcast data set. Under TSO, a system data set containing messages and notices from the system operator, administrators, and other users. Its contents are displayed to each terminal user when he logs on the system, unless suppressed by the user.

* **BS.** The *backspace character*.

BSAM. *Basic sequential access method.*

BSC. *Binary synchronous communication.*

BTAM. *Basic telecommunications access method.*

buffer. (1) * A routine or storage used to compensate for a difference in rate of flow of data, or time of occurrence of events, when transmitting data from one device to another. (2) * An isolating circuit used to prevent a driven circuit from influencing the driving circuit. (3) An area of storage that is temporarily reserved for use in performing an input/output operation, into which data is read or from which data is written. Synonymous with I/O area.

buffer offset. The first field within a physical ASCII record; it precedes the first logical record. For D-format variable-length records, the buffer offset may contain information about the data in the logical records.

buffer pool. (1) An area of storage in which all buffers of a program are kept. (2) Under TCAM, a group of buffers having the same size. A buffer pool is established at initialization time in the message control program; the buffers are built in extents chained together.

buffer prefix. Under TCAM, a control area contained within each TCAM buffer. TCAM fills the prefix area with buffer control information.

buffer unit. Under TCAM, a block from which TCAM buffers are constructed.

buffer unit pool. Under TCAM, all of the buffer units for that system.

bug. (1) * A mistake or malfunction. (2) A semiautomatic telegraph sending key in which movement of a lever to one side produces a series of correctly spaced dots and movement to the other side produces a single dash.

built-in check. Same as *automatic check*.

burst. (1) To separate continuous-form paper into discrete sheets. (2) In data transmission, a sequence of signals counted as one unit in accordance with some specific criterion or measure. (3) See *error burst*.

burst mode. A means of transferring data as a continuous block to or from a particular I/O device on either the multiplexer or selector channel. All channel controls are monopolized for the duration of data transfer.

bus. One or more conductors used for transmitting signals or power.

business data processing. (1) (SC1) Use of automatic data processing in accounting or management. (2) Data processing for business purposes, for example, recording and summarizing the financial transactions of a business. (3) Synonymous with administrative data processing.

business machine. (1) A machine designed to facilitate clerical operations in commercial or scientific activities. (2) In data communications, customer-provided equipment that connects to common carrier's communications services for the purpose of data movement. See also *COAM equipment*.

business machine clocking. A time base oscillator supplied by the business machine for regulating the bit rate of transmission. Synonymous with *non-data set clocking*. Contrast with *data set clocking*.

bussback. The connection, by a common carrier, of the output portion of a circuit back to the input portion of a circuit. See also *loopback test*.

bust this. A phrase used instead of a normal message ending to indicate that the entire message, including heading, is to be disregarded. See also *CANTRAN*.

busy test. A test to determine if telephone circuits are available for use.

byte. (1) * A sequence of adjacent binary digits operated upon as a unit and usually shorter than a computer word. (2) The representation of a character. (3) In System/360 and System/370, a sequence of eight adjacent binary digits that are operated upon as a unit and that constitute the smallest addressable unit in the system.

byte mode. Same as *multiplex mode*.

byte multiplexer channel. A multiplexer channel that interleaves bytes of data. See also *block multiplexer channel*. Contrast with *selector channel*.

C

CAI. *Computer assisted instruction.*

calculator. (1) (SC1) A data processor especially suitable for performing arithmetical operations that requires frequent intervention by a human operator. (2) Generally and historically, a device for carrying out logic and arithmetic digital operations of any kind.

calculus of variations. The theory of maxima and minima of definite integrals whose integrand is a function of the dependent variables, the independent variables, and their derivatives.

call. (1) To transfer control to a specified closed subroutine. (2) In communications, the action performed by the calling party, or the operations necessary in making a call, or the effective use made of a connection between two stations. (3) Synonymous with cue. (4) See *subroutine call*.

call directing code. A Bell System term for an identifying call, which is transmitted on an outlying telegraph receiver and automatically turns on its printer. See also *selective calling, station selection code*. Abbreviated CDC.

called party. On a switched line, the location to which a connection is established.

calling. In communications, a procedure by which a first party attempts to establish a connection with a second party through a central exchange. See also *dialing*.

calling party. On a switched line the location that originates a connection.

calling sequence. (1) * A specified arrangement of instructions and data necessary to set up and call a given subroutine. (2) A polling list. See also *polling*.

camp-on. A method of holding a call for a line that is in use and of signaling when it becomes free. Synonymous with clamp-on.

CAN. The *cancel character*.

cancel character. An accuracy control character used to indicate that the data with which it is associated are in error or are to be disregarded. Abbreviated CAN.

CANTRAN. CANcel TRANsmission. See also *bust this*.

* **capacitor storage.** A storage device that utilizes the capacitance properties of materials to store data.

* **capacity.** See *storage capacity*.

* **card.** See *binary card, header card, laced card, magnetic card, punched card, tape-to-card*.

card code. The combinations of punched holes that represent characters (for example letters, digits) in a punched card.

* **card column.** A single line of punching positions parallel to the short edge of a 3 1/4 x 7 3/8 inch punched card.

* **card deck.** Same as *deck*.

card feed. A mechanism that moves cards into a machine one at a time.

card field. One or more consecutive card columns assigned to data of a specific nature. For example, card columns 15-20 can be assigned to identification.

* **card hopper.** The portion of a card processing machine that holds the cards to be processed and makes them available to a card feed mechanism. Contrast with *card stacker*.

* **card image.** A one-to-one representation of the hole patterns of a punched card, for example, a matrix in which a 1 represents a punch and a 0 represents the absence of a punch.

card punch. A device to record information in cards by punching holes in the cards to represent letters, digits, and special characters.

card reader. A device that senses and translates into machine code the holes in punched cards.

* **card row.** A single line of punch positions parallel to the long edge of a 3 1/4 x 7 3/8 inch punched card.

* **card stacker.** The portion of a card processing machine that receives processed cards. Contrast with *card hopper*.

card-to-tape. Pertaining to equipment that transfers information directly from punched cards to punched or magnetic tape.

CARR. *Carrier*.

* **carriage.** See *automatic carriage*.

* **carriage control tape.** A tape that contains line feed control data for a printing device.

* **carriage return.** The operation that prepares for the next character to be printed or displayed at the specified first position on the same line.

carrier return. On a SELECTRIC ® device, an operation that prepares the next character to be printed at the first position on the next line.

* **carriage return character.** A format effector that causes the location of the printing or display position to be moved to the first space on the same printing or display line. Contrast with *new line character*. Abbreviated CR.

carrier. A continuous frequency capable of being modulated or impressed with a second (informative carrying) signal. See also *automatic carrier, common carrier*.

carrier system. A means of obtaining a number of channels over a single path by modulating each channel on a different carrier frequency and demodulating at the receiving point to restore the signals to their original form. Some typical carrier systems are:

AT & T Carrier System Type		Number of FDC Circuits Derived	Transmission Facility
J	(telephone)	12 FD	4-wire, open-wire
N	(telephone or program)	12 FD	Nonloaded toll or exchange cables
ON	(telephone)	20-24 FD	Cable
TD2	(microwave)	500 FD	Radio
L3	(telephone or program)	1860 FD	Paired coax

* **carry.** (1) One or more digits, produced in connection with an arithmetic operation on one digit place of two or more numerals in positional notation, that are forwarded to another digit place for processing there. (2) The number represented by the digit or digits in (1). (3) Most commonly, a digit as defined in (1), that arises when the sum or product of two or more digits equals or exceeds the radix of the number representation system. (4) Less commonly, a borrow. (5) To forward a carry. (6) The command directing that a carry be forwarded. (7) See *cascaded carry, complete carry, end-around carry, high-speed carry, partial carry, standing-on-nines carry*.

* **cascaded carry.** In parallel addition, a carry process in which the addition of two numerals results in a partial sum numeral and a carry numeral which are in turn added together, this process being repeated

until no new carries are generated. Contrast with *high-speed carry*.

catalog. (1) * An ordered compilation of item descriptions and sufficient information to afford access to the items. (2) The collection of all data set indexes that are used by the control program to locate a volume containing a specific data set. (3) To include the volume identification of a data set in the catalog. (4) Under DOS and TOS, to enter a phase, module, or book into one of the system libraries.

cataloged data set. A data set that is represented in an index, or hierarchy of indexes, that provide the means for locating it.

cataloged procedure. A set of job control statements that has been placed in a partitioned data set called the procedure library, and can be retrieved by naming it in an execute (EXEC) statement or started by the START command.

* cathode ray storage. An electrostatic storage device that utilizes a cathode ray beam for access to the data.

cathode ray tube. An electronic vacuum tube, such as a television picture tube, that can be used to display graphic images.

CAW. *Channel address word.*

CAX. *Community automatic exchange.*

CCB. *Command control block.*

CCH. *Channel-check handler.*

CCW. *Channel command word.*

CCW translation. See *channel program translation.*

CDC. *Call directing code.*

CE. *Customer engineer.*

* cell. See *binary cell, storage cell.*

* centerline. See *stroke centerline.*

central office. The place where communications common carriers terminate customer lines and locate the equipment that interconnects those lines. See also *end office, exchange, local central office.*

* central processing unit. (SC1) A unit of a computer that includes the circuits controlling the interpretation and execution of instructions. Synonymous with main frame. Abbreviated CPU.

* central processor. *A central processing unit.*

centrex. Central office telephone equipment serving subscribers at one location on a private automatic branch exchange basis. The system allows such services as direct inward dialing, direct distance dialing, and console switchboards.

CESD. *Composite external symbol dictionary.*

CESD record. A composite external symbol dictionary record built by the linkage editor or the loader, containing information about a control section name or an entry name.

* chad. The piece of material removed when forming a hole or notch in a storage medium such as punched tape or punched cards. Synonymous with chip.

* chadded. Pertaining to the punching of tape in which chad results.

* chadless. Pertaining to the punching of tape in which chad does not result.

chadless tape. Perforated tape with the chad partially attached, to facilitate interpretive printing on the tape.

* chain code. An arrangement in a cyclic sequence of some or all of the possible different n-bit words, in which adjacent words are related such that each is derivable from its neighbor by displacing the bits one digit position to the left, or right, dropping the leading bit and inserting a bit at the end. The value of the inserted bit needs only to meet the requirement that a word must not recur before the cycle is complete, for example, 000 001 010 101 011 111 110 100 000 ...

* chained list. A list in which the items may be dispersed but in which each item contains an identifier for locating the next item to be considered.

chaining. A system of storing records in which each record belongs to a list or group of records and has a linking field for tracing the chain.

chaining overflow. On a direct access storage device, the writing of overflow records on the next higher available track; each track contains a record that provides a link between the home track and the overflow track. Contrast with *progressive overflow.*

* chaining search. A search technique in which each item contains an identifier for locating the next item to be considered.

* **chain printer.** A printer in which the type slugs are carried by the links of a revolving chain.

change bit. In System/370 virtual storage systems, a bit associated with a page in real storage; the change bit is turned 'ON' by hardware whenever the associated page in real storage is modified. In OS/VS1 and DOS/VS, there is a change bit in the storage key associated with each 2K storage block. In OS/VS2 and VM/370, there is a change bit in each of two storage keys associated with each page frame; if either bit is on, the entire page is considered to have been modified.

* **change dump.** A selective dump of those storage locations whose contents have changed.

channel. (1) * A path along which signals can be sent, for example, data channel, output channel. (2) * The portion of a storage medium that is accessible to a given reading or writing station, for example, track, band. (3) * In communication, a means of one-way transmission. Several channels may share common equipment. For example, in frequency multiplexing carrier systems, each channel uses a particular frequency band that is reserved for it. Contrast with *circuit*. (4) A hardware device that connects the CPU and main storage with the I/O control units. (5) As used in the tariffs, a path for electrical transmission between two or more points without common-carrier-provided terminal equipment. Synonymous with circuit, line, link, path, facility. See also *service*. (6) * See *input channel, output channel*.

channel address word. A word in main storage that specifies the location in main storage at which a channel program begins. Abbreviated CAW.

channel check handler. In System/370 and under OS/360, a feature that records, when a channel error occurs, information about the error and issues a message to the operator. Abbreviated CCH. Under DOS on System/360, a similar function is performed by *machine check recording and recovery (MCRR)*.

channel command. An instruction that directs a channel, control unit, or device to perform an operation or set of operations.

channel command word. A doubleword at the location in main storage specified by the channel address word. One or more CCWs make up the channel program that directs channel operations. Abbreviated CCW.

channel program. One or more channel command words that control a specific sequence of channel operations. Execution of the specific sequence is initiated by a single start I/O instruction.

channel program block. Under TCAM, a control block used in the transfer of data between buffer units and message queues maintained on disk. Abbreviated CPB.

channel program translation. In a channel program for a virtual storage system, replacement by software of virtual storage addresses with real addresses.

channel scheduler. Under DOS and TOS, that part of the supervisor that controls all input/output operations.

channel status word. A doubleword in main storage that provides information about the termination of input/output operations. Abbreviated CSW.

channel-to-channel adapter. A hardware device that can be used to connect two channels on the same computing system or on different systems.

CHAR. Character.

* **character.** (1) A letter, digit, or other symbol that is used as part of the organization, control, or representation of data. A character is often in the form of a spatial arrangement of adjacent or connected strokes. (2) See *accuracy control character, acknowledge character, alphanumeric character set, backspace character, bell character, blank character, block cancel character, block ignore character, cancel character, carriage return character, check character, code extension character, communication control character, control character, cyclic redundancy check character, data link escape character, delete character, device control character, end of medium character, end of text character, end of transmission character, end of transmission block character, enquiry character, error control character, escape character, form feed character, graphic character, horizontal tabulation character, illegal character, line feed character, longitudinal redundancy check character, negative acknowledge character, new line character, null character, numeric character, print control character, rub-out character, shift-in character, shift-out character, space character, special character, start of heading character, start of text character, substitute character, synchronous idle character, vertical tabulation character*.

* **character boundary.** In character recognition, the largest rectangle, with a side parallel to the document reference edge, each of whose sides is tangential to a given character outline.

* **character check.** A check that verifies the observance of rules for the formation of characters.

character-deletion character. A character within a line of terminal input specifying that it and the immediately preceding character are to be removed from the line. See also *line-deletion character.*

character density. A measure of the the horizontal spacing of characters.

character expression. In assembler programming, a character string enclosed by apostrophes. It can be used only in conditional assembly instructions. The enclosing apostrophes are not part of the value represented. Contrast with *quoted string.*

* **character fill.** To insert the representation of a specific character in a storage medium, usually for the purpose of deleting unwanted data.

* **characteristic.** The integral part of a logarithm. For example, in the expression, log643 = 2.808, the .808 is the mantissa and the 2 is the characteristic.

* **character outline.** The graphic pattern established by the stroke edges of a character.

* **character printer.** A device that prints a single character at a time. Contrast with *line printer.*

* **character recognition.** The identification of graphic, phonic, or other characters by automatic means. See *magnetic ink character recognition, optical character recognition.*

character position. Same as *display position.*

character relation. In assembler programming, two character strings separated by a relational operator.

character row. Same as *display line.*

character set. (1) * A set of unique representations called characters, e.g. the 26 letters of the English alphabet, 0 and 1 of the boolean alphabet, the set of signals in the Morse code alphabet, the 128 characters of the ASCII alphabet. (2) In assembler programming, the alphabetic characters A through Z; $, #, @; the digits 0 through 9; and the special characters + - * / , ( ) = . ' & and the blank character.

* **character spacing reference line.** In character recognition, a vertical line that is used to evaluate the horizontal spacing of characters. It may be a line that equally divides the distance between the sides of a character boundary or that coincides with the centerline of a vertical stroke.

* **character string.** A string consisting solely of characters.

* **character subset.** A selection of characters from a character set, comprising all characters which have a specified common feature, for example, in the definition of character set, digits 0 through 9 constitute a character subset.

* **chart.** See *flowchart.*

check. (1) * A process for determining accuracy. (2) * See *arithmetic check, automatic check, built-in check, character check, duplication check, echo check, hardware check, marginal check, mathematical check, modulo N check, odd-even check, parity check, programmed check, residue check, selection check, self-checking code, sight check, summation check, transfer check.* (3) See *machine check interruption, program check interruption.*

* **check bit.** A binary check digit, for example, a parity bit.

* **check character.** A character used for the purpose of performing a check.

* **check digit.** A digit used for the purpose of performing a check.

checkout. Same as *debug.*

checkpoint. (1) * A place in a routine where a check, or a recording of data for restart purposes, is performed. (2) A point at which information about the status of a job and the system can be recorded so that the job step can be later restarted. (3) To record such information.

checkpoint data set. A sequential or partitioned data set containing a collection of checkpoint entries. If a checkpoint data set is a partitioned data set, each checkpoint entry is a member.

checkpoint entry. Under TCAM, a record in the checkpoint data set that is used to restructure the message control program environment upon restart following closedown or system failure. See *environment record, incident record, checkpoint request record, and control record.*

checkpoint records. Records that contain the status of a job and the system at the time the records are written by the checkpoint routine. These records provide the information necessary for restarting a job without having to return to the beginning of the job.

checkpoint request record. Under TCAM, a checkpoint record taken as a result of the execution of a CHECKREQ macro instruction in an application program; the record contains the status of a single destination queue for the application program.

checkpoint restart. The process of resuming a job at a checkpoint within the job step that caused abnormal termination. The restart may be automatic or deferred, where deferred restart involves resubmitting the job. See also *automatic restart, deferred restart*. Contrast with *step restart*.

checkpoint/restart facility. (1) A facility for restarting execution of a program at some point other than at the beginning, after the program was terminated due to a program or system failure. A restart can begin at a checkpoint or from the beginning of a job step, and uses checkpoint records to reinitialize the system. (2) Under TCAM, a facility that records the status of the teleprocessing network at designated intervals or following certain events. Following system failure, the system can be restarted and continue without loss of messages.

check symbol. On an IBM 2260 or 2265 Display Station, the character displayed for any code entered from the keyboard for which no character or symbol has been assigned. Also, a symbol that is displayed on the screen to indicate each character position for which a parity error occurred during transfer of data from the device.

* Chinese binary. Same as *column binary*.

chip. (1) In microcircuitry, a single device, either a transistor or a diode, that has been cut from a larger wafer of silicon. (2) * Same as *chad*.

CIOCS. *Communications input/output control system.*

circuit. (1) * In communications, a means of two-way communication between two points, comprising associated "go" and "return" channels. Contrast with *channel*. (2) A means of two-way communication between two points, comprising associated go and return channels.

circuit grade. The information-carrying capability of a circuit, in speed or type of signal. The grades of circuits are broadband, voice, subvoice, and telegraph. For data use, these grades are identified with certain speed ranges.

circuit load. Same as *line load.*

circuit noise level. The ratio of the circuit noise to some arbitrary amount chosen as reference. This ratio is normally indicated in decibels above the reference noise, dbrn, or in adjusted decibels, dba, which signifies a noise meter reading adjusted to represent the interfering effect under specified conditions. See also *decibel.*

circuit switching. See *line switching.*

* circulating register. A shift register in which data moved out of one end of the register are reentered into the other end as in a closed loop.

* circulating storage. Dynamic storage involving a closed loop. Synonymous with cyclic storage.

clamp-on. Same as *camp-on.*

* clear. To place one or more storage locations into a prescribed state, usually zero or the space character. Contrast with *set*.

* clear area. In character recognition, a specified area that is to be kept free of printing or any other markings not related to machine reading.

CLK. *Clock.*

* clock. (1) A device that generates periodic signals used for synchronization. (2) A device that measures and indicates time. (3) A register or storage area whose contents change at regular intervals in such a way as to measure time.

* clock pulse. A synchronization signal provided by a clock.

* clock track. A track on which a pattern of signals has been recorded to provide a time reference.

closed loop. A group of instructions that are repeated indefinitely.

* closed shop. Pertaining to the operation of a computer facility in which most productive problem programming is performed by a group of programming specialists rather than by the problem originators. The use of the computer itself may also be described as closed shop if full-time trained operators, rather than user/programmers, serve as the operators. Contrast with *open shop.*

* closed subroutine. A subroutine that can be stored at one place and can be linked to one or more calling routines. Contrast with *open subroutine.*

closedown. Under TCAM, orderly deactivation of the message control program.

CMS. *Conversational monitoring system.*

* coalesce. *To combine two or more files into one file.*

COAM equipment. Customer Owned And Maintained communication equipment connected to common-carrier lines. See also *business machine.*

coaxial cable. A cable consisting of one conductor, usually a small copper tube or wire, within and

insulated from another conductor of larger diameter, usually copper tubing or copper braid.

* **COBOL.** COmmon Business-Oriented Language. A business data processing language.

* **code.** (1) (SC1) A set of unambiguous rules specifying the way in which data may be represented, for example, the set of correspondences in the standard code for information interchange. Synonymous with coding scheme. (2) (SC1) in telecommunications, a system of rules and conventions according to which the signals representing data can be formed, transmitted, received, and processed. (3) (SC1) In data processing, to represent data or a computer program in a symbolic form that can be accepted by a data processor. (4) To write a routine. (5) Same as *code set*. (6) Same as *encode*. (7) A set of items, such as abbreviations, representing the members of another set. (8) Same as *code value*. (9) See *alphabet code, alphanumeric code, binary code, biquinary code, chain code, computer code, error correcting code, error detecting code, excess three code, gray code, hamming code, instruction code, interpretive code, machine code, minimum distance code, numeric code, object code, operation code, pseudo code, reflected binary code, return code, self-checking code, two-out-of-five code.*

Code and Go FORTRAN. A version of FORTRAN IV for rapid compilation and execution of programs.

code conversion. A process for changing the bit grouping for a character in one code into the corresponding bit grouping for a character in a second code.

* **coded.** See *binary-coded decimal notation.*

* **code extension character.** A control character used to indicate that one or more of the succeeding code values are to be interpreted according to a different code.

code holes. The information holes in perforated tape, as opposed to the feed or other holes.

* **coder.** (SC1) A person mainly involved in writing but not designing computer programs.

* **code set.** (SC1) The complete set of representations defined by a code, for example, all of the three-letter international identifications for airports. Synonymous with code (5).

* **code value.** (SC1) One element of a code set, for example, the eight-binary digits code value for the delete character. Synonymous with *code 8*.

* **coding.** See *absolute coding, automatic coding,*

relative coding, skeletal coding, specific coding, straight-line coding, symbolic coding.

* **coding scheme.** Same as *code (1)*.

cold start. Same as *initial program load.*

* **collate.** To combine items from two or more ordered sets into one set having a specified order not necessarily the same as any of the original sets. Contrast with *merge*.

collating sequence. Any logical sequence used to order items of data.

* **collator.** A device to collate, merge, or match sets of punched cards or other documents.

* **color.** In optical character recognition, the spectral appearance of the image dependent upon the spectral reflectance of the image, the spectral response of the observer, and the spectral composition of incident light.

* **column.** (1) A vertical arrangement of characters or other expressions. (2) Loosely, a digit place.

* **column binary.** Pertaining to the binary representation of data on cards in which the significances of punch positions are assigned along card columns. For example, each column in a 12-row card may be used to represent 12 consecutive bits. Synonymous with Chinese binary. Contrast with *row binary*.

* **column split.** Pertaining to the sensing or punching of punched card data in a manner that permits certain punch positions within a single column to be ignored or treated separately from the other punch positions of the same column.

* **combination.** See *forbidden combination.*

* **combinational logic element.** A device having at least one output channel and zero or more input channels, all characterized by discrete states, such that the state of each output channel is completely determined by the contemporaneous states of the input channels.

command. (1) * A control signal. (2) * Loosely, an instruction in machine language. (3) * Loosely, a mathematical or logic operator. (4) A request from a terminal for the execution of a particular program, called a command processor. (5) See *operator command, channel command, subcommand.*

command control block. Under DOS and TOS, a 16-byte field required for each channel program executed by physical IOCS. This field is used for

communication between physical IOCS and the problem program. Abbreviated CCB.

* command language.   A source language consisting primarily of procedural operators, each capable of invoking a function to be executed.

command library. Under TSO, a partitioned data set consisting of command processor programs. A user command library can be concatenated to the system command library.

command mode. Under TSO, the entry mode immediately following LOGON, or following completion of a command processor. In command mode, the system is ready to accept any command in the command libraries.

command name. The first term in a command, usually followed by operands.

command privilege class. In VM/370, classes assigned to a VM/370 user that allow him to access logical subsets of the VM/370 control program commands.

command procedure. Under TSO, a data set or a member of a partitioned data set containing TSO commands to be performed sequentially by the EXEC command.

command processing. The reading, analyzing, and performing of commands issued via a console or through an input stream.

command processor. A problem program executed to perform an operation specified by a command.

command statement. A job control statement that is used to issue commands to the system through the input stream.

comment statement. A statement used to include information that may be helpful in running a job or reviewing an output listing.

common area. A control section used to reserve a main storage area that can be referred to by other modules.

common battery central office. A central office that supplies transmitter and signal current for its associated stations and for signaling by the central office equipment from a power source located in the central office. See also *tip.*

common carrier. See *communications common carrier.*

* common field. A field that can be accessed by two or more independent routines.

common language. A language in machine-sensible form that is common to a group of computers and associated equipment.

common segment. In an overlay structure, an overlay segment upon which two exclusive segments are dependent.

communication. Transmission of intelligence between points of origin and reception without alteration of sequence or structure of the information content. See also *data communication.*

communication channel. See *channel (3).*

* communication control character. A control character intended to control or facilitate transmission of data over communication networks.

communication line. Any medium, such as a wire or a telephone circuit, that connects a remote station with a computer.

* communication link. The physical means of connecting one location to another for the purpose of transmitting and receiving data.

communication region. Under DOS and TOS, an area of the supervisor that is set aside for interprogram and intraprogram communication. It contains information useful to both the supervisor and the problem program.

communications common carrier. A government-regulated private company that furnishes the general public with telecommunications service facilities; for example, a telephone or telegraph company.

communication task. A function provided by OS/360 to handle all communication with the operator console.

community automatic exchange. A small dial telephone office serving a community. Abbreviated CAX.

compandor. (COMpressor-ex PANDOR) Equipment that compresses the outgoing speech volume range and expands the incoming speech volume range on a long distance telephone circuit. Such equipment can make more efficient use of voice communication channels. See also *compressor, expandor.*

comparison.   The examination of the relationship between two items of data. It is usually followed by a decision.

* compile. To prepare a machine language program from a computer program written in another programming language by making use of the overall

logic structure of the program, or generating more than one machine instruction for each symbolic statement, or both, as well as performing the function of an assembler.

* compiler. A program that compiles.

* complement. (1) A number that can be derived from a specified number by subtracting it from a second specified number. For example, in radix notation, the specified number may be a given power of the radix or one less than a given power of the radix. The negative of a number is often represented by its complement. (2) See *diminished radix complement, nines complement, ones complement, radix complement, radix-minus-one complement, tens complement, true complement, twos complement.*

* complementary operator. The logic operator whose result is the NOT of a given logic operator.

* complete carry. In parallel addition, a technique in which all of the carries are allowed to propagate. Contrast with *partial carry.*

complex relocatable expression. In assembler programming, a relocatable expression that contains two or more unpaired relocatable terms or an unpaired relocatable term preceded by a minus sign, after all unary operators have been resolved. A complex relocatable expression is not fully evaluated until program fetch time.

component. (1) In teleprocessing, one or more input/output devices attached to a single control unit, and together making up one remote terminal or station. (2) A point in a communications system at which data can enter or leave; an input/output device. A component is always attached to a terminal control unit. (3) * See *solid state component.*

composite external symbol dictionary. Control information associated with a load module that identifies the external symbols in the module. Abbreviated CESD.

composited circuit. A circuit that can be used simultaneously for telephone and direct-current telegraph or signaling applications or signaling, separation between the two being accomplished by frequency discrimination.

compression. See *data compression.*

compressor. An electronic device that compresses the volume range of a signal. See also *compandor, expandor.*

compromise net. A network, used in conjunction with a hybrid coil to balance a subscriber's loop, that is adjusted for an average loop length or an average subscriber's set, or both, to secure compromise (not precision) isolation between the two directional paths of the hybrid.

* computational stability. The degree to which a computational process remains valid when subjected to effects such as errors, mistakes, or malfunctions.

* computer. (1) (SC1) A data processor that can perform substantial computation, including numerous arithmetic or logic operations, without intervention by a human operator during the run. (2) See *analog computer, arbitrary sequence computer, asynchronous computer, automatic computer, consecutive sequence computer, digital computer, general purpose computer, hybrid computer, incremental computer, parallel computer, sequential computer, serial computer, simultaneous computer, special purpose computer, stored program computer, synchronous computer.*

computer assisted instruction. A data processing application in which a computing system is used to assist in the instruction of students. The application usually involves a dialog between the student and a computer program which informs him of his mistakes as he makes them. Abbreviated CAI.

* computer code. A machine code for a specific computer.

* computer instruction. A machine instruction for a specific computer.

* computer network. A complex consisting of two or more interconnected computing units.

* computer program. A series of instructions or statements, in a form acceptable to a computer, prepared in order to achieve a certain result.

computer word. (1) * A sequence of bits or characters treated as a unit and capable of being stored in one computer location. Synonymous with machine word. (2) In System/360 and System/370, 32 bits or 4 bytes. (3) In System/7, 16 bits or 2 bytes.

computing system. A central processing unit, with main storage, input/output channels, control units, direct access storage devices, and input/output devices connected to it.

computing system RPQ. A customer request for a price quotation on alterations or additions to the functional capabilities of the computing system. The RPQ may be used in conjunction with programming

RPQs to solve unique data processing problems. See also *programming RPQ, RPQ.*

concatenated data sets. A group of logically connected data sets that are treated as one data set for the duration of a job step.

concatenation character. In assembler programming, the period (.) that is used to separate character strings that are to be joined together in conditional assembly processing.

* **concurrent.** Pertaining to the occurrence of two or more events or activities within the same specified interval of time. Contrast with *consecutive, sequential, simultaneous.*

concurrent peripheral operations. Same as *spooling.*

conditional assembly. An assembler facility for altering at pre-assembly time the content and sequence of source statements that are to be assembled.

conditional assembly expression. An expression that an assembler evaluates at pre-assembly time.

conditional assembly instruction. An assembler instruction that performs a conditional assembly operation. Conditional assembly instructions are processed at pre-assembly time.

* **conditional jump.** A jump that occurs if specified criteria are met.

condition code. A code that reflects the result of a previous input/output, arithmetic, or logical operation.

conditioning. The addition of equipment to leased voice-grade channel to provide minimum values of line characteristics required for data transmission.

* **conditions.** See *entry conditions.*

configuration. The group of machines, devices, and programs that make up a data processing system.

* **connector.** (1) (SC1) On a flowchart, the means of representing the convergence of more than one flowline into one, or the divergence of one flowline into more than one. It may also represent a break in a single flowline for continuation in another area. (2) A means of representing on a flowchart a break in a line of flow. (3) See *inconnector, outconnector.*

* **consecutive.** Pertaining to the occurrence of two sequential events without the intervention of any other such event. Contrast with *concurrent, sequential, simultaneous.*

* **consecutive sequence computer.** (SC1) A computer in which instructions are executed in an implicitly defined sequence unless specifically specified by a jump instruction.

* **console.** That part of a computer used for communication between the operator or maintenance engineer and the computer.

console function. See *VM/370 console function.*

constant. (1) A fixed or invariable value or data item. (2) * See *figurative constant.*

constant ratio code. A code in which all characters are represented by combinations having a fixed ratio of ones to zeros.

* **content addressed storage.** Same as *associative storage.*

contention. (1) A condition on a communication channel when two or more locations try to transmit at the same time. (2) Unregulated bidding for a line by multiple users. (3) Under TCAM, any point-to-point line configuration in which the station on the line does not use polling or addressing characters.

contention system. A system in which one or more terminals and the computer compete for use of the line.

contents directory. Under MVT and OS/VS2, a series of queues that indicate the routines either in a particular region of main storage or in the link pack area.

context editing. In systems with time sharing, a method of editing a line data set or file without using line numbers. To refer to a particular line, all or part of the contents of that line are specified.

continuation line. A line of a source statement into which characters are entered when the source statement cannot be contained on the preceding line or lines.

* **contrast.** In optical character recognition, the difference between color or shading of the printed material on a document and the background on which it is printed. See *print contrast ratio.*

* **control.** See *numerical control, sequential control.*

control block. A storage area used by a program to hold control information.

control card. A punched card containing input data or parameters for initializing or modifying a program.

* **control character.** (1) A character whose occurrence in a particular context initiates, modifies, or stops a control operation, for example, a character that controls carriage return, a character that controls transmission of data over communication networks. A control character may be recorded for use in a subsequent action. It may in some circumstances have a graphic representation. Contrast with *graphic character*. (2) See *accuracy control character, communication control character, device control character, error control character, print control character*.

control dictionary. The external symbol dictionary and the relocation dictionary, collectively, of an object or load module.

control field. In sorting or merging records, a group of contiguous bits in a control word used in determining sequence.

* **control function.** Same as *control operation*.

control mode. The state that all terminals on a line must be in to allow line discipline, line control, or terminal selection to occur. All terminals on a line are in the control mode, characters on the line are viewed as control characters performing line discipline, that is, polling or addressing.

* **control operation.** An action performed by a device, such as the starting or stopping of a particular process. Conventionally, carriage return, font change, rewind, end of transmission, etc., are control operations, whereas the actual reading and transmission of data are not. Synonymous with control function.

* **control panel.** (1) A part of a computer console that contains manual controls. (2) Same as *plugboard*.

control program. A program that is designed to schedule and supervise the performance of data processing work by a computing system.

control record. (1) A record that contains data used to initiate, modify, or stop a control operation or to determine the manner in which data is processed. (2) Under TCAM, a record included in a checkpoint data set that keeps track of the correct environment records, incident records, and checkpoint request records to use for restructuring the message control program environment during restart.

control registers. In System/370 computing systems, a set of registers used for operating system control of relocation, priority interruption, program event recording, error recovery, and masking operations.

control section. That part of a program specified by the programmer to be a relocatable unit, all elements of which are to be loaded into adjoining main storage locations. Abbreviated CSECT.

control statement. See *job control statement, linkage editor control statement*.

control storage. Monolithic storage, used primarily for microprograms.

control switching points. Collectively, the class 1, 2, and 3 offices (regional, sectional, and primary centers) needed for nationwide dialing. Abbreviated CSP.

control terminal. In systems with time sharing, any active terminal at which the user is authorized to enter commands affecting system operation.

control total. A sum resulting from the addition of a specified field from each record in a group of records, used for checking machine, program, and data reliability.

control unit. A device that controls input/output operations at one or more devices.

control volume. A volume that contains one or more indexes of the catalog.

control word. All control fields used to sort or merge a particular group of records; the major field appears first and other fields follow in descending order of importance.

conversational. Pertaining to a program or a system that carries on a dialog with a terminal user, alternately accepting input and then responding to the input quickly enough for the user to maintain his train of thought. See also *interactive*.

conversational mode. Communication between a terminal and a computer in which each entry from the terminal elicits a response from the computer and vice versa.

conversational monitor system. A virtual machine operating system that operates only under the control of the VM/370 control program. Abbreviated CMS.

conversational remote job entry. An operating system facility for entering job control language statements from a remote terminal, and causing the scheduling and execution of the jobs described in the statements. The terminal user is prompted for missing operands or corrections. Abbreviated CRJE.

conversion. (1) The process of changing from one method of data processing to another or from one

data processing system to another. (2) The process of changing from one form of representation to another; e.g., to change from decimal representation to binary representation. See also *translation*.

* **convert.** To change the representation of data from one form to another, for example, to change numerical data from binary to decimal or from cards to tape.

converter. A device capable of converting impulses from one mode to another, such as analog to digital, or parallel to serial, or from one code to another.

* **convex programming.** In operations research, a particular case of nonlinear programming in which the function to be maximized or minimized and the constraints are appropriately convex or concave functions of the controllable variables. Contrast with *dynamic programming, integer programming, linear programming, mathematical programming, nonlinear programming, quadratic programming.*

coordinate data. (1) Data, expressed in coordinates, that specifies an addressable point on a display surface. (2) On an IBM 2250 Display Unit, the series of data bytes following a display order in the display buffer that contain the information needed to perform the specified operation.

* **copy.** To reproduce data in a new location or other destination, leaving the source data unchanged, although the physical form of the result may differ from that of the source. For example, to copy a deck of cards onto a magnetic tape. Contrast with *duplicate*.

* **core.** See *magnetic core, multiple aperture core.*

core image library. Under DOS and TOS, a library of phases that have been produced as output from link-editing. The phases in the core image library are in a format that is executable either directly or after processing by the relocating loader in the supervisor.

core storage. A form of high-speed storage using magnetic cores.

corner cut. A corner removed from a card for orientation purposes.

* **corrective maintenance.** Maintenance specifically intended to eliminate an existing fault. It may occur as either emergency maintenance or deferred maintenance. Contrast with *preventive maintenance*. Corrective maintenance and preventive maintenance are both performed during maintenance time.

* **corrective maintenance time.** Time, either scheduled or unscheduled, used to perform corrective maintenance.

* **counter.** (1) A device such as a register or storage location used to represent the number of occurrences of an event. (2) See *instruction counter.*

CP. *Command processor.*

CPB. *Channel program block.*

CPI. *Characters per inch.*

CPO. Concurrent peripheral operations. Same as *spooling.*

cps. Characters per second.

* **CPU.** *Central processing unit.*

CPU busy time. Same as *CPU time.*

CPU time. The amount of time devoted by the central processing unit to the execution of instructions. Synonymous with CPU busy time.

* **CR.** (1) An abbreviation denoting a credit symbol in the account field. (2) The *carriage return character.*

* **CRC.** The *cyclic redundancy check character.*

CRJE. *Conversational remote job entry.*

crossbar switch. A relay-operated device that makes a connection between one line in each of two sets of lines. The two sets are physically arranged along adjacent sides of a matrix of contracts or switch points. See also *line switching, step-by-step system.*

crossbar system. A type of line-switching system that uses crossbar switches. See also *step-by step switch.*

crossfire. Interfering current in one telegraph or signaling channel resulting from telegraph or signaling currents in another channel.

* **crosstalk.** The unwanted energy transferred from one circuit, called the "disturbing" circuit, to another circuit, called the "disturbed" circuit.

* **CRT display.** *Cathode ray tube display.*

CRT display device. A display device on which images are produced on a cathode ray tube.

* cryogenics. The study and use of devices utilizing properties of materials near absolute zero in temperature.

* cryotron. A device that makes use of the effects of low temperatures on conductive materials such that small magnetic field changes can control large current changes.

cryptographic. Pertaining to equipment that transforms data to conceal its actual meaning, usually by secret conversion.

CSECT. *Control section.*

CSW. *Channel status word.*

* cue. Same as *call.*

current beam position. On a CRT display device, the coordinates on the display surface at which the electron beam is presently aimed. Synonymous with starting point.

current line pointer. In systems with time sharing, a pointer that indicates the line of a line data set with which the user is currently working.

current record. The record pointed to by the current line pointer.

cursor. A movable spot of light on the cathode ray tube of a console or display unit that indicates where the next character will be entered.

* curtate. A portion of a punched card consisting of adjacent punched rows.

customer engineer. An individual responsible for field maintenance of IBM hardware and software. Abbreviated CE.

customer station equipment. Communications common carrier transmitting and receiving equipment used in connection with private line services and located on the customer's premises.

cutoff. The point of degradation, due to attenuation or distortion, at which a signal becomes unusable.

* cybernetics. (SC1) That branch of learning which brings together theories and studies on communication and control in living organisms and machines.

* cycle. (1) An interval of space or time in which one set of events or phenomena is completed. (2) Any set of operations that is repeated regularly in the same sequence. The operations may be subject to variations on each repetition. (3) See *search cycle.*

cycles per second. Same as *hertz.*

cyclic redundancy check. A system of error checking performed at both the sending and receiving station after a block check character has been accumulated. Abbreviated CRC. See also *longitudinal redundancy check, vertical redundancy check.*

* cyclic redundancy check character. A character used in a modified cyclic code for error detection and correction. Abbreviated CRC.

* cyclic shift. A shift in which the data moved out of one end of the storing register are reentered into the other end, as in a closed loop.

* cyclic storage. Same as *circulating storage.*

cylinder. The tracks of a disk storage device that can be accessed without repositioning the access mechanism.

D

damage assessment routines. In OS/360 and OS/VS, routines that attempt recovery from system failures caused by software. Abbreviated DAR.

damping. A characteristic built into electrical circuits and mechanical systems to prevent unwanted oscillatory conditions.

DAR. *Damage assessment routines.*

DASD. *Direct access storage device.*

DAT. *Dynamic address translation.*

* data. (1) (SC1) A representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by humans or automatic means. (2) Any representations such as characters or analog quantities to which meaning is, or might be, assigned. (3) See *input data, numeric data, output data.*

data acquisition. The process of identifying, isolating, and gathering source data to be centrally processed in a usable form.

data attribute. See *attribute.*

* 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 libaries used by an organization are known as its data bank.

data base. A collection of data fundamental to an enterprise.

data bus. See *bus.*

data cell. A direct access storage volume containing strips of tape on which data is stored.

data collection. A telecommunications application in which data from several locations is accumulated at one location (in a queue or on a file) before processing.

data communication. The transmission and reception of data, often including operations such as coding, decoding, and validation. See also *data transmission, telecommunications.*

data compaction. Same as *null supression.*

data compression. A technique that saves storage space by eliminating gaps, empty fields, redundancies, or unnecessary data to shorten the length of records or blocks.

data constant. See *figurative constant.*

data control block. A control block used by access routines in storing and retrieving data. Abbreviated DCB.

data conversion. The process of changing data from one form of representation to another.

data definition name. The name of a data definition (DD) statement, which corresponds to a data control block that contains the same name. Abbreviated ddname.

data definition (DD) statement. A job control statement that describes a data set associated with a particular job step.

DATA/360 - DOS. A program product that runs on a System/360 computing system under DOS; it provides a means of entering source data through local IBM 2260 Display Stations to a disk file and verifying the data for input to a user's program, eliminating all unit record operations.

data extent block. An extension of the data control block that contains information about the physical status of the data set being processed. Abbreviated DEB.

data file. A collection of related data records organized in a specific manner. For example, a payroll file (one record for each employee, showing his rate of pay, deductions, etc.) or an inventory file (one record for each inventory item, showing the cost, selling price, number in stock, etc.) See also *data set (1), file, logical file.*

* **data flowchart.** (SC1) A flowchart representing the path of data through a problem solution. It defines the major phases of the processing as well as the various data media used. Synonymous with data flow diagram.

* **data flow diagram.** Same as *data flowchart.*

data gathering. See *data collection.*

data generator. A data set utility program that creates multiple data sets within one job for the sequential and partitioned access methods.

* **data hierarchy.** A data structure consisting of sets and subsets such that every subset of a set is of lower rank than the data of the set.

data integrity. See *integrity.*

data link. The communications lines, modems, and communication controls used in transmitting information between two or more stations.

* **data link escape character.** A communication control character used with one or more succeeding characters to form an escape sequence to provide, by some convention, supplementary data communication control operations. Only graphic characters and communication control characters are used in constructing a data link escape sequence. Abbreviated DLE.

* **data logging.** Recording of data about events that occur in time sequence.

data loop transceiver. A station arrangement (data set) for Western Union's Class D leased data channels. Abbreviated DLT. See also *station arrangement, data set.*

data management. A major function of operating systems that involves organizing, cataloging, locating, storing, retrieving, and maintaining data.

* **data medium.** (1) (SC1) The material in or on which a specific physical variable may represent data. (2) (SC1) The physical quantity which may be varied to represent data.

data migration. The moving of data from an online device to an offline or low-priority device, as

determined by the system or as requested by the user. Contrast with *staging*.

data mode. A move mode in which the data portions of all segments of a spanned record are accessed.

data organization. The arrangement of information in a data set. For example, sequential organization or partitioned organization.

data origination. The translation of information from its original form into a machine-readable form or directly into electrical signals.

DATA-PHONE. Both a service mark and a trademark of AT & T and the Bell System. As a service mark, it indicates the transmission of data over the telephone network. As a trademark , it identifies the communication equipment furnished by the Bell System for data communication services.

* **data processing.** (SC1) The execution of a systematic sequence of operations performed upon data. Synonymous with information processing.

data processing system. A network of machine components capable of accepting information, processing it according to a plan, and producing the desired results.

* **data processor.** (SC1) A device capable of performing data processing, including desk calculators, punched card machines, and computers. Synonymous with processor (1).

data protection. A safeguard that prevents the loss or destruction of data.

* **data reduction.** The transformation of raw data into a more useful form, for example, smoothing to reduce noise.

data scaling. See *scaling*.

data security. See *security*.

data set. (1) The major unit of data storage and retrieval in the operating system, consisting of a collection of data in one of several prescribed arrangements and described by control information to which the system has access. See also *direct data set, partitioned data set, sequential data set*. (2) A device that performs the modulation/demodulation and control functions necessary to provide compatibility between business machines and communications facilities. Abbreviated DS. See also *data loop transceiver, line adapter, modem, subset, station arrangement*.

data set clocking. A time base oscillator supplied by the data set for regulating the bit rate of transmission. Contrast with *business machine clocking*.

data set control block. A data set label for a data set in direct access storage. Abbreviated DSCB.

data set extension. Under TSO, a control block containing control information for each of a terminal user's data sets. Abbreviated DSE.

data set label. (1) A collection of information that describes the attributes of a data set and is normaly stored on the same volume as the data set. (2) A general term for data set control blocks and tape data set labels. Abbreviated DSL.

data set name. The term or phrase used to identify a data set. See also *qualified name*.

data set organization. The arrangement of information in a data set. For example, sequential organization or partitioned organization.

data set security. See *security*.

data set utility programs. Programs that can be used to update, maintain, edit, and transcribe data sets.

* **data signaling rate.** In communications, the data transmission capacity of a set of parallel channels. The data signaling rate is expressed in bits per second.

* **data sink.** In communications, a device capable of accepting data signals from a transmission device. It may also check these signals and originate error control signals. Contrast with *data source*.

* **data source.** In communications, a device capable of originating data signals for a transmission device. It may also accept error control signals. Contrast with *data sink*.

DATASPEED. A Bell System marketing term for a family of medium-speed paper tape transmitting and receiving units. Similar equipment is also marketed by the Western Union Telegraph Company.

data stream. All data transmitted through a channel in a single read or write operation.

* **data terminal equipment.** Either a data source or a data sink, or both.

data transmission. The sending of data from one part of a system to another part. See also *data communication*.

dB. See *decibel*.

dBm. *Decibel based on one milliwatt.*

dB meter. A meter having a scale calibrated to read directly in decibel values at a reference level that must be specified (usually one milliwatt equals zero db). Used in audio-frequency amplifier circuits of broadcast stations, public-address systems, and receiver output circuits to indicate volume level.

DCB. Data control block.

* **DC1, DC2, DC3, DC4.** *Device control characters.*

ddname. *Data definition name.*

DD statement. *Data definition statement.*

* **DDA.** *Digital differential analyzer.*

DDD. A telephone circuit disconnected from a central office.

DDR. *Dynamic device reconfiguration.*

dead letter queue. Under TCAM, a queue containing messages that could not be placed in the appropriate destination queue for a terminal or application program.

deadlock. Unresolved contention for the use of a resource.

deallocate. To release a resource that is assigned to a specific task.

DEB. *Data extent block.*

deblock. To remove records from a block.

deblocking. The action of making the first and each subsequent logical record of a block available for processing, one record at a time.

* **debug.** To detect, locate, and remove mistakes from a routine or malfunctions from a computer. Synonymous with troubleshoot.

decay constant. Under TSO, a weighting factor used in calculating the duration of a job's next time slice based on its use of previous time slices. Recent time slices are more heavily weighted than earlier time slices.

deceleration time. The time required to stop a tape after reading or recording the last piece of information from a record on that tape.

decibel. (1) A unit that expresses the ratio of two power levels on a logarithmic scale. (2) A unit for measuring relative power. The number of decibels is ten times the logarithm (base 10) of the ratio of

the measured power levels; if the measured levels are voltages (across the same or equal resistance), the number of decibels is 20 times the log of the ratio. Abbreviated dB. See also *circuit noise level, neper, power level.*

* **decimal.** (1) Pertaining to a characteristic or property involving a selection, choice, or condition in which there are ten possibilities. (2) Pertaining to the number representation system with a radix of ten. (3) See *binary-coded decimal notation.*

* **decimal digit.** In decimal notation, one of the characters 0 through 9.

* **decimal notation.** A fixed radix notation, where the radix is ten. For example, in decimal notation, the numeral 576.2 represents the number 5 x 10 squared plus 7 x 10 to the first power plus 6 X 10 to the zero power plus 2 x 10 to the minus 1 power.

* **decimal numeral.** A decimal representation of a number.

* **decimal point.** The radix point in decimal representation.

* **decision.** A determination of future action.

* **decision instruction.** An instruction that effects the selection of a branch of program, for example, a conditional jump instruction.

* **decision table.** A table of all contigencies that are to be considered in the description of a problem, together with the actions to be taken. Decision tables are sometimes used in place of flowcharts for problem description and documentation.

* **deck.** (1) A collection of punched cards. Synonymous with card deck. (2) See *tape deck.*

declare. In assembler programming, to identify the variable symbols to be used by the assembler at pre-assembly time.

* **decode.** To apply a set of unambiguous rules specifying the way in which data may be restored to a previous representation, for example, to reverse some previous encoding.

* **decoder.** (1) A device that decodes. (2) A matrix of logic elements that selects one or more output channels according to the combination of input signals present. (3) See *operation decoder.*

* **decollate.** To separate the plies of a multipart form or paper stock. Synonymous with deleave.

decrement. (1) The quantity by which a variable is decreased. (2) In some computers, a specific part

of an instruction word. (3) To decrease the value of a number.

dedicated channel option. A VM/370 virtual machine option that improves the performance of a virtual machine by bypassing address translation of virtual devices and VM/370 control program channel scheduling.

dedicated service. See *leased facility, private line.*

dedication. Pertaining to the assignment of a system resource -- an I/O device, a program, or a whole system -- to one application or purpose.

default value. The choice among exclusive alternatives made by the system when no explicit choice is specified by the user.

deferred entry. An entry into a subroutine that occurs as a result of a deferred exit from the program that passed control to it.

deferred exit. The passing of control to a subroutine at a time determined by an asynchronous event rather than at a predictable time.

* deferred maintenance. Maintenance specifically intended to eliminate an existing fault, which did not prevent continued successful operation of the device or program.

deferred restart. A restart performed by the system on resubmission of a job by the programmer. The operator submits the restart deck to the system through a system input reader. Contrast with *automatic restart.*

define the file. See *DTF macro instruction.*

degredation factor. A measure of the loss in performance that results from reconfiguration of a data processing system; for example, a slow-down in run time due to a reduction in the number of central processing units.

* DEL. The *delete character.*

* delay. The amount of time by which an event is retarded.

delay distortion. See *distortion.*

delay equalizer. A corrective network that is designed to make the phase delay or envelope delay of circuit or system substantially constant over a desired frequency range. See also *equalizer.*

* delay line. (1) A sequential logic element with one input channel and in which an output channel state at any one instant, T, is the same as the input

channel state at the instant T-N, where N is a constant interval of time for a given output channel, for example, an element in which the input sequence undergoes a delay of N time units. (2) See *acoustic delay line, electromagnetic delay line, magnetic delay line, sonic delay line.*

deleave. Same as *decollate.*

* delete character. A character used primarily to obliterate any erroneous or unwanted character. For example, on a punched tape, the delete character consists of perforations in all punching positions. Abbreviated DEL. Synonymous with erase character, rub-out character.

deletion record. A new record that will replace or remove an existing record of a master file.

delimiter. (1) * A flag that separates and organizes items of data. Synonymous with separator. (2) A character that groups or separates words or values in a line of input.

delimiter statement. A job control statement used to mark the end of data.

demand paging. In System/370 virtual storage systems, transfer of a page from external page storage to real storage at the time it is needed for execution.

demarcation strip. Usually a terminal board acting as a physical interface between the business machine and the common carrier. See also *interface.*

demodulation. The process of retrieving intelligence (data) from a modulated carrier wave; the reverse of modulation.

* demodulator. See *modulator demodulator.*

demount. To remove a volume from a tape unit or a direct access device.

* density. See *packing density, recording density.*

* description. See *problem description.*

* descriptor. In information retrieval, a word used to categorize or index information. Synonymous with keyword.

* design. See *functional design, logic design.*

destination code. A code in a message header containing the name of a terminal or application program to which the message is directed.

destination field. A field in a message header that contains the destination code.

destination queue. A queue on which messages bound for a particular destination are placed after being processed by the incoming group of the message handler.

destination station. A station to which a message is directed.

destructive cursor. On a CRT display device, a cursor that erases any character through which it passes as it is advanced, backspaced, or otherwise moved. Contrast with *nondestructive cursor*.

* **destructive read.** A read process that also erases the data from the source.

* **detail file.** Same as *transaction file*.

* **development time.** That part of operating time used for debugging new routines or hardware.

device. (1) A mechanical, electrical, or electronic contrivance with a specific purpose. (2) * See *input device, mass storage device, output device, storage device*.

* **device control character.** A control character intended for the control of ancillary devices associated with a data processing or telecommunication system, usually for switching devices "on" or "off", for example, DC1.

device control unit. A hardware device that controls the reading, writing, or display of data at one or more input/output devices or terminals. See also *transmission control unit*.

device independence. The ability to request I/O operations without regard for the characteristics of specific types of input/output devices. See also *symbolic I/O assignment*.

device number. (1) The reference number assigned to any external device. (2) A part of an external page address that refers to a particular paging device. In OS/VS2, together with a group number and a slot number, it identifies the location of a page in external page storage. In VM/370, together with a cylinder number and a page number, it identifies the location of a page in external page storage.

device type. The general name for a kind of device; for example, 2311, 2400, 2400-1. See also *group name, unit address*.

D format. A data set format in which ASCII records are variable in length.

DFT. Diagnostic function test.

* **diagnostic.** Pertaining to the detection and isolation of a malfunction or mistake.

diagnostic function test. A program to test overall system reliability. Abbreviated DFT.

diagnostic routine. A program that facilitates computer maintenance by detection and isolation of malfunctions or mistakes.

* **diagram.** See *block diagram, data flow diagram, functional diagram, logic diagram, setup diagram, Venn diagram*.

dial exchange. An exchange where all subscribers can originate calls by dialing.

dial line. Same as *switched line*.

dial pulse. An interruption in the dc loop of a calling telephone. The interruption is produced by the breaking and making of the dial pulse contacts of a calling telephone when a digit is dialed. The loop current is interrupted once for each unit of value of the digit.

dialing. Establishing a connection, through common communication lines, between a central computing system and a remote terminal. See also *calling*.

dial-up. The use of a dial or pushbutton telephone to initiate a station-to-station telephone call.

dial-up terminal. A terminal on a switched line.

dibit. A group of two bits. In four-phase modulation, each possible dibit is encoded as one of four unique carrier phase shifts. The four possible states for a dibit are 00, 01, 10, and 11.

* **dichotomizing search.** A search in which an ordered set of items is divided into two parts, one of which is rejected, and the process is repeated on the accepted part until the items with the desired property are found.

dictionary. (1) * See *relocation dictionary*. (2) See *external symbol dictionary*.

* **differential analyzer.** (SC1). An analog computer using interconnected integrators to solve differential equations.

* **differential gear.** In analog computers, a mechanism that relates the angles of rotation of three shafts, usually designed so that the algebraic sum of the rotation of two shafts is equal to twice the rotation of the third. A differential gear can be used for addition or subtraction.

* **differentiator.** A device whose output function is proportional to the derivative of the input function with respect to one or more variables, for example, a resistance-capacitance network used to select the leading and trailing edges of a pulse signal.

* **digit.** (1) A symbol that represents one of the non-negative integers smaller than the radix. For example, in decimal notation, a digit is one of the characters from 0 to 9. Synonymous with numeric character. (2) See *binary digit, check digit, decimal digit, equivalent binary digits, sign digit, significant digit.*

digital. (1) Pertaining to the use of discrete integral numbers in a given base to represent all the quantities that occur in a problem or a calculation. (2) * (SC1) Pertaining to data in the form of digits. (3) * Contrast with *analog.*

* **digital computer.** (1) (SC1) 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.*

digital data. Information represented by a code consisting of a sequence of discrete elements.

* **digital differential analyzer.** (1) (SC1) An incremental computer in which the principal type of computing unit is a digital integrator whose operation is similar to the operation of an integrating mechanism. (2) A differential analyzer that uses digital representations for the analog quantities. Abbreviated DDA.

digital signal. A discrete or discontinuous signal; one whose various states are discrete intervals apart.

* **digitize.** To use numeric characters to express or represent data. For example, to obtain from an analog representation of physical quantity a digital representation of the quantity.

* **digit place.** In positional representation, the site where a symbol such as a digit is located in a word representing a number. Synonymous with symbol rank.

* **digit punch.** A punch in rows 1, 2...9 of a punched card.

dimension. In assembler programming, the maximum number of values that can be assigned to a SET symbol representing an array.

* **diminished radix complement.** Same as *radix-minus-one complement.*

diode. An electronic device used to permit current flow in one direction and to inhibit current flow in the other.

direct access. (1) Retrieval or storage of data by a reference to its location on a volume, rather than relative to the previously retrieved or stored data. (2) * Pertaining to the process of obtaining data from, or placing data into, storage where the time required for such access is independent of the location of the data most recently obtained or placed in storage. (3) * Pertaining to a storage device in which the access time is effectively independent of the location of the data. (4) * Synonymous with random access (1). (5) Contrast with *serial access.*

direct access application. A type of computing system application in which master records are normally processed and interrogated in a random (nonsequential) order.

direct access storage device. A device in which the access time is effectively independent of the location of the data. Abbreviated DASD.

* **direct address.** An address that specifies the location of an operand. Synonymous with one-level address. Contrast with *indirect address.*

direct control feature. An optional feature of System/360 and System/370 that provides a means of exchanging control signals between one computing system and another under program control.

direct data set. A data set whose records are in random order on a direct access volume. Each record is stored or retrieved according to its actual address or its address relative to the beginning of the data set. Contrast with *sequential data set.*

direct distance dialing. A telephone exchange service that enables the telephone user to call subscribers outside of his local area without operator assistance. Abbreviated DDD. See also *area code, numbering plan.*

* **direct insert subroutine.** Same as *open subroutine.*

direct system output writer. A job scheduler function that controls the writing of a job's output data sets directly to an output device during execution of the job.

* **direction.** See *flow direction.*

director. Equipment in common carrier telegraph message switching systems, used to make cross-office selection and connection from input line

to output line equipment in accordance with addresses in the message.

direct organization. In DOS, a file organization in which, for purposes of storage and retrieval, there is a direct relationship between the contents of the records and their addresses on disk storage. See also *indexed-sequential organization, sequential organization.*

directory. (1) An index that is used by a control program to locate one more blocks of data that are stored in separate areas of a data set in direct access storage. (2) In DOS and DOS/VS, an index that is used by the system control and service programs to locate one or more sequential blocks of program information that are stored on direct access storage.

directory file. In VM/370, a disk file that defines the virtual machine configuration of each user.

direct-point repeater. A telegraph function in which the receiving relay controlled by the signals received over a line repeats corresponding signals directly into another line or lines without the interposition or any other repeating or transmitting apparatus.

disabled. (1) Pertaining to a state of the central processing unit that prevents the occurrence of certain types of interruptions. Synonymous with masked. (2) In communications, pertaining to a state in which a transmission control unit cannot accept incoming calls on a line.

disabled page fault. In OS/VS and VM/370, a page fault that occurs when I/O and external interruptions are disallowed by the CPU.

* **disaster dump.** A dump made when a nonrecoverable program error occurs.

disconnect mode. In VM/370, the state of a virtual machine that does not have a physical line or terminal connected as an operator console.

disconnect (release). In communications, to disengage the apparatus used in a connection and to restore it to its ready condition when not in use.

disconnect signal. A signal transmitted from one end of a subscriber line or trunk to indicate at the other end that the established connection is to be disconnected.

* **discrete.** (SC1) Pertaining to distinct elements or to representation by means of distinct elements, such as characters.

* **discrete programming.** Same as *integer programming (2).*

disk. (1) Loosely, a *disk storage device.* (2) See *magnetic disk.*

disk monitor system. An operating system for the IBM 1130 Computing System.

Disk Operating System. A disk resident programming system that provides operating system capabilities for 16K and larger System/360 and System/370 computing systems. Abbreviated DOS.

disk pack. A removable direct access storage volume containing magnetic disks on which data is stored. Disk packs are mounted on a disk storage drive, such as the IBM 2311 Disk Storage Drive. See also *disk storage module.*

disk storage. Storage on direct access devices that record data magnetically on rotating disks.

disk storage module. A nonremovable assembly of magnetic disks serviced by two access mechanisms.

dismount. See *demount.*

dispatch. To place into execution.

dispatching. The act of scheduling a task for execution.

dispatching priority. A number assigned to tasks, used to determine the order in which they will use central processing unit in a multitask situation. See also *limit priority.*

displacement. Same as *relative address.*

* **display.** (1) A visual presentation of data. (2) See *cathode ray tube display.*

display character generator. On a CRT display device, a hardware unit that converts the digital code for a character into signals that cause the electron beam to create the character on the screen.

display cycle. On a CRT display device, the sequence of movements of an electron beam needed to create a display image once.

display field. On an IBM 3270 Display Station, an area in the display buffer, and on the screen, that contains a set of characters manipulated or operated upon as a unit.

display line. On a display device, the series of character locations that constitute a horizontal line on the display surface. Synonymous with character row.

display position. On a display device, the series of character locations that constitute a vertical line on the display surface.

* display tube. A tube, usually a cathode ray tube, used to display data.

* dissector. See *image dissector.*

* distance. See *hamming distance, signal distance.*

distortion. The unwanted change in waveform that occurs between two points in a transmission system. The six major forms of distortion are:

bias. A type of telegraph distortion resulting when the significant intervals of the modulation do not all have exactly their theoretical durations.

characteristic. Distortion caused by transients which, as a result of the modulation, are present in the transmission channel and depend on its transmission qualities.

delay. Distortion occurring when the envelope delay of a circuit or system is not constant over the frequency range required for transmission.

end. distortion of start-stop teletypewriter signals. The shifting of the end of all marking pulses from their proper positions in relation to the beginning of the start pulse.

fortuitous ("jitter"). A type of telegraph distortion which results in the intermittent shortening or lengthening of the signals. This distortion is entirely random in nature and can be caused by battery fluctuations, hits on the line, power induction, etc.

harmonic. The resultant presence of harmonic frequencies (due to nonlinear characteristics of a transmission line) in the response when a sinusoidal stimulus is applied.

distributing frame. A structure for terminating permanent wires of a telephone central office, private branch exchange, or private exchange and for permitting the easy change of connections between them by means of crossconnecting wires.

distribution cable. A branch off a feeder cable.

distribution entry. Under TCAM, an entry in the terminal table associated with a distribution list.

distribution list. Under TCAM, a list of terminals, each of which is to receive any message directed to the group.

* DLE. The *data link escape character.*

DLT. Data *loop transceiver.*

* document. (1) A medium and the data recorded on it for human use, for example, a report sheet, a book. (2) By extension, any record that has permanence and that can be read by man or machine.

* documentation. (1) The creating, collecting, organizing, storing, citing, and disseminating of documents, or the information recorded in documents. (2) A collection of documents or information on a given subject.

* document reference edge. In character recognition, a specified document edge with respect to which the alignment of characters is defined.

dormant state. In OS/VS and VM/370, a state in which the active pages of a job have been paged-out.

DOS. *Disk Operating System.*

DOS/VIDEO/370. The IBM Visual Data Entry Online System that runs on System/360 and System/370 computing systems under DOS; it allows online key entry of source data to disk storage through local or remote IBM 3270 Information Display System terminals, eliminating all unit record operations.

DOS volume statistics. A facility that monitors and records the number of temporary read and write errors on currently assigned tape volumes. This facility has two options, error statistics by tape volume (ESTV) and error volume analysis (EVA).

dot cycle. One cycle of a periodic alternation between two signaling conditions, each condition having unit duration. In teletypewriter applications, one dot cycle is a successive mark and a space. Telegraph transmission is sometimes considered in terms of dot cycles per second or dot speed, which is half the speed of transmission as expressed in bauds.

* double precision. Pertaining to the use of two computer words to represent a number.

* double pulse recording. The magnetic recording of bits such that each storage cell is composed of two regions magnetized in opposite polarity with unmagnetized regions on each end. A zero may be represented by a cell composed of a negative region followed by a positive region, and a one by a positive region followed by a negative region, or vice versa.

double punch. More than one numeric punch in any one column of a punched card.

double rail logic. Pertaining to self-timing asynchronous circuits in which each logic variable is represented by two electrical lines which together can take on three meaningful states -- zero, one, and undecided.

doubleword. A contiguous sequence of bits or characters that comprises two computer words and is capable of being addressed as a unit.

downtime. The time interval during which a device is malfunctioning.

downward reference. In an overlay structure, a reference made from a segment to a segment lower in the path, that is, farther from the root segment.

drive. See *tape drive*.

drop (subcriber's). The line from a telephone cable to a subscriber's building.

drop in. The reading of a spurious signal whose amplitude is greater than a predetermined percentage of the nominal signal.

drop out. (1) In magnetic tape a recorded signal whose amplitude is less than a predetermined percentage of a reference signal. (2) In data transmission, a signal received due to the effect of noise or system malfunction.

drum. See *magnetic drum*.

drum storage. A direct access storage device that records data magnetically on a rotating cylinder. A type of addressable auxiliary storage associated with some computers.

dry contact. That part of a circuit containing only contact points and resistive components.

dry reed contact. An encapsulated switch consisting of two metal wires which act as the contact points for a relay.

DS. *Data set (2)*.

DSE. *Data set extension*.

DSNAmE. *Data set name*.

DSS. *Dynamic support system*.

DTF (define the file) macro instruction. Under BPS, BOS, TOS, and DOS, a macro instruction that describes the characteristics of a logical file, indicates the type of processing for the file, and specifies the main storage areas and routines to be used.

dual operation. Of any logic operation, another whose result is the negation of the result of the original operation when applied to the negation of its operands. It is represented by writing 0 for 1 and 1 for 0 in the tabulated values of the statements for the original operation. For example, the OR operation is the dual of the AND operation.

dummy. Pertaining to the characteristic of having the appearance of a specified thing but not having the capacity to function as such. For example, a dummy character, dummy plug, or a dummy statement.

dummy control section. A control section that an assembler can use to format an area of storage without producing any object code. Synonymous with dummy section.

dummy section. Same as *dummy control section*.

dump. (1) To copy the contents of all or part of a storage, usually from an internal storage into an external storage. (2) A process as in (1). (3) The data resulting from the process as in (1). (4) See *change dump, disaster dump, dynamic dump, postmortem dump, selective dump, snapshot dump, static dump*.

duodecimal. (1) Pertaining to a characteristic or property involving a selection, choice, or condition in which there are twelve possibilities. (2) Pertaining to the numeration system with a radix of twelve.

duplex. In communications, pertaining to a simultaneous two-way independent transmission in both directions. Contrast with *half duplex*. Synonymous with full duplex.

duplex channel. A channel providing simultaneous transmission in both directions.

duplexed system. In communications, a system with two distinct and separate sets of facilities, each of which is capable of assuming the system function while the other assumes a standby status. Usually, the sets are identical.

duplicate. To copy so that the result remains in the same physical form as the source. For example, to make a new punched card with the same pattern of holes as an original punched card. Contrast with *copy*.

duplication check. A check based on the consistency of two independent performances of the same task.

duplication factor. In assembler programming, a value that indicates the number of times that the

data specified immediately following the duplication factor is to be generated.

* **dyadic boolean operator.** A boolean operator having two operands. The dyadic boolean operators are AND, equivalence, exclusion, exclusive OR, inclusion, NAND, NOR, OR.

* **dyadic operation.** An operation on two operands.

dynamic address translation. (1) In System/370 virtual storage systems, the change of a virtual storage address to a real storage address during execution of an instruction. See also *address translation.* (2) A hardware feature that performs the translation. Abbreviated DAT.

dynamic allocation. Assignment of system resources to a program at the time the program is executed rather than at the time it is loaded into main storage. See also *dynamic storage allocation.*

dynamic area. (1) In the System/360 Operating System, that portion of main storage that is subdivided into regions or partitions for use by programs that perform job steps and system tasks. The dynamic area is all storage between the supervisor queue area and the link pack area. Contrast with fixed area. (2) In OS/VS, the portion of virtual storage that is divided into regions or partitions that are assigned to job steps and system tasks. See also *pageable dynamic area, nonpageable dynamic area.*

dynamic data set definition. The process of defining a data set and allocating auxiliary storage space for it during job step execution rather than before job step execution.

dynamic device reconfiguration. A facility that allows a demountable volume to be moved, and repositioned if necessary, without abnormally terminating the job or repeating the initial program load procedure. Abbreviated DDR.

dynamic dispatching. In OS/VS2 and VM/370, a facility that assigns priorities to tasks within an automatic priority group to provide optimum use of CPU and I/O resources.

* **dynamic dump.** A dump that is performed during the execution of a computer program.

* **dynamic programming.** In operations research, a procedure for optimization of a multistage problem solution wherein a number of decisions are available at each stage of the process. Contrast with *convex programming, integer programming, linear programming, mathematical programming, nonlinear programming, quadratic programming.*

* **dynamic storage.** A device storing data in a manner that permits the data to move or vary with time such that the specified data are not always available for recovery. Magnetic drum and disk storage are permanent dynamic storage. An acoustic delay line is a volatile dynamic storage.

* **dynamic storage allocation.** A storage allocation technique in which the location of computer programs and data is determined by criteria applied at the moment of need.

* **dynamic subroutine.** A subroutine in skeletal form with regard to certain features, such as the number of repetitions, decimal point position, or item size, that are selected or adjusted in accordance with the data processing requirements.

dynamic support system. An interactive debugging facility that allows authorized maintenance personnel to monitor and analyze events and alter data. Abbreviated DSS.

E

* **EAM.** *Electrical accounting machine.*

EAX. *Electronic Automatic Exchange.*

EBCDIC. *Extended binary coded decimal interchange code.*

ECB. *event control block.*

ECC. Error checking and correction.

* **echo check.** A method of checking the accuracy of transmission of data in which the received data are returned to the sending end for comparison with the original data.

echo suppressor. A line device used to prevent energy from being reflected back (echoed) to the transmitter. It attenuates the transmission path in one direction while signals are being passed in the other direction.

EC mode. *Extended control mode.*

ECT. *Environment control table.*

* **edge.** See *document reference edge, stroke edge.*

* **edit.** To modify the form or format of data, for example, to insert or delete characters such as page numbers or decimal points.

edit mode. In systems with time sharing, an entry mode under the EDIT command that accepts successive subcommands suitable for modifying an existing line data set or file.

* **EDP.** *Electronic data processing.*

* **effective address.** The address that is derived by applying any specified indexing or indirect addressing rules to the specified address and that is actually used to identify the current operand.

effective speed. Speed (less than rated) that can be sustained over a significant span of time and that reflects slowing effects of control codes, timing codes, error detection, retransmission, tabbing, hand keying, etc.

* **effector.** See *format effector.*

* **electrical accounting machine.** Pertaining to data processing equipment that is predominantly electromechanical such as a keypunch, mechanical sorter, collator, and tabulator. Abbreviated EAM.

* **electromagnetic delay line.** A delay line whose operation is based on the time of propagation of electromagnetic waves through distributed or lumped capacitance and inductance.

electronic automatic exchange. The General Telephone Company term for electronic telephone exchange equipment. Abbreviated EAX.

* **electronic data processing.** (1) (SC1) Data processing largely performed by electronic devices. (2) Pertaining to data processing equipment that is predominately electronic, such as an electronic digital computer. Abbreviated EDP.

electronic switching system. Bell System's electronic switching center for central office functions. Abbreviated ESS.

* **electrostatic storage.** A storage device that stores data as electrostatically charged areas on a dielectric surface.

* **element.** See *binary element, combinational logic element, logic element, sequential logic element, threshold element.*

* **eleven-punch.** A punch in the second row from the top, on a Hollerith punched card. Synonymous with X-punch.

* **EM.** The *end of medium character.*

* **embossment.** (1) A distortion of the surface of a document. (2) In character recognition, the distance between the undistorted surface of a

document and a specified part of a printed character.

* **emergency maintenance.** Maintenance specifically intended to to eliminate an existing fault, which makes continued production work unachievable.

* **emergency maintenance time.** Time, usually unscheduled, used to perform emergency maintenance.

* **emulate.** To imitate one system with another such that the imitating system accepts the same data, executes the same programs, and achieves the same results as the imitated system. Contrast with *simulate.*

emulation. The use of programming techniques and special machine features to permit a computing system to execute programs written for another system. Contrast with *simulation.*

emulator. (1) * A device or computer program that emulates. (2) The combination of programming techniques and special machine features that permits a given computing system to execute programs written for another system. See also *integrated emulator.*

emulator generation. The process of assembling and link-editing an emulator program into an operating system during system generation.

enabled. (1) Pertaining to a state of the central processing unit that allows the occurrence of certain types of interruptions. Synonymous with interruptable. (2) In communications, pertaining to the state in which a transmission control unit can accept incoming calls on a line.

enabled page fault. A page fault that occurs when I/O and external interruptions are allowed by the CPU.

* **encode.** To apply a set of unambiguous rules specifying the way in which data may be represented such that a subsequent decoding is possible. Synonymous with code (6).

* **end-around carry.** A carry from the most significant digit place to the least significant digit place.

end distortion. See *distortion.*

end of address. (1) One or more control characters transmitted on a line to indicate the end of non-text characters (for example, addressing characters). (2) Under TCAM, a character that must be placed in a message if the system is to route that message to several destinations. The character must

immediately follow the last destination code in the message header. Abbreviated EOA.

end of block. A code that marks the end of a block of data. Abbreviated EOB.

end office. A class 5 office of a local telephone exchange where a subscriber's loop terminates. See also *central office, exchange, exchange classes, local central office.*

end-of-file mark. A code which signals that the last record of a file has been read. Abbreviated EOF.

* **end of medium character.** A control character that may be used to identify the physical end of the data medium, or end of the used, or wanted, portion of information recorded on a data medium. The position of this character does not necessarily correspond to the physical end of the data medium. Abbreviated EM.

end of message. The specific character or sequence of characters that indicates the termination of a message or record. Abbreviated EOM.

* **end of tape marker.** A marker on a magnetic tape used to indicate the end of the permissible recording area, for example, a photo-reflective strip, a transparent section of tape, or a particular bit pattern.

* **end of text character.** A communication control character used to indicate the end of a text. Abbreviated ETX.

end of transmission. The specific character, or sequence of characters, that indicates termination of sending.

* **end of transmission block character.** A communication control character used to indicate the end of a block of data where data are divided into blocks for transmission purposes. Abbreviated ETB.

* **end of transmission character.** A communication control character used to indicate the conclusion of a transmission, which may have included one or more texts and any associated headings. Abbreviated EOT.

end point. On a display device, the coordinates on the display surface to which a display writer is to be moved.

end-to-end test. As used by the Bell System, a test utilizing the 900-series test equipment. It requires Bell maintenance personnel at each end of the circuit.

energy level diagram. A line drawing that shows increases and decreases of electrical power along a channel of signal communication.

* **engineering.** See *automatic control engineering.*

* **ENQ.** The *enquiry character.*

* **enquiry character.** A communication control character intended for use as a request for a response from a remote station. The response may include station identification and, if required, the type of equipment in service and station status. Abbreviated ENQ.

entering. The process in which a terminal places on the line a message to be transmitted to the computer. Contrast with *accepting.* See also *receiving, sending.*

enterprise number. A unique telephone exchange number that permits the called party to be automatically billed for incoming calls. Synonynous with toll-free number.

* **entry conditions.** The initial data and control conditions to be satisfied for successful execution of a given routine.

entry name. A name within a control section that defines an entry point and can be referred to by any control section.

* **entry point.** In a routine, any place to which control can be passed.

entry symbol. (1) An ordinary symbol that represents an entry name or control section name. (2) See also *external symbol.*

environmental recording, editing, and printing. See *EREP.*

environment control table. Under TSO, a control block that contains information about the user's environment in the foreground region. Abbreviated ECT.

environment record. Under TCAM, a record of the total telecommunications environment at a single point in time.

EOA. *End of address.*

EOB. *End of block.*

EOF. *End of file mark.*

EOM. *End of message.*

* **EOT.** The *end of transmission character.*

EOV. End of volume.

EQ. Equal to. See *relational operator*.

equalization. Compensation for the attenuation (signal loss) increase with frequency. Its purpose is to produce a flat frequency response while the temperature remains constant.

equalizer. Any combination (usually adjustable) of coils, capacitors, or resistors inserted in a transmission line or amplifier circuit to improve its frequency response. See also *delay equalizer*.

* **equipment.** See *data terminal equipment, peripheral equipment*.

* **equivalence.** A logic operator having the property that if P is a statement, Q is a statement, R is a statement, ..., then the equivalence of P,Q,R,..., is true if and only if all statements are true or all statements are false.

* **equivalent binary digits.** The number of binary digits required to express in binary notation a number expressed in another number representation system. For example, approximately 3 1/3 times the number of decimal digits is required to express a decimal numeral as a binary numeral.

equivalent four-wire system. A transmission system using frequency division to obtain full-duplex operation over only one pair of wires.

* **erase.** To obliterate information from a storage medium, for example, to clear, to overwrite.

* **erase character.** Same as *delete character*.

erase head. A device on a magnetic tape drive whose sole function is to erase previous information before writing new information.

EREP. The environmental recording, editing, and printing program that makes the data contained on the system recorder file available for further analysis.

ERP. *Error recovery procedures.*

ERR. *Error.*

error. (1) * Any discrepancy between a computed, observed, or measured quantity and the true, specified, or theoretically correct value or condition. (2) * See *absolute error, inherited error, rounding error, truncation error*. (3) * Contrast with *fault, malfunction, and mistake*. (4) See also *error condition*.

error condition. The state that results from an attempt to execute instructions in a computer program that are invalid or that operate on invalid data.

* **error burst.** In data transmission, a sequence of signals containing one or more errors but counted as only one unit in accordance with some specific criterion or measure. An example of a criterion is that if three consecutive correct bits follow an erroneous bit, then an error burst is terminated.

* **error control character.** Same as *accuracy control character*.

* **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.

* **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.

* **error message.** An indication that an error has been detected.

* **error range.** The difference between the highest and lowest error values.

error rate. A measure of quality of circuit or system; the number of erroneous bits or characters in a sample, frequently taken per 100,000 characters.

* **error ratio.** The ratio of the number of data units in error to the total number of data units.

error recovery procedures. Procedures designed to help isolate and, where possible, to recover from errors in equipment. The procedures are often used in conjunction with programs that record the statistics of machine malfunctions. Abbreviated ERP.

error statistics by tape volume. One of the two options of DOS volume statistics. With this option, the system collects data on tape errors by volume for any volumes used by the system. See also *error volume analysis*. Abbreviated ESTV.

error statistics by volume. In OS/360 and OS/VS, an optional facility that causes the system to collect

information about errors that occur on tape volumes when the volumes are open. Abbreviated ESV.

error volume analysis. One of the two options of DOS volume statistics. With this option, the system issues a message to the operator when a number of temporary read or write errors (specified by the user at system generation time) has been exceeded on a currently accessed tape volume. See also *error statistics by tape volume.* Abbreviated EVA.

* **ESC.** The *escape character.*

* **escape character.** A code extension character used with one or more succeeding characters to form an escape sequence which indicates by some convention that the succeeding characters are to be interpreted differently. Abbreviated ESC.

ESD. *External symbol dictionary.*

ESS. *Electronic switching system.*

ESTV. *Error statistics by tape volume.*

ESV. *Error statistics by volume.*

E-time. *Execution time.*

* **ETB.** *The end of transmission block character.*

* **ETX.** The *end of text character.*

EVA. *Error volume analysis.*

event. (1) * An occurrence or happening. (2) An occurrence of significance to a task; typically, the completion of an asynchronous operation, such as an input/output operation.

event control block. A control block used to represent the status of an event. Abbreviated ECB.

* **excess three code.** A binary coded decimal notation in which each decimal digit N is represented by the binary numeral of N plus 3.

excess sixty-four binary notation. In assembler programming, a binary notation in which each component of a floating-point number E is represented by the binary equivalent of E plus sixty-four.

exchange. A unit established by a communication common carrier for the administration of communication service in a specified area which usually embraces a city, town, or village and its environs. It consists of one or more central offices together with the associated equipment used in furnishing communication service. Synonymous with central office. See also *private automatic exchange,*

private automatic branch exchange, private branch exchange, trunk exchange.

exchange buffering. A technique using data chaining to avoid moving data in main storage, in which control of buffer segments and user program work areas is passed between data management and the user program.

exchange classes. Class 1 (see *regional center*), class 2 (see *sectional center*), class 3 (see *primary center*), class 4 (see *toll center*), class 5 (see *end office*).

exchange service. A service permitting interconnection of any two customers' stations through the use of the exchange service.

* **exclusion.** A logic operator having the property that if P is a statement and Q is a statement, then P exclusion Q is true if P is true and Q is false, false if P is false, and false if both statements are true. P exclusion Q is often represented by a combination of "AND" and "NOT" symbols, such as P∧~Q. Synonymous with NOT-IF-THEN.

* **exclusive OR.** A logic operator having the property that if P is a statement and Q is a statement, then P exclusive OR Q is true if either but not both statements are true, false if both are true or both are false. P exclusive OR Q is often represented by P⊕Q, P⊻Q. Contrast with *OR.*

exclusive reference. A reference between exclusive segments; that is, a reference from a segment in storage to an external symbol in a segment that will cause overlay of the calling segment.

exclusive segments. Segments in the same region of an overlay program, neither of which is in the path of the other. They cannot be in main storage simultaneously.

execute. To carry out an instruction or perform a routine.

execute (EXEC) statement. A job control language (JCL) statement that marks the beginning of a job step and identifies the program to be executed or the cataloged or in-stream procedure to be used.

execution time. The time during which an instruction is decoded and performed. See also *instruction time.* Abbreviated E-time.

* **executive routine.** A routine that controls the execution of other routines. Synonymous with supervisory routine.

expandor. A transducer that, for a given amplitude range of input voltages, produces a larger range of

output voltages. One important type of expandor employs the information from the envelope of speech signals to expand their volume range. See also *compandor, compressor.*

explicit address. An address reference that is specified as two absolute expressions. One expression supplies the value of a displacement. Both values are assembled into the object code of a machine instruction.

* **exponent.** In a floating-point representation, the numeral, of a pair of numerals representing a number, that indicates the power to which the base is raised.

expression. (1) A source-language combination of one or more operations. (2) In assembler programming, one or more operations represented by a combination of terms, and paired parentheses. (3) See *absolute expression, arithmetic expression, complex relocatable expression, relocatable expression.* (4) See also *character expression.*

extended area service. A telephone exchange service, without toll charges, that extends over an area where there is a community of interest in return for a somewhat higher exchange service rate.

extended binary coded decimal interchange code. A set of 256 characters, each represented by eight bits. Abbreviated EBCDIC. See also *binary coded decimal character code.*

extended control (EC) mode. A mode in which all the features of a System/370 computing system, including dynamic address translation, are operational. See also *basic control (BC) mode.*

extension. (1) Additional equipment on the same line and on the same premises, but at a location other than the main station. (2) Each telephone served by a private branch exchange.

extension station. An extra telephone set associated with a main telephone station by means of an extension on the same subscriber line and having the same call number designation as the associated main station. See also *main station.*

extent. A continuous space on a direct access storage device, occupied by or reserved for a particular data set.

external interruption. An interruption caused by a signal from the interruption key on the system console panel, from the timer, or from another computing system.

external merge. A sorting technique that reduces sequences of records or keys to one sequence, usually following one or more internal sorts.

external name. A name that can be referred to by any control section or separately assembled or compiled module; that is, a control section name or an entry name in another module.

external page address. An address that identifies the location of a page in a page data set. In OS/VS1 and DOS/VS, this address is computed from the page number each time a page is to be transferred between real storage and external page storage. In OS/VS2, the address consists of a relative device number, a relative group number, and a relative slot number. In VM/370, the address consists of a cylinder number, a device number, and a page number.

external page storage. In System/360 virtual storage systems, the portion of auxiliary storage that is used to contain pages.

external page storage management. In OS/VS, a set of routines in the paging supervisor that control external page storage.

external page table. In OS/VS2 and VM/370, an extension of a page table that identifies the location on external page storage of each page in that table. Abbreviated XPT.

external reference. (1) A reference to a symbol that is defined as an external name in another module. (2) An external symbol that is defined in another module; that which is defined in the assembler language by an EXTRN statement or by a V-type address constant, and is resolved during linkage editing. Abbreviated EXTRN. See also *weak external reference.*

external storage. Same as *auxiliary storage.*

external symbol. (1) A control section name, entry point name, or external reference that is defined or referred to in a particular module. (2) In assembler programming, an ordinary symbol that represents an external reference. (3) A symbol contained in the external symbol dictionary. (4) See also *entry symbol.*

external symbol dictionary. Control information, associated with an object or load module, that identifies the external symbols in the module. Abbreviated ESD.

extract. (1) * To choose from a set of items all those that meet some criteria, for example, to obtain certain specified digits from a machine word as controlled by an instruction or mask. (2) To

separate specific parts of a word from the whole word. (3) To remove specific items from a file.

* **extract instruction.** An instruction that requests the formation of a new expression from selected parts of given expressions.

EXTRN. *External reference.*

F

facility. (1) A feature of an operating system, designed to serve a particular purpose, for example, the checkpoint/restart facility. (2) A measure of how easy it is to use a data processing system. Together with system performance, a major factor on which the total productivity of an installation depends. (3) Anything used or available for use in furnishing communication service. Commonly, a general term for communications paths.

facsimile. 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. Abbreviated FAX.

facsimile-signal level. An expression of the maximum signal power or voltage created by the scanning of the subject copy as measured at any point in a facsimile system. According to whether the system employs positive or negative modulation, this will correspond to picture white or black respectively. The level may be expressed in decibels with respect to some standard value, such as 1 milliwatt or 1 volt.

* **factor.** See *scale factor.*

* **false add.** To form a partial sum, that is, to add without carries.

false retrievals. Library references that are not pertinent to, but are vaguely related to, the subject of the library search, and are sometimes obtained by automatic search methods.

far-end crosstalk. Crosstalk that travels along the disturbed circuit in the same direction as the signals in that circuit. To determine the far-end crosstalk between two pairs, 1 and 2, signals are transmitted on pair 1 at station A, and the crosstalk level is measured on pair 1 at station B.

fault. (1) * A physical condition that causes a device, a component, or an element to fail to perform in a required manner, for example, a short circuit, a broken wire, an intermittent connection. (2) * See *pattern sensitive fault, program sensitive fault.*   (3) See also *page fault.*

favored execution option. In VM/370, a virtual machine performance option that provides a specified portion of CPU time to a particular virtual machine.

FAX. *Facsimile.*

FCC. *Federal Communications Commission.*

FD (or FDX). *Full duplex. See duplex.*

FDM. *Frequency division multiplex.* See also *multiplexing.*

* **FE.** *format effector.*

Federal Communications Commission. A board of seven commissioners appointed by the President under the Communications Act of 1934, having the power to regulate all interstate and foreign electrical communication systems originating in the United States. Abbreviated FCC.

feedback. The return of part of the output of a machine, process, or system to the computer as input for another phase, especially for self-correcting or control purposes.

* **feedback loop.** The components and processes involved in correcting or controlling a system by using part of the output as input.

* **feedback system.** See *information feedback system.*

feeder cable. The principal cable from a central office.

feed holes. Holes punched in a paper tape to enable it to be driven by a sprocket wheel.

* **ferrite.** An iron compound frequently used in the construction of magnetic cores.

fetch. (1) * To locate and load a quantity of data from storage. (2) In OS/360, to obtain load modules from auxiliary storage and load them into main storage.   (3) In virtual storage systems, to bring load modules or program phases from auxiliary storage into virtual storage. (4) Under DOS and TOS, to bring a program phase into main storage from the core image library for immediate execution. (5) A control program routine that accomplishes (1), (2), (3), or (4). (6) The name of the macro instruction (FETCH) used to accomplish (1), (2), (3), or (4).   (7) See also *loader.*

fetch/load trace. Under DOS and TOS, a program that records information about phases and transients as they are called from the core image library. Abbreviated F/L trace.

fetch protection. A storage protection feature that determines right of access to main storage by matching a protection key, associated with a fetch reference to main storage, with a storage key, associated with each block of main storage. See also *store protection*.

* FF. *The form feed character.*

F format. A data set format in which logical records are the same length.

* Fibonacci number. An integer in the Fibonacci series.

* Fibonacci search. A dichotomizing search such that in each step of the search the original set or remaining subset is subdivided in accordance with successive smaller numbers in the Fibonacci series. If the number of items in the set is not equal to a Fibonacci number, the number of items in the set is assumed to equal the next higher Fibonacci number.

* Fibonacci series. A series of integers in which each integer is equal to the sum of the two preceding integers in the series. The series is formulated mathematically by $x_i = x_{i-1} + x_{i-2}$, where $x_0 = 0$, $x_1 = 1$, that is, 0, 1, 1, 2, 3, 5, 8, 13, 21...

field. (1) * In a record, a specified area used for a particular category of data, for example, a group of card columns used to represent a wage rate or a set of bit locations in a computer word used to express the address of the operand. (2) * See *common field*. (3) *See also display field.*

frame number. In OS/VS2, DOS/VS, and VM/370, the part of a real storage address needed to refer to a frame. See also *page number, segment number.*

fieldata code. A standardized military data transmission code, 7 data bits plus 1 parity bit.

field developed program. A licensed program that performs a function for the user. It may interact with program products, system control programming, or currently available type 1, type 2, or type 3 programs, or it may be a stand-alone program.

FIGS. *Figures shift.*

* figurative constant. A preassigned, fixed, character string with a preassigned, fixed, data name in a particular programming language.

figures shift. A physical shift in a teletypewriter that enables the printing of numbers, symbols, uppercase characters, etc. Abbreviated FIGS. See also *letters shift.*

* file. (1) 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, the 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. (2) See *detail file, inverted file, logical file, master file, transaction file.*

* file gap. An area on a data medium intended to be used to indicate the end of a file and, possibly, the start of another. A file gap is frequently used for other purposes, in particular, as a flag to indicate the end or beginning of some other group of data.

* file layout. The arrangement and structure of data in a file, including the sequence and size of its components. By extension, a file layout might be the description thereof.

* file maintenance. The activity of keeping a file up to date by adding, changing, or deleting data.

file protection. Prevention of the destruction of data recorded on a volume by disabling the write head of a unit.

* file separator. The information separator intended to identify a logical boundary between items called *files*. Abbreviated FS.

* fill. See *character fill, zerofill.*

* film. See *magnetic thin film, thin film.*

* filter. (1) A device or program that separates data, signals, or material in accordance with specified criteria. (2) A mask.

FINAC. Fast Interline Non-activate Automatic Control. A leased automatic teletypewriter system provided by AT & T.

first-generation computer. A computer utilizing vacuum tube components.

first-level message. Under TSO, a diagnostic message which identifies a general condition; more specific information is issued in a second-level message if the text is followed by a "+".

five-level code. A telegraph code that utilizes five impulses for describing a character. Start and stop elements may be added for asynchronous transmission. A common five-level code is Baudot.

fixed. In System/370 virtual storage systems, not capable of being paged-out.

fixed area. In OS/360, the area of main storage occupied by the resident portion of the control program (the nucleus).

fixed BLDL table. In OS/VS, a BLDL table that the user has specified to be fixed in the lower portion of real storage.

* fixed-cycle operation. An operation that is completed in a specified number of regularly timed execution cycles.

fixed-format messages. Messages in which line control characters must be inserted upon departure from a terminal and deleted upon arrival at a terminal; fixed-format messages are intended for terminals with dissimilar characteristics. Contrast with *variable-format messages*.

fixed-length record. A record having the same length as all other records with which it is logically or physically associated. Contrast with *variable-length record*. See also *F format*.

fixed link pack area. In OS/VS2, an extension of the link pack area that occupies fixed pages in the lower portion of real storage.

fixed page. In System/370 virtual storage systems, a page in real storage that is not to be paged-out.

* fixed-point part. In a floating-point representation, the numeral of a pair of numerals representing a number, that is the fixed point factor by which the power is multiplied.

* fixed-point representation. A positional representation in which each number is represented by a single set of digits, the position of the radix point being fixed with respect to one end of the set, according to some convention.

* fixed radix notation. A positional representation in which the significances of successive digit positions are successive integral powers of a single radix; when the radix is positive, permissible values of each digit range from zero to one less than the radix, and negative integral powers of the radix are used to represent fractions.

* fixed storage. storage whose contents are not alterable by computer instructions, for example, magnetic core storage with a lockout feature, photographic disk. Synonymous with nonerasable storage, permanent storage, read-only storage.

fixed word length computer. A computer in which data is treated in units of a fixed number of characters or bits.

* flag. (1) Any of various types of indicators used for identification, for example, a wordmark. (2) A character that signals the occurrence of some condition, such as the end of a word. (3) Synonymous with mark, sentinel, tag.

* flip-flop. A circuit or device containing active elements, capable of assuming either one of two stable states at a given time. Synonymous with toggle (1).

* floating-point base. In floating-point representation, the fixed positive integer that is the base of the power. Synonymous with floating-point radix.

* floating-point radix. Same as *floating-point base*.

* floating-point representation. A number representation system in which each number, as represented by a pair of numerals, equals one of those numerals times a power of an implicit fixed positive integer base where the power is equal to the implicit base raised to the exponent represented by the other numeral.

$$\underline{\text{Common Notation}}$$
$$0.0001234 \text{ or } (0.1234) \times (10^{-3})$$

$$\underline{\text{A}} \underline{\text{Floating-Point}} \underline{\text{Representation}}$$
$$1234 \text{ -03}$$

Contrast with *variable-point representation*.

* flow. See *bidirectional flow, normal direction flow, reverse direction flow*.

* flowchart. (1) (SC1) A graphical representation for the definition, analysis, or solution of a problem, in which symbols are used to represent operations, data, flow, equipment, etc. Contrast with *block diagram*. (2) See *data flowchart, programming flowchart*.

* flowchart symbol. (SC1) A symbol used to represent operations, data, flow, or equipment on a flowchart.

* flowchart text. The descriptive information that is associated with flowchart symbols.

* flow direction. (SC1) In flowcharting, the antecedent-to-successor relation, indicated by arrows or other conventions, between operations on a flowchart.

F/L trace. *Fetch/load trace*.

* flying spot scanner. In optical character recognition, a device employing a moving spot of light to scan a sample space, the intensity of the transmitted or reflected light being sensed by a photoelectric transducer.

folding. A technique used with the universal character set (UCS) feature to allow each of the 256 possible character codes to print some character on a chain or train with fewer graphics. For example, it allows the printing of uppercase graphics when lowercase graphics are not available in the character array.

* font. (1) A family or assortment of characters of a given size and style, for example, 9 point Bodoni Modern. (2) See *type font.*

* forbidden combination. A combination of bits or other representations that is not valid according to some criteria. Contrast with *illegal character.*

foreground. (1) In multiprogramming, the environment in which high-priority programs are executed. (2) Under TSO, the environment in which programs are swapped in and out of main storage to allow CPU time to be shared among terminal users. All command processor programs execute in the foreground. Contrast with *background.*

foreground-initiated background job. Under TSO, a job submitted from a remote terminal for scheduling and execution in the background.

foreground initiation. Under DOS and TOS, the execution of system routines that process operator commands to start a foreground program. See also *foreground initiator, single program initiator.*

foreground initiator. Under TOS, a program that is called into main storage to perform job control type functions for foreground programs not executing in batch job mode. See also *single program initiator.*

foreground job. (1) A high-priority job, usually a real-time job. (2) A teleprocessing or graphic display job that has an indefinite running time during which communication is established with one or more users at local or remote terminals. (3) Under TSO, any job executing in a swapped region of main storage, such as a command processor or a terminal user's program. Contrast with *background job.*

foreground message processing program. Under TSO, a problem program run in the foreground using the telecommunications access method (TCAM) to handle messages for one or more terminals.

* foreground processing. The automatic execution of the programs that have been designed to preempt the use of the computing facilities. Usually a real-time program. Contrast with *background processing.*

foreground program. (1) In multiprogramming, a high priority program. (2) Under TSO, a program executed in a swapped region of main storage.

foreground region. A region to which a foreground job is assigned.

foreign exchange service. A service that connects a customer's telephone to a telephone company central office normally not serving the customer's location.

* form. See *normalized form, standard form.*

* form feed character. A format effector that controls the movement of the printing position to the predetermined printing or display position on the next form, page, or equivalent. Abbreviated FF.

* formal logic. The study of the structure and form of valid argument without regard to the meaning of the terms in the argument.

* format. (1) The arrangement of data. (2) See *address format.*

* format effector. A control character intended to be used by a printing or display device for controlling the layout or position of information. Abbreviated FE. Synonymous with layout character.

formatted display. On an IBM 3270 Display Station, a display in which the attributes of one or more display fields have been defined by the user.

* FORTRAN. FORmula TRANslating system. A language primarily used to express computer programs by arithmetic formulas.

FORTRAN control characters. Same as *American National Standard control characters.*

fortuitous distortion. See *distortion.*

* four-address. Pertaining to an instruction format containing four address parts.

* four-plus-one-address. Pertaining to an instruction containing four operand addresses and one control address.

four-row keyboard. The keyboard in model 33 and 35 teletypewriter equipment. See also *three-row keyboard.*

four-wire circuit. A communication path in which four wires (two for each direction of transmission) are presented to the station equipment.

four-wire repeater. A telephone repeater for use in a four-wire circuit consisting of two amplifiers, one servicing one side or transmission direction of the four-wire circuit and the other servicing the second side of the four-wire circuit.

four-wire terminating set. An arrangement by which four-wire circuits are terminated on a two-wire basis for interconnection with two-wire circuits.

fox message. A standard message used for testing telegraph circuits and machines because it includes all the alphamerics as well as most of the function characters. The message is: THE QUICK BROWN FOX JUMPED OVER A LAZY DOG'S BACK 1234567890 (STATION NAME) SENDING.

fragmentation. See storage fragmentation.

frame. (1) * An area, one recording position long, extending across the width of a magnetic or paper tape perpendicular to its movement. Several bits or punched positions may be included in a single frame through the use of different recording positions across the width of the tape. (2) * See main frame. (3) See also page frame.

frame number. In System/370 virtual storage systems, the part of a real storage address needed to refer to a frame. See also page number, segment number.

frame rate. Same as regeneration rate.

frame table. See page frame table.

frame table entry. In System/370 virtual storage systems, an entry in the page frame table that describes how a frame is being used. Abbreviated FTE.

frame (type A). A distributing frame carrying on one side (horizontal) all outside lines, and on the other side (vertical) the terminations of the central office equipment and protective devices for them.

frame (type B). A distributing frame carrying on one side (vertical) all outside lines and protective devices for those lines, and on the other side (horizontal) all connections of the outside lines toward the central office equipment.

framing. The process of selecting the bit groupings representing one or more characters from a continuous stream of bits.

framing bits. Noninformation-carrying bits used to make possible the separation of characters in a bit stream. Synonymous with synch bits.

free routing. That method of traffic handling wherein messages are forwarded toward their destination over any available channel without depending on a predetermined routing plan.

frequency. Rate of signal oscillation in hertz.

frequency division multiplex. See multiplexing.

frequency-shift keying. Frequency modulation of a carrier by a modulating signal which varies between a fixed number of discrete values (a digital signal). Abbreviated FSK.

* FS. File separator.

FSK. Frequency-shift keying.

FTS. Federal Telecommunications System.

* full duplex. Same as duplex.

full speed. The top-rated speed of transmission equipment -- in transoceanic telegraph, 50 baud or 66+ wpm.

fullword. See computer word.

fully perforated tape. Perforated paper tape in which the perforations are complete -- that is, in which the punch makes a complete hole in the tape (as opposed to chadless tape, where the hole is not completely punched out).

* function. (1) A specific purpose of an entity or its characteristic action. (2) In communications, a machine action such as a carriage return or line feed.

* functional design. The specification of the working relations between the parts of a system in terms of their characteristic actions.

* functional diagram. A diagram that represents the functional relationships among the parts of a system.

function key. A terminal key, such as the attention key, that causes the transmission of a signal not associated with a printable character. Detection of the signal usually causes the system to perform some predefined function for the user.

* function table. (1) Two or more sets of data so arranged that an entry in one set selects one or more entries in the remaining sets, for example, a tabulation of the values of a function for a set of values of the variable, a dictionary. (2) A device constructed of hardware, or a subroutine, which can either decode multiple inputs into a single output or encode a single input into multiple outputs.

G

* **gap.** See *block gap, file gap, inter-record gap, record gap.*

gangpunch. To punch all or part of the information from one punched card into succeeding cards.

* **gate.** (1) A device having one output channel and one or more input channels, such that the output channel state is completely determined by the input channel states, except during switching transients. (2) A combinational logic element having at least one input channel. (3) An AND gate. (4) An OR gate.

GDG. *Generation data group.*

GE. Greater than or equal to. See *relational operator.*

* **gear.** See *differential gear.*

generalized supervisor calls trace. Under DOS and TOS, a program that records SVC interruptions as they occur. All or a selected group of SVCs can be traced. Abbreviated GSVC trace.

generalized trace facility. An optional OS/VS service program that records significant system events (such as supervisor calls and start I/O operations) for the purpose of problem determination. Abbreviated GTF.

* **general purpose computer.** (SC1) A computer that is designed to handle a wide variety of problems.

general purpose operating system. An operating system designed to handle a wide variety of computing system applications.

generalized sort/merge program. A program that is designed to sort or merge a wide variety of records in a variety of formats.

general register. A register used for operations such as binary addition, subtraction, multiplication, and division. General registers are used primarily to compute and modify addresses in a program.

generate. (1) * To produce a program by selection of subsets from a set of skeletal coding under the control of parameters. (2) To produce assembler language statements from the model statements of a macro definition when the definition is called by a macro instruction.

generation data group. A collection of data sets that are kept in chronological order; each data set is called a generation data set. Abbreviated GDG.

generation data set. One generation of a generation data group.

* **generator.** A controlling routine that performs a generate function, for example, report generator, I/O generator.

get. To obtain a record from an input file.

GIS. Generalized Information System. A set of generalized routines that can be used in conjunction with OS/360 to satisfy specific data requirements such as file maintenance, creation of data bases, and retrieval of management information. ..

GJP. *Graphic job processor.*

global. Pertaining to that part of an assembler program that includes the body of any macro definition called from a source module and the open code portion of the source module. Contrast with *local.*

global variable symbol. In assembler programming, a variable symbol that can be used to communicate values between macro definitions and between a macro definition and open code. Contrast with *local variable symbol.*

GM. *Group mark.*

* **graphic.** A symbol produced by a process such as handwriting, drawing, or printing.

* **graphic character.** A character normally represented by a graphic. Contrast with *control character.*

graphic display program. A program designed to display information, in graphic or alphameric form, on the face of a TV-like display tube.

graphic job processing. An optional feature of MFT and MVT that enables users at display units to quickly and conveniently define and start jobs that are processed under the operating system. The feature also allows interactive use of graphic display programs.

graphic job processor. a program that elicits job control information from a user as he selects and performs job control operations at an IBM 2250 Display Unit or an IBM 2260 Display Station. it interprets the information entered by the user and converts it into job control language. Abbreviated GJP. See also *satellite graphic job processor.*

graphic programming services. In OS/360 and OS/VS, a number of services provided for use in designing and executing programs that communicate with a user at an IBM 2250 Display Unit, or an IBM 2260 Display Station.

* **gray code.** A binary code in which sequential numbers are represented by binary expressions, each of which differs from the preceding expression in one place only. Synonymous with reflected binary code.

* **grid.** In optical character recognition, two mutually orthogonal sets of parallel lines used for specifying or measuring character images.

group. A word; in telegraph usage, arbitrarily six characters in length. See also *slot group.*

grouped records. Records combined into a unit to conserve storage space or reduce access time.

group indicate. The printing of indicative information from only the first record of group.

* **group mark.** A mark that identifies the beginning or end of a set of data, which could include words, blocks, or other items.

group name. A generic name for a collection of I/O devices, for example, DISK or TAPE. See also *device type, unit address.*

group number. In OS/VS2 and VM/370, a part of an external page address that refers to a slot group; together with a device number and a slot number it identifies the location of a page in external page storage.

* **group separator.** The information separator intended to identify a logical boundary between items called "groups". Abbreviated GS.

* **GS.** *Group separator.*

GSVC trace. *Generalized supervisor calls trace.*

GT. Greater than. See also *relational operator.*

GTF. *Generalized trace facility.*

H

* **half-adder.** A combinational logic element having two outputs, S and C, and two inputs, A and B, such that the outputs are related to the inputs according to the following table. (S denotes sum without carry, C denotes carry.)

Input		Output	
A	B	C	S
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

Two half-adders may be used for performing binary addition.

* **half-adjust.** To round by one-half of the maximum value of the number base of the counter.

* **half duplex.** In communications, pertaining to an alternate, one way at a time, independent transmission. Contrast with *duplex.*

half-speed. Half the top-rated speed of the associated equipment; in transoceanic telegraph, 25 baud or 33+ wpm.

* **halfword.** A contiguous sequence of bits or characters which comprises half a computer word and is capable of being addressed as a unit.

halt instruction. A machine instruction that stops the execution of the program.

* **hamming code.** A data code which is capable of being corrected automatically.

* **hamming distance.** Same as *signal distance.*

handshaking. Exchange of predetermined signals when a connection is established between two data set devices. See also *answerback.*

hard copy. A printed copy of machine output in a visually readable form; for example, printed reports, listings, documents, and summaries. See also *display (1).*

hardcopy log. In systems with multiple console support or a graphic console, a permanent record of system activity.

* **hardware.** (SC1) Physical equipment, as opposed to the computer program or method of use, for example, mechanical, magnetic, electrical, or electronic devices. Contrast with *software (2).*

* **hardware check.** Same as *automatic check.*

harmonic distortion. See *distortion.*

harmonic telephone ringer. A telephone ringer that responds only to alternating current within a very narrow frequency band. A number of such ringers, each responding to a different frequency, are used in one type of selective ringing where there are several parties on a subscriber's line.

* **Hartley.** A unit of information content, equal to one decadal decision, or the designation of one of ten possible and equally likely values or states.

hash total. A summation for checking purposes of one or more corresponding fields of a file that would ordinarily not be summed.

HASP. An extension to the System/360 Operating System that provides supplementary job management, data management, and task management functions such as control of job flow, ordering of tasks, and spooling.

HD or HDX. *Half duplex.*

* **head.** A device that reads, writes, records, or erases data on a storage medium, for example, a small electromagnet used to read, write, or erase data on a magnetic drum or tape, or the set of perforating, reading, or marking devices used for punching, reading, or printing on paper tape.

header. Same as *message header.*

* **header card.** A card that contains information related to the data in cards that follow.

header label. A file or data set label that precedes the data records on a unit of recording media.

header record. A record containing common, constant, or identifying information for a group of records that follows. Synonymous with header table.

header segment. A part of a message that contains any portion of the message header.

header table. Same as *header record.*

* **heading.** In ASCII and communications, a sequence of characters preceded by the start of heading character used as machine sensible address or routing information. Contrast with *text.*

hertz. A unit of frequency equal to one cycle per second. Abbreviated Hz.

* **heuristic.** Pertaining to exploratory methods of problem solving in which solutions are discovered by

evaluation of the progress made toward the final result. Contrast with *algorithm.*

hexadecimal. Pertaining to a number system with a base of 16; valid digits range from 0 through F, where F represents the highest units position (15). Synonymous with sexadecimal.

hierarchy. (1) * See *data hierarchy.* (2) See also *main storage hierarchy support.*

* **high-speed carry.** Any technique in parallel addition for speeding up carry propagation, for example, standing-on nines carry. Contrast with *cascaded carry.*

* **hit.** A successful comparison of two items of data. Contrast with *match.*

hit ratio. The ratio of the number of successful references to main storage to the total number of references.

hits. Momentary line disturbances which could result in mutilation of characters being transmitted.

hold page queue. In OS/VS and DOS/VS, a queue to which pages in real storage are initially assigned through operations such as page-in or page reclamation. See also *active page queue, available page queue.*

* **hole pattern.** A punching configuration within a card column that represents a single character of a character set.

home address. An address written on a direct access volume, denoting a track's address relative to the beginning of the volume.

home loop. An operation involving only those input and output units associated with the local terminal.

home record. The first record in a chain of records.

* **hopper.** See *card hopper.*

* **horizontal tabulation character.** A format effector that causes the printing or display position to be moved forward to the next of a series of predetermined positions along the same printing or display line. Abbreviated HT.

host computer. (1) The primary or controlling computer in a multiple computer operation. (2) A computer used to prepare programs for use on another computer or on another data processing system; for example, a computer used to compile, link edit, or test programs to be used on another system.

housekeeping. Operations or routines that do not contribute directly to the solution of the problem but do contribute directly to the operation of the computer.

* **HT.** The *horizontal tabulation character.*

human-oriented language. A programming language that is more like a human language than a machine language.

hunting. See *trunk hunting.*

hybrid coil. An arrangement using one or more transformers wired as a balanced bridge to provide two-to-four wire conversion for long distance telecommunication circuits.

* **hybrid computer.** (SC1) A computer for data processing using both analog representation and discrete representation of data.

hybrid integrated circuit. A class of integrated circuits wherein the substrate is a passive material such as ceramic and the active chips are attached to its surface.

* **hysteresis loop.** See *magnetic hysteresis loop.*

I

IBM 2361 Core Storage. Magnetic core storage that can be added to the processor storage of some System/360 computing systems. The core storage is an extension of and is addressed in the same way as processor storage. The number of bytes obtained per storage cycle, and all other features of 2361 storage except its 8-microsecond speed are the same as those of the processor storage of the system to which it is attached.

IBM System/360. A large collection of computing system devices that can be connected together in many combinations to produce a wide range of computing systems that share many characteristics, including a common machine language.

IBM System/360 Basic Programming Support. A group of independent programs designed primarily for 8K and 16K card and tape configurations. It provides an input/output control system and facilities for compiling, loading, system maintenance, and macro handling. The user builds a control program to suit his own processing requirements. Abbreviated BPS/360.

IBM System/370. An upward-compatible extension of the IBM System/360, offering new function and improved price/performance.

IBM System/360 Operating System. A comprehensive collection of control program options, language processors, I/O support, application programs, and service routines, designed to meet the needs of users who require the extensive facilities of a large operating system.

IBM System/360 Time Sharing System. A programming system that provides users with conversational online access to a computing system with one or more processing units and simultaneously processes batched jobs. Abbreviated TSS.

IBM Virtual Machine Facility. A time sharing system control program that consists of: (1) a control program that manages the resources of an IBM System/370 computing system in such a way that multiple remote terminal users have a functional simulation of a computing system (a virtual machine) at their disposal, and (2) the conversational monitor system. Abbreviated VM/370.

ICA. International Communication Association, formerly called Industrial Communication Association.

* **identifier.** A symbol whose purpose is to identify, indicate or name a body of data.

* **identity unit.** An N-input unit that yields a specified output signal only when all N-input signals are alike.

idle character. A character transmitted on a communications line that does not print or punch at the output component of the accepting terminal.

* **idle time.** That part of available time during which the hardware is not being used. Contrast with *operating time.*

* **IDP.** *Integrated data processing.*

* **IF-THEN.** Same as *inclusion.*

* **illegal character.** A character or combination of bits that is not valid according to some criteria, for example, with respect to a specified alphabet, a character that is not a member. Contrast with *forbidden combination.*

* **image.** See *card image.*

* **image dissector.** In optical character recognition, a mechanical or electronic transducer that sequentially detects the level of light intensity in

different areas of a completely illuminated sample space.

* **immediate access store.** A store whose access time is negligible in comparison with other operating times.

* **immediate address.** Pertaining to an instruction in which an address part contains the value of an operand rather than its address. Synonymous with zero-level address.

impedance. The combined effect of resistance, inductance, and capacitance on a signal at a particular frequency.

* **implication.** Same as *inclusion.*

implicit address. In assembler programming, an address reference that is specified as one absolute or relocatable expression. An implicit address must be converted into its explicit base-displacement form before it can be assembled into the object code of a machine instruction.

IMS/360. Information Management System. A general purpose system that enhances the capabilities of OS/360 for batch processing and teleprocessing. It allows users to access a computer-maintained data base through remote terminals.

inactive program. Under DOS and TOS, a program that is loaded but not ready to be executed, or a program that is not loaded.

inactive station. A station that is currently ineligible for entering or accepting messages.

incidental programming. Ideas, concepts, and techniques developed by IBM systems engineers in the course of their activities for a customer that may be of value to other customers and systems engineers. Original material that results from these activities belongs exclusively to the customer; however, the associated concepts and techniques may subsequently be used by IBM.

incident record. See *control record.*

* **inclusion.** A logic operator having the property that if P is a statement and Q is a statement, then P inclusion Q is false if P is true and Q is false, true if if P is false, and true if both statements are true. P inclusion Q is often represented by P>Q. Synonymous with IF-THEN, implication.

* **inclusive OR.** Same as *OR.*

inclusive reference. A reference between inclusive segments; that is, a reference from a segment in

main storage to an external symbol in a segment that will not cause overlay of the calling segment.

inclusive segments. Segments in the same region of an overlay program that are in the same path; they can be in main storage simultaneously.

incoming group. Under TCAM, that portion of a message handler that is designed to handle messages arriving for the message control program. Contrast with *outgoing group.*

incoming trunk. A trunk coming into a central office.

* **inconnector.** In flowcharting, a connector that indicates a continuation of a broken flowline. Contrast with *outconnector.*

* **incremental computer.** (1) (SC1) A computer in which incremental representation of data is mainly used. (2) A special purpose computer that is specifically designed to process changes in the variables as well as the absolute value of the variables.

* **incremental integrator.** A digital integrator modified so that the output signal is maximum negative, zero, or maximum positive when the value of the input is negative, zero, or positive.

* **incremental representation.** (1) (SC1) A method of representing a variable in which changes in the values of the variable are represented, rather than the values themselves. (2) See *binary incremental representation, iternary incremental representation.*

independent utility programs. A group of utility programs that support, but are not part of, the IBM System/360 Operating System. They are used chiefly by the system programmer to initialize and prepare direct access storage devices for use under operating system control.

index. (1) * An ordered reference list of the contents of a file or document, together with keys or reference notations for identification or location of those contents. (2) * To prepare a list as in (1). (3) * A symbol or a numeral used to identify a particular quantity in an array of similar quantities. For example, the terms of an array represented by X_1, X_2,..., X_{100} have the indexes 1, 2,..., 100, respectively. (4) * To move a machine part to a predetermined position, or by a predetermined amount, on a quantized scale. (5) In OS/360 data management, a table in the catalog structure used to locate data sets. (6) A table used to locate the records of an indexed sequential data set. (7) * See *index register.*

* **indexed address.** An address that is modified by the content of an index register prior to or during the execution of a computer instruction.

indexed sequential access method. See *basic indexed sequential access method, queued indexed sequential access method.*

indexed sequential data set. A data set in which each record contains a key that determines its location. The location of each record is computed through the use of an index.

indexed sequential organization. A file organization in which records are arranged in logical sequence by key. Indexes to these keys permit direct access to individual records.

indexing. A technique of address modification often implemented by means of index registers.

index register. (1) * A register whose content may be added to or subtracted from the the operand address prior to or during the execution of a computer instruction. (2) In assembler programming, a register whose contents are added to the operand or absolute address derived from a combination of a base address with a displacement.

indicator. A device that registers a condition in the computer.

indirect address. An address that specifies a storage location that contains either a direct address or another indirect address. Synonymous with multilevel address. Contrast with *direct address.*

induction coil. An apparatus for transforming a direct current by induction into an alternating current.

* **industrial data processing.** Data processing for industrial purposes.

* **infinite pad method.** In optical character recognition, a method of measuring reflectance of a paper stock such that doubling the number of backing sheets of the same stock will not change the measured reflectance.

* **infix notation.** A method of forming mathematical expressions by alternating single operands and operators. These expressions are defined by rules of operator precedence and by parentheses. An operator performs its indicated function upon its adjacent terms. In infix notation, the expression "a plus b multiplied by c" would be represented as (a+b)xc. Contrast with *prefix notation.*

* **information.** (SC1) The meaning that a human assigns to data by means of the known conventions used in their representation.

* **information bits.** In telecommunications, those bits which are generated by the data source and which are not used for error control by the data transmission system.

* **information feedback system.** In telecommunications, an information transmission system that uses an echo check to verify the accuracy of the transmission.

* **information processing.** (SC1) Same as *data processing.*

* **information retrieval.** (SC1) The methods and procedures for recovering specific information from stored data.

information retrieval system. A computing system application designed to recover specific information from a mass of data.

* **information separator.** A control character intended to identify a logical boundary of information. The name of the separator does not necessarily indicate what it separates. Abbreviated IS.

* **information theory.** The branch of learning concerned with the likelihood of accurate transmission or communication of messages subject to transmission failure, distortion, and noise.

* **inherited error.** An error carried forward from a previous step in a sequential process.

* **inhibiting signal.** A signal that prevents an operation from taking place.

in-house. See *in-plant system.*

* **initialize.** To set counters, switches, and addresses to zero or other starting values at the beginning of, or at prescribed points in, a computer routine. Synonymous with prestore.

initial program load. The initialization procedure that causes an operating system to commence operation. Abbreviated IPL.

* **initial program loader.** The procedure that causes the initial part of an operating system or other program to be loaded such that the program can then proceed under its own control. Contrast with *bootstrap.* Abbreviated IPL.

initiating task. The job management task that controls the selection of a job and the preparation of the steps of that job for execution.

initiator/terminator. The job scheduler function that selects jobs and job steps to be executed, allocates input/output devices for them, places them under task control, and at completion of the job, supplies control information for writing job output on a system output unit.

* **ink.** See *magnetic ink.*

inline processing. The processing of data in random order, not subject to preliminary editing or sorting.

inner macro instruction. A macro instruction that is nested inside a macro definition. Contrast with *outer macro instruction.*

in-plant system. A system whose parts, including remote terminals, are all situated in one building or localized area.

* **input.** (1) Pertaining to a device, process, or channel involved in the insertion of data or states, or to the data or states involved. (2) One, or a sequence of, input states. (3) Same as *input device.* (4) Same as *input channel.* (5) Same as *input process.* (6) Same as *input data.* (7) See *manual input, real time input.*

* **input area.** An area of storage reserved for input. Synonymous with input block.

* **input block.** Same as *input area.*

input blocking factor. In a tape sort, the number of data records in each record of the input file. Abbreviated B.

* **input channel.** A channel for impressing a state on a device or logic element. Synonymous with input (4).

* **input data.** Data to be processed. Synonymous with input (6).

* **input device.** The device or collective set of devices used for conveying data into another device. Synonymous with input (3).

input job queue. Same as *input work queue.*

input job stream. Same as *input stream.*

input mode. Under TSO, an entry mode that accepts successive lines of input under the EDIT command for a line data set. The lines are not checked for the presence of subcommands.

input/output. (1) * Pertaining to either input or output, or both. (2) A general term for the equipment used to communicate with a computer, commonly called I/O. (3) The data involved in such communication. (4) The media carrying the data for input/output.

input/output control system. Under BOS, BPS, DOS, and TOS, a group of routines provided by IBM for handling the transfer of data between main storage and auxiliary storage devices. Abbreviated IOCS. See also *physical IOCS* and *logical IOCS.*

input/output interruption. See *I/O interruption.*

* **input process.** (1) The process of receiving data by a device. (2) The process of transmitting data from peripheral equipment, or external storage, to internal storage. (3) Synonymous with input (5).

input queue. Same as *input work queue.*

input reader. See *reader (2).*

* **input state.** The state occurring on a specified input channel.

input stream. The sequence of job control statements and data submitted to an operating system on an input unit especially activated for this purpose by the operator. Synonymous with input job stream, job input stream.

input stream control. Same as *JES reader.*

input work queue. In OS/360 and OS/VS, a queue (waiting list) of job definitions in direct access storage assigned to a job class and arranged in order of assigned priority. Synonymous with input queue, input job queue, job queue.

inquiry. A request for information from storage, for example; a request for the number of available airline seats, or a machine statement to initiate a search of library documents.

inquiry and transaction processing. A type of teleprocessing application in which inquiries and records of transactions received from a number of terminals are used to interrogate or update one or more master files maintained by the central system.

* **inquiry station.** Data terminal equipment used for inquiry into a data processing system.

installation. A particular computing system, in terms of the work it does and the people who manage it, operate it, apply it to problems, service it, and use the results it produces.

* **installation time.** Time spent in installing and testing either hardware, or software, or both, until they are accepted.

in-stream procedure. A set of job control statements placed in the input stream that can be used any number of times during a job by naming the procedure in an execute (EXEC) statement.

instruction. (1) * A statement that specifies an operation and the values or locations of its operands. (2) * See *computer instruction, decision instruction, extract instruction, logic instruction, machine instruction, macro instruction, repetition instruction.* (3) See *assembler instruction, conditional assembly instruction.*

* **instruction address.** The address that must be used to fetch an instruction. Contrast with *address part.*

* **instruction code.** Same as *operation code.*

* **instruction control unit.** In a digital computer, those parts that effect the retrieval of instructions in proper sequence, the interpretation of each instruction, and the application of the proper signals to the arithmetic unit and other parts in accordance with this interpretation.

* **instruction counter.** A counter that indicates the location of the next computer instruction to be interpreted.

instruction format. The allocation of bits or characters of a machine instruction to specific functions.

* **instruction register.** A register that stores an instruction for execution.

* **instruction repertoire.** The set of operations that can be represented in a given operation code.

instruction statement. See *instruction (1).*

instruction time. The time during which an instruction is fetched from the main storage of a computer into an instruction register. Abbreviated I-time. See also *execution time.*

* **integer programming.** (1) In operations research, a class of procedures for locating the maximum or minimum of a function subject to constraints, where some or all variables must have integer values. Contrast with *convex programming, dynamic programming, linear programming, mathematical programming, nonlinear programming, quadratic programming.* (2) Loosely, *discrete programming.*

integral boundary. A location in main storage at which a fixed-length field, such as a halfword or doubleword, must be positioned. The address of an integral boundary is a multiple of the length of the field, in bytes. See also *boundary alignment.*

integrated adapter. An integral part of a central processing unit that provides for the direct connection of a particular type of device and uses neither a control unit nor the standard I/O interface. See also *integrated communications adapter, integrated file adapter.*

integrated circuit. A combination of interconnected circuit elements inseparably associated on or within a continuous substrate. See *monolithic integrated circuit, hybrid integrated circuit.*

integrated communications adapter. An integrated adapter that allows connection of multiple communication lines to a processing unit.

* **integrated data processing.** (SC1) Data processing in which the coordination of data acquisition and all other stages of data processing is achieved in a coherent system, for example, a business data processing system in which data for orders and buying are combined to accomplish the functions of scheduling, invoicing, and accounting. Abbreviated IDP.

integrated emulator. An emulator program whose execution is controlled by an operating system in a multiprogramming environment. Contrast with *standalone emulator.*

integrated file adapter. An integrated adapter that allows connection of multiple disk storage devices to a processing unit.

* **integrating motor.** A motor designed to give a constant ratio of output shaft rotational speed to input signal. The angle of rotation of the shaft with respect to a datum is proportional to the time integral of the applied signal.

* **integrator.** (1) A device whose output function is proportional to the integral of the input function with respect to a specified variable, for example, a watt-hour meter. (2) See *incremental integrator.*

integrity. Preservation of data or programs for their intended purpose.

* **intelligence.** See *artificial intelligence.*

interaction. The acceptance by a system of a line of input from a terminal, processing of the line, and a return of data, if any, to the terminal. See also *interaction time.*

interaction time. In systems with time sharing, the time between acceptance by the system of a line of input from a terminal and the point at which it can accept the next line from the terminal. Contrast with *response time.*

interactive. Pertaining to an application in which each entry elicits a response, as in an inquiry system or an airline reservation system. An interactive system may also be conversational, implying a continuous dialog between the user and the system.

* interblock gap. Same as *block gap*.

intercepted station. Under TCAM, a station to which no messages may be sent. An intercepted station can enter messages -- only messages sent to that station are stopped.

intercepting. Routing of a call or message placed for a disconnected or nonexistent telephone number or terminal address to an operator position or to a specially designated terminal.

intercepting trunk. A trunk to which a call for a vacant number or changed number or a line out of order is connected for action by an operator.

intercept operator. The operator who, in the intercept service, requests the number called, determines the reason for the intercept, and relays the information to the calling party.

intercommunicating system. A privately owned system without a switchboard capable of two-way communication, normally limited to a single unit, building, or plant. Stations may or may not be equipped for originating a call, but they can answer any call.

interexchange channel. A channel connecting two different exchange areas.

* interface. A shared boundary. An interface might be a hardware component to link two devices or it might be a portion of storage or registers accessed by two or more computer programs.

* interleave. To arrange parts of one sequence of things or events so that they alternate with parts of one or more other sequences of things or events and so that each sequence retains its identity, for example, to organize storage into banks with independent busses so that sequential data references may be overlapped in a given period of time.

interleaving. (1) The act of accessing two or more bytes or streams of data from distinct storage units simultaneously. (2) The alternating of two or more operations or functions through the overlapped use of a computer facility.

interlock. To prevent a machine or device from initiating further operations until the operation in process is completed.

intermediate distributing frame. In a local central office, a distributing frame, that cross-connects subscriber lines to the subscriber line circuit. (In a private branch exchange, its purpose is similar.) Abbreviated IDF.

intermediate total. In telegraph usage, the result when a summation is terminated by a change of group that is neither the most nor the least significant.

* internal storage. Addressable storage directly controlled by the central processing unit of a digital computer.

International Organization for Standardization. An organization established to promote the development of standards to facilitate the international exchange of goods and services, and to develop mutual cooperation in areas of intellectual, scientific, technological, and economic activity. Abbreviated ISO.

International Telecommunication Union. The specialized telecommunications agency of the United Nations, established to provide standardized communications procedures and practices, including frequency allocation and radio regulations on a worldwide basis. Abbreviated ITU.

interoffice trunk. A direct trunk between local central offices in the same exchange.

internal sort. A sorting technique that creates sequences of records or keys. Usually, it is a prelude to a merge phase in which the sequences created are reduced to one by an external merge.

* interpreter. (1) A computer program that translates and executes each source language statement before translating and executing the next one. (2) A device that prints on a punched card the data already punched in the card.

* interpreting. Printing on paper tape or cards the meaning of the holes punched on the same tape or cards.

* interpretive code. The instruction repertoire for the source language input to an interpreter (1).

interpretive routine. A routine that decodes instructions written as pseudo codes and immediately executes those instructions, as contrasted with a compiler which decodes the pseudo codes and produces a machine-language routine to be executed at a later time.

* inter-record gap. Same as *record gap*.

interrupt. (1) * To stop a process in such a way that it can be resumed. (2) In data transmission, to take an action at a receiving station that causes the transmitting station to terminate a transmission.

interruptable. Same as *enabled.*

interruption. A break in the normal sequence of instruction execution. It causes an automatic transfer to a preset storage location where appropriate action is taken. See also *external interruption, I/O interruption, machine check interruptions, program check interruption, SVC interruption.*

interruption network. A network of circuits in a computing system that continuously monitors its operation. The network detects events that normally require intervention and direction by the supervisor, and initiates interruptions.

* **interstage punching.** A mode of card punching such that the odd or even numbered card columns are used.

intertoll trunk. A trunk between toll offices in different telephone exchanges.

invalid exclusive reference. An exclusive reference in which a common segment does not contain a reference to the symbol used in the exclusive reference.

invalid page. In System/370 virtual storage systems, a page that cannot be directly addressed by the dynamic address translation feature of the central processing unit.

* **invert.** To change a physical or logical state to its opposite.

* **inverted file.** (1) In information retrieval, a method of organizing a cross-index file in which a keyword indentifies a record. The items, numbers, or documents pertinent to that keyword are indicated. (2) A file whose sequence has been reversed.

invitation. The process in which a computer makes contact with a terminal in order to give the terminal the opportunity to transmit a message if it has one ready; forms of invitation include polling and enabling.

invitation list. Under TCAM, a sequence of polling characters or identification sequences associated with the stations on line; the order in which the characters are specified determines the order in which the stations are invited to enter a message.

invitation to send. A Western Union term for a character sequence sent to an outlying

teletypewriter terminal that polls its tape transmitter. See also *transmitter start code, polling.* Abbreviated ITS.

inward WATS. A telephone service similar to WATS but applicable to incoming calls. See also *WATS.*

* **I/O.** *input/output.*

I/O appendage. A user-written routine that provides additional control over I/O operations during channel program operations.

I/O area. Same as *buffer (3).*

IOCS. *Input/output control system.*

I/O interruption. An interruption caused by the termination of an I/O operation or by operator intervention at the I/O device.

IPL. (1) * *Initial program loader.* (2) *Initial program load.*

* **IS.** An *information separator.*

ISAM. *Indexed sequential access method.*

* **ISO.** *International Organization for Standardization.*

* **item.** (1) In general, one member of a group. For example, a record may contain a number of items, such as fields or groups of fields; a file may consist of a number of items, such as records; a table may consist of a number of items, such as entries. (2) A collection of related characters treated as a unit.

iterate. To repeatedly execute a loop or series of steps, for example, a loop in a routine.

ITF: BASIC. A simple, algebra-like language designed for ease of use at a terminal.

ITF: PL/I. A conversational subset of PL/I designed for ease of use at the terminal.

I-time. *Instruction time.*

ITS. *Invitation to send.*

ITU. *International Telecommunication Union.*

J

jack. A connecting device to which a wire or wires of a circuit may be attached and which is arranged for the insertion of a plug.

JCL. *Job control language.*

JECS. *Job entry central services.*

JEPS. *Job entry peripheral services.*

JES. *Job entry subsystem.*

JES reader. In OS/VS1, the part of the job entry subsystem that controls the input stream and its associated job control statements. Synonymous with input stream control.

JES writer. In OS/VS1, the part of the job entry subsystem that controls the output of specified data sets. Synonymous with output stream control.

job. (1) * A specified group of tasks prescribed as a unit of work for a computer. By extension, a job usually includes all necessary computer programs, linkages, files, and instructions to the operating system. (2) A collection of related problem programs, identified in the input stream by a JOB statement followed by one or more EXEC and DD statements. (3) See also *batched job, background job, foreground job, terminal job.*

job accounting interface. Under DOS, a function that accumulates, for each job step, accounting information that can be used for charging usage of the system, planning new applications, and supervising system operation more efficiently.

job accounting table. Under DOS, an area in the supervisor where accounting information is accumulated for the user.

job batch. A succession of job definitions that are placed one behind another to form a batch. Each job batch is placed on an input device and processed with a minimum of delay between one job or job step and another.

job class. Any one of a number of job categories that can be defined under an MFT or MVT control program configuration. By classifying jobs and directing initiator/terminators to initiate specific classes of jobs, it is possible to control the mixture of jobs that are performed concurrently.

job control. Under DOS and TOS, a program that is called into storage to prepare each job or job step to be run. Some of its functions are to assign I/O devices to symbolic names, set switches for program use, log (or print) job control statements, and fetch the first phase of each job step.

job control language. A programming language used to code job control statements. Abbreviated JCL.

* **job control statement.** A statement in a job that is used in identifying the job or describing its requirements to the operating system.

job definition. A series of job control statements that define a job.

job entry central services. In OS/VS1, the part of the job entry subsystem that provides centralized storage and retrieval of: (1) system input and output data for each job, (2) control tables representing jobs, thus forming a queue of work, and (3) job tables used during job execution. Abbreviated JECS.

job entry peripheral services. In OS/VS1, the part of the job entry subsystem that schedules and performs reader and writer operations. Abbreviated JEPS.

job entry subsystem. In OS/VS1, a system facility for spooling, job queueing, and managing the scheduler work area. Abbreviated JES.

job input device. A device assigned by the operator to read job definitions and any accompanying input data.

job input file. A data file (or data set) consisting of a series of job definitions and accompanying data.

job input stream. Same as *input stream.*

job library. A set of user-identified, partitioned data sets used as the primary source of load modules for a given job.

job management. A general term that collectively describes the functions of job scheduling and command processing.

jobname. The name assigned to a JOB statement; it identifies the job to the system.

job-oriented terminal. A terminal designed for a particular application.

job output device. A device assigned by the operator for common use in recording output data for a series of jobs.

job output file. A data file (or data set) consisting of output data produced by a series of jobs.

job output stream. Same as *output stream.*

job pack area. Under MVT and OS/VS2, the two subpools in a region into which executable programs are loaded.

job priority. Under MVT and OS/VS2, a value assigned to a job that, together with an assigned job

class, determines the priority to be used in scheduling the job and allocating resources to it.

job processing. The reading of job control statements and data from an input stream, the initiating of job steps defined in the statements, and the writing of system output messages.

job queue. Same as *input work queue*.

job scheduler. Under OS/360, the part of the control program that reads and interprets job definitions, schedules the jobs for processing, initiates and terminates the processing of jobs and job steps, and records job output data.

job (JOB) statement. The job control statement that identifies the beginning of a job. It contains such information as the name of the job, an account number, and the class and priority assigned to the job.

job step. (1) * The execution of a computer program explicitly identified by a job control statement. A job may specify that several job steps be executed. (2) A unit of work associated with one processing program or one cataloged procedure and related data. A job consists of one or more job steps.

job step initiation. The process of selecting a job step for execution and allocating input/output devices for them.

job step restart. Same as *step restart*.

job step task. A task that is initiated by an initiator/terminator in the job scheduler in accordance with specifications in an execute (EXEC) statement. In an MVT control program configuration, a job step task can initiate any number of other tasks.

job stream. See *input stream, output stream*.

job support task. A task that reads and interprets job definitions or converts job input and output data from one input/output medium to another.

JPA. *Region job pack area*.

* **jump.** (1) A departure from the normal sequence of executing instructions in a computer. Synonymous with transfer (1). (2) See *conditional jump*.

justification. The act of adjusting, arranging, or shifting digits to the left or right, to fit a prescribed pattern.

* **justify.** (1) To adjust the printing positions of characters on a page so that the lines have the desired length and that both the left and right hand margins are regular. (2) By extension, to shift the contents of a register so that the most or the least significant digit is at some specified position in the register. Contrast with *normalize*. (3) See *left-justify, right-justify*.

K

k. Kilo; 1000 in decimal notation.

K. 1024 bytes; used in referring to storage capacity.

* **Karnaugh map.** In logic design, a rectangular diagram of a logic function of variables drawn with overlapping subrectangles such that each intersection of overlapping subrectangles represents a unique combination of the logic variables and such that an intersection is shown for all combinations.

key. (1) * One or more characters within an item of data that are used to identify it or control its use. (2) * See *actual key, search key*. (3) In sorting, same as *control word*.

keyboard. A device for the encoding of data by key depression, which causes the generation of the selected code element.

keyboard send/receive. A combination teletypewriter transmitter and receiver with transmission capability from keyboard only. Abbreviated KSR.

key click. Transient pulses or surges on a transmission line set up by the opening or closing of contacts.

key-click filter. A filter that attenuates the surges produced each time the keying circuit contacts of a transmitter are opened or closed.

keying. The forming of signals, such as those employed in telegraph transmission, by the interruption of a direct current or modulation of a carrier between discrete values of some characteristics.

keying chirps. Sounds accompanying code signals when the transmitter is unstable and shifts slightly in frequency each time the sending key is closed.

keying wave. The emission that takes place in telegraph communication while the information portions of the code characters are being transmitted. Synonymous with marking wave.

key pulse. Same as *pushbutton dialing.*

* **keypunch.** A keyboard actuated device that punches holes in a card to represent data.

keyword. (1) One of the significant and informative words in a title or document that describe the content of that document. (2) A symbol that identifies a parameter. (3) A part of a command operand that consists of a specific character string (such as DSNAME =). (4) * Same as *descriptor.*

keyword parameter. A parameter that consists of a keyword, followed by one or more values. See also *positional parameter.*

KSR. Keyboard send/receive.

KWIC. Keyword in context.

KWOC. Keyword out of context.

L

label. (1) * One or more characters used to idenfify a statement or an item of data in a computer program. (2) An identification record for a tape or disk file. (3) In assembler programming, a name entry. (4) See also *entry name, magnetic tape label, name, symbol.*

label cylinder. Same as *label information cylinder.*

label information cylinder. Under DOS, a cylinder of the system residence file that stores label information read from job control statements or commands. Synonymous with label cylinder.

* **laced card.** A punched card that has a lace-like appearance, usually without information content.

* **lag.** The delay between two events.

landline facilities. Facilities of domestic communications common carriers that are within continental United States.

* **language.** (1) A set of representations, conventions, and rules used to convey information. (2) See *algorithmic language, artificial language, command language, machine language, natural language, object language, problem oriented language, procedure oriented language, programming language, source language, target language.*

language statement. A statement that is coded by a programmer, operator, or other user of a computing system, to convey information to a processing program such as a language translator or service program, or to the control program. A language statement may request that an operation be performed or may contain data that is to be passed to the processing program.

language subset. A part of a language that can be used independently of the rest of the language.

language translator. A general term for any assembler, compiler, or other routine that accepts statements in one language and produces equivalent statements in another language.

large capacity storage. An optional extension to processor storage. Abbreviated LCS. See also IBM 2361 Core Storage.

* **latency.** The time between the completion of the interpretation of an address and the start of the actual transfer from the addressed location. Latency includes the delay associated with access to storage devices such as magnetic drums and delay lines.

* **layout.** See *file layout, record layout.*

layout character. Same as *format effector.*

LCB. Line control block.

LCS. Large capacity storage.

LE. Less than or equal to. See *relational operator.*

* **leader.** The blank section of tape at the beginning of a reel of tape.

* **leapfrog test.** A check routine that copies itself through storage.

* **learning.** See *machine learning.*

leased facility. A facility reserved for sole use of a single leasing customer. See also *private line service.*

* **left-justify.** (1) To adjust the printing positions of characters on a page so that the left margin of the page is regular. (2) By extension, to shift the contents of a register so that the most significant digit is at some specified position of the register. Contrast with *normalize.*

* **length.** See *block length, record length, word length.*

* **letter.** A graphic, which, when used alone or combined with others, represents in a written language one or more sound elements of the spoken

language; diacritical marks used alone and punctuation marks are not letters.

letters shift. A physical shift in a teletypewriter that enables the printing of alphabetic characters. Also, the name of the character that casues this shift. See also *figures shift.* Abbreviated LTRS.

* **level.** The degree of subordination in a hierarchy.

level compensator. An automatic gain control device used in the receiving equipment of a telegraph circuit.

* **LF.** *The line feed character.*

librarian. Under DOS and TOS, the set of programs that maintains, services, and organizes the system and private libraries.

library. (1) * A collection of organized information used for study and reference. (2) * A collection of related files. For example, one line of an invoice may form an item, a complete invoice may form a record, the 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. (3) * See *program library.* (4) In OS/360 and OS/VS, any partitioned data set. (5) See *job library, link library, private library.*

library macro definition. A macro definition stored in a program library;for example, the IBM-supplied supervisor and data management macro definitions. See also *source macro definition.*

* **library routine.** A proven routine that is maintained in a program library.

light pen attention. An interruption generated by a light pen when it senses light on the screen of a CRT display device. Synonymous with selector pen attention.

light pen tracking. The process of tracing the movement of a light pen across the screen of a CRT display device.

* **light stability.** In optical character recognition, the resistance to change of color of the image when exposed to radiant energy.

limit priority. In OS/VS2 and MVT, (and under MFT with subtasking), a priority specification associated with every task in a multitask operation, representing the highest dispatching priority that the task may assign to itself or to any of its subtasks.

line. (1) On a terminal, one or more characters entered before a return to the first printing or display position. (2) A string of characters accepted by the system as a single block of input from a terminal, for example, all characters entered before a carriage return or all characters entered before the terminal user hits the attention key. (3) In communications, same as channel, circuit. (4) * See *acoustic delay line, character spacing reference line, delay line, electromagnetic delay line, magnetic dealy line, sonic delay line.*

line adapter. An IBM modem that is a feature of a particular device. See also *data set (2), modem.*

* **linear optimization.** Same as *linear programming.*

* **linear programming.** (1) (SC1) In operations research, a procedure for locating the maximum or minimum of a linear function of variables that are subject to linear constraints. (2) Synonymous with linear optimization. Abbreviated LP.

line control. The scheme of operating procedures and control signals by which a telecommunications system is controlled.

line control block. In systems with TCAM, an area of main storage containing control information for operations on a line; one is maintained for each line in the system. Abbreviated LCB.

line data set. In systems with time sharing, a data set with logical records that are printable lines.

line deletion character. A terminal character that specifies that all characters are to be deleted from a line of terminal input.

* **line feed character.** A format effector that causes the printing or display position to be moved to the next printing or display line. Abbreviated LF.

line group. A set of one or more communication lines of the same type, over which terminals with similar characteristics can communicate with the computer.

line hit. An electrical interference causing the introduction of spurious signals on a circuit.

line impedance. The impedance of a transmission line. It is a function of the resistance, inductance, conductance, and capacitance of the line, and the frequency of the signal. Synonymous with characteristic impedance.

line level. The signal level in decibels (or nepers) at a particular position on a transmission line.

line load. Usually a percentage of maximum circuit capability to reflect actual use during a span of time;

for example, peak hour line load. Synonymous with circuit load.

line loop. An operation performed over a communication line from an input unit at one terminal to output units at a remote terminal.

line loop resistance. The metallic resistance of the local loop. Synonymous with loop resistance.

line noise. Noise originating in a transmission line.

line number. (1) A number associated with a line in a printout or display. (2) In systems with time sharing, a number associated with a line in a line data set.

line number editing. In systems with time sharing, a mode of operation under the EDIT command in which lines to be modified are referred to by line number.

* line printer. A device that prints all characters of a line as a unit. Contrast with *character printer*.

* line printing. The printing of an entire line of characters as a unit.

line relay. A relay activated by the signals on a line.

line stretcher. An impedance matching device for coaxial transmission lines.

line switching. A communications switching system that completes a circuit from sender to receiver at the time of transmission, as opposed to message switching. See also *step-by-step switch*. Synonymous with circuit switching.

* link. See *communication link*.

* linkage. In programming, coding that connects two separately coded routines.

linkage editor. A processing program that prepares the output of language translators for execution. It combines separately produced object or load modules; resolves symbolic cross references among them; replaces, deletes, and adds control sections, and generates overlay structures on request; and produces executable code (a load module) that is ready to be fetched into main storage.

link library. A partitioned data set from which load modules are fetched when they are referred to in execute (EXEC) statements and in ATTACH, LINK, LOAD, and transfer control (XCTL) macro instructions.

link pack area. (1) Under MVT, an area of main storage containing reenterable routines from system

libraries. Their presence in main storage saves loading time when one is needed. (2) In OS/VS2, an area of virtual storage containing reenterable routines that are loaded at IPL time and can be used concurrently by all tasks in the system. Abbreviated LPA.

link pack area directory. In OS/VS2, a directory that contains an entry for each entry point in link pack area modules.

link pack area extension. Under TSO, an extension of the link pack area containing system routines used only when TSO is operating. It is loaded when TSO is started by the operator.

link pack area library. In OS/VS2, a partitioned data set that contains the modules specified to be in the link pack area.

link pack area queue. In OS/VS2, a queue that contains a contents directory entry for each link pack area module currently in use, for each module in the link pack update area, and for each module in the fixed link pack area.

link pack update area. In OS/VS2, an area in virtual storage containing modules that are additions to or replacements for link pack area modules for the current IPL.

list. (1)* An ordered set of items. (2) To print every relevant item of data. (3)* See *chained list, pushdown list, pushup list*.

listing. A printout, usually prepared by a language translator, that lists the source language statements and contents of a program.

* list processing. A method of processing data in the form of lists. Usually, chained lists are used so that the logical order of items can be changed without altering their physical locations.

literal. A symbol or a quantity in a source program that is itself data, rather than a reference to data. Contrast with *figurative statement*.

literal pool. n area of storage into which an assembler assembles the values of the literals specified in a source module.

literature search. A systematic and exhaustive search for published material on a specific subject and, usually, the preparation of abstracts on that material.

* load. In programming, to enter data into storage or working registers.

load. (1) * In programming, to enter data into storage or working registers. (2) In OS/360 and OS/VS, to bring a load module from a partitioned data set into main storage for execution. (3) In DOS, to bring a program phase from a core image library into main storage for execution.

* load-and-go. An operating technique in which there are no stops between the loading and execution phases of a program, and which may include assembling or compiling.

loader. (1) A processing program that combines the basic editing and loading functions of linkage editor and program fetch in one job step. It accepts object modules and load modules created by the linkage editor and generates executable code directly in main storage. The loader does not produce load modules for program libraries. (2) Under DOS, a supervisor routine that retrieves program phases from the core image library and loads them into main storage. See also relocating loader. (3) * See initial program loader.

loading. Adding inductance (load coils) to a transmission line to minimize amplitude distortion. See also lumped loading.

load map. A map containing the main (or real) storage addresses of control sections and entry points of a program loaded into main (or real) storage.

* load mode. In some variable-word-length computers, data transmission such that certain delimiters are moved with the data. Contrast with move mode.

load module. The output of the linkage editor; a program in a format suitable for loading into main storage for execution.

load module library. A partitioned data set that is used to store and retrieve load modules. See also object module library, source module library.

load point. The beginning of the recording area on a reel of magnetic tape.

local. In assembler programming, pertaining to that part of a program that is either the body of any macro definition called from a source module or the open code portion of the source module.

local central office. A central office arranged for terminating subscriber lines and provided with trunks of establishing connections to and from other central offices. See also central office, end office.

local channel. In private line services, that portion of a channel within an exchange that is provided to connect the main station with an interexchange channel.

local loop. A channel connecting the subscriber's equipment to the line-terminating equipment in the central office exchange.

local service area. The area containing the telephone stations that a flat rate customer may call without incurring toll charges.

local station. A station whose control unit is connected directly to a computer data channel. Contrast with remote station.

local system queue area. (1) Under TSO, a portion of the foreground (swapped) region used for control blocks that are to be swapped out along with a terminal job. (2) In OS/VS2, one or more segments associated with each virtual storage region that contain job-related system control blocks. Abbreviated LSQA.

local variable symbol. In assembler programming, a variable symbol that can be used to communicate values inside a macro definition or in the open code portion of a source module. Contrast with global variable symbol.

locate mode. A way of providing data by pointing to its location instead of moving it. See also move mode, substitute mode.

location. (1) * Any place in which data may be stored. (2) * See protected location. (3) Contrast with address.

location counter. A counter whose value indicates the address of data assembled from a machine instruction or a constant, or the address of an area of reserved storage, relative to the beginning of a control section.

* locking. Pertaining to code extension characters that change the interpretation of an unspecified number of following characters. Contrast with non-locking.

lock mode. Under TCAM, a mode in which the connection between a terminal and an application program is maintained for the duration of a message and its response.

lockout. (1) In a telephone circuit controlled by an echo-suppressor, the inability of one or both subscribers to get through because of either excessive local circuit noise or continuous speech from one subscriber. (2) In data communications, to place unaddressed terminals on a multipoint line in control state so that they will not receive transmitted data. See also blink, polling, selection.

(3) In multiprocessing, a programming technique used to prevent access to ciritical data by both central processing units at the same time.

lock/unlock facility. In OS/VS2, a supervisor facility that controls the execution of instruction strings when a disabled page fault occurs.

logger. A device that automatically records physical processes with respect to time.

* **logic.** See *double rail logic, formal logic, symbolic logic.*

* **logical add.** Same as *OR (1).*

logical expression. In assembler programming, a conditional assembly expression that is a combination of logical terms, logical operators, and paired parentheses.

* **logical file.** A collection of one or more logical records.

logical IOCS. A comprehensive set of macro instruction routines provided to handle creation, retrieval, and maintenance of data files.

* **logical multiply.** Same as *AND.*

logical operator. In assembler programming, an operator or pair of operators that can be used in a logical expression to indicate the action to be performed on the terms in the expression. The logical operators are AND, OR, NOT, AND NOT, and OR NOT.

logical record. (1)* A collection of items independent of their physical environment. Portions of the same logical record may be located in different physical records. (2) A record from the standpoint of its content, function, and use rather than its physical attributes; that is, one that is defined in terms of the information it contains.

logical relation. In assembler programming, a logical term in which two expressions are separated by a relational operator. The relational operators are EQ, GE, GT, LE, LT, and NE. See also *arithmetic relation, character relation.*

logical term. In assembler programming, a term that can be used only in a logical expression.

* **logic design.** The specification of the working relations between the parts of a system in terms of symbolic logic and without primary regard for hardware implementation.

* **logic diagram.** A diagram that represents a logic design and sometimes the hardware implementation.

* **logic element.** (1) A device that performs a logic function. (2) See *combinational logic element, sequential logic element.*

* **logic instruction.** An instruction that executes an operation that is defined in symbolic logic, such as AND, OR, NOR.

* **logic shift.** A shift that affects all positions.

* **logic symbol.** (1) A symbol used to represent a logic element graphically. (2) A symbol used to represent a logic operator.

logon. The procedure by which a user begins a terminal session.

logoff. The procedure by which a user ends a terminal session.

longitudinal redundancy check. A system of error checking performed at the receiving station after a block check character has been accummulated. Abbreviated LRC. See also *cyclic redundancy check, vertical redundancy check.*

* **longitudinal redundancy check character.** On a tape where each character is represented in a lateral row of bits, a character used for checking the parity of each track in the longitudinal direction. Such a character is usually the last character recorded in each block and is used in some magnetic recording systems to reestablish the initial recording status. Abbreviated LRC.

long lines. A department of AT & T HQ that provides most intercompany transmission facilities in the Bell System.

* **look-up** See *table look-up.*

* **loop.** (1) A sequence of instructions that is executed repeatedly until a terminal condition prevails. (2) See *feedback loop, magnetic hysteresis loop.*

loopback test. A test in which signals are looped from a test center through a data set or loopback switch and back to the test center for measurement. See also *bussback.*

loop counter. In assembler programming, a counter used to prevent excessive looping during conditional assembly processing.

loop jack switchboard. A patch panel with rows of jacks for physical access to local loops (maximum capacity of 90 channels). Each column of four jacks accesses one local loop and consists of looping jacks, a set jack, and a miscellaneous jack.

loop transmission. A mode of multipoint operation in which a network is configured as a closed loop of individual point-to-point data links interconnected by stations that serve as regenerative repeaters. Data transmitted around the loop is regenerated and retransmitted at each station until it arrives at its destination station. Any station can introduce data into the loop.

low speed. Usually, data transmission speed of 600 bps or less.

low tape. An indication that the supply of paper tape in a perforator is nearly depleted.

* LP. *Linear programming.*

LPA. *Link pack area.*

* LRC character. The *longitudinal redundancy check character.*

LSQA. *Local system queue area.*

LT. Less than. See *relational operator.*

LTRS. *Letters shift.*

* Lukasiewicz notation. Same as *prefix notation.*

lumped loading. Inserting uniformly spaced inductance coils along the line, since continuous loading is impractial. See also *loading.*

M

m. *Merge order.*

* machine. See *accounting machine, electrical accounting machine, turing machine, universal turing machine.*

* machine address. Same as *absolute address.*

machine check interruption. An interruption that occurs as a result of an equipment malfunction or error. Abbreviated MCI.

machine check analysis and recording. Under DOS on System/370, a feature that records machine check error information and then attempts to recover from the error. Abbreviated MCAR. On System/360, a similar function is performed by *machine check recording and recovery (MCRR).*

machine check handler. A feature that analyzes error and attempts recovery by retrying the failing instruction, if possible. If retry is unsuccessful, it attempts to correct the malfunction or to isolate the affected task. Abbreviated MCH.

machine check recording and recovery. Under DOS on System/360, a feature that records pertinent data on the system recorder file after either a machine check or channel error occurs. Abbreviated MCRR. On System/370, a similar function is performed by *machine check analysis and recording (MCAR).*

* machine code. An operation code that a machine is designed to recognize.

machine-independent. Pertaining to procedures or programs created without regard for the actual devices will be used to process them.

* machine instruction. An instruction that a machine can recognize and execute.

* machine language. A language that is used directly by a machine.

* machine learning. (SC1) The ability of a device to improve its performance based on its past performance. Related to artificial intelligence.

machine oriented language. A programming language that is more like a machine language than a human language.

* machine readable medium. A medium that can convey data to a given sensing device. Synonymous with automated data medium.

machine run. The execution of one or more routines that are linked to form one operating unit.

machine-sensible information. Information in a form that can be read by a specific machine.

* machine word. Same as *computer word.*

macro. See *macro definition, macro instruction, macro prototype statement.*

macro call. Same as *macro instruction.*

macro definition. A set of statements that defines the name of, format of, and conditions for

generating a sequence of assembler language statements from a single source statement. See also *library macro definition, source macro definition.*

macro expansion. (1) The sequence of statements that result from a macro generation operation. (2) Same as *macro generation.*

macro generation. An operation in which an assembler produces a sequence of assembler language statements by processing a macro definition called by a macro instruction. Macro generation takes place at pre-assembly time. Synonymous with macro expansion.

macro instruction. (1) * An instruction in a source language that is equivalent to a specified sequence of machine instructions. (2) In assembler programming, an assembler language statement that causes the assembler to process a predefined set of statements called a macro definition. The statements normally produced from the macro definition replace the macro instruction in the program. Synonymous with macro call.

macro instruction operand. In assembler programming, an operand that supplies a value to be assigned to the corresponding symbolic parameter of the macro definition called by the macro instruction.

macro language. The representations and rules for writing macro instructions and macro definitions.

macro library. A library of macro definitions used during macro expansion.

macro processing instruction. An assembler instruction that is used in macro definitions and processed at pre-assembly time.

macro prototype. Same as *macro prototype statement.*

macro prototype statement. An assembler language statement that is used to give a name to a macro definition and to provide a model (prototype) for the macro instruction that is to call the macro definition.

* **macroprogramming.** Programming with macro instructions.

* **magazine.** See *card hopper.*

* **magnetic card.** A card with a magnetic surface on which data can be stored by selective magnetization of portions of the flat surface.

* **magnetic core.** A configuration of magnetic material that is, or is intended to be, placed in a spatial relationship to current-carrying conductors and

whose magnetic properties are essential to its use. It may be used to concentrate an induced magnetic field as in a transformer induction coil, or armature, to retain a magnetic polarization for the purpose of storing data, or for its nonlinear properties as in a logic element. It may be made of such material as iron, iron oxide, or ferrite and in such shapes as wires, tapes, toroids, rods, or thin film.

* **magnetic delay line.** A delay line whose operation is based on the time of propagation of magnetic waves.

* **magnetic disk.** A flat circular plate with a magnetic surface on which data can be stored by selective magnetization of portions of the flat surface.

* **magnetic drum.** A right circular cylinder with a magnetic surface on which data can be stored by selective magnetization of portions of the curved surface.

* **magnetic hysteresis loop.** A closed curve showing the relation between the magnetization force and the induction of magnetization in a magnetic substance when the magnetized field (force) is carried through a complete cycle.

* **magnetic ink.** An ink that contains particles of a magnetic substance whose presence can be detected by magnetic sensors.

* **magnetic ink character recognition.** The machine recognition of characters printed with magnetic ink. Contrast with *optical character recognition.* Abbreviated MICR.

* **magnetic storage.** A storage device that utilizes the magnetic properties of materials to store data, for example, magnetic cores, tapes, and films.

* **magnetic tape.** (1) A tape with a magnetic surface on which data can be stored by selective polarization of portions of the surface. (2) A tape of magnetic material used as the constituent in some forms of magnetic cores.

magnetic tape label. One or more records at the beginning of a magnetic tape that identifies and describes the data recorded on the tape and contains other information, such as the serial number of the tape reel.

* **magnetic thin film.** A layer of magnetic material, usually less than one micron thick, often used for logic or storage elements.

main distributing frame. A distributing frame, on one part of which terminate the permanent outside lines entering the central office building and on another part of which terminate the subscriber line

multiple cabling, trunk multiple cabling. etc., used for associating any outside line with any desired terminal in such a multiple or with any other outside line. It usually carries the central office protective devices and functions as a test point between line and office. In a private exchange, the main distributing frame is for similar purposes. Abbreviated MDF.

* **main frame.** (SC1) Same as *central processing unit.*

main page pool. In DOS/VS, the set of all page frames in real storage not assigned to the supervisor or one of the real partitions.

main station. A telephone station with a distinct call number disignation and directly connected to central office. Also, in leased lines for customer equipment, the main point where such equipment interfaces the local loop. See also *extension station.*

main storage. (1) * The general purpose storage of a computer. Usually, main storage can be accessed directly by the operating registers. Contrast with *auxiliary storage.* (2) All program-addressable storage from which instructions may be executed and from which data can be loaded directly into registers. (3) See also *real storage, virtual storage.*

main storage hierarchy support. An optional division of main storage that provides addressing distinction between processor storage (hierarchy 0) and IBM 2361 Core Storage (hierarchy 1).

main storage partition. Under MFT, a subdivision of the dynamic area that is allocated to a job step or a system task.

main storage region. Under MVT, a subdivision of the dynamic area that is allocated to a job step or a system task.

main task. Under DOS and TOS, the main program within a partition in a multiprogramming environment.

* **maintenance.** (1) Any activity intended to eliminate faults or to keep hardware or programs in satisfactory working condition, including tests, measurements, replacements, adjustments, and repairs. (2) See *corrective maintenance, emergency maintenance, file maintenance, preventive maintenance, scheduled maintenance.*

* **maintenance time.** Time used for hardware maintenance. It includes preventive maintenance time and corrective maintenance time. Contrast with *available time.*

major control field. The most significant control field in a record; the control field upon which sorting

according to the collating sequence is first attempted.

* **majority.** A logic operator having the property that if P is a statement, Q is a statement, R is a statement,..., then the majority of P, Q, R,..., is true if more than half the statements are true, false if half or less are true.

major time slice. In systems with the time sharing option (TSO), the period of time during which a terminal job is in main storage. See also *minor time slice.*

major total. The result when a summation is terminated by the most significant change of group.

* **makeup time.** That part of available time used for reruns due to malfunctions or mistakes during a previous operating time. Contrast with *development time, production time.*

* **malfunction.** The effect of a fault. Contrast with *error, mistake.*

* **management information system.** (1) (SC1) Management performed with the aid of automatic data processing. Abbreviated MIS. (2) An information system designed to aid in the performance of management functions.

* **mantissa.** The fractional part of a logarithm. in the expression, log 643 = 2.808, the .808 is the mantissa and the 2 is the characteristic.

manual exchange. An exchange where calls are completed by an operator.

* **manual input.** (1) The entry of data by hand into a device. (2) The data entered as in (1).

manual operation. Processing of data in a system by direct manual techniques.

* **map.** (1) To establish a correspondence between the elements of one set and the elements of another set. (2) See *Karnaugh map.*

mapped buffer. A display buffer in which each character position has a corresponding character position on the display surface.

* **marginal check.** A preventive maintenance procedure in which certain operating conditions, such as supply voltage of frequency, are varied about their nominal values in order to detect and locate incipient defective parts.

margin control. Same as *range finder.*

margin-punched card. A card punched only on the border, with holes to represent data, thereby leaving the center free for written or printed information.

mark. (1) A presence of a signal. In telegraph communications, a mark represents the closed condition or current flowing. A mark condition is normally used to represent a binary 1 signal state. (2) * Same as *flag*. (3) * See *group mark*.

* marker. See *end-of-tape marker*.

mark-hold. The normal no-traffic line condition whereby a steady mark is transmitted. This may be a customer-selectable option.

marking wave. Same as *keying wave*.

* Markov chain. A probabilistic model of events, in which the probability of an event is dependent only on the event that precedes it.

mark-sense. To mark a position on a punched card with an electrically conductive pencil, for later conversion to machine punching.

* mark sensing. The electrical sensing of manually recorded conductive marks on a nonconductive surface.

mark-to-space transition. The transition, or switching, from a marking impulse to a spacing impulse.

* mask. (1) A pattern of characters that is used to control the retention or elimination of portions of another pattern of characters. (2) A *filter*.

masked. Same as *disabled*.

mass storage (online). The storage of a large amount of data which is also readily accessible to the central processing unit of a computer.

* mass storage device. A device having a large storage capacity, for example, magnetic disk, magnetic drum.

master clock. The primary source of timing signals used to control the timing of pulses.

master console. In a system with multiple consoles, the basic console used for communication between the operator and the system.

* master file. A file that is either relatively permanent, or that is treated as an authority in a particular job.

master scheduler. A control program routine that responds to operator commands and initiates the requested actions.

master scheduler task. In OS/360 and OS/VS, the command processing task that controls the searching of a queue of pending commands and the attaching of tasks for executing these commands.

master station. A unit having control of all other terminals on a multipoint circuit for purposes of polling or selection.

* match. To check for identity between two or more items of data. Contrast with *hit*.

* mathematical check. A programmed check that uses mathematical relationships. Synonymous with arithmetic check.

* mathematical model. A mathematical representation of a process, device, or concept.

* mathematical programming. In operations research, a procedure for locating the maximum or minimum of a function subject to constraints. Contrast with *convex programming, dynamic programming, integer programming, linear programming, nonlinear programming, quadratic programming*.

* matrix. (1) In mathematics, a two-dimensional rectangular array of quantities. Matrices are manipulated in accordance with the rules of matrix algebra. (1) In computers, a logic network in the form of an array of input leads and output leads with logic elements connected at some of their intersections. (3) By extension, an array of any number of dimensions.

* matrix storage. Storage, the elements of which are arranged such that access to any location requires the use of two or more coordinates, for example, cathode ray storage, magnetic core storage.

MCAR. *Machine check analysis and recording.*

MCH. *Machine check handler.*

MCI. *Machine check interruption.*

MCP. *Message control program.*

MCRR. *Machine check recording and recovery.*

MCS. *Multiple console support.*

MDF. *Main distributing frame.*

* medium. (1) The material, or configuration thereof, on which data are recorded, for example, paper tape, cards, magnetic tape. Synonymous with data medium. (2) See *automated data medium, data medium, machine readable medium, portable data medium*.

medium speed. Usually, data transmission rate between 600 bps and the limit of a voice-grade facility.

member. A partition of a partitioned data set.

memory. (1) * Same as *storage*. (2) * See *acoustic memory*. (3) See also *auxiliary storage, external page storage, main storage, processor storage, real storage, virtual storage*.

* **memory protection.** Same as *storage protection*.

* **mercury storage.** A storage device that utilizes the acoustic properties of mercury to store data.

mercury-wetted relay. A device that uses mercury as the relay contact closure substance.

merge. (1)* To combine items from two or more similarly ordered sets into one set that is arranged in the same order. Contrast with *collate*. (2) A program or routine that performs this function.

merge order. The number of files or sequences to be combined during a merge operation. Abbreviated m.

merge pass. In sorting, the processing of records to reduce the number of sequences by a factor equal to the specified merge order.

message. (1) * An arbitrary amount of information whose beginning and end are defined or implied. (2) In telecommunications, a combination of characters and symbols transmitted from one point to another on a network. (3) * See *error message, operator message*.

message circuit. A long-distance telephone circuit used in furnishing regular long-distance or toll service to the general public. The term is used to differentiate these circuits from circuits used for private line service.

message control program. A program that is used to control the sending or receiving of messages to or from remote terminals.

message handler. Under TCAM, a sequence of user-specified macro instructions that examine and process control information in message headers, and perform functions necessary to prepare message segments for forwarding to their destinations. One message handler is required for each line group having unique message handling requirements.

message header. The leading part of a message that contains information such as the source or destination code of the message, the message priority, and the type of message. See also *message text*.

message processing program. A program that processes or otherwise responds to messages received from terminals.

message queue. A queue of messages that are awaiting processing or waiting to be sent to a terminal.

message routing. The process of selecting the correct circuit path for a message.

message switching. A telecommunications application in which a message received by a central system from one terminal is sent to one or more other terminals.

message text. The part of a message consisting of the actual information that is routed to a user at a terminal or to a program. See also *message header*.

* **method.** See *infinite pad method, Monte Carlo method, queued access method, random walk method*.

MFT. *Multiprogramming with a fixed number of tasks.*

MFT with subtasking. An option of MFT in which each task can attach a number of subtasks that can execute in the same partition.

* **MICR.** *Magnetic ink character recognition.*

microcircuit. A combination of intraconnected and interconnected elements inseparably associated on or within a single continuous substrate to perform an electronic circuit function.

microinstruction. A basic or elementary machine instruction.

microprogram. A program that consists of micro instructions.

microprogramming. A method of operation of the CPU in which each complete instruction starts the execution of a sequence of instructions, called microinstructions, which are generally at a more elementary level.

microroutine. See *microprogram*.

microsecond. One-millionth of a second.

microwave. Any electromagnetic wave in the radio frequency spectrum above 890 megahertz.

migration. See *data migration, page migration*.

millisecond. One-thousandth of a second.

minidisk. In VM/370, a continuous area in direct access storage that is assigned a virtual device address.

* **minimum distance code.** A binary code in which the signal distance does not fall below a specified minimum value.

minor control field. Any control field that is of less significance than the major control field in a sorting operation.

minor time slice. Under TSO, the time within a major time slice when a terminal job has the highest priority for execution. See also *major time slice.*

minor total. The result when a summation is terminated by the least significant change of group.

miscellaneous intercept. In Bell System leased telegraph message-switching systems, the act of intercepting single-address messages containing a nonvalid call directing code or intercepting multiple-address messages without a proper multiple-address code. See also *willful intercept.*

missing page interruption. Same as *page fault.*

* **mistake.** A human action that produces an unintended result. Contrast with *error, fault, malfunction.*

* **mixed radix notation.** A positional representation in which the ratios of significances of all pairs of adjacent digit places are not the same. For example, if three digits are used to represent hours, tens of minutes, and minutes, the significances of the digits, taking one minute as a unit, are 60, 10, and 1. The radices of the second and third digits are 6 and 10 respectively. A comparable number representation system making use of a least a digit to represent days, and of two digits to represent hours, would not satisfy the difinition for mixed radix notation, the ratio of the significances of the "day" and "tens of hours" positions not being an integer.

M65MP. *Model 65 Multiprocessing System.*

* **mnemonic.** See *mnemonic symbol.*

mnemonic operation code. An operation code consisting of mnemonic symbols that indicate the nature of the operation to be performed, the type of data used, or the format of the instruction performing the operation.

* **mnemonic symbol.** A symbol chosen to assist the human memory, for example, an abbreviation such as "mpy" for "multiply".

mod/demod. Modulator-demodulator unit. See also *data set, modem.*

mode. (1) A method of operation; for example, the binary mode, the interpretive mode, the alphameric mode. (2) The most frequent value in the statistical sense. (3) * See *access mode, load mode, move mode.*

* **model.** See *mathematical model.*

Model 65 Multiprocessing System. A computing system in which two interconnected Model 65 central processing units share the same main storage and most I/O devices. The activities of the two CPUs are directed by a single control program. Abbreviated M65MP.

model statement. A statement in the body of a macro definition or in open code from which an assembler language statement can be generated at pre-assembly time. Values can be substituted at one or more points in a model statement; one or more identical or different statements can be generated from the same model statement under the control of a conditional assembly loop.

modem. (1) * (MOdulator-DEModulator) A device that modulates and demodulates signals transmitted over communication facilities. (2) See also *data set (2), modulation.*

modify. To alter a part of an instruction or routine.

modulation. The process by which some characteristic of one wave is varied in accordance with another wave or signal. This technique is used in data sets and modems to make business machine signals compatible with communications facilities.

* **modulator-demodulator.** A modulator and a demodulator in the same signal conversion equipment.

module. (1)* A program unit that is discrete and identifiable with respect to compiling, combining with other units, and loading; for example, the input to, or output from, an assembler, compiler, linkage editor, or executive routine. (2) * A packaged functional hardware unit designed for use with other components. (3) * See *object module, programming module.* (4) See *disk storage module, load module, source module.*

* **modulo N check.** Same as *residue check.*

* **monadic boolean operator.** A boolean operator having only one operand, for example, NOT.

* monadic operation. An operation on one operand, for example, negation. Synonymous with unary operation.

* monitor. Software or hardware that observes, supervises, controls, or verifies the operations of a system.

monitor printer. A device that prints all message transmitted over the circuit to which it is connected.

monolithic integrated circuit. A type of integrated circuit wherein the substrate is an active material, such as the semiconductor silicon.

monolithic storage. Storage made up of monolithic integrated circuits.

* monostable. Pertaining to a device that has one stable state.

* Monte Carlo method. (SC1) A method of obtaining an approximate solution to a numerical problem by the use of random numbers, for example, the random walk method.

* motor. See integrating motor.

* move. Same as transfer, transmit.

move mode. (1) * In some variable-word-length computers, data transmission such that certain delimiters are not moved with the data. Contrast with load mode. (2) A transmittal mode in which the record to be processed is moved into a user work area. See also locate mode, substitute mode.

MPS. Multiprogramming system.

M response. Same as V response.

* multiaddress. Pertaining to an instruction format containing more than one address part.

multidrop line. Same as multipoint line.

multijob operation. Concurrent execution of job steps from two or more jobs.

* multilevel address. Same as indirect address.

multiple-address message. A message to be delivered to more than one destination.

* multiple aperture core. A magnetic core with two or more holes through which wires may be passed and around which magnetic flux may exist. Multiple aperture cores may be used for nondestructive reading.

multiple console support. An optional feature of MVT and OS/VS2 that permits selective message routine to up to 32 operator's consoles. Abbreviated MCS.

multiple-job processing. Controlling the performance of more than one data processing job at a time.

* multiple punching. Punching more than one hole in the same column of a punched card by means of more than one keystroke.

multiple-task management. Managing the performance of more than one data processing task at a time.

* multiplex. To interleave or simultaneously transmit two or more messages on a single channel.

multiplexer. A hardware device that allows handling of multiple signals over a single channel.

multiplexer channel. A channel designed to operate with a number of I/O devices simultaneously. Several I/O devices can transfer records at the same time by interleaving items of data. See also byte multiplexer, block multiplexer.

multiplexing. The division of a transmission facility into two or more channels either by splitting the frequency band transmitted by the channel into narrower bands, each of which is used to constitute a distinct channel (frequency-division multiplexing), or by allotting this common channel to several different information channels, one at a time (time-division multiplexing).

multiplex mode. A means of transferring records to or from low-speed I/O devices on the multiplexer channel, by interleaving bytes of data. The multiplexer channel sustains simultaneous I/O operations on several subchannels. Bytes of data are interleaved and then routed to or from the selected I/O devices, or to and from the desired locations in main storage. Synonymous with byte mode.

* multiplier. See quarter squares multiplier.

* multiply. See logical multiply.

multipoint line. A line or circuit interconnecting several stations. Synonymous with multidrop line.

multiprocessing. (1) * Pertaining to the simultaneous execution of two or more computer programs or sequences of instructions by a computer or computer network. (2) * Loosely, parallel processing. (3) Simultaneous execution of

two or more sequences of instructions by a multiprocessor.

multiprocessing system. A computing system employing two or more interconnected processing units to execute programs simultaneously.

multiprocessor. (1) * A computer employing two or more processing units under integrated control. (2) A system consisting of two or more CPUs (or ALUs, or processors) that can communicate without manual intervention.

* **multiprogramming.** Pertaining to the concurrent execution of two or more programs by a computer.

multiprogramming system. A system that can process two or more programs concurrently by interleaving their execution. Abbreviated MPS.

multiprogramming with a fixed number of tasks. The OS/360 control program that supervises the execution of a fixed number of tasks in main storage, and allocates system resources among them. See also *MFT with subtasking.* Abbreviated MFT.

multiprogramming with a variable number of tasks. The OS/360 control program that supervises the execution of a variable number of tasks in main storage, and allocates system resources among them. Abbreviated MVT.

multisystem mode. An operating mode of the Model 65 Multiprocessing System in which all of main storage and most auxiliary storage devices are shared by both central processing units. See also *partitioned mode.*

multitasking. The concurrent execution of one main task and one or more subtasks in the same partition or region.

multitask operation. Multiprogramming; called multitask operation to express not only concurrent execution of two or more programs, but also the concurrent execution of a single reenterable program used by many tasks.

MVT. Multiprogramming with a variable number of tasks.

MVT with Model 65 multiprocessing. An extension of the MVT control program, used with the Model 65 Multiprocessing System.

Mylar. A DuPont trademark for polyester film, often used as a base for magnetically coated or perforated information media.

N

N. In sorting, file size; the number of records to be processed by the sort.

* **NAK.** The *negative acknowledge character.*

name. (1) A 1-to 8-character alphameric term that identifies a data set, a control statement, a program, or a cataloged procedure. The first character of the name must be alphabetic. (2) * See *qualified name.* (3) See also *entry name, external name, name entry, label.*

name entry. In assembler programming, the entry in the name field of an assembler language statement.

* **NAND.** A logic operator having the property that if P is a statement, Q is a statement, R is a statement,..., then the NAND of P, Q, R,... is true if at least one statement is false, false if all statements are true. Synonymous with NOT-AND, Sheffer stroke.

nanosecond. One-thousand-millionth of a second.

* **natural language.** A language whose rules reflect and describe current usage rather than prescribed usage. Contrast with *artificial language.*

* **n-core-per-bit storage.** A storage device that employs N magnetic cores for each bit to be stored, for example, one-core-per-bit storage, two-core-per-bit storage.

NE. Not equal to. See *relational operator.*

near-end crosstalk. Crosstalk that is propagated in a disturbed channel in the direction opposite to the direction of propagation of the current in the disturbing channel. Ordinarily, the terminal of the disturbed channel at which the near-end crosstalk is present, is near, or coincides with, the energized terminal of the disturbing channel.

* **needle.** A probe that may be passed through holes or notches to assist in sorting or selecting cards.

* **negate.** To perform the logic operation NOT.

negative acknowledgment. In binary synchronous communications, a line control character sent by a receiving terminal to indicate that an error was encountered in the previous block and that the receiving terminal is ready to accept another transmission of the erroneous block.

* **negative acknowledge character.** A communication control character transmitted by a receiver as a negative response to a sender. A negative

acknowledge character may also be used as an accuracy control character. Abbreviated NAK.

neper. A unit for measuring power. The number of nepers is the logarithm (base e) of the ratio of the measured power levels. See also *decibel.*

* **nest.** To imbed subroutines or data in other subroutines or data at a different hierarchical level such that the different levels of routines or data can be executed or accessed recursively.

nesting level. In assembler programming, the level at which a term or subexpression appears in an expression, or the level at which a macro definition containing an inner macro instruction is processed by an assembler.

network. (1) In teleprocessing, a number of communication lines connecting a computer with remote terminals. (2) The interconnection of electrical components. (3) * See *computer network.*

* **network analog.** The expression and solution of mathematical relationships between variables using a circuit or circuits to represent these variables.

* **network analyzer.** A device that simulates a network such as an electrical supply network.

neutral transmission. A method of transmitting teletypewriter signals, whereby a mark is represented by current on the line, and space is represented by the absence of current. By extension to tone signaling, neutral transmission is a method of signaling employing two signaling states, one of the states representing both a space condition and also the absence of any signaling. Synonymous with unipolar, See also *polar transmission.*

* **new-line character.** A format effector that causes the printing or display position to be moved to the first position of the next printing or display line. Abbreviated NL. Contrast with *carriage return character.*

* **nines complement.** The radix-minus-one complement in decimal notation.

NIP. *Nucleus initialization program.*

* **NL.** The *new-line character.*

* **N-level address.** An indirect address that specifies N level of addressing.

* **node.** The representation of a state or an event by means of a point on a diagram.

nondestructive cursor. On a CRT display device, a cursor that can be moved within a display surface without changing or destroying the data displayed on the screen. Contrast with *destructive cursor.*

* **noise.** (1) Random variations of one or more characteristics of any entity such as voltage, current, or data. (2) A random signal of known statistical properties of amplitude, distribution, and spectral density. (2) Loosely, any disturbance tending to interfere with the normal operation of a device or system.

noise killer. An electrical network inserted in a telegraph circuit, usually at the sending end, for the purpose of reducing interference with other communication circuits.

nominal (rated) speed. Maximum speed or data rate of a device or facility which makes no allowance for necessary delaying functions, such as checking or tabbing.

non-data set clocking. Same as *business machine clocking.*

* **nondestructive read.** A read process that does not erase the data in the source. Abbreviated NDR.

nonequivalence element. A logic element whose action represents the boolean connective exclusive OR.

* **nonerasable storage.** Same as *fixed storage.*

* **nonlinear optimization.** Same as *nonlinear programming.*

* **nonlinear programming.** (SC1) In operations research, a procedure for locating the maximum or minimum of a function of variables which are subject to constraints, when either the function or the constraints, or both, are nonlinear. Contrast with *convex programming, dynamic programming, integer programming, linear programming, mathematical programming, quadratic programming.* Synonymous with nonlinear optimization.

nonloaded lines. Cable pairs or transmission lines with no added inductive loading. See also *loading.*

* **non-locking.** Pertaining to code extension characters that change the interpretation of one or a specified number of characters. Contrast with *locking.*

nonpageable dynamic area. In OS/VS, an area of virtual storage whose virtual addresses are identical to real addresses; it is used for programs or parts of programs that are not to be paged during execution. Synonymous with V = R dynamic area.

nonpageable partition. In OS/VS1, a subdivision of the nonpageable dynamic area that is allocated to a job step or system task that is not to be paged during execution. In a nonpageable partition, each virtual address is identical to its real address. Synonymous with V = R partition.

nonpageable region. In OS/VS2, a subdivision of the nonpageable dynamic area that is allocated to a job step or system task that is not to be paged during execution. In a nonpageable region, each virtual address is identical to its real address. Synonymous with V = R region.

* **non-polarized return-to-zero recording.** A return to reference method of recording in which the reference condition is the absence of magnetization. Ones are represented by a specified condition of magnetization; zeros are represented by the absence of magnetization.

nonresident portion (of a control program). Control program routines that are loaded into main storage as they are needed and can be overlaid after their completion.

* **non-return-to-change recording.** A method of recording in which ones are represented by a specified condition of magnetization and zeros are represented by a different condition.

* **non-return-to-reference recording.** Same as *non-return-to-zero recording.*

non-return-to-zero change on ones recording. A modified form of non-return-to-zero recording in which a binary 1 is represented by a flux reversal on tape, with a binary 0 represented by the absence of such a change. Abbreviated NRZI.

* **non-return-to-zero 'mark' recording.** A method of recording in which ones are represented by a change in the condition of magnetization; zeros are represented by the absence of change. Abbreviated NRZ(M).

* **non-return-to-zero recording.** A method of recording in which the change between the state of magnetization repressneting either zero or one provides the reference condition. Synonymous with non-return-to-reference recording. Abbreviated NRZ.

nonreusable. The attribute that indicates that the same copy of a routine cannot be used by another task.

nonsimultaneous transmission. Usually, transmission in which a device or facility can move data in only one direction at a time. Same as *half-duples.* Contrast with *duplex, simultaneous transmission.*

nonspecific volume request. In job control language (JCL), a request that allows the system to select suitable volumes.

nonstandard labels. Labels that do not conform to American National Standard or IBM System/360 and System/370 standard label conventions.

non-switched line. A connection between a remote terminal and a computer that does not have to be established by dialing.

nontemporary data set. A data set that exists after the job that created it terminates. Contrast with *temporary data set.*

* **no op.** An instruction that specifically instructs the computer to do nothing, except to proceed to the next instruction in sequence.

* **NOR.** A logic operator having the property that if P is a statement, Q is a statement, R is a statement,..., then the NOR of P, Q, R,... is true if all statements are false, false if at least one statement is true. P NOR Q is often represented by a combination of 'OR' and 'NOT' symbols, such as ~(PVQ). P NOR Q is also called "neither P NOR Q." Synonymous with NOT-OR.

* **normal direction flow.** (SC1) A flow in a direction from left to right or top to bottom on a flowchart.

* **normalize.** (1) To multiply a variable or one or more quantities occurring in a calculation by a numerical coefficient in order to make an associated quantity assume a nominated value, for example, to make a definite integral o: a variable, or the maximum member of a set cf quantities, equal to unity. Contrast with *justify, left-justify, right-justify.* (2) Loosely, to scale.

* **normalized form.** The form taken by a floating point representation of a number when the fixed-point part lies within some prescribed standard range, so chosen that any given number will be represented by a unique pair of numerals. Synonymous with standard form.

* **NOT.** A logic operator having the property that if P is a statement, then the NOT of P is true if P is false, false if P is true. The NOT of P is often represented by $\overline{P}, \sim P, \neg P, P.'$

* **NOT-AND.** Same as *NAND.*

notation. (1) A representational system that uses characters and symbols in positional relationships to express information. (2)* See *binary notation, decimal notation, fixed radix notation, infix notation, Lukasiewicz notation, mixed radix notation,*

parentheses-free notation, polish notation, positional notation, prefix notation, radix notation.

* **NOT-IF-THEN.** Same as *exclusion.*

* **NOT-OR.** Same as *NOR.*

* **NRZ.** *Non-return-to-zero recording.*

NRZI. *Non-return-to-zero change on ones recording.*

* **NRZ(M).** *Non-return-to-zero mark recording.*

nucleus. That portion of a control program that always remains in main storage.

nucleus initialization program. The program that initializes the resident control program; it allows the operator to request last minute changes to certain options specified during system generation. Abbreviated NIP.

* **null character.** A control character that serves to accomplish media fill or time fill, for example, in ASCII the all zeros character (not numeric zero). Null characters may be inserted into or removed from, a sequence of characters without affecting the meaning of the sequence, but control of equipment or the format may be affected. Abbreviated NUL. Contrast with *space character.*

null character string. Same as *null string.*

null statement. A job control statement used to mark the end of a job's control statements and data.

* **null string.** The notion of a string depleted of its entities, or the notion of a string prior to establishing its entities.

null suppression. The bypassing of all null characters in order to reduce the amount of data to be transmitted. Synonymous with data compaction.

* **number.** (1) A mathematical entity that may indicate quantity or amount of units. (2) Loosely, a numeral. (3) See *binary number, Fibonacci number, random numbers.*

numbering plan. A uniform numbering system wherein each telephone central office has unique designation similar in form to that of all other offices connected to the nationwide dialing network. In the numbering plan, the first three of ten dialed digits denote area code; the next three, office code; and the remaining four, station number. See also *area code.*

* **number representation.** (SC1) The representation of numbers by agreed sets of symbols according to agreed rules. Synonymous with numeration.

* **number representation system.** An agreed set of symbols and rules for number representation. Synonymous with numeral system, numeration system.

* **number system.** Loosely, a number representation system.

* **numeral.** (1) A discrete representation of a number. For example, twelve, 12, XII, 1100 are four different numerals that represent the same number. (2) A numeric word that represents a number. (3) See *binary numeral, decimal numeral.*

* **numeral system.** Same as *number representation system.*

* **numeration.** Same as *number representation.*

* **numeration system.** Any agreed set of symbols and rules for number representation. Synonymous with number representation system.

* **numeric.** (SC1) Pertaining to numerals or to representation by means of numerals. Synonymous with numerical.

* **numerical.** See as *numeric.*

* **numerical analysis.** The study of methods of obtaining useful quantitative solutions to problems that have been expressed mathematically, including the study of the errors and bounds on errors in obtaining such solutions.

* **numerical control.** (SC1) Automatic control of a process performed by a device that makes use of all or part of numerical data generally introduced as the operation is in process.

* **numeric character.** Same as *digit.*

* **numeric code.** (SC1) A code whose code set consists only of digits and associated special characters.

* **numeric data code.** A code consisting only of numerals and special characters.

numeric shift. A control for selecting the numeric character set in an alphameric keyboard-printer.

* **numeric word.** A word consisting of digits and possibly space characters and special characters. For example, in the universal decimal classification system, the numeric word 621.39 + 897 is used as an identifier for a class of literature.

O

* **object code.** Output from a compiler or assembler which is itself executable machine code or is suitable for processing to produce executable machine code.

* **object language.** Same as *target language.*

* **object module.** A module that is the output of an assembler or compiler and is input to a linkage editor.

object module library. A partitioned data set that is used to store and retrieve object modules. See also *load module library, source module library.*

* **object program.** A fully compiled or assembled program that is ready to be loaded into the computer. Synonymous with target program. Contrast with *source program.*

OBR. *Outboard recorder.*

* **OCR.** *Optical character recognition.*

* **octal.** (1) Pertaining to a characteristic or property involving a selection, choice, or condition in which there are eight possibilities. (2) Pertaining to the number representation system with a radix of eight.

* **octet.** A byte composed of eight bits.

* **odd-even check.** Same as *parity check.*

off-hook. Activated (in regard to a telephone set). By extension, a data set automatically answering on a public switched system is said to go *off-hook.* Contrast with *on-hook.* See also *switch hook.*

* **offline.** Pertaining to equipment or devices not under control of the central processing unit.

* **offline storage.** Storage not under control of the central processing unit.

offline system. In teleprocessing, that kind of system in which human operations are required between the original recording functions and the ultimate data processing function. This includes conversion operations as well as the necessary loading and unloading operations incident to the use of point-to-point or data-gathering systems. Contrast with *online system.*

offset. The number of measuring units from an arbitrary starting point in a record, area, or control block, to some other point.

offset stacker. A card stacker that can stack cards selectively under machine control so that they

protrude from the balance of the deck to give physical identification.

OLTEP. Online test executive program.

on-demand system. A system from which information or service is available at time of request.

* **one-address.** Same as *single-address.*

one-for-one translation. Conversion of one source language instruction to one machine language instruction.

* **one-level address.** Same as *direct address.*

* **one-plus-one address.** Pertaining to an instruction that contains one operand address and one control address.

* **ones complement.** The radix-minus-one complement in binary notation.

one-way trunk. A trunk between central exchanges where traffic can originate on only one end.

on-hook. Deactivated (in regard to a telephone set). A telephone not in use is *on-hook.* Contrast with *off-hook.* See also *switch hook.*

* **online.** (1) Pertaining to equipment or devices under control of the central processing unit. (2) Pertaining to a user's ability to interact with a computer.

* **online storage.** Storage under the control of the central processing unit.

online system. (1) In teleprocessing, a system in which the input data enters the computer directly from the point of origin or in which output data is transmitted directly to where it is used. (2) In telegraph usage, a system of transmitting directly into the system. See also *line loop.* Contrast with *offline system.*

online test executive program. A facility that schedules and controls activities on the online test system (OLTS) and provides communication with the operator. This program is part of a set of programs that can be used to test I/O devices, control units, and channels concurrently with the execution of programs. Abbreviated OLTEP.

online testing. In a telecommunications or teleprocessing system, any testing of a remote terminal or station that is performed concurrently with execution of the user's programs -- that is, while the terminal is still connected to the central

processing unit -- with only minimal effect on the user's normal operation.

online test system. A system that allows a user to test I/O devices concurrently with execution of programs. Tests may be run to diagnose I/O errors, verify repairs and engineering changes, or to periodically check devices. Abbreviated OLTS. See also *online test executive program.*

open code. In assembler programming, that portion of a source module that lies outside of and after any *source macro definitions* that may be specified.

* openended. Pertaining to a process or system that can be augmented.

* open shop. Pertaining to the operation of a computer facility in which most productive problem programming is performed by the problem originator rather than by a group of programming specialists. The use of the computer itself may also be described as open shop if the user/programmer also serves as the operator, rather than a full time trained operator. Contrast with *closed shop.*

* open subroutine. A subroutine that is inserted into a routine at each place it is used. Synonymous with direct insert subroutine. Contrast with *closed subroutine.*

open wire. (1) In communications, a conductor separately supported above the surface of the ground, that is, on insulators. See also *open-wire line.* (2) A broken wire.

open-wire line. A pole line in which the conductors are principally in the form of bare, uninsulated wire. Ceramic, glass, or plastic insulators are used to physically attach the bare wire to the telephone poles. Short circuits between the individual conductors are avoided by appropriate spacing.

operand. (1) * That which is operated upon. An operand is usually identified by an address part of an instruction. (2) Information entered with a command name to define the data on which a command processor operates and to control the execution of the command processor. (3) See also *keyword, keyword operand, keyword parameter, positional operand, positional parameter.*

* operating system. (SC1) Software which controls the execution of computer programs and which may provide scheduling, debugging, input/output control, accounting, compilation, storage assignment, data management, and related services.

Operating System/Virtual Storage. A compatible extension of the IBM System/360 Operating System that supports relocation hardware and the extended

control facilities of System/370. Abbreviated OS/VS.

* operating time. That part of available time during which the hardware is operating and assumed to be yielding correct results. It includes development time, production time, and makeup time. Contrast with *idle time.*

* operation. (1) A defined action, namely, the act of obtaining a result from one or more operands in accordance with a rule that completely specifies the result for any permissible combination of operands. (2) The set of such acts specified by such a rule, or the rule itself. (3) The act specified by a single computer instruction. (4) A program step undertaken or executed by a computer, for example, addition, multiplication, extraction, comparison, shift, transfer. The operation is usually specified by the operator part of an instruction. (5) The event or specific action performed by a logic element. (6) See *auxiliary operation, control operation, dual operation, dyadic operation, fixed-cycle operation, monadic operation, parallel operation, sequential operation, serial operation, unary operation.*

* operation code. A code that represents specific operations. Synonymous with instruction code.

* operation decoder. A device that selects one or more control channels according to the operation part of a machine instruction.

* operation part. Loosely, the operator part of an instruction.

* operations analysis. Same as *operations research.*

* operations research. The use of the scientific method to provide criteria for decisions concerning the actions of people, machines, and other resources in a system involving repeatable operations. Synonymous with operations analysis.

operator. (1) * In the description of a process, that which indicates the action to be performed on operands. (2) * A person who operates a machine. (3) * See *boolean operator, complementary operator, dyadic boolean operator, monadic boolean operator.* (4) See *arithmetic operator, binary operator, logical operator, unary operator.* (5) See also *concatenation character.*

operator command. A statement to the control program, issued via a console device, or control terminal, that causes the control program to provide requested information, alter normal operations, initiate new operations, or terminate existing operations.

operator control station. Under TCAM, any station that is eligible to enter operator commands.

operator message. A message from the operating system or a problem program directing the operator to perform a specific function, such as mounting a tape reel, or informing him of specific conditions within the system, such as an error condition.

OPM. Operations per minute (equivalent to characters per minute when control functions are included).

* **optical character recognition.** The machine identification of printed characters through use of light-sensitive devices. Contrast with *magnetic ink character recognition.* Abbreviated OCR.

optical reader. A device that reads hand written or machine printed symbols into a computing system.

* **optical scanner.** (1) A device that scans optically and usually generates an analog or digital signal. (2) A device that optically scans printed or written data and generates their digital representations.

* **optimization.** See *linear optimization, nonlinear optimization.*

* **OR.** (1) A logic operator having the property that if P is a statement, Q is a statement, R is a statement,..., then the OR of P, Q, R,... is true if at least one statement is true, false if all statements are false. P OR Q is often represented by P+Q, PVQ. Synonymous with inclusive OR, boolean add, logical add. Contrast with *exclusive OR.* (2) The abbreviation for operations research. (3) See *exclusive OR, inclusive OR.*

order. (1) * To arrange items according to any specified set of rules. Synonymous with sort. (2) * an arrangement of items according to any specified set of rules. (3) See *merge order.*

* **ordering bias.** The degree to which a set of data departs from random distribution. An ordering bias will increase or decrease the effort necessary to order a set of data from the effort anticipated for random distribution.

ordinary symbol. In assembler programming, a symbol that represents an assembly-time value when used in the name or operand field of an instruction in the assembler language. Ordinary symbols are also used to represent operation codes for assembler language instructions.

* **organizing.** See *self-organizing.*

* **OR gate.** A gate that implements the logic OR operator.

orientation. As applied to a teletypewriter, an adjustment of the time the receiving apparatus starts selection. The adjustment is made with respect to the start transition. See also *range finder.*

origin. (1) The absolute storage address of the beginning of a program or block. (2) In relative coding, the absolute storage address to which addresses in a region are referenced.

OS. See *IBM System/360 Operating System, Operating System/Virtual Storage.*

OS/360. *IBM System/360 Operating System.*

OS/VIDEO/370. The IBM Visual Data Entry Online System that runs on System/360 and System/370 computing systems under OS/360 with MFT or MVT; it allows online key entry of source data to disk storage through local or remote IBM 3270 Information Display Station terminals, eliminating all unit record operations.

OS/VS. Operating System/Virtual Storage.

oscilloscope. An instrument for displaying visually the changes in a varying current or voltage.

outboard recorder. Under DOS, a feature that records pertinent data on the system recorder file when an unrecoverable I/O error occurs. Abbreviated OBR.

* **outconnector.** In flowcharting, a connector that indicates a point at which a flowline is broken for continuation at another point. Contrast with *inconnector.*

outer macro instruction. In assembler programming, a macro instruction that is specified in open code. Contrast with *inner macro instruction.*

outgoing group. Under TCAM, that portion of the message handler that is designed to handle messages being sent from the message control program to any of the lines, line groups, or application programs. Contrast with *incoming group.*

OUTLIM. *Output limiting facility.*

* **outline.** See *character outline.*

* **output.** (1) (SC1) Pertaining to a device, process, or channel involved in an output process, or to the data or states involved. (2) One, or a sequence of, output states. (3) Same as *output device.* (4) Same as *output channel.* (5) Same as *output process.* (6) Same as *output data.* (7) See *real time output.*

* **output area.** An area of storage reserved for output.

output blocking factor. In a tape sort, the number of data records in each record in the output file. Abbreviated Bo.

* **output channel.** A channel for conveying data from a device or a logic element. Synonymous with output (4).

output class. Under MFT, MVT, and OS/VS, any one of up to 36 different categories, defined at an installation, to which output data produced during a job step can be assigned. When an output writer is started, it can be directed to process from one to eight different classes of output data.

* **output data.** (SC1) Data to be delivered from a device or program, usually after some processing. Synonymous with output (6).

* **output device.** (SC1) The device or collective set of devices used for conveying data out of another device. Synonymous with output (3).

output limiting facility. A facility that monitors the number of logical records produced for SYSOUT data sets. Abbreviated OUTLIM.

* **output process.** (SC1) The process of delivering data by a system, subsystem, or device. Synonymous with output (5).

output queue. See *output work queue.*

* **output state.** The state occurring on a specified output channel.

output stream. Diagnostic messages and other output data issued by an operating system or a processing program on output devices especially activated for this purpose by the operator. Synonymous with job output stream, output job stream.

output stream control. Same as *JES writer.*

output work queue. A queue of control information describing system output data sets, that specifies to an output writer the location and disposition of system output.

output writer. A part of the job scheduler that transcribes specified output data sets onto a system output device independently of the program that produced the data sets.

* **overflow.** (1) That portion of the result of an operation that exceeds the capacity of the intended unit of storage. (2) Pertaining to the generation of overflow as in (1). (3) Contrast with *underflow.*

overflow position. An extra position in the register in which the overflow digit is developed.

overflow record. On an indirectly addressed file, a record whose key is randomized to the address of a full track or to the address of a home record.

overlap. To do something at the same time that something else is being done; for example, to perform input/output operations while instructions are being executed by the central processing unit.

overlay. (1) * The technique of repeatedly using the same blocks of internal storage during different stages of a program. When one routine is no longer needed in storage, another routine can replace all or part of it. (2) A program segment or phase that is loaded into main storage. It replaces all or part of a previously loaded segment.

overlay module. A load module that has been divided into overlay segments, and has been provided by the linkage editor with information that enables the overlay supervisor to implement the desired loading of segments when requested.

overlay path. All of the segments in an overlay tree between a particular segment and the root segment, inclusive.

overlay program. A program in which certain control sections can use the same storage locations at different times during execution.

overlay region. A continuous area of main storage in which segments can be loaded independently of paths in other regions. Only one path within a region can be in main storage at any one time.

overlay segment. See *segment.*

* **overlay supervisor.** A routine that controls the proper sequencing and positioning of segments of computer programs in limited storage during their execution.

overlay tree. A graphic representation showing the relationships of segments of an overlay program and how the segments are arranged to use the same main storage area at different times.

overwrite. To record into an area of storage so as to destroy the data that was previously stored there.

owned. In communications, supplied by and belonging to a customer, as opposed to private and public.

P

PABX. *Private automatic branch exchange.*

* pack. To compress data in a storage medium by taking advantage of known characteristics of the data, in such a way that the original data can be recovered, for example, to compress data in a storage medium by making use of bit or byte locations that would otherwise go unused.

* packing density. The number of useful storage cells per unit of dimension, for example, the number of bits per inch stored on a magnetic tape or drum track.

packing factor. The percentage of locations on a file that are actually used.

pad. (1) To fill a block with dummy data, usually zeros or blanks. (2) A device which introduces transmission loss into a circuit. It may be inserted to introduce loss or match impedances. See also *pushbutton dialing pad, switching pad.*

pad character. A character introduced to use up time while a function (usually mechanical) is being accomplished -- for example, carriage return, form eject, etc.

* padding. A technique used to fill a block with dummy data.

page. (1) In virtual storage systems, a fixed-length block of instructions, data, or both, that can be transferred between real storage and external page storage. (2) To transfer instructions, data, or both, between real storage and external page storage.

pageable dynamic area. In OS/VS, an area of virtual storage whose addresses are not identical to real addresses; it is used for programs that can be paged during execution. Synonymous with V = V dynamic area.

pageable partition. In OS/VS1, a subdivision of the pageable dynamic area that is allocated to a job step

pageable region. In OS/VS2, a subdivision of the pageable dynamic area that is allocated to a job step or a system task that can be paged during execution. Synonymous with V = V region.

page control block. In OS/VS, a control block that indicates the status of a paging request. Abbreviated PCB.

page data set. In System/370 virtual storage systems, a data set in external page storage in which pages are stored.

page fault. In System/370 virtual storage systems, a program interruption that occurs when a page that is marked 'not in real storage' is referred to by an active page. Synonymous with missing page interruption, page translation exception.

page fixing. In System/370 virtual storage systems, marking a page as nonpageable so that it remains in real storage.

page frame. In System/370 virtual storage systems, a block of real storage that can contain a page. Synonymous with frame.

page frame table. In System/370 virtual storage systems, a table that contains an entry for each frame. Each frame table entry describes how the frame is being used.

page-in. In System/370 virtual storage systems, the process of transferring a page from external page storage to real storage.

page migration. In OS/VS2, the transfer of pages from a primary paging device to a secondary paging device to make more space available on the primary paging device.

page number. In System/370 virtual storage systems, the part of a virtual storage address needed to refer to a page. See also *frame number.*

page-out. In System/370 virtual storage systems, the process of transferring a page from real storage to external page storage.

page pool. In DOS/VS, the set of page frames available for paging virtual mode programs.

page printer. A device that produces printed page copy as its output.

page reclamation. In OS/VS and VM/370, the process of making addressable the contents of a page in real storage that has been marked invalid. Page reclamation can occur after a page fault or after a request to fix or load a page.

page table. In System/370 virtual storage systems, a table that indicates whether a page is in real storage and correlates virtual addresses with real storage addresses. Abbreviated PGT.

page translation exception. In System/370 virtual storage systems, a program interruption that occurs when a virtual address cannot be translated by the hardware because the invalid bit in the page table entry for that address is set. Synonymous with page fault, program interruption code 17. See also *segment translation exception, translation specification exception.*

page wait. In OS/VS and VM/370, a condition in which the active request block for a task is placed in the wait state while a requested page is located in real storage or is brought into real storage.

paging. In System/370 virtual storage systems, the process of transferring pages between real storage and external page storage.

paging device. In System/370 virtual storage systems, a direct access storage device on which pages (and possibly other data) are stored.

paging rate. In System/370 virtual storage systems, the average number of page-ins and page-outs per unit of time.

paging supervisor. In OS/VS and VM/370, a part of the supervisor that allocates and releases real storage space (page frames) for pages, and initiates page-in and page-out operations.

* panel. See *control panel*.

paper tape reader. A device that senses and translates the holes in perforated tape into electrical signals.

* parallel. (1) Pertaining to the concurrent or simultaneous occurrence of two or more related activities in ultiple devices or channels. (2) Pertaining to the simultaneity of two or more processes. (3) Pertaining to the simultaneous processing of the individual parts of a whole, such as the bits of a character and the characters of a word, using separate facilities for the various parts. (4) Contrast with *serial*.

* parallel computer. (1) A computer having multiple arithmetic or logic units that are used to accomplish parallel operations or parallel processing. Contrast with *serial computer*. (2) Historically, a computer, some specified characteristic of which is parallel; for example, a computer that manipulates all bits of a word in parallel.

* parallel operation. Pertaining to the concurrent or simultaneous execution of two or more operations in devices such as multiple arithmetic or logic units. Contrast with *serial operation*.

* parallel processing. Pertaining to the concurrent or simultaneous execution of two or more processes in multiple devices such as channels or processing units. Contrast with *multiprocessing, serial processing*.

* parallel search storage. A storage device in which one or more parts of all storage locations are queried simultaneously. Contrast with *associative storage*.

* parallel storage. A storage device in which characters, words or digits are accessed simultaneously or concurrently.

* parallel transmission. In telecommunications, the simultaneous transmission of a certain number of signal elements constituting the same telegraph or data signal. For example, use of a code according to which each signal is characterized by a combination of three out of twelve frequencies simultaneously transmitted over the channel. Contrast with *serial transmission*.

parameter. (1) * A variable that is given a constant value for a specific purpose or process. (2) See *keyword parameter, positional parameter, symbolic parameter*.

* parentheses-free notation. Same as *prefix notation*.

* parity bit. A check bit appended to an array of binary digits to make the sum of all the binary digits, including the check bit, always odd or always even.

* parity check. A check that tests whether the number of ones (or zeros) in an array of binary digits is odd or even. Synonymous with odd-even check.

parse. In systems with time sharing, to analyze the operands entered with a command and build up a parameter list for the command processor from the information.

* part. See *address part, fixed-point part, operation part*.

* partial carry. In parallel addition, a technique in which some or all of the carries are stored temporarily instead of being allowed to propagate immediately. Contrast with *complete carry*.

partition. See *main storage partition, partitioned data set, virtual storage partition*.

partitioned access method. See *basic partitioned access method*.

partitioned data set. In OS/360 and OS/VS, a data set in direct access storage that is divided into partitions, called members, each of which can contain a program or part of a program. Each partitioned data set contains a directory (or index) that the control program can use to locate a program in the library. Abbreviated PDS. Synonymous with program library.

partitioned mode. An operating mode of the Model 65 Multiprocessing System in which main storage, control units, auxiliary storage units, and input/output devices are apportioned between the

two central processing units, which operate as separate and distinct systems. See also *multisystem mode*.

* **pass.** One cycle of processing a body of data.

password. (1) A unique string of characters that a program, computer operator, or user must supply to meet security requirements before gaining access to data. (2) In systems with time sharing, a one-to eight-character symbol that the user may be required to supply at the time he logs on the system. The password is confidential, as opposed to the user identification.

* **patch.** (1) To modify a routine in a rough or expedient way. (2) A temporary electrical connection.

path. See *overlay path*.

* **pattern.** See *hole pattern*.

* **pattern recognition.** The identification of shapes, forms, or configurations by automatic means.

* **pattern sensitive fault.** A fault that appears in response to some particular pattern of data. Contrast with *program sensitive fault*.

PAX. *Private automatic exchange.*

PBX. *Private branch exchange.*

PCB. *Page control block.*

PCI. *Program check interruption.*

* **PCM.** (1) Punched card machine. (2) Pulse code modulation.

PCP. *Primary control program.*

PDAID. *Problem determination aid.*

PDS. *Partitioned data set.*

PER. *Program event recording.*

perforated. Punched.

perforator. (1) A device that punches. In telegraph equipment, a paper tape punch that is controlled mechanically. It is used for punching tape offline. See also *reperforator*. (2) * See *receiving perforator*.

performance. Together with facility, one of the two major factors on which the total productivity of a system depends. Performance is largely determined by a combination of three other factors: throughput, response time, and availability.

* **peripheral equipment.** (SC1) In a data processing system, any unit of equipment, distinct from the central processing unit, which may provide the system with outside communication.

* **peripheral transfer.** The process of transmitting data between two peripheral units.

permanent read/write error. An error that cannot be eliminated by retrying a read/write operation.

* **permanent storage.** Same as *fixed storage*.

PFT. *Page frame table.*

PGT. *Page table.*

PH. Phase. Also shown by Greek letter ϕ .

phantom circuit. A superimposed circuit derived from two suitably arranged pairs of wires called side circuits, with each pair of wires being a circuit itself and at the same time acting as one conductor of the phantom circuit.

phase. (1) Under DOS and TOS, the smallest complete unit that can be referred to in the core image library. (2) A part of a sort/merge program; e.g., sort phase, merge phase.

phase distortion. See *distortion*.

phase modulation. Angle modulation in which the phase angle of a sinusoidal carrier is caused to vary from a reference carrier phase angle by an amount proportional to the instantaneous amplitude of the modulating signal.

physical IOCS. Supervisory routines that schedule and supervise the execution of channel programs. Physical IOCS controls the actual transfer of records between external storage and main storage, and provides I/O device error recovery.

physical record. A record from the standpoint of the manner or form in which it is stored, retrieved, and moved; that is, one that is defined in terms of physical qualities. A physical record may contain all or part of one or more logical records.

picosecond. One trillionth of a second. One thousandth of a nanosecond.

* **pinboard.** A perforated board into which pins are manually inserted to control the operation of equipment.

pinfeed platen. A cylindrical platen that drives the paper by means of integral rings of pins engaging perforated holes, rather than pressure.

* **pitch.** See *row pitch*.

* **place.** See *digit place*.

PL/I. A high-level programming language, designed for use in a wide range of commercial and scientific computer applications.

plant. As used by common carriers, the physical facilities, such as switching equipment, service department, central office personnel, and cable. The term is generally used with the modifiers *inside*, *outside*.

platen. A backing, commonly cylindrical, against which printing mechanisms strike to produce an impression.

plot. To draw or diagram. To connect the point-by-point coordinate values.

* **plugboard.** A perforated board into which plugs are manually inserted to control the operation of equipment. Synonymous with control panel (2).

plug-in unit. A self-contained circuit assembly.

PMS. *Public Message Service.*

* **point.** See *branchpoint, breakpoint, checkpoint, decimal point, entry point, fixed point, floating point, radix point, rerun point*.

pointer. An address or other indication of location.

point-to-point line. A line that connects a single remote station to the computer; it may be either switched or nonswitched.

point-to-point transmission. Transmission of data directly between two points without the use of any intermediate terminal or computer.

polar relay. A relay containing a permanent magnet that centers the armature. The direction of movement of the armature is governed by the direction of current flow.

polar transmission. A method for transmitting teletypewriter signals, whereby the marking signal is represented by direct current flowing in one direction, and the spacing signal is represented by an equal current flowing in the opposite direction. By extension to tone signaling, polar transmission is a method of transmission employing three distinct states, two to represent a mark and a space, and one to represent the absence of a signal.

Synonymous with bipolar. See also *neutral transmission, telegraph*.

* **Polish notation.** Same as *prefix notation*.

polling. A technique by which each of the terminals sharing a communications line is periodically interrogated to determine whether it requires servicing. See also *blind, lockout, selection, TSC*.

polling characters. A set of characters peculiar to a terminal and the polling operation; response to these characters indicates to the computer whether the terminal has a message to enter.

polling list. A list that specifies the sequence in which stations are to be polled.

port. (1) An entrance to or exit from a network. (2) In data communications, that part of a data processor which is dedicated to a single data channel for the purpose of receiving data from or transmitting data to one or more external, remote devices.

* **portable data medium.** (SC1) A data medium intended to be easily transportable independently of the mechanism used in its interpretation.

PORT-A-PUNCH. ® An IBM registered trademark for portable punching equipment.

* **position.** (1) In a string, each location that may be occupied by a character or binary digit, and may be identified by a serial number. (2) See *punch position, sign position*.

* **positional notation.** (SC1) A number representation system in which a number is represented by means of an ordered set of digits, such that the value contributed by each digit depends on its position as well as upon its value. Synonymous with positional representation.

positional operand. In assembler programming, an operand in a macro instruction that assigns a value to the corresponding positional parameter declared in the prototype statement of the called macro definition.

positional parameter. A parameter that must appear in a specified location, relative to other parameters. See also *keyword parameter*.

* **positional representation.** Same as *positional notation*.

post. (1) To enter a unit of information on a record. (2) To note the occurrence of an event.

* **postmortem.** Pertaining to the analysis of an operation after its completion.

* **postmortem dump.** A static dump, used for debbuging purposes, performed at the end of a machine run.

postprocessor. In emulation, a program that converts data produced by an emulator to the format of the emulated system.

power level. The ratio of the power at a point to some arbitrary amount of power chosen as a reference. This ratio is usually expressed either in decibels based on 1 milliwatt (abbreviated dBm) or in decibels based on 1 watt (abbreviated dBw). See also *decibel.*

PQA. *Protected queue area.*

pre-assembly time. The time at which an assembler processes macro definitions and performs conditional assembly operations.

precedence prosign. A group of characters that indicate to communications personnel how a message is to be handled.

* **precision.** (1) The degree of discrimination with which a quantity is stated. For example, a three-digit numeral discriminates among 1000 possibilities. (2) See *double precision.*

* **predefined process.** A process that is identified only by name and that is defined elsewhere.

preferred virtual machine. In VM/370, a generic name describing a particular virtual machine to which one or more of the performance options have been assigned.

* **prefix notation.** A method of forming mathematical expressions in which each operator precedes its operands. For example, in prefix notation, the expression "(a plus b) multiplied by c" could be represented by x+abc. Synonymous with Lukasiewicz notation, parentheses-free notation, Polish notation. Contrast with *infix notation.*

preprocessor. In emulation, a program that converts data from the format of an emulated system to the format accepted by an emulator.

* **preset.** To establish an initial condition, such as the control values of a loop.

* **prestore.** Same as *initialize.*

* **preventive maintenance.** Maintenance specifically intended to prevent faults from occurring during subsequent operation. Contrast with *corrective*

maintenance. Corrective maintenance and preventive maintenance are both performed during maintenance time.

* **preventive maintenance time.** Time, usually scheduled, used to perform preventive maintenance.

primary center. A control center connecting toll centers together; a class 3 office. It can also serve as a toll center for its local end offices.

primary control program. An OS/360 control program designed to perform one job or task at a time. Abbreviated PCP.

primary operator control station. Under TCAM, the operator control station that can receive an error recovery procedure message, send operator commands, and receive related responses.

primary paging device. In OS/VS2 and VM/370, an auxiliary storage device that is used in preference to secondary paging devices for paging operations. Portions of a primary paging device can be used for purposes other than paging operations.

primary track. On a direct access device, the original track on which data is stored. See also *alternate track.*

* **print control character.** A control character for print operations such as line spacing, page ejection, or carriage return.

printer. (1) A device that writes output data from a system on paper or other media. (2) * See *chain printer, character printer, line printer.*

* **printing.** See *line printing.*

priority. A rank assigned to a task that determines its precedence in receiving system resources. See also *dispatching priority, job priority, limit priority, time sharing priority.*

priority indicator. A group of characters that indicate the relative urgency of a message and thus its order of transmission.

priority scheduler. A form of job scheduler that uses input and output work queues to improve system performance.

private automatic branch exchange. A private automatic telephone exchange that provides for the transmission of calls to and from the public telephone network. Abbreviated PABX.

private automatic exchange. A dial telephone exchange that provides private telephone service to an organization and that does not allow calls to be

transmitted to or from the public telephone network. Abbreviated PAX.

private branch exchange. A manual exchange connected to the public telephone network on the user's premises and operated by an attendant supplied by the user. Abbreviated PBX.

private code. An unnamed control section.

private library. A user-owned library that is separate and distinct from the system library.

private line. The channel and channel equipment furnished to a customer as a unit for his exclusive use, without interexchange switching arrangements.

private line service. A communication service used exclusively by one particular customer. Also, the whole process of providing private line circuits. See also *leased facility*.

private volume. In OS/360 and OS/VS, a mounted volume that the system can allocate only to an output data set for which a specific volume request is made. A private volume is demounted after its last use in a job step. Contrast with *public volume*.

privileged instruction. An instruction that can be executed only when the central processing unit is in the supervisor state.

* **problem.** See *benchmark problem*.

* **problem description.** (1) (ISO) In information processing, a statement of a problem. The statement may also include a description of the method of solution, the procedures and algorithms, etc. (2) A statement of a problem. The statement may also inlcude a description of the method of solution, the solution itself, the transformations of data and the relationship of procedures, data, constraints, and environment.

problem determination. The process of identifying a hardware, software, or system failure and determining whether IBM or the user is responsible for diagnosis and repair.

problem determination aid. A program that traces a specified event when it occurs during the operation of a program. Abbreviated PDAID.

problem diagnosis. Analysis that results in identifying the precise cause of a hardware, software, or system failure.

* **problem oriented language.** A programming language designed for the convenient expression of a given class of problems.

problem program. Any program that is executed when the central processing unit is in the problem state; that is, any program that does not contain privileged instructions. This includes IBM-distributed programs, such as language translators and service programs, as well as programs written by a user.

problem state. A state during which the central processing unit cannot execute input/output and other privileged instructions. Contrast with *supervisor state*.

procedure. (1) * (SC1) The course of action taken for the solution of a problem. (2) * See *inline procedures*. (3) In a procedure oriented language, an independent, named block of statements that defines a specific portion of a program.

procedure library. A program library in direct access storage containing job definitions. The reader/interpreter can be directed to read and interpret a particular job definition by an execute statement in the input stream.

* **procedure oriented language.** A programming language designed for the convenient expression of procedures used in the solution of a wide class of problems.

procedure step. A unit of work associated with one processing program and related data within a cataloged procedure. A cataloged procedure consists of one or more procedure steps.

* **process.** A systematic sequence of operations to produce a specified result. See *input process, output process, predefined process*.

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.

* **processing.** See *administrative data processing, automatic data processing, background processing, batch processing, business data processing, data processing, electronic data processing, foreground processing, industrial data processing, information processing, integrated data processing, list processing, multiprocessing, parallel processing, serial processing*.

processing program. (1) A general term for any program that is not a control program. (2) Any program capable of operating in the problem program state. This includes IBM-distributed language processors, application programs, service programs, and user-written programs. Synonymous with processor (2).

processing unit. See *central processing unit.*

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. COBOL processor, FORTRAN processor. (3) * See *data processor, multiprocessor.* (4) Same as *processing program.*

processor storage. General purpose storage that is part of a central processing unit. Synonymous with real storage.

PROC statement. A job control statement used in cataloged or in-stream procedures. It can be used to assign default values for symbolic parameters contained in a procedure. For in-stream procedures, it is used to mark the beginning of the procedure.

* **production time.** That part of operating time that is neither development time nor makeup time.

productivity. See *system productivity.*

* **program.** (1) (SC1) A series of actions proposed in order to achieve a certain result. (2) Loosely, a routine. (3) To design, write and test a program as in (1). (4) Loosely, to write a routine. (5) See *computer program, object program, source program, target program.*

program attention key. On a display device keyboard, a key that produces an interruption to solicit program action that does not require the reading of data from the display buffer. Abbreviated PA key.

program check interruption. An interruption caused by unusual conditions encountered in a program, such as incorrect operands. Abbreviated PCI.

program event recording. A hardware feature used to assist in debugging programs by detecting program events. Abbreviated PER.

program fetch time. The time at which a program in the form of load modules or phases is loaded into main storage for execution.

program interruption. See *interruption, program check.*

program interruption code 16. Same as *segment translation exception.*

program interruption code 17. Same as *page translation exception.*

program interruption code 18. Same as *translation*

specification exception.

program library. (1) * A collection of available computer programs and routines. (2) Same as *partitioned data set.*

* **programmed check.** A check procedure designed by the programmer and implemented specifically as a part of his program. Contrast with *automatic check.*

* **programmer.** (SC1) A person mainly involved in designing, writing, and testing computer programs.

* **programming.** (1) (SC1) The design, the writing, and testing of a program. (2) See *automatic programming, convex programming, discrete programming, dynamic programming, integer programming, linear programming, macro programming, mathematical programming, multiprogramming, nonlinear programming, quadratic programming.*

* **programming flowchart.** (SC1) A flowchart representing the sequence of operations in a program.

* **programming language.** A language used to prepare computer programs.

* **programming module.** A discrete identifiable set of instructions, usually handled as a unit, by an assembler, a compiler, a linkage editor, a loading routine, or other type of routine or subroutine.

programming RPQ. A customer request for a price quotation on alterations or additions to the functional capabilities of system control programming or program products. The RPQ may be used in conjunction with computing system RPQs to solve unique data processing problems.

programming support representative. An individual responsible for field maintenance of IBM software. Abbreviated PSR.

program product. A licensed program that performs a function for the user and usually interacts with and relies upon system control programming or some other IBM-provided control program. A program product contains logic related to the user's data and is usable or adaptable to meet his specific requirements.

* **program sensitive fault.** A fault that appears in response to some particular sequence of program steps. Contrast with *pattern sensitive fault.*

program status word. A doubleword in main storage used to control the order in which instructions are executed, and to hold and indicate the status of the

computing system in relation to a particular program. Abbreviated PSW.

program temporary fix. A temporary solution or by-pass of a problem diagnosed by IBM field engineering as the result of a defect in a current unaltered release of the program. Abbreviated PTF.

progressive overflow. On a direct access storage device, the writing of overflow records on the next consecutive track. Contrast with *chaining overflow*.

prompting. In systems with time sharing, a function that helps a terminal user by requesting him to supply operands necessary to continue processing.

propagation delay. The time necessary for a signal to travel from one point on a circuit to another.

protected field. On an IBM 3270 Display Station, a display field in which the user cannot enter, modify, or erase data from the keyboard. Contrast with *unprotected field*.

* **protected location.** A storage location, reserved for special purposes, in which data cannot be stored without undergoing a screening procedure to establish suitability for storage therein.

protected queue area. In OS/VS1, an area located at the high address end of each virtual storage partition.

* **protection.** See *memory protection, storage protection*.

protection key. An indicator that appears in the current program status word whenever an associated task has control of the system; this indicator must match the storage keys of all main storage blocks that the task is to use. Synonymous with *storage protection key*.

prototype statement. Same as *macro prototype statement*.

pseudo-clock A main storage location used by timer supervision routines to calculate timer intervals and time-of-day.

* **pseudo code.** A code that requires translation prior to execution.

* **pseudo-random number sequence.** A sequence of numbers, determined by some defined arithmetic process, that is satisfactorily random for a given purpose, such as by satisfying one or more of the standard statistical tests for randomness. Such a sequence may approximate any one of several statistical distributions, such as uniform, normal, or Gaussian distribution.

PSR. *Programming support representative.*

PSW. *Program status word.*

PTF. *Program temporary fix.*

Public Message Service. The public telegram system offered by Western Union. Abbreviated PMS.

public switched network. Any switching system that provides circuit switching to many customers. In the USA, there are four such networks: Telex, TWX, telephone, and Broadband Exchange.

public volume. In OS/360 and OS/VS, a mounted volume that the system can allocate to an output data set for which a nonspecific volume request is made. A public volume remains mounted until the device on which it is mounted is required for another volume. Contrast with *private volume*.

* **pulse.** See *clock pulse, synchronization pulses*.

pulse code modulation. Transmission of information by modulation of a pulsed, or intermittent, carrier. Pulse width, count, phase, or amplitude may be the varied characteristic. Abbreviated PCM.

* **pulse repetition rate.** The number of pulses per unit time.

* **punch.** (1) A perforation, as in a punched card or paper tape. (2) See *digit punch, keypunch, eleven punch, spot punch, twelve punch, zone punch*.

* **punched card.** (1) A card punched with a pattern of holes to represent data. (2) A card as in (1) before being punched.

* **punched tape.** A tape on which a pattern of holes or cuts is used to represent data.

* **punching.** See *interstage punching, multiple punching*.

* **punch position.** A defined location on a card or tape where a hole may be punched.

push-button dialing. The use of keys or pushbuttons instead of a rotary dial to generate a sequence of digits to establish a circuit connection. The signal form is usually tones. Synonymous with key pulse, Touchtone (AT & T), Touch-Call (GT & E). Contrast with *rotary dial*.

push-button dialing pad. A twelve-key device to originate tone keying signals. It usually is attached to rotary dial telephones for use in originating data signals.

pushdown list. (1) * A list that is constructed and maintained so that the next item to be retrieved and removed is the most recently stored item still in the list, that is, last in, first out. (2) Synonymous with pushdown stack.

pushdown stack. Same as *pushdown list.*

* **pushdown store.** A store that is the hardware implementation of a pushdown list.

* **pushup list.** A list that is constructed and maintained so that the next item to be retrieved and removed is the oldest item still in the list, that is, first in, first out.

put. To place a single data record into an output file.

Q

QCB. *Queue control block.*

QISAM. *Queued indexed sequential access method.*

QSAM. *Queued sequential access method.*

QTAM. *Queued telecommunications access method.*

quad. A structural unit employed in cable, consisting of four separately insulated conductors twisted together.

* **quadratic programming.** In operations research, a particular case of nonlinear programming in which the function to be maximized or minimized is a quadratic function and the constraints are linear functions. Contrast with *convex programming, dynamic programming, integer programming, linear programming, mathematical programming, nonlinear progamming.*

* **qualified name.** A data name explicitly accompanied by specification of the class to which it belongs in a given classification system.

qualifier. All names in a qualified name other than the rightmost, which is called the simple name.

* **quantization.** The subdivision of the range of values of a variable into a finite number of nonoverlapping, and not necessarily equal, subranges or intervals, each of which is represented by an assigned value within the subrange. For example, a person's age is quantized for most purposes with a quantum of one year.

* **quantize.** To subdivide the range of values of a variable into a finite number of nonoverlapping, but not necessarily equal, subranges or intervals, each of which is represented by an assigned value within the subrange.

* **quantum.** A subrange in quantization.

quarter-speed. One-fourth the rated speed of the associated equipment; in transoceanic telegraph, one-fourth of full speed or 12.5 baud or 16+ wpm.

* **quarter squares multiplier.** An analog multiplier unit that uses the identity $xy = 1/4[(x+y)^2-(x-y)^2]$.

queue. (1) A waiting line or list formed by items in a system waiting for service; for example, tasks to be performed or messages to be transmitted in message switching system. (2) To arrange in, or form, a queue.

queue control block. A control block that is used to regulate the sequential use of a programmer-defined facility among requesting tasks. Abbreviated QCB.

* **queued access method.** Any access method that automatically synchronizes the transfer of data between the program using the access method and input/output devices, thereby eliminating delays for input/output operations.

queued indexed sequential access method. An extended version of the sequential form of the basic indexed sequential access method (BISAM). When this method is used, a queue is formed of input data blocks that are awaiting processing or output data blocks that have been processed and are awaiting transfer to auxiliary storage or to an output device. Abbreviated QISAM.

queued sequential access method. An extended version of the basic sequential access method (BSAM). When this method is used, a queue is formed of input data blocks that are awaiting processing or output data blocks that have been processed and are awaiting transfer to auxiliary storage or to an output device. Abbreviated QSAM.

queued telecommunications access method. A method used to transfer data between main storage and remote terminals. Application programs use GET and PUT macro instructions to request the transfer of data, which is performed by a message control program. The message control program synchronizes the transfer, thus eliminating delays for input/output operations. Abbreviated QTAM.

quick start. Same as *system restart (2).*

quick cell. In OS/VS2, a reserved space in the system queue area or in a local system queue area that can be used to reduce the time required to allocate space for a control block.

* quiescing. (1) The process of bringing a device or a system to a halt by rejection of new requests for work. (2) The process of bringing a mulitprogrammed system to a halt by rejection of new jobs.

* quinary. See *biquinary code.*

quoted string. In assembler programming, a character string enclosed by apostrophes that is used in a macro instruction operand to represent a value that can include blanks. The enclosed apostrophes are part of the value represented. Contrast with *character expression.*

R

* radial transfer. An *input process* (2), or an *output process* (2).

* radix. (1) (SC1) In positional representation, that integer, if it exists, by which the significance of the digit place must be multiplied to give the significance of the next higher digit place. For example, in decimal notation, the radix of each place is ten; in a biquinary code, the radix of the five places is two. Synonymous with base (3). (2) See *floating-point radix, mixed radix notation.*

* radix complement. (SC1) A complement obtained by subtracting each digit from one less than its radix, then adding one to the least significant digit, executing all carries required. For example, tens complement in decimal notation, twos complement in binary notation. Synonymous with true complement.

* radix-minus-one complement. A complement obtained by subtracting each digit from one less than the radix. For example, nines complement in decimal notation, ones complement in binary notation. Synonymous with diminished radix complement.

* radix notation. A positional representation in which the significance of any two adjacent digit positions has an integral ratio called the radix of the less significant of the two positions; permissible values of the digit in any position range from zero to one less than the radix of that position.

* radix point. In radix notation, the real or implied character that separates the digits associated with

the integral part of a numeral from those associated with the fractional part.

rain barrel effect. Sound noted on an overcompensated (equalized) line.

RAMAC ®. Random access storage. See *direct access storage device.*

* random access. (1) Same as *direct access.* (2) In COBOL, an access mode in which specific logical records are obtained from or placed into a mass storage file in a nonsequential manner.

randomizing. A technique by which the range of keys for an indirectly addressed file is reduced to successively smaller ranges of addresses by some method of computation until the desired address is found.

* random numbers. (1) A series of numbers obtained by chance. (2) A series of numbers considered appropriate for satisfying certain statistical tests. (3) A series of numbers believed to be free from conditions which might bias the result of a calculation. (4) See *pseudo-random number sequence.*

random processing. The treatment of data without respect to its location in external storage, and in an arbitrary sequence governed by the input against which it is to be processed.

* random walk method. In operations research, a variance-reducing method of problem analysis in which experimentation with probabilistic variables is traced to determine results of a significant nature. Uninteresting walks add only to the variance of the process and thus contribute nothing. An interesting walk tends to lead toward a predictive solution.

* range. (1) The set of values that a quantity or function may assume. (2) The difference between the highest and lowest value that a quantity or function may assume. (3) See *error range.*

range finder. An adjustable mechanism on a teletypewriter receiver that allows the receiver-distributor face to to be moved through an arc corresponding to the length of a unit segment. It is adjusted normally for best results under operating line conditions. See also *orientation, receiving margin.*

rank. (1) To arrange in an ascending or descending series according to importance. (2) * See *symbol rank.*

raster grid. On a display device, the grid of addressable coordinates on the display surface.

* rate. See *data signalling rate,* *pulse repetition rate.*

rate center. A specified geographic location used by telephone companies to determine mileage measurements for the application of interexchange mileage rates.

rated speed. Same as *nominal speed.*

* ratio. See *error ratio,* *print contrast ratio,* *read-around ratio,* *residual error ratio.*

raw data. Data that has not been processed or reduced.

RCT. *Region control task.*

* read. (1) To acquire or interpret data from a storage device, a data medium, or any other source. (2) See *destructive read,* *nondestructive read.*

* read-around ratio. The number of times a specific spot, digit, or location in electrostatic storage may be consulted before spillover of electrons causes a loss of data stored in surrounding spots. The surrounding data must be restored before the deterioration results in any loss of data.

reader. (1) A device that converts information in one form of storage to information in another form of storage. (2) A part of the scheduler that reads an input stream into the system.

reader/interpreter. A part of job management that reads and interprets a series of job definitions from an input stream.

reading task. In OS/360 and OS/VS, the job management task that controls the reading and interpreting of job control statements, and the reading and analyzing of operator commands in an input stream.

read-only. A type of access to data that allows it to be read but not modified.

* read-only storage. Same as *fixed storage.*

ready condition. The condition of a task that is in contention for the central processing unit.

real address. In virtual storage systems, the address of a location in real storage.

real address area. In DOS/VS, the area of virtual storage where virtual addresses are equal to real addresses.

real mode. In DOS/VS, the mode of a program that may not be paged. See also *virtual mode.*

real storage. (1) In System/370 virtual storage systems, the storage of a System/370 computing system from which the central processing unit can directly obtain instructions and data, and to which it can directly return results. (2) Same as processor storage.

real storage page table. In OS/VS1, a table that contains an entry for each 2K page frame in real storage. This table is the centralized information interface for real storage management. Abbreviated RSPT.

real partition. In DOS/VS, a division of the real address area of virtual storage that may be allocated for programs that are not to be paged, or programs that contain pages that are to be fixed. See also *virtual partition.*

realtime. (1) * Pertaining to the actual time during which a physical process transpires. (2) * Pertaining to the performance of a computation during the actual time that the related physical process transpires in order that results of the computation can be used in guiding the physical process. (3) Pertaining to an application in which response to input is fast enough to affect subsequent input, such as a process control system or a computer assisted instruction system.

* realtime input. Input data inserted into a system at the time of generation by another system.

* realtime output. Output data removed from a system at time of need by another system.

receive interruption. The interruption of a transmission to a terminal by a higher priority transmission from the terminal. Synonymous with break.

receive-only typing reperforator. A teletypewriter receiver that produces perforated tape with characters along the edge of the tape. Synonymous with rotor.

receiving. The process by which a computer obtains a message from a line. Contrast with *sending.* See also *accepting, entering.*

receiving-end crossfire. The crossfire in a telegraph channel introduced from one or more adjacent channels at the terminal end remote from the transmitter.

receiving margin. In telegraph applications, the usable range over which the range finder may be adjusted. The normal range for a properly adjusted machine is approximately 75 points on a 120-point scale. Synonymous with operating range. See also *range finder.*

* **receiving perforator.** A tape punch that automatically converts coded electrical signals into perforations.

* **recognition.** See *character recognition, magnetic ink character recognition, optical character recognition, pattern recognition.*

* **record.** (1) A collection of related items of data, treated as a unit, for example, one line of an invoice may form a record; a complete set of such records may form a file. (2) See *logical record, variable-length record.*

recorder file. Same as *system recorder file.*

* **record gap.** An area on a data medium used to indicate the end of a block or record. Synonymous with inter-record gap.

* **recording.** See *double pulse recording, non-polarized return-to-zero recording, non-return-to-change recording, non-return-to-reference recording, non-return-to-zero (mark) recording, non-return-to-zero recording.*

* **recording density.** The number of bits in a single linear track measured per unit of length of the recording medium.

recording trunk. A trunk from a local telephone central office or private branch exchange to a long distance office, used only for communication between operators.

* **record layout.** The arrangement and structure of data in a record, including the sequence and size of its components. By extension, a record layout might be the description itself.

* **record length.** A measure of the size of a record, usually specified in units such as words or characters.

* **record separator.** The information separator intended to identify a logical boundary between items called *records.* Abbreviated RS.

recoverable ABEND. An error condition in which control is passed to a specified routine that allows continued execution of the program. Contrast with *unrecoverable ABEND.* See also *STAE, STAI.*

recoverable error. An error condition that allows continued execution of a program.

recovery management support. The facilities that gather information about hardware reliability and allow retry of operations that fail because of CPU, I/O device, or channel errors. See also *machine*

check handler, channel check handler. Abbreviated RMS.

recursive. Pertaining to a process in which each step makes use of the results of earlier steps.

* **reduction.** See *data reduction.*

redundancy. In the transmission of information, that fraction of the gross information content of a message that can be eliminated without loss of essential information.

redundancy check. An automatic or programmed check based on the systematic insertion of components or characters used especially for checking purposes.

reel. A mounting for a roll of tape.

reenterable. The attribute of a load module that allows the same copy of the load module to be used concurrently by two or more tasks.

reference bit. In System/370 virtual storage systems, a bit associated with a page in real storage; the reference bit is turned 'ON' by hardware whenever the associated page in real storage is referred to (read or stored into). In OS/VS1 and DOS/VS, there is a reference bit in the storage key associated with each 2K storage block. In OS/VS2 and VM/370, there is a reference bit in each of two storage blocks associated with each page frame.

reference level. See *relative transmission level.*

reference noise. The magnitude of circuit noise that will produce a circuit noise meter reading equal to that produced by ten micro-microwatts of electric power at 1000 cycles per second.

reference volume. That magnitude of a complex electric wave, such as that corresponding to speech or music, that gives a reading of zero VU on a standard volume indicator. The sensitivity of the volume indicator is adjusted so that reference volume or zero VU is read when the instrument is connected across a 600-ohm resistance to which there is delivered a power of 1 milliwatt at 1000 cycles per second. See also *voice unit.*

refile. The procedure of transmitting a message from a station on a leased line network to a station not serviced by the leased line network. This is usually accomplished by sending the message to a preselected Western Union office for retransmission as a telegram to the addressee.

* **reflected binary code.** Same as *gray code.*

refreshable. The attribute of a load module that prevents it from being modified by itself or by any other module during execution. A refreshable load module can be replaced by a new copy during execution by a recovery management routine without changing either the sequence or results of processing.

regen. Same as *regenerative repeater.*

regeneration. The restoration of stored information.

regenerative repeater. Normally, a repeater utilized in telegraph applications. Its function is to retime and retransmit the received signal impulses restored to their original strength. These repeaters are speed- and code-sensitive, and are intended for use with standard telegraph speeds and codes. Synonymous with regen.

region. See *main storage region, overlay region, virtual storage region.*

regional center. A control center (class 1 office) connecting sectional centers of the telephone system together. Every pair of regional centers in the United States has a direct circuit group running from one center to the other.

region control task. Under TSO, the control program routine that handles quiesce/restore and LOGON/LOGOFF. Abbreviated RCT.

region job pack area. In OS/VS2, an area in a virtual storage region that contains modules that are not in the link pack area but are needed for the execution of jobs. Abbreviated JPA.

* register. (1) A device capable of storing a specified amount of data such as one word. (2) See *address register, circulating register, index register, instruction register, return code register, shift register.*

* registration. The accurate positioning relative to a reference.

regulation. Compensation for changes in loss as the cable's temperature varies. Its purpose is to adjust equalization so that the flat frequency response is maintained as the temperature changes.

relation. In assembler programming, the comparison of two expressions to see if the value of one is equal to, less than, or greater than the value of the other.

relational operator. In assembler programming, an operator that can be used in an arithmetic or character relation to indicate the comparison to be performed between the terms in the relation. The

relational operators are EQ (equal to), GE (greater than or equal to), GT (greater than), LE (less than or equal to), LT (less than), and NE (not equal to).

* relative address. The number that specifies the difference between the absolute address and the base address.

* relative coding. Coding that uses machine instructions with relative addresses.

relative data. In a program for a CRT display device, values that specify a new position for an electron beam in terms of the number of raster units in the x and y directions away from the current beam position. Contrast with *absolute data.*

relative line number. A number assigned by the user to a communications line of a line group at system generation.

relative order. In a program for a CRT display device, a display order that specifies that the data bytes following the order are raster unit displacements in the x and y directions from the current beam position. Contrast with *absolute order.*

relative transmission level. The ratio of the test-tone power at one point to the test-tone power at some other point in the system chosen as a reference point. The ratio is expressed in db. The transmission level at the transmitting switchboard is frequently taken as zero level reference point. See also *zero transmission level reference point.*

relay center. A central point where message switching takes place; a message switching center.

* reliability. The probability that a device will function without failure over a specified time period or amount of usage.

relocatable. The attribute of a set of code whose address constants can be modified to compensate for a change in origin.

relocatable expression. In assembler programming, an assembly-time expression whose value is affected by program relocation. A relocatable expression can represent a relocatable address.

relocatable library. Under DOS and TOS, a library of relocatable object modules and IOCS modules required by various compilers. It allows the user to keep frequently-used modules available for combination with other modules without recompilation.

relocatable library module. Under DOS and TOS, a module consisting of one or more complete control

sections cataloged as a single entry in the relocatable library.

relocatable term. In assembler programming, a term whose value is affected by program relocation.

* **relocate.** In computer programming, to move a routine from one portion of storage to another and to adjust the necessary address references so that the routine, in its new location, can be executed.

relocate hardware. Same as *dynamic address translation (2).*

relocating loader. In DOS/VS, an optional feature of the supervisor that modifies addresses of a phase, if necessary, and loads it at execution time into a partition selected by the user.

relocation. The modification of address constants to compensate for a change in origin of a module, program, or control section.

* **relocation dictionary.** The part of an object module or load module that identifies all addresses that must be adjusted when a relocation occurs.

* **remote access.** Pertaining to communication with a data processing facility by one or more stations that are distant from that facility.

remote job entry. Submission of job control statements and data from a remote terminal, causing the jobs described to be scheduled and executed as though encountered in the input stream.

remote station. (1) * Data terminal equipment for communicating with a data processing system from a location that is time, space, or electrically distant. (2) Contrast with *local station.*

remote terminal. An input/output control unit and one or more input/output devices attached to a system through a transmission control unit.

repeater. A device used to amplify or reshape signals.

repeater, single-line. A telegraph repeater utilizing a pair of cross-coupled polar relays that are inserted in series with a circuit to repower the signal.

repeater coil. A one-to-one ratio audio-frequency transformer for transferring energy from one electrical circuit to another and to permit, in wire communication work, the formulation of simplex and phantom circuits.

* **reperforator.** See *receiving perforator.*

reperforator/transmitter. A teletypewriter unit consisting of a reperforator and a tape transmitter, each independent of the other. It is used as a relaying device and is especially suitable for transforming the incoming speed to a different outgoing speed, and for temporary queuing. Abbreviated RT.

* **repertoire.** See *instruction repertoire.*

* **repetition instruction.** An instruction that causes one or more instructions to be executed an indicated number of times.

report generation. A technique for producing complete machine reports from information that describes the input file and the format and content of the output report.

report program generator. A processing program that can be used to generate object programs that produce reports from existing sets of data. Abbreviated RPG.

* **representation.** See *fixed-point representation, floating-point representation, incremental representation, number representation, number representation system, positional representation, variable-point representation.*

reproduce. To prepare a duplicate of stored information, especially for punched cards, punched paper tape, or magnetic tape.

reproducer. A device that will duplicate, in one card, all or part of the information contained in another card.

request parameter list. In OS/VS1, a list of parameters that accompanies a request for job entry susystem services. Abbreviated RPL.

* **rerun.** A repeat of a machine run, usually because of a correction, an interruption, or a false start.

* **rerun point.** That location, in the sequence of instructions in a computer program, at which all information pertinent to the rerunning of the program is available.

* **research.** See *operations research.*

reserved page option. In VM/370, a virtual machine option that allows the most active pages of a virtual machine's storage to remain allocated in real storage.

* **reset.** (1) To restore a storage device to a prescribed initial state, not necessarily that denoting zero. (2) To place a binary cell into the state denoting zero.

resident. Pertaining to a program that is permanently located in storage. For example, the nucleus in main storage or a system library on direct access storage.

* **residual error ratio.** The error ratio remaining after attempts at correction.

* **residue check.** A check in which each operand is accompanied by the remainder obtained by dividing this number by N, the remainder then being used as a check digit or digits. Synonymous with modulo N check.

* **resolver.** A device whose input is a vector quantity and whose outputs are components of the vector.

resource. Any facility of the computing system or operating system required by a job or task, and including main storage, input/output devices, the central processing unit, data sets, and control or processing programs.

resource manager. A general term for any control program function responsible for the allocation of a resource.

* **response.** See *spectral response.*

response time. (1) The time between the submission of a item of work to a computing system and the return of results. (2) In systems with time sharing, the time between the end of a block of user input and the display of the first character of system response at the terminal. Contrast with *interaction time.*

restart. (1) * To reestablish the execution of a routine, using the data recorded at a checkpoint. (2) See *checkpoint entry, checkpoint records, checkpoint restart, checkpoint/restart facility, checkpoint routine.*

restore. See *reset.*

* **retrieval.** See *information retrieval.*

retry. In communications, resending the current block of data (from the last EOB or ETB) a prescibed number of times, or until it is entered correctly or accepted.

* **return.** See *carriage return.*

return code. A value placed in the return code register at the completion of a program. The value is established by the user and may be used to influence subsequent action or be printed for programmer analysis.

* **return code register.** A register used to store a return code.

reusable. The attribute of a routine that allows the same copy of the routine to be used by two or more tasks. See also *reenterable, serially reusable.*

reverse break. Same as *transmit interruption.*

reverse channel. In conjunction with Bell System data sets, a means of simultaneous communication from the receiver to the transmitter over half-duplex data transmission systems. The reverse channel is generally used only for the transmission of control information.

* **reverse direction flow.** In flowcharting, a flow in a direction other than left to right or top to bottom.

rewind. To return a magnetic or paper tape to its beginning.

* **right-justify.** (1) To adjust the printing positions of characters on a page so that the right margin of the page is regular. (2) To shift the contents of a register so that the least significant digit is at some specified position of the register. Contrast with *normalize.*

ringdown. A method of signaling subscribers and operators using either a 20-cycle AC signal, a 135-cycle AC signal, or a 1000-cycle ac signal interrupted 20 times per second.

RMS. *Recovery management support.*

RO. Receive only; a receive-only device, usually a page printer. A receive-only device can receive messages but cannot transmit.

* **rollback.** A programmed return to a prior checkpoint.

* **roll-in.** To restore in main storage data which had previously been transferred from main storage to auxiliary storage.

* **roll-out.** To record the contents of main storage in auxiliary storage.

rollout/rollin. An optional feature of the MVT configuration of the control program that allows the temporary reassignment of one or more main storage regions from one job step to another.

root segment. That segment of an overlay program that remains in main storage at all times during the execution of the overlay program; the first segment in an overlay program.

rotary dial. In a switched system, the conventional dialing method which creates a series of pulses to identify the called station. Contrast with *pushbutton dialing, tone dialing.*

rotor. The rotating component of a sensor. See also *stator.*

ROTR. *Receive-only typing reperforator.*

round. To adjust the least significant digits retained in truncation to partially reflect the dropped portion. For example, when rounded to three digits, the decimal number 2.7561 becomes 2.76.

rounding. Same as *roundoff.*

* **rounding error.** An error due to roundoff. Contrast with *truncation error.*

* **roundoff.** To delete the least significant digit or digits of a numeral and to adjust the part retained in accordance with some rule.

* **routine.** (1) (SC1). An ordered set of instructions that may have some general or frequent use. (2) See *execution routine, library routine, service routine, subroutine, supervisory routine, tracing routine, utility routine.*

routing. The assignment of the communications path by which a message or telephone call will reach its destination.

routing code. (1) In communications, a combination of one or more digits used to route a call to a predetermined area. (2) A code assigned to an operator message and used, in systems with multiple console support (MCS), to route the message to the proper console.

routing indicator. An address, or group of characters, in the header of a message defining the final circuit or terminal to which the message has to be delivered.

* **row.** A horizontal arrangement of characters or other expressions.

* **row binary.** Pertaining to the binary representation of data on cards in which the significances of punch positions are assigned along card rows. For example, each row in an 80-column card may be used to represent 80 consecutive binary digits. Contrast with *column binary.*

* **row pitch.** The distance measured between corresponding points of adjacent rows.

RPG. *Report program generator.*

RPL. *Request parameter list.*

RPQ. Request for price quotation. See *computing system RPQ, programming RPQ.*

* **RS.** The *record separator.*

RSPT. *Real storage page table.*

RT. *Reperforator/transmitter.*

RTTY. *Radio teletypewriter communications.*

* **rub-out character.** Same as *delete character.*

* **run.** A single, continuous performance of a computer program or routine.

running open. In telegraph applications, a term used to describe a machine connected to an open line or a line without battery (constant space condition). A telegraph receiver under such a condition appears to be running, as the type hammer continually strikes the type box but does not move across the page, because the open line is continually decoded as the baudot character BLANK, or ASCII character NULL.

S

* **sampling.** (1) Obtaining the values of a function for regularly or irregularly spaced discrete values of the independent variable. (2) In statistics, obtaining a sample from a population.

satellite computer. (1) A computer that is under the control of another computer and performs subsidiary operations. (2) An offline auxiliary computer.

satellite graphic job processor. A program that elicits job control information from a user at an IBM 2250 Display Unit attached to an IBM 1130 Computing System, allowing him to define and initiate jobs to be processed by a remote IBM System/360 computing system. See also *graphic job processor.* Abbreviated SGJP.

* **scale.** To adjust the representation of a quantity by a factor in order to bring its range within prescribed limits.

* **scale factor.** A number used as a mulitplier, so chosen that it will cause a set of quantities to fall within a given range of values. To scale the values 856, 432, -95, and -182 between -1 and +1, a scale factor of 1/1000 would be suitable.

scaling. In assembler programming, indicating the number of digit positions in object code to be occupied by the fractional portion of a fixed-point or floating-point constant.

* **scan.** To examine sequentially, part by part.

* **scanner.** See *flying spot scanner, optical scanner.*

SCATS. Sequentially Controlled Automatic Transmitter Start. A single-service multipoint teletypewriter arrangement providing for automatic message transmission between all locations on the circuit without station contention.

scatter format. A load module attribute that permits dynamic loading of control sections into nonadjoining areas of main storage.

scatter loading. Placing the control sections of a load module into nonadjoining positions of main storage.

* **scheduled maintenance.** Maintenance carried out in accordance with an established plan.

scheduler. See *job scheduler, master scheduler.*

scheduler work area data set. In OS/VS1, a data set on auxiliary storage that contains most of the job management control blocks (such as the JCT, JFCB,SCT, and SIOT). There is one scheduler work area data set for each initiator. Abbreviated SWADS.

* **scheme.** See *coding scheme.*

scope. (1) In assembler programming, that part of a source program in which a variable symbol can communicate its value. (2) See also *global, local.*

screen. The display surface of a CRT display device.

SC1. Subcommittee 1; a subcommittee of ISO Technical Committee/97, responsible for the development of an international vocabulary for data processing.

SDR. *Statistical data recorder.*

* **search.** (1) To examine a set of items for one or more having a desired property. (2) See *binary search, chaining search, dichotomizing search, Fibonacci search.*

* **search cycle.** The part of a search that is repeated for each item, which normally consists of locating the item and carrying out a comparison.

* **search key.** Data to be compared to specific parts of each item for the purpose of conducting a search.

secondary console. In a system with multiple consoles, any console except the master console. The secondary console handles one or more assigned functions on the multiple console system.

secondary operator control station. Under TCAM, any operator control station that can send operator commands and receive related responses.

secondary paging device. In OS/VS2 and VM/370, an auxiliary storage device that is not used for paging operations until the available space on primary paging devices falls below a specified minimum. Portions of a secondary paging device can be used for purposes other than paging operations.

secondary storage. Same as *auxiliary storage.*

second-generation computer. A computer utilizing solid state components.

sectional center. A control center connecting primary centers together; a class I office.

security. Prevention of access to or use of data or programs without authorization.

seek. To position the access mechanism of a direct access device at a specified location.

seek time. The time that is needed to position the access mechanism of a direct access storage device at a specified position. See also *access time.*

segment. (1) * To divide a computer program into parts such that the program can be executed without the entire program being in internal storage at any one time. (2) * A part of a computer program as in (1). (3) In telecommunications, a portion of a message that can be contained in a buffer. (4) In System/370 virtual storage systems, a continuous area of virtual storage that is allocated to a job or system task.

segment table. In System/370 virtual storage systems, a table used in dynamic address translation to control user access to virtual storage segments. Each entry indicates the length, location, and availability of a corresponding page table. Abbreviated SGT.

segment table entry. In System/370 virtual storage systems, an entry in the segment table that indicates the length, location, and availability of a corresponding page table. Abbreviated STE.

segment translation exception. In System/370 virtual storage systems, a program interruption that occurs when a virtual address cannot be translated by the hardware because the invalid bit in the segment table entry for that address is set.

Synonymous with program interruption code 16. See also *page translation exception, translation specification exception.*

selection. Addressing a terminal or a component on a selective calling circuit. See also *blind, lockout, polling.*

* selection check. A check that verifies the choice of devices, such as registers in the execution of an instruction.

selective calling. The ability of the transmitting station to specify which of several stations on the same line is to receive a message. See also *call directing code, station selection code.*

* selective dump. A dump of one or more specified storage locations.

selector. A device for directing electrical input pulses onto one or two output lines, depending upon the presence or absence of a predetermined accompanying control pusle.

selector channel. A channel designed to operate with only one I/O device at a time. Once the I/O device is selected, a complete record is transferred one byte at a time. Contrast with *block multiplexer channel, multiplexer channel.*

selector pen attention. Same as *light pen attention.*

* self-adapting. (SC1). Pertaining to the ability of a system to change its performance characteristics in response to its environment.

* self-checking code. Same as *error detecting code.*

self-defining delimiter. Any character appearing in the first position of certain character strings in the TSO command language. A repetition of the character within the string is interpreted as a delimiter.

self-defining term. In assembler progamming, an absolute term whose value is implicit in the specification of the term itself.

* self-organizing. (SC1) Pertaining to the ability of a system to arrange its internal structure.

self-relocating program. A program that can be loaded into any area of main storage, and that contains an initialization routine to adjust its address constants so that it can be executed at that location.

* semantics. The relationships between symbols and their meanings.

semiautomatic message switching center. A center at which an operator routes messages according to information contained in them.

sending. The process by which the central computer places a message on a line for transmission to a terminal. Contrast with *receiving.* See also *accepting, entering.*

sense switch. See *alteration switch.*

* sensing. See *mark sensing.*

sensor. A device that converts measurable elements of a physical process into data meaningful to a computer.

sensor-based. Pertaining to the use of sensing devices, such as transducers or sensors, to monitor a physical process.

sensor-based computer. A computer designed and programmed to receive real-time data (analog or digital) from transducers, sensors, and other data sources that monitor a physical process. The computer may also generate signals to elements that control the process. For example, the computer might receive data from a gauge or flowmeter, compare the data with a predetermined standard, and then produce a signal that operates a relay, valve, or other control mechanism.

sensor-based system. An organization of components, including a computer whose primary source of input is data from sensors and whose output can be used to control the related physical process.

* sentinel. Same as *flag.*

* separator. (1) See *file separator, group separator, information separator, record separator, unit separator.* (2) Same as *delimiter.*

sequence. (1) * An arrangement of items according to a specified set of rules. (2) In sorting, a group of records whose control fields are in ascending or descending order, according to the collating sequence. (3) * See *calling sequence, collating sequence, consecutive sequence computer, pseudo-random number sequence.*

sequence symbol. In assembler programming, a symbol used as a branching label for conditional assembly instructions. It consists of a period, followed by one to seven alphameric characters, the first of which must be alphabetic.

sequencing. Ordering in a series or according to rank or time.

* **sequential.** Pertaining to the occurrence of events in time sequence, with little or no simultaneity or overlap of events. Contrast with *concurrent, consecutive, simultaneous.*

sequential access method. See *basic sequential access method, queued sequential access method.*

* **sequential computer.** A computer in which events occur in time sequence, with little or no simultaneity or overlap of events.

* **sequential control.** A mode of computer operation in which instructions are executed in an implicitly defined sequence until a different sequence is explicitly initiated by a jump instruction.

sequential data set. A data set whose records are organized on the basis of their successive physical positions, such as on magnetic tape. Contrast with *direct data set.*

* **sequential logic element.** A device having at least one output channel and one or more input channels, all characterized by discrete states, such that the state of each output channel is determined by the previous states of the input channels.

* **sequential operation.** Pertaining to the performance of operations one after the other.

sequential scheduling system. A form of the job scheduler that reads one input stream and executes only one job step at a time from that input stream.

* **serial.** (1) Pertaining to the sequential or consecutive occurrence of two or more related activities in a single device or channel. (2) Pertaining to the sequencing of two or more processes. (3) Pertaining to the sequential processing of the individual parts of a whole, such as the bits of a character or the characters of a word, using the same facilities for successive parts. (4) Contrast with *parallel.*

* **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 access time is dependent upon the location of the data most recently obtained or placed in storage. Contrast with *direct access.*

* **serial computer.** (1) A computer having a single arithmetic and logic unit. (2) A computer, some specified characteristic of which is serial, for example, a computer that manipulates all bits of a word serially. Contrast with *parallel computer.*

serialize. To change from parallel-by-bit to serial-by-bit.

serially reusable. The attribute of a routine that allows the same copy of the routine to be used by another task after the current use has been concluded.

serially reusable load module. A module that cannot be used by a second task until the first task has finished using it.

* **serial operation.** Pertaining to the sequential or consecutive execution of two or more operations in a single device such as an arithmetic or logic unit. Contrast with *parallel operation.*

* **serial processing.** Pertaining to the sequential or consecutive execution of two or more processes in a single device such as a channel or processing unit. Contrast with *parallel processing.*

serial transfer. A transfer of data in which elements are transferred in succession over a single line.

* **serial transmission.** In telecommunications, transmission at successive intervals of signal elements constituting the same telegraph or data signal. The sequential elements may be transmitted with or without interruption, provided that they are not transmitted simultaneously. For example, telegraph transmission by a time divided channel. Contrast with *parallel transmission.*

* **series.** See *Fibonacci series.*

service. The common-carrier function of furnishing a system of facilities to meet customers' communications requirements, for example, private line service, telephone service. See also *channel.*

serviceability. The ease with which hardware or software failures can be detected, diagnosed, and repaired.

* **service routine.** A routine in general support of the operation of a computer, for example, an input/output, diagnostic, tracing, or monitoring routine. Synonymous with utility routine.

* **servomechanism.** (1) (SC1) An automatic control system incorporating feedback that governs the physical position of an element by adjusting either the values of the coordinates or the values of their time derivatives. (2) A feedback control system in which at least one of the system signals represents mechanical motion. (3) Any feedback control system.

session. The period of time during which a user engages in a dialog with a conversational time sharing system; the elapsed time from when a terminal user logs on the system until he logs off the system.

* **set.** (1) A collection. (2) To place a storage device into a specified state, usually other than that denoting zero or space character. Contrast with *clear*. (3) To place a binary cell into the state denoting one. (4) See *alphanumeric character set, character set, code set, preset, reset.*

SET symbol. In assembler programming, a variable symbol used to communicate values during conditional assembly processing.

setup. (1) * (SC1) In a computer that consists of an assembly of individual computing units, the arrangement of interconnections between the units, and the adjustments needed for the computer to solve a particular problem. (2) * An arrangement of data or devices to solve a particular problem. (3) The preparation of a computing system to perform a job or job step. Setup is usually performed by an operator and often involves performing routine functions, such as mounting tape reels and loading card decks.

* **setup diagram.** (SC1) A diagram specifying a given computer setup.

setup time. The time required by an operator to prepare a computing system to perform a job or job step.

severity code. A code assigned to an error detected in a source module.

sexadecimal (sexidecimal.) Same as *hexadecimal.*

SGJP. *Satellite graphic job processor.*

SGT. *Segment table.*

shadow page table. In VM/370, a page table created and used by VM/370 to control the execution of a virtual machine operating system that is performing paging operations.

* **Shannon.** A unit of measurement of quality of information equal to that contained in a message represented by one or the other of two equally probable, exclusive, and exhaustive states.

* **share.** See *time share.*

shared DASD option. An OS/360 and OS/VS option that enables independently operating computing systems to jointly use common data residing on shared direct access storage devices.

shared file. A direct access device that may be used by two systems at the same time; a shared file may link two systems.

shared main storage multiprocessing. A mode of operation in which two processing units have access to all of main storage.

* **sharing.** See *time sharing.*

* **Sheffer stroke.** Same as *NAND.*

* **shift.** (1) A movement of data to the right or left. (2) See *arithmetic shift, cyclic shift, logic shift.*

shift character. In telecommunications, a control character that determines the alphabetic/numeric shift of character codes in a message.

* **shift-in character.** A code extension character that can be used by itself to cause a return to the character set in effect prior to the departure caused by a shift-out character, usually to return to the standard character set. Abbreviated SI.

* **shift-out character.** A code extension character that can be used by itself to substitute another character set for the standard character set, usually to access additional graphic characters. Abbreviated SO.

* **shift register.** A register in which the stored data can be moved to the right or left.

* **shop.** See *closed shop, open shop.*

short block. A block of F-format data that contains fewer logical records than are specified for the block.

shoulder tap. Under MVT with Model 65 Multiprocessing, a technique that uses the WRITE DIRECT instruction to enable one central processing unit to communicate with another central processing unit.

SI. (1) * The *shift-in character.* (2) Systeme International d'Unites, the international metric system.

sideband. A frequency band above and below the carrier frequency, produced as a result of modulation.

side circuit. A circuit arrangement for deriving a phantom circuit. In four wire circuits, the two wires associated with the "GO" channel form one "side circuit", and those associated with the "return" channel form another. See also *phantom circuit.*

side circuit loading coil. A loading coil for introducing a desired amount of inductance in a side circuit and a minimum amount of inductance in the associated phantom circuit.

side circuit repeating coil. A repeating coil that functions simultaneously as a transformer at a terminal of a side circuit and as a device for superposing one side of a phantom circuit on that side circuit. Synonymous with side circuit repeat coil.

* **sight check.** A check performed by sighting through the holes of two or more aligned punched cards toward a source of light to verify the punching, for example, to determine if a hole has been punched in a corresponding punch position on all cards in the deck.

* **signal.** (1) (SC1) A time-dependent value attached to a physical phenomenon and conveying data. (2) The event or phenomenon that conveys data from one point to another. (3) See *inhibiting signal*.

* **signal distance.** The number of digit positions in which the corresponding digits of two binary words of the same length are different. Synonymous with hamming distance.

signal-to-noise ratio (S/N). The relative power of the signal to the noise in a channel.

* **sign bit.** A binary digit occupying the sign position.

* **sign digit.** A digit occupying the sign position.

signed field. A field that has a character in it to designate its algebraic sign.

* **significance.** (SC1) In positional representation, the factor, dependent on the digit place, by which a digit is multiplied to obtain its additive contribution in the representation of a number. Synonymous with weight.

* **significant digit.** A digit that is needed for a certain purpose, particularly one that must be kept to preserve a specific accuracy or precision.

* **sign position.** A position, normally located at one end of a numeral, that contains an indication of the algebraic sign of the number.

simple buffering. A technique for controlling buffers in such a way that the buffers are assigned to a single data control block and remain so assigned until the data control block is closed.

simple name. The rightmost component of a qualified name. For example, "apple" is the simple name in "tree.fruit.apple".

simplex circuit. A circuit derived from an existing two-wire circuit by the use of a center-tapped repeating coil. This additional circuit must use another wire conductor or ground return to complete its path.

simplex mode. Operation of a communication channel in one direction only, with no capability for reversing.

* **simulate.** (1) (SC1) To represent certain features of the behavior of a physical or abstract system by the behavior of another system. (2) To represent the functioning of a device, system, or computer program by another, for example, to represent the functioning of one computer by another, to represent the behavior of a physical system by the execution of a computer program, to represent a biological system by a mathematical model. (3) Contrast with *emulate*.

simulated attention. A function that allows terminals without attention keys to interrupt processing. The terminal is queried periodically for a specified character string. See also *attention interruption*.

simulation. ((1) * (SC1) The representation of certain features of the behavior of a physical or abstract system by the behavior of another system; for example, the representation of physical phenomena by means of operations performed by a computer or the representation of operations of a computer by those of another computer. (2) The use of programming techniques alone to duplicate the operation of one computing system on another computing system. Contrast with *emulation*.

* **simulator.** (SC1) A device, system, or computer program that represents certain features of the behavior of a physical or abstract system.

* **simultaneous.** Pertaining to the occurrence of two or more events at the same instant of time. Contrast with *concurrent, consecutive, sequential*.

* **simultaneous computer.** (SC1) A computer that contains a separate unit to perform each portion of the entire computation concurrently, the units being interconnected in a way determined by the computation; at different times in a run, a given interconnection carries signals representing different values of the same variable, for example, a differential analyzer.

simultaneous processing. The performance of two or more data processing tasks at the same instant of time. Contrast with *concurrent processing*.

simultaneous transmission. Transmission of control characters or data in one direction while information is being received in the other direction. Contrast with *nonsimultaneous transmission*.

singing. Sound caused by unstable oscillations on the line.

* **single-address.** Pertaining to an instruction format containing one address part. Synonymous with one-address.

single-address message. A message that is to be delivered to only one destination.

single-office exchange. An exchange served by a single central office.

single operation. See *half duplex.*

single program initiator. Under DOS, a program that is called into main storage to perform job control type functions for foreground programs not executing from batched job input. Abbreviated SPI. See also *foreground initiator.*

single-sideband transmission. That type of carrier transmission in which one sideband is transmitted, and the other is suppressed. The carrier wave may be either transmitted or suppressed.

* **single step.** Pertaining to a method of operating a computer in which each step is performed in response to a single manual operation.

single-wire line. A transmission line that uses the ground as one side of the circuit.

* **sink.** See *data sink.*

* **skeletal coding.** Sets of instructions in which some addresses and other parts remain undetermined. These addresses and other parts are usually determined by routines that are designed to modify them in accordance with given parameters.

* **skew.** The angular displacement of a symbol or data medium from the intended or ideal placement.

* **skip.** To ignore one or more instructions in a sequence of instructions.

slice. Those parts of a waveform lying inside two given amplitude limits on the same side of the zero axis. See also *time slice.*

slicer. A circuit that effectively amplifies a slice.

slot. In OS/VS, a continuous area on a paging device in which a page can be stored.

slot group. In OS/VS2, a set of slots on one or more tracks within a cylinder on a paging device.

slot number. In OS/VS2, a part of an external page address that refers to a slot; together with a device

number and a group number, it identifies the location of a page in external page storage.

SLT. Solid logic technology.

SMF. *System management facilities.*

* **smooth.** To apply procedures that decrease or eliminate rapid fluctuations in data.

smoothline. See *nonloaded lines.*

S/N. *Signal-to-noise ratio.*

* **snapshot dump.** A selective dynamic dump performed at various points in a machine run.

sneak current. A leakage current that gets into telephone circuits from other circuits. It is too weak to cause immediate damage, but can produce harmful heating effects if allowed to continue.

* **SO.** The *shift-out character.*

* **software.** (SC1) A set of programs, procedures, and possibly associated documentation concerned with the operation of a data processing system. For example, compilers, library routines, manuals, circuit diagrams. Contrast with *hardware.*

* **SOH.** The *start of heading character.*

solid logic technology. Miniaturized modules used in computers, which result in faster circuitry because of reduced distance for current to travel.

* **solid state component.** A component whose operation depends on the control of electric or magnetic phenomena in solids, for example, a transistor, crystal diode, ferrite core.

solid state computer. A computer that uses solid state, or semiconductor, components. Synonymous with second generation computer.

SOM. *Start of message.*

* **sonic delay line.** Same as *acoustic delay line.*

sort. (1)* To segregate items into groups according to some definite rules. (2) A programmer routine that orders datdata. (3)* Same as *order.*

sort blocking factor. In sorting, the number of data records to be placed in each block.

* **sorter.** A person, device, or computer routine that sorts.

sort/merge program. A processing program that can be used to sort or merge records in a prescribed sequence.

SOTUS. Sequentially Operated Teletypewriter Universal Selector. In the 81D1 Automatic Teletypewriter Systems, a station control device located at each Model 19 type station on a multistation line. It is the selecting device at each station.

sounder. A telegraph receiving instrument in which an electromagnet attracts an armature each time a pulse arrives. The armature makes an audible sound as it hits against its stops at the beginning and end of each current impulse, and the intervals between these sounds are translated from code into the received message by the operator.

* source. See *data source*.

* source language. The language from which a statement is translated.

source macro definition. In assembler programming, a macro definition included in a source module. A source macro definition can be entered into a program library; it then becomes a library macro definition.

source module. The source statements that constitute the input to a language translator for a particular translation.

source module library. A partitioned data set that is used to store and retrieve source modules. See also *object module library, load module library*.

* source program. A computer program written in a source language. Contrast with *object program*.

source recording. The recording of data in machine-readable documents, such as punched cards, punched paper tape, or magnetic tape. Once in this form, the data may be transmitted, processed, or reused without manual processing.

source statement. A statement written in symbols of a programming language.

source statement library. Under DOS and TOS, a collection of books (such as macro definitions) cataloged onto the system by the librarian.

* SP. The *space character*.

space. (1)* A site intended for the storage of data, for example, a site on a printed page or a location in a storage medium. (2)* A basic unit of area, usually the size of a single character. (3)* One or more space characters. (4)* To advance the reading or display position according to a prescribed format, for example, to advance the printing or display position horizontally to the right or vertically down. Contrast with *backspace*. (5) An impulse that, in a neutral circuit, causes the loop to open or causes absence of signal. In a polar circuit it causes the loop current to flow in a direction opposite to that for a mark impulse. A space impulse is equivalent to a binary 0.

* space character. A normally nonprinting graphic character used to separate words. The space character is also a format effector which controls the movement of the printing or display position, one position forward. The space character may also be considered in the hierarchy of information separators. Synonymous with blank character. Contrast with *null character*. Abbreviated SP.

space-hold. The normal no-traffic line condition whereby a steady space is transmitted; it may be a customer-selectable option.

space record. In OS/VS, a record that separates pages in a page data set.

space-to-mark transition. The transition, or switching, from a spacing impulse to a marking impulse.

spacing bias. See *distortion*.

spanned record. A logical record that is stored in two or more physical records.

* special character. A graphic character that is neither a letter, nor a digit, nor a space character.

* special purpose computer. (SC1) A computer that is designed to handle a restricted class of problems.

* specific address. Same as *absolute address*.

* specific coding. Same as *absolute coding*.

* spectral response. The variation in sensitivity of a device to light of different wavelengths.

SPI. *Single program initiator*.

* split. See *column split*.

spooling. The reading and writing of input and output streams on auxiliary storage devices, concurrently with job execution, in a format convenient for later processing or output operations. Synonymous with concurrent peripheral operations.

* spot punch. A device for punching one hole at a time.

SPX circuit. *Simplex circuit.*

SQA. *System queue area.*

* stability. See *computational stability, light stability.*

stacked job. Same as *batched job (2).*

stacked job processing. A technique that permits multiple job definitions to be grouped (stacked) for presentation to the system, which automatically recognizes the jobs, one after the other. More advanced systems allow job definitions to be added to the group (stack) at any time and from any source, and also honor priorities. See also *batch processing.*

* stacker. See *card stacker.*

STAE (specify task asynchronous exit). A macro instruction that specifies a routine to receive control in the event of the issuing task's abnormal termination.

staging. The moving of data from an offline or low-priority device back to an online or higher-priority device, usually on demand of the system or on request of the user. Contrast with *data migration.*

STAI (subtask ABEND intercept). A keyword of the ATTACH macro instruction that specifies a routine to receive control after the abnormal termination of a subtask.

standalone emulator. An emulator whose execution is not controlled by a control program; it does not share system resources with other programs and excludes all other jobs from the computing system while it is being executed.

standalone program. A program that can be executed independently of an operating system.

* standard form. Same as *normalized form.*

standard test-tone power. One milliwatt (0 dBm) at 1000 cycles per second.

standby. (1) A condition of equipment that will permit complete resumption of stable operation within a short span of time. (2) A duplicate set of equipment to be used if the primary unit becomes unusable because of malfunction.

* standing-on-nines carry. In parallel addition of decimal numbers, a high-speed carry in which a carry input to a given digit place is bypassed to the next digit place if the current sum in the given digit place is nine.

start element. The first element of a character in certain serial transmissions, used to permit synchronization. In baudot teletypewriter operation, it is one space bit.

starting point. On a CRT display device, same as *current beam position.*

* start of heading character. A communication control character used as the first character of a heading of a message. Abbreviated SOH.

start of message. A character or group of characters transmitted by the polled terminal and indicating to other stations on the line that what follows are addresses of stations to receive the answering message. Abbreviated SOM.

* start of text character. A communication control character used to indicate the start of a text, and to terminate a heading. Abbreviated STX.

start-stop transmission. Asynchronous transmission in which each group of code elements corresponding to a character signal is preceded by a start signal which serves to prepare the receiving mechanism for the reception and registration of a character, and is followed by a stop signal which serves to bring the receiving mechanism to rest in preparation for the reception of the next character. See also *stop element.*

* state. See *input state, output state.*

* statement. (1) In computer programming, a meaningful expression or generalized instruction in a source language. (2) See *job control statement.*

static CP area. In VS1, those portions of virtual storage that are allocated, during system generation and initial program load, to control program functions.

* static dump. A dump that is performed at a particular point in time with respect to a machine run, frequently at the end of a run.

* staticize. (1) To convert serial or time-dependent parallel data into static form. (2) Occasionally, to retrieve an instruction, and its operands from storage prior to its execution.

* static storage. Storage other than dynamic storage.

station. (1) One of the input or output points of a system that uses communication facilities; for example, the telephone set in the telephone system or the point where the business machine interfaces with the channel on a leased private line. (2) One or more computers, terminals, or devices at a

particular location. (3) * See *inquiry station, remote station, tape station.*

station arrangement. A tariff term for a device such as a data set required on certain subvoice-grade leased channels. See also *data loop transceiver, data set.*

station battery. The electric power source for signaling at a station.

station selection code. A Western Union term for an identifying call that is transmitted to an outlying telegraph receiver and automatically turns its printer on. See also *call directing code, selective calling.*

statistical data recorder. Under DOS, a feature that records the cumulative error status of an I/O device on the system recorder file. Abbreviated SDR.

stator. The stationary part of a sensor. See also *rotor.*

STE. *Segment table entry.*

* **step.** (1) One operation in a computer routine. (2) To cause a computer to execute one operation. (3) See *job step, single step.*

step-by-step switch. A switch that moves in synchronism with a pulse device, such as a rotary telephone dial. Each digit dialed causes the movement of successive selector switches to carry the connection forward until the desired line is reached. Synonymous with stepper switch. See also *line switching, crossbar system.*

step-by-step system. A type of line-switching system that uses step-by-step switches.

step restart. A restart that begins at the beginning of a job step. The restart may be automatic or deferred, where deferral involves resubmitting the job. See also *checkpoint restart.*

stop bit. See *stop element.*

stop element. The last element of a character in asynchronous serial transmissions, used to ensure recognition of the next start element. In baudot teletypewriter operation, it is 1.42 mark bits; in IBM 1050, it is 1.0 mark bit. See also *start-stop transmission.*

stop instruction. A machine operation or routine which requires manual action other than the use of the start key to continue processing.

* **storage.** (1) Pertaining to a device into which data can be entered, in which they can be held, and from which they can be retrieved at a later time. (2)

Loosely, any device that can store data. (3) Synonymous with memory. (4) See *acoustic storage, associative storage, auxiliary storage, capacitor storage, cathode ray storage, circulating storage, content addressed storage, dynamic storage, electrostatic storage, external page storage, fixed storage, internal storage, magnetic storage, main storage, matrix storage, mercury storage, n-core-per-bit storage, nonerasable storage, parallel search storage, parallel storage, permanent storage, read-only storage, real storage, static storage, temporary storage, virtual storage, volatile storage, working storage.*

* **storage allocation.** (1) The assignment of blocks of data to specified blocks of storage. (2) See *dynamic storage allocation.*

storage block. (1) A continuous area of main storage, consisting of 2048 bytes, to which a storage key can be assigned. (2) In OS/VS1, a 2K block of real storage to which a storage key can be assigned. See also *page frame.*

* **storage capacity.** The amount of data that can be contained in a storage device.

* **storage cell.** An elementary unit of storage, for example, a binary cell, a decimal cell.

storage cycle. The periodic sequence of events that occurs when information is transferred to or from main storage.

* **storage device.** A device into which data can be inserted, in which they can be retained, and from which they can be retrieved.

storage fragmentation. Inability to assign real storage locations to virtual addresses because the available spaces are smaller than the page size.

storage interference. In a system with shared storage, the referencing of the same block of storage by two or more processing units.

storage key. An indicator associated with one or more storage blocks, that requires that tasks have a matching protection key to use the blocks.

storage protection. (1) * An arrangement for preventing access to storage for either reading, or writing, or both. Synonymous with memory protection. (2) See also *fetch protection, store protection.*

storage protection key. See *protection key, storage key.*

storage reconfiguration. Under the Model 65 Multiprocessing System, a function that makes an

area of defective storage unavailable and frees any system resources associated with it.

storage region. See *main storage region, overlay region, virtual storage region.*

storage register. A device for holding a unit of information.

storage stack. Same as *pushdown list.*

* **store.** To enter data into a storage device. (2) To retain data in a storage device. (3) A storage device. (4) See *immediate access store, pushdown store.*

store and forward. The interruption of data flow from the originating terminal to the designated receiver by storing the information enroute and forwarding it at a later time. See also *message switching.*

* **stored program computer.** (SC1) A computer controlled by internally stored instructions that can synthesize, store, and in some cases alter instructions as as though they were data, and that can subsequently execute these instructions.

store protection. A storage protection feature that determines right of access to main storage by matching a protection key, associated with a store reference to main storage, with a storage key, associated with each block of main stotrage. See also *fetch protection.*

STR. *Synchronous transmitter receiver.*

* **straight line coding.** Coding in which loops are avoided by the repetition of parts of the coding when required.

* **string.** (1) A linear sequence of entities such as characters or physical elements. (2) See *alphabetic string, bit string, character string, null string, symbol string, unit string.*

* **striping.** In flowcharting, the use of a line across the upper part of a flowchart symbol to signify that a detailed representation is located elsewhere in the same set of flowcharts.

* **stroke.** (1) In character recognition, a straight line or arc used as a segment of a graphic character. (2) See *Sheffer stroke.*

* **stroke centerline.** In character recognition, a line midway between the two stroke edges.

* **stroke edge.** In character recognition, the line of discontinuity between a side of a stroke and the background, obtained by averaging, over the length of the stroke, the irregularities resulting from the printing and detecting processes.

* **stroke width.** In character recognition, the distance measured perpendicularly to the stroke centerline between the two stroke edges.

stunt box. A device to (1) control the nonprinting functions of a teletypewriter terminal, such as carriage return, line feed, and (2) recognize line control characters, for example, CDC.

* **STX.** The *start of text character.*

* **SUB.** The *substitute character.*

subcommand. A request for an operation that is within the scope of work requested by a previously-issued command.

submodular phase. Under DOS and TOS, a phase made up of selected control sections from one or more modules as compared with a phase that is made up of all control sections from one or more modules.

subparameter. One of the variable items of information that follows a keyword parameter and can be either positional or identified by a keyword.

subpool. All of the storage blocks allocated under a subpool number for a particular task.

* **subroutine.** (1) A routine that can be part of another routine. (2) See *closed subroutine, direct insert subroutine, dynamic subroutine, open subroutine.*

* **subroutine call.** The subroutine, in object coding, that performs the call function.

subscriber's loop. See *local loop.*

* **subset.** See *character subset.*

subset. (1) A set contained within a set. (2) In communications, a subscriber set, such as a telephone. (3) A modulation and demodulation device.

* **substitute character.** An accuracy control character intended to replace a character that is determined to be invalid, in error, or cannot be represented on a particular device. Abbreviated SUB.

substitute mode. A transmittal mode used with exchange buffering on which segments are pointed to, and exchanged with, user work areas. See also *locate mode, move mode.*

substrate (of a microcircuit). The supporting material upon which or within which an integrated circuit is fabricated, or to which an integrated circuit is attached.

subsystem. A secondary or subordinate system, usually capable of operating independently of, or asynchronously with, a controlling system.

subtask. A task that is initiated and terminated by a higher order task.

subtasking. See *MFT with subtasking*.

* **subtractor.** See *adder-subtractor*.

subvoice-grade channel. A channel of bandwidth narrower than that of voice-grade channels. Such channels are usually subchannels of a voice-grade line. Common usage excludes telegraph channels from this definition.

* **summation check.** A check based on the formation of the sum of the digits of a numeral. The sum of the individual digits is usually compared with a previously computed value.

superposed circuit. An additional channel obtained from one or more circuits, normally provided for other channels, in such a manner that all the channels can be used simultaneously without mutual interference.

superposed (superimposed) ringing. Party-line telephone ringing in which a combination of alternating and direct currents is utilized, the direct currents, of both polarities, being provided for selective ringing.

supervisor. (1) The part of a control program that coordinates the use of resources and maintains the flow of CPU operations. (2) * See *overlay supervisor*.

supervisor call instruction. An instruction that . interrupts the program being executed and passes control to the supervisor so that it can perform a specific service indicated by the instruction. Abbreviated SVC.

supervisor lock. In OS/VS and VM/370, an indicator used to inhibit entry to disabled code while a disabled page fault is being resolved.

supervisor state. A state during which the central processing unit can execute input/output and other privileged instructions. Contrast with *problem state*.

supervisory relay. A relay which, during a telephone call, is controlled by the transmitter current supplied to a subscriber line to receive from the associated

stations signals that control the actions of operators or switching mechanisms.

* **supervisory routine.** Same as *executive routine*.

supervisory signals. Signals used to indicate the various operating states of circuit combinations.

* **suppression.** See *zero suppresion*.

SVC. *Supervisor call instruction.*

SVC interruption. An interruption caused by the execution of a supervisor call instruction, causing control to be passed to the supervisor.

SVC routine. A control program routine that performs or begins a control program service specified by a supervisor call instruction.

SWADS. *Scheduler work area data set.*

swap. (1) In systems with time sharing, to write the main storage image of a job to auxiliary storage and read the image of another job into main storage. (2) Under OS/VS2 with TSO, to write the active pages of a job to external page storage and read pages of another job from external page storage into real storage.

swap allocation unit. Under TSO, an arbitrary unit of auxiliary storage space into which a swap data set is divided, and by which it is allocated.

swap data set. Under TSO, a data set dedicated to the swapping operation.

swap data set control block. Under TSO, a control block describing a swap data set, containing a DCB, a space queue, and device dependent control information.

swap-in. (1) In systems with time sharing, the process of reading a terminal job's main storage image from auxiliary storage into main storage. (2) Under OS/VS2 with TSO, the process of reading pages of a job from external page storage into real storage.

swap-out. (1) In systems with time sharing, the process of writing a terminal job's main storage image from main storage to auxiliary storage. (2) Under OS/VS2 with TSO, the process of writing the active pages of a job from real storage to external page storage.

swapping. (1) In systems with time sharing, a process that writes a job's main storage image to auxiliary storage, and reads another job's main storage image into main storage. (2) Under OS/VS2 with TSO, a paging technique that writes

the active pages of a job to external page storage
and reads pages of another job from external page
storage into real storage.

* switch. A device or programming technique for
making a selection, for example, a toggle, a
conditional jump.

switched line. A communication line in which the
connection between the computer and a remote
station is established by dialing. Synonymous with
dial line.

switch hook. A switch on a telephone set,
associated with the structure supporting the receiver
or handset. It is operated by the removal or
replacement of the receiver or handset on the
support. See also off-hook, on-hook.

switching. (1) Pertaining to a connection
established by dialing between a remote terminal
and a computer. (2) See automatic volume
switching, line switching.

switching center. A location that terminates multiple
circuits, and is capable of interconnecting circuits or
transferring traffic between circuits; may be
automatic, semiautomatic, or torn-tape.

switching pad. A transmission loss pad
automatically cut in and out of a toll circuit for
different operating conditions.

switch room. That part of a telephone central office
building that houses switching mechanisms and
associated apparatus.

switch train. A sequence of switches through which
connection must be made to establish a circuit
between a calling telephone and a called telephone.
See also train.

symbol. (1) * A representation of something by
reason of relationship, association, or convention.
mnemonic symbol (2) In OS/360 and OS/VS, any
group of eight or less alphameric and national
characters that begins with an alphabetic or national
(#, @, $) character. (3) * See abstract symbol,
flowchart symbol, logic symbol. (4) See mnemonic
synbol, ordinary symbol, sequence symbol, SET
symbol, variable symbol.

* symbolic address. An address expressed in symbols
convenient to the computer programmer.

* symbolic coding. Coding that uses machine
instructions with symbolic addresses.

symbolic I/O assignment. A means by which a
problem program can refer to an I/O device by a
symbolic name. Before the program is executed, a

specific I/O device is assigned to the symbolic
name.

* symbolic logic. The discipline that treats formal
logic by means of a formalized artificial language or
symbolic calculus whose purpose is to avoid the
ambiguities and logical inadequacies of natural
languages.

symbolic parameter. In assembler programming, a
variable symbol declared in the prototype statement
of a macro definition. A symbolic parameter is
usually assigned a value from the corresponding
operand in the macro instruction that calls the
macro definition. See also keyword parameter,
positional parameter.

* symbol rank. Same as digit place.

* symbol string. A string consisting solely of symbols.

* SYN. The synchronous idle character.

synch bits. Same as framing bits.

* synchronization pulses. Pulses introduced by
transmitting equipment into the receiving equipment
to keep the two equipments operating in step.

synchronous. Occurring with a regular or
predictable time relationship.

* synchronous computer. (SC1) A computer in which
each event, or the performance of any basic
operation, is constrained to start on, and usually to
keep in step with, signals from a clock. Contrast
with asynchronous computer.

synchronous idle character. A communication
control character used by a synchronous data
transmission system in the absence of any other
character to provide a signal from which
synchronism may be achieved or retained between
data terminal equipment. Abbreviated SYN.

synchronous transmission. Transmission in which
the sending and receiving instruments are operating
continuously at substantially the same frequency
and are maintained, by means of correction, in a
desired phase relationship.

synchronous transmitter receiver. The transmission
unit of the class of IBM terminals employing
synchronous transmission. The STR unit maintains
line synchronization, transmits and receives
characters, and transmits and receives checking and
control information. The STR family of terminals
includes the IBM 1009, 1013, 7701, 7702, 7710,
7711, 7740, 7750, a System/360 Model 20 with
Communications Adapter, and an 1130 with a

Synchronous Communications Adapter. Abbreviated STR.

synonym. In an indirectly addressed file, a record whose key randomizes to the address of a home record.

* syntax. (1) The structure of expressions in a language. (2) The rules governing the structure of a language.

syntax checker. A program that tests source statements in a programming language for violations of the syntax of that language.

SYSGEN. *System generation.*

SYSIN. A system input stream; also, the name used as the data definition name of a data set in the input stream.

SYSLOG. *System log.*

SYSOUT. A system output stream; also, an indicator used in data definition statements to signify that a data set is to be written on a system output unit.

* system. (1) (SC1) An assembly of methods, procedures, or techniques united by regulated interaction to form an organized whole. (2) (SC1) An organized collection of men, machines, and methods required to accomplish a set of specific functions. (3) See *information feedback system, management information system, number representation system, number system, numeral system, numeration system, operating system.*

System/7. A sensor-based system for the solution of plant automation, process control, laboratory automation, and data acquisition applications.

system control programming. IBM-supplied programming that is fundamental to the operation and maintenance of the system. It serves as an interface with program products and user programs and is available without additional charge.

system generation. The process of using an operating system to assemble and link together all of the parts that constitute another operating system. Abbreviated SYSGEN.

system input device. A device specified as a source of an input stream.

system integrity. See *integrity.*

system library. A collection of data sets in which the various parts of an operating system are stored.

system loader. See *loader (2).*

system lock. In OS/VS1, an indicator in the communications vector table, used to inhibit the dispatching of any task except paging supervisor tasks.

system log. A data set in which job-related information, operational data, descriptions of unusual occurrences, commands, and messages to or from the operator may be stored. Abbreviated SYSLOG.

system macro definition. A library macro definition supplied by IBM.

system macro instruction. A macro instruction that calls for the processing of an IBM-supplied library macro definition; for example, the ATTACH macro.

system management facilities. An optional control program feature of OS/360 and OS/VS that provides the means for gathering and recording information that can be used to evaluate system usage. Abbreviated SMF.

System/3 Model 6. A general purpose system for commercial data processing and interactive problem solving.

System/3 Model 10. A general purpose commercial data processing system using the 96-column card and designed primarily for small businesses.

system output device. A device assigned to record output data for a series of jobs.

system output writer. A job scheduler function that transcribes specified output data sets onto a system output unit, independently of the program that produced the data sets.

system productivity. A measure of the work performed by a system. productivity largely depends on a combination of two other factors; the facility (ease of use) of the system and the performance (throughput, response time, and availability) of the system.

system programmer. (1) A programmer who plans, generates, maintains, extends, and controls the use of an operating system with the aim of improving the overall productivity of an installation. (2) A programmer who designs programming systems and other applications.

system queue area. (1) In OS/360, a main storage area reserved for control blocks and tables maintained by the control program. (2) In OS/VS, an area of virtual storage reserved for system-related control blocks. Abbreviated SQA.

system recorder file. Under DOS, the file that is used to record hardware reliability data. Synonymous with recorder file.

system residence volume. The volume on which the nucleus of the operating system and the highest-level index of the catalog are located.

system resource. Any facility of the computing system that may be allocated to a task.

system restart. (1) A restart that allows reuse of previously-initialized input and output work queues. Synonymous with warm start. (2) A restart that allows reuse of a previously-initialized link pack area. Synonymous with quick start.

system task. A control program function that is performed under the control of a task control block.

system utility device. A device that is assigned for the temporary storage of intermediate data for a series of job steps.

system utility programs. A collection of problem state programs designed for use by a system programmer in performing such functions as changing or extending the indexing structure of the catalog.

system variable symbol. In assembler programming, a variable symbol that does not have to be declared because the assembler assigns them read-only values.

systems analysis. The analysis of an activity to determine precisely what must be accomplished and how to accomplish it.

T

* **table.** A collection of data in which each item is uniquely identified by a label, by its position relative to the other items, or by some other means.

* **table look-up.** A procedure for obtaining the function value corresponding to an argument from a table of function values.

* **tabulate.** (1) To form data into a table. (2) To print totals.

* **tag.** (1) One or more characters attached to an item or record for the purposes of identification. (2) Same as *flag*.

tag sort. A sort in which addresses of records (tags), and not the records themselves, are moved during the comparison procedure.

* **tape.** See *carriage control tape, magnetic tape, punched tape*.

* **tape deck.** Same as *tape unit*.

* **tape drive.** A device that moves tape past a head. Synonymous with tape transport.

Tape Operating System. A tape resident system that provides operating system capabilities for 16K and larger IBM System/360 systems. Abbreviated TOS.

tape relay. A method (using perforated tape as the intermediate storage) of relaying messages between the transmitting and receiving stations.

tape resident system. An operating system that uses magnetic tape for online storage of system routines.

* **tape station.** Same as *tape unit*.

* **tape to card.** Pertaining to equipment or methods that transmit data from either magnetic tape or punched tape to punched cards.

* **tape transport.** Same as *tape drive*.

* **tape unit.** A device containing a tape drive, together with reading and writing heads and associated controls. Synonymous with tape deck, tape station.

* **target language.** The language to which a statement is translated. Synonymous with object language.

* **target program.** Same as *object program*.

tariff. The published rate for a specific unit of equipment, facility, or type of service provided by a communications common carrier. Also, the vehicle by which the regulating agencies approve or disapprove such facilities or services. Thus, the tariff becomes a contact between customer and common carrier.

task. A unit of work for the central processing unit; therefore, the basic multiprogramming unit under the control program.

task control block. The consolidation of control information related to a task. Abbreviated TCB.

task dispatcher. In OS/360 and OS/VS, the control program function that selects from the task queue the task that is to have control of the central processing unit, and gives control to the task.

task management. Those functions of the control program that regulate the use by tasks of the central processing unit and other resources, except for input/output devices.

task queue. A queue of all the task control blocks present in the system at any one time.

TCAM. *Telecommunications access method.*

TCU. *Transmission control unit.*

TD. *Transmitter-distributor.*

tele-autograph. A writing telegraph instrument, in which movement of a pen in the transmitting apparatus varies the current in two circuits in such a way as to cause corresponding movement of a pen at the remote receiving instrument. Synonymous with telewriter.

telecommunication control unit. Same as *transmission control unit.*

telecommunication lines. Telephone and other communication lines that are used to transmit messages from one location to another.

telecommunications. (1) * Pertaining to the transmission of signals over long distances, such as by telegraph, radio, or television. (2) Data transmission between a computing system and remotely located devices via a unit that performs the necessary format conversion and controls the rate of transmission.

telecommunications access method. A method used to transfer data between main storage and remote or local terminals. Application programs use either GET and PUT or READ and WRITE macro instructions to request the transfer of data, which is performed by a message control program. The message control program synchronizes the transfer, thus eliminating delays for terminal input/output operations. Abbreviated TCAM.

telegraph. A system employing the interruption or change in polarity of direct current for the transmission of signals. See also *polar transmission.*

telegraph grade circuit. A circuit suitable for transmission by teletypewriter equipment. Normally, the circuit is considered to employ DC signaling at a maximum speed of 75 bauds.

telemeter. To transmit digital or analog metering data by communication facilities. For example, data can be telemetered from a missile and recorded at a ground station.

Telepak. A leased channel offering of telephone companies and Western Union providing specific-size bundles of voice-grade, telegraph-grade, subvoice-grade, and broadband channels between two points; also, just the broadband channels. Mileage charges are constant for each mile rather than regressive as in conventional single-leased lines.

telephone company. Any common carrier providing public telephone system service.

teleprinter. Equipment used in a printing telegraph system. See also *teletypewriter.*

teleprocessing. The processing of data that is received from or sent to remote locations by way of telecommunication lines.

TELESPEED. A Western Union marketing term for DATASPEED equipment.

Teletype. Trademark of Teletype Corporation, usually referring to a series of different types of teleprinter equipment such as tape punches, reperforators, and page printers, utilized for communications systems.

teletypewriter. A generic term referring to the basic equipment made by Teletype Corporation and to teleprinter equipment.

teletypewriter exchange service. Teletypewriter service in which suitably arranged teletypwriter stations are provided with lines to a central office for access to other such stations throughout the U.S. and Canada. Both baudot- and ASCII- coded machines are used. Business machines may also be used, with certain restrictions. Abbreviated TWX.

teletypewriter switching systems. Total message switching systems where the terminals are teletypewriter equipment.

telewriter. Same as *tele-autograph.*

telex. An automatic teleprinter exchange service provided by Western Union, similar to teletypewriter exchange service but worldwide. Only baudot equipment is provided; business machines may also be used. Abbreviated TEX.

temporary data set. A data set that is created and deleted in the same job. Contrast with *nontemporary data set.*

temporary read/write error. An error that is eliminated by retrying a read/write operation.

* **temporary storage.** In programming, storage locations reserved for intermediate results. Synonymous with working storage.

* **tens complement.** The radix complement in decimal notation.

term. (1) The smallest part of an expression that can be assigned a value. (2) See *absolute term, arithmetic term, logical term, relocatable term.*

terminal. A device, usually equipped with a keyboard and some kind of display, capable of sending and receiving information over a communication channel. See also *job-oriented terminal, remote terminal.*

terminal I/O wait. The condition of a task in which the task cannot continue processing until a message is received from a terminal.

terminal job. In systems with time sharing, the processing done on behalf of one terminal user from logon to logoff.

terminal job identification. Under TSO, a two-byte identification assigned to each terminal job. Abbreviated TJID.

terminal monitor program. Under TSO, a program that accepts and interprets commands from the terminal, and causes the appropriate command processors to be scheduled and executed. Abbreviated TMP.

terminal repeater. A repeater for use at the end of a trunk line.

terminal room. A room, associated with a telephone central office, private branch exchange, or private exchange, which contains distributing frames, relays, and similar apparatus except that mounted in the switchboard sections.

terminal session. See *session.*

terminal table. An ordered collection of information that identifies each line, station, component, or application program from which a message can originate or to which a message can be sent.

terminal user. In systems with time sharing, anyone who is eligible to log on.

terminated line. A transmission line with a resistance attached across its far end equal to the characteristic impedance of the line, so that no reflection and no standing waves are present when a signal is placed on it at the near end. Contrast with *bridge tap.*

* **ternary.** (1) Pertaining to a characteristic or property involving a selection, choice, or condition in which there are three possibilities. (2) Pertaining to the numeration system with a radix of three.

* **ternary incremental representation.** (SC1) Incremental representation in which the value of an increment is rounded to one of three values, plus or minus one quantum or zero.

* **test.** See *leapfrog test.*

test board. Switchboard equipment with testing apparatus, so arranged that connections can be made from it to telephone lines or central office equipment for testing pupposes.

test tone. A tone used in identifying circuits for trouble location or for circuit adjustment. See also *standard test tone power.*

TESTRAN. (TEST TRANslator) A set of assembler language macro instructions that can be used to test programs written in the assembler language.

test translator. A facility that allows various debugging procedures to be specified in assembler language programs.

TEX. *Telex.*

text. (1) * In ASCII and communications, a sequence of characters treated as an entity if preceded and terminated by one STX and one EXT communication control character, respectively. Contrast with *heading.* (2) The control sections of an object module or load module. (3) The data portion of a telecommunications message.

* **then.** See *IF-THEN.*

* **theory.** See *information theory.*

* **thin film.** Loosely, magnetic thin film.

third-generation computer. A computer utilizing solid logic technology components.

thrashing. In virtual storage systems, a condition in which the system can do little useful work because of excessive paging.

* **three-address.** Pertaining to an instruction format containing three address parts.

* **three-plus-one address.** Pertaining to an instruction that contains three operand addresses and one control address.

three-row keyboard. The keyboard on baudot-coded teletypewriter equipment. See also *four-row keyboard.*

* **threshold.** (1) A logic operator having the property that if P is a statement, Q is a statement, R is a statement,..., then the threshold of P, Q, R,... is true if at least N statements are true, false if less than N statements are true, where N is a specified nonnegative integer called the threshold condition. (2) The threshold condition as in (1).

* **threshold element.** A device that performs the logic threshold operation but in which the truth of each input statement contributes, to the output determination, a weight associated with that statement.

   throughput. The total volume of work performed by a computing system over a given period of time.

   tie line. A private-line communications channel of the type provided by communications common carriers for linking two or more points together.

   tie trunk. A telephone line or channel directly connecting two branch exchanges.

* **time.** See *access time, available time, corrective maintenance time, development time, downtime, idle time, installation time, maintenance time, makeup time, operating time, preventive maintenance time, production time, real time, word time.*

   time-out. The time interval allotted for certain operations to occur; for example, response to polling or addressing before system operation is interrupted and must be restarted.

* **time share.** To use a device for two or more interleaved purposes.

   time sharing. (1) * Pertaining to the interleaved use of the time of a device. (2) A method of using a computing system that allows a number of users to execute programs concurrently and to interact with the programs during execution.

   time sharing control task. Under TSO, a system task that handles system initialization, allocation of time-shared regions, swapping, and general control of the time-sharing operation. Abbreviated TSC.

   time sharing driver. Under TSO, an addition to the dispatcher that determines which task is to execute next.

   time sharing interface area. Under TSO, a control block used for communication between the time sharing driver and the time sharing interface program.

   time sharing interface program. Under TSO, a program that handles all communication between the control program and the time sharing driver.

   time sharing option. An option of MVT and OS/VS2 that provides conversational time sharing from remote terminals. Abbreviated TSO.

   time sharing priority. In systems with time sharing, a ranking within the group of tasks associated with a single user, used to determine their precedence in receiving system resources.

   time slice. (1) An interval of time on the central processing unit allocated for use in performing a task. Once the interval has expired, CPU time is allocated to another task; thus a task cannot monopolize CPU time beyond a fixed limit. (2) In systems with time sharing, a segment of time allocated to a terminal job. See also *major time slice, minor time slice.*

   time slicing. (1) A feature that can be used to prevent a task from monopolizing the central processing unit and thereby delaying the assignment of CPU time to other tasks. (2) In systems with time sharing, the allocation of time slices to terminal jobs.

   tip. The end of the plug used to make circuit connections in a manual switchboard. The tip is the connector attached to the positive side of the common battery which powers the station equipment. By extension, it is the positive battery side of a communications line. Synonymous with tip side. See also *common battery central office.*

   tip side. Same as *tip.*

   TJID. *Terminal job identification.*

   TMP. *Terminal monitor program.*

* **toggle.** (1) Same as *flip-flop.* (2) Pertaining to any device having two stable states.

   toll. In public switched systems, a charge for a connection beyond an exchange boundary, based on time and distance.

   toll center. A central office where channels and toll message circuits terminate. While this is usually one particular central office in a city, larger cities may have several central offices where toll message circuits terminate. A class 4 office. Synonymous with toll office, toll point.

   toll-free number. Same as *enterprise number.*

   tone dialing. Same as *pushbutton dialing.*

   torn-tape switching center. A location where operators tear off the incoming printed and punched paper tape and transfer it manually to the proper outgoing circuit.

TOS. *Tape Operating System.*

Touch-call. Proprietary term of GT & E. See also *pushbutton dialing.*

trace. (1) The record of a series of events. (2) To record a series of events as they occur.

* **tracing routine.** A routine that provides a historical record of specified events in the execution of a program.

* **track.** (1) The portion of a moving storage medium, such as a drum, tape, or disk, that is accessible to a given reading head position. (2) See *clock track.*

track hold. A facility that protects a track while it is being accessed. When data on a·track is being modified by a task in one partition, that track cannot be accessed at the same time by a task or subtask in another partition.

traffic. In communications, transmitted and received messages.

trailer label. A file or data set label that follows the data records on a unit of recording media.

trailer record. A record which follows one or more records and contains data related to those records.

train. A sequence of pieces of apparatus joined together to forward or complete a call. See also *switch train.*

TRAN. *Transmit.*

* **transaction file.** A file containing relatively transient data to be processed in combination with a master file. For example, in a payroll application, a transaction file indicating hours worked might be processed with a master file containing employee name and rate of pay. Synonymous with detail file.

transceiver. A terminal that can transmit and receive traffic.

* **transcribe.** To transfer data from one medium to another, performing conversions as necessary for acceptance by the receiving medium.

* **transducer.** A device for converting energy from one form to another.

* **transfer.** (1) Same as *jump.* (2) Same as *transmit.* (3) See *peripheral transfer, radial transfer.*

* **transfer check.** A check on the accuracy of a data transfer.

* **transform.** To change the form of data according to specific rules.

transient area. A main storage area used for temporary storage of transient routines, such as nonresident SVC or error-handling routines.

transient error. An error that occurs once or at unpredictable intervals.

transient routines. Self-relocating routines, permanently stored on the system residence device and loaded into the transient area when needed for execution.

transistor. A small solid-state, semiconducting device, ordinarily using germanium, that performs nearly all the functions of an electronic tube, especially amplification.

transition. The switching from one state (for example, positive voltage) to another (negative voltage) in a serial transmission.

* **translate.** To convert from one language to another without significantly changing the meaning.

translation specification exception. In System/370 virtual storage systems, a program interruption that occurs when a page table entry, segment table entry, or the control register pointing to the segment table contains information in an invalid format. Synonymous with program interruption code 18. See also *page translation exception, segment translation exception.*

translation tables. Page tables and segment tables.

translator. (1) A device that converts information from one system of representation into equivalent information in another system of representation. In telephone equipment, the device that converts dialed digits into call-routine information. (2) A routine for changing information from one representation or language to another.

* **transliterate.** To convert the characters of one alphabet to the corresponding characters of another alphabet.

* **transmission.** (1) The sending of data from one location and the receiving of data in another location, usually leaving the source data unchanged. (2) The sending of data. (3) In ASCII and communications, a series of characters, including headings and texts. (4) See *parallel transmission, serial transmission.*

transmission code. A code for sending information over communications lines.

transmission level. See *relative transmission level.*

transmission control unit. An input/output control unit that addresses messages to and receives messages from a number of remote terminals. Synonymous with telecommunications control unit. Abbreviated TCU.

transmission interruption. The interruption of a transmission from a terminal by a higher priority transmission to the terminal. Synonymous with reverse break.

* **transmit.** To send data from one location and to receive the data at another location. Synonymous with transfer (2), move.

transmittal mode. The method by which the contents of an input buffer are made available to the program, and the method by which a program makes records available for output.

transmitter-distributor. The device in a teletypewriter terminal which makes and breaks the line in timed sequence. Modern usage of the term refers to a paper tape transmitter. Abbreviated TD.

transmitter start code. A Bell System term for character sequence that is sent to an outlying teletypewriter terminal which automatically polls its tape transmitter or keyboard. See also *TS, polling.* Abbreviated TSC.

* **transport.** See *tape transport.*

transposition. Interchanging the position of open-wire conductors relative to each other to reduce induced signals.

transverse crosstalk coupling. Between a disturbing and a disturbed circuit in any given section, the vector summation of the direct couplings between adjacent short lengths of the two circuits, without dependence on intermediate flow in other nearby circuits.

* **trap.** An unprogrammed conditional jump to a known location, automatically activated by hardware, with the location from which the jump occurred recorded.

trivial response. Under TSO, a response from the system to a request for processing that should require only one time slice; for example, a syntax check of one FORTRAN statement.

* **troubleshoot.** Same as *debug.*

trouble unit. A weighting figure applied to telephone circuit or circuits to indicate the expected performance in a given period.

* **true complement.** Same as *radix complement.*

* **truncate.** To terminate a computational process in accordance with some rule, for example, to end the evaluation of a power series at a specified term.

* **truncation error.** An error due to truncation. Contrast with *rounding error.*

trunk. A telephone channel between two control offices or switching devices which is used in providing a telephone connection between subscribers.

trunk exchange. An exchange devoted primarily to interconnecting trunks.

trunk group. Those trunks between two points, both of which are switching centers and/or individual message distribution points, and which employ the same multiplex terminal equipments.

trunk hunting. A method of switching incoming calls to the next consecutive or next available number if the first called number is busy.

* **truth table.** A table that describes a logic function by listing all possible combinations of input values and indicating, for each combination, the true output values.

TSC. *Time sharing control task.*

TS dispatcher. Under TSO, a section of the time sharing interface program executed as part of the operating system dispatcher. It initiates work requested by the time sharing driver.

TSO. *Time sharing option.*

TSO command language. The set of commands, subcommands, and operands recognized under the time sharing option (TSO).

TSS. *IBM System/360 Time Sharing System.*

TTY. *Teletypewriter equipment.*

* **tube.** See *display tube.*

tuning. The process of adjusting system control variables to make the system divide its resources most efficiently for the workload.

* **turing machine.** (1) A mathematical model of a device that changes its internal state and reads from, writes on, and moves, a potentially infinite tape, all in accordance with its present state, thereby constituting a model for computer-like behavior. (2) See *universal turing machine.*

turnaround time. (1) The elapsed time between submission of a job to a computing center and the return of results. (2) In communications, the actual time required to reverse the direction of transmission from send to receive or vice versa when using a half-duplex circuit. For most communications facilities, there will be time required by line propagation and line effects, modem timing, and machine reaction. A typical time is 200 milliseconds on a half-duplex telephone connection.

* **twelve-punch.** A punch in the top row of a Hollerith punched card. Synonymous with Y-punch.

* **two-address.** Pertaining to an instruction format containing two address parts.

* **two-out-of-five code.** A positional notation in which each decimal digit is represented by five binary digits of which two are one kind, for example, ones, and three are the other kind, for example, zeros.

* **two-plus-one address.** Pertaining to an instruction that contains two operand addresses and one control address.

* **twos complement.** The radix complement in binary notation.

two-tone keying. See *frequency-shift keying.*

two-wire circuit. A metallic circuit formed by two conductors insulated from each other. It is possible to use the two conductors as a one-way transmission path, a half-duplex path, or a duplex path.

TWX. *teletypewriter exchange service.*

typebar. A linear type element containing printable symbols.

* **type font.** A type face of a given size and style, for example, 10-point Bodoni Modern.

type 1 programming. System programs, written, tested, and announced prior to June 23, 1969, that are distributed and supported by IBM.

type 2 programming. Application programs, written tested, and announced prior to June 23, 1969, that are distributed and supported by IBM.

type 3 programming. Programs developed prior to June 23, 1969 by IBM authors, but not formally tested or supported by IBM. They are distributed without charge to the data processing community.

type 4 programming. Programs developed prior to June 23, 1969, by one or more authors, at least one

an employee of an IBM customer, but not formally tested or supported by IBM. They are distributed without charge to the data processing community.

typing reperforator. A reperforator which types on chadless tape about one-half inch beyond where corresponding characters are punched. Some units type on the edge of special-width tape.

U

UADS. *User attribute data set.*

UCS. *Universal character set.*

U format. A data set format in which blocks are of unknown length.

unallocate. See *deallocate.*

* **unary operation.** See *monadic operation.*

unary operator. An arithmetic operator having only one term. The unary operators that can be used in absolute, relocatable, and arithmetic expressions are: positive (+) and negative (-).

unattended operation. The automatic features of a station's operation which permit the transmission and reception of messages on an unattended basis. Contrast with *attended operation.*

unbalanced (to ground). The state of impedance on a two-wire line when the impedance to ground as measured from one wire is different from the impedance to ground as measured from the other wire. Contrast with *balanced to ground.*

unblock. See *deblock.*

undefined record. A record having an unspecified or unknown length. See also *U format.*

* **underflow.** Pertaining to the condition that arises when a machine computation yields a non-zero result that is smaller than the smallest non-zero quantity that the intended unit of storage is capable of storing. Contrast with *overflow.*

unformatted display. On an IBM 3270 Display Station, a display in which no display field has been defined by the user. Contrast with *protected field.*

unipolar. See *neutral transmission.*

* **unit.** (1) A device having a special function. (2) A basic element. (3) See *arithmetic unit, central processing unit, control unit, identity unit, tape unit.*

unit address. The three-character address of a particular device, specified at the time a system is installed; for example, 191 or 293. See also *device type, group name.*

unit record. A card containing one complete record; a punched card.

* **unit separator.** The information separator intended to identify a logical boundary between items called "units". Abbreviated US.

* **unit string.** A string containing only one entity.

universal character set. A printer feature that permits the use of a variety of character arrays. Abbreviated UCS.

* **universal turing machine.** A turing machine that can simulate any other turing machine.

* **unpack.** To recover the original data from packed data.

unprotected field. On an IBM 3270 Display Station, a display field in which the user can enter, modify, or erase data from the keyboard. Contrast with *protected field.*

unrecoverable ABEND. An error condition that results in abnormal termination of a program. Contrast with *recoverable ABEND.*

unrecoverable error. An error that results in abnormal termination of a program.

update. To modify a master file with current information according to a specified procedure.

upward reference. In overlay, a reference made from a segment to another segment higher in the same path; that is, closer to the root segment.

* **US.** The *unit separator.*

* **USASCII.** Same as *ASCII.*

USASI. United States of America Standards Institute; a former name of the American National Standard, Institute. Same as *ANSI.*

user. Anyone who requires the services of a computing system. See also *terminal user.*

user attribute data set. Under TSO, a partitioned data set with a member for each authorized user. Each member contains the appropriate passwords, user identifications, account numbers, LOGON procedure names, and user characteristics that define the user profile. Abbreviated UADS.

user exit. A point in an IBM-supplied program at which a user exit routine may be given control.

user exit routine. A routine written by a user to take control at a user exit of a program supplied by IBM.

USERID. *User identification.*

user identification. A one-to eight-character symbol identifying a system user. Abbreviated USERID.

user main storage map. Under TSO, a map of the allocated storage in a user's region, built by the region control task, and used to determine how much of the region needs to be swapped.

user profile table. In systems with time sharing, a table of user attributes kept for each active user, built from information gathered during logon.

· **user's set.** An apparatus located on the premises of a user of a communication or signaling service and designed to function with other parts of a system.

utility program. A problem program designed to perform an everyday task, such as transcribing data from one storage device to another.

* **utility routine.** Same as *service routine.*

V

valid exclusive reference. In overlay, an exclusive reference in which a common segment contains a reference to the symbol used in the exclusive reference.

validity check. A check that a code group is actually a character of the particular code in use.

* **value.** See *code value.*

* **variable.** A quantity that can assume any of a given set of values.

variable-format messages. Messages in which line control characters are not to be deleted upon arrival nor inserted upon departure; variable-format messages are intended for terminals with similar characteristics. Contrast with *fixed-format messages.*

variable-length record. (1) A record having a length independent of the length of other records with which it is logically or physically associated. Contrast with *fixed-length record.* See also *V format.* (2) * Pertaining to a file in which the records are not uniform in length.

* **variable-point representation.** A positional representation in which the position of the radix point is explicitly indicated by a special character at that position. Contrast with *floating point representation*.

variable symbol. In assembler programming, a symbol used in macro and conditional assembly processing that can assume any of a given set of values.

* **venn diagram.** A diagram in which sets are represented by closed regions.

verification mode. In systems with time sharing, a mode of operation under the EDIT command in which all subcommands are acknowledged and any textual changes are displayed as they are made.

verifier. A device similar to a card punch used to check the inscribing of data by rekeying.

* **verify.** (1) To determine whether a transcription of data or other operation has been accomplished accurately. (2) To check the results of keypunching.

vertical redundancy check. An odd parity check performed on each character of a,transmitted block of ASCII-coded data as the block is received. Abbreviated VRC. See also *cyclic redundancy check, longitudiual redundancy check*.

* **vertical tabulation character.** A format effector that causes the location of the printing or display position to be moved a predetermined number of lines perpendicular to the printing line. Abbreviated VT.

V format. A data set format in which logical records are of varying length and include a length indicator, and in which V-format logical records may be blocked, with each block containing a block length indicator.

virtual address. In virtual storage systems, an address that refers to virtual storage and must, therefore, be translated into a real storage address when it is used.

virtual address area. In DOS/VS, the area of virtual storage whose addresses are greater than the highest address of the real address area.

virtual address space. In virtual storage systems, the virtual storage assigned to a job, terminal user, or system task.

virtual computing system. Same as *virtual machine*.

virtual equals real (V = R) storage. Same as *nonpageable dynamic area*.

virtual machine. (1) A functional simulation of a computer and its associated devices. (2) In VM/370, a functional equivalent of an IBM System/370 computing system. Each virtual machine is controlled by a suitable operating system. VM/370 controls the concurrent execution of multiple virtual machines.

virtual mode. In DOS/VS, the mode of a program that may be paged.

virtual partition. (1) In OS/VS1, a division of the dynamic area of virtual storage, established at system generation. (2) In DOS/VS, a division of the virtual address area of virtual storage that is allocated for programs that may be paged.

virtual = real option. In VM/370, a virtual machine option that permits the entire storage of a virtual machine to have the same range of addresses as real storage, except page zero which is relocated. It is used for programs that dynamically modify channel programs and for performance gains.

virtual region. In OS/VS2, a subdivision of the dynamic area that is allocated (in segment-size blocks) to a job step or a system task.

virtual storage. Addressable space that appears to the user as real storage, from which instructions and data are mapped into real storage locations. The size of virtual storage is limited by the addressing scheme of the computing system (or virtual machine) and by the amount of auxiliary storage available, rather than by the actual number of real storage locations.

virtual storage partition. See *virtual partition*.

virtual storage region. See *virtual region*.

VM/370 *IBM Virtual Machine Facility/370*.

VM/370 console function. A VM/370 facility that allows the remote terminal user to simulate a function available at a System/370 console. The command facilities of VM/370 (excluding the subsystem CMS) are referred to collectively as console functions.

VOGAD. Voice-Operated Gain-Adjusting Device. A device somewhat similar to a compandor and used on some radio systems; a voice-operated device which removes fluctuation from input speech and sends it out at a constant level. No restoring device is needed at the receiving end.

voice-frequency carrier telegraphy. That form of carrier telegraphy in which the carrier currents have frequencies such that the modulated currents may

be transmitted over a voice-frequency telephone channel.

voice-frequency telegraph system. A telegraph system permitting use of up to 20 channels on a single circuit by frequency division multiplexing.

voice-grade channel. A channel suitable for transmission of speech, digital or analog data, or facsimile, generally with a frequency range of about 300 to 3000 cycles per second.

voice-operated device. A device used on a telephone circuit to permit the presence of telephone currents to effect a desired control. Such a device is used in most echo suppressors.

voice unit. A measure of the gross amplitude of volume of an electrical speech or program wave. The reference volume is usually zero VU, which is one millivolt of steady sine wave into a 600-ohm resistive load. A good volume is usually between -10 and -30 VU. Anything over zero VU is definitely too loud; anything under -55 VU is definitely too soft. Readings will depend on the meter's frequency response and calibration criteria. See also *reference volume.*

* **void.** In character recognition, the inadvertent absence of ink within a character outline.

* **volatile storage.** A storage device in which stored data are lost when the applied power is removed, for example, an acoustic delay line.

 volatility. The percentage of records on a file that are added or deleted in a run. See also *activity.*

volume. (1) That portion of a single unit of storage which is accessible to a single read/write mechanism, for example, a drum, a disk pack, or part of a disk storage module. (2) A recording medium that is mounted and demounted as a unit, for example, a reel of magnetic tape, a disk pack, a data cell.

volume serial number. A number in a volume label that is assigned when a volume is prepared for use in the system.

volume table of contents. A table on a direct access volume, that describes each data set on the volume. Abbreviated VTOC.

 VRC. *Vertical redundancy check.*

V = R dynamic area. Same as *nonpageable dynamic area.*

V = R partition. Same as *nonpageable partition.*

V = R storage. Same as *nonpageable dynamic area.*

V response. An answer or response of a teletypewriter terminal to a poll or address selection. Synonymous with M response.

* **VT.** The *vertical tabulation character.*

VTOC. *Volume table of contents.*

V-type address constant. In the assembler language, an address constant used for branching to another module. See also *A-type address constant.*

VU. *Voice unit.*

W

wait state. (1) the condition of a task that is dependent on one or more events in order to enter the ready condition. (2) The condition of a central processing unit when all operations are suspended.

warm start. Same as *system restart (1).*

warning message. An indication that a possible error has been detected. Contrast with *error message.*

WATS. Wide Area Telephone Service. A service provided by telephone companies which permits a customer, by use of an access line, to make calls to telephones in a specific zone on a dial basis for a flat monthly charge. Monthly charges are based on the size of the area in which the calls are placed, not on the number or length of calls. Under the WATS arrangement, the U.S. is divided in six zones to be called on a fulltime or measured-time basis. See also *inward WATS.*

way station. A Western Union term for a station on a multipoint circuit.

weak external reference. An external reference that does not have to be resolved during linkage editing. If it is not resolved, it appears as though its value was resolved to zero. Abbreviated WXTRN.

* **weight.** Same as *significance.*

* **who are you?** (SC1) A transmission control character intended for switching on an answerback unit in the station with which the connection has been set up, or for initiating a response including station identification and, if required, the type of equipment in service and station status. Abbreviated WRU.

* **width.** See *stroke width.*

willful intercept. The act of intercepting messages intended for stations having equipment or line trouble. See also *miscellaneous intercept.*

word. (1) * A character string or a bit string considered as an entity. (2) * See *alphabetic word, computer word, half-word, machine word, numeric word.* (3) In System/360 and System/370, 32 bits or 4 bytes. (4) In System/7, 16 bits or 2 bytes.

* **word length.** A measure of the size of a word, usually specified in units such as characters or binary digits.

* **word time.** In a storage device that provides serial access to storage locations, the time interval between the appearance of corresponding parts of successive words.

work file. (1) In sorting, an intermediate file used for temporary storage of data between phases. (2) see also *work volume.*

working set. The set of a user's pages that must be active in order to avoid excessive paging.

* **working storage.** Same as *temporary storage.*

work queue entry. The control blocks and tables created from one job in an input stream and placed in the job's input work queue or in one of the output work queues.

work volume. A volume made available to the system to provide storage space for temporary files or data sets at peak loads.

WPM. Words per minute. A common measure of speed in telegraph systems.

wraparound. (1) The continuation of an operation from the maximum addressable location in storage to the first addressable location. (2) The continuation of register addresses from the highest register address to the lowest. (3) On a CRT display device, the continuation of an operation, e.g. a read or cursor movement, from the last character position in the display buffer to the first position in the display buffer.

* **write.** To record data in a storage device or a data medium. The recording need not be permanent, such as the writing on a cathode ray tube display device.

writer. See *output writer.*

writing task. In OS/360, the job management task that controls the transfer of system messages and SYSOUT data sets from the direct access volume on which they were initially written to a specified output device. Contrast with *reading task.*

WRU. The *who-are-you character.*

WXTRN. *Weak external reference.*

X

X-off. *Transmitter off.*

X-on. *Transmitter on.*

* **X-punch.** Same as *eleven-punch.*

Y

* **Y-punch.** Same as *twelve-punch.*

Z

Z. Characteristic impedance.

* **zerofill.** To character fill with the representation of zero.

* **zero-level address.** Same as *immediate address.*

* **zero suppression.** The elimination of nonsignificant zeros in a numeral.

zero transmission level reference point. An arbitrarily chosen point in a circuit to which all relative transmission levels are referred. The transmission level at the transmitting switchboard is frequently taken as the zero transmission level reference point. See also *relative transmission level.*

* **zone punch.** A punch in the eleven, twelve, or zero row of a punched card.

access mode. In COBOL, a technique that is used to obtain a specific logical record from, or to place a specific logical record into, a file assigned to a mass storage device.

actual decimal point. The physical representation, using either of the decimal point characters (. or ,), of the decimal point position in a data item. When specified, it will appear in a printed report, and it requires an actual space in storage.

actual key. (1) * In COBOL, a data item that may be used as a hardware address and that expresses the location of a record on a mass storage device. (2) A key which can be directly used by the system to locate a logical record on a mass storage device.

alphabetic character. A character which is one of the 26 characters of the alphabet, or a space. In COBOL, the term does not include any other characters.

aphanumeric character. Any character in the computer's character set.

alphanumeric edited character. A character within an alphanumeric character string which contains at least one B or 0.

arithmetic expression. A statement containing any combination of data names, numeric literals, and figurative constants, joined together by one or more arithmetic operators in such a way that the statement as a whole can be reduced to a single numeric value.

arithmetic operator. A symbol (single character or two-character set) which directs the system to perform an arithmetic operation. The following list shows arithmetic operators:

Meaning	Symbol
Addition	+
Subtraction	-
Multiplication	*
Division	/
Exponentiation	**

assumed decimal point. A decimal point position which does not involve the existence of an actual character in a data item. It does not occupy an actual space in storage.

character set. All the valid COBOL characters.

character string. A connected sequence of characters. All COBOL characters are valid.

class condition. A statement that the content of an item is wholly alphabetic or wholly numeric. It may be true or false.

clause. A set of consecutive COBOL words whose purpose is to specify an attribute of an entry. There are three types of clauses: data, environment, and file.

COBOL character. Any of the 51 valid characters in the COBOL character set.

comment. An annotation in the identification division or procedure division of a COBOL source program. As an IBM extension, comments may be included at any point in a COBOL source program.

compile time. The time during which a COBOL source program is translated by the COBOL compiler into a machine language object program.

compiler directing statement. A COBOL statement which causes the compiler to take a specific action at compile time, rather than causing the object program to take a particular action at execution time.

compound condition. A statement that tests two or more relational expressions. It may be true or false.

condition. (1) One of a set of specified values a data item can assume. (2) A simple conditional expression: relation condition, class condition, condition-name condition, sign condition, switch-status condition, NOT condition.

conditional statement. A syntactically correct statement, made up of data names, and/or literals, and/or figurative constants, and/or logical operators, so constructed that it tests a truth value. The subsequent action of the object program is dependent on this truth value.

conditional variable. A data item that can assume more than one value; one or more of the values it assumes has a condition name assigned to it.

condition name. The name assigned to a specific value, set of values, or range of values, that a data item may assume.

condition-name condition. A statement that the value of a conditional variable is one of a set (or range) of values of a data item identified by a condition name. The statement may be true or false.

configuration section. A section of the environment division of the COBOL program. It describes the overall specification of computers.

connective. A word or a punctuation character that associates a data name or paragraph name with its qualifier, links two or more operands in a series, or forms a condition expression.

CONSOLE. A COBOL mnemonic name associated with the console typewriter.

contiguous items. Consecutive elementary or group items in the data division that have a definite relationship with each other.

control bytes. Bytes associated with a physical record that serve to identify the record and indicate its length, blocking factor, etc.

data description entry. An entry in the data division that is used to describe the characteristics of a data item. It consist of a level number, followed by an optional data name, follows by data clauses that fully describe the format the data will take. An elementary data description entry (or item) cannot logically be subdivided further. A group data description entry (or item) is made of a number of related group and/or elementary items.

data division. One of the four main component parts of a COBOL program. The data division describes the files to be used in the program and the records contained within the files. It also describes any internal working-storage records that will be needed.

data item. A unit of recorded information that can be identified by a symbolic name or by a combination of names and subscripts. Elementary data items cannot logically be subdivided. A group data item is made up of logically related group and/or elementary items and can be a logical group within a record or can itself be a complete record.

data name. A name assigned by the programmer to a data item in a COBOL program. It must contain at least one alphabetic character.

declaratives. A set of one or more compiler-directing sections written at the beginning of the procedure division of a COBOL program. The first section is preceded by the header DECLARATIVES. The last section is followed by the header END DECLARATIVES.

device number. The reference number assigned to any external device.

digit. Any of the numerals from 0 through 9. In COBOL, the term is not used in reference to any other symbol.

division. One of the four major portions of a COBOL program: the identification division, which names the program, the environment division, which indicates the machine equipment and equipment features to be used in the program, the data division, which defines the nature and characteristics of data to be processed, and the procedure division, which consists of statements directing the processing of data in a specified manner at execution time.

division header. The COBOL words that indicate the beginning of a particular division of a COBOL program. The four division headers are: identification division, environment division, data division, and procedure division.

division name. The name of one of the four divisions of a COBOL program.

EBCDIC character. Any one of the symbols included in the eight-bit EBCDIC (Extended Binary-Coded-Decimal Interchange Code) set. All 51 COBOL characters are included.

editing character. A single character or a fixed two-character combination used to create proper formats for output reports.

elementary item. A data item that cannot logically be subdivided.

entry. Any consecutive set of descriptive clauses terminated by a period, written in the identification, environment, or procedure divisions of a COBOL program.

entry name. A programmer-specified name that establishes an entry point in a COBOL subprogram.

environment division. One of the four main component parts of a COBOL program. The environment division describes the computers upon which the source program is compiled and those on which the object program is executed, and provides a linkage between the logical concept of files and their records, and the physical aspects of the devices on which files are stored.

execution time. The time at which an object program actually performs the instructions coded in the procedure division, using the actual data provided.

exponent. A number, indicating how many times another number (the base) is to be repeated as a factor. Positive exponents denote multiplication, negative exponents denote division, fractional exponents denote a root of a quantity. In COBOL, exponentiation is indicated with the symbol ** followed by the exponent.

F-mode records. Records of a fixed length, each of which is wholly contained within a block. Blocks may contain more than one record.

figurative constant. A reserved word that represents a numeric value, a character, or a string of repeated values or characters. The word can be written in a COBOL program to represent the values or characters without being defined in the data division.

file control. The name and header of an environment division paragraph in which the data files for a given source program are named and assigned to specific input/output devices.

file description. An entry in the file section of the data division that provides information about the identification and physical structure of a file.

file name. A name assigned to a set of input data or output data. A file name must include at least one alphabetic character.

file section. A section of the data division that contains descriptions of all externally stored data (or files) used in a program. Such information is given in one or more file description entries.

floating-point literal. A numeric literal whose value is expressed in floating-point notation -- that is, as a decimal number followed by a exponent which indicates the actual placement of the decimal point.

function name. A name, supplied by IBM, that identifies system logical units, printer and card punch control characters, and report codes. When a function name is associated with a mnemonic name in the environment division, the mnemonic name can then be substituted in any format in which substitution is valid.

group item. A data item made up of a series of logically related elementary items. It can be part of a record or a complete record.

header label. A record that identifies the beginning of a physical file or a volume.

high-order position. The leftmost position in a string of characters.

identification division. One of the four main component parts of a COBOL program. The identification division identifies the source program and the object program and, in addition, may include such documentation as the author's name, the installation where written, date written, etc.

identifier. A data name, unique in itself, or made unique by the syntactically correct combination of qualifiers, subscripts, and/or indexes.

imperative statement. A statement consisting of an imperative verb and its operands, which specifies that an action be taken, unconditionally. An imperative statement may consist of a series of imperative statements.

index. A computer storage position or register, the contents of which identify a particular element in a table.

index data item. A data item in which the contents of an index can be stored without conversion to subscript form.

index name. A name, given by the programmer, for an index of a specific table. An index name must contain at least one alphabetic character. It is one word (4 bytes) in length.

indexed data name. A data name identifier which is subscripted with one or more index names.

input-output section. In the environment division, the section that names the files and external media needed by an object program. It also provides information required for the transmission and handling of data during the execution of an object program.

integer. A numeric data item or literal that does not include any character positions to the right of the decimal point, actual or assumed. Where the term 'integer' appears in formats, 'integer' must not be a numeric data item.

invalid key condition. A condition that may arise at execution time in which the value of a specific key associated with a mass storage file does not result in a correct reference to the file REWRITE, START, and WRITE statements for the specific error conditions involved).

I-O control. The name, and the header, for an environment division paragraph in which object program requirements for specific input/output techniques are specified. These techniques include rerun checkpoints, sharing of same areas by several data files, and multiple file storage on a single tape device.

key. One or more data items, the contents of which identify the type or the location of a record, or the ordering of data.

key word. A reserved word whose use is essential to the meaning and structure of a COBOL statement.

level indicator. Two alphabetic characters that identify a specific type of file, or the highest position in a hierarchy. The level indicators are: FD, SD, RD.

level number. A numeric character or two-character set that identifies the properties of a data description entry. Level numbers 01 through 49 define group items; the highest level is identified as 01, and the subordinate data items within the hierarchy are identified with level numbers 02 through 49. Level numbers 66, 77, and 88 identify special properties of a data description entry in the data division.

library name. The name of a member of a data set containing COBOL entries, used with the COPY and BASIS statements.

linkage section. A section of the data division that describes data made available from another program.

literal. A character string whose value is implicit in the characters themselves. The numeric literal 7 expresses the value 7, and the nonnumeric literal "CHARACTERS" expresses the value CHARACTERS.

logical operator. A COBOL word that defines the logical connections between relational operators. The three logical operators and their meanings are: OR (logical inclusive -- either or both), AND (logical connective -- both), and NOT (logical negation).

logical record. In COBOL, the most inclusive data item, identified by a level-01 entry. It consists of one or more related data items.

low-order position. The rightmost position in a string of characters.

main program. The highest level COBOL program involved in a step. (Programs written in other languages that follow COBOL linkage conventions are considered COBOL programs in this sense.)

mass storage file. A collection of records assigned to a mass storage device.

mass storage file segment. A part of a mass storage file whose beginning and end are defined by the file limit clause in the environment division.

mnemonic name. A programmer-supplied word associated with a specific function name in the environment division. It when may be written in place of the function name in any format where such a substitution is valid.

mode. The manner in which records of a file are accessed or processed.

name. A word composed of not more than 30 characters, which defines a COBOL operand.

noncontiguous item. A data item in the working-storage section of the data division which bears no relationship with other data items.

nonnumeric literal. A character string bounded by quotation marks, which means literally itself. For example, "CHARACTER" is the literal for and means CHARACTER. The string of characters may include any characters in the computer's set, with the exception of the quotation mark. Characters that are not COBOL characters may be included.

numeric character. A character that belongs to one of the set of digits 0 through 9.

numeric edited character. A numeric character which is in such a form that it may be used in a printed output. It may consist of external decimal digits 0 through 9, the decimal point, commas, the dollar sign, etc., as the programmer wishes.

numeric item. An item whose description restricts its contents to a value represented by characters from the digits 0 through 9. The item may also contain a leading or trailing operational sign represented either as an overpunch or as a separate character.

numeric literal. A numeric character or string of characters whose value is implicit in the characters themselves. Thus, 777 is the literal as well as the value of the number 777.

object-computer. The name of an environment division paragraph in which the computer upon which the object program will be run is described.

object program. The set of machine language instructions that is the output from the compilation of a COBOL source program. The actual processing of data is done by the object program.

object time. The time during which an object program is executed.

operand. The "object" of a verb or an operator. That is, the data or equipment governed or directed by a verb or operator.

operational sign. An algebraic sign associated with a numeric data item, which indicates whether the item is positive or negative.

optional word. A reserved word included in a specific format only to improve the readability of a COBOL statement. If the programmer wishes, optional words may be omitted.

paragraph. A set of one or more COBOL sentences, making up a logical processing entity, and preceded by a paragraph name or a paragraph header.

paragraph header. A word followed by a period that identifies and precedes all paragraphs in the identification division and environment division.

paragraph name. A programmer-defined word that identifies and precedes a paragraph.

parameter. * A variable that is given a specific value for a specific purpose or process. (In COBOL, parameters are most often used to pass data values between calling and called programs.)

physical record. A physical unit of data, synonymous with a block. It can be composed of a portion of of one logical record, of one complete logical record, or of a group of logical records.

priority number. A number, ranging in value from 0 to 99, which classifies source program sections in the procedure division.

procedure. One or more logically connected paragraphs or sections within the procedure division, which direct the computer to perform some action or series of related actions.

procedure division. One of the four main component parts of a COBOL program. The procedure division contains instructions for solving a problem. The procedure division may contain imperative-statements, conditional statements, paragraphs, procedures, and sections.

procedure-name. A word that precedes and identifies a procedure, used by the programmer to transfer control from one point of the program to another.

program-name. A word in the identification division that identifies a COBOL source program.

punctuation character. A comma, semicolon, period, quotation mark, left or right parenthesis, or a space.

qualifier. A group data name that is used to refer to a non-unique data name at a lower level in the same hierarchy, or a section name that is used to refer to a non-unique paragraph. In this way, the data name or the paragraph name can be made unique.

random access. In COBOL, an access mode in which specific logical records are obtained from, or placed into, a mass storage file in a nonsequential manner.

record description. The total set of data description entries associated with a particular logical record.

record name. A data name that identifies a logical record.

relation character. A character that expresses a relationship between two operands. The following are COBOL relation characters:

Character	Meaning
>	Greater than
<	Less than
=	Equal to

relation condition. A statement that the value of an arithmetic expression or data item has a specific relationship to another arithmetic expression or data item. The statement may be true or false.

relational operator. A reserved word, or a group of reserved words, or a group of reserved words and relation characters. A relational operator plus programmer-defined operands make up a relational expression.

reserved word. A word used in a COBOL source program for syntactical purposes. It must not appear in a program as a user-defined operand.

run unit. A set of one or more object programs that function, at object time as a unit to provide problem solutions.

S-mod records. Records that span physical blocks. Records may be fixed or variable in length. Blocks may contain one or more segments. A segment may contain one record or a portion of a record. Each segment contains a segment-length field and a control field indicating whether or not it is the first and/or last or an intermediate segment of the record. Each block contains a block-length field.

section. A logically related sequence of one or more paragraphs. A section must always be named.

section header. A combination of words that precedes and identifies each section in the environment, data, and procedure divisions.

section name. A word specified by the programmer that precedes and identifies a section in the procedure division.

sentence. A sequence of one or more statements, the last ending with a period followed by a space.

separator. An optional word or character that improves readability.

sequential access. An access mode in which logical records are obtained from, or placed into, a file in such a way that each successive access to the file refers to the next subsequent logical record in the file. The order of the records is established by the programmer when creating the file.

sequential processing. The processing of logical records in the order in which records are accessed.

sign condition. A statement that the algebraic value of a data item is less than, equal to, or greater than zero. It may be true or false.

simple condition. An expression that can have two values, and causes the object program to select between alternate paths of control, depending on the value found. The expression can be either true or false.

slack bytes. Bytes inserted between data items or records to ensure correct alignment of some numeric items. Slack bytes contain no meaningful data. In some cases, they are inserted by the compiler; in others, it is the responsibility of the programmer to insert them. The 'synchronized' clause instructs the compiler to insert slack bytes when they are needed for proper alignment. Slack bytes between records are inserted by the programmer.

source computer. The name of an environment division paragraph. In it, the computer upon which the source program will be compiled is described.

special character. A character that is neither numeric nor alphabetic. Special characters in COBOL include the space ( ), the period (.). as well as the following:

$$+ - * / = \$, ; ") ($$

special names. The name of an environment division paragraph, and the paragraph itself, in which names supplied by IBM are related to mnemonic names specified by the programmer. In addition, this paragraph can be used to exchange the functions of the comma and the period, or to specify a substitution character for the currency sign, in the PICTURE string.

special register. Compiler-generated storage areas primarily used to store information produced with the use of specific COBOL features.

standard data format. The concept of actual physical or logical record size in storage. The length in the standard data format is expressed in the number of bytes a record occupies and not necessarily the number of characters, since some characters take up one full byte of storage and others take up less.

statement. A syntactically valid combination of words and symbols written in the procedure division. A statement combines COBOL reserved words and programmer-defined operands.

subject or entry. A data name or reserved word that appears immediately after a level indicator or level number in a data division entry. It serves to reference the entry.

subprogram. A COBOL program that is invoked by another COBOL program. (Programs written in other languages that follow COBOL linkage conventions are COBOL programs in this sense.)

subscript. An integer or a variable whose value references a particular element in a table.

system name. A name, specified by IBM, that identifies any particular external device used with the computer, and characteristics of files contained within it.

table. A collection and arrangement of data in a fixed form for ready reference. Such a collection follows some logical order, expressing particular values (functions) corresponding to other values (arguments) by which they are referred to.

table element. A data item that belongs to the set of repeated items comprising a table. An argument together with its corresponding functions makes up a table element.

test condition. A statement that, taken as a whole, may be either true or false, depending on the circumstances existing at the time the expression is evaluated.

trailer label. A record that identifies the ending of a physical file or of a volume.

U-mode records. Records of undefined length. They may be fixed or variable in length; there is only one record per block.

unary operator. An arithmetic operator (+ or -) that can precede a single variable, a literal, or a left parenthesis in an arithmetic expression. The plus sign multiplies the value by +1; the minus sign sign multiplies the value by -1.

V-mode records. Records of variable length, each of which is wholly contained within a block. Blocks may contain more than one record. Each record contains a record length field, and each block contains a block length field.

variable. A data item whose value may be changed during execution of the object program.

verb. A COBOL reserved word that expresses an action to be taken by a COBOL compiler or an object program.

volume switch procedures. Standard procedures executed automatically when the end of a unit or reel has been reached before end-of-file has been reached.

word. In COBOL, a string of not more than 30 characters, chosen from the following: the letters A through Z, the digits 0 through 9, and the hyphen (-). The hyphen may not appear as either the first or last character.

word boundary. Any particular storage position at which data must be aligned for certain processing operations in System/360. The halfword boundary must be divisible by 2, the fullword boundary must be divisible by 4, the doubleword boundary must be divisible by 8.

working storage section. A section name (and the section itself) in the data division. The section describes records and noncontiguous data items that are not part of external files, but are developed and processed internally. It also defines data items whose values are assigned in the source program.

Appendix B: FORTRAN Glossary

alphabetic character. A character of the set A,B,C,...,Z,$.

alphameric character. A character of the set which includes the alphabetic characters and the numeric characters.

argument. A parameter passed between a calling program and a subprogram or statement function.

arithmetic expression. A combination of arithmetic operators and arithmetic primaries.

arithmetic operator. One of the symbols +, -, *, /, **, used to denote, respectively, addition, subtraction, multiplication, division, and exponentiation.

arithmetic primary. An irreducible arithmetic unit; a single constant, variable, array element, function reference, or arithmetic expression enclosed in parentheses.

array. An ordered set of data items identified by a single name.

array declarator. The part of a statement which describes an array used in a program unit. It indicates the name of the array, the number od dimensions it contains, and the size of each dimension. An array declarator may appear in a DIMENSION, COMMON, or explicit specification statement.

array element. A data item in an array, identified by the array name followed by a subscript indicating its position in the array.

array name. The name of an ordered set of data items.

assignment statement. An arithmetic or logical variable or array element, followed by an equal sign (=), followed by an arithmetic or logical expression.

basic real constant. A string of decimal digits containing a decimal point.

blank common. An unlabeled (unnamed) common block.

common block. A storage area that may be referred to by a calling program and one or more subprograms.

complex constant. An ordered pair of real constants separated by a comma and enclosed in parentheses. The first real constant represents the real part of the complex number; the second represents the imaginary part.

constant. A fixed and unvarying quantity. The four classes of constants specify numbers (numerical constants), truth values (logical constants), literal data (literal constants), and hexadecimal data (hexadecimal constants).

control statement. Any of the several forms of GO TO, IF and DO statements, or the PAUSE, CONTINUE, and STOP statements, used to alter the normally sequential execution of FORTRAN statements, or to terminate the execution of the FORTRAN program.

data item. A constant, variable, or array element.

data set reference number. A constant or variable in an input/output statement, which specifies the data set which is to be operated upon.

data type. The mathematical properties and internal representation of data and functions. The four basic types are integer, real, complex, and logical.

DO loop. Repetitive execution of the same statement or statements by use of a DO statement.

DO variable. A variable, specified in a DO statement, which is initialized or incremented prior to each execution of the statement or statements within a DO loop. It is used to control the number of times the statements within the DO loop are executed.

dummy argument. A variable within a FUNCTION or SUBROUTINE statement, or statement function definition, with which actual arguments from the calling program or function reference are associated.

executable program. A program that can be used as a self-contained procedure. It consists of a main program and, optionally, one or more subprograms or non-FORTRAN-defined external procedures, or both.

executable statement. A statement which specifies action to be taken by the program; for example, calculations to be performed, conditions to be tested, flow of control to be altered.

extended range of a DO statement. Those statements that are executed between the transfer out of the innermost DO of a completely nested nest of DO statements and the transfer back into the range of the innermost DO.

external function. A function whose definition is external to the program unit which refers to it.

external procedure. A procedure subprogram or a procedure defined by means other than FORTRAN statements.

formatted record. A record which is transmitted with the use of a FORMAT statement.

function subprogram. An external function defined by FORTRAN statements and headed by a FUNCTION statement. It returns a value to the calling program unit at the point of reference.

hexadecimal constant. The character Z followed by a hexadecimal number, formed from the set 0 through 9 and A through F.

hierarchy of operations. Relative priority assigned to arithmetic or logical operations which must be performed.

implied DO. The use of an indexing specification similar to a DO statement (but without specifying the word DO and with a list of data elements, rather than a set of statements, as its range).

integer constant. A string of decimal digits containing no decimal point.

I/O list. A list of variables in an I/O statement, specifying the storage locations into which data is to be read or from which data is to be written.

labeled common. A named common block.

length specification. An indication, by the use of the form *s, of the number of storage locations (bytes) to be occupied by a variable or array element.

literal constant. A string of alphameric and/or special characters enclosed in quotation marks or preceded by a wH specification.

logical constant. A constant that specifies a truth value: true or false.

logical expression. A combination of logical primaries and logical operators.

logical operator. Any of the set of three operators .NOT., .AND., .OR..

logical primary. An irreduceable logical unit: a logical constant, logical variable, logical array element, logical function reference, relational expression, or logical expression enclosed in parentheses, having the value true or false.

looping. Repetitive execution of the same statement or statements, usually controlled by a DO statement.

main program. A program unit not containing a FUNCTION, SUBROUTINE, or BLOCK DATA statement and containing at least one executable statement. A main program is required for program execution.

name. A string of from one through six alphameric characters, the first of which must be alphabetic, used identify a variable, an array, a function, a subroutine, a common block, or a namelist.

nested DO. A DO loop whose range is entirely contained by the range of another DO loop.

nonexecutable statement. A statement which describes the use or extent of the program unit, the characteristics of the operands, editing information, statement functions, or data arrangement.

numeric character. Any one of the set of characters 0,1,2,...,9.

numeric constant. An integer, real, or complex constant.

predefined specification. The FORTRAN-defined type and length of a variable, based on the initial character of the variable name in the absence of any specification to the contrary. The characters I-N are typed INTEGER*4; the character A-H, O-Z, and $ are typed REAL*4.

procedure subprogram. A function or subroutine subprogram.

program unit. A main program or a subprogram.

range of a DO statement. Those statements which physically follow a DO statement, up to and including the statement specified by the DO statement as being the last to be executed in the DO loop.

real constant. A string of decimal digits which must have either a decimal point or a decimal exponent, and may have both.

relational expression. An arithmetic expression, followed by a relational operator, followed by an arithmetic expression. The expression has the value true or false.

relational operator. Any of the set of operators which express an arithmetic condition that can be either true or false. The operators are: .GT., .GE., .LT., .LE., .EQ., .NE., and are defined as greater than, greater than or equal to, less than, less than or equal to, equal to, and not equal to, respectively.

scale factor. A specification in a FORMAT statement whereby the location of the decimal point in a real number (and, if there is no exponent, the magnitude of the number) can be changed.

specification statement. One of the set of statements which provide the compiler with information about the data used in the source program. In addition, the statement supplies information required to allocate storage for this data.

specification subprogram. A subprogram headed by a BLOCK DATA statement and used to initialize variables in labeled (named) common blocks.

statement. The basic unit of a FORTRAN program, composed of a line or lines containing some combination of names, operators, constants, or words whose meaning is predefined to the FORTRAN compiler. Statements fall into two broad classes: executable and nonexecutable.

statement function. A function defined by a function definition within the program unit in which it is referred to..

statement function definition. A name, followed by a list of dummy arguments, followed by an equal sign (=), followed by an arithmetic or logical expression.

statement function reference. A reference in an arithmetic or logical expression to a previously defined statement function.

statement number. A number of from one through five decimal digits placed within columns 1 through 5 of the initial line of a statement. It is used to identify a statement uniquely, for the purpose of transferring control, defining a DO loop range, or referring to a FORMAT statement.

subprogram. A program unit headed by a FUNCTION, SUBROUTINE, or BLOCK DATA statement.

subroutine subprogram. A subroutine consisting of FORTRAN statements, the first of which is a SUBROUTINE statement. It optionally returns one or more parameters to the calling program unit.

subscript. A subscript quantity or set of subscript quantities, enclosed in parentheses and used in conjunction with an array name to identify a particular array element.

subscript quantity. A component of a subscript: a positive integer constant, integer variable, or expression which evaluates to a positive integer constant. If there is more than one subscript quantity in a subscript, the quantities must be separated by commas.

type declaration. The explicit specification of the type and, optionally, length of a variable or function by use of an explicit specification statement.

unformatted record. A record for which no FORMAT statement exists, and which is transmitted with a one-to-one correspondence between internal storage locations and external positions in the record.

variable. A data item that is not an array or array element, identified by a symbolic name.

action specification. In an ON statement, the on-unit or the single keyword SYSTEM, either of which specifies the action to be taken whenever an interruption results from raising of the named on-condition. The action specification can also include the keyword SNAP.

activate (a block). To initiate the execution of a block. A procedure block is activated when it is invoked at any of its entry points; a begin block is activated when it is encountered in normal flow of control, including a branch.

activation (of a block).

(1) The process of activating a block.

(2) The execution of a block.

activation (of a preprocessor variable or entry name). The establishment of the validity for replacement of the value of a variable or the returned value of an entry name. The first activation must be the result of appearance of the name in a %DECLARE statement. If an active variable or entry name is made inactive by a %DEACTIVATE statement, it may be activated again by a %ACTIVATE statement.

active.

(1) The state of a block after activation and before termination.

(2) The state in which a preprocessor variable or preprocessor entry name is said to be when its value can replace the corresponding identifier in source program text.

(3) The state in which an event variable is said to be during the time it is associated with an asynchronous operation. An event variable remains active and, hence, cannot be associated with another operation until a WAIT statement specifying that event variable has been executed or, in the case of an event variable associated with a task, until an EXIT, RETURN, or END statement has caused termination of the task.

(4) The state in which a task variable is said to be when its associated task is attached.

(5) The state in which a task is said to be before it has been terminated.

additive attributes. Attributes for which there are no defaults and which, if required, must always be added to the list of specified attributes or be implied (that is, they have to be added to the set of attributes, if they are required).

adjustable extent. Bound (of an array), length (of a string), or size (of an area) that may be different for different generations of the associated variable. Adjustable bounds, lengths, and sizes are specified as expressions or asterisks (or by REFER options for based variables), which are evaluated separately for each generation. They cannot be used for static variables.

aggregate. See *data aggregate*.

aggregate expression. An array expression or a structure expression.

alignment. The storing of data items in relation to certain machine-dependent boundaries.

allocated variables. A variable with which internal storage has been associated and not freed.

allocation.

(1)The reservation of internal storage for a variable.

(2)A generation of an allocated variable.

alphabetic character. Any of the characters A through Z of the English alphabet and the alphabetic extenders #, $, and @ (which may have different graphic representation in different countries).

alphameric character. An alphabetic character of a digit.

alternative attribute. An attribute that may be chosen from a group of two or more alternatives. If none is specified, a default is assumed.

ambiguous reference. A reference that is not sufficiently qualified to identify one and only one name known at the point of reference.

ancestral task. The attaching task or any of the tasks in a direct line from the given task to, and including, the major task.

area. A declared portion of contiguous internal storage identified by an area variable and reserved, on allocation, for the allocation of based variables.

area variable. A variable with the AREA attribute; its values may only be areas.

argument. An expression in an argument list as part of a procedure reference.

argument list. A parenthesized list of one or more arguments, separated by commas, following an entry-name constant, an entry-name variable, a generic name, or a built-in function name. The list is passed to the parameters of the entry point.

arithmetic constant. A fixed-point constant or a floating-point constant. Although most arithmetic constants can be signed, the sign is not part of the constant.

arithmetic conversion. The transformation of a value from one arithmetic representation to another.

arithmetic data. Data that has the characteristics of base, scale, mode, and precision. It includes coded arithmetic data, pictured numeric character data, and pictured numeric bit data.

arithmetic operators. Either of the prefix operators + and -, or any of the following infix operators:

+ - * / **

arithmetic picture data. Decimal picture data or binary picture data.

array. A named, ordered collection of data elements, all of which have identical attributes. An array has dimensions specified by the dimension attribute, and its individual elements are referred to by subscripts. An array can also be an ordered collection of identical structures.

array expression. An expression whose evaluation yields an array value.

array of structures. An ordered collection of identical structures specified by giving the dimension attribute to a structure name.

assignment. The process of giving a value to a variable.

asynchronous operation. The overlap of an input/output operation with the execution of statements, or the concurrent execution of procedures using multiple flows of control for different tasks.

attachment of a task. The invocation of a procedure and the establishment of a separate flow of control to execute the invoked procedure (and procedures it invokes) asynchronously with execution of the invoking procedure.

attention. An occurrence, external to a task, that could cause an interrupt within the task.

attribute.

(1) A descriptive property associated with a name to describe a characteristic of items that the name amy represnet.

(2) A descriptive property used to describe a characteristic of the result of evaluation of an expression.

automatic storage allocation. The allocation of storage for automatic variables.

automatic variable. A variable that is allocated automatically at the activation of block and released automatically at the termination of that block.

base. The number system in terms of which an arithmetic value is represented.

base element. The name of a structure member that is not a minor structure.

base item. The automatic, controlled, or static variable or the parameter upon which a defined variable is defined. The name amy be qualified and/or subscripted.

based storage allocation. The allocation of storage for based variables.

based variable. A variable whose generations are idnetified by locator variables. A based variable can be used to refer to values of variables of any storage class; it can also be allocated and freed explicitly by use of the ALLOCATE and FREE statements.

begin block. A collection of statements headed by a BEGIN statement and ended by an END statement that is a part of a program that delimits the scope of names and that is activated by normal sequential flow of control, including any branch resulting from a GO TO statement.

binary. The number system based on the number 2.

binary digit characters. The picture specification characters 1, 2, and 3.

binary picture data. Arithmetic picture data specified by picture specifications containing the following types of picture specification characters:

(1) Binary digit characters

(2) The virtual point picture character

(3) The exponent character, K

(4) The sign character, S

bit. A binary digit (0 or 1).

bit string. A string composed of zero or more bits.

bit-string operators. The logical operators ¬ (not), & (and), and | (or).

block. A begin block or procedure block.

block heading statement. The PROCEDURE or BEGIN statement that heads a block of statements.

bounds. The upper and lower limits of an array dimension.

buffer. Intermediate storage, used in input/output operations, into which a record is read during input and from which a record is written during output.

built-in function. A function that is supplied by the language.

call. (verb) to invoke a subroutine by means of the CALL statement or CALL option; (noun) such an invocation.

character. An element of a character set.

character set. A defined collection of characters. See *language character set* and *data character set*.

character-string. A string composed of zero or more characters.

character-string picture data. Data described by a picture specification which must have at least one A or X picture specification character.

closing (of a file). The dissociation of a file from a data set.

coded arithmetic data. Arithmetic data that is stored in a form that is acceptable, without conversion, for arithmetic calculations.

comment. A string of zero or more characters used for documentation, that is preceded by /* and terminated by */ and which is a delimiter.

commercial character. The following picture specification characters:

(1) CR (credit)

(2) DB (debit)

(3) T, I, and R, the overpunched-sign characters, which indicate that the associated position in the data item contains or may contain a digit with an overpunched sign and that this overpunched sign

is to be considered in the character string value of the data item.

comparison operators. Infix operators used in comparison expressions. They are ¬< (not less than), < (less than), <= (less than or equal to), ¬= (not equal to), = (equal to), >= (greater than or equal to), > (greater than), and ¬> (not greater than).

compile-time statement. See *preprocessor statement*.

complex data. Arithmetic data, each item of which consists of a real part and an imaginary part.

composite operators. An operator composed of two operator symbols, e.g., ¬>

compound statement. A statement whose statement body contains one or more other statements.

concatenation. The operation that joins two strings in the order specified, thus forming one string whose length is equal to the sum of the lengths of the two strings. It is specified by the operator ||.

condition. See *on-condition*.

condition list. A list of one or more condition prefixes.

condition name. A language keyword (or CONDITION followed by a parenthesized programmer-defined name) that denotes an oncondition that might arise within a task.

condition prefix. A parenthesized list of one or more languae condition names, prefixed to a statement. It specifies whether the named on-conditions are to be enabled.

connected reference. A reference to connected storage; it must be apparent, prior to execution of the program, that the storage is connected.

connected storage. Internal storage of an uninterrupted linear sequence of items that can be referred to by a single name.

constant. An arithmetic or string data item that does not have a name and whose value cannot change; an unsubscripted label prefix or a file name or an entry name.

contained text. All text in a procedure (including nested procedures) except its entry names and condition prefixes of the PROCEDURE statement; all test in a begin block except labels and condition prefixes of the BEGIN statement that heads the block. Internal blocks are contained in the external procedure.

contextual declaraction. The appearance of an identifier that has not been explicitly declared, in a context that allows the association of specific attributes with the identifier.

control format item. A specification used in edit-directed transmission to specify positioning of a data item within the stream or printed page.

control variable. A variable used to control the iterative execution of a group. See *iterative do-group*.

controlled parameter. A parameter for which the CONTROLLED attribute is specified; it can be associated only with arguments that have the CONTROLLED attribute.

controlled storage allocation. The allocation of storage for controlled variables.

controlled variable. A variable whose allocation and release are controlled by the ALLOCATE and FREE statements, with access to the current generation only.

conversion. The transformation of a value from one representation to another to conform to a given set of attributes.

cross section of an array. The elements represented by the extent of a least one dimension (but not all dimensions) of an array. An asterisk in the place of a subscript in an array reference indicates the entire extent of that dimension.

current generation. That generation (of an automatic or controlled variable) currently available by reference to the name of the variable.

data. Representation of information or of value in a form suitable for processing.

data aggregate. A logical collection of two or more data items that can be referred to either collectively or individually; an array or structure.

data character set. All of those characters whose representation is recognized by the computer in use.

data-directed transmission. The type of stream-oriented transmission in which data is transmitted as a group, comprising one or more items separated by commas, terminated by a semicolon, where each is of the form

   name = constant

The name can be qualified and/or subscripted.

data format item. A specification used in edit-directed transmission to describe the representation of a data item in the stream.

data item. A single unit of data; it is synonymous with *element*.

data list. A parenthesized list of expressions or repetitive specifications, separated by commas, used in a stream-oriented input or output specification that represents storage locations to which data items are to be assigned during input or values which are to be obtained for output.

data set. A collection of data external to the program that can be accessed by the program by reference to a single file name.

data specification. The portion of a stream-oriented data transmission statement that specifies the mode of transmission (DATA, LIST, or EDIT) and includes the data list (or lists) and, for edit-directed mode, the format list (or lists).

data stream. Data being transferred from or to a data set by stream-oriented transmission, as a continuous stream of data elements in character form.

data transmission. The transfer of data from a data set to the program or vice versa.

deactivated. The state in which a preprocessor variable or entry name is said to be when its value cannot replace the corresponding identifier in source program text.

decimal. The number system based on the number 10.

decimal digit character. The picture specirication character 9.

decimal picture data. Arithmetic picture data specified by picture specifications containing the following types of picture specification characters:

(1) Decimal digit characters

(2) The virtual point picture character

(3) Zero-suppression characters

(4) Sign and currency symbol characters

(5) Insertion characters

(6) Commerical characters

(7) Exponent characters

declaraction.

(1) The establishment of an identifier as a name and the construction of a set of attributes (partial or complete) for it.

(2) A source of attributes of a particular name.

default. The alternative attribute or option assumed, or specified for assumption by the DEFAULT statement, when none has been specified.

defined item. A variable declared to represent part of all of the same storage as that assigned to another variable known as the base item.

delimiter. All operators, comments, and the following characters: percnet, parentheses, comma, period, semicolon, colon, assignment symbol, and blank; they define the limits of identifiers, constants, picture specifications, iSUBs, and keywords.

descriptor. See *parameter descriptor.*

digit. One of the characters 0 through 9.

dimensionality. The number of bounds specifications in an array declaraction.

disabled. The state in which a particular on-condition will not result in an interrupt.

do-group. A sequence of statements headed by a DO statement and ended by its corresponding END statement, used for control purposes.

do loop. See *iterative do-group.*

drifting characters. See *sign and currency symbol characters.*

dummy argument. Temporary storage that is created sutomatically to hold the value of an argument that is (1) a constant, (2) an operational expression, (3) a variable whose attributes differ from those specified for the corresponding parameter in a known declaration, or (4) an argument enclosed in parentheses.

edit-directed transmission. The type of stream-oriented transmission in which data appears as a continuous stream of characters and for which a format list is required to specify the editing desired for the associated data list.

element. A single item of data as opposed to a collection of data items such as an array; a scalar item.

element expression. An expression whose evaluation yields an element value.

element variable. A variable that represents an element; a scalar variable.

enabled. That state in which a particular on-condition will result in a program interrupt.

entry constant. An entry name.

entry expression. An expression whose evaluation yields an entry value.

entry name. An identifier that is explicitly or contextually declared to have the ENTRY attribute (unless the VARIABLE attribute is given) or has an implied ENTRY attribute; the value of an entry variable.

entry point. A point in a procedure at which it may be invoked. See *primary entry point* and *secondary entry point.*

entry value. The entry point represneted by an entry constant; the value includes the environment of the activation that is associated with the entry constant.

entry variable. A variable that can represent entry values. It must have both the ENTRY and VARIABLE attributes.

environment (of an activation). Information associated with the invocation of a block that is used in the interpretation of references, within the invoked block, to data declared outside the block. This information includes generations of automatic variables, extents of defined variables, and generations of parameters.

environment (of a label constant). Identity of the particular activation of a block to which a reference to a statement label constant applies. This information is determined at the time a statement-lable constant is passed as an argument or is assigned to a statement-label variable, and it is passed or assigned along with the constant.

epilogue. Those processes that occur automatically at the termination of a block or task.

evaluation. Reduction of an expression to a single value (which may be an array or structure value).

event. An activity in a program whose status and completion can be determined from an associated event variable.

event variable. A variable with the EVENT attribute, which amy be associated with an event; its value indicates whether the action ahs been completed and the status of the completion.

explicit declaraction. The appearance of an identifier in a DECLARE statement, as a label prefix, or in a parameter list.

exponent characters. The following picture specification characters:

(1) K and E, which are used in floating-point picture specifications to indicate the beginning of the exponent field.

(2) F, the scaling factor character, specified with an integer constant which indicates the number of decimal positions the decimal point is to be moved from its assumed position to the right (if the constant is positive) or to the left (if the constant is negative).

expression. A notation, within a program, that represents a value; a constant or a reference appearing alone, or combinations of constants and/or references with operators.

extent. The range indicated by the bounds of an array dimension, the range indicated by the length of a string, or the range indicated by the size of an area.

external name. A name (with the EXTERNAL attribute) whose scope is not necessarily confined only to one block and its contained blocks.

external procedure. A procedure that is not contained in any other procedure.

factoring. The application of one or more attributes or of a level number to a parenthesized list of names.

field (in the data stream). That protion of athe data stream whose width, in number of characters, is defined by a single data or spacing format item.

field (of a picture specification). Any character-string picture specification or that portion (or all) of a numeric character or numeric bit picture specification that describes a fixed-point number.

file. A named representation, within a program, of a data set. A file is associated with a single data set for each opening.

file attribute. Any of the attributes that describe the characteristics of a file.

file constant. A name declared for a file and for which a complete set of file attributes exists during the time that the file is open.

file expression. An expression whose evaluation yields a file name.

file name. A name declared for a file.

file variable. A variable to which file constants can be assigned; it must have both the attributes FILE and VARIABLE. No file-name attributes, other than FILE, can be specified for a file-name variable.

fixed-point constant. See *arithmetic constant.*

floating-point constant. See *arithmetic constant.*

flow of control. Sequence of execution.

format item. A specification used in edit-directed transmission to describe the representation of a data item in the stream (data format item) or to specify positioning of a data item within the stream (control format item).

format list. A parenthesized list of format items required for an edit-directed data specification.

fully-qualified name. A qualified name that is complete, i.e., that includes all names in the hierarchical sequence above the structure member to which the name refers, as well as the name of the member itself.

function. A function procedure (programmer-specified or built-in); a procedure that is invoked by the appearance of one of its entry names in a function reference and which returns a value to the point of reference.

function reference. The appearance of an entry name or built-in function name (or an entry variable) in an expression.

generation (of a variable). The allocation of a static variable, a particular allocation of a controlled or automatic variable, or the storage indicated by a particular locator qualification of a based variable or by a defined variable or a parameter.

generic name. The name of a family of entry names. A reference to the name is replaced by the particular entry name whose parameter descriptors match the attributes of the arguments in the argument list at the point of invocation.

group. A do-group; it can be used whereever a single statement can appear, except as an on-unit.

identifier. A string of alphameric and, possibly, break characters, not contained in a comment or constant and which is preceded and followed by a delimiter; the initial character must be alphabetic.

implicit declaraction. The establishment of an identifier, which has no explicit or contextual declaration, as a name. A default set of attributes is assumed for the identifier.

implicit opening. The opening of a file as the result of an input or output statement other than the OPEN statement.

infix operator. An operator that appears between two operands.

initial procedure. An external procedure that is the first procedure invoked in the execution of a PL/I program.

input/output. The transfer of data between an external medium and internal storage.

insertion picture character. A picture specification character that is, on assignment of the associated data to a character string, inserted in the indicated position. When used in a P format item for input, an insertion character serves as a checking picture character.

interleaved array. An array whose name refers to non-connected storage.

interleaved subscripts. A subscript notation, used with subscripted qualified names, in which not all of the necessary subscripts immediately follow the same component name.

internal block. A block that is contained in another block.

internal name. A name that is not known outside the block in which it is declared.

internal procedure. A procedure that is contained within a block.

internal text. All of the text contained in a block except that text that is contained in another block. Thus the text of an internal block (except its entry names) is not internal to the containing block.

interrupt. The redirection of flow of control of the program (possibly temporary) as the result of the raising of an enabled on-condition or attention.

invocation. The activation of a procedure.

invoke. To activate a procedure at one of its entry points.

invoked procedure. A procedure that has been activated at one of its entry points.

invoking block. A block containing a statement that activates a procedure.

iteration factor. An expression that specifies:

(1) In an INITIAL attribute specification, the number of consecutive elements of an array that are to be initialized with a given constant.

(2) In a format list, the number of times a given format item or list of items is to be used in succession.

iterative do-group. A do-group whose DO statement specifies a control variable and/or a WHILE option.

key. Data that identifies a record within a direct-access data set. See *source key* and *recorded key.*

keyword. An identifier that, when used in the proper context, has either a language-defined or an implementation-defined meaning in the program.

known. (applied to a name) recognized with its declared meaning; a name is known throughout its scope.

label. A name used to identify a statement other than a PROCEDURE or ENTRY statement; a statement label.

label constant. An unsubscripted name that appears prefixed to any statement other than a PROCEDURE or ENTRY statement.

label expression. An expression whose evaluation. yields a label value.

label list (of a label variable declaration). A parenthesized list of one or more statement-label constants immediately following the keyword LABEL to specify the range of values that the declared variable may have; names in the list are separated by commas. When specified for a label array, it indicates that each element of the array may assume any of the values listed.

label list (of a statement). All of the label prefixes of a statement.

label prefix. A label prefixed to a statement.

label varaible. A variable declared with the LABEL attribute and thus able a assume as its value a label constant.

language character set. A character set which has been defined to represent program elements in the source language (in this context, character-string constants and comments are not considered as program elements).

leading zeros. Zeros that have no significance in the value of an arithmetic integer; all zeros to the left of the first significant integer digit of a number.

level number. An unsigned decimal integer constant in a DECLARE or ALLOCATE statement that specifies the position of a name in the hierarchy of a structure. It precedes the name to which it refers and is separated from that name only by one or more blanks. Level numbers appear without the names in a parameter descriptor of an ENTRY attribute specification.

level-one variable. A major structure name; any unsubscripted variable not contained within a structure.

list-directed transmission. The type of stream-oriented transmission in which data in the stream appears as constants separated by blanks or commas and for which formatting is provided automatically.

locator qualification. In a reference to a based variable, either a locator variable or function reference connected by an arrow to the left of a based variable to specify the generation of the based varaible to which the reference refers, or the implicit connection of a locator variable with the based reference.

locator varaible. A variable whose value identifies the location in internal storage of a variable or a buffer.

locked name. A name that is not necessarily available at a given time to all tasks that know the name.

locked record. A record in an EXCLUSIVE DIRECT UPDATE file that is available to only one task at a time.

logical level (of a structure member). The depth indicated by a level number when all level numbers are in direct sequence, that is, when the increment between successive level numbers is one.

logical operators. The bit-string operators

¬ (not), & (and), and | (or).

lower bound. The lower limit of an array dimension.

major structure. A structure whose name is declared with level number 1.

major task. The task that has control at the outset of execution of a program. It exists throughout execution of the program.

minor structure. A structure that is contained within another structure. The name of a minor structure is declared with a level number greater than one.

mode (of arithmetic data). A characteristic of arithmetic data; real or complex.

multiple declaration. Two or more declarations of the same identifier internal to the same block without different qualifications, or two or more external declarations of the same identifier with different attributes in the same program.

multiprocessing. The use of a computing system with two or more processing units to execute two or more programs simultaneously.

multiprogramming. The use of a computing system to execute more than one program concurrently, using a single processing unit.

multitasking. A facility that allows a programmer to make use of the multiprogramming or multiprocessing capability of a system.

name. An identifier appearing in a context where it is not a keyword.

nesting. The occurrence of

(1) A block within another block.

(2) A group within another group.

(3) An IF statement in a THEN clause or an ELSE clause.

(4) A function reference as an arugment of a function reference.

(5) A remote format item in the format list of a FORMAT statement.

(6) A parameter descriptor list in another parameter descriptor list.

(7) An attribute specification within a parenthesized anme list for which one or more attributes are being factored.

non-connected storage. Separate locations in storage that contain related items of data that can be referred to by a single name but that are separated by other data items not referred to by that name. Examples are the storage referred to by an unsubscripted elementary name in an array of structures or by a subscripted name referring to an array cross section in which the subscript list contains an asterisk to the left of any element expression.

null locator value. A special locator value that cannot identify any location in internal storage; it gives a positive indication that a locator variable does not currently identify any generation of data.

null string. A string data item of zero length.

numeric bit data. See *binary picture data*.

numeric character data. See *decimal picture data.*

offset variable. A locator variable with the OFFSET attribute, whose value identifies a location in sotrage, relative to the beginning of an area.

on-condition. An occurrence, within a PL/I task, that could cause a program interrupt. It may be the detection of an unexpected error or of an occurrence that is expected, but at an unpredicatble time.

on-unit. The specified action to be executed upon detection of the on-condition named in the containing ON statement. This excludes SYSTEM and SNAP.

opening (of a file). The association of a file with a data set and the completion of a full set of attributes for the file name.

operand. An expression to whose value an operator is applied.

operation expression. An expression containing one or more operators.

operator. A symbol specifying an operation to be performed. See *arithmetic operators, bit-string operators, comparison operators*, and *concatenation.*

option. A specification in a statement that may be used to influence the execution or interpretation of the statement.

padding. One or more characters or bits concatenated to the right of a string to extend the string to a required length. For character strings, padding is with blanks; for bit strings, with zeros.

parameter. A name in a procedure that is used to refer to an argument passed to that procedure.

parameter descriptor. The set of attributes specified for a single parameter in an ENTRY attribute specification.

parameter descriptor list. The list of all parameter descriptors in an ENTRY attribute specification.

partially-qualified name. A qualified name that is incomplete, i.e., that includes one or more, but not all, names in the hierarchical sequence above the structure member to which the partially-qualified anem refers, as well as the name of the member itself.

picture specification. A character-by-character description of the composition and characteristics of binary picutre data, decimal picture data, and character-string picture data.

picture specification character. Any of the characters that can be used in a picture specification. See *binary*

picture data, decimal picture data, and *character-string picture data.*

point of invocation. The point in the invoking block at which the procedure reference to the invoked procedure appears.

pointer varaible. A locator variable with the POINTER attribute, whose value identifies an absolute location in internal storage.

precision. The value range of an arighmetic variable expressed as a total number of digits and, for fixed-point variables, the number of those digits assumed to appear to the right of the decimal or binary point.

prefix. A label or a parenthesized list of one or more condition names connected by a colon to the beginning of a statement.

prefix operator. An operator that precedes an operand and applies only to that operand. The prefix operators are + (plus), - (minus), and ¬ (not).

preprocessor. A program that examines the source program for preprocessor statements which are then executed, resulting in the alteration of the source program.

preprocessor statement. A special statement appearing in the source program that specifies how the source program text is to be altered; it is identified by a leading percent sign and is executed as it is encountered by the preprocessor (it appears without the percent sign in preprocessor procedures, which are invoked by a preprocessor function reference).

primary entry point. The entry point identified by any of the names in the label list of the PROCEDURE statement.

priority. A value associated with a task, that specifies the procedence of the task relative to other tasks.

problem data. String or arithmetic data that is processed by a PL/I program.

procedure. A collection of statements, headed by a PROCEDURE statement and ended by an END statement, that is a part of a program, that delimits the scope of names, and that is activated by a reference to one of its entry names.

procedure reference. An entry constant or variable or a built-in function name followed by none or more argument lists. It may appear in a CALL statement or CALL option or as a function reference.

processor. A program that prepares source program text (possibly preprocessed text) for execution.

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program. A set of one or more external procedures.

program control data. Data used in a PL/I program to affect the execution of the program, that is, any data that is not string or arithmetic data.

prologue. The processes that occur automatically on block activation.

pseudo variable. Any of the built-in function names that can be used to specify a target variable.

qualified name. A hierarchical sequence of names of structure members, connected by periods, used to identify a component of a structure. Any of the names may be subscripted. See also *locator qualification.*

range (of a default specification). A set of identifiers, constants, and/or parameter descriptors to which the attributes in a default specification of a DEFAULT statement apply.

record. The logical unit of transmission in a record-oriented input or output operation.

recorded key. A key recorded in a direct-access vlume to identify an associated data record.

recursion. The reactivation of an active procedure.

REFER expression. The expression preceding the keyword REFER, from which an original bound, length, or size is taken when a based variable containing a REFER option is allocated, either by an ALLOCATE or LOCATE statement.

REFER object. The unsubscripted element variable appearing in a REFER option that specifies a current bound, length, or size for a member of a based structure. It must be a member of the structure, and it must precede the member declared with the REFER option.

reference. The appearance of a name, except in a context that causes explicit declaration.

remote format item. The letter R specified in a format list together with the label of a separate FORMAT statement.

repetition factor. A parenthesized unsigned decimal integer constant that specifies:

(1) The number of occurrences of a string configuration that make up a string constant.

(2) The number of occurrences of a picture specification character in a picture specification.

repetitive specification. An element of a data list that specifies controlled iteration to transmit one or more data items, generally used in conjunction with arrays.

returned value. The value returned by a function procedure to the point of invocation.

scalar item. A single item of data; an element.

scalar variable. A variable that can represent only a single data item; an element variable.

scale. A system of mathematical notation: fixed-point or floating-point scale of an arithmetic value.

scale factor. A specification of the number of fractional digits in a fixed-point number.

scope (of a condition prefix). The portion of a program throughout which a particular condition prefix applies.

scope (of a declaraction). The portion of a program throughout which a particular declaration is a source of attributes for a particular name.

(scope (of a name). The portion of a program throughout which the meaning of a particular name does not change.

secondary entry point. An entry point identified by any of the names in the label list of an ENTRY statement.

separator. See *delimiter.*

sign and currency symbol characters. The picture specification characters S, +, -, and $. These can be used

(1) As static characters, in which case they are specified only once in a picture specification and appear in the associated data item in the position in which they have been specified.

(2) As drifting characters, in which case they are specified more than once (as a string in a picture specification) but appear in the associated data item at most once, immediately to the left of the significant portion of the data item.

simple parameter. A parameter for which no storage-class attribute is specified; it may represent an argument of any storage class, but only the current generation of a controlled argument.

source key. A key referred to in a record-oriented transmission statement that identifies a particular record within a direct-access data set.

standard file. A file assumed by the processor in the absence of a FILE or STRING option in a GET or PUT

statement; SYSIN is the standard input file and SYSPRINT is the standard output file.

standard system action. Action specified by the language to be taken in the absence of an on-unit for an on-condition.

statement. A basic element of a PL/I program that is used to delimit a portion of the program, to describe names used in the program, or to specify action to be taken. A statement can consist of a condition list, a label list, a statement identifier, and a statement body that is terminated by a semicolon.

statement body. That part of a statement that follows the statement identifier, if any, and is terminated by the semicolon; it includes the statement options.

statement identifier. The PL/I keyword that indicates the purpose of the statement.

statement-label constant. See *label constant*.

statement-label expression. See *label expression*.

statement-label variable. See *label variable*.

static storage allocation. The allocation of storage for static variables.

static variable. A variable that is allocated before execution of the program begins and that remains allocated for the duration of execution of the program.

stream. See *data stream*.

string. A connected sequence of characters of bits that is treated as a single data item.

string variable. A variable declared with the BIT or CHARACTER attribute, whose values can be either bit strings or character strings.

structure. A hierarchical set of names that refers to an aggregate of data items that may have different attributes.

structure expression. An expression whose evaluation yields a structure value.

structure member. Any of the minor structures of elementary names in a structure.

structure of arrays. A structure containing arrays specified by declaring individual member names with the dimension attribute.

structuring. The makeup of a structure, in terms of the number of members, the order in which they appear, their attributes, and their logical levels (but not necessarily their names or declared level numbers).

subfield (of a picture specification). That portion of a picture specification field that appears before or after a V picture specification character.

subgeneration. The portion of a generation represneted by a qualified and/or subscripted reference.

subroutine. A procedure that is invoked by a CALL statement or CALL option. A subroutine cannot return a value to the invoking block, but it van alter the value of variables.

subscript. An element expression that specifies a position within a dimension of an array. A subscript can also be an asterisk, in which case it specifies the entire extent of the dimension.

subscript list. A parenthesized list of one or more subscripts, one for each dimension of an array, which together uniquely identify either a single element or cross-section of the array.

subtask. A task that is attached by the given task or any of the tasks in a direct line from the given task to the last attached task.

synchronous. Using a single flow of control for serial execution of a program.

target variable. A variable to which a value is assigned.

task. The execution of one or more procedures by a single flow of control.

task name. An identifier used to refer to a task variable.

task variable. A variable with the TASK attribute whose value gives the relative priority of a task.

termination (of a block). Cessation of execution of a block, and the return of control to the activating block by means of a RETURN or END statement, or the transfer of control to the activating block or to some other active block by means of a GO TO statement.

termination (of a task). Cessation of the flow of control for a task.

truncation. The removal of one or more digits, characters, or bits from one end of an item of data when a string length or precision of a target variable has been exceeded.
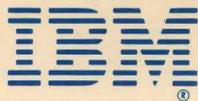
upper bound. The upper limit of an array dimension.

variable. A named entity that is used to refer to data and to which values can be assigned. Its attributes remain constant, but it can refer to different values at different times. Variables fall into three categories, applicable to any data type: element, array, and structure. Variables may be subscripted and/or qualified or pointer qualified.

virtual point picture character. The picture specification character V, which is used in picture specifications to indicate the position of an assumed decimal or binary point.

zero-suppression characters. The picture specification characters Z, Y, and *, which are used to suppress zeros in the corresponding digit positions.