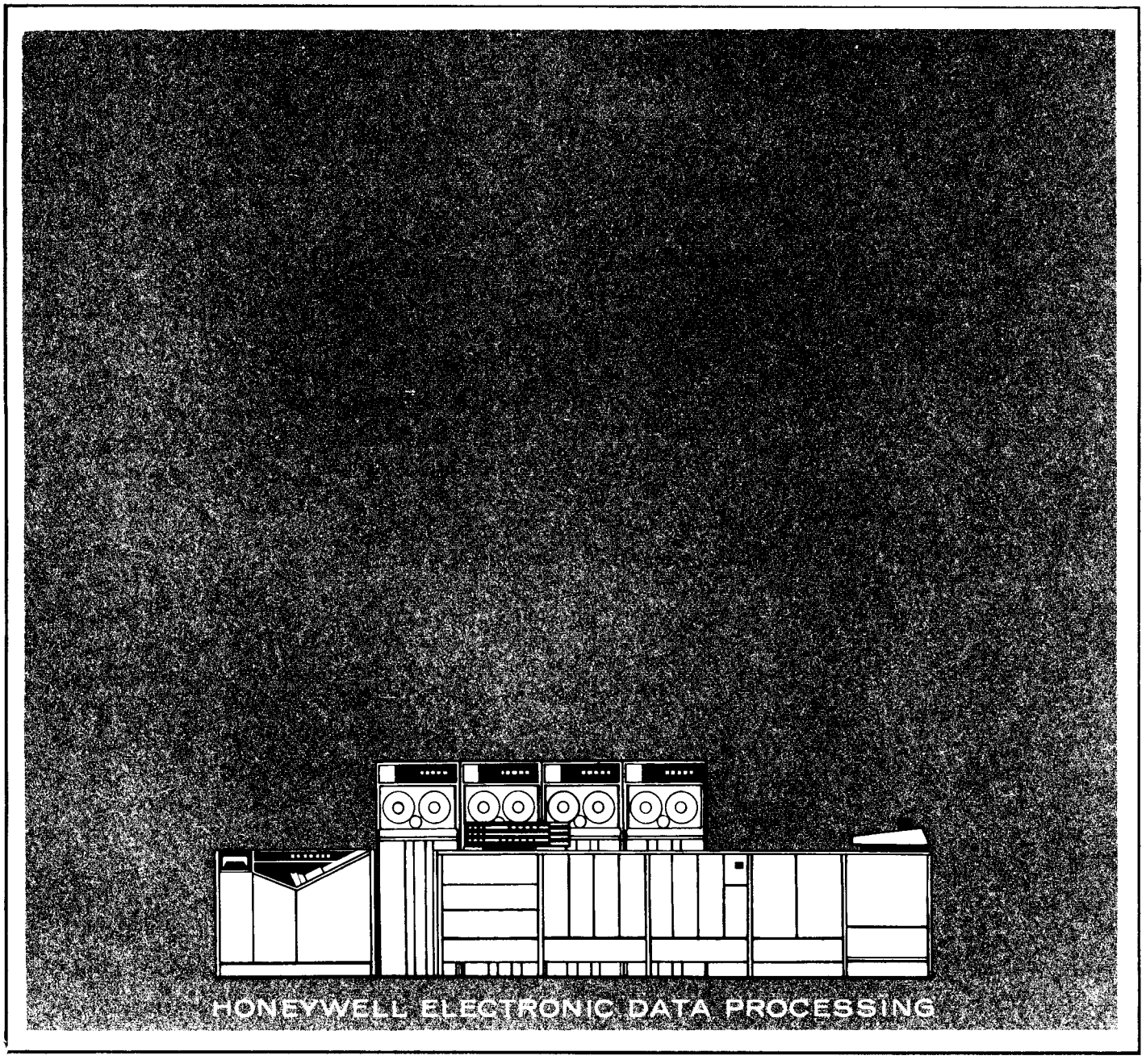
GLOSSARY OF DATA PROCESSING AND COMMUNICATIONS TERMS



FIRST EDITION
First Printing, August, 1964
Second Printing, October, 1964

SECOND EDITION
First Printing, January, 1965
Second Printing, April, 1965

THIRD EDITION
First Printing, April, 1966

Honeywell Inc.
Electronic Data Processing Division
Wellesley Hills, Massachusetts 02181

Printed in U.S.A.
WP-8784

When ordering this publication please specify title and underscored portion of file number.

143.0000.0000.0-279
10466

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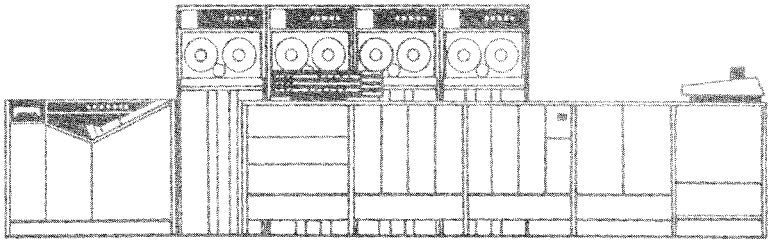


Honeywell

ELECTRONIC DATA PROCESSING

FOREWORD

A glossary is indispensable to both newcomers and veterans in the data processing field. The newcomer finds a glossary helpful in finding his bearings as quickly and as surely as possible. He marks his way with definitions, and relationships eventually become evident and whole patterns take form.

Even veterans find that they have all too often been incorrect in their assumptions as to the meaning of a term. Or, they will feel the need of a glossary when precision is critical in communicating with others. Whichever the case, a glossary, to be useful, must be comprehensive and its definitions lucid.

We believe that the Honeywell Glossary is one of the most comprehensive data processing glossaries ever published by a computer manufacturer. In addition to containing the standard EDP terms, it keeps pace with the fast-rising data transmission field by the inclusion of several hundred communications terms that will soon be common data processing language. It is also one of the most current glossaries available, inasmuch as it includes hundreds of the latest ASA* definitions.

This book is largely based on definitions found in the Bureau of the Budget's Automatic Data Processing Glossary. We wish to extend our appreciation also to the X3. 5 subcommittee of the American Standards Association. X3. 5 definitions have been indicated throughout the text by an asterisk (*) which states, in effect:

> Proposed American standard definition developed by Subcommittee X3. 5 — Terminology and Glossary, and presented for trial and criticism by authorization of ASA Sectional Committee X3 — Computers and Information Processing. Publication by Honeywell EDP is approved by X3 by letter dated 11 November 1963 on the mutual understanding that said definitions are not finally accepted as standards and are subject to change, modification and withdrawal, in part or in whole.

The Honeywell Glossary will be updated periodically. We solicit comments and criticisms. A Users' Remarks Form is provided in the back of this Glossary for this purpose.

A

ABSOLUTE ADDRESS, see (address, absolute).

ABSOLUTE CODE, see (code, absolute).

ABSOLUTE ERROR, see (error, absolute).

ABSOLUTE VALUE COMPUTER, see (computer, absolute value).

A. C. DUMP, see (dump, a. c.).

A. C. Signalling, a transmission method which utilizes a alternating current.

ACCELERATION TIME, see (time, acceleration).

ACCESS, IMMEDIATE, pertaining to the ability to obtain data from or place data in a storage device, or register directly without serial delay due to other units of data, and usually in a relatively short period of time.

ACCESS MODE *, in COBOL, a technique that is used to obtain a specific logic record from, or to place a specific logic record into, a file assigned to a mass storage device.

ACCESS, PARALLEL, the process of obtaining information from or placing information into storage where the time required for such access is dependent on the simultaneous transfer of all elements of a word from a given storage location. Synonymous with (simultaneous access).

ACCESS, RANDOM *, (1) pertaining to the process of obtaining information from or placing information into storage where the time required for such access is independent of the location of the information most recently obtained or placed in storage. (2) Pertaining to a device in which random access, as defined in definition 1, can be achieved without effective penalty in time.

ACCESS, SERIAL *, pertaining to the process of obtaining information from or placing information into storage when there is a time sequential relation governing the successive storage locations.

ACCESS, SIMULTANEOUS, same as (access, parallel).

ACCESS TIME, see (time, access).

ACCOUNTING MACHINE, same as (tabulator).

ACCUMULATOR, (1) the register and associated equipment in the arithmetic unit of the computer in which arithmetical and logical operations are performed. (2) A unit in a digital computer where numbers are totaled; i.e., accumulated. Often the accumulator stores one operand and upon receipt of any second operand, it forms and stores the result of performing the indicated operation on the first and second operands. Related to (adder).

ACCURACY *, the degree of freedom from error, that is, the degree of conformity to truth or to a rule. Accuracy is contrasted with precision, e.g., four-place numbers are less precise than six-place numbers, nevertheless a properly computed four-place number might be more accurate than an improperly computed six-place number.

ACCURACY CONTROL SYSTEM, an error detection and correction system.

ACOUSTIC DELAY LINE, see (line, acoustic delay).

ACTION, RATE, a type of control action in which the rate of correction is made proportional to how fast the condition is going awry. This is also called derivative action.

ACTUAL KEY *, see Key, Actual

ADD SUBTRACT TIME, see (time, add subtract).

ADDER *, a device whose output is a representation of the sum of the quantities represented by its inputs. Related to (accumulator).

ADDRESS *, (1) an identification, as represented by a name, label, or number, for a register, location in storage, or other data source or destination. (2) Loosely, any part of an instruction which specifies the location of an operand for the instruction.

ADDRESS (communications), the coded representation of the destination of a message.

ADDRESS, ABSOLUTE *, (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) An address which indicates the exact storage location where the referenced operand is to be found or stored in the actual machine code address numbering system. Synonymous with (specific address) and related to (code, absolute). (4) Synonymous with machine address.

ADDRESS, ARITHMETIC, the assembly-language technique of appending an address modifier, consisting of a sign and up to four decimal digits, to a symbolic tag in order to designate a memory location address relative to the location represented by the tag. See (address, relative).

ADDRESS, BASE, (1) a number which appears as an address in a computer instruction, but which serves as the base, index, initial or starting point for subsequent addresses to be modified. Synonymous with (presumptive address) and (reference address). (2) A number used in symbolic coding in conjunction with a relative address.

ADDRESS, DIRECT, an address which indicates the location where the referenced operand is to be found or stored with no referenced to an index register or B-Box. Synonymous with (first level address).

ADDRESS, EFFECTIVE, (1) a modified address. (2) The address actually considered to be used in a particular execution of a computer instruction.

ADDRESS, FIRST LEVEL, same as (address, direct).

ADDRESS, FLOATING, formerly, an address written in such a way that it can easily be converted to a machine address by indexing, assembly, or by some other means.

ADDRESS FOUR, a method of specifying the location of operands and instructions in which the storage location of the two operands and the storage location of the results of the operation are cited, and the storage location of the next instruction to be executed are cited.

ADDRESS, FOUR"PLUS"ONE *, see (format, address).

ADDRESS, IMMEDIATE, an instruction address in which the address part of the instruction is the operand. Synonymous with (zero level address).

ADDRESS, INDEXED, an address that is to be modified or has been modified by an index register or similar device. Synonymous with (variable address).

ADDRESS, INDIRECT, an address in a computer instruction which indicates a location where the address of the referenced operand is to be found. In some computers the machine address indicated can itself be indirect. Such multiple levels of addressing are terminated either by prior control or by a termination symbol. Synonymous with (second level address).

ADDRESS, MACHINE, an absolute, direct, unindexed address expressed as such, or resulting after indexing and other processing has been completed.

ADDRESS, MULTI, same as (address, multiple).

ADDRESS, MULTILEVEL *, same as indirect address.

ADDRESS, MULTIPLE, a type of instruction which specifies the addresses of two or more items which may be the addresses of locations of inputs or outputs of the calculating unit or the addresses of locations of instructions for the control unit. The term multi-address is also used in characterizing computers; e.g., two, three, or four address machines. Synonymous with (multi-address).

ADDRESS, ONE, (1) a single address. (2) A system of machine instruction such that each complete instruction explicitly describes one operation and involves one storage location. Synonymous with (single address) and related to (instruction, one address).

ADDRESS, ONE"PLUS"ONE, see (format, address).

ADDRESS PART *, a part of an instruction word which specifies the address of an operand.

ADDRESS, PRESUMPTIVE, same as (address, base) (1).

ADDRESS, REFERENCE, same as (address, base) (1).

ADDRESS REGISTER *, see Register, Address

ADDRESS, RELATIVE, an address to which the base address must be added in order to find the machine address.

ADDRESS, SECOND LEVEL, same as (address, indirect).

ADDRESS, SINGLE, same as (address, one) (2).

ADDRESS, SPECIFIC, same as (address, absolute).

ADDRESS, SYMBOLIC, a label, alphabetic or alphameric used to specify a storage location in the context of a particular program. Often, programs are first written using symbolic addresses in some convenient code, which are translated into absolute addresses by an assembly program.

ADDRESS, THREE, a method of specifying the location of operands and instructions in which the storage location of the two operands and the storage location of the results of the operations are cited; e.g., addend, augend, and sum addresses all specified in one instruction word.

ADDRESS, THREE"PLUS"ONE *, see (format, address).

ADDRESS, TWO"PLUS"ONE *, see (format, address).

ADDRESS, VARIABLE, same as (address, indexed).

ADDRESS, ZERO LEVEL, same as (address, immediate).

ADDRESSING SYSTEM, see (system, addressing).

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.

ADJACENT CHANNEL, the channel whose frequency band is adjacent to that of the reference channel.

ADJACENT CHANNEL INTERFERENCE, adjacent channel interoccurs when two modulated carrier channels are placed close together in frequency so that one or both sidebands extend from one into the other.

ADJACENT CHANNEL SELECTIVITY, characteristic of a receiver which governs its ability to reject symbols or channels adjacent to that of the desired signals.

ADMIRAL, Automatic and Dynamic Monitor with Immediate Relocation, Allocation and Loading), Honeywell's advanced dynamic operating system for the H-800/1800 series. It consists of a primary monitor which is a general purpose control package, and which communicates with a collection of secondary monitors, each specialized to the particular characteristics and requirements of a specific programming system.

ADP AUTOMATIC DATA PROCESSING *, pertaining to automatic data processing equipment such as EAM and EDP equipment. See (processing, automatic data).

ADVANCE FEED TAPE, perforated paper tape which has the leading edge of the feed holes directly in line with the leading edges of the intelligence holes. A Western Union exclusive, this characteristic made it possible to readily differentiate between the "front end" and the "tail end" of an uninterpreted tape. While some applications still use advance feed tape, most new ones no longer use it. (See center feed tape).

ADVANCE, ITEM, a technique in the grouping of records for operating successively on different records in storage.

AGENDA, in linear programming, a set of programs used by a linear programming software package to manipulate a problem matrix.

ALF, see (alpha).

ALGEBRA, BOOLEAN, a process of reasoning, or a deductive system of theorems using a symbolic logic, and dealing with classes, propositions, or on-off circuit elements. It employs symbols to represent operators such as AND, OR, NOT, EXCEPT, IF...THEN, etc., to permit mathematical calculation. Named after George Boole, famous English mathematician (1815-1864).

ALGOL *, ALGorithmic Oriented Language, an international procedure-oriented language. See (language, algorithmic).

ALGORITHM *, a prescribed set of well defined rules, or process, for the solution of a problem in a finite number of steps, e.g., a full statement of an arithmetical procedure for evaluating sin X to a stated precision.

ALGORITHM, DUAL, a method of operating on a matrix in linear programming, by working with a substitute matrix (known as the dual matrix) which is related to the original.

ALGORITHM, INTEGER, a method of solving a linear programming problem in which the answers are constrained to be integers.

ALGORITHM, REVISED SIMPLEX, an algorithm that uses sophisticated decision rules in manipulating the matrix in order to solve a linear programming problem. Honeywell's linear programming software uses the Revised Simplex Algorithm with additional sophistications.

ALGORITHM, SIMPLEX, the algorithm evolved by Danzig and used as a model for most linear programming software packages.

ALGORITHM TRANSLATION, see (translation, algorithm).

ALGORITHMIC, pertaining to a constructive calculating process usually assumed to lead to the solution of a problem in a finite number of steps.

ALGORITHMIC LANGUAGE, see (language, algorithmic).

ALLOCATION, STORAGE *, the assignment of blocks of data to specified blocks of storage.

ALPHA, a term used to indicate alphabetical characters as differentiated from numerical.

ALPHABET *, an ordered set of unique representations, called characters. E.G., the alphabet 0 and 1, the 26 letters of the English alphabet, and the complete American Standard Coded Character set. Clarified by (set, character).

ALPHABETIC CODE, see (code, alphabetic).

ALPHABETIC-NUMERIC, the characters which include letters of the alphabet, numerals, and other symbols such as punctuation or mathematical symbols.

ALPHAMERIC, a contraction of alphanumeric and alphabetic-numeric.

ALPHANUMERIC, a contraction of alphabetic-numeric.

ALPHANUMERIC INSTRUCTION, see (instruction, alphanumeric).

ALPS (Advanced Linear Programming System), an advanced Honeywell operations research technique which can be used to maximize the efficiency of any real world situation that can be expressed as a set of linear equations. For example, ALPS can be used to maximize profit in a manufacturing plant by determining the scheduling of men, machines, and materials that achieves maximum use of these resources. Applications include sales forecasting, materials blending, advertising, transportation and other multi-factor problems.

ALU, (Arithmetic) and (Logical Unit), see (unit, arithmetic).

AM, see (modulation, amplitude).

AMPLIFIER, an unidirectional device which is capable of delivering an enlargement of the wave form of the electric current, voltage, or power supplied to it.

AMPLIFIER, BUFFER, an amplifier used to isolate the output of any device, e.g., oscillator, from the effects produced by changes in lead from subsequent circuits.

AMPLITUDE, PULSE, see (pulse amplitude).

ANALOG, the representation of numerical quantities by means of physical variables; e.g., translation, rotation, voltage, or resistance. Contrasted with (digital).

ANALOG COMPUTER, see (computer, analog).

ANALOG DEVICE, see (device, analog).

ANALOG NETWORK, see (network, analog).

ANALOG REPRESENTATION, see (representation, analog).

ANALYSIS *, the methodical investigation of a problem, and the separation of the problem into smaller related units for further detailed study.

ANALYSIS, NUMERICAL *, 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.

ANALYSIS, SYSTEMS, the examination of an activity, procedure, method, technique, or a business to determine what must be accomplished and how the necessary operations may best be accomplished.

ANALYST *, a person skilled in the definition of problems and the development of algorithms for their solution. Especially algorithms which may be implemented on a computer.

ANALYTIC RELATIONSHIP, see (relationship, analytic).

ANALYZER, a computer routine whose purpose is to analyze a program written for the same or a different computer. This analysis may consist of summarizing instruction references to storage and tracing sequences of jumps.

ANALYZER, DIFFERENTIAL *, a mechanical or electrical analog device primarily designed and used to solve differential equations.

ANALYZER, DIGITAL DIFFERENTIAL *, a differential analyzer that uses digital representations for the analog quantities. Synonomous with (DDA).

ANALYZER, ELECTRONIC DIFFERENTIAL, a form of analog computer using interconnected electronic integrators to solve differential equations.

ANALYZER, MECHANICAL DIFFERENTIAL, a form of analog computer using interconnected mechanical surfaces to solve differential equations; e.g., the Bush differential analyzer developed by Vannevar Bush at M.I.T. which used differential gear boxes to perform addition and a combination of wheel disk spherical mechanisms to perform integration.

ANALYZER, NETWORK *, a simulator for the study of a network, e.g., electrical supply network. Synonymous with (network calculator).

AND, same as (operator, and).

AND CIRCUIT, same as (gate, and).

AND GATE, see (gate, and).

AND OPERATOR, see (operator, and).

ANGLE, see (modulation, angle).

ANNOTATION *, an added descriptive comment or explanatory note.

APPLICATION, the system or problem to which a computer is applied. Reference is often made to an application as being either of the computational type, wherein arithmetic computations predominate, or of the data processing type, wherein data handling operations predominate.

APPLICATION STANDBY, an application in which two or more computers are tied together as a part of a single over-all system and which, as in the case of an inquiry application, stand ready for immediate activation and appropriate action.

APPLICATION STUDY, see (study, application).

AREA *, see Clear Area

AREA, CONSTANT, a part of storage designated to store the invariable quantities required for processing.

AREA, EXTENDED, see (extended area).

AREA, INPUT, same as (block, input) (1).

AREA, INSTRUCTION, (1) a part of storage allocated to receive and store the group of instructions to be executed. (2) The storage locations used to store the program.

AREA, OUTPUT, same as (block, output) (2).

ARGUMENT *, an independent variable, e.g., in looking up a quantity in a table, the number, or any of the numbers, which identifies the location of the desired value.

ARGUS (Automatic Routine Generating and Updating System): an integrated automatic programming system for the H-800 which includes a symbolic assembly language, an assembly program, automatic inclusion of library routines, file maintenance of a library of unchecked programs, a checkout system, and a production scheduling and operating system.

ARITHMETIC, ADDRESS, see (address arithmetic).

ARITHMETIC CHECK, same as (check, mathematical).

ARITHMETIC, FIXED POINT, (1) a method of calculation in which operations take place in an invariant manner, and in which the computer does not consider the location of the radix point. This is illustrated by desk calculators or slide rules, with which the operator must keep track of the decimal point. Similarly with many automatic computers, in which the location of the radix point is the programmer's responsibility. Contrasted with (arithmetic, floating, point). (2) A type of arithmetic in which the operands and results of all arithmetic operations must be properly scaled so as to have a magnitude between certain fixed values.

ARITHMETIC, FLOATING DECIMAL, same as (arithmetic, floating point).

ARITHMETIC, FLOATING POINT, a method of calculation which automatically accounts for the location of the radix point. This is usually accomplished by handling the number as a signed mantissa times the radix raised to an integral exponent; e.g., the decimal number +88.3 might be written as $+.883 \times 10^{2}$; the binary number -.0011 as $-.11 \times 2^{-2}$. Synonymous with (floating decimal arithmetic) and contrasted with (arithmetic, fixed point) (1).

ARITHMETIC, INTERNAL, the computations performed by the arithmetic unit of a computer.

ARITHMETIC, MULTI PRECISION, a form of arithmetic similar to double precision arithmetic except that two or more words may be used to represent each number.

ARITHMETIC SECTION, same as (unit, arithmetic).

ARITHMETIC SHIFT, see (shift, arithmetic).

ARITHMETIC UNIT, see (unit, arithmetic).

ARITHMETIC OPERATION, see (operation, arithmetic).

ARTIFICIAL BASIS, see Basic, Artificial.

ARTIFICAL INTELLIGENCE, see (intelligence, artificial).

ARRAY, a series of items arranged in a meaningful pattern.

ARTIFICIAL LANGUAGE, see (language, artificial).

ASA CODE, an information interchange seven-level code recently adopted as standard code by the American Standard Association.

ASCII, American Standard Code for Information Interchange.

ASPECT CARD, see (card, aspect).

ASR, Automatic Send-Receive set. A combination teletypewriter transmitter and receiver with transmission capability from either keyboard or paper tape. Most often used in a half-duplex circuit.

ASSEMBLE *, to prepare a machine language program from a symbolic language program by substituting absolute operation codes and addresses for symbolic operation codes and addresses on a one-for-one basis.

ASSEMBLER *, a program that assembles. See (assemble). Synonymous with (assembly routine); (assembly program) and related to (compiler).

ASSEMBLY LANGUAGE, the machine-oriented programming language (e.g., EASY, ARGUS) belonging to an assembly system.

ASSEMBLY LIST, see (list, assembly).

ASSEMBLY PROGRAM, same as (assembler).

ASSEMBLY ROUTINE, same as (assembler).

ASSEMBLY SYSTEM, an automatic programming software system which includes a programming language and a number of machine language programs. These programs aid the programmer by performing different programming functions such as checkout, updating, etc.

ASSEMBLY UNIT, see (unit, assembly).

ASYNCHRONOUS, pertaining to a lack of time coincidence in set of repeated events where this term is applied to a computer to indicate that the execution of one operation is dependent on a signal that the previous operation is completed.

ASYNCHRONOUS COMPUTER, see (computer, asynchronous).

ASYNCHRONOUS DEVICE, a device in which the speed of operation is not related to any frequency in the system to which it is connected.

ASYNCHRONOUS TRANSMISSION, a transmission process such that between any two significant instants in the same group*, there is always an integral number of unit intervals. Between two significant instants located in different groups, there is not always an integral number of unit intervals.

*) In data transmission this group is a block or a character.

*) In telegraphy this group is a character.

ATTENUATE, to obtain a fractional part or reduce the energy of an action or signal. Measurement may be made as percentage, per unit, or in decibels, which is 10 times logic of power ratio, or 20 log of voltage ratio; contrasted with "Amplify".

ATTENUATION, the difference (loss) between delivered (transmitted) and received power due to transmission loss through equipment, lines or other communication devices.

ATTENUATION, ECHO, see (echo attenuation).

ATTENUATION, SIGNAL, the reduction in the strength of electrical signals.

AUDIO, frequencies which can be heard by the human ear (usually 15 cycles to 20,000 cycles per second).

AUDIT, TRAIL, a system of providing a means for tracing items of data from processing step to step, particularly from a machine produced report or other machine output back to the original source data.

AUTO-ABSTRACT, (1) a collection of words selected from a document, arranged in a meaningful order, commonly by an automatic or machine method, (2) To select an assemblage of key words from a document, commonly by an automatic or machine method.

AUTO-MAN, a locking switch which controls the method of operation, i.e., automatic or manual.

AUTOMATH, a Honeywell scientific compiler that translates mathematical notation into machine instructions. The Automath 800 will accept Fortran II language as will Automath 400 and 1400. Automath 1800 (which will also run on large H-800 systems) will accept Fortran IV.

AUTOMATIC CHECK, see (check, automatic).

AUTOMATIC CODE, see (code, automatic).

AUTOMATIC COMPUTER, see (computer, automatic).

AUTOMATIC DATA PROCESSING, see (processing, automatic data).

AUTOMATIC DATA PROCESSING EQUIPMENT, see (equipment, automatic data processing).

AUTOMATIC DATA PROCESSING SYSTEM, see (system, automatic data processing).

AUTOMATIC DICTIONARY, see (dictionary, automatic).

AUTOMATIC ERROR CORRECTION, see (correction, automatic error).

AUTOMATIC EXCHANGE, an exchange in which communication between subscribers is effected, without the intervention of an operator, by means of devices set in operation by the originating subscriber's instrument.

AUTOMATIC FEED PUNCH, see (punch, automatic feed).

AUTOMATIC MESSAGE, see (switching center).

AUTOMATIC PROGRAMMING, see (programming, automatic).

AUTOMATIC ROUTINE, see (routine, automatic).

AUTOMATIC SEND-RECEIVE, see (ASR).

AUTOMATIC STOP, see (stop, automatic).

AUTOMATIC SWITCHING CENTER, communications center designed specifically for relaying digitized data by automatic electronic methods.

AUTOMATION *, (1) 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.

AUTOMATION, SOURCE DATA, the many methods of recording information in coded forms on paper tapes, punched cards, or tags that can be used over and over again to produce many other records without rewriting. Synonymous with SDA.

AUTOMONITOR, to make an electronic computer prepare a record of its own data processing operations, or a program or routine for this purpose.

AUTOPOLLING, a term that refers to a party-line circuit in which equipment is provided which automatically permits each station to transmit according to a predetermined arrangement.

AUXILIARY EQUIPMENT, same as (equipment, off line).

AUXILIARY ROUTINE, see (routine, auxiliary).

AUXILIARY STORAGE, see (storage, auxiliary).

AVAILABLE MACHINE TIME, same as (time, available) (2).

AVAILABLE TIME, see (time, available).

AVERAGE EFFECTIVENESS LEVEL, see (level, average effectiveness).

B

BALANCED CIRCUITS, a circuit terminated by a network whose impedance balances the impedance of the line so that the return losses are infinite.

BALANCED ERROR, (range of), see (error, balanced) (range of).

BALANCED LINE, a transmission line consisting of two conductors, in the presence of ground, capable of being operated in such a way that the voltages of the two conductors at all transverse planes are equal in magnitude and opposite in polarity with respect to ground; the currents in the two conductors are equal in magnitude and opposite in direction.

BAND *, a group of circular recording tracks on storage devices such as drums or disks.

BAND (communications), (1) the gamut or range of frequencies. (2) The frequency spectrum between two defined limits. (3) The frequencies which are within two definite limits.

BAND, DEAD, a specific range of values in which the incoming signal can be altered without also changing the outgoing response. Synonymous with (dead space), (dead zone), and (switching blank) and similar to (zone, neutral).

BAND ELIMINATION FILTER, a filter having a single attenuation band, neither of the cut-off frequencies being zero or infinite.

BAND, GUARD, see (guard band).

BAND PASS, the difference in cycles/sec between the limiting frequencies of a band in which the attenuation of any frequency, with respect to the central frequency, is less than a specified value (usually half power or three db).

BAND-PASS FILTER, a filter having a single transmission band, neither of the cut-off frequencies being zero nor infinite.

BAND PROPORTIONAL, the range of values of a condition being regulated which will cause the controller to operate over its full range. Usually expressed by engineers in terms of percentage of instrument full scale range.

BAND REJECTION FILTER, see (band elimination filter).

BAND STOP FILTER, see (band elimination filter).

BAND, V-F, see (V-F band).

BANDWIDTH, (1) a group of consecutive frequencies constituting a band which exists between limits of stated frequency attenuation. A band is normally defined as more than 3.0 decibels greater than the mean attenuation across the band. (2) A group of consecutive frequencies constituting a band which exists between limits of stated frequency delay.

BANDWIDTH, NOMINAL, the maximum band of frequencies, inclusive of guard bands, assigned to a channel.

BASE *, same as (radix).

BASE ADDRESS, see (address, base).

BASE NOTATION, same as (notation, radix).

BASE NUMBER, same as (radix).

BASEBAND, in the process of modulation, the baseband is the frequency band occupied by the aggregate of the transmitted signals when first used to modulate a carrier. The term is commonly applied to cases where the ratio of the upper to the lower limit of the frequency band is large compared to unity.

Note: Examples are the band employed for the transmission of picture and synchronizing signals in television, and that for multichannel pulse telephone systems.

BASIC SOLUTION, see Solution, Basic

BASIS, in a linear programming problem, a matrix with a group of column vectors (a square subset of the rectangular matrix) currently being considered for the solution; called the basis because it is used as a base for determining an improved solution.

BASIS, ARTIFICIAL, in linear programming, algorithms that determine an initial solution by automatically assigning artificial values to the variables (so as to make each constraining equation independently valid, e.g., by adding an artificial variable to each equation and assigning it to the right-hand side) are said to start with an artificial basis. A matrix whose variables are artificially assigned values is an artificial basis for linear programming computation.

BATCH PROCESSING, see (processing, batch).

BATCH TOTAL, see (total, batch).

BATTEN SYSTEM, same as (system, peek-a-boo).

BAUD, see (channel). A technical term, originally used to express the capabilities of a telegraph transmission facility in terms of "modulation rate per unit of time...". For practical purposes, it is now used interchangeably with "bits per second" as the unit of measure of data flow. It was derived from the name Baudot, after whom the Baudot Code was named.

Example: If the duration of audit is 20 milliseconds the modulation rate is 50 bauds. Clarified by (rate, bit) and capacity, channel).

BAUDOT CODE, the standard five channel teletypewriter code consisting of a start impulse and five character impulses, all of equal length, and a stop impulse whose length is 1.42 times all of the start impulse. Also known as the 7.42 unit code. The Baudot code has been used by the telegraph industry for about 100 years.

B-BOX*, same as (register, index).

BELL SIGNAL, a yellow lamp which glows whenever the bell signal is detected by a reperforator. As long as it glows, this position has priority in establishing cross-office connection.

BENCHMARK PROBLEM, see (problem, benchmark).

BIAS, (1) an unbalanced range of error; i.e., having an average error that is not zero. (2) The average D.C. voltage maintained between certain elements of a circuit, such as between the cathode and the control grid of a vacuum tube.

BIAS DISTORTION, see (distortion, bias).

BIAS, INTERNAL, see (internal bias).

BIAS, MARKING, see (marking bias).

BIAS, SPACING, see (spacing bias).

BILLIBIT, one billion bits. Same as kilomegabit.

BILLICYCLE, one billion cycles. Same as kilomegacycle.

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 base of two. Related to (decimal, binary coded) and clarified by (systems, number).

BINARY CELL, see (cell, binary).

BINARY CODE, see (code, binary).

BINARY CODED CHARACTER, see (character, binary coded).

BINARY CODED DECIMAL, see (decimal, binary coded).

BINARY CODED DECIMAL NOTATION, see (notation, binary coded decimal).

BINARY CODED DECIMAL NUMBER, see (number, binary coded decimal).

BINARY, COLUMN *, pertaining to the binary representation of data on punched cards in which adjacent positions in a column correspond to adjacent bits of the data. For example, each column in a 12 row card may be used to represent 12 consecutive bits of a 36 bit word.

BINARY COUNTER, see (counter, binary).

BINARY DIGIT, see (digit, binary).

BINARY NOTATION, see (notation, binary).

BINARY NUMBER, see (number, binary).

BINARY NUMBER SYSTEM, same as (system, number) (2).

BINARY POINT, see (point, binary).

BINARY, ROW *, pertaining to the binary representation of data on punched cards in which adjacent positions in a row correspond to adjacent bits of the data. For example, each row in an 80 row card may be used to represent 80 consecutive bits of two 40 bit words.

BINARY SEARCH, see (search, binary).

BINARY SIGNALLING, see (signalling, binary).

BINARY TO DECIMAL CONVERSION, see (conversion, binary to decimal).

BINARY VARIABLE, same as (variable, two valued).

BINARY REGISTER ERROR DETECTION SYSTEM, this system is based upon the concept of assigning binary "one" values to the pulses as they appear in each channel for all marking pulses of each code combination.

BIONICS *, the functions, characteristics and phenonema of living systems and the relating of these to the development of hardware systems.

BI-POLAR (Uni-Polar), when a logical "true" input is represented by an electrical voltage polarity opposite to that representing a logical "false" input, the signal is defined as bi-polar. If both "true" and "false" inputs are represented by the same electrical voltage polarity, the signal is defined as uni-polar.

BIQUINARY CODE, see (code, biquinary).

BIQUINARY CODED DECIMAL NUMBER, BIQUINARY NOTATION, see (notation, biquinary).

BIQUINARY NUMBER, see (number, biquinary).

BISTABLE *, pertaining to devices capable of assuming either one of two stable states.

BIT *, a binary digit.

BIT, CHECK *, a binary check digit. Related to (check parity) and (number, self checking).

BIT LOCATION, see (location, bit).

BIT, PARITY *, a binary digit appended to an array of bits to make the sum of all the bits always odd or always even.

BIT RATE, see (rate, bit).

BIT, SIGN, a binary digit used as a sign draft.

BIT STREAM, a term commonly used in conjunction with a transmission method in which character separation is accomplished by the terminal equipment and the bits are transmitted over the circuit in a consecutive line of bits.

BIT, ZONE, (1) one of the two left most bits in a commonly used system in which six bits are used for each character. Related to (over-punch). (2) Any bit in a group of bit positions that are used to indicate a specific class of items; e.g., numbers, letters, special signs, and commands.

BITS, INFORMATION, see (information bits).

BITS, SERVICE, see (service bits).

BLANK, (1) a regimented place of storage where data may be stored; e.g., a location in a storage medium. Synonymous with (space). (2) A character used to indicate an output space on a printer in which nothing is printed. (3) A condition of "no information at all" in a given column of a punched card or in a given location in a perforated tape. In the case of tape, the feed hole is perforated but no intelligence is perforated into the same vertical column. In some cases, however, processing equipment may be programmed to recognize a blank and perform certain functions, just as with any other function code.

BLANK CHARACTER *, see Character, Blank

BLANK, SWITCHING, same as (band, dead).

BLIND (UNBLIND), the selective controlling of a transmission printer or reperforator. Used for example, to prevent prices from typing on a receiving teletypewriter.

BLOCK *, a set of associated words or characters handled as a unit.

BLOCK DIAGRAM, see (diagram, block).

BLOCK, INPUT, (1) a section of internal storage of a computer reserved for the receiving and processing of input information. Synonymous with (input area). (2) An input buffer. (3) A block of computer words considered as a unit and intended or destined to be transferred from an external source or storage medium to the internal storage of the computer.

BLOCK LENGTH, see (length, block).

BLOCK, OUTPUT, (1) a block of computer words considered as a unit and intended or destined to be transferred from an internal storage medium to an external destination. (2) A section of internal storage reserved for storing data which are to be transferred out of the computer. Synonymous with (output area). (3) A block used as an output buffer.

BLOCK SORT, see (sort, block).

BLOCK, STANDBY, locations always set aside in storage for communication with buffers in order to make more efficient use of such buffers.

BLOCK TRANSFER, see (transfer, block).

BLOCKETTE, a subdivision of a group of consecutive machine words transferred as a unit, particularly with reference to input and output.

BLOCKING, the combining of two or more records into one block.

BOOKKEEPING OPERATION, see (operation, bookkeeping).

BOOLEAN ALGEBRA, see (algebra, Boolean).

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.

BORROW, an arithmetically negative carry. It occurs in direct subtraction by raising the low order digit of the minuend by one unit of the next higher order digit; e.g., when subtracting 67 from 92, a tens digit is borrowed from the 9, to raise the 2 to a factor of 12; the 7 of 67 is then subtracted from the 12 to yield 5 as the units digit of the difference; the 6 is then subtracted from 8, or 9-1, yielding 2 as the tens digit of the difference.

BOUNDARY *, see Character Boundary

BOX, B, same as (register, index).

BOX, DECISION, the symbol used in flow charting to indicate a choice or branching in the information processing path.

BOX, STUNT, see (stunt box).

BRANCH *, (1) a set of instructions that are executed between two successive decision instructions. (2) To select a branch as in 1. Related to (transfer, conditional).

BRANCH INSTRUCTION, see (instruction, branch).

BRANCH, CONDITIONAL, same as (transfer, conditional).

BRANCH, UNCONDITIONAL, same as (transfer, unconditional).

BRANCHPOINT *, pertaining to the location in a routine where a branch is selected.

BREAK, to break, in a communication circuit, the receiving user interrupts the sending user and takes control of the circuit. The term is used especially in connection with half-duplex telegraph circuits and two-way telephone circuits equipped with voice-operated devices.

BREAKPOINT *, a point in a program as specified by an instruction, instruction digit, or other condition, where the program may be interrupted by external intervention or by a monitor routine.

BREAKPOINT INSTRUCTION, see (instruction, breakpoint).

BREAKPOINT SWITCH, see (switch, breakpoint).

BREAKPOINT SYMBOL, see (symbol, breakpoint).

B-REGISTER, (1) same as (register, index). (2) A register used as an extension of the accumulator during multiply and divide processes.

BRIDGE, a Honeywell (Liberator) program which performs direct translation from the machine language of competitive systems to the machine language of the Honeywell 200 computer.

BRIDGE DUPLEX SYSTEM, a duplex system based on the Wheatstone bridge principle in which a substantial neutrality of the receiving apparatus to the sent currents is obtained by an impedance balance.

BROADBAND, as applied to data transmission, it is used to denote transmission facilities capable of handling frequencies greater than those required for high-grade voice communications, (i.e., higher than 3 to 4 kc).

BROADBAND NOISE, see (noise, broadband).

BROADCAST, some control stations have the ability to broad-

cast messages to all stations on a circuit at the same time. This is accomplished by using a call which is common to all stations.

BRUSH, an electrical conductor for reading data from a punch card.

BUCKET, a slang expression used to indicate some portion of storage specifically reserved for accumulating data, or totals; e.g., "throw it in bucket #1." is a possible expression. Commonly used in initial planning.

BUFFER *, (1) a storage device used to compensate for a difference in rate of flow or data or time of occurrence of events when transmitting data from one device to another. See (storage, buffer). (2) An insulating circuit used to avoid reaction of a driven circuit on any driving circuit.

BUFFER AMPLIFIER, see (amplifier, buffer).

BUFFER STORAGE, see (storage, buffer).

BUFFERED COMPUTER, see (computer, buffered).

BUG, a mistake in the design of a routine or a computer, or a malfunction.

BUILT IN AUTOMATIC CHECK, same as (check, automatic).

BUILT IN CHECK, same as (check, automatic).

BURST, ERROR, see (error, burst).

BUS *, one or more conductors used for transmitting signals or power from one or more sources to one or more destinations. Synonomous with (trunk).

BUSINESS DATA PROCESSING *, see Data Processing, Business

BYTE *, a sequence of adjacent binary digits operated upon as a unit and usually shorter than a word.

C

CABLE, assembly of insulated pairs of voice conductors in a common protective sheath so arranged as to permit the conductors to be identified. The number of fine gauge conductors in telephone cables may run into thousands.

CABLE, COAXIAL, 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.

CABLE, COMBINATION, cable having conductors grouped in combination such as pairs and quads.

CABLE, COMPOSITE, in communication practice, a composite cable is a cable in which conductors of different gauges, or types, are combined under one sheath.

CABLE, PAIRED, a cable in which all of the conductors are arranged in the form of twisted pairs, none of which is arranged with others to form quads.

CABLE, QUADDED, a cable in which at least some of the conductors are arranged in the form of quads.

CALCULATING, computing a result by multiplication, division, addition or subtraction, or by a combination of these operations. A data processing function.

CALCULATING, CARD PROGRAMMED, see (card programmed calculating).

CALCULATION, FIXED-POINT, a calculation made with fixed point arithmetic.

CALCULATION, FLOATING POINT, a calculation made with floating point arithmetic.

CALCULATOR *, (1) a device capable of performing arithmetic. (2) A calculator as in 1, which requires frequent manual intervention. (3) Generally and historically, a device for carrying out logical and arithmetical digital operations of any kind.

CALCULATOR, NETWORK, same as (analyzer, network).

CALL *, to transfer control to a specified closed subroutine.

CALL DIRECTION CODE, see (CDC).

CALL IN, to transfer control of a digital computer temporarily from a main routine to a subroutine, which is inserted in the sequence of calculating operations to fulfill a subsidiary purpose.

CALL NUMBER, see (number, call).

CALLING, SELECTIVE, see (selective calling).

CALLING SEQUENCE, see (sequence, calling).

CAMP-ON, method of holding a call for a line that is in use, and signalling when it becomes free.

CAPACITY, CHANNEL, (1) the maximum number of binary digits or elementary digits to other bases which can be handled in a particular channel per unit time. (2) The maximum possible information transmission rate through a channel at a specified error rate. The channel capacity may be measured in bits per second or bauds. Clarified by (rate, bit) and (baud).

CAPACITY, CIRCUIT, the number of communications channels which can be handled by a given circuit at the same time.

CAPACITY, MEMORY, same as (capacity, storage).

CAPACITY, STORAGE *, the amount of data that can be contained in a storage device. Synonomous with (memory capacity).

CARD, ASPECT, a card on which is entered the accession numbers of documents in an information retrieval system. The documents are judged to be related in an important fashion to the concept for which the card is established. Related to (system, peek-a-boo; system, uniterm; docuterm; and uniterm).

CARD-TO-CARD (communications), the operation of transferring data in punched card form at one location into the same form at another location.

CARD COLUMN, one of twenty to ninety single digit columns in a tabulating card. When punched, a column contains only one digit, one letter, or one special code.

CARD, CONTROL, a card which contains input data or parameters for a specific application of a general routine.

CARD, EDGE NOTCHED, a card of any size provided with a series of holes on one or more edges for use in coding information for a simple mechanical search technique. Each hole position may be coded to represent an item of information by notching away the edge of the card into the hole. Cards containing desired information may then be mechanically selected from a deck by inserting a long needle in a hole position and lifting the deck to allow the notched cards to fall from the needle. Unwanted cards remain in the deck.

CARD, EDGE PUNCHED, a card of fixed size into which information may be recorded or stored by punching holes along one edge in a pattern similar to that used for punch tape. Hole positions are arranged to form coded patterns in 5, 6, 7, or 8 channels and usually represent data by a binary coded decimal system.

CARD, EIGHTY (80) COLUMN, a punch card with 80 vertical columns representing 80 characters. Each column is divided into two sections, one with character positions labeled zero through nine, and the other labeled eleven (11) and twelve (12). The 11 and 12 positions are also referred to as the X and Y zone punches, respectively. Related to (card, punch) and (card, ninety column).

CARD FEED, see (feed, card).

CARD FIELD, see (field, card).

CARD HOPPER *, see Hopper

CARD IMAGE, see (image, card).

CARD JAM, see (jam, card).

CARD, MASTER, a card containing fixed or indicative information for a group of cards. It is usually the first card of that group.

CARD, NINETY (90) COLUMN, a punch card with 90 vertical columns representing 90 characters. The columns are divided in half horizontally, such that the vertical columns in the upper half of the card are numbered 1 through 45, and those in the lower half 46 through 90. Six punching positions may be used in each column; these are designated, from top to bottom, to represent the digits 0, 1, 3, 5, 7, and 9 by a single punch. The digits 2, 4, 6, and 8 and other characters may be represented by a combination of two or more punches. Related to (card, punch) and card, eighty column).

CARD, PROGRAM, see (program card).

CARD-PROGRAMMED, (1) the capability of being programmed by punch cards. (2) The capability of performing sequences of calculating operations according to instructions contained in a stack of punch cards.

CARD PROGRAMMED CALCULATING, card programmed calculating makes use of several connected machine units. An accounting machine reads from punched cards the factors for calculating and the codes instruct the machines about calculations to be made. A multiple step data processing operation.

CARD, PUNCH, a heavy stiff paper of constant size and shape, suitable for punching in a pattern that has meaning, and for being handled mechanically. The punched holes are sensed electrically by wire brushes, mechanically by metal fingers, or photoelectrically by photocells. Related to (card, eighty column) and (card, ninety column).

CARD PUNCH UNIT, same as (punch, card).

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

CARD PUNCHING, the basic method for converting source data into punched cards. The operator reads the source document, and, by depressing keys, converts the information into punched holes. See (keypunch).

CARD READER, see (reader, card).

CARD READER UNIT, same as (reader, card) (2).

CARD REPRODUCER, see (reproducer, card).

CARD STACKER, see (stacker, card).

CARD-TO-TAPE (communications), the operation of conversion from the 12 unit Hollerith code of tab cards into a perforated tape code; usually into the five unit Baudot code.

CARD TO TAPE CONVERTER, see (converter, card to tape).

CARD, TRANSFER, same as (card, transition).

CARD, TRANSFER OF CONTROL, same as (card, transition).

CARD, TRANSITION, a card used in the loading of a deck of program cards, which causes the termination of loading and initiates the execution of the program. Synonymous with (transfer of control card and transfer card).

CARD VERIFYING, a means of checking the accuracy of key punching. A duplication check. A second operator verifies the original punching by depressing the keys of a verifier while reading the same source data. The machine compares the key depressed with the hole already punched in the card.

CARRIAGE, AUTOMATIC *, a control mechanism for a typewriter or other listing device which can automatically control the feeding, spacing, skipping, and ejecting of paper or preprinted forms.

CARRIAGE RETURN *, the operation that causes the next character to be printed at the left margin.

CARRIER, a signal suitable for modulation by an audio or other signal. The resultant modulated signal can then be transmitted over a communication facility. Modulation methods include amplitude, phase and pulse.

CARRIER, COMMON COMMUNICATIONS, a company recognized by an appropriate regulatory agency as having a vested interest in furnishing communications services.

CARRIER, CONTINUOUS, a carrier over which transmission of information is accomplished by means which do not interrupt the carrier.

CARRIER FREQUENCY, carrier frequency of a periodic carrier wave of any wave shape is equal to the reciprocal of its period. The frequency of a periodic pulse carrier often is called the pulse-repetition frequency.

CARRIER NOISE (residual modulation), carrier noise is the noise produced by undesired variations of a radio-frequency signal in the absence of any intended modulation.

CARRIER POWER OUTPUT RATING, the carrier power output rating is the unmodulated power nominally available at the output terminals of the transmitter when connected to its normal antenna, or to a circuit equivalent thereof. Unless otherwise stated this is the normal rating of the transmitter.

CARRIER SHIFT, difference between the steady state, mark and space frequencies in a data carrier system using frequency shift modulation.

CARRIER SYSTEM, a means of obtaining a number of channels over a single path by modulating each channel upon a different carrier frequency and demodulating at the receiving point to restore the signals to their original form.

CARRIER WAVE, see (wave, carrier).

CARRIERS, wave suitable for modulation by the intelligence to be transmitted over a communication system. The component of a transmitted wave upon which an audio signal or other form of intelligence can be impressed. The carrier can be sinusoidal wave or a recurring series of pulses. The carrier can be a high frequency current superimposed on a voice circuit, on which can be modulated additional voice or signalling channels.

CARRY *, (1) a character or characters, produced in connection with an arithmetic operation on one digit place of two or more number representations in positional notation, and forwarded to another digit place for processing there. (2) The number represented by the character or characters in 1. (3) Most commonly, a character as defined in 1, that arises in adding when the sum 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.

CARRY, CASCADED *, in parallel addition, a carry process in which the addition of two numerals results in a sum numeral and a carry numeral which are in turn added together, this process being repeated until no new carries are generated. Contrasts with carry, high-speed.

CARRY, COMPLETE, a carry which is allowed to propagate.

CARRY-COMPLETE SIGNAL, see (signal, carry-complete).

CARRY, END-AROUND *, a carry from the most significant digit place to the least significant digit place.

CARRY, HIGH-SPEED *, any technique in parallel addition for speeding up carry propagation, e.g., standing-on-nines carry.

CARRY, PARTIAL *, a technique in parallel addition wherein some or all of the carries are stored temporarily instead of being allowed to propagate immediately.

CARRY, STANDING-ON-NINES *, 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 place is nine.

CARRY TIME, see (time, carry).

CASCADE CONTROL, see (control, cascade).

CASCADED CARRY, see (carry, cascaded).

CATHODE-FOLLOWER, a vacuum-tube circuit in which the input signal is applied to the control grid and the output is taken from the cathode. Electrically, such a circuit possesses high input impedance and low output impedance characteristics. The equivalent circuit using a transistor is called an emitter follower.

CATHODE RAY TUBE, see (tube, cathode ray).

CDC Call Direction Code. An identifying call, usually two letters, which is transmitted to an outlying receiver and automatically turns on its printer (selective calling).

CELL, BINARY *, a storage cell of one binary digit capacity, e.g., a single-bit register.

CELL, STORAGE *, an elementary unit of storage, e.g., binary cell, decimal cell.

CENTER, AUTOMATIC SWITCHING, see (automatic switching center).

CENTER, DATA PROCESSING, a computer installation providing data processing service for others, sometimes called customers, on a reimbursable or non-reimbursable basis.

CENTER FEED TAPE, perforated paper tape which has the feed holes centered directly in line with the centers of the intelligence holes. The most common method in use today.

CENTERLINE *, see Stroke Centerline

CENTER, RELAY, see (relay center).

CENTER, STORE-AND-FORWARD SWITCHING, see (store-and-forward switching center).

CENTER, SWITCHING, see (switching center).

CENTER, SWITCHING, AUTOMATIC MESSAGE, see (switching center, automatic message).

CENTER, SWITCHING, SEMIAUTOMATIC MESSAGE, see (switching center, semiautomatic message).

CENTER, SWITCHING, TORN TAPE, see (switching center, torn tape).

CENTRAL OFFICE, CENTRAL EXCHANGE, a common carrier facility which performs the necessary circuit switching functions required in the operation of communication networks.

CENTRAL PROCESSING UNIT, see (unit, central processing).

CENTRALIZED DATA PROCESSING, see (processing, centralized data).

CHAD *, the piece of material removed when forming a hole or notch in a storage medium such as paper tape or punched cards.

CHADDED PAPER TAPE, see (tape, chadded paper).

CHADLESS *, pertaining to the punching of tape in which chad does not result.

CHADLESS PAPER TAPE, see (tape, chadless paper).

CHAIN, (1) Any series of items linked together (2) Pertaining to a routine consisting of segments which are run through the computer in tandem, only one being within the computer at any one time and each using the output from the previous program as its input.

CHAIN CODE *, see Code, Chain

CHANGE DUMP, see (dump, change).

CHANGE TAPE, see (tape, change).

CHANGE, STEP, the change from one value to another in a single increment in negligible time.

CHANNEL *, (1) a path along which signals can be sent, e.g., data channel, output channel. (2) The portion of a storage medium that is accessible to a given reading station, e.g., track, band.

CHANNEL (communications), an electrical transmission path among two or more stations or channel terminations in telephone or telegraph company offices, furnished by wire, radio or a combination of both.

CHANNEL - 2400 BAUD, a 2400 baud data channel is contemplated for the near future. This is a synchronous system, also accepting polar pulse input conforming to E.I.A. standards, and capable of delivering signals at the destination having the same characteristics. This channel would permit transmission of punched cards at the rate of 100 per minute, or magnetic tape at the rate of 300 characters per second.

CHANNEL, ADJACENT, see (adjacent channel).

CHANNEL, ANALOG, a channel on which the information transmitted can take any value between the limits defined by the channel. Voice channels are analog channels.

CHANNEL CAPACITY, see (capacity, channel).

CHANNEL, CLASS "D", class D channel can be utilized to transmit punched paper tape at approximately 240 words per minute, depending upon the code element (5, 6, 7, or 8 level code) employed. It could also be used to transmit 80 column punched cards at the rate of 10 to 11 per minute.

CHANNEL, CLASS "E", the class "E" data channel is capable of transmission rates up to 1200 baud. This channel will also accept polar pulse input conforming to E.I.A. standards, and will deliver signals at the destination having the same characteristics.

CHANNEL, DUPLEX, a channel providing simultaneous transmission in both directions.

CHANNEL, FOUR-WIRE, a two-way circuit where the signals simultaneously follow separate and distinct paths in opposite directions in the transmission medium.

CHANNEL, HALF-DUPLEX, a channel capable of transmitting and receiving signals, but in only one direction at a time.

CHANNEL, INFORMATION, see (information channel).

CHANNEL, PILOT, see (pilot channel).

CHANNEL RELIABILITY, see (reliability, channel).

CHANNEL, SIMPLEX, a channel which permits transmission in one direction only.

CHANNEL, TELEGRAPH, see (telegraph channel).

CHANNEL, TIME DERIVED, see (time derived channel).

CHANNEL, TWO-WIRE, a two-way circuit for transmission in either direction.

CHANNEL, VOICE GRADE, a channel which permits transmission of speech.

CHANNELIZING, the process of subdividing wideband transmission facilities for the purpose of putting many different circuits requiring comparatively narrow bandwidths on a single wideband facility.

CHANNELS, in perforated tape, channels are longitudinal rows where intelligence holes may be punched along the length of the tape. Also known as levels or tracks.

CHARACTER, (1) one symbol of a set of elementary symbols such as those corresponding to the keys on a typewriter. The symbols usually include the decimal digits 0 through 9, the letters A through Z, punctuation marks, operation symbols, and any other single symbols which a computer may read, store, or write. (2) The electrical, magnetic, or mechanical profile used to represent a character in a computer, and its various storage and peripheral devices. A character may be represented by a group of other elementary marks, such as bits or pulses.

CHARACTER,BINARY CODED, one element of a notation system representing alphanumeric characters such as decimal digits, alphabetic letters, and punctuation marks by a predetermined configuration of consecutive binary digits.

CHARACTER, BLANK *, - a character used to produce a character space on an output medium.

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 character used for the purpose of performing a check.

CHARACTER, CODE, see (code character).

CHARACTER, CONTROL *, a character whose occurrence in a particular context initiates, modifies, or stops a control operation, e.g., a character to control carriage return.

CHARACTER DENSITY, see (density, character).

CHARACTER, ESCAPE *, a character used to indicate that the succeeding one or more characters are expressed in a code different from the code currently in use.

CHARACTER, ILLEGAL, a character or combination of bits which is not accepted as a valid representation by the machine design or by a specific routine. Illegal characters are commonly detected and used as an indication of machine malfunction.

CHARACTER, LEAST SIGNIFICANT, see (least significant character).

CHARACTER, MOST SIGNIFICANT, see (most significant character).

CHARACTER OUTLINE *, the graphic pattern established by the stroke edges of a character.

CHARACTER READER, see (reader, character).

CHARACTER RECOGNITION, see (recognition, character).

CHARACTER, REDUNDANT, a character specially added to a group of characters to insure conformity with certain rules which can be used to detect computer malfunction.

CHARACTER SET, see (set, 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, SPECIAL *, in a character set a character that is neither a numeral nor a letter, e.g., / * $ = and ?

CHARACTERISTIC DISTORTION, (1) a fixed distortion which results in either shortened or lengthened impulses. It generally does not change in degree from day to day. (2) distortions caused by transients which, as a result of the modulation, are present in the transmission channel and depend on its transmission qualities.

CHARACTERISTIC IMPEDANCE, see (impedance, characteristic).

CHARACTERS, THROW-AWAY, see (throw-away characters).

CHART, FLOW, a graphic representation of the major steps of work in process. The illustrative symbols may represent documents, machines, or actions taken during the process. The area of concentration is on where or who does what rather than how it is to be done. Synonymous with (process chart) and (flow diagram).

CHART, LOGICAL FLOW, a detailed solution of the work order in terms of the logic, or built in operations and characteristics, of a specific machine. Concise symbolic notation is used to represent the information and describe the input, output, arithmetic, and logical operations involved. The chart indicates types of operations by use of a standard set of block symbols. A coding process normally follows the logical flow chart.

CHART, OPERATIONS FLOW, a schematic representation of the interconnected logical steps necessary to solve a particular problem.

CHART, PROCESS, same as (chart, flow).

CHART, SYSTEMS FLOW, a schematic representation of the flow of information through the components of a processing system.

CHECK, a process of partial or complete testing of the correctness of machine operations, the existence of certain prescribed conditions within the computer, or the correctness of the results produced by a program. A check of any of these conditions may be made automatically by the equipment or may be programmed. Related to (check, marginal).

CHECK, ARITHMETIC, same as (check, mathematical).

CHECK, AUTOMATIC *, a check performed by equipment built into the equipment specifically for checking purposes. Synonymous with (built in check; built in automatic check; hardware check); and contrasted with (check, programmed).

CHECK BIT, see (bit, check).

CHECK, BUILT IN *, same as (check, automatic).

CHECK, BUILT IN AUTOMATIC, same as (check, automatic).

CHECK CHARACTER, one or more characters carried in such a fashion that if a single error occurs (excluding compensating errors) a check will fail, and the error will be reported.

CHECK CODE, see (code, check).

CHECK DIGIT, see (digit, check).

CHECK, DUMP, a check which usually consists of adding all the digits during dumping, and verifying the sum when retransferring.

CHECK, DUPLICATION *, a check based on the consistency of two independent performances of the same task.

CHECK, ECHO *, 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.

CHECK, FORBIDDEN COMBINATION, a check, usually an automatic check, which tests for the occurrence of a non-permissible code expression. A self checking code, or error detecting code, uses code expressions such that one or more errors in a code expression produces a forbidden combination. A parity check makes use of a self-checking code employing binary digits in which the total number of 1's, or 0's, in each permissible code expression is always even or always odd. A check may be made either for even parity or odd parity. A redundancy check employs a self-checking code which makes use of redundant digits called check digits. Some of the various names that have been applied to this type of check are: forbidden pulse combination, unused order, improper instruction, unallowable digits, improper command, false code, forbidden digit, non existent code, and unused code.

CHECK, HARDWARE, same as (check, automatic).

CHECK INDICATOR, see (indicator, check).

CHECK INDICATOR INSTRUCTION, see (instruction, check indicator).

CHECK, LONGITUDINAL, see (longitudinal check).

CHECK, MARGINAL *, a preventive maintenance procedure in which certain operating conditions, (e.g., supply voltage or frequency) are varied about their nominal values in order to detect and locate incipient defective parts. Synonymous with (test, marginal) and (high-low bias test), and related to (check).

CHECK MATHEMATICAL, a check which uses mathematical identities or other properties, occasionally with some degree of discrepancy being acceptable; e.g., checking multiplication by verifying that AxB = BxA. Synonymous with (arithmetic check).

CHECK, MODULAR N *, a check based on the formation of a residue, modular N, of the number being verified. Same as (check, residue).

CHECK NUMBER, see (number, check).

CHECK, ODD-EVEN *, same as (check, parity).

CHECK, PARITY *, a check which tests whether the number of ones (or zeros) in an array of binary digits is odd or even.

CHECK, TRANSVERSE, see (transverse check).

CHECK PROBLEM, see (problem, check).

CHECK, PROGRAMMED *, a check procedure designed by the

programmer and implemented specifically as a part of his program. Contrasted with (check, automatic) and synonymous with (check, routine).

CHECK, REDUNDANCY *, an automatic or programmed check based on the systematic insertion of components or characters used expressly for checking purposes. Related to (check, parity) and to (check, forbidden combination).

CHECK REGISTER, see (register, check).

CHECK, RESIDUE *, a check based on the formation of a residue of the number being verified. Similar to (check, modular N).

CHECK ROUTINE, same as (check, programmed).

CHECK, SELECTION *, a check that verifies the choice of devices such as registers in the execution of an instruction.

CHECK, SEQUENCE, a data processing operation designed to check the sequence of the items in a file assumed to be already in sequence.

CHECK-SUM, the sum used in a summation check.

CHECK, SUMMATION *, a check based on the formation of the sum of the digits of the number. The sum of the individual digits (called the check-sum digit) is usually compared with a previously computed value (called the check-sum).

CHECK, SYSTEM, a check on the overall performance of the system, usually not made by built-in computer check circuits; e.g., control totals, hash totals, and record counts.

CHECK, TRANSFER *, a check on the accuracy of a data transfer.

CHECK, TWIN, a continuous duplication check achieved by duplication of hardware and automatic comparison.

CHECK, VALIDITY, a check based upon known limits or upon given information or computer results; e.g., a calendar month will not be numbered greater than 12, and a week does not have more than 168 hours.

CHECKING, LOOP, see (loop checking).

CHECKOUT, (1) a general term for a set of routines designed to provide the programmer with a complete evaluation of his program under operating conditions. Checkout routines are provided in the Honeywell assembly systems. (2) The process of checking out a program.

CHECKPOINT *, a location in a routine where a check is performed.

CHINESE BINARY, same as (code, column-binary).

CIRCUIT, a system of conductors and related electrical elements through which electrical current flows.

CIRCUIT, (communication), a means of bothway communication between two points, comprising associated "go" and "return" channels.

CIRCUIT, AND, same as (gate, and).

CIRCUIT CAPACITY, see (capacity, circuit).

CIRCUIT, CLEAR-TO-SEND, see (clear-to-send circuit).

CIRCUIT-DROPOUT, the momentary interruption of a transmission because of the complete failure of a circuit.

CIRCUIT, ECCLES-JORDAN, same as (flip-flop).

CIRCUIT, FRAME/GROUNDING, see (frame grounding circuit).

CIRCUIT, HALF-DUPLEX, see (half-duplex circuit).

CIRCUIT, INTERLOCK, see (interlock circuit).

CIRCUIT, LEASED, see (leased lines, leased circuit).

CIRCUIT, LONGITUDINAL, see (longitudinal circuit).

CIRCUIT, MULTIPOINT, a circuit, interconnecting several locations, wherein information transmitted is available at all locations simultaneously.

CIRCUIT, MULTI-TONE, see (multi-tone circuit).

CIRCUIT, NEUTRAL, see (neutral circuit).

CIRCUIT NOISE LEVEL, the circuit noise level at any point in a transmission system is the ratio of the circuit noise at that point to some arbitrary amount of circuit noise chosen as a reference. This ratio is usually expressed in decibels above reference noise, abbreviated dbrn, signifying the reading of a circuit noise meter, or in adjusted decibels, abbreviated dba, signifying circuit noise meter reading adjusted to represent interfering effect under specified conditions.

CIRCUIT, OR, same as (gate, or).

CIRCUIT, PHANTOM, see (phantom circuit).

CIRCUIT, RECEIVED DATA, see (received data circuit).

CIRCUIT RELIABILITY, see (reliability, circuit).

CIRCUIT, SEND REQUEST, see (send request circuit).

CIRCUIT, SIDE, see (side circuit).

CIRCUIT, SINGLE, see (single circuit).

CIRCUIT SWITCHING, a system in which stations on different circuits within a network are joined by connection of the two circuits together. See (switching, circuit or line).

CIRCUIT, TRANSMITTED DATA, see (transmitted data circuit).

CIRCUIT, TRIBUTARY, see (tributary circuit).

CIRCUIT, TRUNK, see (trunk circuit).

CIRCUIT, TV, see (radio frequencies).

CIRCUIT, WAY-OPERATED, see (way-operated circuit).

CIRCUITS, BALANCED, see (balanced circuits).

CIRCULAR SHIFT, same as (shift, cyclic).

CIRCULATING REGISTER, see (register, circulating).

CIRCULATING STORAGE, see (storage circulating).

CLAMPER, when used in broadband transmissions, reinserts low frequency signal components which were not faithfully transmitted.

CLEAR *, (1) to place a storage device into a prescribed state, usually that denoting zero or blank. Contrasted with (hold) and clarified by (erase). (2) To place a binary cell into the "zero" state.

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.

CLEAR-TO-SEND CIRCUIT, signals on this circuit are originated in the signal converter. For Send-Only and Full-Duplex service, the signal converter shall hold the Clear-to-Send circuit in the "on" condition at all times. This circuit is not required for Receive-Only service. For Half-Duplex service, when the Send Request signal is switched to the "on" condition, the Clear-to-Send circuit shall be switched to the "on" condition after a time delay sufficient to effect the reversal of direction of transmission of the data communication channel and all associated equipment. When the Send Request circuit is switched back to the "off" condition, the Clear-to-Send circuit shall be switched back to the "off" condition.

CLOCK *, (1) a device that generates periodic signals used for synchronization. (2) A device that measures and indicates time. (3) Equipment providing a time base used in a transmission system to control the timing of certain functions such as the duration of signal elements, the sampling, etc.

CLOCK FREQUENCY, see (frequency, clock).

CLOCK RATE, see (rate, clock).

CLOCK, REAL TIME, a clock which indicates the passage of actual time, in contrast to a fictitious time set up by the computer program; such as, elapsed time in the flight of

a missile, wherein a 60-second trajectory is computed in 200 actual milliseconds, or a 0.1 second interval is integrated in 100 actual microseconds.

CLOSED LOOP, see (loop, closed).

CLOSED ROUTINE, see (routine, closed).

CLOSED SHOP, see (shop, closed).

CLOSED SUBROUTINE, see (subroutine, closed).

COAXIAL CABLE, see (cable, coaxial).

COBOL *, COmmon Business Oriented Language. A business data processing language. See (language, common business oriented).

CODE *, (1) a set of rules that are used to convert data, e.g., the set or correspondences in the American Standard Code for Information Interchange. (2) The set of representations defined by the set of rules as in 1, e.g., a coded character set as in the above American Standard Code or the repertoire of instructions for a particular computer. See (instruction). (3) Same as (encode).

CODE, ABSOLUTE, a code using absolute addresses and absolute operation codes; i.e., a code which indicates the exact location where the referenced operand is to be found or stored. Synonymous with (one level code) and (specific code) and related to (address, absolute).

CODE, ALPHABETIC, a system of alphabetic abbreviations used in preparing information for input into a machine; e.g., Boston, New York, Philadelphia, and Washington may in alphabetical coding be reported as BS, NY, PH, WA. Contrasted with (code, numeric).

CODE, ASA, see (ASA code).

CODE, AUTOMATIC, a code which allows a machine to translate or convert a symbolic language into a machine language for automatic machine or computer operations.

CODE, BAUDOT, see (Baudot code).

CODE, BINARY, (1) a coding system in which the encoding of any data is done through the use of bits; i.e., 0 or 1. (2) A code for the ten decimal digits, 0, 1, ..., 9 in which each is represented by its binary, radix 2, equivalent; i.e., straight binary.

CODE, BIQUINARY, a two part code in which each decimal digit is represented by the sum of the two parts, one of which has the value of decimal zero or five and the other the values zero through four. The abacus and soroban both use biquinary codes. An example follows.

Decimal	Biquinary	Interpretation
0	0 000	0+0
1	0 001	0+1
2	0 010	0+2
3	0 011	0+3
4	0 100	0+4
5	1 000	5+0
6	1 001	5+1
7	1 010	5+2
8	1 011	5+3
9	1 100	5+4

CODE, CHAIN *, an arrangement in a cyclic sequence of some or all of the possible different N-bit words, in which adjacent words are linked by the relationship that each word is derived 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, e.g., 000 001 010 101 011 111 110 100 000 .....

CODE CHARACTER, a particular arrangement of code elements used in a code to represent a single value or symbol.

CODE CHECK, to isolate and remove mistakes from a routine.

CODE CHECKING TIME, see (time, code checking).

CODE, CHINESE BINARY, same as (code, column-binary).

CODE, COLUMN-BINARY, a code used with punch cards in which successive bits are represented by the presence or absence of punches on contiguous positions in successive columns as opposed to rows. Column-binary code is widely used in connection with 36-bit word computers where each group of 3 columns is used to represent a single word. Synonymous with (code, chinese binary).

CODE, COMPUTER, (1) a system of combinations of binary digits used by a given computer. Synonymous with (machine code). (2) A repertoire of instructions.

CODE, CYCLIC, same as (code, gray).

CODE, DICTIONARY, an alphabetical arrangement of English words and terms, associated with their code representations. Related to (dictionary, reverse code).

CODE, DIRECT, a code which specifies the use of actual computer command and address configurations.

CODE-ELEMENT, the elemental unit from which a code is constructed; e.g., Baudot code is a binary representation of the alphabet and numerals in which a grouping, presence or absence, of five elements expresses the code information.

CODE, ERROR CORRECTING, an error detecting code in which the forbidden pulse combination produced by gain or loss of a bit indicates which bit is wrong.

CODE, ERROR CORRECTING (COMMUNICATIONS), see (error correcting code (communications)).

CODE, ERROR DETECTING, a code in which errors produce forbidden combinations. A single error detecting code produces a forbidden combination if a digit gains or loses a single bit. A double error detecting code produces a forbidden combination if a digit gains or loses either one or two bits and so forth. Synonymous with (code, self checking) and related to (number, self checking).

CODE, ERROR DETECTING (COMMUNICATIONS), see (error detecting code (communications)).

CODE, EXCESS-THREE, a binary coded decimal code in which each digit is represented by the binary equivalent of that number plus three, for example:

Decimal Digit	XS 3 Code	Binary Value
0	0011	3
1	0100	4
2	0101	5
3	0110	6
4	0111	7
5	1000	8
6	1001	9
7	1010	10
8	1011	11
9	1100	12

CODE, GRAY, a binary code in which sequential numbers are represented by expressions which are the same except in one place and in that place differ by one unit; e.g.,

Decimal	Binary	Gray
0	000	000
1	001	001
2	010	011
3	011	010
4	100	110
5	101	111

thus in going from one decimal digit to the next sequential digit, only one binary digit changes its value. Synonymous with (cyclic code).

CODE, HAMMING, see (hamming code).

CODE, IDENTIFYING, see (identifying code).

CODE, INSTRUCTION, the list of symbols, names and definitions of the instructions which are intelligible to a given computer or computing system.

CODE, INTERPRETIVE, same as (routine, interpretive).

CODE, LETTERS, see (letters code).

CODE LINE, a single instruction written usually on one line, in a code for a specific computer to solve a problem. This instruction is usually stored as a whole in the program register of the computer while it is executed, and it may contain one or more addresses of registers or storage locations in the computer where numbers or machine words are to be obtained or sent, and one or more operations to be executed. Synonymous with (line, program).

CODE, LINE FEED, see (line feed code).

CODE, MACHINE, same as (code, computer) (1).

CODE, MACHINE LANGUAGE, same as (code, computer) (1) and contrasted with (code, symbolic).

CODE, MICRO, (1) a system of coding making use of sub-operations not ordinarily accessible in programming; e.g., coding that makes use of parts of multiplication or division operations. (2) A list of small program steps. Combinations of these steps, performed automatically in a prescribed sequence, form a macro-operation like multiply, divide, and square root.

CODE, MINIMUM ACCESS, a system of coding which minimizes the effect of delays for transfer of data or instructions between storage and other machine components.

Related to (code, optimum); (code, minimum latency); and to (coding, minimum access).

CODE, MINIMUM LATENCY, same as (code, minimum access) and related to (coding, minimum access).

CODE, MNEMONIC OPERATION, an operation code in which the names of operations are abbreviated and expressed mnemonically to facilitate remembering the operations they represent. A mnemonic code normally needs to be converted to an actual operation code by an assembler before execution by the computer. Examples of mnemonic codes are ADD for addition, CLR for clear storage and SQR for square root.

CODE, MODULATION, a code used to cause variations in a signal in accordance with a predetermined scheme; normally used to alter or modulate a carrier wave to transmit data. Clarified by (modulator).

CODE, MULTIPLE ADDRESS, an instruction code in which an instruction word can specify more than one address to be used during the operation. In a typical instruction of a four address code the addresses specify the location of two operands, the location at which the results are to be stored and the location of the next instruction in the sequence. In a typical three address code, the fourth address specifying the location of the next instructions is dispensed with, the instructions are taken from storage in a pre-assigned order. In a typical two address code, the addresses may specify the locations of the operands. The results may be placed at one of the addresses or the destination of the results may be specified by another instruction.

CODE, NON-PRINT, see (non-print, non-print code, NP code).

CODE, NON-REPRODUCING, see (non-reproducing codes).

CODE, NUMERIC, a system of numerical abbreviations used in the preparation of information for input into a machine; i.e., all information is reduced to numerical quantities. Contrasted with (code, alphabetic).

CODE, ONE LEVEL, same as (code, absolute).

CODE, OPERATION, the part of a computer instruction word which specifies, in coded form, the operation to be performed.

CODE, OPTIMUM, a computer code which is particularly efficient with regard to a particular aspect; e.g., minimum time of execution, minimum or efficient use of storage space, and minimum coding time. Related to (code, minimum access).

CODE, P.I., see (P.I. codes).

CODE, PRINT RESTORE, see (print restore, print restore code).

CODE, PSEUDO, same as (code, symbolic).

CODE, PULSE, (1) a code in which sets of pulses have been assigned particular meanings. (2) The binary representations of characters.

CODE, PUNCH TAPE, a code used to represent data on punch tape.

CODE, QUIBINARY, a binary coded decimal code for representing decimal numbers in which each decimal digit is represented by seven binary digits which are coefficients of 8, 6, 4, 2, 0, 1, 0, respectively.

CODE, REDUNDANT, see (redundant code).

CODE, RELATIVE, a code in which all addresses are specified or written with respect to an arbitrarily selected position, or in which all addresses are represented symbolically in a computable form.

CODE, REPRODUCTION, see (reproduction codes).

CODE, SELF CHECKING, same as (code, error detecting).

CODE, SELF DEMARCATING, a code in which the symbols are so arranged and selected that the generation of false combinations by interaction of segments from two successive codes is prevented.

CODE, SKELETAL, the framework of a routine which is completed by a generalized routine using input parameters.

CODE, SKIP, see (skip code).

CODE, SPACE, see (space code).

CODE, SPECIFIC, same as (code, absolute).

CODE, STOP, see (stop code).

CODE, STRAIGHT LINE, the repetition of a sequence of instructions, with or without address modification, by explicitly writing the instructions for each repetition. Generally straight line coding will require less execution time and more space than equivalent loop coding. If the number of repetitions is large, this type of coding is tedious unless a generator is used. The feasibility of straight line coding is limited by the space required as well as the difficulty of coding a variable number of repetitions.

CODE, SYMBOLIC, a code which expresses programs, in source language; i.e., by referring to storage locations and machine operations by symbolic names and addresses which are independent of their hardware determined names and addresses. Synonymous with (pseudo code) and contrasted with (code, machine language).

CODE, TRANSMITTER START, see (transmitter start code).

CODE, TWO-OUT-OF-FIVE, a system of encoding the decimal digits 0, 1, ..., 9 where each digit is represented by binary digits of which 2 are zeros and 3 are ones or vice versa.

CODED DECIMAL, see (decimal, coded).

CODED DECIMAL NOTATION, see (notation, coded decimal).

CODED DECIMAL NUMBER, see (number, coded decimal).

CODED PROGRAM, see (program, coded).

CODED STOP, see (stop, coded).

CODER, (1) a person who prepares instruction sequences from detailed flow charts and other algorithmic procedures prepared by others, as contrasted with a programmer who prepares the procedures and flow charts. (2) A device which sets up a series of signals in a code form.

CODES, FUNCTION, see (function codes).

CODES, NON-REPRODUCING, see (non-reproducing codes).

CODES, P.I., see (P.I. codes).

CODES, REPRODUCTION, see (reproduction codes).

CODING, the ordered list in computer code or pseudo code,

of the successive computer instructions representing successive computer operations for solving a specific problem.

CODING, MINIMUM ACCESS, the process of developing or applying a minimum access code. Related to (code, optimum), and to (code, minimum latency).

COINCIDENCE GATE, see (gate, coincidence).

COLLATE *, to compare and merge two or more similarly ordered sets of items to one ordered set.

COLLATE, a Honeywell systems program which combines two or more ordered files to produce a single file.

COLLATION SEQUENCE, see (sequence, collation).

COLLATOR *, a device to collate or merge sets of cards into a sequence.

COLLECTION, DATA, see (data collection).

COLOR *, in OCR, 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, digit place.

COLUMN-BINARY, same as (code, column-binary).

COLUMN, CARD, see (card column).

COLUMN VECTOR, in linear programming, a one-dimensional array of numbers. Each column of a matrix is a column vector.

COMMAND *, (1) loosely, a control signal. (2) Loosely, an instruction in machine language. (3) Loosely, an operator.

COMMAND CODE: Bits 1 through 12 of a Honeywell instruction word. (2) Synonymous with operation code.

COMMENT, an expression which explains or identifies a particular step in a routine, but which has no effect on the operation of the computer in performing the instructions for the routine.

COMMON BUSINESS ORIENTED LANGUAGE, see (language, common business oriented).

COMMON CARRIER, see (carrier, common communication).

COMMON MACHINE LANGUAGE, see (language, common machine).

COMMUNICATION, the transferring of information from one point to another.

COMMUNICATION, DATA, the transmission of data from one point to another.

COMMUNICATIONS, ELECTRICAL, see (electrical communications).

COMMUNICATIONS, ELECTROMAGNETIC, see (electromagnetic communications).

COMMUNICATIONS, PHYSICAL WAVE, see (physical wave communications).

COMMUNICATIONS, RADIO, see (radio communications).

COMPACT (COMputer Planning And Control Technique), a management tool, developed by Honeywell, to aid those directly responsible for the installation of a computer in the planning and scheduling of a computer installation, and for programming new applications.

COMPANDOR, a device, for use on a telephone channel, designed to improve the voice and crosstalk performance. The input is effectively compressed for transmission and then expanded to near original form at the receiving end. A compandor may distort some types of data signals.

COMPARATOR, (1) a device for comparing two different transcriptions of the same information to verify the accuracy of transcription, storage, arithmetic operation or other processes, in which a signal is given dependent upon some relation between two items; i.e., one item is larger than, smaller than, or equal to the other. (2) A form of verifier.

COMPARE, to examine the representation of a quantity to discover its relationship to zero, or to examine two quantities usually for the purposes of discovering identity or relative magnitude.

COMPARISON, the act of comparing and, usually, acting on the result of the comparison. The common forms are comparison of two numbers for identity, comparison of two numbers for relative magnitude, and comparison of two signs plus or minus.

COMPATIBILITY, EQUIPMENT, the characteristic of computers by which one computer may accept and process data prepared by another computer without conversion or code modification.

COMPILE *, to prepare a machine language program from a computer program written in another programming language by performing the usual functions of an assembler and also making use of the overall logical structure of the program or generating more than one machine instruction for each symbolic statement or both.

COMPILER *, a program that compiles. See (compile). Synonomous with (compiling routine) and related to (assembler).

COMPILING ROUTINE, same as (compiler).

COMPLEMENT, (1) a quantity expressed to the base N, which is derived from a given quantity by a particular rule; frequently used to represent the negative of the given quantity. (2) A complement on N, obtained by subtracting each digit of the given quantity from N-1, adding unity to the least significant digit, and performing all resultant carrys; e.g., the twos complement of binary 11010 is 00110; the tens complement of decimal 456 is 544. (3)A complement on N-1, obtained by subtracting each digit of the given quantity from N-1; e.g., the ones complement of binary 11010 is 00101; the nines complement of decimal 456 is 543. Synonymous with (radix minus 1 complement) and (radix complement).

COMPLEMENT, NINES *, a radix-minus-one complement with the radix equal to ten.

COMPLEMENT, ONES *, a radix-minus-one complement with the radix equal to two.

COMPLEMENT, RADIX, same as (complement) (3).

COMPLEMENT, RADIX, MINUS 1, same as (complement) (2).

COMPLEMENT, TENS *, a radix complement with the radix equal to ten.

COMPLEMENT, TRUE *, same as radix complement.

COMPLEMENT, TWOS *, a radix complement with the radix equal to two.

COMPLETE CARRY, see (carry, complete).

COMPLETE OPERATION, see (operation, complete).

COMPONENT, QUADRATURE, see (quadrature component).

COMPONENT, SOLID STATE *, a component whose operation depends on the control of electric or magnetic phenomena in solids, e.g., a transistor, crystal diode, or ferrite.

COMPUTER *, (1) a device capable of solving problems by accepting data, performing prescribed operations on the data, and supplying the results of these operation. Various types of computers are, calculator, digital computer, or analog computer. (2) In information processing, usually, an automatic stored program computer.

COMPUTER, ABSOLUTE VALUE, a computer which processes all data expressed in full values of all variables at all times. Contrasted with (computer, incremental).

COMPUTER, ANALOG, a computer which represents variables by physical analogies. Thus any computer which solves problems by translating physical conditions such as flow, temperature, pressure, angular position, or voltage

into related mechanical or electrical quantities and uses mechanical or electrical equivalent circuits as an analog for the physical phenomenon being investigated. In general it is a computer which uses an analog for each variable and produces analogs as output. Thus an analog computer measures continuously whereas a digital computer counts discretely. Related to (machine, data processing).

COMPUTER, ASYNCHRONOUS *, 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 for the next event or operations. Contrasted with (computer, synchronous).

COMPUTER, AUTOMATIC *, a computer that can perform a sequence of operations without intervention by a human operator.

COMPUTER, BUFFERED, a computing system with a storage device which permits input and output data to be stored temporarily in order to match the slow speed of input-output devices with the higher speeds of the computer. Thus, simultaneous input-output-computer operations are possible. A data transmission trap is essential for effective use of buffering since it obviates frequent testing for the availability of a data channel.

COMPUTER CODE, see (code, computer).

COMPUTER, DIGITAL *, a computer that solves problems by operating on discreet data representing variables by performing arithmetic and logical processes on these data. Related to (machine, data processing).

COMPUTER EFFICIENCY, same as (ratio, operating).

COMPUTER, FIXED PROGRAM, a computer in which the sequence of instructions are permanently stored or wired in, and perform automatically and are not subject to change either by the computer or the programmer except by rewiring or changing the storage input. Related to (computer, wired program).

COMPUTER, GENERAL PURPOSE *, a computer that is designed to solve a wide class of problems.

COMPUTER, INCREMENTAL *, a special purpose computer that is specifically designed to process changes in the variables as well as the absolute value of the variables themselves, e.g., digital differential analyzer. Contrasted with (computer, absolute value).

COMPUTER-LIMITED, pertaining to a situation in which the time required for computation exceeds the time required to read inputs and write outputs.

COMPUTER NETWORK *, a complex consisting of two or more interconnected computing units.

COMPUTER OPERATION, see (operation, computer).

COMPUTER, PARALLEL, a computer in which the digits or data lines are handled concurrently by separate units of the computer. The units may be interconnected in different ways as determined by the computation to operate in parallel or serially. Mixed serial and parallel machines are frequently called serial or parallel according to the way arithmetic processes are performed. An example of a parallel computer is one which handles decimal digits in parallel although it might handle the bits which comprise a digit either serially or in parallel. Contrasted with (computer, serial).

COMPUTER, SERIAL, a computer in which digits or data lines are handled sequentially by separate units of the computer. Mixed serial and parallel machines are frequently called serial or parallel according to the way arithmetic processes are performed. An example of a serial computer is one which handles decimal digits serially although it might handle the bits which comprise a digit either serially or in parallel. Contrasted with (computer, parallel).

COMPUTER, SOLID STATE, a computer built primarily from solid state electronic circuit elements.

COMPUTER, SPECIAL PURPOSE *, a computer that is designed to solve a restricted class of problems.

COMPUTER, STORED PROGRAM *, a digital computer that, under control of its own instructions, can synthesize, alter, and store instructions as though they were data and can subsequently execute these new instructions.

COMPUTER, SYNCHRONOUS *, a computer in which each event or the performance of each operation starts as a result of a signal generated by a clock. Contrasted with (computer, asynchronous) and clarified by (frequency, clock).

COMPUTER, WIRED PROGRAM, a computer in which the instructions that specify the operations to be performed are specified by the placement and interconnection of wires. The wires are usually held by a removable control panel, allowing flexibility of operation, but the term is also applied to permanently wired machines which are then called fixed program computers. Related to (computer, fixed program).

CONCEPT-COORDINATION, a term used to describe the basic principles of various punched card and mechanized information retrieval systems which involve the multidimensional analysis of information and coordinate retrieval. In concept coordination, independently assigned concepts are used to characterize the subject contents of documents and the latter are identified during searching by means of either such assigned concepts or a combination of the same.

CONDENSED INSTRUCTION DECK, see (deck, condensed instruction).

CONDITIONAL BRANCH, same as (transfer, conditional).

CONDITIONAL BREAKPOINT INSTRUCTION, see (instruction, conditional breakpoint).

CONDITIONAL JUMP, same as (transfer, conditional).

CONDITIONAL TRANSFER OF CONTROL, a computer instruction which when reached in the course of a program will cause the computer either to continue with the next instruction in the original sequence or to transfer control to another stated instruction, depending on a condition regarding some property of a number or numbers which has then been determined.

CONDITIONAL TRANSFER, see (transfer, conditional).

CONDITIONING, SIGNAL, to process the form or mode of a signal so as to make it intelligible to or compatible with a given device, including such manipulation as pulse shaping, pulse clipping, digitzing, and linearizing.

CONFIGURATION, a group of machines which are interconnected and are programmed to operate as a system.

CONJUNCTION, the logical operation which makes use of the AND operator or logical product. The conjunction of two variables, or expressions, may be written as A·B, A∧B, A n B, or just plain AB. These may also be described as an intersection when using Venn diagrams. Clarified by (operator, and); (gate, and) and contrasted with (disjunction).

CONJUNCTIVE SEARCH, see (search, conjunctive).

CONNECTIVES, LOGICAL, the operators or words, such as AND, OR, OR ELSE, IF THEN, NEITHER NOR, and EXCEPT, which make new statements from given statements and which have the property that the truth or falsity of the new statements can be calculated from the truth or falsity of the given statements and the logical meaning of the operator.

CONNECTOR *, in a flow chart, the means of representing the convergence of more than one flow line into one, or the divergence of one flow line into more than one. It may also represent a break in a single flow line for continuation in another area.

CONNECTOR, VARIABLE, (1) a flow chart symbol representing a sequence connection which is not fixed, but which can be varied by the flow-charted procedure itself. (2) The device which inserts instructions in a program corresponding to selection of paths appearing in a flow chart. (3) The computer instructions which cause a logical chain to

take one of several alternative paths. Synonymous with (n-way switch) and (programmed switch).

CONSOLE *, that part of a computer which is used for communication between the operator or service engineer and the computer.

CONSTANT AREA, see (area, constant).

CONSTANT INSTRUCTION, see (instruction, constant).

CONSTANT(S), (1) the quantities or messages, which will be present in the machine and available as data for the program and which, usually, are not subject to change with time. (2) Information whose value or meaning is fixed for the program to which it belongs.

CONSTRAINT, in linear programming, values of an equation that specify limits for the sums of the variables. A constraint may define a maximum, a minimum, or an equality limit for the sum of terms in a linear equation.

CONTENT(S), the data contained in any storage medium. Quite prevalently, the symbol ( ) is used to indicate the contents of; e.g., (M) indicates the contents of the storage location whose address is M; or (T_2) may indicate the contents of the tape on input-output unit two.

CONTENTION, a condition on a multipoint communication channel when two or more locations try to transmit at the same time.

CONTRAST *, (1) In OCR, the differences between color or shading of the printed material on a document and the background on which it is printed. (2) See Print Contrast Ratio

CONTROL *, 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.

CONTROL CARD, see (card, control).

CONTROL, CASCADE, an automatic control system in which various control units are linked in sequence, each control unit regulating the operation of the next control unit in line.

CONTROL COUNTER, see (counter, control).

CONTROL DATA, see (data, control).

CONTROL, FEEDBACK, a type of system control obtained when a portion of the output signal is operated upon and fed back to the input in order to obtain a desired effect.

CONTROL FIELD, see (field, control).

CONTROL GRID, see (grid, control).

CONTROL, MANUAL, the direction of a computer by means of manually operated switches.

CONTROL, MASTER, an application oriented routine usually applied to the highest level of a subroutine hierarchy.

CONTROL, NUMERICAL, descriptive of systems in which digital computers are used for the control of operations, particularly of automatic machines; e.g., drilling or boring machines, wherein the operation control is applied at discrete points in the operation or process. Contrasted with (control, process) in which control is applied continuously.

CONTROL, ORTHOTRONIC, see (orthotronic control).

CONTROL PANEL, see (panel, control).

CONTROL, PROCESS, descriptive of systems in which computers, most frequently analog computers, are used for the automatic regulation of operations or processes. Typical are operations in the production of chemicals wherein the operation control is applied continuously and adjustments to regulate the operation are directed by the computer to keep the value of a controlled variable constant. Contrasted with (control, numerical).

CONTROL PROGRAM, see (program, control).

CONTROL, PROGRAM, descriptive of a system in which a computer is used to direct an operation or process and automatically to hold or to make changes in the operation or process on the basis of a prescribed sequence of events.

CONTROL, PROPORTIONAL, a method of control in which the intensity of action varies linearly as the condition being regulated deviates from the condition prescribed.

CONTROL REGISTER, see (register, control).

CONTROL SEQUENCE, see (sequence, control).

CONTROL, SEQUENTIAL *, a mode of computer operation in which instructions are executed in consecutive order, unless otherwise specified by a jump.

CONTROL, SUPERVISORY, a control system which furnishes intelligence, usually to a centralized location, to be used by an operator to supervise the control of a process or operation.

CONTROL TOTAL, see (total, control).

CONTROL, TRANSFER, same as (transfer)(5).

CONTROL, UNCONDITIONAL TRANSFER OF, same as (transfer, unconditional).

CONTROL UNIT, see (unit, control).

CONTROL UNIT, PERIPHERAL: An intermediary control device which links a peripheral unit to the central processor or, in the case of off-line operation, to another peripheral unit.

CONTROL WORD, see (word, control).

CONVERSION, (1) the process of changing information from one form of representation to another; such as, from the language of one type of machine to that of another or from magnetic tape to the printed page. Synonymous with (conversion, data). (2) The process of changing from one data processing method to another, or from one type of equipment to another; e.g., conversion from punch card equipment to magnetic tape equipment.

CONVERSION, BINARY TO DECIMAL, the process of converting a number written to the base of two to the equivalent number written to the base of ten.

CONVERSION, DATA, same as (conversion)(1).

CONVERSION, DECIMAL TO BINARY, the process of converting a number written to the base of ten, or decimal, into the equivalent number written to the base of two, or binary.

CONVERSION EQUIPMENT, see (equipment, conversion).

CONVERT *, to change the representation of data from one form to another, e.g., to change numerical data from binary to decimal or from cards to tape.

CONVERTER, a device which converts the representation of information, or which permits the changing of the method for data processing from one form to another; e.g., a unit which accepts information from punch cards and records the information on magnetic tape, and possibly including editing facilities.

CONVERTER, CARD TO TAPE, a device which converts information directly from punched cards to punched or magnetic tape.

CONVERTER, (FREQUENCY), in heterodyne reception, a converter is the portion of the receiver which converts the incoming signal to the intermediate frequency.

CONVERTER, TAPE TO CARD, a device which converts information directly from punched or magnetic tape to cards.

CONVERTER, (TELEGRAPHY), a telegraph repeater in which the input and output signals are formed according to the same code, but not according to the same type of electrical modulation.

COOPERATION, INDEX OF, see (index of cooperation).

COORDINATE INDEXING, see (indexing, coordinate).

COORDINATE-PAPER, marginally punched, continuous form graph paper normally used for printout on an XY plotter.

COPY *, to reproduce data leaving the original data unchanged.

COPY, HARD, a printed copy of machine output; e.g., printed reports, listings, documents, and summaries.

CORDONNIER SYSTEM, same as (system, peek-a-boo).

CORE DUMP, same as (dump).

CORE, MAGNETIC *, a configuration of magnetic material that is, or is intended to be, placed in a rigid special relationship to current-carrying conductors and whose magnetic properties are essential to its use. For example, 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 non-linear properties as in a logic element. It may be made of such material as iron, iron oxide or ferrite in such shapes as wires, tapes, toroids, or thin film.

CORE STORAGE, same as (storage, magnetic core).

CORRECTION, AUTOMATIC ERROR, a technique, usually requiring the use of special codes and or automatic retransmission, which detects and corrects errors occurring in transmission. The degree of correction depends upon coding and equipment configuration.

COUNTER *, a device such as a register or storage location used to represent the number of occurrences of an event.

COUNTER, BINARY, (1) a counter which counts according to the binary number system. (2) A counter capable of assuming one of two stable states.

COUNTER, CONTROL, a device which records the storage location of the instruction word, which is to be operated upon following the instruction word in current use. The control counter may select storage locations in sequence, thus obtaining the next instruction word from the subsequent storage location, unless a transfer or special instruction is encountered.

COUNTER, INSTRUCTION *, a counter which indicates the location of the next computer instruction to be interpreted.

COUNTER, LOCATION, (1) the control section register which contains the address of the instruction currently being executed. (2) A register in which the address of the current instruction is recorded. Synonymous with (program address counter).

COUNTER, PROGRAM, same as (register, control).

COUNTER, PROGRAM ADDRESS, same as (counter, location) (2).

COUNTER, RING, a loop of interconnected bistable elements such that one and only one is in a specified state at any given time and such that, as input signals are counted, the position of the element in the specified state moves in an ordered sequence around the loop.

COUPLING, CROSS TALK, see (cross talk coupling).

CPS, abbreviation for both "characters per second" and "cycles per second."

CPU, Central Processing Unit, same as (frame, main)(1).

CRIPPLED LEAP FROG TEST, see (test, crippled leap frog).

CROSS-BAR, an automatic telephone switching system using movable switches mounted on bars. The dialed information is received and stored by common circuits which select and test the switching paths and control the operation of the switching mechanisms.

CROSS FIRE, interference from one telegraph circuit to another telegraph circuit or into a telephone circuit.

CROSS ISLE, see (switching center, torn tape).

CROSS TALK, cross talk occurs when signals on one telephone circuit appear on another circuit as interference. The circuit which is the source of the signals is known as the disturbing circuit, and that on which the signals are heard is the disturbed circuit.

CROSS TALK COUPLING (crosstalk loss), crosstalk coupling is cross coupling between speech communication channels or their component parts. Note: crosstalk coupling is measured between specified points of the disturbing and disturbed circuits and is preferably expressed in decibels.

CRYOGENICS *, the study and use of devices utilizing properties of materials near absolute zero in temperature.

CUT-OFF, the frequency of transmission at which the loss exceeds by 10 decibels that observed at 1000 cycles.

CYBERNETICS *, the theory of control and communication in the machine and the animal.

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) In alternating current, the time for a change of state from a zero through a positive and negative maximum, and back to zero.

CYCLE, GRANDFATHER, the period during which magnetic tape records are retained before reusing so that records can be reconstructed in the event of loss of information stored on a magnetic tape.

CYCLE-INDEX, the number of times a cycle has been executed or the difference, or the negative of the difference, between the number that has been executed and the number of repetitions desired.

CYCLE, MAJOR, (1) the maximum access time of a recirculating serial storage element. (2) Thetime for one rotation of a magnetic drum or of pulses in an acoustic delay line. (3) A number of minor cycles.

CYCLE, MEMORY, see (memory cycle).

CYCLE, MINOR, the time interval between the appearance of corresponding parts of successive words in a storage device which provides serial access to storage positions.

CYCLE-RESET, to return a cycle index to its initial value.

CYCLE, STORAGE, (1) a periodic sequence of events occurring when information is transferred to or from the storage device of a computer. (2) Storing, sensing, and regeneration form parts of the storage sequence.

CYCLIC CODE, same as (code, gray).

CYCLIC SHIFT, see (shift, cyclic).

D

DAMPING, a characteristic built into electrical circuits and mechanical systems to prevent rapid or excessive corrections which may lead to instability or oscillatory conditions; e.g., connecting a register on the terminals of a pulse transformer to remove natural oscillations or placing a moving element in oil or sluggish grease to prevent mechanical overshoot of the moving parts.

DATA, a general term used to denote any or all facts, numbers, letters and symbols, or facts that refer to or describe an object, idea, condition, situation, or other factors. It connotes basic elements of information which can be processed or produced by a computer. Sometimes data is considered to be expressible only in numerical form, but information is not so limited. Related to (information).

DATA, ANALOG, a physical representation of information such that the representation bears an exact relationship to the original information. The electrical signals on a telephone channel are analog data representation of the original voice.

DATA COLLECTION, the act of bringing data from one or more points to a central point. May be in-plant or out-plant.

DATA, CONTROL, the items of data, one or more of which is used to identify, select, execute or modify another routine, record, file, operation or data value.

DATA CONVERSION, see (conversion, data).

DATA, DIGITAL, information represented by a code consisting of a sequence of discrete elements.

DATA ELEMENT, see (element, data).

DATA ERROR, see (error, data).

DATA GATHERING, see (data collection).

DATA HANDLING, same as (processing, data)(2).

DATA LINK, equipment which permits the transmission of information in data format.

DATA, MASTER, a set of data which is altered infrequently and supplies basic data for processing operations. The data content of a Master File. Examples include: names, badge numbers, or pay rates in personnel data; or stock numbers, stock descriptions, or units of measure in stock control data.

DATA ORIGINATION, see (origination, data).

DATA-PHONE, both a service mark and a trade mark of the Bell System. As the former it indicates the use of the Bell System message network for the transmission of data and as the latter it identifies the branch of data sets designed and manufactured for DATA-PHONE service.

DATA PHONE, see (phone, data).

DATA PROCESSING, see (processing, data).

DATA PROCESSING, BUSINESS *, data processing for business purposes; e.g., recording and summarizing the financial transactions of business organizations.

DATA PROCESSING CENTER, see (center, data processing).

DATA PROCESSING, INDUSTRIAL *, data processing for industrial purposes.

DATA PROCESSING MACHINE, see (machine, data processing).

DATA PROCESSING SYSTEM: see (system, data processing machine).

DATA PURIFICATION, see (purification, data).

DATA, RAW, data which has not been processed. Such data may or may not be in machine-sensible form.

DATA REDUCTION *, (1) The process of transforming masses of raw test or experimentally obtained data, usually gathered by automatic recording equipment, into useful, condensed, or simplified intelligence. (2) The transformation of raw data into a more useful form, e.g., smoothing to reduce noise.

DATA-REDUCTION, ON-LINE, the processing of information as rapidly as the information is received by the computing system or as rapdily as it is generated by the source.

DATA TERMINAL, a device which modulates and/or demodulates data between one input/output device and a data transmission link.

DATA, TEST, a set of data developed specifically to test the adequacy of a computer run or system. The data may be actual data that has been taken from previous operations, or artificial data created for this purpose.

DATA, TRANSACTION, a set of data in a data processing area, a record of occurrence of a new event or transaction, in which the incidence of the data is essentially random and unpredictable. Hours worked, quantities shipped, and amounts invoiced are examples from, respectively, the areas of payroll, accounts receivable, and accounts payable.

DATA TRANSMISSION, the sending of data from one place to another or from one part of a system to another.

DATA TRANSMISSION EQUIPMENT, see (equipment, data transmission).

DATA TRANSMISSION UTILIZATION MEASURE, the ratio of useful data output of a data transmission system to the total data input.

DATA WORD, see (word, data).

DATAMATIC, former name of Honeywell EDP. The title of the corporation founded jointly by Minneapolis-Honeywell Regulator Company and Raytheon Manufacturing Company in 1955. The former assumed sole ownership in 1957 and the corporation became a division of Minneapolis-Honeywell under the name Honeywell EDP.

DATAMATION, a shortened term for automatic data processing; taken from data and automation.

DATASET, a circuit termination device used to provide interface between a circuit and terminal input/output equipment.

DATASPEED, a copyright term of the Bell System used to describe a series of terminal input/output paper tape devices.

DATE, DELIVERY, the date of physical delivery on-site of the components of the computer configuration without regard to whether or not they have been unpacked, placed in final position, or interconnected. Delivery of equipment carries no connotation of operational status.

DATE, INSTALLATION, the date new equipment is ready for use. The commencement of rental normally begins on the day following the date on which the contractor officially notifies the using organization that the equipment is installed and ready for use, subject to the acceptance and standard of performance provisions of the applicable contract.

D.C. COUPLED, the connection by a device which passes the steady state characteristics of a signal and which largely eliminates the transient or oscillating characteristics of the signal.

D.C. DUMP, see (dump, d.c.).

D.C. SIGNALLING, a transmission method which utilizes direct current.

DDA *, Digital Differential Analyzer. See (analyzer, digital differential).

DEAD BAND, see (band, dead).

DEAD HALT, same as (halt, drop dead).

DEAD SPACE, same as (band, dead).

DEAD TIME, see (time, dead).

DEAD ZONE, same as (band, dead).

DEBUG *, to isolate and remove the mistakes from a routine or malfunction from a computer. Related to (routine, diagnostic).

DEBUGGING AID ROUTINE, see (routine, debugging aid).

DECADE, a group or assembly of ten units; e.g., a counter which counts to ten in one column or a resistor box which inserts resistance quantities in multiples of powers of 10.

DECAY TIME, see (time, decay).

DECELERATION TIME, see (time, deceleration).

DECIBEL, a unit measurement of transmission loss, gain or relative level. The formal definition is 1db=decibel = 10 log P1/P2 where P1 and P2 are measurements of power and are expressed in watts. It is also a convenient general practice to speak of voltage or current gains in "db".

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.

DECIMAL, BINARY CODED *, pertaining to a decimal notation in which the individual decimal digits are each represented by a binary code group, e.g., in the 8-4-2-1 coded decimal notation, the number twenty-three is represented as 0010 0011, in binary notation, twenty-three is represented as 10111. Related to (binary).

DECIMAL, CODED, describing a form of notation by which each decimal digit separately is expressed in another number system; e.g., in the 8-4-2-1 coded decimal notation, the

number twelve is represented as 0001 0010, for 1 and 2; whereas in pure or straight binary notation it is represented as 1100. Other coded decimal notations used are the 5-4-2-1, the excess three, and the 2-3-2-1 codes.

DECIMAL CODED DIGIT, see (digit, decimal coded).

DECIMAL NUMBER, see (number, decimal).

DECIMAL NUMBERING SYSTEM, see (system, decimal numbering).

DECIMAL TO BINARY CONVERSION, see (conversion, decimal to binary).

DECISION, the computer operation of determining if a certain relationship exists between words in storage or registers, and taking alternative courses of action. This is effected by conditional jumps or equivalent techniques. Use of this term has given rise to the misnomer "magic brain;" actually the process consists of making comparisons by use of arithmetic to determine the relationship of two terms (numeric, alphabetic or a combination of both); e.g., equal, greater than, or less than.

DECISION BOX, see (box, decision).

DECISION, LOGICAL, the choice or ability to choose between alternatives. Basically this amounts to an ability to answer yes or no with respect to certain fundamental questions involving equality and relative magnitude; e.g., in an inventory application, it is necessary to determine whether or not there has been an issue of a given stock item.

DECISION TABLE *, see Table, Decision

DECK, a collection of cards, commonly a complete set of cards which have been punched for a definite service or purpose.

DECK, CONDENSED INSTRUCTION, the card output from an assembly program in which several instructions per card are punched in machine language. Input to the assembly program may consist of one instruction per card, thus, the name condensed is used for output.

DECODE *, to apply a code so as to reverse some previous encoding. Inverse of (encode).

DECODER *, (1) a device that decodes. (2) A matrix of switching elements which selects one or more output channels according to the combination of input signals present. Contrasted with (encoder) and clarified by (matrix).

DECODING, (1) performing the internal operations by which a computer determines the meaning of the operation code of an instruction; also sometimes applied to addresses. In interpretive routines and some subroutines, an operation by which a computer determines the meaning of parameters in the routine. (2) Translating a secretive language into the clear.

DECREMENT, (1) the quantity by which a variable is decreased. (2) A specific part of an instruction word in some binary computers, thus a set of digits.

DECREMENT FIELD, see (field, decrement).

DEFINITION, (1) the resolution and sharpness of an image, or the extent to which an image is brought into sharp relief. (2) The degree with which a communication system reproduces sound images or messages.

DEFINITION, PROBLEM, the art of compiling logic in the form of general flow charts and logic diagrams which clearly explain and present the problem to the programmer in such a way that all requirements involved in the run are presented.

DEFLECTION-SENSITIVITY, used in connection with cathode ray tubes, the quotient of the change in displacement of the electron beam at the place of impact, divided by the change in the deflecting field. It is usually expressed in millimeters per volt applied between the deflection electrode plates for electrostatic field deflection, or in millimeters per gauss for magnetic field deflection.

DELAY *, the amount of time by which a signal is retarded.

DELAY, DIFFERENTIAL, the difference between the maximum and the minimum frequency delays occurring across a band.

DELAY DISTORTION (also termed envelope delay or phase delay), distortion resulting from non-uniform speed of transmission of the various frequency components of a signal through a transmission medium.

DELAY, ENVELOPE, see (envelope delay).

DELAY LINE, see (line, delay).

DELIMITER, a character which limits a string of characters, and therefore cannot be a member of the string.

DELIVERY DATE, see (date, delivery).

DEMODULATION, the process of retrieving an original signal from a modulated carrier wave. This technique is used to make communications signals compatible with business machine signals.

DEMODULATOR, (1) a device which receives tones from a transmission circuit and converts them to electrical pulses, or bits, which may be accepted by a business machine. (2) A device which detects the modulating signals, thus removes the carrier signal and reconstitutes the intelligence. Clarified by (code, modulation) and contrasted with (modulator).

DENSITY, CHARACTER, the number of characters that can be stored per unit of length; e.g., on some makes of magnetic tape drives, 200 or 556 bits can be stored serially, linearly, and axially to the inch.

DENSITY, PACKING *, the number of useful storage elements per unit of dimension, e.g., the number of bits per inch stored on a magnetic tape or drum track.

DEPARTURE, FREQUENCY, see (frequency departure).

DESCRIPTION, PROBLEM *, a statement of a problem and possibly a description of the method of its solution, or the solution itself. The transformations of data and the relationship of procedures, data, constraints, environments, etc. may also be included.

DESCRIPTOR, an elementary term, word, or simple phrase used to identify a subject, concept, or idea.

DESIGN, FUNCTIONAL *, the specification of the working relations between the parts of a system in terms of their characteristic actions.

DESIGN, ITEM, the specification of what fields make up an item, the order in which the fields are to be recorded, and the number of characters to be allocated to each field.

DESIGN, LOGIC *, the specification of the working relations between the parts of a system in terms of symbolic logic and without primary regard for its hardware implementation.

DESIGNATION, FREQUENCY SPECTRUM, see (frequency spectrum designation).

DETAIL FILE, see (file, detail).

DETAIL PRINTING, a card-to-hard-copy operation. A data processing function for preparing documents from series of punched cards. Automatic addition, or cross-subtraction may be combined in the same operation.

DETECTION SYSTEM, see (error detecting system).

DETERMINANT, in linear programming, a determinant is a unique number obtained by performing certain arithmetic operations on the elements of a square matrix (i.e., a matrix with the same number of rows and columns). Can be used to solve a system of n linear equations in n unknowns.

DEVIATION, FREQUENCY, see (frequency deviation).

DEVICE, ANALOG, a mechanism which represents numbers by physical quantities; e.g., by lengths, as in a slide rule, or by voltage currents as in a differential analyzer or a computer of the analog type.

DEVICE, ASYNCHRONOUS, see (asynchronous device).

DEVICE, FILM OPTICAL SENSING, a piece of equipment capable of reading the contents of a film by optical methods; i.e., a system consisting of a light source, lenses, photocells and a film moving mechanism. The output of the device is digitized and transferred directly to an electronic computer. An example of such a device is the FOSDIC system developed jointly by the Bureau of Census and the National Bureau of Standards.

DEVICE, INPUT, the mechanical unit designed to bring data to be processed into a computer; e.g., a card reader, a tape reader, or a keyboard.

DEVICE, INPUT/OUTPUT see (input/output device).

DEVICE, OUTPUT, the part of a machine which translates the electrical impulses representing data processed by the machine into permanent results such as printed forms, punched cards, and magnetic writing on tape.

DEVICE, STORAGE *, a device into which data can be inserted, in which it can be retained, and from which it can be retrieved.

DIAGNOSTIC *, pertaining to the detection and isolation of a malfunction or a mistake.

DIAGNOSTIC ROUTINE, see (routine, diagnostic).

DIAGNOSTIC TEST, see (test, diagnostic).

DIAGNOTOR, a combination diagnostic and edit routine which questions unusual situations and notes the implied results.

DIAGRAM, (1) a schematic representation of a sequence of subroutines designed to solve a problem. (2) A coarser and less symbolic representation than a flow chart, frequently including descriptions in English words. (3) A schematic or logical drawing showing the electrical circuit or logical arrangements within a component.

DIAGRAM, BLOCK *, a diagram of a system, instrument, computer or program in which selected portions are represented by annotated boxes and interconnecting lines.

DIAGRAM, FLOW, same as (chart, flow).

DIAGRAM, FUNCTIONAL *, a diagram that represents the functional relationships among the parts of a system.

DIAGRAM, LOGIC *, a diagram that represents a logic design or its hardware implementation.

DIAGRAM, VENN *, a diagram in which sets are represented by closed regions.

DIAL, (Disc Interrogation And Loading), a Honeywell system that enables the user to locate information on, print the contents of, and load and unload, discs.

DIAL EXCHANGE, see (exchange, dial).

DIALING, DIRECT DISTANCE, an exchange service which enables a telephone user to select subscribers outside the user's local area.

DIAL-UP, the service whereby a dial telephone can be used to initiate and effect a station-to-station telephone call.

DI-CAP STORAGE, see (storage, di-cap).

DICHOTOMIZING SEARCH, same as (search, binary).

DICTIONARY, a list of code names used in a routine or system and their intended meaning in that routine or system.

DICTIONARY, AUTOMATIC, the component of a language translating machine which will provide a word for word substitution from one language to another. In automatic searching systems, the automatic dictionary is the component which substitutes codes for words or phrases during the encoding operation. Related to (translation, machine).

DICTIONARY CODE, see (code, dictionary).

DICTIONARY, REVERSE CODE, an alphabetic or numeric alphabetic arrangement of codes, associated with their corresponding English words or terms. Related to (code, dictionary).

DIFFERENCE, LOGICAL, all elements belonging to class A but not to class B, when two classes of elements, class A and class B, are given.

DIFFERENTIAL ANALYZER, see (analyzer, differential).

DIFFERENTIAL DELAY, see (delay, differential).

DIFFERENTIAL MODULATION, a type of modulation in which the choice of the significant condition for any signal element is dependent on the choice for the previous signal element.

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

DIGIT *, a character used to represent one of the integers smaller than the radix, e.g., in decimal notation, one of the characters 0 to 9.

DIGIT, BINARY *, a character used to represent one of the integers smaller than the radix 2.

DIGIT, CHECK *, a digit used for the purpose of performing a check.

DIGIT, DECIMAL CODED, a digit or character defined by a set of decimal digits, such as a pair of decimal digits specifying a letter or special character in a system of notation.

DIGIT, OCTAL, the symbol 0, 1, 2, 3, 4, 5, 6, or 7 used as a digit in the system of notation which uses 8 as the base or radix. Clarified by (systems, number).

DIGIT, SIGN *, a digit in the sign position.

DIGIT, SIGNIFICANT *, a digit that contributes to the precision of an accurate numeral. The number of significant digits is counted beginning with the digit contributing the most value, called the most significant digit, and ending with the one contributing the least value, called the least significant digit.

DIGITAL *, pertaining to data in the form of digits.

DIGITAL COMPUTER, see (computer, digital).

DIGITAL DIFFERENTIAL ANALYZER, see (analyzer, digital differential).

DIGITIZE, to convert an analog measurement of a physical variable into a numerical value, thereby expressing the quantity in digital form. Synonymous with (quantize).

DIGITIZER, a device which converts an analog measurement into digital form.

DIGITS, EQUIVALENT BINARY *, the number of binary places required to label uniquely each distinct element of a set.

DIGIT(S), SIGNIFICANT, a set of digits, usually from consecutive columns beginning with the most significant digit different from zero and ending with the least significant digit whose value is known and assumed relevant; e.g., 2300.0 has five significant digits, whereas 2300 probably has two significant digits; however, 2301 has four significant digits and 0.0023 has two significant digits.

DIODE, a device used to permit current flow in one direction in a circuit and to inhibit current flow in the other. In computers, these are primarily germanium or silicon crystals.

DIRECT ADDRESS, see (address, direct).

DIRECT CODE, see (code, direct).

DIRECT INSERT SUBROUTINE, same as (subroutine, open).

DIRECTION, FLOW *, the antecedent-to-successor relation, indicated by arrows or other conventions, between operations on flowcharts.

DIRECTORY, a file with the layout for each field of the record which it describes; thus a directory describes the layout of a record within a file.

DISC, MAGNETIC *, a flat circular plate with a magnetic

surface on which data can be stored by selective magnetization of portions of the flat surface.

DISCRIMINATION, FREQUENCY, see (frequency discrimination).

DISJUNCTION, the logical operation which makes use of the OR operator or the logical sum. The disjunction of two variables, or expressions, may be written as A+B, A∨B, or A∨B. These may also be described as a union when using Venn diagrams. Clarified by (operator, or); (gate, or) and contrasted with (conjunction).

DISJUNCTIVE SEARCH, see (search, disjunctive).

DISK STORAGE, see (storage, disk).

DISPERSE, a data processing operation in which input items or fields are distributed or duplicated in more than one output item or field.

DISPLAY *, a visual presentation of data.

DISPLAY TUBE, see (tube, display).

DISPLAY UNIT, a device which provides a visual representation of data.

DISTANCE, HAMMING *, same (as distance, signal).

DISTANCE, SIGNAL *, the number of digit positions in which the corresponding digits of two binary words of the same length are different.

DISTORTION, an undesired change in waveform between the received signal and the original transmitted signal.

DISTORTION, ASYMMETRICAL, distortion affecting a two-condition (or binary) modulation (or restitution) in which all the significant intervals corresponding to one of the two significant conditions have longer or shorter durations than the corresponding theoretical durations of the excitation. If this particular requirement is not met, distortion is present.

DISTORTION, ATTENUATION, distortion due to variation of loss or gain within a frequency.

DISTORTION, BIAS, (1) bias distortion or bias of start-stop teletypewriter signals is the uniform shifting of the beginning of all marking pulses from their proper positions in relation to the beginning of the start pulse. (2) Distortion affecting a two-condition (or binary) modulation (or restitution) in which all the significant intervals corresponding to one of the two significant conditions have longer or shorter durations than the corresponding theoretical durations.

DISTORTION, CHARACTERISTIC, see (characteristic distortion).

DISTORTION, DEGREE OF INHERENT, degree of distortion of the restitution when the modulation is affected without distortion. Notes: By inherent distortion is meant the combination of the different types of distortion caused by the channel (bias, characteristic, etc...). This notation may be extended to the constituent elements of a channel, such as a telegraph relay. It will be necessary to specify in what conditions the channel is used (type of apparatus, modulation rate, manual or automatic keying, etc...) and to effect the modulation under these conditions. In particular, defined as follows: the point of entry at which the distortionless modulation is applied; the terminal point where the distortion is measured.

DISTORTION, DELAY, see (delay distortion).

DISTORTION, DELAY/FREQUENCY, that form of distortion which occurs when the envelope delay of a circuit or system is not constant over the frequency range required for transmissions.

DISTORTION, END, end distortion of start-stop teletypewriter signals is the shifting of the end of all marking pulses from their proper positions in relation to the beginning of the start pulse.

DISTORTION, FORTUITOUS, see (fortuitous distortion).

DISTORTION, HARMONIC, distortion due to the non-linear characteristics of a transmission which results in the presence of harmonic frequencies in the response when a sinusoidal stimulus is applied.

DISTORTION, MARKING END, see (marking end distortion).

DISTORTION, NON-LINEARITY, distortion which occurs due to the transmission properties of a system being dependent upon the instantaneous magnitude of the transmitted signal. Note: Non-linearity distortion gives rise to amplitude/amplitude and harmonic distortion, intermodulation, and flutter.

DISTORTION, PHASE/FREQUENCY, that form of distortion which occurs under either or both of the following conditions: (a) if the phase/frequency characteristic is not linear over the frequency range of interest; (b) if the zero-frequency intercept of the phase/frequency characteristic is not zero or an integral multiple of 2 radians.

DISTORTION, QUANTIZATION, see (quantization distortion).

DISTORTION, SINGLE-HARMONIC, the ratio of the power at the fundamental frequency, measured at the output of the transmission system considered, to the power of any single harmonic observed at the output of the system because of its non-linearity, when a single frequency signal of specified power is applied to the input of the system. It shall be expressed in db.

DISTORTION, SPACING END, see (spacing end distortion).

DISTORTION, TELEGRAPH, telegraph distortion refers to the condition in which the significant intervals have not all exacted their theoretical duration.

DISTORTION, TOTAL-HARMONIC, the ratio of the power at the fundamental frequency, measured at the output of the transmission system considered, to the power of all harmonics observed at the output of the system because of its non-linearity, when a signal frequency signal of specified power is applied to the input of the system. It shall be expressed in db.

DISTRIBUTION, FRAME, a structure for terminating wires and connecting them together in any desired order.

DISTRIBUTOR, the electronic circuitry which acts as an intermediate link between the accumulator and drum storage.

DISTRIBUTOR, TIME-PULSE, a device or circuit for allocating timing pulses or clock pulses to one or more conducting paths or control lines in specified sequence.

DISTRIBUTOR, TRANSMITTER, see (transmitter distributor).

DIVERSITY, FREQUENCY (RECEPTION) (frequency diversity), that form of diversity reception which utilizes transmission at different frequencies.

DIVERSITY RECEPTION, that method of radio reception whereby, in order to minimize the effects of fading, a resultant signal is obtained by combination or selection, or both, of two or more sources of received-signal energy which carry the same modulation or intelligence, but which may differ in strength or signal-to-noise ratio at any given instant.

DIVERSITY, SPACE RECEPTION (space-diversity), that form of diversity reception which utilizes receiving antennas placed in different locations.

DIVISION, TIME, see (time, division).

DOCUMENT, (1) a form, voucher, or written evidence of a transaction. (2) To instruct, as by citation of references. (3) To substantiate, as by listing of authorities. (4) * In flow charting, a medium and the information recorded on it for human use, e.g., a report sheet, pages of a book, etc.

DOCUMENT SOURCE, a document from which data is extracted.

DOCUMENT REFERENCE EDGE *, in character recognition, a specified document edge with respect to which the alignment of characters is defined.

DOCUMENTATION, the group of techniques necessary for the orderly presentation, organization and communication of recorded specialized knowledge, in order to maintain a complete record of reasons for changes in variables.

Documentation is necessary not so much to give maximum utility as to give an unquestionable historical reference record.

DOCUTERM, a word or phrase descriptive of the subject matter or concept of an item of information and considered important for later retrieval of information. Related to (card, aspect).

DOUBLE LENGTH NUMBER, see (number, double length).

DOUBLE PRECISION, see (precision, double).

DOUBLE PRECISION NUMBER, same as (number, double length).

DOUBLE PRECISION QUANTITY, see (quantity, double precision).

DOWN TIME, see (time, down).

DRIVE, TAPE, same as (transport, tape). Synonymous with (unit, tape), and clarified by (unit, magnetic tape), and (unit, paper tape).

DROP DEAD HALT, see (halt, drop dead).

DROPS, FALSE, the documents spuriously identified as pertinent by an information retrieval system, but which do not satisfy the search requirements, due to causes such as improper coding, punching spurious or wrong combinations of holes, or improper use of terminology.

DRUM, MAGNETIC *, a right circular cylinder with a magnetic surface on which data can be stored by selective magnetization of portions of the curved surface.

DRUM MARK, see (mark, drum).

DRUM, PROGRAM, see (program drum).

DUMMY *, pertaining to the characteristic of having the appearance of a specified thing but not having the capacity to function as such.

DUMMY INSTRUCTION, see (instruction, dummy).

DUMP *, (1) to copy the contents of all or part of a storage, usually from an internal storage into an external storage. (2) The process as in 1. (3) The data resulting from the process as in 1. Synonomous with (memory dump), (core dump), (memory print-out), and (storage dump).

DUMP, A.C., the removal of all alternating current power intentionally, accidentially or conditionally from a system or component. An a.c. dump usually results in the removal of all power, since direct current is usually supplied through a rectifier or converter.

DUMP, CHANGE, a print-out or output recording of the contents of all storage locations in which a change has been made since the previous change dump.

DUMP CHECK, see (check, dump).

DUMP, CORE, same as (dump).

DUMP, D.C., the removal of all direct current power, intentionally, accidentially, or conditionally, from a system or component.

DUMP, DYNAMIC *, a dump that is performed periodically during the execution of a program.

DUMP, MEMORY, same as (dump).

DUMP, POSTMORTEM *, a static dump, to be used for debugging purposes, that is performed at the end of a machine run.

DUMP, POWER, the removal of all power accidentally or intentionally.

DUMP, SELECTIVE *, a dump of a selected area of internal storage.

DUMP, SNAPSHOT *, a selective dynamic dump performed at various points in a machine run.

DUMP, STATIC *, a dump that is performed at a particular point in time with respect to a machine run, frequently at the end of a run.

DUMP, STORAGE, same as (dump).

DUODECIMAL NUMBER, see (number, duodecimal).

DUOPRIMED WORD, see (word, duoprimed).

DUPLEX, FULL, method of operation of a communication circuit where each end can simultaneously transmit and receive. When used on a radio circuit, duplex operation requires two frequencies.

DUPLEX, HALF, permits one direction, electrical communications between stations. Technical arrangements may permit operation in either direction but not simultaneously. Therefore, this term is qualified by one of the following suffixes: S/O for send only; R/O for receive only; S/R for send or receive.

DUPLEXING, the scheme of combining a master tape with either a tape or a series of punched cards containing pure data plus appropriate switching codes to produce a document. This may be done on a Flexowriter, in conjunction with two tape readers or a tape reader and a card reader, working on a "flip-flop" basis. Duplexing permits substantial reductions in the length of data transmissions in that fixed information and most of the function codes can be stored in the master tape and need never be transmitted over the line.

DUPLEXING, SYNCHRO, see (synchro duplexing).

DUPLICATE *, same as (copy).

DUPLICATING, the automatic copying (punching) of repetitive information from a master card or master tape into succeeding tapes or cards.

DUPLICATION CHECK, see (check, duplication).

DURATION, PULSE, see (pulse duration).

DYNAMIC MEMORY, same as (storage, dynamic).

DYNAMIC STORAGE, see (storage, dynamic).

DYNAMIC SUBROUTINE, see (subroutine, dynamic).

E

EAM *, Electrical Accounting Machines. Pertaining to data processing equipment that is predominantly electromechanical, such as key punches, mechanical sorters, collators and tabulators. See (machine, electrical accounting).

EASY I, (Efficient Assembly SYstem), an assembly system for the Honeywell 400 computer with a minimum hardware configuration. It requires 1024 words of memory, three tape drives, a card reader and a printer.

EASY II, Honeywell's programming and operating system designed to assist the users of larger H-400 (at least 2048 words of memory) and H-1400 systems in all phases of their data processing efforts. It is compatible with EASY I.

EASY 800, a Honeywell assembly program whereby the assembly and checkout of H-400/1400 programs on an H-800 is possible through the use of an H-400/1400 simulator and automatic checkout system.

EASYMATH, Honeywell's assembly system for its Honeywell 300 scientific computer. It converts symbolic programs to object programs.

EASYTRAN, a Honeywell (Liberator) program which performs direct translation from the symbolic language of competing systems to H-200 symbolic language. It enables the 1401, for example, to be used as the translator prior to installation of the H-200.

ECCLES-JORDAN CIRCUIT, same as (flip-flop).

ECCLES-JORDAN TRIGGER, same as (flip-flop).

ECHO, echo is the effect of a wave which, having derived (for example by reflection) from a primary wave, arrives at

either end of the same circuit with sufficient magnitude and delay to be distinctly recognized.

ECHO ATTENUATION, in a four-wire (or two-wire) circuit equipped with repeaters or multiplex equipment, in which the two directions of transmission can be separated from each other, the attenuation of the echo currents (which return to the input of the circuit under consideration) is determined by the ratio of the transmitted power P1 to the echo power received P2. It shall be expressed in db.

ECHO CHECK, see (check, echo).

ECHO SUPPRESSOR, see (suppressor, echo).

ECHO TALKER, a portion of the transmitted signal returned from a distant point to the transmitting source with sufficient time delay to be received as interference.

EDGE NOTCHED CARD, see (card, edge notched).

EDGE PUNCHED CARD, see (card, edge punched).

EDIT *, to modify the form of format of data, e.g., to insert or delete characters such as page numbers or decimal points.

EDIT, POST, to edit the results of a previous computation.

EDITOR, a routine which performs editing operations.

EDP, Electronic Data Processing, see (processing, electronic data).

EFFECTIVE ADDRESS, see (address, effective).

EIGHT LEVEL, any teletypewriter code which utilizes eight impulses, in addition to the start and stop impulses, for describing a character.

EIGHTY (80) COLUMN CARD, see (card, eighty (80) column).

ELECTRIC DELAY LINE, see (line, electric delay).

ELECTRICAL ACCOUNTING MACHINE, see (machine, electrical accounting).

ELECTRICAL COMMUNICATIONS, in electrical communications, some material with relatively low electrical resistance (as copper wire) is provided as a link between sending and receiving points. The sender uses a translating device (i.e., telephone) which is capable of producing a detectable electrical configuration in response to the sender's emitting pattern.

ELECTROMAGNETIC COMMUNICATIONS, the electromagnetic wave conductor is space itself. The electromagnetic frequencies available today for communications fall into two categories: frequencies which form "wire-less" communications (such as visual light of fairly high frequency); and frequencies man uses for wireless communications (such as radio, short wave and microwave transmitting, of relatively lower frequencies). In communicating by radio, short and microwave frequencies, translators similar in principle to those used in electrical communications are needed, though the equipment requirement increases.

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, pertaining to that branch of science which deals with the motion, emission and behavior of currents of free electrons, especially in vacuum, gas or phototubes and special conductors or semi-conductors. This is contrasted with electric which pertains to the flow of large currents in metal conductors.

ELECTRONIC CALCULATING PUNCH, see (punch, electronic calculating).

ELECTRONIC DATA PROCESSING, see (processing, electronic data).

ELECTRONIC DATA PROCESSING EQUIPMENT, same as (equipment, automatic data processing)(1).

ELECTRONIC DATA PROCESSING MACHINE, see (machine, electronic data processing).

ELECTRONIC DATA PROCESSING SYSTEM, see (system, electronic data processing).

ELECTRONIC DIFFERENTIAL ANALYZER, see (analyzer, electronic differential).

ELECTRONIC SWITCH, see (switch, electronic).

ELECTROSTATIC PRINTER, same as (printer, xerographic).

ELECTROSTATIC STORAGE, see (storage, electrostatic).

ELEMENT, COMBINATIONAL LOGIC *, (1) a device having at least one output channel and two or more input channels, all characterized by discreet states, such that the state of each output channel is completely determined by the contemporaneous states of the input channels. (2) A logic element used in combinational logic.

ELEMENT, DATA, a specific item of information appearing in a set of data; e.g., in the following set of data, each item is a data element: the quantity of a supply item issued, a unit rate, an amount, and the balance of stock items on hand.

ELEMENT ERROR RATE, the ratio of the number of elements incorrectly received to the total number of elements sent.

ELEMENT, LOGIC *, a device that performs a logic function.

ELEMENT, SEQUENTIAL *, a device having at least one output channel and one or more input channels, all characterized by discreet states, such that the state of each output channel is determined by the previous states of the input channels.

ELEMENT, THRESHOLD *, 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.

ELEVEN PUNCH (11-punch), same as (punch, x)(2).

ENCIPHER, same as (encode).

ENCODE *, to apply the rules of a code. Synonomous with (encipher). Inverse of (decode).

ENCODED QUESTION, see (question, encoded).

ENCODER, a device capable of translating from one method of expression to another method of expression, e.g., translating a message, "add the contents of A to the contents of B", into a series of binary digits. Contrasted with (decoder) and clarified by (matrix).

END AROUND CARRY, see (carry, end around).

END AROUND SHIFT, same as (shift, cyclic).

END DISTORTION, see (distortion, end).

END OF FILE, termination or point of completion of a quantity of data. End of file marks are used to indicate this point. Synonymous with (EOF).

END OF FILE INDICATOR, see (indicator, end of file).

END INSTRUMENT, a device which is connected to one terminal of a loop and is capable of converting usable intelligence inot electrical signals or vice versa. It includes all generating, signal converting and loop terminating devices employed at the transmitting and/or receiving location.

END MARK, see (mark, end).

END PRINTING, the conversion of punched information into bold printing across the end of the card simultaneously with gang punching, summary punching, reproducing, or mark-sensed punching. This is similar to interpreting, and makes possible quick reference to the card.

END OF MESSAGE, the specific set of characters which indicates the termination of a message.

END-OF-RECORD WORD, the last word of a record on tape. It has a unique bit configuration and may be used to define the end of a record in memory.

ENGINEERING TIME, see (time, engineering).

ENGLISH, RULY, a form of English in which every word has one and only one conceptual meaning and each concept has one and only one word to describe it. This is a hypothetical language based on English which complies uniformly to a definite set of rules, without exceptions.

ENTRY, (1) a statement in a programming system. In general each entry is written on one line of a coding form and punched on one card, although some systems permit a single entry to overflow several cards. (2) A member of a list.

ENTRY, KEYBOARD, (1) an element of information inserted manually, usually via a set of switches or marked punch levers, called keys, into an automatic data processing system. (2) A medium as in (1) above for achieving access to or entrance into an automatic data processing system.

ENTRY POINT *, in a routine, any place to which control can be passed.

ENVELOPE DELAY, characteristics of a circuit which result in some frequencies arriving ahead of others even though they were transmitted together.

EOF, End Of File, see (end of file).

EQUALIZATION, the process of reducing frequency and/or phase distortion of a circuit by the introduction of networks to compensate for the difference in attenuation and/or time delay at the various frequencies in the transmission band.

EQUALIZER, DELAY (also, phase equalizer), a corrective network which is designed to make the phase delay or envelope delay of a circuit or system substantially constant over a desired frequency range.

EQUATION SOLVER, see (solver, equation).

EQUIPMENT, AUTOMATIC DATA PROCESSING, (1) a machine, or group of interconnected machines, consisting of input, storage, computing, control, and output devices, which uses electronic circuitry in the main computing element to perform arithmetic and/or logical operations automatically by means of internally stored or externally controlled programmed instructions. Synonymous with (equipment, electronic data processing). (2) The data processing equipment which directly supports or services the central computer operation. Clarified by (equipment, peripheral).

EQUIPMENT, AUXILIARY, same as (equipment, off-line).

EQUIPMENT COMPATIBILITY, see (compatibility, equipment).

EQUIPMENT, CONVERSION, the equipment that is capable of transposing or transcribing the information from one type of data processing medium to render it acceptable as input to another type of processing medium.

EQUIPMENT, DATA TRANSMISSION, the communications equipment used in direct support of data processing equipment.

EQUIPMENT, ELECTRONIC DATA PROCESSING, same as (equipment, automatic data processing) (1).

EQUIPMENT-FAILURE, a fault in the equipment, excluding all external factors, which prevents the accomplishment of a scheduled job.

EQUIPMENT, FLIP-FLOP, see (flip-flop equipment).

EQUIPMENT, INPUT, (1) the equipment used for transferring data and instructions into an automatic data processing system. (2) The equipment by which an operator transcribes original data and instructions to a medium that may be used in an automatic data processing system.

EQUIPMENT, OFF-LINE, the peripheral equipment or devices not in direct communication with the central processing unit of a computer. Synonymous with (auxiliary equipment).

EQUIPMENT, ON-LINE, descriptive of a system and of the peripheral equipment or devices in a system in which the operation of such equipment is under control of the central processing unit, and in which information reflecting current activity is introduced into the data processing system as soon as it occurs. Thus, directly in-line with the main flow of transaction processing. Synonymous with (in-line processing), and (on-line processing).

EQUIPMENT, OUTPUT, the equipment used for transferring information out of a computer.

EQUIPMENT, PERIPHERAL, the auxiliary machines which may be placed under the control of the central computer. Examples of this are card readers, card punches, magnetic tape feeds and high-speed printers. Peripheral equipment may be used on-line or off-line depending upon computer design, job requirements and economics. Clarified by (equipment, automatic data processing) and by (equipment, off-line).

EQUIPMENT, REMOTE CONTROL, see (remote control station).

EQUIPMENT, TABULATING, the machines and equipment using punch cards. The group of equipment is called tabulating equipment because the main function of installations of punch card machines for some 20 years before the first automatic digital computer was to produce tabulations of information resulting from sorting, listing, selecting, and totaling data on punch cards. This class of equipment is commonly called PCM or tab equipment. Similar to (machine, electrical accounting), clarified by (tabulator).

EQUIPMENTS, HIGH PERFORMANCE see (high performance equipments).

EQUIPMENTS, LOW PERFORMANCE, see (low performance equipments).

EQUIVALENCE *, a logical 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; false otherwise.

EQUIVALENT BINARY DIGITS, see (digits, equivalent binary).

EQUIVALENT FOUR WIRE, in equivalent four wire systems, different frequency bands are used to form a "high group" and "low group" for the two directions of transmission, thereby permitting operation over a single pair of conductors.

ERASABLE STORAGE, see (storage, erasable).

ERASE, to replace all the binary digits in a storage device by binary zeros. In a binary computer, erasing is equivalent to clearing, while in a coded decimal computer where the pulse code for decimal zero may contain binary ones, clearing leaves decimal zero while erasing leaves all-zero pulse codes in all storage locations. Clarified by (clear) (1).

ERROR, (1) the general term referring to any deviation of a computed or a measured quantity from the theoretically correct or true value. (2) The part of the error due to a particular identifiable cause; e.g., a truncation error. Contrasted with (mistake). In a restricted sense, that deviation due to unavoidable random disturbances, or to the use of finite approximations to what is defined by an infinite series. (3) The amount by which the computed or measured quantity differs from the theoretically correct or true value.

ERROR, ABSOLUTE, the magnitude of the error disregarding the algebraic sign or if a vectorial error, disregarding its direction.

ERROR, BALANCED (RANGE OF), (1) a range of error in which the maximum and minimum possible errors are opposite in sign and equal in magnitude. (2) A range of error in which the average value is zero.

ERROR BURST, a group of bits in which two successive erroneous bits are always separated by less than a given number (X) of correct bits. Note: The last erroneous bit in a burst and the first erroneous bit in the following burst are accordingly separated by X correct bits or more. The number X should be specified when describing an error burst.

ERROR CODE, a specific character which may be punched into a card or tape to indicate that a conscious error was made in the associated block of data. Machines reading the error code may be programmed to throw out the entire block automatically.

ERROR CORRECTING CODE, see (code, error correcting).

ERROR CORRECTING CODE, (communications) a code in which each telegraph or data signal conforms to specific rules of construction so that departures from this construction in the received signals can be automatically detected, and which permits the automatic correction, at the receive terminal, of some or all of the errors. Such codes require more signal elements than are necessary to convey the basic information.

ERROR, DATA, a deviation from correctness in data, usually an error, which occurred prior to processing the data.

ERROR DETECTING CODE, see (code, error detecting).

ERROR DETECTING CODE, (communications), a code in which each telegraph or data signal conforms to specific rules of construction, so that departures from this construction in the received signals can be automatically detected. Such codes require more signal elements than are necessary to convey the fundamental information.

ERROR DETECTING AND FEEDBACK SYSTEM, a system employing an error-detecting code and so arranged that a signal detected as being in error automatically initiates a request for retransmission of the signal detected as being in error.

ERROR DETECTING SYSTEM, a system employing an error detecting code and so arranged that any signal detected as being in error is (a) either deleted from the data delivered to the data sink, in some cases with an indication that such deletion has taken place (b) or delivered to the data sink. together with an indication that it has been detected as being in error.

ERROR DETECTION ROUTINE, see (routine, error detection).

ERROR, INHERENT same as (error, inherited).

ERROR, INHERITED *, the error in the value of quantities which serve as the initial conditions at the beginning of a step in a step-by-step calculation. Synonymous with (inherent error).

ERROR, MACHINE, a deviation from correctness in data resulting from an equipment failure.

ERROR, PROPAGATED, an error occurring in one operation which spreads through and influences later operations and results.

ERROR RANGE, see (range, error).

ERROR RATE, see (rate, error).

ERROR RATE OF KEYING, ratio of the number of alphabetic signals incorrectly transmitted to the number of alphabetic signals of the message.

ERROR RATE OF A TELEGRAPH COMMUNICATION, ratio of the number of alphabetic signals of a message incorrectly received (after automatic translation, where applicable) to the number of alphabetic signals of the message, the keying being correct. Note: A telegraph communication may have a different error rate for the two directions of transmission. The notion of error rate could be applied to any operation taking place in a telegraph communication (e.g., keying, translation etc). The statement of the error rate will be accompanied by that of the time interval, generally limited, during which the observation was made. For a communication established for a sufficiently long time, the probability of exceeding an assigned value of error rate could be considered.

ERROR, RATE OF A TRANSLATION (communications), ratio of the number of alphabetic signals incorrectly translated to the number of alphabetic signals in the message, the restitution at the input of the receiving apparatus being without distortion.

ERROR, RESIDUAL, the difference between an optimum result derived from experience or experiment and a supposedly exact result derived from theory.

ERROR, ROUNDING, the error resulting from rounding off a quantity by deleting the less significant digits and applying some rule of correction to the part retained; e.g., 0.2751 can be rounded to 0.275 with a rounding error of .0001. Synonymous with (round-off error) and contrasted with (error, truncation).

ERROR, ROUND-OFF, same as (error, rounding).

ERROR, SINGLE, see (single error).

ERROR, TRUNCATION, the error resulting from the use of only a finite number of terms of an infinite series, or from the approximation of operations in the infinitesimal calculus by operations in the calculus of finite differences. It is frequently convenient to define truncation error, by exclusion, as any error generated in a computation not due to rounding, initial conditions or mistakes. A truncation error would thus be that deviation of a computed quantity from the theoretically correct value that would be present even in the hypothetical situation in which no mistakes were made, all given data were exact, no inherited error, and infinitely many digits retained in all calculations. Contrasted with (error, rounding).

EVALUATION, PERFORMANCE, the analysis in terms of initial objectives and estimates, and usually made on-site, of accomplishments using an automatic data processing system, to provide information on operating experience and to identify corrective actions required if any.

EXALTED CARRIER RECEPTION, a method of receiving either amplitude or phase modulated signals in which the carrier is separated from the sidebands, filtered and amplified, and then combined with the sidebands again at a higher level prior to demodulation.

EXCEPT GATE, see (gate, except).

EXCEPTION PRINCIPLE SYSTEM, see (system, exception principle).

EXCESS-FIFTY, a binary representation in which the decimal number 'n' is represented by the binary equivalent of (n+50).

EXCESS-THREE CODE, see (code, excess-three).

EXCHANGE, to interchange the contents of two storage devices or locations.

EXCHANGE, AUTOMATIC, see (automatic exchange).

EXCHANGE, CENTRAL OFFICE, the place where a communication common carrier locates the equipment which interconnects incoming subscribers and circuits.

EXCHANGE, DIAL, an exchange where all subscribers originate their calls by dialing.

EXCHANGE, MANUAL, an exchange where calls are completed by an operator.

EXCHANGE, MESSAGE, a device, placed between a communication line and a computer, in order to take care of certain communication functions and thereby free the computer for other work.

EXCHANGE, PRIVATE AUTOMATIC (PAX), a dial exchange which provides private telephone service to an organization, and which does not allow calls to be transmitted to or from the public telephone network.

EXCHANGE, PRIVATE AUTOMATIC BRANCH (PABX), a private automatic exchange which provides for the transmission of calls to and from the public telephone network.

EXCHANGE, PRIVATE BRANCH (PBX), a manual or dial exchange, connected to the public telephone network, located on a customer's premises and operated by his employees.

EXCHANGE SERVICE, a service permitting interconnection of any two customer's telephones through the use of switching equipment.

EXCLUSIVE OR OPERATOR, see (operator, exclusive or).

EXECUTE, to interpret a machine instruction and perform the indicated operation(s) on the operand(s) specified.

EXECUTION OF AN INSTRUCTION, the set of elementary steps carried out by the computer to produce the result specified by the operation code of the instruction.

EXECUTION TIME, see (time, execution).

EXECUTIVE ROUTINE, see (routine, executive).

EXECUTIVE SYSTEM, same as (system, operating).

EXIT, a way of momentarily interrupting or leaving a repeated cycle of operations in a program.

EXPRESSION, any symbol representing a variable or a group of symbols representing a group of variables possibly combined by symbols representing operators in accordance with a set of definitions and rules.

EXTENDED AREA, see (service, extended area).

EXTERNAL MEMORY, same as (storage, external).

EXTERNAL STORAGE, see (storage, external).

EXTRACT, (1) to copy from a set of items all those items which meet a specified criterion. (2) To remove only a given set of digits or characters occupying certain specified locations in a computer word, such as extract the 8, 9, and 10 binary digits of a 44-bit word, as specified by the filter. Clarified by (filter). (3) To derive a new computer word from part of another word, usually by masking. Related to (unpack).

EXTRACT INSTRUCTION *, an instruction that requests the formation of a new expression from selected parts of given expressions.

EXTRACTOR, same as (filter).

F

FACSIMILE (FAX), transmission of pictures, maps, diagrams, etc. by wire. The image is scanned at the transmitter and reconstructed at the receiving station.

FACSIMILE POSTING, the process of transferring, by a duplicating process, a printed line on a report to a ledger or other recorded sheet. These may be posted from a transaction listing previously prepared on an accounting machine. A data processing function.

FACT (Fully Automatic Compiling Technique), a Honeywell business data processing compiler that provides for easy and uniform handling of all aspects of data processing, including input editing, sorting, processing of variable-length records, and report writing, all in an easy-to-learn, English-like language.

FACTOR, MODULATION, see (modulation factor).

FACTOR, SCALE *, a number used as a multiplier, so chosen that it will cause a set of quantities to fall within a given range of values, e.g., in order to scale the values 856, 432, -95, and -182 between -1 and +1, a scale factor of 1/1000 would be suitable.

FADING, the variation of radio field intensity caused by changes in the transmission medium.

FADING, FLAT, that type of fading in which all components of the received radio signal fluctuate in the same proportion simultaneously.

FADING, SELECTIVE, fading which affects the different frequencies within a specified band unequally.

FALSE DROPS, see (drops, false).

FALSE RETRIEVALS, see (retrievals, false).

FAST ACCESS STORAGE, see (storage, fast access).

FAULT *, a physical condition that causes a device, a component or element to fail to perform in a required manner, e.g., a short circuit, a broken wire, an intermittent connection.

FAULT, PATTERN-SENSITIVE *, a fault that appears in response to some particular pattern of data.

FAULT, PROGRAM-SENSITIVE *, a fault that appears in response to some particular sequence of program steps.

FAX, see (facsimile).

FEASIBLE SOLUTION, a linear programming term. See Solution, Feasible.

FEED, (1) to supply the material to be operated upon to a machine. (2) A device capable of feeding as in definition #1.

FEED, CARD, a mechanism which moves cards serially into a machine.

FEED HOLES, a series of small holes in perforated paper tape which convey no information, but are solely for the purpose of engaging the feed pawls or sprocket which transport the tape over the sensing pins of various reading devices.

FEED, TAPE, a mechanism which will feed tape to be read or sensed.

FEEDBACK, the part of a closed loop system which automatically brings back information about the condition under control.

FEEDBACK CONTROL, see (control, feedback).

FEEDBACK CONTROL SIGNAL, see (signal, feedback control).

FEEDING, FORM, see (form feeding or form feedout).

FEEDOUT, FORM, see (form feeding or form feedout).

FERROELECTRIC, pertaining to a phenomenon exhibited by certain materials in which the material is polarized in one direction or the other, or reversed in direction by the application of a positive or negative electric field of magnitude greater than a certain amount. The material retains the electric polarization unless it is disturbed. The polarization can be sensed by the fact that a change in the field induces an electromotive force which can cause a current.

FERROMAGNETIC, pertaining to a phenomenon exhibited by certain materials in which the material is polarized in one direction or the other, or reversed in direction by the application of a positive or negative magnetic field of magnitude greater than a certain amount. The material retains the magnetic polarization unless it is disturbed. The polarization can be sensed by the fact that a change in the field induces an electromotive force, which can cause a current.

FETCH, to obtain a quantity of data from a place of storage.

FIELD *, a specified area of a record used for a particular category of data, e.g., 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.

FIELD, CARD, a set of card columns, either fixed as to number and position or, if variable, then identifiable by position relative to other fields. Corresponding fields on successive cards are normally used to store similar information.

FIELD, CONTROL, a constant location where information for control purposes in placed; e.g., in a set of punch cards, if columns 79 and 80 contain various codes which control whether or not certain operations will be performed on any particular card, then columns 79 and 80 constitute a control field.

FIELD, DECREMENT, a portion of an instruction word set aside specifically for modifying the contents of a register or storage location.

FIELD, FIXED, a given field on punch cards or a given number of holes along the edge of an edge punched card, set aside for the recording of a given type or classification of information.

FIELD, FREE, a property of information processing recording media which permit recording of information without regard to a preassigned or fixed field; e.g., in information

retrieval devices information may be dispersed in the record in any sequence or location.

FIELD LENGTH, see (length, field).

FIELD, SIGNED, a field which has a plus or minus character coding over the units position to designate the algebraic sign of the entire number.

FIGURES SHIFT, a function performed by a teletypewriter machine, when initiated by the figures shift character, which causes the machine to shift to upper case for numbers, symbols, etc.

FILE *, a collection of related records, e.g., in inventory control, one line of an invoice containing data on the material, the quantity and the price forms an item, a complete invoice forms a record, and the complete set of such records forms a file.

FILE, DETAIL, a file of information which is relatively transient. This is contrasted with a master file which contains relatively more permanent information; e.g., in the case of weekly payroll for hourly employees, the detail file will contain employee number, regular time, and overtime, the hours such employee has worked in a given week, and other information changing weekly. The master file will contain the employee's name, number, department, rate of pay, deduction specifications, and other information which regularly stays the same from week to week.

FILE GAP, see (gap, file).

FILE IDENTIFICATION, see (identification, file).

FILE MAINTENANCE, see (maintenance, file).

FILE, MASTER, a file containing relatively permanent information.

FILE PROTECTION, see (protection, file).

FILM OPTICAL SENSING DEVICE, see (device, film optical sensing).

FILMOREX SYSTEM, see (system, Filmorex).

FILTER *, (1) a pattern of characters that is used to control the selection or elimination of portions of another pattern of characters. Synonymous with (extractor) and (mask) and clarified by (extract) (2). (2) A device or program that separates data, signals, or material in accordance with specified criteria.

FILTER (communications), devices used to either suppress unwanted frequencies or noise, or to separate channels in communications circuits.

FILTER, BAND ELIMINATION, see (band elimination filter).

FILTER, BAND-PASS, see (band-pass filter).

FILTER, BAND REJECTION, see (band elimination filter).

FILTER, BAND STOP, see (band elimination filter).

FIRE, CROSS, see (cross fire).

FIRST LEVEL ADDRESS, same as (address, direct).

FIVE LEVEL, any teletypewriter code which utilizes five impulses, in addition to the start and stop impulses, for describing a character.

FIXED CYCLE OPERATION, see (operation, fixed cycle).

FIXED FIELD, see (field, fixed).

FIXED LENGTH RECORD, see (record, fixed length).

FIXED POINT ARITHMETIC, see (arithmetic, fixed point).

FIXED POINT CALCULATION, see (calculation, fixed point).

FIXED PROGRAM COMPUTER, see (computer, fixed program).

FIXED WORD LENGTH, see (word length, fixed).

FLAG *, (1) any of various types of indicators used for identification e.g., a word mark. (2) A character that signals the occurrence of some condition, such as the end of a word.

FLIP-FLOP, (1) a bi-stable device; i.e., a device capable of assuming two stable states. (2) A bi-stable device which may assume a given stable state depending upon the pulse of history of one or more input points and having one or more output points. The device is capable of storing a bit of information. (3) A control device for opening or closing gates; i.e., a toggle. Synonymous with (Eccles-Jordan circuit) and (Eccles-Jordan trigger).

FLIP-FLOP EQUIPMENT, an electronic or electromechanical device which causes automatic alternation between two possible circuit paths. The same term is often applied to any mechanical operation which is analogous to the principles of the flip-flop.

FLOATING ADDRESS, see (address, floating).

FLOATING DECIMAL ARITHMETIC, same as (arithmetic, floating point).

FLOATING POINT ARITHMETIC, see (arithmetic, floating point).

FLOATING POINT CALCULATION, see (calculation, floating point).

FLOATING POINT ROUTINE, see (routine, floating point).

FLOW, BIDIRECTIONAL *, flow that can extend over the same flowlines in either direction.

FLOW CHART, see (chart, flow).

FLOW DIAGRAM, same as (chart, flow).

FLOW, NORMAL-DIRECTION *, a flow in a direction from left to right or top to bottom.

FLOW, REVERSE-DIRECTION *, a flow in a direction other than left to right or top to bottom.

FLOWLINE *, a line representing a connecting path between symbols on a flow chart.

FLUTTER, in communication practice, flutter is (1) distortion due to variation in loss resulting from the simultaneous transmission of a signal at another frequency. (2) A similar effect due to phase distortion or, (3) in recording and reproducing, deviation of frequency which results, in general, from irregular motion during recording, duplication, or reproduction. Note: One important usage is to denote the effect of variation in the transmission characteristics of a loaded telephone circuit, caused by the action of telegraph direct currents on the loading coils.

FLYING SPOT, see (spot, flying).

FLYING SPOT SCANNER *, see Scanner, Flying Spot

FM, Frequency Modulation.

FONT *, (1) A family or assortment of characters of a given size and style. (2) See Type Font.

FORBIDDEN COMBINATION CHECK, see (check, forbidden combination).

FORCE, to intervene manually in a routine and cause the computer to execute a jump instruction.

FOREIGN EXCHANGE SERVICE, that service which connects a customer's telephone to a telephone company central office normally not serving the customer's location.

FORM FEEDING OR FORM FEEDOUT, the rapid, accurate positioning of document forms on a teleprinter or business machine.

FORM STOP, see (stop,form).

FORMAL LOGIC, see (logic, formal).

FORMAT, (1) the predetermined arrangement of characters, fields, lines, page numbers, and punctuation marks, usually on a single sheet or in a file. This refers to input, output and files. (2) Arrangement of code characters within a group, such as a word or message.

FORMAT, ADDRESS *, 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, e.g., one "plus" one, two "plus" one, three "plus" one.

FORTRAN *, FORmula TRANslation. Any of several specific procedure-oriented programming languages.

FORTUITOUS DISTORTION, an intermittent distortion which results in either shortened or lengthened impulses. It is caused by battery fluctuations, hits on the line, power induction, etc.

FORWARD, see (switching).

FOSDIC, Film Optical Sensing Device for Input to Computers, same as (device, film optical sensing).

FOUR ADDRESS, see (address, four).

FOUR ADDRESS INSTRUCTION, see (instruction, four address).

FOUR-WIRE CHANNEL, see (channel, four-wire).

FOUR WIRE, EQUIVALENT, see (equivalent four wire).

FOX MESSAGE, a standard message which is used for testing teletypewriter circuits and machines because it includes all the alphanumerics on a teletypewriter as well as most of the function characters such as space, figures shift, letters shift, etc. It is: THE QUICK BROWN FOX JUMPED OVER A LAZY DOG'S BACK 1234567890 --- SENDING. The sending station's identification is inserted in the three blank spaces which precede the word SENDING.

FRAME, the array of binary digits across the width of magnetic tape or paper tape. Six frames are required to encode one Honeywell word on magnetic tape.

FRAME GROUNDING CIRCUIT, this conductor shall be electrically bonded to the machine frame and/or to any conducting parts which are normally exposed to operating personnel. This circuit may further be connected to external grounds as may be required by applicable Fire Underwriters Codes.

FRAME, MAIN, (1) the central processor of the computer system. It contains the main storage, arithmetic unit and special register groups. Synonymous with (CPU) and (central processing unit). (2) All that portion of a computer exclusive of the input, output, peripheral and in some instances, storage units.

FREE FIELD, see (field, free).

FREQUENCIES, RADIO, see (radio frequencies).

FREQUENCY, in AC signalling, refers to the number of complete cycles transmitted per second. Usually expressed in cycles per second (cps); kilocycles per second (kcs), megacycles per second (mcs), etc.

FREQUENCY, CARRIER see (carrier frequency).

FREQUENCY-CHANGE SIGNALLING, a telegraph signalling method in which one or more particular frequencies correspond to each desired signalling condition of a telegraph code. The transition from one set of frequencies to the other may be either a continuous or a discontinuous change in frequency or in phase.

FREQUENCY, CLOCK, the master frequency of periodic pulses which schedules the operation of the computer. Clarified by (computer, synchronous).

FREQUENCY DEPARTURE, the amount of variation of a carrier frequency or center frequency from its assigned value. Note: This concept was formerly described as frequency deviation, a usage which is now deprecated because of the currency of a different meaning in phase and frequency modulation.

FREQUENCY DEVIATION, frequency deviation, in frequency modulation, is the peak difference between the instantaneous frequency of the modulated wave and the carrier frequency.

FREQUENCY DISCRIMINATION, a term applied generally to the operation of selecting a desired frequency (or frequencies) from a spectrum of frequencies.

FREQUENCY-DIVISION MULTIPLEX, a multiplex system in which the available transmission frequency-exchange range is divided into narrower bands, each used for a separate channel.

FREQUENCY-EXCHANGE SIGNALLING, a frequency-exchange signalling method in which the change from one-signalling condition to another is accompanied by decay in amplitude of one or more frequencies and by build-up in amplitude of one or more other frequencies.

FREQUENCY, INSTANTANEOUS, the instantaneous rate of change of phase with respect to time (expressed in radians per seconds) divided by 2.

FREQUENCY, NATURAL, the frequency of free oscillation of a system.

FREQUENCY RESPONSE, see (response, frequency).

FREQUENCY SHIFT, system of telegraph-teletypewriter operation in which the mark signal is one frequency and the space signal a different frequency. Note: CCITT recommends that mark is the lower frequency. Also, the difference between mark and space will vary in different systems, e.g., 170 cps U.S.A., 120 cps Europe.

FREQUENCY SHIFT KEYING, frequency modulation method in which the frequency is made to vary at the significant instants: (a) by smooth transitions. The modulated wave and the change in frequency are continuous at the significant instants; (b) by abrupt transitions. The modulated wave is continuous but the frequency is discontinuous at the significant instant.

FREQUENCY SPECTRUM DESIGNATION,
VLF (very low frequency) .....Below 30 kc/s (0.03 mc/s).
LF (low frequency).....30 to 300 kc/s (0.03 mc/s).
MF (medium frequency)..300 to 3,000 kc/s (0.03 to 3 mc/s).
HF (high frequency)..3,000 to 30,000 kc/s (3 to 30 mc/s).
VHF (very high frequency)..... 30 to 300 mc/s.
UHF (ultrahigh frequency).....300 to 3,000 mc/s.
SHF (superhigh frequency) .....3,000 to 30,000 mc/s.
FHF (extremely high frequency..30,000 to 300,000 mc/s.

FREQUENCY, TELEPHONE, see (voice frequency, telephone frequency).

FREQUENCY TOLERANCE OF RADIO TRANSMITTER, the extent to which the carrier frequency of the transmitter may be permitted to depart from the frequency.

FREQUENCY TRANSLATION, the transfer en bloc of signals occupying a definite frequency band (such as a channel or group of channels) from one position in the frequency spectrum to another, in such a way that the arithmetic frequency difference of signals within the band is unaltered.

FREQUENCY, VOICE, a frequency lying within that part of the audio range which is employed for the transmission of speech. Note: Voice frequencies used for commercial transmission of speech usually lie within the range 200 to 3500 cycles per second.

FULL-DUPLEX OPERATION, full-duplex, or duplex, operation refers to communication between two points in both directions simultaneously.

FULL DUPLEX, PARTIAL, a method of operation of a communication circuit in combination with a data communications terminal in which information may be transmitted full duplex, but with the restriction that while data is being transmitted on one channel the only data that may be transmitted simultaneously on the other channel is control information required for coordination of the communications channel.

FULL-DUPLEX SERVICE, a service in which the data communication channel is capable of simultaneous and independent transmission and reception.

FUNCTION *, a specific purpose of an entity or its characteristic action.

FUNCTION CODES, codes which appear in tape or cards to operate machine functions, such as carriage return, space, shift, skip, tabulate, etc.

FUNCTION, OBJECTIVE, in linear programming, and equation, the value of which is maximized or minimized

during the solution of a linear programming problem. The objective function is often called the "cost function" in L. P. models of cost minimization.

FUNCTION SWITCH, see (switch, function).

FUNCTION TABLE, see (table, function).

FUNCTION, TRANSFER, (1) a mathematical expression frequently used by control engineers which expresses the relationship between the outgoing and the incoming signals of a process, or control element. The transfer function is useful in studies of control problems. (2) A mathematical expression or expressions which describe(s) the relationship between physical conditions at two different points in time or space in a given system, and perhaps, also, describes the role played by the intervening time or space.

FUNCTIONAL DESIGN *, see Design, Functional

FUNCTOR, an improper term to be avoided. This term is sometimes used to designate a logic element which performs a specific function or provides a linkage between variables.

G

GAIN, the ratio between the output signal and the input signal of a device.

GAIN, INSERTION, see (insertion loss (or gain)).

GAIN, OVERALL, see (overall gain).

GAIN, TRANSMISSION, the action by which, or result in which, the power of an electrical signal is increased. It shall be expressed in db.

GAME THEORY, see (theory, game).

GANG PUNCH, see (punch, gang).

GAP, (1) an interval of space or time used as an automatic sentinel to indicate the end of a word, record, or file of data on a tape; e.g., a word gap at the end of a word, a record or item gap at the end of a group of words, and a file gap at the end of a group of records or items. (2) The absence of information for a specified length of time or space on a recording medium, as contrasted with marks and sentinels which are the presence of specific information to achieve a similar purpose. Marks are used primarily internally in variable word length machines. Sentinels achieve similar purposes either internally or externally; however, sentinels are programmed rather than inherent in the hardware. Related to (gap, file) and (symbol, terminating). (3) The space between the reading or recording head and the recording medium, such as tape, drum, or disk. Related to (gap, head).

GAP, FILE *, a gap used to indicate the end of a file. Related to (gap) (2).

GAP, HEAD, (1) the space between the reading or recording head and the recording medium, such as tape, drum or disk. (2) The space or gap intentionally inserted into the magnetic circuit of the head in order to force or direct the recording flux into the recording medium.

GAP, INTER-RECORD, an interval of space or time, deliberately left between recording portions of data or records. Such spacing is used to prevent errors through loss of data or overwriting, and permits tape stop-start operations.

GAP, RECORD *, a gap used to indicate the end of a record.

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 contemporaneous input channel states, except during switching transients. (2) A combination logic element having at least one input channel. (3) An AND gate. (4) An OR gate.

GATE, AMPLITUDE, a transducer which transmits only portions of an input wave lying between two amplitude boundaries. Note: The term is used especially when the two amplitude boundaries are close to each other as compared with the amplitude range of the input.

GATE, AND a signal circuit with two or more input wires in which the output wire gives a signal, if and only if, all input wires receive coincident signals. Synonymous with (and circuit) and clarified by (conjunction).

GATE, COINCIDENCE, a circuit with the ability to produce an output which is dependent upon a specified type of or the coincident nature of the input; e.g., an AND gate has an output pulse when there are pulses in time coincidence at all inputs; an OR gate has an output when any one or any combination of input pulses occur in time coincidence. Any gate may contain a number of inhibits, in which there is no output under any condition of input if there is time coincidence of an inhibit or except signal.

GATE, EXCEPT, a gate in which the specified combination of pulses producing an output pulse is the presence of a pulse on one or more input lines and the absence of a pulse on one or more other input lines.

GATE, OR, an electrical gate or mechanical device which implements the logical OR operator. An output signal occurs whenever there are one or more inputs on a multichannel input. An OR gate performs the function of the logical "inclusive OR Operator." Synonymous with (or circuit) and clarified by (disjunction).

GATE PULSE, see (pulse, gate).

GATE, SYNCHRONOUS, a synchronous gate is a time gate wherein the output intervals are synchronized with an incoming signal.

GATE, TIME, a time gate is a transducer which gives output only during chosen time intervals.

GATHERING, DATA see (data collection).

GATING, gating is the process of selecting those portions of a wave which exist during one or more selected time intervals or which have magnitudes between selected limits.

GENERAL PROGRAM, see (program, general).

GENERAL PURPOSE COMPUTER, see (computer, general purpose).

GENERAL ROUTINE, same as (program, general).

GENERAL TELEPHONE NETWORK, GENERAL SWITCHED TELEPHONE NETWORK, this term refers to the facilities provided by the telephone companies in the United States which permit each telephone subscriber to communicate with any other telephone subscriber.

GENERATE *, (1) To construct a computer program by use of a program generator. (2) To produce a program by selection of subsets from a set of skeletal coding under the control of parameters.

GENERATING ROUTINE, see (routine, generating).

GENERATOR, PROGRAM, a program which permits a computer to write other programs, automatically. Generators are of two types: (a) the character controlled generator, which operates like a compiler in that it takes entries from a library tape, but unlike a simple compiler in that it examines control characters associated with each entry, and alters instructions found in the library according to the directions contained in the control characters. (b) The pure generator which is a program that writes another program. When associated with an assembler a pure generator is usually a section of program which is called into storage by the assembler from a library tape and which then writes one or more entries in another program. Most assemblers are also compilers and generators. In this case the entire system is usually referred to as an assembly system. Related to (language, problem oriented).

GENERATOR, RANDOM NUMBER, a special machine routine or hardware designed to produce a random number or series of random numbers according to specified limitations.

GENERATOR, REPORT, a technique for producing complete data processing reports giving only a description of the desired content and format of the output reports, and certain information concerning the input file.

GIGACYCLE, a kilomegacycle per second, 10^9 cycles per second. Synonymous with (kilomegacycle).

GRADE, TELETYPE, see (teletype grade).

GRANDFATHER CYCLE, see (cycle, grandfather).

GRAPHIC PANEL, see (panel, graphic).

GRAY CODE, see (code, gray).

GRID *, in OCR, two mutually orthogonal sets of parallel lines used for specifying or measuring character images.

GRID, CONTROL, the electrode of a vacuum tube other than a diode upon which a signal voltage is impressed in order to regulate the plate current, usually electrode or grid number 1.

GROUND, SIGNAL, see (signal ground).

GROUP, LINK, see (link group).

GROUP MARK, see (mark, group).

GROUPING OF RECORDS, see (records, grouping of).

GUARD BAND, an unused frequency band between two channels to give a margin of safety against mutual interference.

GULP, several bytes, thus a part of a word.

H

HALF-ADD, the process of combining two binary words to produce a third which will have one-bits in the positions where the bits in the two operands differ, and zero-bits where the bits in the two operands are the same.

HALF-ADDER *, a combinational logic element having two outputs, $\underline{S}$ and $\underline{C}$, and two inputs, $\underline{A}$ and $\underline{B}$, such that the outputs are related to the inputs according to the following table.

INPUT		OUTPUT	
$\underline{A}$	$\underline{B}$	$\underline{S}$	$\underline{C}$
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

$\underline{S}$ and $\underline{C}$ denote =sum without carry= and =carry=, respectively. Two half-adders may be used for performing binary addition.

HALF-ADJUST, a kind of rounding in which the value of the least significant digit of a number determines whether or not a one shall be added to the next higher significant digit, or, in which the two least significant digits determine whether or not a one is to be added to the next higher significant digit. If the least significant digits represent less than one-half, nothing is added to the next higher significant digit, if the least significant digits represent one-half or more then a one is added to the next higher significant digit.

HALF-DUPLEX CIRCUIT, a duplex inter-city facility with single loops to the terminals capable of two-way non-simultaneous operation.

HALF-DUPLEX OPERATION, half-duplex or single telegraph operation refers to communication on a circuit in only one direction at a time, with or without a break feature. The break feature enables the receiving station to interrupt the sending station.

HALF-DUPLEX SERVICE, one in which the data communication channel is capable of transmitting and receiving signals, but is not equipped for simultaneous and independent transmission and reception.

HALT, DEAD, same as (halt, drop dead).

HALT, DROP DEAD, a machine halt from which there is no recovery. Such a halt may be deliberately programmed. A drop dead halt may occur through a logical error in programming. Examples in which a drop dead halt could occur are division by zero and transfer to a non-existent instruction word. Synonymous with (dead halt).

HAMMING CODE, one of the error correction code systems in use today, named after the inventor.

HAMMING DISTANCE *, same as Signal Distance

HANDLING, DATA, same as (processing, data) (2).

HANDSHAKING, in a synchronous transmission scheme, the term is used to describe the process by which predetermined configurations of characters are exchanged by the receiving and transmitting equipment to establish synchronization.

HANG-UP, a nonprogrammed stop in a routine. It is usually an unforeseen or unwanted halt in a machine pass. It is most often caused by improper coding of a machine instruction or by the attempted use of a non-existent or improper operation code.

HARD COPY, see (copy, hard).

HARDWARE, the physical equipment or devices forming a computer and peripheral equipment. Constrasted with (software).

HARDWARE CHECK, same as (check, automatic).

HASH TOTAL, see (total, hash).

HEAD *, a device that reads, records or erases information in a storage medium, e.g., a small electromagnet used to read, write or erase information on a magnetic drum or tape, or the set of perforating, reading or marking devices and block assembly used for punching, reading or printing on paper tape.

HEAD GAP, see (gap, head).

HEAD, READ WRITE, a small electromagnet used for reading, recording, or erasing polarized spots, which represent information, on magnetic tape, disk or drum.

HEADER, the first part of a message, which contains all necessary information for directing the message to the destination(s).

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 (algorithmic).

HEURISTIC PROGRAM, same as (routine, heuristic).

HEURISTIC ROUTINE, see (routine, heuristic).

HEXADECIMAL, (1) the characters B-G which represent the remaining 6 four-bit combinations not used in BCD. (2) The code consisting of 16 four-bit combinations used to represent the 10 decimal digits and the six hexadecimal characters B-G.

HIERARCHY, a specified rank or order of items, thus, a series of items classified by rank or order.

HIGH-LOW BIAS TEST, same as (check, marginal).

HIGH ORDER, pertaining to the weight or significance assigned to the digits of a number; e.g., in the number 123456, the highest order digit is one; the lowest order digit is six. One may refer to the three high order bits of a binary word, as another example. Clarified by (order) (3).

HIGH PERFORMANCE EQUIPMENTS, those equipments having sufficiently exacting characteristics to permit their use in trunk or line circuits.

HIGH-SPEED CARRY, see (carry, high-speed).

HIGH-SPEED PRINTER, see (printer, high-speed).

HIGH-SPEED READER, see (reader, high-speed).

HIT ON THE LINE, a momentary open circuit on a teletypewriter loop.

HOLD, the function of retaining information in one storage device after also transferring it to another device. Contrasted with (clear) (1).

HOLES, FEED, see (feed holes).

HOLLERITH, a widely used system of encoding alphanumeric information onto cards, hence Hollerith cards is synony-

mous with punch cards. Such cards were first used in 1890 for the U. S. Census and were named after Herman Hollerith, their originator.

HOMEOSTASIS, the dynamic condition of a system wherein the input and output are balanced precisely, thus presenting an appearance of no change, hence a steady state.

HOPPER *, a device that holds cards and makes them available to a feed mechanism. Contrasts with (stacker) and (output magazine). Synonomous with (magazine, input).

HORIZONTAL SYSTEM, see (system, horizontal).

HOUSEKEEPING, (1) pertaining to administrative or overhead operations or functions which are necessary in order to maintain control of a situation; e.g., for a computer program, housekeeping involves the setting up of constants and variables to be used in the program. Synonymous with (red tape). (2) A general term used to describe coding which reserves, restores, and clears memory areas.

HOUSEKEEPING OPERATION, see (operation, housekeeping).

HOUSEKEEPING ROUTINE, see (routine, housekeeping).

HSP, High-Speed Printer, see (printer, high-speed).

HSR, High-Speed Reader, see (reader, high-speed).

HUB, a socket on a control panel or plugboard into which an electrical lead or plug wire may be connected in order to carry signals, particularly to distribute the signals over many other wires.

HUNTING, a continuous attempt on the part of an automatically controlled system to seek a desired equilibrium condition. The system usually contains a standard, a method of determining deviation from this standard and a method of influencing the system such that the difference between the standard and the state of the system is brought to zero. Clarified by (servomechanism).

HYSTERESIS, (1) the lagging in the response of a unit of a system behind an increase or a decrease in the strength of a signal. (2) A phenomenom demonstrated by materials which make their behavior a function of the history of the environment to which they have been subjected.

I

IAL, International Algebraic Language, see (language, international algebraic).

IDENTIFICATION, FILE, the coding required to identify each physical unit of the outputs of electronic data processing machine runs.

IDENTIFIER *, a symbol whose purpose is to identify, indicate, or name a body of data.

IDENTITY MATRIX, see Matrix, Identity

IDENTIFYING CODE, a code placed in perforated tape or punched cards to identify the contents therein, or their origin.

IDLE TIME, see (time, idle).

IDP, Integrated Data Processing, see (processing, integrated data).

IGNORE, (1) a typewriter character indicating that no action whatsoever be taken; e.g., in teletype or flexowriter code, a character code consisting of holes punched in every hole position is an ignore character; this convention makes possible erasing any previously punched character. (2) An instruction requiring non-performance of what normally might be executed; i.e., not to be executed. This instruction should not be confused with a NO OP or Do Nothing instruction, since these generally refer to an instruction outside themselves.

ILLEGAL CHARACTER, see (character, illegal).

IMAGE, an exact duplicate array of information or data stored in, or in transit to, a different medium.

IMAGE, CARD *, a one-to-one representation of the contents of a punched card, e.g., a matrix in which a 1 represents a punch and a 0 represents the absence of a punch.

IMAGE DISSECTOR *, in OCR, a mechanical or electronic transducer that sequentially detects the level of light in different areas of a completely illuminated sample space.

IMMEDIATE ACCESS, see (access, immediate).

IMMEDIATE ADDRESS, see (address, immediate).

IMPEDANCE, CHARACTERISTIC, (1) the ratio of voltage to current at every point along a transmission line on which there are no standing waves. (2) The square root of the product of the open and short circuit impedance of the line. When a transmission line is terminated in its characteristic impedance, energy is not reflected, but is fully absorbed in the terminating impedance.

IMPEDANCE, TERMINAL, see (terminal impedance).

IMPULSE NOISE, see (noise, impulse).

INCLUSIVE OR OPERATOR, see (operator, inclusive or).

INCREMENTAL COMPUTER, see (computer, incremental).

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) A symbol or a number used to identify a particular quantity in an array of similar quantities, e.g., the terms of an array represented by X(1), X(2)....X(100) have the indexes 1, 2, ... 100 respectively. (3) Pertaining to an index register.

INDEX, MODULATION, see (modulation index).

INDEX OF COOPERATION - DIAMETRAL (FACSIMILE) the product of the drum lines per inch, diameter in inches, and the line advance in scanning.

INDEX, QUALITY, see (quality index (telegraph)).

INDEX REGISTER, see (register, index).

INDEX, WORD, an index based on the selection of words as used in a document, without giving thought to synonyms and more generic concepts related to the term selected.

INDEX-WORD, a storage position or register the contents of which may be used to modify automatically the effective address of any given instruction.

INDEXED ADDRESS, see (address, indexed).

INDEXING, the process of establishing memory addresses by adding the value in an address field of an instruction to a value stored in a specified index register.

INDEXING, COORDINATE, an indexing scheme by with descriptors may be correlated or combined to show any interrelationships desired for purposes of more precise information retrieval.

INDEXING, UNITERM, a system of coordinate indexing which utilizes single terms, called Uniterms, to define a document uniquely. Related to (system, uniterm).

INDICATOR, CHECK, a device which displays or announces that an error has been made or that a checking operation has determined that a failure has occurred.

INDICATOR, END OF FILE, a device associated with each input and output unit that makes an end of file condition known to the routine and operator controlling the computer.

INDICATOR, MACHINE CHECK, a protective device which will be turned on when certain conditions arise within the machine. The machine can be programmed to stop or to run a separate correction routine or to ignore the condition.

INDICATOR, OVERFLOW CHECK, a device which is turned on by incorrect, or unplanned for, operations in the execution of an arithmetic instruction, particularly when an arithmetic operation produces a number too large for the system to handle.

INDICATOR, READ WRITE CHECK, a device incorporated in certain computers to indicate upon interrogation whether or not an error was made in reading or writing. The

machine can be made to stop, re-try the operation or follow a special subroutine depending upon the result of the interrogation.

INDICATOR, ROLE, a code assigned to a keyword to indicate the role of the keyword; e.g., a keyword may be a noun, verb, adjective, or adverb; therefore, an indicator is used to identify the specific role of the keyword.

INDICATOR, ROUTINE, see (routine indicator).

INDICATOR, SIGN CHECK, an error checking device, indicating no sign or improper signing of a field used for arithmetic processes. The machine can, upon interrogation be made to stop or enter into a correction routine.

INDICATORS, the devices which register conditions, such as high or equal conditions resulting from a comparison of plus or minus conditions resulting from a computation. A sequence of operations within a procedure may be varied according to the position of an indicator.

INDICATORS, PRIORITY, see (priority indicators).

INDIRECT ADDRESS, see (address, indirect).

INDIVIDUAL LINE, a subscriber line arranged to serve only one main station although additional stations may be connected to the line as extensions. An individual line is not arranged for discriminatory ringing with respect to the stations on that line.

INFEASIBLE SOLUTION, see Solution, Infeasible

INFINITE PAD METHOD *, in OCR, 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.

INFORMATION, a collection of facts or other data especially as derived from the processing of data. Related to (data).

INFORMATION, ADMINISTRATIVE, information of a textual nature, originated and prepared by one person for scrutiny by another.

INFORMATION BITS, those bits which are generated by the data source and which are not used for error-control by the data transmission system.

INFORMATION CHANNEL, the transmission and intervening equipment involved in the transfer of information in a given direction between two terminals. An information channel includes the modulator and demodulator, and any error-control equipment irrespective of its location, as well as the backward channel when provided.

INFORMATION FEEDBACK SYSTEM, an error-control system using message feedback with reception of the erroneous group from the sending station.

INFORMATION PROCESSING, see (processing, information).

INFORMATION REQUIREMENTS, see (requirements information).

INFORMATION RETRIEVAL *, the study of methods and procedures for recovering specific information from stored data.

INFORMATION RETRIEVAL SYSTEM, see (system, information retrieval).

INFORMATION SYSTEM, see (system, information).

INFORMATION THEORY, see (theory, information).

INFORMATION WORD, see (word, information).

INHERENT ERROR, same as (error, inherited).

INHERITED ERROR, see (error, inherited).

INHIBITING INPUT, see (input, inhibiting).

INHIBITING SIGNAL, see (signal, inhibiting).

INITIALIZE *, to set various counters, switches and addresses to zero, or other starting values, at the beginning of, or at prescribed points, in a computer routine.

INK BLEED *, in OCR, the capillary flow of ink beyond the edges of a printed character.

INK SMUDGE *, in OCR, the displacement of ink under shear beyond the original edges of a printed character.

INK SQUEEZEOUT *, in OCR, the displacement of ink from the center to the edges of a character during printing, resulting in a character with "darker" outlines than the center.

INLINE PROCEDURES *, in COBOL, the set of procedural instructions that are part of the main sequential and controlling flow of the program.

IN-LINE PROCESSING, same as (on-line).

IN-LINE SUBROUTINE, see (subroutine, in-line).

IN-PLANT SYSTEM, a data handling system confined to one building or a number of buildings in one locality.

INPUT *, (1) the data to be processed. (2) The state or sequence of states occurring on a specified input channel. (3) The device or collective set of devices used for bringing data into another device. (4) A channel for impressing a state on a device or logic element. (5) The process of transferring data from an external storage to an internal storage. (6) Pertaining to any entities such as are cited above.

INPUT (communications), (1) the current, voltage, power, or driving force applied to a circuit or device. (2) The terminals or other places where current, voltage, power or driving force may be applied to a circuit or device.

INPUT AREA, same as (block, input) (1).

INPUT BLOCK, see (block, input).

INPUT DEVICE, see (device, input).

INPUT EQUIPMENT, see (equipment, input).

INPUT, INHIBITING, a gate input which, if in its prescribed state, prevents any output which might otherwise occur.

INPUT MAGAZINE, see (magazine, input).

INPUT, MANUAL *, (1) the entry of data by hand into a device at the time of processing. (2) The data entered as in 1.

INPUT-OUTPUT, a general term for the equipment used to communicate with a computer and the data involved in the communication. Synonymous with (I/O).

INPUT-OUTPUT DEVICE (communications), any subscriber (user) equipment which introduces data into or extracts data from a data communications system.

INPUT-OUTPUT LIMITED, pertaining to a system or condition in which the time for input and output operation exceeds other operations.

INPUT ROUTINE, see (routine, input).

INPUT STACKER, same as (magazine, input).

INQUIRY, a technique whereby the interrogation of the contents of a computer's storage may be initiated at a keyboard.

INQUIRY STATION, see (station, inquiry).

INSERTION LOSS (OR GAIN), the loss due to the insertion of a quadripole between 2 impedances Ze (generator) and Zg (load) is the expression in transmission units of the ratio P1/P2 where P1 is the apparent power received by the load Zr before the insertion of the said quadripole, and P2 is the apparent power received by the load Zr after the insertion of the said quadripole. If the number thus obtained is negative, then there is an insertion gain.

INSIDE PLANT, in communication practice, inside plant is that part of the plant within a central office, intermediate station or subscriber's premises which is on the office or station side of the point of connection with the outside plant. Note: The plant in a central office is commonly referred to as central office plant and that on station premises as station plant.

INSTALLATION DATE, see (date, installation).

INSTANTS, SIGNIFICANT, see (significant instants).

INSTRUCTION *, a statement that specifies an operation and the values or locations of all operands. In this context, the term instruction is preferable to the terms command or order which are sometimes used as synonomous. Command should be reserved for electronic signals. Order should be reserved for sequence, interpolation, and related usage. Both command and order have important military applications. See (code) (2).

INSTRUCTION, ALPHANUMERIC, the name given to instructions which can be used equally well with alphabetic or numeric kinds of fields of data.

INSTRUCTION AREA, see (area, instruction).

INSTRUCTION, BRANCH, an instruction to a computer that enables the programmer to instruct the computer to choose between alternative sub-programs depending upon the conditions determined by the computer during the execution of the program. Synonymous with (transfer instruction).

INSTRUCTION, BREAKPOINT, (1) an instruction which will cause a computer to stop or to transfer control in some standard fashion to a supervisory routine which can monitor the progress of the interrupted program. (2) An instruction which, if some specified switch is set, will cause the computer to stop or take other special action.

INSTRUCTION, CHECK INDICATOR, an instruction which directs that a signal device which is turned on to call operators' attention to the fact that there is some discrepancy in the instruction now in use.

INSTRUCTION CODE, see (code, instruction).

INSTRUCTION, COMPUTER *, same as (instruction, machine).

INSTRUCTION, CONDITIONAL BREAKPOINT, a conditional jump instruction which, if some specified switch is set or situation exists, will cause the computer to stop; after which either the routine may be continued as coded, or a jump may be forced.

INSTRUCTION, CONSTANT, an instruction not intended to be executed as an instruction, written in the form of a constant. Related to (instruction, dummy).

INSTRUCTION, CONTROL, an instruction to the assembly program which directs some aspect of the assembly process.

INSTRUCTION COUNTER, see (counter, instruction).

INSTRUCTION, DECISION *, an instruction that effects the selection of a branch or a program, e.g., a conditional jump instruction.

INSTRUCTION, DUMMY, an artifical instruction or address inserted in a list to serve a purpose other than the execution as an instruction. Related to (instruction, constant).

INSTRUCTION, EXTRACT *, an instruction that requests the formation of a new expression from selected parts of given expressions.

INSTRUCTION, FOUR ADDRESS, a machine instruction usually consisting of the addresses of two operands, the address for storing the result, the address of the next instruction, the command to be executed, and miscellaneous indices. Synonymous with (three plus one address instruction).

INSTRUCTION, LOGICAL *, an instruction that carries out a logical operation, such as AND, OR, NOR.

INSTRUCTION, MACHINE *, an instruction that the particular machine can recognize and execute.

INSTRUCTION, MACRO *, an instruction that is replaced in a routine by a predetermined sequence of machine instructions,

INSTRUCTION, MICRO, a small, single, short, add, shift or delete type of command.

INSTRUCTION, MULTIPLE ADDRESS, an instruction consisting of an operation code and two or more addresses. Usually specified as a two-address, three-address, or four-address instruction.

INSTRUCTION, NO ADDRESS, an instruction specifying an operation which the computer can perform without having to refer to its storage unit.

INSTRUCTION, NO-OP, (1) an instruction which specifically instructs the computer to do nothing but process the next instruction in sequence. (2) A blank instruction. (3) A skip instruction. (4) A waste instruction. Synonymous with (waste instruction) and (skip).

INSTRUCTION, ONE ADDRESS, an instruction consisting of an operation and exactly one address. The instruction code of a signal address computer may include both zero- and multi-address instructions as special cases. Related to (address, one).

INSTRUCTION, ONE PLUS ONE ADDRESS, an instruction containing two or four addresses one of which specifies explicitly the location of the next instruction to be executed. It is usually used on computers whose storage has a latency factor; e.g., a drum computer.

INSTRUCTION, PSEUDO, (1) a symbolic representation in a compiler or interpreter. (2) A group of characters having the same general form as a computer instruction, but never executed by the computer as an actual instruction. Synonymous with (quasi instruction).

INSTRUCTION, QUASI, same as (instruction, pseudo).

INSTRUCTION REGISTER, same as (register, program).

INSTRUCTION REPERTORY, see (repertory, instruction).

INSTRUCTION, REPETITION *, an instruction whose execution is repeated an indicated number of times before the next instruction is processed.

INSTRUCTION, SKIP, an instruction having no effect other than directing the processor to proceed to another instruction designated in the storage portion. Synonymous with (skip) and (instruction, no-op) (3).

INSTRUCTION, SYMBOLIC, an instruction in an assembly language directly translatable into a machine code.

INSTRUCTION, THREE PLUS ONE ADDRESS, same as (instruction, four address).

INSTRUCTION TIME, see (time, instruction).

INSTRUCTION, TRANSFER, same as (instruction, branch).

INSTRUCTION, TWO, THREE OR FOUR ADDRESS, an instruction consisting of an operation and 2, 3, or 4 addresses respectively. The addresses may specify the location of operands, results, or other instructions.

INSTRUCTION, WASTE, same as (instruction, no-op) (4).

INSTRUCTION, ZERO ADDRESS, an instruction consisting of an operation which does not require the designation of an address in the usual sense; e.g., the instruction, "shift left 0003," has in its normal address position the amount of the shift desired.

INSTRUMENT, END, see (end instrument).

INTEGRATED DATA PROCESSING, see (processing, integrated data).

INTEGRATOR *, a device whose output function is proportional to the integral of the input function with respect to a specified variable, e.g., a watt-hour meter.

INTELLIGENCE, ARTIFICIAL *, the capability of a device to perform functions that are normally associated with human intelligence, such as reasoning, learning, self-improvement.

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.

INTERFACE, a common boundary between automatic data processing systems or parts of a single system. In communications and data systems, may involve code, format, speed, or other changes as required.

INTERFERENCE, the presence of undesirable energy in a circuit, caused by electrostatically or electromagnetically coupled external circuits.

INTERFERENCE, ADJACENT CHANNEL, see (adjacent channel interference).

INTERFIX, a technique which allows the relationships of key words in an item or document to be described so that very specific inquiries can be answered without false retrievals due to crosstalk.

INTERLACE, to assign successive storage locations; e.g., on a magnetic drum, usually for the purpose of reducing access time.

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.

INTERLOCK, to arrange the control of machines or devices so that their operation is interdependent in order to assure their proper coordination.

INTERLOCK (communications), any protective feature which helps to prevent interference to normal transmission or processing of data by other operations, such as sending from the keyboard while an automatic transmission is in progress, or to prevent sending more than one character at a time from the keyboard.

INTERLOCK CIRCUIT, the signal on this circuit originates in the signal converter and shall be in the "on" condition only when all the following conditions are met: a) That its internal switching circuits are arranged for signalling on a communication facility. b) That it is not in any abnormal or test condition which disables or impairs any normal function associated with the class of service being used.

INTERMEDIATE SUBCARRIER, a carrier which may be modulated by one or more subcarriers and which is used as a modulating wave to modulate a carrier.

INTERNAL ARITHMETIC, see (arithmetic, internal).

INTERNAL BIAS (TELETYPEWRITER), that bias, either marking or spacing, that may occur within a start-stop teletypewriter receiving mechanism and which will have the same effect on the margins of operation as bias external to the receiver.

INTERNAL MEMORY, same as (storage, internal).

INTERNAL STORAGE, see (storage, internal).

INTERNALLY STORED PROGRAM, see (program, internally stored).

INTERNATIONAL ALGEBRAIC LANGUAGE, see (language, international algebraic).

INTEROFFICE TRUNK, a direct trunk between local central offices in the same exchange.

INTERPRET, (1) to print on a punch card the information punched in that card. (2) To translate non-machine language into machine language instructions.

INTERPRETER *, (1) a program that translates and executes each souce language expression before translating and executing the next one. (2) A device that prints on a punched card the data already punched in the card.

INTERPRETING, the translation of punched holes in tape or cards into printed information on the same tape or card.

INTERPRETIVE CODE, same as (routine, interpretive).

INTERPRETIVE PROGRAMMING, see (programming, interpretive).

INTERPRETIVE ROUTINE, see (routine, interpretive).

INTER-RECORD GAP, see (gap, inter-record).

INTERRUPT, to temporarily disrupt the normal operation of a routine by a special signal from the computer. Usually the normal operation can be resumed from that point at a later time.

INTERRUPTED CONTINUOUS WAVES, continuous waves that are interrupted at a constant audio-frequency rate.

INTERSTAGE PUNCHING, see (punching, interstage).

INTERTOLL TRUNK (INTERTOLL OFFICE TRUNK), a trunk between toll offices in different telephone exchanges.

INTERVAL, SIGNIFICANT, a time interval during which a given significant condition according to the code and the signal to be transmitted is, or should be, transmitted.

INTERVAL, UNIT, in a system using an equal-length code, or in a system using an isochronous modulation, the interval of time such as the theoretical durations of the significant intervals of a telegraph modulation (or restitution) are whole multiples of this interval.

INTERVALS, MARKING AND SPACING, see (marking and spacing intervals).

INTRAFAX, Western Union leases closed-circuit facsimile systems called Intrafax to government, military and industrial users.

INVERSE (Basis), in linear programming, a reciprocal form of the basis which is more amenable to algebraic manipulation is called the inverse of the basis. To create the "inverse" one must invert the basis (usually performed by one of the Agenda in a linear programming software package).

INVERSE (Matrix), in matrix algebra, the inverse of a matrix is analogous to the reciprocal of a number in linear algebra. If the product of two matrices is I_3, each matrix is the inverse of the other.

INVERTER, a circuit which takes in a positive pulse and puts out a negative one, or takes in a negative pulse and puts out a positive one. The physical meaning of positive and negative depends on the specific circuit and the conventions established for it.

I/O *, an abbreviation for input/output. Synonomous with (input/output).

ISLE, CROSS, see (switching center, torn tape).

ISOCHRONOUS, having a regular periodicity.

ISOCHRONOUS MODULATION (OR RESTITUTION), modulation (or restitution) in which the time interval separating any two significant instants is theoretically equal to the unit interval or to a multiple of this.

ITEM, (1) a set of one or more fields containing related information. (2) A unit of correlated information relating to a single person or object. (3) The contents of a single message.

ITEM ADVANCE, see (advance, item).

ITEM DESIGN, see (design, item).

ITEM SIZE, see (size, item).

ITERATIVE, describing a procedure or process which repeatedly executes a series of operations until some condition is satisfied. An iterative procedure can be implemented by a loop in a routine.

ITERATIVE PROCESS, see (process, iterative).

J

JAM, CARD, a pile-up of cards in a machine.

JITTER, short time instability of a signal. The instability may be in either amplitude or phase, or both. The term is applied especially to signals reproduced on the screen of a cathode-ray tube. The term "tracking jitter" is used to describe minor variations in the pointing of an automatic tracking radar.

JOB-ORIENTED TERMINAL, see (terminal, job-oriented).

JUMP, same as (transfer) (5).

JUMP, CONDITIONAL, same as (transfer, conditional).

JUMP, UNCONDITIONAL, same as (transfer, unconditional).

K

KEY *, same as (label).

KEY, ACTUAL *, 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 medium.

KEYBOARD ENTRY, see (entry, keyboard).

KEYBOARD LOCKOUT, an interlock feature which prevents sending from the keyboard while the tape transmitter or another station is sending on the same circuit, to avoid breaking up the transmission by simultaneous sending.

KEYBOARD SEND/RECEIVE, see (KSR).

KEYING, ERROR RATE OF, see (error rate of keying).

KEYING, FREQUENCY SHIFT, see (frequency shift keying).

KEYPUNCH *, a keyboard-operated device that punches holes in a card to represent data. See (punch, card).

KEY-VERIFY, to use the punch card machine known as a verify, which has a keyboard, to make sure that the information supposed to be punched in a punch card has actually been properly punched. The machine signals when the punched hole and the depressed key disagree.

KILO, a prefix meaning one thousand.

KILOBAUDS, new and higher capacity data channels. For special applications, some data channels capable of 20 kilobauds have been placed in service.

KILOCYCLE, a thousand cycles per second, or 10^3 cycles per second. Clarified by (megacycle, gigacycle and teracycle).

KILOMEGA, a prefix meaning one billion e.g., a kilomegacycle means one billion cycles (same as billicycle and gigacycle) and a kilomegabit means one billion bits (same as billibit).

KSR, Keyboard Send-Receive set. A combination transmitter and receiver with transmission capability from keyboard only.

L

LABEL *, one or more characters used to identify an item of data.

LACING, extra multiple punching in a card column to signify the end of a specific card run. The term is derived from the lace work appearance of the card.

LAG *, the delay between two successive events.

LAG (communications), lag in a telegraph system is the time elapsing between the operation of the transmitting device and the response of the receiving device.

LAMP (Library Additions and Maintenance Program), Honeywell programs that maintain the library of subroutines and microroutines available through the ARGUS and EASY assembly systems.

LANGUAGE, a system for representing and communicating information or data between people, or between people and machines. Such a system consists of a carefully defined set of characters and rules for combining them into larger units, such as words or expressions, and rules for word arrangement or usage to achieve specific meanings.

LANGUAGE, ALGORITHMIC, an arithmetic language by which numerical procedures may be precisely presented to a computer in a standard form. The language is intended not only as a means of directly presenting any numerical procedure to any suitable computer for which a compiler exists, but also as a means of communicating numerical procedures among individuals. The language itself is the result of international cooperation to obtain a standardized algorithmic language. The International Algebraic Language is the forerunner of ALGOL. Synonymous with (ALGOL) and clarified by (language, international algebraic).

LANGUAGE, ARTIFICIAL, a language specifically designed for ease of communication in a particular area of endeavor, but one that is not yet natural to that area. This is contrasted with a natural language which has evolved through long usage.

LANGUAGE, ASSEMBLY, see (assembly language).

LANGUAGE, COMMON MACHINE, a machine sensible information representation which is common to a related group of data processing machines.

LANGUAGE, COMMON BUSINESS ORIENTED, a specific language by which business data processing procedures may be precisely described in a standard form. The language is intended not only as a means for directly presenting any business program to any suitable computer, for which a compiler exists, but also as a means of communicating such procedures among individuals. Synonymous with (COBOL).

LANGUAGE, INTERNATIONAL ALGEBRAIC, the forerunner of (ALGOL). Synonymous with (IAL) and clarified by (language, algorithmic).

LANGUAGE, MACHINE, same as (language, machine oriented), and related to (language, object).

LANGUAGE, MACHINE ORIENTED, (1) a language designed for interpretation and use by a machine without translation. (2) A system for expressing information which is intelligible to a specific machine; e.g., a computer or class of computers. Such a language may include instructions which define and direct machine operations, and information to be recorded by or acted upon by these machine operations. (3) The set of instructions expressed in the number system basic to a computer, together with symbolic operation codes with absolute addresses, relative addresses, or symbolic addresses. Synonymous with (language, machine); clarified by (language); related to (language, object); and contrasted with (language, problem oriented). (4) A programming language which is only one step removed from machine language. Assembly languages are referred to as machine-oriented because of the one-to-one relation between assembly instructions and machine instructions, and because of the degree to which the format of the machine instruction determines the format of the assembly instruction.

LANGUAGE, NATURAL *, a language whose rules reflect and describe current usage rather than prescribed usage.

LANGUAGE, OBJECT *, same as (language, target).

LANGUAGE, PROBLEM ORIENTED, (1) a language designed for convenience of program specification in a general problem area rather than for easy conversion to machine instruction code. The components of such a language may bear little resemblance to machine instructions. (2) A machine independent language where one needs only to state the problem, not the how of solution. Related to (generators, program) and contrasted with (language, procedure oriented).

LANGUAGE, PROCEDURE ORIENTED, a machine independent language which describes how the process of solving the problem is to be carried out; e.g., FORTRAN. Contrasted with (language, problem oriented).

LANGUAGE, PROGRAMMING *, a language used to prepare computer programs.

LANGUAGE, SOURCE *, a language that is an input to a given translation process.

LANGUAGE, TARGET *, a language that is an output from a given translation process.

LATENCY TIME, see (time, latency).

LEADER, (1) a record which precedes a group of detail records, giving information about the group not present in the detail records; e.g., beginning of batch 17. (2) An unused or blank length of tape at the beginning of a reel of tape preceding the start of the recorded data.

LEAPFROG TEST, see (test, leapfrog).

LEARNING, MACHINE *, the capability of a device to improve its performance based on its past performance.

LEASED LINES, LEASED CIRCUIT, a service category wherein the connections to separate points is permanently in existence for the duration of the contract.

LEAST SIGNIFICANT CHARACTER, the character in the rightmost position in a number or word.

LENGTH, BLOCK, the total number of records, words or characters contained in one block.

LENGTH, FIELD, the physical extent of a field. On a punch card it refers to the number of columns. On a tape it refers to bit positions.

LENGTH, PULSE, see (pulse length).

LENGTH, RECORD, the number of characters necessary to contain all the information in a record.

LENGTH, REGISTER, the number of digits, characters, or bits which a register can store.

LENGTH, WORD *, the number of bits or other characters in a word.

LETTER *, in an alphabet, a character used in the representation of sounds of a spoken language.

LETTERS CODE, in the Baudot code, the function which causes machines to shift to lower case. This code is used to "rub-out" errors in tape, as it is made up of intelligence pulses in each of the five channels, and causes receiving machines to print nothing.

LETTERS SHIFT, a function performed by a teleprinter, when initiated by the letters shift character, which causes the machine to shift from upper case to lower case.

LEVEL, AVERAGE EFFECTIVENESS, a percentage figure determined by subtracting to total computer down time from the total performance period hours, and dividing the difference by the total performance period hours. For this computation, equipment down time can be measured by those intervals during the performance period between the time that the contractor or other person having maintenance responsibility is notified of equipment failure, and the equipment is returned to the user in proper operating condition.

LEVEL, CIRCUIT NOISE, see (circuit noise level).

LEVEL, EIGHT, see (eight level).

LEVEL, FIVE, see (five level).

LEVEL, OVERLOAD, see (overload level).

LEVEL, POWER, see (power level).

LEVEL, REFERENCE, see (reference level).

LEVEL, RELATIVE TRANSMISSION, see (relative transmission level).

LEVEL, TRANSMISSION, see (transmission level).

LEVEL, VOLTAGE, see (voltage level).

LEVELS, see (channels).

LIBERATOR, the Honeywell 200 computer's hardware design concept which makes the basic instruction repertoire of the H-200 equivalent to the instruction repertoires of several other data processing systems. This allows users of numerous competitive systems to take advantage of the superior throughput and cost/performance characteristics of the H-200 without incurring the prohibitive costs of reprogramming.

LIBRARY, (1) a collection of information available to a computer, usually on magnetic tapes. (2) A file of magnetic tapes.

LIBRARY, PROGRAM *, a collection of available computer programs and routines.

LIBRARY, ROUTINE, a collection of standard proven routines and subroutines by which problems and parts of problems may be solved.

LIBRARY, SUBROUTINE, a set of standard and proven subroutines which is kept on file for use at any time.

LIGHT STABILITY *, in OCR, the resistance to change of color of the image when exposed to radiant energy.

LIMITER, a device which reduces the power of an electrical signal when it exceeds a specified value. The amount of reduction or compression increases with increase of the input power.

LINE, ACOUSTIC DELAY *, a delay line whose operation is based on the time of propagation of sound waves. Synonymous with (sonic delay line) and related to (line, mercury delay).

LINE, BALANCED, see (balanced line).

LINE CODE, see (code, line).

LINE, DELAY, a device capable of retarding a pulse of energy between input and output, based on the properties of materials, or circuit parameters or mechanical devices. Examples of delay lines are material media such as mercury, in which sonic patterns may be propagated in time; lumped constant electrical lines; coaxial cables, transmission lines and recirculating magnetic drum loops. Related to (line, magnetic delay).

LINE, ELECTRIC DELAY, a delay line using properties of lumped or distributed capacitive and inductive elements.

LINE, ELECTROMAGNETIC DELAY *, a delay line whose operation is based on the time of propagation of electromagnetic waves through distributed or lumped capitance and inductance.

LINE FEED CODE, a function code which causes page teleprinters or similar devices to rotate the platen up one line.

LINE FINDER, in telegraphic terminology, a piece of switching appartus which electromechanically seeks an idle circuit to a given destination from among all of the circuits to that destination.

LINE FINDER, in data processing terminology, an electromechanical device, attached to the platen of a printer, which automatically line-feeds it to a predetermined line on a printed form. Similar to VERTICAL TABULATION in telegraphic terminology. "Line Switching" sometimes called "toll" service, is a means of connecting each call between sender and receiver utilizing telephone company switching facilities.

LINE, HIT ON THE see (hit on the line).

LINE, INDIVIDUAL, see (individual line).

LINE, MAGNETIC DELAY *, a delay line whose operation is based on the time of propogation of magnetic waves. Related to (line, delay).

LINE, MAGNETOSTRICTIVE DELAY, a delay line which utilizes the physical principle of magnetostriction. Clarified by (magnetostriction).

LINE, MERCURY DELAY, a sonic or acoustic delay line in which mercury is used as the medium of sound transmission, with transducers on each end to permit conversion to and from electrical energy. Related to (line, acoustic delay).

LINE NOISE, noise originating in a transmission line.

LINE PRINTER, see (printer, line).

LINE, PRIVATE, see (private leased line, private line).

LINE SIDE, data terminal connections to a communications circuit between two data terminals.

LINE, SONIC DELAY *, same as (line, acoustic delay).

LINE, SUBSCRIBER, a telephone line between a central office and a telephone station, private branch exchange, or other end equipment.

LINE SWITCHING, see (switching, circuit).

LINE, TELEPHONE, see (telephone line).

LINE, TIE, see (tie line).

LINEAR PROGRAMMING, see (programming, linear).

LINES, LEASED, see (leased lines, leased circuit).

LINK, a Honeywell program that controls the input/output activities of the H-200 computer when it is performing as an on-line subsidiary to the larger Honeywell 800 or 1800 computers.

LINK, (TRANSMISSION), a section of a channel (or circuit) between (a) a transmitting station and the following telegraph repeater; (b) two successive telegraph repeaters; (c) a receiving station and the preceding telegraph repeater.

LINK, COMMUNICATION *, the physical means of connecting one location to another for the purpose of transmitting information.

LINK, DATA, see (data link).

LINK GROUP, consists of those links which employ the same multiplex terminal equipments.

LINK, RADIO, see (radio link).

LINKAGE *, in programming, coding that connects two separately coded routines.

LINKED SUBROUTINE, same as (subroutine, closed).

LIST, ASSEMBLY, a printed list which is the by-product of an assembly procedure. It lists in logical instruction sequence all details of a routine showing the coded and symbolic notation next to the actual notations established by the assembly procedure. This listing is highly useful in the debugging of a routine.

LIST, PUSH-DOWN *, a list that is constructed and maintained so that the next item to be retrieved is the most recently stored item in the list, i.e., last in, first out.

LIST, PUSH-UP, 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, i.e., first in, first out.

LOAD, (1) to put data into a register or storage. (2) To put a magnetic tape onto a tape drive, or to put cards into a card reader.

LOAD-AND-GO *, an operating technique in which there are no stops between the loading and execution phase of a program, and which may include assembly or compilation.

LOAD POINT, see (point, load).

LOADING ROUTINE, see (routine, loading).

LOCAL LOOP, see (subscriber station).

LOCAL SIDE, data terminal connections to input-output devices.

LOCATION, a storage position in the main internal storage which can store one computer word and which is usually identified by an address.

LOCATION, BIT, a storage position on a record capable of storing one bit.

LOCATION COUNTER, see (counter, location).

LOCATIONS, PROTECTED *, locations reserved for special purposes, and in which data cannot be stored without undergoing a screening procedure to establish suitability for storage therein.

LOCKOUT, KEYBOARD, see (keyboard lockout).

LOG, a record of everything pertinent to a machine run including: identification of the machine run, record of alteration switch settings, identification of input and output tapes, copy of manual key-ins, identification of all stops, and a record of action taken on all stops.

LOGGER, a device which automatically records physical processes and events, usually chronologically.

LOGIC, (1) the science dealing with the criteria or formal principles of reasoning and thought. (2) The systematic scheme which defines the interactions of signals in the design of an automatic data processing system. (3) The basic principles and application of truth tables and interconnection between logical elements required for arithmetic computation in an automatic data processing system. Related to (logic, symbolic).

LOGIC, FORMAL *, the discipline that investigates the structure of propositions and of deductive reasoning by methods that abstract from the content of the propositions under consideration and deal only with their logical form.

LOGIC, MATHEMATICAL, same as (logic, symbolic).

LOGIC, SYMBOLIC *, 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. Advantages of the symbolic method are greater exactness of formulation, and power to deal with more complex material. Synonymous with (mathematical logic) and related to (logic).

LOGICAL CONNECTIVES, see (connectives, logical).

LOGICAL DECISION, see (decision, logical).

LOGICAL DESIGN, see (design, logic).

LOGICAL DIAGRAM, see (diagram, logic).

LOGICAL DIFFERENCE, see (difference, logical).

LOGICAL ELEMENT, see (element, logical).

LOGICAL FLOW CHART, see (chart, logical flow).

LOGICAL MULTIPLY, same as (operator, and).

LOGICAL OPERATION, see (operation, logical).

LOGICAL OPERATOR, same as (operator) (1).

LOGICAL SHIFT, same as (shift, cyclic).

LOGICAL SUM, see (sum, logical).

LOGICAL SYMBOL, see (symbol, logic).

LONGITUDINAL CHECK, a system of error-control based on the check that some preset rules for the formation of the group of bits in the same numerical order in all the character signals in a block are observed.

LONGITUDINAL CIRCUIT, a circuit formed by one telephone wire (or by two or more telephone wires in parallel) with return through the earth or through any other conductors except those which are taken with the original wire or wires to form a metallic telephone circuit.

LOOK UP TABLE, same as (table), and not to be confused with the verb form (table look up).

LOOP *, (1) a sequence of instructions that is repeated until a terminal condition prevails. (2) A communications circuit between two private subscribers or between a subscriber and the local switching center.

LOOP CHECKING, 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, which are stored there for this purpose.

LOOP, CLOSED, pertaining to a system with feedback type of control, such that the output is used to modify the input.

LOOP, OPEN, pertaining to a control system in which there is no self correcting action for misses of the desired operational condition, as there is in a closed loop system.

LOOP, RAPID ACCESS, a small section of storage, particularly in drum, tape or disk storage units, which has much faster access than the remainder of the storage. Synonymous with (revolver).

LOSS, INSERTION, see (insertion loss (or gain)).

LOSS, OVERALL, see (overall loss).

LOSS, TRANSMISSION, a general term used to denote a decrease in signal power in transmission from one point to another. Transmission loss is usually expressed in transmission units.

LOW-ORDER, pertaining to the weight or significance assigned to the digits of a number; e.g., in the number 123456, the

low order digit is six. One may refer to the three low-order bits of a binary word, as another example. Clarified by (order) (3).

LOW-ORDER POSITION, the rightmost position in a number or word.

LOW PERFORMANCE EQUIPMENTS, those equipments having insufficiently exacting characteristics to permit their use in trunk or link circuits. Such equipment may be employed in subscriber line circuits whenever it meets the line circuit requirements.

LPM, Lines Per Minute.

M

MACHINE, ACCOUNTING *, (1) a keyboard 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. Same as (tabulator).

MACHINE ADDRESS, see (address, machine).

MACHINE CHECK INDICATOR, see (indicator, machine check).

MACHINE CODE, same as (code, computer) (1).

MACHINE, DATA PROCESSING, a general name for a machine which can store and process numeric and alphabetic information. Related to (computer, analog; computer, digital); and (equipment, automatic data processing).

MACHINE, ELECTRICAL ACCOUNTING, the set of conventional punch card equipment including sorters, collators and tabulators. Synonymous with (EAM) and clarified by (equipment, tabulating).

MACHINE, ELECTRONIC DATA PROCESSING, same as (equipment, automatic data processing).

MACHINE ERROR, see (error, machine).

MACHINE LANGUAGE, see (language, machine).

MACHINE LANGUAGE CODE, see (code, machine language).

MACHINE OPERATOR, see (operator, machine).

MACHINE ORIENTED LANGUAGE, see (language, machine oriented).

MACHINE RUN, see (run, machine).

MACHINE, SELF ORGANIZING, a class of machines which may be characterized loosely as containing a variable network in which the elements are organized by the machine itself, without external intervention, to meet criteria of successful operation. Synonymous with (self organizing machine).

MACHINE-SENSIBLE, pertaining to information in a form which can be read by a specific machine.

MACHINE TRANSLATION, see (translation, machine).

MACHINE, TURING *, a mathematical model of a device that operates to read from, write on, and move an infinite tape, thereby constituting a model for computer-like behavior. The behavior of a turing machine is specified by a tape alphabet, a set of internal states, and a mapping of the alphabet and the internal states.

MACHINE WORD, see (word, machine).

MACRO INSTRUCTION, see (instruction, macro).

MAGAZINE, INPUT, the card-feed magazine in a reader, or read-punch unit. Synonymous with (input stacker).

MAGAZINE, OUTPUT, a mechanism that accumulates cards after they have passed through a machine. Synonymous with (output stacker).

MAGNETIC CORE STORAGE, see (storage, magnetic core).

MAGNETIC DELAY LINE, see (line, magnetic delay).

MAGNETIC DISK, see (disk, magnetic).

MAGNETIC DISK STORAGE, see (storage, magnetic disk).

MAGNETIC DRUM, see (drum, magnetic).

MAGNETIC DRUM STORAGE, see (storage, magnetic drum).

MAGNETIC INK *, an ink that contains particles of a magnetic substance whose presence can be detected by magnetic sensors.

MAGNETIC SHIFT REGISTER, see (register, magnetic shift).

MAGNETIC STORAGE, see (storage, magnetic).

MAGNETIC TAPE, see (tape, magnetic).

MAGNETIC TAPE READER, see (reader, magnetic tape).

MAGNETIC TAPE STORAGE, see (storage, magnetic tape).

MAGNETIC TAPE UNIT, see (unit, magnetic tape).

MAGNETIC THIN-FILM *, a layer of magnetic material, usually less than 1(one) micron thick. Magnetic thin films may be used for logic or storage elements.

MAGNETIC WIRE, see (wire, magnetic).

MAGNETOSTRICTION, a phenomenon wherein certain materials increase in length in the direction of the magnetic field when subjected to such a field, and restore to their original length when demagnetized.

MAGNETOSTRICTIVE DELAY LINE, see (line, magnetostrictive delay).

MAIN FRAME, see (frame, main).

MAIN STORAGE, see (storage, main).

MAINTENANCE *, tests, measurements, replacements, adjustments, and repairs intended to keep equipment or programs in satisfactory working order.

MANAGEMENT INFORMATION SYSTEM, see (system, management information).

MAINTENANCE, FILE, the periodic modification of a file to incorporate changes which occurred during a given period.

MAINTENANCE, PREVENTIVE, the maintenance of a computer system which attempts to keep equipment in top operating condition and to preclude failures during production runs.

MAINTENANCE, REMEDIAL, the maintenance performed by the contractor following equipment failure; therefore, is performed as required, on an unscheduled basis.

MAJOR CYCLE, see (cycle, major).

MAJORITY *, a logical 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 and only if more than half the statements are true, false if half or less are true.

MAKE-BREAK OPERATION, a type of telegraph circuit operation where the flow of current is interrupted as pulses are transmitted.

MALFUNCTION, a failure in the operation of the hardware of a computer.

MALFUNCTION, PROGRAM SENSITIVE, a malfunction which occurs only when some unusual combination of program steps occur.

MALFUNCTION ROUTINE, same as (routine, diagnostic).

MANIPULATED VARIABLE, see (variable, manipulated).

MANUAL CONTROL, see (control, manual).

MANUAL EXCHANGE, see (exchange, manual).

MAP, to transform information from one form to another..

MARGIN, of a telegraph apparatus (or the local end with its termination). The maximum degree of distortion of the circuit (at the end of which the apparatus is situated) which is compatible with the correct translation of all signals which it may possibly receive.

MARGIN, RECEIVING, see (receiving margin).

MARGINAL CHECK, see (check, marginal).

MARGINAL TEST, same as (check, marginal).

MARK, a sign or symbol used to signify or indicate an event in time or space; e.g., end of word or message mark, a file mark, a drum mark, an end of tape mark.

MARK (communications), an impulse which, in a neutral circuit, causes the loop to be closed; or in a polar circuit, causes the loop current to flow in a direction opposite to that for a space impulse.

MARK, DRUM, a character used to signify the end of a record on a drum.

MARK, END, an indicator to signal the end of a word or the end of a unit of data.

MARK, GROUP, a special character used to designate the end of a record in storage for a write instruction.

MARK-HOLD, the normal no-traffic line condition whereby a steady mark is transmitted.

MARK, RECORD, a special character used in some computers either to limit the number of characters in a data transfer, or to separate blocked or grouped records in tape.

MARK, RECORD STORAGE, a special character which appears only in the record storage unit of the card reader to limit the length of the record read into storage.

MARK, SEGMENT, a special character written on tape to separate one section of a tape file from another.

MARK SENSING, see (sensing, mark).

MARK-TO-SPACE TRANSITION, the transition, or switching, from a marking impulse to a spacing impulse.

MARK, STORAGE, the name given to a point location which defines the character space immediately to the left of the most significant character in accumulator storage. An example would be:

a	7	4	6	7	4	8	9

in which the letter "a" would be the storage mark.

MARK, TAPE, the special character that is written on tape to signify the physical end of the recording on tape.

MARKING, the "idle" condition on a telegraph circuit where the circuit is closed but no transmission is taking place. This condition also exists when transmission is taking place and a bit of intelligence corresponding to a "yes" is being sent. Marking is the normal information condition.

MARKING BIAS, bias distortion which lengthens the marking impulse by advancing the space-to-mark transition.

MARKING END DISTORTION, end distortion which lengthens the marking impulse by delaying the mark-to-space transition.

MARKING AND SPACING INTERVALS, in telegraph communication, marking intervals are the intervals which correspond, according to convention, to one condition or position of the originating transmitting contracts, usually a closed condition; spacing intervals are the intervals which correspond to another condition of the originating transmitting contracts, usually an open condition.

MASK *, same as (filter) (1).

MASKING, (1) the process of extracting a non-word group or a field of characters from a word or a string of words. (2) The process of setting internal program controls to prevent transfers which otherwise would occur upon setting of internal machine latches.

MASTER CARD, see (card, master).

MASTER CONTROL, see (control, master).

MASTER DATA, see (data, master).

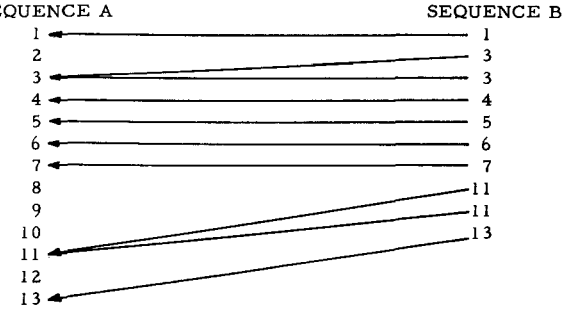
MASTER FILE, see (file, master).

MASTER INSTRUCTION TAPE, see (tape, master instruction).

MASTER PROGRAM FILE, see (tape, master instruction).

MASTER REFERENCE SYSTEM FOR TELEPHONE TRANSMISSIO' the Master Reference System for Telephone Transmission, adopted by the International Advisory Committee for Long Distance Telephone (CCIF), is a primary reference telephone system for determining by comparison the performance of other telephone systems and components with respect to the loudness, articulation or other transmission qualities of received speech. The determination is made by adjusting the loss of a distortionless trunk in the master reference system for equal performance with respect to the quality under consideration.

MATCH, a data processing operation similar to a merge, except that instead of producing a sequence of items made up from the input, sequences are matched against each other on the basis of some key. The following is a schematic of a two-item match:



MATHEMATICAL CHECK, see (check, mathematical).

MATHEMATICAL LOGIC, same as (logic, symbolic).

MATHEMATICAL MODEL, see (model, mathematical).

MATRIX, (1) an array of quantities in a prescribed form; in mathematics, usually capable of being subject to a mathematical operation by means of an operator or another matrix according to prescribed rules. (2) An array of coupled circuit elements; e.g., diodes, wires, magnetic cores, and relays, which are capable of performing a specific function; such as, the conversion from one numerical system to another. The elements are usually arranged in rows and columns. Thus a matrix is a particular type of encoder or decoder. Clarified by (encoder) and (decoder).

MATRIX, A- (A-MATRIX), in linear programming, the matrix containing the coefficients of the terms in the set of simultaneous linear constraints (after the constraints have been normalized).

MATRIX, IDENTITY, in linear programming, the identity matrix is a square matrix whose principal diagonal (elements running from upper left corner to lower right corner) is composed only of ones and all other elements are zero; e.g., an identity matrix is illustrated:

$$I_4 = \begin{matrix} 1\ 0\ 0\ 0 \\ 0\ 1\ 0\ 0 \\ 0\ 0\ 1\ 0 \\ 0\ 0\ 0\ 1 \end{matrix}$$

MATRIX PRINTER, same as (printer, wire).

MATRIX, SEMANTIC, a graphical device for plotting in a standard conventional form whatever precise elements of meaning have been ascertained from the semantic analysis of a concept.

MATRIX, TECHNOLOGY, in linear programming, the technology matrix is the set of input/output coefficients in the original problem, excluding the coefficients in the cost rows and the elements of the right-hand side. Often, each element specifies the number of units of the resource consumed by one unit of the activity. The levels of the activities determine the number of units of resources consumed. Thus, the elements are constants of proportionality or between the activities and resources. Usually, these ratios are a direct function of technology.

MEASURE, DATA TRANSMISSION UTILIZATION, see (data transmission utilization measure).

MECHANICAL DIFFERENTIAL ANALYZER, see (analyzer, mechanical differential).

MECHANICAL REPLACEMENT, see (replacement, mechanical).

MECHANICAL TRANSLATION, see (translation, mechanical).

MEDIUM *, the material or configuration thereof on which data is recorded, e.g., paper tape, cards, magnetic tape, etc.

MEGA, a prefix meaning million.

MEGABIT, one million binary bits.

MEGACYCLE, a million cycles per second, 10^6 cycles per second.

MEMORY, in the Honeywell systems, the high-speed magnetic core internal storage unit contained within the central processor. See (storage).

MEMORY CAPACITY, same as (capacity, storage).

MEMORY CYCLE, (1) the process of reading and restoring information in magnetic core memory. (2) The time required to complete this process.

MEMORY DUMP, same as (dump).

MEMORY, DYNAMIC, same as (storage, dynamic).

MEMORY, EXTERNAL, same as (storage, external).

MEMORY, INTERNAL, same as (storage, internal).

MEMORY PRINT-OUT, same as (dump).

MEMORY, RANDOM ACCESS, same as (storage, random access).

MEMORY REGISTER, same as (register, storage).

MERCURY DELAY LINE, see (line, mercury delay).

MERCURY STORAGE, see (storage, mercury).

MERCURY TANK, see (tank, mercury).

MERGE, to combine items into one sequenced file from two or more similarly sequenced files without changing the order of the items.

MESSAGE, (1) a group of words, variable in length, transported as a unit. (2) A transported item of information.

MESSAGE (communications), a transmitted series of words or symbols intended to convey information. As used in message switching, a message consists of header, text and an end of message.

MESSAGE, AUTOMATIC, see (switching center).

MESSAGE EXCHANGE, see (exchange, message).

MESSAGE FEEDBACK, see (loop checking).

MESSAGE, FOX, see (fox message).

MESSAGE, MULTIPLE ADDRESS, a message which is to be delivered to more than one destination.

MESSAGE ROUTING, see (routing, message).

MESSAGE, SEMIAUTOMATIC, see (switching center).

MESSAGE, SINGLE ADDRESS, a message which is to be delivered to only one destination.

MESSAGE SWITCHING, a system in which data transmissions between stations on different circuits within a network is accomplished by routing the data through a central point. See (store and forward).

METHOD, MONTE CARLO, a trial and error method of repeated calculations to discover the best solution of a problem. Often used when a great number of variables are present, with inter-relationships so extremely complex as to forestall straightforward analytical handling.

MICR (Magnetic Ink Character Recognition), a check-encoding system employed by banks for the purpose of automating check handling. Checks are imprinted (using magnetic ink) with characters of a type face and dimensions specified by the American Banking Association. There are fourteen characters - ten numbers (0-9) and four special symbols - which are used to provide amount, identifying and control information.

MICRO CODE, see (code, micro).

MICRO INSTRUCTION, see (instruction, micro).

MICRO PROGRAMMING, see (programming, micro).

MICROPROGRAM, (1) a program of analytic instructions which the programmer intends to construct from the basic subcommands of a digital computer. (2) A sequence of pseudo commands which will be translated by hardware into machine subcommands. (3) A means of building various analytic instructions as needed from the subcommand structure of a computer. (4) A plan for obtaining maximum utilization of the abilities of a digital computer by efficient use of the subcommands of the machine.

MICROSECOND, one millionth of a second, 10^{-6} seconds, abbreviated microsec.

MICROWAVE, an electromagnetic wave in the super-high frequency radio spectrum ranging from 1,000 to 300,000 megacycles per second.

MILLIMICROSECOND, same as (nanosecond).

MILLISECOND, one thousandth of a second, 10^{-3} seconds, abbreviated msec. or ms.

MINIMUM ACCESS CODE, see (code, minimum access).

MINIMUM ACCESS PROGRAMMING, see (programming, minimum access).

MINIMUM ACCESS ROUTINE, see (routine, minimum access).

MINIMUM DISTANCE CODE *, a binary code in which the signal distance does not fall below a specified minimum value.

MINIMUM LATENCY CODE, same as (code, minimum access).

MINIMUM LATENCY PROGRAMMING, same as (programming, minimum access).

MINIMUM LATENCY ROUTINE, same as (routine, minimum access).

MINOR CYCLE, see (cycle, minor).

MINUEND, the quantity from which another quantity is subtracted or is to be subtracted.

MINUS ZONE, see (zone, minus).

MISTAKE, a human failing; e.g., faulty arithmetic, use of incorrect formula, or incorrect instructions. Mistakes are sometimes called gross errors to distinguish from rounding and truncation errors. Thus, computers malfunction and humans make mistakes. Computers do not make mistakes and humans do not malfunction, in the strict sense of the word. Contrasted with (error) (2).

MIT, Master Instruction Tape, see (tape, master instruction).

MIXED BASE NOTATION, same as (notation, mixed radix).

MIXED BASE NUMBER, same as (number, mixed radix).

MIXED RADIX NOTATION, see (notation, mixed radix).

MIXED RADIX NUMBER, see (number, mixed radix).

MNEMONIC, pertaining to the assisting, or intending to assist, human memory; thus a mnemonic term, usually an abbreviation, that is easy to remember; e.g., mpy for multiply and acc for accumulator.

MNEMONIC OPERATION CODE, see (code, mnemonic operation).

MOD/DEMOD, abbreviated form for modulating and demodulating units.

MODE, (1) a computer system of data representation; e.g., the binary mode. (2) A selected mode of computer opera-

tion. (3) A method of card reading and punching. There are two: (a) the normal mode, which reads and punches the Hollerith code; i.e., it interprets each column as a six-bit alphanumeric character, and (b) the transcription mode, which interprets each punch as a binary one and each non-punch as a binary zero.

MODE, NOISY, a floating point arithmetic procedure associated with normalization in which "1" bits, rather than "0" bits, are introduced in the low order bit position during the left shift.

MODEL, MATHEMATICAL *, a mathematical representation that simulates the behavior of a process, device or concept.

MODEM, contraction of modulator-demodulator. A device to convert one form of signal to another form for equipment compatibility.

MODIFIER, a quantity used to alter the normal interpretation and execution of an instruction; e.g., an index tag or indirect address tag.

MODIFY, (1) to alter a portion of an instruction so its interpretation and execution will be other than normal. The modification may permanently change the instruction or leave it unchanged and affect only the current execution. The most frequent modification is that of the effective address through use of index registers. (2) To alter a subroutine according to a defined parameter.

MODULATION, the process by which some characteristic of one wave is varied in accordance with another wave. This technique is used to make business machine signals compatible with communications facilities.

MODULATION, AMPLITUDE (AM), the form of modulation in which the amplitude of the carrier is varied in accordance with the amplitude of the original signal.

MODULATION, ANGLE, modulation in which the angle of a sine wave carrier is the characteristic varied. Phase and frequency modulation are particular forms of angle modulation.

MODULATION CODE, see (code, modulation).

MODULATION, COHERENCE, modulation in which the succession of significant instants is simply related to the characteristics of the current transmitted to line. Example: Modulation obtained by reversing the phase of a carrier when the current passes through zero.

MODULATION, CROSS, a type of intermodulation due to modulation of the carrier of the desired signal by an undesired wave.

MODULATION, DIFFERENTIAL, see (differential modulation).

MODULATION, DOUBLE, modulation of one wave by another which is itself modulated.

MODULATION FACTOR, the modulation factor expressed as a percentage. The modulation factor in the case of a sine wave is the ratio of half the difference of the maximum and the minimum amplitude to the mean amplitude of the wave.

MODULATION WITH A FIXED REFERENCE, a type of modulation in which the choice of the significant condition for any signal element is based on a fixed reference.

MODULATION, FREQUENCY, varying the frequency of a carrier of fixed amplitude above and below the normal carrier frequency in accordance with the amplitude variations of an applied signal voltage.

MODULATION, HIGH-LEVEL, modulation produced at a point in a system where the power level approximates that at the output of the system.

MODULATION INDEX, of a frequency modulated wave. The ratio of the frequency deviation to the maximum modulation frequency.

MODULATION, ISOCHRONOUS, see (isochronous modulation).

MODULATION, LOW-LEVEL, modulation produced at a point in a system where the power level is low compared with the power level at the output of the system.

MODULATION, MULTIPLE (COMPOUND MODULATION), multiple modulation is a succession of processes of modulation wave from one process becomes the modulating wave for the next. Note: In designating multiple modulation systems by letter symbols, the processes are listed in the order in which the signal intelligence encounters them. For example, PPM-AM means a system in which one or more signals are used to position-modulate their respective pulse subcarriers which are spaced in time and are used to amplitude-modulate a carrer.

MODULATION, PHASE, variation of frequency modulation. A varying of the carrier frequency by a signal with the maximum deviation at the point of maximum phase angle. A constant amplitude.

MODULATION, PULSE-AMPLITUDE, amplitude modulation of a pulse carrier.

MODULATION, PULSE CODE, the form of modulation in which the modulating signal is sampled, and the sample quantized and coded so that each element of information consists of different kinds and/or numbers of pulses and spaces.

MODULATION, PULSE-CODE, modulation of a pulse train in accordance with a code.

MODULATION, (PULSE-WIDTH MODULATION) (PULSE-LENGTH MODULATION), a form of pulse-time modulation in which the durations of pulses are varied.

MODULATION, PULSE FREQUENCY, the form of modulation in which the pulse repetition frequency of the carrier is varied in accordance with successive samples of the modulating signal.

MODULATION, PULSE LENGTH, see (pulse length modulation).

MODULATION, PULSE POSITION, a form of pulse-time modulation in which the positions in time pulses are varied, without modifying their duration.

MODULATION, PULSE-TIME, modulation in which the time of occurrence of some characteristic of a pulse carrier is varied from the unmodulated value. (This includes pulse-position and pulse-duration or pulse-width modulation).

MODULATION, SIGNIFICANT CONDITIONS OF, see (significant conditions of a modulation).

MODULATION, SINGLE SIDEBAND, modulation whereby the spectrum of the modulating wave is translated in frequency by a specified amount, either with or without inversion.

MODULATION, TWO-PHASE, see (two-phase modulation).

MODULATOR, a device which varies a repetitive phenomenon in accordance with some predetermined scheme usually introduced as a signal. Clarified by (code, modulation and demodulator).

MODULE, (1) an interchangeable plug-in item containing components. (2) An incremental block of storage or other building block for expanding the computer capacity.

MODULO N CHECK, see (check, modulo N).

MONITOR, to supervise and verify the correct operation of a program during its execution, usually by means of a diagnostic routine used from time to time to answer questions about the program.

MONITOR ROUTINE, same as (routine, executive).

MONITOR SYSTEM, same as (system, operating).

MONITORING (communications), monitoring is observation of the characteristics of transmitted signals.

MONOSTABLE *, pertaining to a device which has one stable state.

MONTE CARLO METHOD, see (method, monte carlo).

MOST SIGNIFICANT CHARACTER, the character in the left-most position in a number or word.

MRT (Master Relocatable Tape), a Honeywell routine that contains checked-out programs to be scheduled by Executive for production operation.

MULTI-ADDRESS, same as (address, multiple).

MULTI-ASPECT, pertaining to searches or systems which permit more than one aspect, or facet, of information to be used in combination, one with the other to effect identifying and selecting operations.

MULTILEVEL ADDRESS *, see Address, Multilevel

MULTI-PRECISION ARITHMETIC, see (arithmetic, multi-precision).

MULTI-STATION, any network of stations capable of communication with each other, whether on one circuit or through a switching center.

MULTI-TONE CIRCUIT, a telegraph transmission system in which it is necessary to use two or more channels simultaneously in the same direction for transmitting a signal between the same two points.

MULTIPLE, a system of wiring so arranged that a circuit, a line, or a group of lines are accessible at a number of points, to any one of which a connection can be made.

MULTIPLE ADDRESS, same as (address, multiple).

MULTIPLE ADDRESS CODE, see (code, multiple address).

MULTIPLE ADDRESS INSTRUCTION, see (instruction, multiple address).

MULTIPLE ADDRESS MESSAGE, see (message, multiple address).

MULTIPLE LENGTH NUMBER, see (number, multiple length).

MULTIPLE PROGRAMMING, see (programming, multiple).

MULTIPLE PUNCHING, see (punching, multiple).

MULTIPLEX, the process of transferring data from several storage devices operating at relatively low transfer rates to one storage device operating at a high transfer rate in such a manner that the high-speed device is not obliged to wait for the low-speed devices.

MULTIPLEX DATA TERMINAL, a device which modulates and/or demodulates data between two or more input-output devices and a data transmission link.

MULTIPLEX, FREQUENCY-DIVISION, see (frequency-division multiplex).

MULTIPLEX, MULTICHANNEL, use of a common channel in order to make two or more channels, either by splitting of the frequency band transmitted by the common channel into narrower bands, each of which is used to constitute a distinct channel (frequency-division multiplex), or by allotting this common channel in turn, to constitute different intermittent channels (time-division multiplex).

MULTIPLEX, TIME DIVISION, see (time division multiplex).

MULTIPLEXING *, the interleaved or simultaneous transmission of two or more messages for a single channel.

MULTIPLICATION TIME, see (time, multiplication).

MULTIPLY, LOGICAL, same as (operator, and).

MULTIPOINT, see (circuit, multipoint).

MULTIPROCESSING *, pertaining to the simultaneous or interleaved execution of two or more programs or sequences of instructions by a computer or computer network; may be accomplished by multiprogramming, parallel processing, or both.

MULTIPROCESSOR *, (1) A machine with multiple arithmetic and logic units for simultaneous use. (2) A computer capable of multiprocessing.

MULTIPROGRAMMING *, the interleaved or simultaneous execution of two or more programs by a single computer.

N

N-LEVEL ADDRESS *, a multilevel address that specifies N levels of addressing.

NAND *, a logical 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 and only if at least one statement is false, false if and only if all statements are true.

NANOSECOND, billionth of a second, 10^{-9} seconds. Synonymous with (millimicrosecond).

NEGATION *, the "not" logical operation.

NEST, (1) to embed a subroutine or block of data into a larger routine or block of data. (2) To evaluate an nth degree polynomial by a particular algorithm which uses (n-1) multiply operations and (n-1) add operations in succession.

NET CONTROL STATION, a station on a network which coordinates the use of the network (or circuit) by all of the stations on the net.

NETWORK, the interconnection of a number of points by communications facilities.

NETWORK, ANALOG, a circuit or circuits which represent(s) physical variables in such a manner as to permit the expression and solution of mathematical relationships between the variables or permits the solution directly by electric or electronic means.

NETWORK ANALYZER, see (analyzer, network).

NETWORK CALCULATOR, same as (analyzer, network).

NETWORK, LEASED LINE OR PRIVATE WIRE, a series of points interconnected by telegraph or telephone channels, and reserved for the exclusive use of one customer.

NETWORK, PRIVATE TELEGRAPH, a system of points interconnected by leased telegraph channels and providing hard-copy and/or five-track punched paper tape at both sending and receiving points.

NETWORK, PRIVATE TELEPHONE, a series of points interconnected by leased voice-grade telephone lines, with switching facilities or exchange operated by the customer.

NETWORK, SWITCHED MESSAGE, see (switched message network.

NEUTRAL CIRCUIT, a teletypewriter circuit in which current flows in only one direction. The circuit is closed during the marking condition and open during the spacing condition.

NEUTRAL ZONE, see (zone, neutral).

NEW SYNC, allows for a rapid transition from one transmitter to another on multipoint private line data networks.

NINETY (90) COLUMN CARD, see (card, ninety (90) column).

NO ADDRESS INSTRUCTION, see (instruction, no address).

NO CHARGE MACHINE FAULT TIME, see (time, no charge machine fault).

NO CHARGE NON MACHINE FAULT TIME, see (time, no charge non machine fault).

NOISE *, (1) random variations of one or more characteristics of any entity such as voltage, current, and data. (2) Loosely, any disturbance tending to interfere with the normal operation of a device or system.

NOISE (communications), disturbing electrical impulses within the audio range, introduced in a circuit by equipment components, man's interference or natural disturbance.

NOISE, BROADBAND (WHITE), the thermal noise which is uniformly distributed across the frequency spectrum at a wide range of energy levels.

NOISE, CARRIER see (carrier noise).

NOISE, IMPULSE, a pulse appearing at the output of a circuit which was not transmitted from the originating input to the circuit. These pulses usually are induced from circuit functioning or from sources outside the circuit and its associated input-output equipment.

NOISE, LINE, see (line noise).

NOISE, RANDOM, see (random noise).

NOISE, REFERENCE, see (reference noise).

NOISY MODE, see (mode, noisy).

NON ARITHMETIC SHIFT, same as (shift, cyclic).

NON DESTRUCTIVE READ, see (read, non destructive).

NON ERASABLE STORAGE, see (storage, non erasable).

NON PRINT, NON PRINT CODE, NP CODE, the third case of a teleprinter, in which functions may be performed and signals passed through without printing or spacing taking place. The non print code (NP code) is the function code which triggers this condition.

NON REPRODUCING CODES, codes (punched into master tapes) which cause functions to be performed but are not reproduced in the product tape.

NON SCHEDULED MAINTENANCE TIME, see (time, non scheduled maintenance).

NON VOLATILE STORAGE, see (storage, non volatile).

NO-OP INSTRUCTION, see (instruction, no-op).

NOR *, a logical 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 and only if all statements are false, false if and only if at least one statement is true.

NORMAL DIRECTION FLOW *, in flowcharting, a flow in a direction from left to right, or top to bottom.

NORMAL STAGE PUNCHING, see (punching, normal stage).

NORMALIZATION, in linear programming, normalization is the conversion of the original problem into an equivalent problem that exhibits a basic solution. Input to normalization includes a matrix of detached coefficients corresponding to the original problem. By convention, this matrix is said to have exactly m constraint rows; it has any number of columns. The appropriate artificial variables and slack variables are created for computational convenience. Their coefficients are adjoined to the matrix, increasing its size. The result is an A-matrix containing the coefficients of a set of simultaneous linear equations; this normalized problem is equivalent to the original problem. Matrix transformations are used to determine a basic solution. The result is the initial tableau in explicit form or product form. The tableau is input to the simplex algorithm.

NORMALIZE, (1) in programming to adjust the exponent and fraction of a floating point quantity so that the fraction lies in the prescribed normal standard range. (2) In mathematical operations to reduce a set of symbols or numbers to a normal or standard form. Synonymous with (standardize).

NOT *, a logical 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.

NOTATION, (1) the act, process, or method of representing facts or quantities by a system or set of marks, signs, figures, or characters. (2) A system of such symbols or abbreviations used to express technical facts or quantities; as mathematical notation. (3) An annotation; note.

NOTATION, BASE, same as (notation, radix).

NOTATION, BINARY, a number system written to the base two notation.

NOTATION, BINARY CODED DECIMAL, a method of representing each figure in a decimal number by a four figured binary number.

NOTATION, BIQUINARY, a method for expressing a quantity less than ten, using two figures, wherein the first (left) figure is of radix two and the second (right) figure is of radix five.

NOTATION, CODED DECIMAL, a method of representing each figure in a decimal number by a character or a group of characters.

NOTATION, MIXED BASE, same as (notation, mixed radix).

NOTATION, MIXED RADIX *, a radix notation that uses more than one radix, e.g., biquinary notation.

NOTATION, POLYVALENT, a method for describing salient characteristics, in condensed form, using two or more characters, where each character or group of characters represents one of the characteristics.

NOTATION, POSITIONAL *, a number representation by means of an ordered set of digits, such that the value contributed by each digit depends on its position as well as on the digit value. Synonymous with (positional number).

NOTATION, RADIX, (1) an annotation consisting of a decimal number, in parentheses, written as a subscript suffix to a number, its decimal value indicating the radix of the number; e.g., $11_{(2)}$ indicates the number 11 is in the radix of two; $11_{(8)}$ indicates the number 11 is in the radix of eight. (2) A number written without its radix notation is assumed to be in the radix of ten. Synonymous with (base notation).

NOTATION, SYMBOLIC, a method of representing a storage location by one or more figures.

NULL, (1) an absence of information, as contrasted with zero or blank for the presence of no-information. (2) Zero. (3) Pertaining to no deflection from a center or end position.

NUMBER *, (1) a mathematical entity inferring quantity or amount of units. (2) Loosely, a numeral. Clarified by (systems, number).

NUMBER, BASE, same as (radix).

NUMBER, BINARY, a number, usually consisting of more than one figure, representing a sum, in which the individual quantity represented by each figure is based on a radix of two. The figures used are 0 and 1.

NUMBER, BINARY CODED DECIMAL, a number usually consisting of successive groups of figures, in which each group of four figures is a binary number that represents but does not necessarily equal arithmetically, a particular figure in an associated decimal number; e.g., if the three rightmost figures of a decimal number are 262, the three rightmost figure groups of the binary coded decimal number might be 0010, 0110, 0010.

NUMBER, BIQUINARY, (1) a number, consisting of a pair of figures representing a sum, in which the quantity represented by the left figure is based on the radix two, and the quantity represented by the right figure is based on the radix five. The figures 0 and 1 are used for the left figure, and 0, 1, 2, 3, and 4 are used for the right figure. (2) A number consisting of successive pairs of figures, representing a sum, in which the quantity represented by each pair of figures is based on a radix of ten.

NUMBER, BIQUINARY CODED DECIMAL, a number usually consisting of successive pairs of figures, in which each pair is a biquinary number; e.g., if the figures of a decimal number are 3671, the biquinary coded decimal number would be 03 11 12 01.

NUMBER, CALL, (1) a group of characters identifying a subroutine and containing: (a) information concerning parameters to be inserted in the subroutine, (b) information to be used in generating the subroutine, or (c) information related to the operands. (2) A call word, if the quantity of characters in the call number is equal to the length of a computer word.

NUMBER, CHECK, a number composed of one or more digits and used to detect equipment malfunctions in data transfer operations. If a check number consists of only one digit, it is synonymous with check digit. Related to (digit, check).

NUMBER, CODED DECIMAL, a number consisting of successive characters or a group of characters in which each character or group of characters usually represents a specific figure in an associated decimal number; e.g., if

the figures of a decimal number are 45, the coded decimal number might be represented as GQ, or LLZZ, or 1101 0110.

NUMBER, DECIMAL, a number, usually of more than one figure, representing a sum, in which the quantity represented by each figure is based on the radix of ten. The figures used are 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9.

NUMBER, DOUBLE LENGTH, a number having twice as many figures as are normally handled in a particular device. Synonymous with (double precision number).

NUMBER, DOUBLE PRECISION, same as (number, double length).

NUMBER, DUODECIMAL *, (1) pertaining to a characteristic or property involving a selection, choice or condition in which there are twelve possibilities. (2) Pertaining to the number representation system with a radix of twelve.

NUMBER, HEXADECIMAL, same as (number, sexadecimal).

NUMBER, MIXED BASE, same as (number, mixed radix).

NUMBER, MIXED RADIX, a number consisting of two or more characters, representing a sum, in which the quantity represented by each character is based on a different radix. Synonymous with (mixed base number).

NUMBER, MULTIPLE LENGTH, a number having two, three, or more times as many figures as are normally handled in a particular device.

NUMBER, OCTAL, a number of one or more figures, representing a sum in which the quantity represented by each figure is based on a radix of eight. The figures used are 0, 1, 2, 3, 4, 5, 6, and 7. Clarified by (octal).

NUMBER, OPERATION, (1) a number designating the position of an operation, or its equivalent subroutine in the sequence of operations comprising a routine. (2) A number identifying each step in a program stated in symbolic code.

NUMBER, POLYVALENT, a number, consisting of several figures, used for description, wherein each figure represents one of the characteristics being described.

NUMBER, POSITIONAL, same as (notation, positional).

NUMBER, RADIX, same as (radix).

NUMBER, READ-AROUND, see (read-around ratio).

NUMBER, SELF CHECKING, a number with a suffix figure related to the figure(s) of the number, used to check the number after it has been transferred from one medium or device to another. Related to (bit, check); and (code, error detecting).

NUMBER, SEPTINARY, a number, usually of more than one figure, representing a sum, in which the quantity represented by each figure is based on a radix of seven. The figures used are 0, 1, 2, 3, 4, 5, and 6.

NUMBER, SEXIDECIMAL, a number, usually of more than one figure, representing a sum in which the quantity represented by each figure is based on a radix of sixteen.

NUMBER, SYMBOLIC, a numeral, used in writing routines, for referring to a specific storage location; such numerals are converted to actual storage addresses in the final assembling of the program.

NUMBER SYSTEMS, see (system, number).

NUMERAL *, a number representation.

NUMERIC, a term referring to data consisting of numbers as differentiated from alphabetical characters.

NUMERIC CODE, see (code, numeric).

NUMERICAL ANALYSIS, see (analysis, numerical).

NUMERICAL CONTROL, see (control, numerical).

N-WAY SWITCH, same as (connector, variable) (3).

O

OBJECT LANGUAGE, see (language, object).

OBJECT PROGRAM, see (program, object).

OBJECT ROUTINE, same as (program, object).

OCR *, (Optical Character Recognition) machine identification of printed characters through use of light-sensitive devices. Contrast with MICR.

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. Clarified by (number, octal).

OCTAL DIGIT, see (digit, octal).

OCTAL NUMBER, see (number, octal).

OCTONARY SIGNALLING, see (signalling, octonary).

ODD-EVEN CHECK, same as (check, parity).

OFFICE, CENTRAL see (central office).

OFF-LINE *, pertaining to peripheral equipment or devices not in direct communication with the central processing unit of a computer. Clarified by (equipment, off-line).

OFF-LINE EQUIPMENT, see (equipment, off-line).

OFF-PUNCH, a punch not properly positioned in a column of a card.

OFFSET, the difference between the value or condition desired and that actually attained.

ON-DEMAND SYSTEM, a system from which timely information or service is available on request.

ON-LINE *, pertaining to peripheral equipment or devices in direct communication with the central processing unit of a computer. Clarified by (equipment, on-line); synonymous with (in-line processing), and (on-line processing).

ON-LINE PROCESSING, same as (on-line).

ON-LINE DATA-REDUCTION, see (data-reduction, on-line).

ON THE FLY PRINTER, see (printer, on the fly).

ONE ADDRESS, see (address, one).

ONE ADDRESS INSTRUCTION, see (instruction, one address).

ONE LEVEL CODE, same as (code, absolute).

ONE PLUS ONE ADDRESS, see (address, one plus one).

ONE PLUS ONE ADDRESS INSTRUCTION, see (instruction, one plus one address).

ONE WAY (CONNECTION), a connection between telegraph sets, one of which is a transmitter and the other a receiver.

ONE-WAY REVERSIBLE TELEGRAPH OPERATION, refers to communication on a circuit in one direction at a time without a break feature.

OPEN-ENDED, or OPENENDED *, pertaining to a process or system that can be augmented.

OPEN LOOP, see (loop, open).

OPEN ROUTINE, see (routine, open).

OPEN SHOP, see (shop, open).

OPEN SUBROUTINE, see (subroutine, open).

OPERAND *, that which is operated upon. The operands are usually identified by the address parts of the instructions.

OPERATING RATIO, see (ratio, operating).

OPERATING SYSTEM, see (system, operating).

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, e.g., addition, multiplication, extraction, comparison, shift, or transfer. The operation is usually specified by the operation part of

an instruction. (5) The event or specific action performed by a logic element.

OPERATION, ARITHMETIC, a computer operation in which the ordinary elementary arithmetic operations are performed on numerical quantities. Contrasted with (operation, logical).

OPERATION, AUXILIARY *, an operation performed by equipment not under continuous control of the central processor unit.

OPERATION, BOOKKEEPING, a computer operation which does not directly contribute to the result; i.e., arithmetical, logical, and transfer operations used in modifying the address section of other instructions, in counting cycles and in rearranging data. Synonymous with (red tape operation).

OPERATION CODE, see (code, operation).

OPERATION, COMPLETE, an operation which includes obtaining the instruction, obtaining all the operands from storage, performing the operation, and returning the results to storage.

OPERATION, COMPUTER, the electronic action resulting from an instruction. In general it is a computer manipulation required to secure results.

OPERATION, DYADIC *, an operation on two operands.

OPERATION, FIXED-CYCLE *, an operation that is completed in a specified number of regularly timed execution cycles. Contrasted with (operation, variable cycle).

OPERATION, FULL-DUPLEX, see (full-duplex operation).

OPERATION, HALF-DUPLEX see (half-duplex operation).

OPERATION, HOUSEKEEPING, a general term for the operation which must be performed for a machine run usually before actual processing begins. Examples of housekeeping operations are: establishing controlling marks, setting up auxiliary storage units, reading in the first record for processing, initializing, set-up verification operations, and file identification.

OPERATION, LOGICAL, (1) a logical or boolean operation on N-state variables which yields a single N-state variable; e.g., a comparison on the 3-state variables A and B, each represented by -, O, or +, which yields: - when A is less than B, O when A equals B, and + when A is greater than B. Specifically, operations such as AND, OR, and NOT on two-state variables which occur in the algebra of logic; i.e., Boolean algebra. (2) The operations of logical shifting, masking, comparing, selecting, searching, matching, sorting, merging, and other non-arithmetic operations of a computer. Contrasted with (operation, arithmetic).

OPERATION, MAKE-BREAK, see (make-break operation).

OPERATION, MONADIC *, an operation on one operand, e.g., negation.

OPERATION NUMBER, see (number, operation).

OPERATION, PARALLEL, the performance of several actions, usually of a similar nature, simultaneously through provision of individual similar or identical devices for each such action. Particularly flow or processing of information. Parallel operation is performed to save time over serial operation. Parallel operation usually requires more equipment. Contrasted with (operation, serial).

OPERATION PART *, loosely, the operator part of an instruction.

OPERATION, POLAR, see (polar operation).

OPERATION, REAL-TIME, ON-LINE, SIMULATED, the processing of data in synchronism with a physical process in such a fashion that the results of the data-processing are useful to the physical operation.

OPERATION, RED TAPE, same as (operation, bookkeeping).

OPERATION REGISTER, see (register, operation).

OPERATION, SCHEDULED, the periods of time during which the user plans to use specified equipment. Such a designation must be made a given number of hours in advance, provided however, that such scheduled hours of the operation may be modified after that time in the event of an emergency, or in the event that equipment failure creates a need for such rescheduling. Usually the foregoing is further modified in that during the performance period the hours rescheduled as a result of equipment failure usually are not considered as scheduled hours of operation in computing equipment effectiveness.

OPERATION, SEQUENTIAL *, pertaining to the performance of operations one after the other.

OPERATION, SERIAL *, an operation whose processes are performed in a time sequence. See (serial). Contrasted with (operation, parallel).

OPERATION, SINGLE STEP, a method of operating an automatic computer manually in which a single instruction or part of an instruction is performed in response to a single operation of a manual control. This method is generally used for detecting mistakes.

OPERATION, TRANSFER, an operation which moves information from one storage location or one storage medium to another; e.g., read, record, copy, transmit, or exchange. Transfer is sometimes taken to refer specifically to movement between different storage media.

OPERATION, UNARY *, same as (operation, monadic).

OPERATION USE TIME, see (time, operation use).

OPERATION, VARIABLE CYCLE, a computer action in which any cycle of action or operation may be of a different time length. Such action is characteristic of an asynchronous computer. Contrasted with (operation, fixed cycle).

OPERATIONS RESEARCH, the use of analytic methods adopted from mathematics for solving operational problems. The objective is to provide management with a more logical basis for making sound predictions and decisions. Among the common scientific techniques used in operations research are the following: linear programming, probability theory, information theory, game theory, monte carlo method, and queuing theory. Synonymous with (O.R.).

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.

OPERATOR, AND, (1) a logical operator which has the property that if P is a statement and Q is a statement, then P AND Q is true if both statements are true, false if either is false or both are false. Truth is normally expressed by the value 1, falsity by 0. The AND operator is often represented by a centered dot ($P \cdot Q$), by no sign (PQ), by an inverted "u" or logical product symbol ($P \wedge Q$), or by the letter "X" or multiplication symbol (PxQ). Note that the letters AND are capitalized to differentiate between the logical operator and the word "and" in common usage. (2) The logical operation which makes use of the AND operator or logical product. Synonymous with (and; logical multiply) and clarified by (conjunction).

OPERATOR, EXCLUSIVE OR, a logical operator which has the property that if P and Q are two statements, then the statement P*Q, where the * is the Exclusive OR operator, is true if either P or Q, but not both are true, and false if P and Q are both false or both true, according to the following table, wherein the figure 1 signifies a binary digit or truth.

P	Q	P*Q	
0	0	0	(even)
0	1	1	(odd)
1	0	1	(odd)
1	1	0	(even)

Note that the Exclusive OR is the same as the inclusive OR, except that the case with both inputs true yields no output; i.e., P*Q is true if P or Q are true, but not both. Primarily used in compare operations.

OPERATOR, INCLUSIVE OR, a logical operator which has the property that P or Q is true, if P or Q or both is true; when the term OR is used alone, as in OR-gate, the Inclusive OR is usually implied.

OPERATOR, MACHINE, the person who manipulates the computer controls, places information media into the input devices, removes the output and performs other related functions.

OPERATOR, OR, a logical operator which has the property such that if P or Q are two statements, then the statement P OR Q is true or false varies according to the following table of possible combinations: Clarified by (disjunction).

P	Q	P or Q
False	True	True
True	False	True
True	True	True
False	False	False

OPTIMAL, in linear programming, a solution is optimal no other feasible solution can be found that yields to the objective function a value larger than the current value. There may exist other feasible solutions equally good, but none better. An optimal solution may be an optimum solution; i.e., it may be unique.

OPTIMIZE, to rearrange the instructions or data in storage so that a minimum number of time consuming jumps or transfers are required in the running of a program.

OPTIMUM, in linear programming, a solution is obtimum no other feasible solution can be found that yields to the objective function a value as large as the current value. There are no other feasible solutions equally good, and none better. An optimum solution is necessarily an optimal solution, i.e., is a special case of the optimal solution.

OPTIMUM CODE, see (code, optimum).

OPTIMUM PROGRAMMING, see (programming, optimum).

OPUS (Octal Program Updating System), a Honeywell system used to update EASY I program tapes.

O. R. Operations Research, same as (operations research).

OR, see (operator, or).

OR CIRCUIT, same as (gate, or).

OR GATE, see (gate, or).

ORDER, (1) a defined successive arrangement of elements or events. This term is losing favor as a synonym for instructions, due to ambiguity. (2) To sequence or arrange in a series. (3) The weight or significance assigned to a digit position in a number. Clarified by (high order) and (low order).

ORDER WIRE, in communication practice, an order wire is an auxiliary circuit for use in the lineup and maintenance of communication facilities.

ORIGIN, the absolute storage address in relative coding to which addresses in a region are referenced.

ORIGINATION, DATA, the act of creating a record in a machine sensible form, directly or as a by-product of a humanly readable document.

ORTHOSCANNER, a Honeywell input device designed to read printed documents and to regenerate and read defaced information. It reads orthocode (a series of small vertical bars).

ORTHOTRONIC CONTROL: The Honeywell correction technique which employs a frame parity check, a longitudinal check, and the two orthotronic words. The check is made as information is transferred from magnetic tape to memory.

OUT-PLANT SYSTEM, a data transmission system consisting of one or more centrally located terminals and one or more terminals located at some distance.

OUTPUT *, (1) that data that has been processed. (2) The state or sequence of states occurring on a specified output channel. (3) The device or collective set of devices used for taking data out of a device. (4) A channel for expressing a state on a device or logic element. (5) The process of transferring data from an internal storage to an external storage. (6) Pertaining to any entities such as are cited above.

OUTPUT AREA, same as (block, output) (2).

OUTPUT BLOCK, see (block, output).

OUTPUT DEVICE, see (device, output).

OUTPUT EQUIPMENT, see (equipment, output).

OUTPUT MAGAZINE, see (magazine, output).

OUTPUT POWER, a characteristic of an amplifier denoting the power it can deliver into its load. The "normal power output" is the power absorbed by the load of the amplifier under normal operating conditions and the "maximum usable power" is that for which the acceptable maximum harmonic distortion of the output signal is reached.

OUTPUT STACKER, same as (magazine, output).

OVERALL LOSS (OR GAIN), a conventional term adopted to represent the composite attenuation, the transducer loss and the insertion loss, of a circuit in the particular case where the impedances between which the circuit is inserted are both equal to a resistance of 600 ohms (in this particular case these 3 losses are the same). Note: The equivalent of a circuit must not be confused with the reference equivalent of a circuit which implies direct or indirect comparison with the fundamental reference systems effected by the voice and by the ear.

OVERFLOW, (1) the condition which arises when the result of an arithmetic operation exceeds the capacity of the storage space alloted in a digital computer. (2) the digit arising from this condition if a mechanical or programmed indicator is included, otherwise the digit may be lost.

OVERFLOW CHECK INDICATOR, see (indicator, overflow check).

OVERLAY, a technique for bringing routines into high-speed storage from some other form of storage during processing, so that several routines will occupy the same storage locations at different times. Overlay is used when the total storage requirements for instructions exceed the available main storage.

OVERLOAD LEVEL, the operating limit of a system, component, etc., that point at which operation ceases to be satisfactory as a result of signal distortion, overheating, damage etc.

OVER-MODULATION, the overloading of an amplitude-modulated transmitter in which the modulating current is greater than that which gives 100% modulation.

OVERPUNCH, to add holes in a card column that already contains one or more holes. Synonymous with (zone punch) and related to (bits, zone) (1).

P

PABX, see (exchange, private automatic branch).

PACK, to include several short items of information into one machine item or word by utilizing different sets of digits to specify each brief item.

PACKING DENSITY, see (density, packing).

PADDING, a technique used to fill out a block of information with dummy records.

PAM, see (pulse modulation).

PANEL, CONTROL, (1) an interconnection device, usually removable, which employs removable wires to control the operation of computing equipment. It is used on punch card machines, to carry out functions which are under control of the user. On computers it is used primarily to control input and output functions. (2) A device or component of some data processing machines, which permits the expression of instructions in a semi-fixed computer program

by the insertion of pins, plugs, or wires into sockets, or hubs in the device, in a pattern to represent instructions, and thus making electrical interconnections which may be sensed by the data processing machine. Synonymous with (plugboard) and related to (pinboard).

PANEL, GRAPHIC, a master control panel which, pictorially and usually colorfully, traces the relationship of control equipment and the process operation. It permits an operator at a glance, to check on the operation of a far flung control system by noting dials, valves, scales, and lights.

PAPER TAPE, see (tape, paper).

PAPER TAPE READERS, see (reader, paper tape).

PARALLEL *, (1) pertaining to the simultaneity of two or more processes. (2) Pertaining to the simultaneity of two or more similar or identical 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. Contrasted with (serial). Related to (operation, parallel).

PARALLEL ACCESS, see (access, parallel).

PARALLEL BY CHARACTER, the handling of all the characters of a machine word simultaneously in separate lines, channels or storage cells.

PARALLEL COMPUTER, see (computer, parallel).

PARALLEL OPERATION, see (operation, parallel).

PARALLEL PROCESSING, see (processing, parallel).

PARALLEL RUNNING, see (running, parallel).

PARALLEL STORAGE, see (storage, parallel).

PARALLEL TRANSFER, see (transfer, parallel).

PARAMETER, (1) a quantity in a subroutine, whose value specifies or partly specifies the process to be performed. It may be given different values when the subroutine is used in different main routines or in different parts of one main routine, but which usually remains unchanged throughout any one such use. Related to (parameter, program). (2) A quantity used in a generator to specify machine configuration, designate subroutines to be included, or otherwise to describe the desired routine to be generated. (3) A constant or a variable in mathematics, which remains constant during some calculation. (4) A definable characteristic of an item, device, or system.

PARAMETER, PRESET, a parameter incorporated into a subroutine during input.

PARAMETER, PROGRAM, a parameter incorporated into a subroutine during computation. A program parameter frequently comprises a word stored relative to either the subroutine or the entry point and dealt with by the subroutine during each reference. It may be altered by the routine and/or may vary from one point of entry to another. Related to (parameter) (1).

PARAMETRIC COST ROW, in linear programming, a process of progressively incrementing each element of the objective-function row (cost row) by a small amount of the corresponding element in a change row. Generally, the objective value (not the basis list or the solution vector) changes until a non-basis vector must enter the basis to maintain optimality of the solution. At this point, the basis list and the solution vector (not the objective value) change, and incrementing may proceed.

PARAMETRIC PROGRAMMING, in linear programming, post-optimal analyses in which local changes in the problem are made all at once and changes in the solution are recorded. These analyses include parametric cost row analysis and parametric right-hand-side analysis.

PARAMETRIC RIGHT-HAND SIDE, in linear programming, a process of progressively incrementing each element of the right-hand-side vector by a small amount of the corresponding element in a change vector. Generally, the solution vector and the objective value (not the basis list) change until a vector must leave the basis to maintain feasibility of the solution. At this point, the basis list (not the solution vector or the objective value) changes, and incrementing may proceed.

PARITY BIT, see (bit, parity).

PARITY CHECK, see (check, parity).

PART, ADDRESS *, a part of an instruction word that specifies the address of an operand.

PART, OPERATION *, same as (part, operator).

PART, OPERATOR *, a part of an instruction word that specifies an operator.

PARTIAL CARRY, see (carry, partial).

PARTY LINE CIRCUIT, a multi-station net in which all stations are on a single circuit. The stations must share the circuit since only one station may transmit at a time.

PASS, a complete cycle of reading, processing and writing; i.e. a machine run.

PASS, BAND, see (band pass).

PATCH *, to modify a program by adding a section of coding.

PATTERN RECOGNITION, see (recognition, pattern).

PAX, see (exchange, private automatic).

PBX, see (exchange, private branch).

PCM *, (1) Punched Card Machines. Same as (machine, electrical accounting). (2) Pulse Code Modulation. See (pulse modulation, code).

PDM, see (pulse modulation).

PEEK-A-BOO SYSTEM, see (system, peek-a-boo).

PERFORATED TAPE, same as (tape, punch).

PERFORATION RATE, see (rate, perforation).

PERFORATOR, an off-line, keyboard-operated device for punching code holes in paper tape.

PERFORMANCE EVALUATION, see (evaluation, performance).

PERFORMANCE PERIOD, see (period, performance).

PERIOD, PERFORMANCE, a period of 30 consecutive calendar days during which a newly installed computer is being tested for acceptance by the U.S. Government. Such a period does not include equipment time used for data purification, file conversion, and similar preparatory operations or those hours of operation rescheduled as a result of equipment failure.

PERIPHERAL CONTROL UNIT, see (control unit, peripheral).

PERIPHERAL EQUIPMENT, see (equipment, peripheral).

PERMANENT STORAGE, see (storage, permanent).

PERT (Program Evaluation and Review Technique), a two-phase operations research program (PERT TIME and PERT COST) which solves specific problems related to management control. See (PERT TIME) and (PERT COST).

PERT COST, a PERT program for providing management with cost control for all phases of a project. See (PERT).

PERT TIME, a PERT program which allows management to plan, schedule, and direct projects, as well as evaluate progress during project execution. See (PERT).

PHANTOM CIRCUIT, a superposed circuit derived from two suitably arranged pairs of wires, called side circuits, the two wires of each pair being effectively in parallel.

PHASE, see (modulation, phase).

PHASE SHIFT, see (shift, phase).

PHONE, DATA, a generic term to describe a family of devices available to facilitate data communication.

PHOTOMICROGRAPHY, the process of making a larger photograph of a much smaller original.

PHYSICAL WAVE COMMUNICATIONS, for physical wave communications, only those tones which have vibration frequencies to which the human ear is sensitive have any practical use. Those tones range between 16 vibrations or cycles per second, to 20,000 cycles per second. The origin or such a sound can be anything from a falling log to the human voice. The sound is transmitted through any mass, such as water or air, and the receiver could be a human ear or a device to record the sounds mechanically, such as a phonograph record. By its nature, physical wave communication is limited to comparatively short distance.

P.I. CODES, Program Indicator codes. When two or more programs are used in the same program tape, the use of PI Codes permits automatic selection of programs and permits switching from one program to the other.

PICK UP FAIL, a lamp which glows when none of the stations responds to the invitation to send. After 5 seconds a disconnect sequence starts which extinguishes the lamp.

PICOSECOND, one thousandth of a nanosecond, or 10^{-12} seconds; abbreviated psec.

PIEZOELECTRIC, a term applied to the phenomenon whereby certain materials, commonly crystalline, develop useful electrical pressures (voltages) when the material is subjected to variable mechanical pressures, strains, or stresses; conversely, the materials develop mechanical strains or stresses when electrical voltages are applied.

PILOT, in a transmission system, a pilot is a signal wave, usually a single frequency, transmitted over the system to indicate or control its characteristics.

PILOT CHANNEL, a channel over which a pilot is transmitted.

PILOT, REFERENCE, see (reference pilot).

PILOT, SYNCHRONIZING, see (synchronizing pilot).

PINBOARD *, a perforated board that accepts manually inserted pins to direct the operation of equipments. Related to (panel, control) (2).

PING-PONG, the programming technique of using two magnetic tape units for multiple reel files and switching automatically between the two units until the complete file is processed.

PITCH, ROW *, the distance measured along punched paper tape between the centers of adjacent holes.

PIVOT, during each iteration of a linear programming algorithm, the vector selected to enter the basis is called the incoming vector, and the vector selected to leave the basis is called the outgoing vector. The one matrix element in the incoming vector that corresponds to the non-zero element of the outgoing vector is called the pivot element or simply the pivot. Matrix transformations are used to transform the pivot to a value of 1, giving a new tableau and terminating the current iteration.

PLANE, a screen of magnetic cores. Planes are combined to form stacks.

PLANT, INSIDE, see (inside plant).

PLOTTER, a visual display or board in which a dependent variable is graphed by an automatically controlled pen or pencil as a function of one or more variables.

PLOTTER, XY, a device used in conjunction with a computer to plot coordinate points in the form of a graph.

PLUG, PROGRAM PATCHING, a relatively small auxiliary plugboard patched with a specific variation of a portion of a program and designed to be plugged into a relatively larger plugboard patched with the main program.

PLUGBOARD, same as (panel, control) (2).

PLUS ZONE, see (zone, plus).

POINT *, in positional notation, the character or implied character that separates the integral part of a numerical expression from the fractional part, e.g., a decimal point.

POINT, BINARY, the radix point in a binary number system; i.e., the dot that marks the position between the integral and fractional, or units and halves in a binary number.

POINT, FIXED *, pertaining to a number system in which the location of the point is fixed with respect to one end of the numerals, according to some convention.

POINT, FLOATING *, pertaining to a number system in which the location of the point does not remain fixed with respect to one end of the numerals.

POINT, LOAD, a preset point at which magnetic tape is initially positioned under the read-write head to start reading or writing.

POINT-TO-POINT TRANSMISSION, transmission of data between two points.

POINT, RADIX, the dot that delineates the integer digits from the fractional digits of a number; specifically, the dot that delineates the digital position involving the zero exponent of the radix from the digital position involving the minus-one exponent of the radix. The radix point is often identified by the name of the system; e.g., binary point, octal point, or decimal point. In the writing of any number in any system, if no dot is included, the radix point is assumed to follow the rightmost digit. Synonymous with (point).

POINT, VARIABLE *, pertaining to a number system in which the location of the point is indicated by a special character at that location.

POINT, ZERO TRANSMISSION LEVEL REFERENCE, see (zero transmission level reference point).

POLAR, BI- (UNI-), see (bi-polar).

POLAR OPERATION, a type of circuit operation where the flow of current is reversed as pulses are transmitted. Polar differs from "make-break" operation in that, with polar operation, current always flows when the circuit is closed. Only the direction of current flow is reversed by transmission.

POLL, a flexible, systematic method, centrally controlled, for permitting stations on a multipoint circuit to transmit without contending for the line.

POLYPHASE, a unique Honeywell sorting technique which permits sorting with either an odd or even number of tapes, thus permitting greater system flexibility than conventional methods.

POLYVALENCE, the property of being interrelated in several ways.

POLYVALENT NOTATION, see (notation, polyvalent).

POLYVALENT NUMBER, see (number, polyvalent).

POSITION, LOW ORDER, see (low order position).

POSITION, PUNCH, the row position of a punched hole in a specific column of a punch card. In an 80-column punch card the rows are designated 0 to 9, X or Y; in a 90-column card the rows are designated 0, 1, 3, 5, 7, and 9.

POSITION, SIGN *, the position at which the sign of a number is loacted.

POSITIONAL NOTATION, see (notation, positional).

POSITIONAL NUMBER, same as (notation, positional).

POSITIONAL REPRESENTATION, see (representation, positional).

POSITIONS, PUNCHING, the specific areas; i.e., row-column intersects, on a punch card where holes may be punched.

POST, to enter an item on a record.

POST EDIT, see (edit, post).

POSTMORTEM *, pertaining to the analysis of an operation after its completion.

POST MORTEM DUMP, see (dump, post mortem).

POST MORTEM ROUTINE, see (routine, post mortem).

POSTING, FACSIMILE, see (facsimile posting).

POSTING TERMINAL DIGIT, the arranging and recording of serial numbers of documents on the basis of the final digit of each of the numbers.

POWER, APPARENT, the product of the root-mean-square value of the current and the root-mean-square value of the voltage.

POWER, AVAILABLE, the maximum power obtainable from a given source by suitable adjustment of the load. For a source which is equivalent to a constant sinusoidal e.m.f. in series with an impedance independent of amplitude, it is the mean-square value of the e.m.f. divided by four times the resistive component of the impedance of the source.

POWER DUMP, see (dump, power).

POWER LEVEL, the power level at any point in a transmission system is the ratio of the power at that point to some arbitrary amount of power chosen as a reference. This ratio is usually expressed either in decibels referred to one milliwatt, abbreviated dbm, or in decibels referred to one watt, abbreviated dbw.

POWER OUTPUT, see (output power).

POWER, STANDARD TEST TONE, see (standard test tone power).

PPM see (pulse modulation).

PRE-EDIT, to edit the input data previous to the computation.

PRE-STORE, (1) to set an initial value for the address of an operand or of a cycle index. (2) To restore. (3) To store a quantity in an available or convenient location before it is required in a routine.

PRECISION, (1) the degree of exactness with which a quantity is stated. (2) The degree of discrimination or amount of detail; e.g., a 3 decimal digit quantity discriminates among 1000 possible quantities. A result may have more precision than it has accuracy; e.g., the true value of pi to 6 significant digits is 3.14159; the value 3.14162 is precise to 6 figures, given to 6 figures, but is accurate only to about 5.

PRECISION, DOUBLE, the retention of twice as many digits of a quantity as the computer normally handles; e.g., if a computer, whose basic word consists of 10 decimal digits is called upon to handle 20 decimal digit quantities, then double precision arithmetic must be resorted to.

PRECISION, TRIPLE, the retention of three times as many digits of a quantity as the computer normally handles; e.g., a computer whose basic word consists of 10 decimal digits is called upon to handle 30 decimal digit quantities.

PREDICATE, to affirm or deny, in mathematical logic, one or more subjects.

PRELIMINARY PROPOSAL REVIEW, see (review, preliminary proposal).

PRESELECTION, a technique for saving time available in buffered computers (by which a block of data is read into computer storage from the next input tape to be called upon before the data are required in the computer. The selection of the next input tape is determined by instruction to the computer.

PRESET *, to establish an initial condition, such as the control values of a loop.

PRESUMPTIVE ADDRESS, same as (address, base) (1).

PREVENTIVE MAINTENANCE, see (maintenance, preventive).

PRIMARY STORAGE, see (storage, primary).

PRIMITIVE, a primitive usually pertains to the lowest level of a machine instruction or lowest unit of language translation.

PRINT CONTRAST RATIO *, in OCR, the ratio obtained by subtracting the reflectance at an inspection area from the maximum reflectance found within a specified distance from that area, and dividing the result by that maximum reflectance.

PRINT RESTORE, PRINT RESTORE CODE, the function which causes a printer to resume printing when it has been in non-print case. The PR code triggers this function.

PRINTER, CHARACTER, a device capable of producing "hard copy" in which printing is accomplished a character at a time.

PRINTER ELECTROSTATIC, same as (printer, xerographic).

PRINTER, HIGH-SPEED, a printer which operates at a speed more compatible with the speed of computation and data processing so that it may operate on-line. At the present time a printer operating at a speed of 250 lines per minute, 100 characters per line is considered high-speed. Synonymous with HSP.

PRINTER, LINE, a device capable of printing one line of characters across a page; i.e., 100 or more characters simultaneously as continuous paper advances line by line in one direction past type bars or a type cylinder that contains all characters in all positions.

PRINTER, MATRIX, same as (printer, wire).

PRINTER, ON THE FLY, a high-speed line printer using continuously rotating print wheels and fast-acting hammers to print the successive letters contained in one line of text so rapidly that all of the characters in the printed line look as though they were all printed simultaneously.

PRINTER, SERIAL, a device capable of printing characters, one at a time across a page. Many variations in serial printers exist; e.g., typewriter; stylus or matrix serial printer; and high-speed, multiple-line stylus or matrix serial printer.

PRINTER, WIRE, a high-speed printer that prints character-like configurations of dots through the proper selection of wire-ends from a matrix of wire-ends, rather than conventional characters through the selection of type faces. Synonymous with (matrix printer).

PRINTER, XEROGRAPHIC, a device for printing an optical image on paper in which dark and light areas of the original are represented by electro-statically charged and uncharaged areas on the paper. The paper is dusted with particles of finely powdered dry ink and the particles adhere only to the electrically charged areas. The paper with ink particles is then heated, causing the ink to melt and become permanently fixed to the paper.

PRINTING, DETAIL, see (detail printing).

PRINTING, END, see (end printing).

PRINTING, LINE *, the printing of an entire line of characters at once.

PRINT-OUT, MEMORY, see (dump).

PRIORITY INDICATORS, groups of characters used in the header of a message to define the order of transmitting messages over a communication channel.

PRIVATE LEASED LINE, PRIVATE LINE, a service offered by the common carriers in which a customer may lease, for his exclusive use, a circuit between two or more geographic points.

PRIVATE TELEGRAPH, see (network).

PRIVATE WIRE, see (network).

PROBABILITY THEORY, see (theory, probability).

PROBLEM, BENCHMARK *, a problem used to evaluate the performance of computers relative to each other.

PROBLEM, CHECK, a problem chosen to determine whether the computer or a program is operating correctly.

PROBLEM DEFINITION, see (definition, problem).

PROBLEM ORIENTED LANGUAGE, see (language, problem). oriented).

PROBLEM, TROUBLE LOCATION, a test problem whose incorrect solution supplies information on the location of

faulty equipment. It is used after a check problem has shown that a fault exists.

PROCEDURE *, the course of action taken for the solution of a problem.

PROCEDURE ORIENTED LANGUAGE, see (language, procedure oriented).

PROCESS, a general term covering such terms as assemble, compile, generate, interpret, and compute.

PROCESS CHART, same as (chart, flow).

PROCESS CONTROL, see (control, process).

PROCESS, ITERATIVE, a process for calculating a desired result by means of a repeating cycle of operations, which comes closer and closer to the desired result; e.g., the arithmetical square root of N may be approximated by an iterative process using additions, subtractions, and divisions only.

PROCESS, PREDEFINED *, a process that is identified only by name and that is specified elsewhere.

PROCESSING, AUTOMATIC DATA, data processing performed by a system of electronic or electrical machines so interconnected and interacting as to reduce to a minimum the need for human assistance or intervention. Synonymous with (ADP) and related to (system, automatic data processing).

PROCESSING, BATCH, a technique by which items to be processed must be coded and collected into groups prior to processing.

PROCESSING, BUSINESS DATA *, data processing for business purposes, e.g., recording and summarizing the financial transactions of a business.

PROCESSING, CENTRALIZED DATA, data processing performed at a single, central location on data obtained from several geographical locations or managerial levels. Decentralized data processing involves processing at various managerial levels or geographical points throughout the organization.

PROCESSING, DATA, (1) the preparation of source media which contain data or basic elements of information, and the handling of such data according to precise rules of procedure to accomplish such operations as classifying, sorting, calculating, summarizing, and recording. (2) The production of records and reports. Synonymous with (data handling).

PROCESSING, ELECTRONIC DATA *, data processing largely performed by electronic means. Synonymous with (EDP) and related to (processing, automatic data).

PROCESSING, INDUSTRIAL DATA *, data processing for industrial purposes.

PROCESSING, INFORMATION, a less restrictive term than data processing, encompassing the totality of scientific and business operations performed by a computer.

PROCESSING, IN LINE, same as (on-line) (2).

PROCESSING, INTEGRATED DATA, (1) a system that treats as a whole, all data processing requirements to accomplish a sequence of data processing steps, or a number or related data processing sequences, and which strives to reduce or eliminate duplicating data entry or processing steps. (2) The processing of data by such a system. Synonymous with (IDP).

PROCESSING, ON-LINE, same as (on-line).

PROCESSING, PARALLEL, the operation of a computer so that programs for more than one run are stored simultaneously in its storage, and executed concurrently.

PROCESSING, REAL TIME, the processing of information or data in a sufficiently rapid manner so that the results of the processing are available in time to influence the process being monitored or controlled. Synonymous with (real time system).

PROCESSOR, (1) a generic term which includes assembly, compiling, and generation. (2) A shorter term for automatic data processor or arithmetic unit.

PRODUCTION RUN, the run which fulfills the end for which the program was written. It occurs after the program has been successfully checked out.

PROGRAM *, (1) a plan for solving a problem. (2) Loosely, a routine. (3) To devise a plan for solving a problem. (4) Loosely, to write a routine. See (routine).

PROGRAM ADDRESS COUNTER, same as (counter, location) (2).

PROGRAM, ASSEMBLY, same as (assembler).

PROGRAM CARD, a pre-punched card which serves to instruct the machine in which it is used concerning the steps or operations it is to perform.

PROGRAM CHECK, see (check, program).

PROGRAM, CODED, a program which has been expressed in the code or language of a specific machine or programming system.

PROGRAM, COMPUTER *, a plan or routine for solving a problem on a computer. Contrasted with such terms as fiscal program, military program, and development program.

PROGRAM, CONTROL, a sequence of instructions which prescribe the series of steps to be taken by a system, a computer or any other device.

PROGRAM CONTROL, see (control, program).

PROGRAM COUNTER, same as (register, control).

PROGRAM DRUM, a revolving cylinder on which the program card is mounted.

PROGRAM, GENERAL, a program expressed in computer code designed to solve a class of problems, or specializing on a specific problem when appropriate parametric values are supplied. Synonymous with (general routine).

PROGRAM GENERATOR, see (generator, program).

PROGRAM, HEURISTIC, same as (routine, heuristic).

PROGRAM, INTERNALLY STORED, a sequence of instructions, stored inside the computer in the same storage facilities as the computer data, as opposed to external storage on punched paper tape and pinboards.

PROGRAM LANGUAGE, see (language, program).

PROGRAM, OBJECT, the program which is the output of an automatic coding system. Often the object program is a machine language program ready for execution, but it may well be in an intermediate language. Synonymous with (target program), (object routine) and contrasted with (program, source).

PROGRAM PARAMETER, see (parameter, program).

PROGRAM PATCHING PLUG, see (plug, program patching).

PROGRAM REGISTER, see (register, program).

PROGRAM SENSITIVE MALFUNCTION, see (malfunction, program sensitive).

PROGRAM, SOURCE, a computer program written in a language designed for ease of expression of a class of problems or procedures, by humans; e.g., symbolic or algebraic. A generator, assembler translator or compiler routine is used to perform the mechanics of translating the source program into an object program in machine language. Contrasted with (program, object).

PROGRAM, SPECIFIC, a program for solving a specific problem only.

PROGRAM STEP, see (step, program).

PROGRAM STOP, see (stop, program).

PROGRAM STORAGE, see (storage, program).

PROGRAM, STORED, same as (routine, stored).

PROGRAM, SUPERVISORY, same as (routine, executive).

PROGRAM TAPE, see (tape, program).

PROGRAM, TARGET, same as (program, object).

PROGRAM TEST, see (test, program).

PROGRAM TESTING TIME, see (time, program testing).

PROGRAM, UTILITY, same as (routine, utility).

PROGRAMMED SWITCH, same as (connector, variable) (3).

PROGRAMMER, a person who prepares problem solving procedures and flow charts and who may also write and debug routines.

PROGRAMMING, AUTOMATIC *, programming that uses a computer to perform some stages of the work involved in preparing a program.

PROGRAMMING, INTERPRETIVE, the writing of programs in a pseudo machine language, which is precisely converted by the computer into actual machine language instructions before being performed by the computer.

PROGRAMMING, LINEAR, a technique of mathematics and operations research for solving certain kinds of problems involving many variables where a best value or set of best values is to be found. This technique is not to be confused with computer programming, although problems using the technique may be programmed on a computer. Linear programming is most likely to be feasible when the quantity to be optimized, sometimes called the objective function, can be stated as a mathematical expression in terms of the various activities within the system, and when this expression is simply proportional to the measure of the activities; i.e., is linear, and when all the restrictions are also linear.

PROGRAMMING, MICRO, the technique of using a certain special set of instructions for an automatic computer, that consists only of basic elemental operations which the programmer may combine into higher level instructions, which he may then program using the higher level instructions only; e.g., if a computer has only basic instructions for adding, subtracting, and multiplying, the instruction for dividing would be defined by microprogramming.

PROGRAMMING, MINIMUM ACCESS, programming in such a way that minimum waiting time is required to obtain information out of storage. Synonymous with (minimum latency programming) and contrasted with (programming, random access).

PROGRAMMING, MINIMUM LATENCY, same as (programming, minimum access).

PROGRAMMING, MULTIPLE, the programming of a computer by allowing two or more arithmetical or logical operations to be executed simultaneously. Contrasted with (programming, serial).

PROGRAMMING, OPTIMUM, programming in order to maximize efficiency with respect to some criterion; e.g., least storage usage, least time share of peripheral equipment, or least use of time between operations.

PROGRAMMING, RANDOM ACCESS, programming without regard to the time required for access to the storage positions called for in the program. Contrasted with (programming, minimum access).

PROGRAMMING, SERIAL, the programming of a computer by which only one arithmetical or logical operation can be executed at one time; e.g., a sequential operation. Contrasted with (programming, multiple).

PROGRAMMING, SYMBOLIC, the use of arbitrary symbols to represent addresses in order to facilitate programming.

PROPAGATED ERROR, see (error, propagated).

PROPERTY SORT, see (sort, property).

PROPORTIONAL BAND, see (band, proportional).

PROPORTIONAL CONTROL, see (control, proportional).

PROTECTION, FILE, a device or method which prevents accidential erasure of operative data on magnetic tape reels.

PRT (Production Run Tape), a Honeywell tape containing checked-out and scheduled production running on Honeywell 800 and and 1800 computers.

PSEUDO CODE, same as (code, symbolic).

PSEUDO INSTRUCTION, see (instruction, pseudo).

PSEUDO-OPERATION, an operation which is not part of the computer's operation repertoire as realized by hardware; hence an extension of the set of machine operations.

PSEUDO-RANDOM, the property of satisfying one or more of the standard criteria for statistical randomness but being produced by a definite calculation process. Related to (number, uniformly distributed random).

PSEUDO RANDOM NUMBER SEQUENCE, see (sequence, pseudo random number).

PSP, a Honeywell 400/1400 program for selecting specific tape programs from a master tape for checkout or production runs.

PSPA (Program Selection Process A), the Honeywell process which selects from the symbolic program tape the programs and test data to be executed during a checkout run on Honeywell 800 and 1800 computers.

PSPB (Program Selection Process B), the Honeywell routine that prepares a master relocatable tape of checked-out programs for input to an Executive scheduling run on Honeywell 800 and 1800 computers.

PTS (Program Test System), a Honeywell system that automatically checks out programs, producing diagnostic information where necessary to aid in production run organization.

PTT (Program Test Tape), a Honeywell tape that contains programs and test data to be tested during a checkout run.

PULSE, a significant, and sudden change of short duration in the level of some electric variable, usually voltage.

PULSE AMPLITUDE, maximum instantaneous value of a pulse.

PULSE CODE, see (code, pulse).

PULSE DECAY TIME, interval of time required for the trailing edge of a pulse to decay from 90% to 10% of the pulse amplitude.

PULSE DURATION (PULSE LENGTH), the duration of a pulse is the time interval between the points on the leading and trailing edges at which the instantaneous value bears a specified relation to the pulse amplitude.

PULSE, GATE, a pulse which enables a gate circuit to pass a signal; usually, the gate pulse is of longer duration than the signal, to make sure that coincidence in time occurs.

PULSE LENGTH, nominal duration of a standard pulse which is the time interval between the half amplitude points of the rise and decay points of the curve. For pulses of other shapes, the points on the curve must be stated. Time interval between the points on the leading and trailing edges at which the instantaneous value bears a specified relation to the pulse amplitude. Note: Frequently the specified relation is taken as 50% (see pulse duration, pulse width).

PULSE, MARKING (TELETYPEWRITER), a marking pulse or "mark" is the signal pulse which, in dc neutral operation, corresponds to a "circuit closed" or "current on" condition.

PULSE MODULATION, the use of a series of pulses to convey the information contained in the modulating function. The characteristics of a train of pulses may be modified in one of several ways to convey information including amplitude, (PAM) position (PPM) and duration (PDM).

PULSE MODULATION, AMPLITUDE (PAM), a pulse code modulation method whereby the pulse amplitude is varied so that the envelope follows the modulating function.

PULSE MODULATION, CODE (PCM), see (modulation, pulse code).

PULSE MODULATION, DURATION (PDM), a pulse modulation method whereby the duration of the pulse follows the modulating signal.

PULSE MODULATION, FREQUENCY, modulation in which the pulse repetition frequency of the carrier is varied in accordance with the amplitude and frequency of the modulating signal.

PULSE MODULATION, LENGTH, pulse time modulation in which the value of each instantaneous sample of the modulating wave is caused to modulate the duration of a pulse. Note: In pulse modulation, the modulating wave may vary the time of occurrence of the leading edge, the trailing edge, or both edges of the pulse. See (pulse modulation, width).

PULSE MODULATION, POSITION (PPM), a pulse modulation method whereby the position of the pulse follows the modulating function.

PULSE MODULATION, TIME, modulation in which the value of an instantaneous sample of modulating wave are called to modulate the time occurrence of some characteristic of a pulse carrier.

PULSE MODULATION, WIDTH, the duration of a pulse in the time interval between the points of the leading and trailing edges at which the instantaneous value bears a specified relation to the pulse amplitude.

PULSE REGENERATION, pulse regeneration is the process of restoring a series of pulses to the original timing, form and relative magnitude.

PULSE REPETITION RATE, see (rate, pulse repetition).

PULSE SPACING (TELETYPEWRITER), a spacing pulse or "space" is the signal pulse which, in dc neutral operation, corresponds to a "circuit open" or "no current" condition.

PULSE, SPROCKET, (1) a pulse generated by magnetized spot which accompanies every character recorded on magnetic tape. This pulse is used during read operations to regulate the timing of the read circuits and also to provide a count on the number of characters read from tape. (2) A pulse generated by the sprocket or driving hole in paper tape which serves as the timing pulse for reading or punching the paper tape.

PULSE, UNIDIRECTIONAL, see (unidirectional pulse).

PULSE WIDTH, time interval between the points on the leading and trailing edges at which the instantaneous value bears a specified relation to the pulse amplitude. Note: Frequently, the specified relation is taken as 50%. See (pulse duration, pulse width).

PUNCH, (1) to shear a hole by forcing a solid or hollow, sharp edged tool through a material into a die. (2) The hole resulting from (1) above.

PUNCH, AUTOMATIC FEED, a card punch having a hopper, a card track and a stacker. The movement of cards through the punch is automatic.

PUNCH CARD, see (card, punch).

PUNCH, CARD, a machine which punches cards in designated locations to store data which can be conveyed to other machines or devices by reading or sensing the holes. Synonymous with (card punch unit).

PUNCH CARD UNIT, same as (punch, card).

PUNCH, ELECTRONIC CALCULATING, a card punch machine which reads a punch card, performs arithmetic and other operations sequentially and punches the result in a card.

PUNCH, ELEVEN (11), same as (punch, X) (2).

PUNCH, GANG, to punch identical or constant information into all of a group of punch cards.

PUNCH POSITION, see (position, punch).

PUNCH, SPOT, a hand operated device resembling a pair of pliers, for selectively punching holes in punch cards.

PUNCH, SUMMARY, a card punch operating in conjunction with another machine, commonly a tabulator, to punch into cards data which have been summarized or calculated by the other machine.

PUNCH TAPE, see (tape, punch).

PUNCH TAPE CODE, see (code, punch tape).

PUNCH, TWELVE (12), same as (punch, Y) (2).

PUNCH, X, (1) a punch in the X or 11 row of an 80-column card. (2) A punch in position 11 of a column. The X punch is often used to control or select, or to indicate a negative number as if it were a minus sign. Also called an 11-punch. Synonymous with (eleven (11) punch).

PUNCH, Y, (1) a punch in the Y or 12 row of an 80-column card; i.e., the top row of the card. (2) A punch in position 12 of a column. It is often used for additional control or selection, or to indicate a positive number as if it were a plus sign. Synonymous with (twelve (12) punch).

PUNCH, ZONE, see (zone punch).

PUNCHING, CARD, see (card punching).

PUNCHING, INTERSTAGE, a system of punching in which only odd numbered rows of cards are used. Contrasted with (punching, normal stage).

PUNCHING, MULTIPLE, (1) the reference to punch cards and more specifically to Hollerith cards. (2) The punching of two or more holes in a column.

PUNCHING, NORMAL STAGE, a system of punching in which only even numbered rows of the card are used. Contrasted with (punching, interstage).

PUNCHING POSITIONS, see (positions, punching).

PUNCHING RATE, see (rate, punching).

PURIFICATION, DATA, the reduction of the number of errors as much as possible prior to using data in an automatic data terminal equipment has processing system.

PUSH-BUTTON SWITCHING, a reperforator switching system in which selection of the outgoing channel is initiated by an operator.

PUSH DOWN LIST, see (list, push down).

PUSH UP LIST, see (list, push up).

Q

Q-FACTOR (of a coil or capacitor), the magnitude of the ratio, at a given frequency, of the imaginary part (reactance) to the real part (resistance) of the impedance.

Q-FACTOR, MAGNIFICATION FACTOR, quotient of the potential difference across the terminals of an oscillatory circuit in resonance divided by the assumed e.m.f. applied in series to the circuit.

QUAD, an assembly of four separately insulated conductors, twisted together in such a manner as to provide two pairs.

QUADRATURE, quadrature expresses the phase relationship between two periodic quantities of the same period when the phase difference between them is one fourth of a period.

QUADRATURE COMPONENT, reactive component of a current or voltage due to inductive or capacitive reactance in a circuit.

QUADRIPUNTAL, pertaining to four punches, specifically having four random punches on a punch card. This term is used in determinative documentation.

QUADRUPLEX SYSTEM, a system of Morse-telegraphy arranged for the simultaneous independent transmission of two messages in each direction over a single circuit.

QUALITY INDEX (TELEGRAPH), the probability of exceeding an assigned value: of the degree of inherent distortion of a channel, or of a telegraph repeater, etc; or, of the degree of distortion of the modulation produced by an apparatus. The probability of the effective margin of a receiving apparatus being less than its nominal margin (or less than a value assigned for the apparatus).

QUANTITY, a positive or negative real number in the mathematical sense.

QUANTITY, DOUBLE PRECISION, a quantity having twice as many digits as are normally carried in a word of a fixed word-length computer.

QUANTIZATION *, the subdivision of the range of values of a variable into a finite number of non-overlapping sub-ranges.

QUANTIZATION DISTORTION, in communication, quantization is a process in which the range of values of a wave is divided into a finite number of smaller sub-ranges, each of which is represented by an assigned (or quantized) value within the sub-range. Note: Quantized may be used as an adjective modifying various forms of modulation, for example quantized pulse-amplitude modulation.

QUANTIZE *, to subdivide the range of values of a variable into a finite number of non-overlapping subranges or intervals, each of which is represented by an assigned value within the subrange, e.g., to represent a person's age as a number of whole years.

QUANTIZER, same as (digitizer).

QUANTUM, the sub-ranges resulting from quantization.

QUASI INSTRUCTION, same as (instruction, pseudo).

QUATERNARY SIGNALLING, see (signalling, quaternary).

QUEUEING THEORY, see (theory, queueing).

QUESTION, ENCODED, a question set up and encoded in a form appropriate for operating, programming or conditioning a searching device.

QUIBINARY CODE, see (code, quibinary).

QUIESCENT CARRIER TELEPHONY, that form of carrier telephony in which the carrier is suppressed whenever there are no modulating signals to be transmitted.

R

RADIO COMMUNICATION, any telecommunication by means of radio waves.

RADIO FREQUENCIES, very efficient carriers of data. They are also the fastest and most expensive. 3.3 Million characters per second can be transmitted over a TV circuit (see TELPAK).

RADIO LINK, the channel provided by means of a radio emitter and a radio receiver.

RADIX, the quantity of characters for use in each of the digital positions of a numbering system. In the more common numbering systems the characters are some or all of the Arabic numerals as follows:

System Name	Characters	Radix
BINARY	(0, 1)	2
OCTAL	(0, 1, 2, 3, 4, 5, 6, 7)	8
DECIMAL	(0, 1, 2, 3, 4, 5, 6, 7, 8, 9)	10

Unless otherwise indicated, the radix of any number is assumed to be 10. For positive identification of a radix 10 number, the radix is written in parentheses as a subscript to the expressed number; i.e., $126_{(10)}$. The radix of any nondecimal number is expressed in similar fashion; e.g., $11_{(2)}$ and $5_{(8)}$. Synonymous with (base); (base number) and (radix number).

RADIX COMPLEMENT, same as (complement) (3).

RADIX MINUS 1 COMPLEMENT, same as (complement) (2).

RADIX NOTATION, see (notation, radix).

RADIX NUMBER, same as (radix).

RADIX POINT, see (point, radix).

RAM, Random Access Memory, see (storage, random access).

RANDOM ACCESS, see (access, random).

RANDOM ACCESS MEMORY, same as (storage, random access).

RANDOM ACCESS PROGRAMMING, see (programming, random access).

RANDOM ACCESS STORAGE, see (storage, random access).

RANDOM NOISE, noise due to the aggregate of a large number of elementary disturbances with random occurrence in time.

RANDOM NUMBER GENERATOR, see (generator, random number).

RANDOM NUMBER SEQUENCE, see (sequence, random number).

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.

RANGE (ORIENTATION), in printing telegraphy, range is that fraction of a perfect signal element through which the time of selection may be varied so as to occur earlier or later than the normal time of selection, without causing errors while signals are being received. The range of a printing telegraph receiving device is commonly measured in percent of a perfect signal element by adjusting the indicator.

RANGE, BALANCED ERROR *, an error range in which the highest and lowest error values are opposite in sign and equal in magnitude.

RANGE, DYNAMIC, the dynamic range of a transmission system is the difference in decibels between the noise level of the system and its overload level.

RANGE, ERROR *, the difference between the highest and lowest error values.

RANGE FINDER, an adjustable mechanism on a teleprinter which allows the receiver distributor fact to be moved through an arc corresponding to the length of a unit segment. It is normally adjusted for best results under operating line conditions.

RANGING, in linear programming, post-optimal analyses in which ranges are computed. The ranges in which various elements may lie without causing changes to the optimal solution; may be handled in cost-ranging analysis and right-hand-side analysis.

RANGING, COST in linear programming a procedure in which the range is computed over which the objective coefficient of a specified basis vector can be changed without requiring a change of basis to maintain optimality of the solution. To change an objective coefficient to any value in the range determined for it yields the same optimal basis and solution vector but in general a different objective value.

RANGING, RIGHT-HAND-SIDE in linear programming, a procedure in which the range is computed over which a specified right-hand-side element can be changed without requiring a change of basis to maintain feasibility of the solution. To change a right-hand-side element to any value in the range determined for it yields the same optimal basis but in general a different solution vector and objective value.

RAPID ACCESS LOOP, see (loop, rapid access).

RATE ACTION, see (action, rate).

RATE, BIT, the rate at which binary digits, or pulses representing them pass a given point on a communications line or channel. Clarified by (baud) and (capacity, channel).

RATE, CLOCK, the time rate at which pulses are emitted from the clock. The clock rate determines the rate at which logical or arithmetic gating is performed with a synchronous computer.

RATE, ELEMENT ERROR, see (element error rate).

RATE, ERROR, the total amount of information in error, due to the transmission media, divided by the total amount of information received.

RATE, MODULATION, reciprocal of the unit interval measured in seconds. (This rate is expressed in bauds.)

RATE, PERFORATION, the rate at which characters, rows or words are punched in a paper tape.

RATE, PULSE REPETITION, the number of electric pulses per unit of time experienced by a point in a computer, usually the maximum, normal or standard pulse rate.

RATE, PUNCHING, the number of cards, characters, blocks, fields or words of information placed in the form of holes distributed on cards, or paper tape per unit of time.

RATE, READING, the number of characters, words, fields, blocks or cards sensed by a sensing device per unit of time.

RATE, RESET, the number of corrections per unit of time made by the control system.

RATE, RESIDUAL ERROR, see (residual error rate).

RATE, SAMPLING, the rate at which measurements of physical quantities are made; e.g., if it is desired to calculate the velocity of a missile and its position is measured each millisecond, then the sampling rate is 1,000 measurements per second.

RATE, SIGNALLING, the rate at which signals are transmitted.

RATE, UNDETECTED ERROR, see (undetected error rate).

RATING, CARRIER POWER OUTPUT, see (carrier power output rating).

RATIO, BREAK-MAKE, the ratio of the break period to the make period.

RATIO, CARRIER-TO-NOISE, the ratio in decibels of the value of the carrier to that of the noise after selection and before any nonlinear process such as amplitude limiting and detection.

RATIO, DEVIATION, in a frequency modulation system, the deviation ratio is the ratio of the maximum frequency deviation to the maximum modulating frequency of the system under specified conditions.

RATIO, OPERATING, the ratio of the number of hours of correct machine operation to the total hours of scheduled operation; e.g., on a 168-hour week scheduled operation, if 12 hours of preventive maintenance are required and 4.8 hours of unscheduled down time occurs, then the operating ratio is (168 - 16.8)/168, which is equivalent to a 90% operating ratio. Synonymous with (computer efficiency).

RATIO, READ-AROUND, see (read-around ratio).

RATIO, SIGNAL TO NOISE, the ratio of the amount of signals conveying information to the amount of signals not conveying information.

RATIO, SIGNAL-TO-NOISE (communications), the ratio of the magnitude of the signal to that of the noise. This ratio is often expressed in decibels. Note: This ratio is expressed in many different ways, for example, in terms of peak values in the case of impulse noise and in terms of root-mean-square values in the case of random noise, the signal being assumed sinusoidal. In special cases other measures of signal and noise may be used if clearly stated.

RAW DATA, see (data, raw).

READ *, to acquire data from a source.

READ-AROUND RATIO *, the number of times a specific spot, digit or location in electrostatic storage may be consulted before spillover of electrons will cause a loss of data stored in surrounding spots. The surrounding data must be restored before the deterioration can cause any loss of data.

READ IN-READ OUT, an optional feature which may be added to certain off-line office machinery permitting on-line operation.

READ-IN, to sense information contained in some source and transmit this information to an internal storage.

READ-OUT, to sense information contained in some internal storage and transmit this information to a storage external to the computer.

READ, NON DESTRUCTIVE, a reading of the information in a register without changing that information.

READ PUNCH UNIT, see (unit, read punch).

READ TIME, same as (time, access).

READ WHILE WRITING, the reading of a record or group of records into storage from tape at the same time another record or group of records is written from storage to tape.

READ WRITE CHECK INDICATOR, see (indicator, read write check).

READ WRITE HEAD, see (head, read write).

READER, CARD, (1) a mechanism that senses information punched into cards. (2) An input device consisting of a mechanical punch card reader and related electronic circuitry which transcribes data from punch cards to working storage or magnetic tape. Synonymous with (card reader unit).

READER, CHARACTER, a specialized device which can convert data represented in one of the type fonts or scripts read by human beings directly into machine language. Such a reader may operate optically; or if the characters are printed in magnetic ink, the device may operate magnetically or optically.

READER, HIGH-SPEED, a reading device capable of being connected to a computer so as to operate on-line without seriously holding up the computer. A card reader reading more than 250 cards per minute would be called a high-speed reader. A reader which reads punched paper tape at a rate greater than 50 characters per second could also be called a high-speed reader. Synonymous with (HSR).

READER, MAGNETIC TAPE, a device capable of sensing information recorded on a magnetic tape in the form of a series of magnetized spots.

READER, PAPER TAPE, a device capable of sensing information punched on a paper tape in the form of a series of holes.

READINESS REVIEW, see (review, readiness).

READING, DESTRUCTIVE *, a reading process that destroys the data in the source.

READING, NON-DESTRUCTIVE *, a reading process that does not destroy the data in the source.

READING RATE, see (rate, reading).

REAL-TIME *, (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 computations can be used in guiding the physical process. See (processing real time) and (operation, real time).

REAL TIME CLOCK, see (clock, real time).

REAL TIME OPERATION, see (operation, real time).

REAL TIME PROCESSING, see (processing, real time).

REAL TIME SYSTEM, same as (processing, real time).

RECEIVED DATA CIRCUIT, signals on this circuit are originated by the receiving signal converter, in response to signals received over the communication media. This circuit is not required for Send-Only service. In Half-Duplex service, the receiving signal converter shall hold marking condition on the Received Data circuit when the remote data its Send Request circuit in the off condition. Optionally, in Half-Duplex service, the Received Data circuit may be used to monitor transmitted signals (e.g., for local copy).

RECEIVE-ONLY SERVICE, service in which the data communication channel is capable of receiving signals, but is not equipped to transmit signals.

RECEIVER SIGNAL, equipment controlled by signalling currents transmitted over the line and used generally to send out new signals.

RECEIVING MARGIN, sometimes referred to as Range or Operating Range. 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.

RECEPTION, DIVERSITY, see (diversity reception).

RECEPTION, EXALTED CARRIER, see (exalted carrier reception).

RECOGNITION, CHARACTER, the technology of using a machine to sense and encode into a machine language characters which are written or printed to be read by human beings.

RECOGNITION, PATTERN, the recognition of shapes or other patterns by a machine system. Patterns may be such as physical shapes or speech patterns.

RECORD, (1) a group of related facts or fields of information treated as a unit, thus a listing of information, usually in printed or printable form. (2) To put data into a storage device.

RECORD, FIXED LENGTH, a record whose number of characters is fixed. The restriction may be deliberate to simplify and speed processing or may be caused by the characteristics of the equipment used.

RECORD GAP, see (gap, record).

RECORD LENGTH, see (length, record).

RECORD MARK, see (mark, record).

RECORD, REFERENCE, an output of a computer that lists the operations and their positions in the final specific routine, and contains information describing the segmentation and storage allocation of the routine.

RECORD STORAGE MARK, see (mark, record storage).

RECORD, TRAILER, a record which follows a group of records and contains pertinent data related to the group of records.

RECORD, UNIT, (1) a separate record that is similar in form and content to other records; e.g., a summary of a particular employee's earnings to date. (2) Sometimes refers to a piece of non-tape auxiliary equipment; e.g., card reader, printer or console typewriter.

RECORDS, GROUPING OF, the combining of two or more records into one block of information on tape, to decrease the wasted time due to tape acceleration and deceleration and to conserve tape space. This is also called blocking of records.

RECURSIVE, pertaining to a process which is inherently repetitive. The result of each repetition is usually dependent upon the result of the previous repetition.

RED TAPE, same as (housekeeping).

RED TAPE OPERATION, same as (operation, bookkeeping).

REDUNDANCY, in the transmission of information, redundancy is the fraction of the gross information content of a message which can be eliminated without loss of essential information. Numerically, it is one minus the ratio of the net information content to the gross information content, expressed in percent.

REDUNDANT CHARACTER, see (character, redundant).

REDUNDANT CHECK, see (check, redundant).

REDUNDANT CODE, a code using more signal elements than necessary to represent the intrinsic information.

REEL, a spool of tape, generally magnetic tape.

REFERENCE ADDRESS, same as (address, base) (1).

REFERENCE LEVEL (SINGLE SIDEBAND EQUIPMENT), the reference level for voice frequency input power to a single sideband transmitter shall be the power of one of two equal tones which together cause the transmitter to develop its full rated power output.

REFERENCE NOISE, the magnitude of circuit noise that will produce a circuit noise meter reading equal to that produced by 10 watts of electric power at 1,000 cycles per second.

REFERENCE PILOT, a different wave from those which transmit the telecommunication signals (telegraphy, telephony). It is used in carrier systems to facilitate maintenance and adjustment of the carrier transmission system. For example automatic level regulation, synchronization of oscillators, etc.

REFERENCE RECORD, see (record, reference).

REFERENCE TIME, see (time, reference).

REFLECTED BINARY CODE *, same as Gray Code

REFLECTION FACTOR, the reflection factor between two impedances Z_1 and Z_2 is $\frac{4Z_1 Z_2}{Z_1 + Z_2}$

REGENERATION, (1) the process of returning a part of the output signal of an amplifier to its input circuit in such a manner that it reinforces the excitation and thereby increases the total amplification. (2) Periodic restoration of stored information.

REGENERATIVE REPEATER, a repeater in which signals retransmitted are practically free from distortion.

REGISTER *, a device capable of storing a specified amount of data, such as one word.

REGISTER, ADDRESS *, register that stores an address.

REGISTER, B, see (B-register).

REGISTER, CHECK, a register used to store information temporarily where it may be checked with the result of a succeeding transfer of this information.

REGISTER, CIRCULATING *, a shift register in which data moved out of one end are re-entered into the other end as in a closed loop.

REGISTER, CONTROL, a register which holds the identification of the instruction word to be executed next in time sequence, following the current operation. The register is often a counter which is incremented to the address ofthe next sequential storage location, unless a transfer or other special instruction is specified by the program. Synonymous with (program counter) and contrasted with (register, program).

REGISTER, INDEX *, a register whose content is added to or subtracted from the operand address prior to or during the execution of an instruction. Synonymous with (B-register) (1), and (B-box).

REGISTER, INSTRUCTION, same as (register, program).

REGISTER LENGTH, see (length, register).

REGISTER, MAGNETIC SHIFT, a register which makes use of magnetic cores as binary storage elements, and in which the pattern of binary digital information can be shifted from one position to the next left or right position.

REGISTER, MEMORY, same as (register, storage).

REGISTER, OPERATION, a register in which an operation is stored and analyzed in order to set conditions for the execution cycle.

REGISTER, PROGRAM, a register in which the current instruction of the program is stored. Synonymous with (instruction register) and contrasted with (register, control).

REGISTER, SEQUENCE, see (sequence register).

REGISTER, SHIFT *, a register in which the stored data can be moved to the right or left.

REGISTER, STANDBY, a register in which accepted or verified information can be stored, so as to be available for a rerun in case the processing of the information is spoiled by a mistake in the program, or a malfunction in the computer.

REGISTER, STORAGE, a register in the storage of the computer, in contrast with a register in one of the other units of the computer. Synonymous with (memory register).

REGISTRATION, the accuracy of the positioning of punched holes in a card.

REIMBURSED TIME, see (time, reimbursed).

RELATIONSHIP, ANALYTIC, the relationship which exists between concepts, and corresponding terms, by virtue of their definition and inherent scope of meaning.

RELATIONSHIP, SYNTHETIC, a relation existing between concepts which pertain to empirical observation. Such relationships are involved, not in defining concepts or terms, but in reporting the results of observations and experiments.

RELATIVE ADDRESS, see (address, relative).

RELATIVE CODE, see (code, relative).

RELATIVE TRANSMISSION LEVEL, the relative transmission level at any point in a transmission system is the ratio of the test tone power at that point to the test tone power at some point in the system chosen as a reference point. The ratio shall be expressed in db. The transmission level at the transmitting switch-board is frequently taken as zero level reference point.

RELAY CENTER, synonymous with (message switching center).

RELIABILITY, (1) a measure of the ability to function without failure. (2) The amount of credence placed in a result.

RELIABILITY, CHANNEL, the percentage of time the channels meet the arbitrary standards established by the user.

RELIABILITY, CIRCUIT, the percentage of time the circuit meets arbitrary standards by the user.

RELOCATE *, in 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.

REMEDIAL MAINTENANCE, see (maintenance, remedial).

REMOTE CONTROL EQUIPMENT, the formulating and reformulating apparatus used for performing a prescribed function or functions at a distance by electrical means.

REPEATER, a device used to amplify and/or reshape communications signals.

REPEATER, REGENERATIVE, see (regenerative repeater).

REPEATER STATION, station at which a repeater is located for the purpose of building up and equalizing the strength of a telephone or telegraph signal in a long line. Intermediate station in a microwave system which is arranged to receive a signal from an adjacent station and amplify and retransmit to another adjacent station. Usually performs the function in both directions simultaneously.

REPERFORATOR, (1) the contraction of the words receiving perforator. (2) Any tape punch which automatically converts coded electrical signals into perforations in tape.

REPERTORY, INSTRUCTION, (1) the set of instructions which a computing or data processing system is capable of performing. (2) The set of instructions which an automatic coding system assembles.

REPETITION, AUTOMATIC, a system in which each signal is automatically sent more than once, the duplicated signal being separated from the initial transmission by a constant delay.

REPETITION INSTRUCTION *, an instruction that causes one or more instructions to be executed an indicated number of times.

REPLACEMENT, MECHANICAL, an action originated by the contractor and taken by him to substitute one machine for another that is installed at a customer's site. Such action usually is occasioned by the mechanical condition of the equipment being replaced.

REPORT GENERATOR, see (generator, report).

REPRESENTATION, ANALOG, a representation which does not have discrete values but is continuously variable.

REPRESENTATION, POSITIONAL, a number representation or number system in which the significance or value of each digit depends upon its place or position with respect to a radix point. Related to (system, number).

REPRESENTATIVE CALCULATING TIME, see (time, representative calculating).

REPRODUCER, CARD, a device that reproduces a punch card by punching another similar card.

REPRODUCTION CODES, function codes in a master tape which are carried through the data processing operations and also appear in the product tape. See (non-reproducing codes).

REQUEST REPEAT SYSTEM, a system employing an error-detecting code and so arranged that a signal detected as being in error automatically initiates a request for retransmission of the signal detected as being in error.

REQUIREMENTS, INFORMATION, the actual or anticipated questions which may be posed to an information system.

RERUN, to repeat all or part of a program on a computer.

RERUN-POINT, the stage of a computer run at which all information pertinent to the running of the routine is available either to the routine itself, or to a rerun routine in order that a run may be rerun.

RERUN ROUTINE, see (routine, rerun).

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 "zero" state.

RESET CYCLE, see (cycle, reset).

RESET RATE, see (rate, reset).

RESIDUAL ERROR, see (error, residual).

RESIDUAL ERROR RATE, the ratio of the number of bits, unit elements, characters, and blocks incorrectly received but undetected or uncorrected by the error-control equipment, to the total number of bits, unit elements, characters, blocks sent.

RESIDUE CHECK, see (check, residue).

RESOLVER *, a device whose input is a vector quantity and whose outputs are components of the vector.

RESPONSE, the response of a device or system is a quantitative expression of the output as a function of the input under conditions which must be explicitly stated. The response characteristic, often presented graphically, gives the response as a function of some independent variable such as frequency or direction.

RESPONSE, FREQUENCY, (1) a measure of the ability of a device to take into account, follow or act upon a varying condition; e.g., as applied to amplifiers, the frequencies at which the gain has fallen to the one-half power point or to 0.707 of the voltage gain, either at the high or low end of the frequency spectrum. When applied to a mechanical controller, the maximum rate at which changes in condition can be followed and acted upon, since it is implied that the controller can follow slow changes. (2) The relationship of the gain or loss of a device to the frequency of the applied signal.

RESPONSE, SPECTRAL *, the variation in sensitivity of a device to light of different wavelengths.

RESTART, to go back to a specific planned point in a routine, usually in the case of machine malfunction, for the purpose of rerunning the portion of the routine in which the error occurred. The length of time between restart points in a given routine should be a function of the mean free error time of the machine itself.

RESTITUTION, series of significant conditions determined by the decisions taken according to the products of the telegraph demodulation.

RESTITUTION, SIGNIFICANT CONDITIONS OF A, see (significant conditions of a restitution).

RESTORE, to return an index register, a variable address, or other computer word to its initial or preselected value.

RESTORE, TAPE SKIP, see (tape skip restore).

RESTORER, DIRECT-CURRENT, a means, used in a circuit incapable of transmitting slow variations but capable of transmitting components of higher frequency, by which a direct-current or low-frequency component is reinserted after transmission.

RETRIEVAL, INFORMATION, see (information retrieval).

RETRIEVALS, FALSE, the library references which are not pertinent to but are vaguely related to the subject of the library search and are sometimes obtained by automatic search methods.

RETURN, the mechanism providing for a return in the usual sense. In particular a set of instructions at the end of a subroutine which permit control to return to the proper point in the main routine.

REVERSE CODE DICTIONARY, see (dictionary, reverse code).

REVERSE DIRECTION FLOW *, in flowcharting, a flow in a direction other than left to right, or top to bottom.

REVIEW, PRELIMINARY PROPOSAL, an on-site review to provide guidance to proponent agencies in the preparation of ADP system proposals.

REVIEW, READINESS, an on-site examination of the adequacy of preparations for effective utilization upon installation of a computer, and to identify any necessary corrective actions.

REVOLVER, same as (loop, rapid access).

REWIND, to return a film or magnetic tape to its beginning or passed location.

REWRITE, the process in a storage device of restoring the information in the device to its state prior to reading.

RING COUNTER, see (counter, ring).

RING SHIFT, same as (shift, cyclic).

RISE TIME, see (time, rise).

RO, Receive Only. A receive only page printer.

ROLE INDICATOR, see (indicator, role).

ROLLBACK ROUTINE, same as (routine, rerun).

ROLL-OUT, a process, often used in diagnostic routines, in which a register or counter is read out by the following process: Add 1 to the digits in each column simultaneously; do this n times, where n is the radix of the number in the register; when the result in each column changes from n-1 to 0, issue a signal.

ROTOR, phonetic term for ROTR.

ROTR, Receive Only Typing Reperforator. A teleprinter which produces perforated tape with characters typed along the edge of the tape.

ROUND, same as (round off).

ROUNDING ERROR, see (error, rounding).

ROUND-OFF *, to delete the least significant digit or digits of a numeral and to adjust the part retained in accordance with some rule.

ROUND-OFF ERROR, same as (error, rounding).

ROUTE, (1) the route followed, or to be followed, for the transmission of a telegram or the establishment of a connection. (2) The means of transmission (wire, cable, radio) used, or to be used, for the transmission of a telegram or the establishment of a connnection.

ROUTINE, a set of coded instructions arranged in proper sequence to direct the computer to perform a desired operation or sequence of operations. A subdivision of a program consisting of two or more instructions that are functionally related; therefore, a program. Clarified by (subroutine) and related to (program).

ROUTINE, ASSEMBLY, same as (assembler).

ROUTINE, AUTOMATIC, a routine that is executed independently of manual operations, but only if certain conditions occur within a program or record, or during some other process.

ROUTINE, AUXILIARY, a routine designed to assist in the operation of the computer and in debugging other routines.

ROUTINE CHECK, same as (check, programmed).

ROUTINE, CLOSED, a routine which is not inserted as a block of instructions within a main routine but is entered by basic linkage from the main routine.

ROUTINE, COMPILING, same as (compiler).

ROUTINE, DEBUGGING AID, a routine to aid programmers in the debugging of their routines. Some typical routines are: storage, print-out, tape print-out and drum print-out routines.

ROUTINE, DIAGNOSTIC, a routine used to locate a malfunction in a computer, or to aid in locating mistakes in a computer program. Thus, in general, any routine specifically designed to aid in debugging or trouble shooting. Synonymous with (malfunction routine) and related to (debug).

ROUTINE, ERROR DETECTION, a routine used to detect whether or not an error has occurred, usually without special provision to find or indicate its location.

ROUTINE, EXECUTIVE, a routine which controls loading and relocation of routines and in some cases makes use of instructions which are unknown to the general programmer. Effectively, an executive routine is part of the machine itself. Synonymous with (monitor routine); (supervisory routine) and (supervisory program).

ROUTINE, FLOATING POINT, a set of subroutines which cause a computer to execute floating point arithmetic. These routines may be used to simulate floating point operations on a computer with no built in floating point hardware.

ROUTINE, GENERAL, same as (program, general).

ROUTINE, GENERATING, a form of compiling routine, capable of handling less fully defined situations.

ROUTINE, HEURISTIC, a routine by which the computer attacks a problem not by a direct algorithmic procedure, but by a trial and error approach frequently involving the act of learning. Synonymous with (heuristic program).

ROUTINE, HOUSEKEEPING, the initial instructions in a program which are executed only one time; e.g., clear storage.

ROUTINE, INPUT, a routine, sometimes stored permanently in a computer, to allow reading of programs and data into the machine.

ROUTINE, INTERPRETIVE, a routine which decodes and immediately executes instructions written as pseudo codes. This is contrasted with a compiler which decodes the pseudo codes into a machine language routine to be executed at a later time. The essential characteristic of an interpretive routine is that a particular pseudo code operation must be decoded each time it is executed. Synonymous with (interpretive code).

ROUTINE LIBRARY, see (library, routine).

ROUTINE, LOADING, a routine which, once it is itself in storage, is able to bring other information into storage from cards or tape.

ROUTINE, MALFUNCTION, same as (routine, diagnostic).

ROUTINE, MINIMUM ACCESS, a routine so coded that by judicious arrangement of data and instructions in storage, the actual access time is less than the expected random access time. Such a routine is used with serial storage systems. Synonymous with (minimum latency routine).

ROUTINE, MINIMUM LATENCY, same as (routine, minimum access).

ROUTINE, MONITOR, same as (routine, executive).

ROUTINE, OBJECT, same as (program, object).

ROUTINE, OPEN, a routine which can be inserted directly into a larger routine without a linkage or calling sequence.

ROUTINE, POST MORTEM, a service routine useful in analyzing the cause of a failure, such as a routine that dumps out the content of a store after a failure. Related to (post mortem).

ROUTINE, RERUN, a routine designed to be used after a computer malfunction or a coding or operating mistake to reconstitute a routine from the last previous rerun point. Synonymous with (rollback routine).

ROUTINE, ROLLBACK, same as (routine, rerun).

ROUTINE, SEQUENCE CHECKING, a routine which checks every instruction executed, and prints out certain data; e.g., to print out the coded instructions with addresses, and the contents of each of several registers, or it may be designed to print out only selected data, such as transfer instructions and the quantity actually transferred.

ROUTINE, SERVICE, a broad class of routines which are standardized at a particular installation for the purpose of assisting in maintenance and operation of the computer as well as the preparation of programs as opposed to routines for the actual solution of production problems. This class includes monitoring or supervisory routines, assemblers, compilers, diagnostics for computer malfunctions, simulation of peripheral equipment, general diagnostics and input data. The distinguishing quality of service routines is that they are generally standardized so as to meet the servicing needs at a particular installation, independent of any specific production type routine requiring such services.

ROUTINE, SPECIFIC, a routine to solve a particular mathematical, logical, or data handling problem in which each address refers to explicitly stated registers and locations.

ROUTINE, STORED, a series of instructions in storage to direct the step-by-step operation of the machine. Synonymous with (stored program).

ROUTINE, SUPERVISORY, same as (routine, executive).

ROUTINE, TEST, a routine designed to show whether a computer is functioning properly or not.

ROUTINE, TRACING, a diagnostic routine used to provide a time history of one or more machine registers and controls during the execution of the object routine. A complete tracing routine would reveal the status of all registers and locations affected by each instruction, each time the instruction is executed. Since such a trace is prohibitive in machine time, traces which provide information only following the execution of certain types of instructions are more frequently used. Furthermore, a tracing routine may be under control of the processor, or may be called in by means of a trapping feature. Related to (trap).

ROUTINE, TRANSLATING, same as (translator) (1).

ROUTINE, UTILITY, a standard routine used to assist in the operation of the computer; e.g., a conversion routine, a sorting routine, a printout routine, or a tracing routine. Synonymous with (utility program).

ROUTING, the assigning of the communications path over which a message or telephone call will travel to its destination.

ROUTING, ALTERNATE, assignment of a secondary communications path to a destination if the primary path is unavailable.

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.

ROUTING, MESSAGE, the function performed at a central message processor of selecting the route, or alternate route if required, by which a message will proceed to the next point in reaching its destination.

ROW BINARY, a method of representing binary numbers on a card where successive bits are represented by the presence or absence of punches in a successive position in a row as opposed to a series of columns. Row binary is especially convenient in 40 bit word, or less, computers; wherein the card frequently is used to store 12 binary words on each half of the card.

ROW PITCH, the distance measured along paper tape between the centers of adjacent holes.

RT, Reperforator Transmitter. A receiver-transmitter consisting of a reperforator and a tape distributor, each of which is 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.

RULY ENGLISH, see (english, ruly).

RUN, the performance of one program on a computer, thus the performance of one routine, or several routines linked so that they form an automatic operating unit, during which manual manipulations by the computer operator are zero, or at least minimal.

RUN, MACHINE, the execution of one or several machine routines which are linked to form one operating unit.

RUN, PRODUCTION, see (production run).

RUNNING OPEN, term used to describe a machine connected to an open line or a line without battery. A teleprinter under such a condition appears to be running, as the type hammer continually strikes the type box but does not move across the page.

RUNNING, PARALLEL, (1) the running of a newly developed system in a data processing area in conjunction with the continued operation of the current system. (2) The final step in the debugging of a system, this step follows a system test.

S

SAMPLING *, obtaining a value of a variable at regular or intermittent intervals.

SAMPLING RATE, see (rate, sampling).

SCALE *, (1) A range of values frequently dictated by the computer word-length or routine at hand. (2) To change a quantity by a factor in order to bring its range within prescribed limits.

SCALE FACTOR, see (factor, scale).

SCAN *, to examine sequentially part by part.

SCANNER, an instrument which automatically samples or interrogates the state of various processes, files, conditions, or physical states and initiates action in accordance with the information obtained.

SCANNER (communications), a scanner sequentially checks each of the sites on the particular leased line for traffic. Another scanner at the control center can sequentially check several lines to determine whether a message is present or not.

SCANNER, FLYING SPOT *, in OCR, a device employing a moving spot of light to scan a sample space, the intensity of transmitted or reflected light being sensed by a photoelectric transducer.

SCANNER, VISUAL *, (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.

SCHEDULED OPERATION, see (operation, scheduled).

SCOPE (System to Coordinate the Operation of Peripheral Equipment), a group of Honeywell routines that optimize the use of peripheral devices (on H-200, H-800 and H-1800 computers) during parallel operation. Card readers, card punches and high-speed readers are controlled for simultaneous operation at full speed.

SCREEN, (1) the surface in an electrostatic cathode ray storage tube where electrostatic charges are stored, and by means of which information is displayed or stored temporarily. (2) To make a preliminary selection from a set of entities, selection criteria being based on a given set of rules or conditions.

SDA, Source Data Automation, see (automation, source data).

SEARCH *, to examine a set of items for those that have a desired property.

SEARCH, BINARY *, a search in which a set of items is divided into two parts, where one part is rejected, and the process is repeated on the accepted part until those items with the desired property are found. Synonymous with (dichotomizing search).

SEARCH, CONJUNCTIVE, a search defined in terms of a logical product; i.e., conjunctive form, in contrast to a disjunctive form, or logical sum.

SEARCH, DICHOTOMIZING, same as (search, binary).

SEARCH, DISJUNCTIVE, a search defined in terms of a logical sum; i.e., disjunctive form, in contrast to a conjunctive form or logical product.

SEARCH TIME, see (time, search).

SECOND LEVEL ADDRESS, same as (address, indirect).

SECONDARY STORAGE, see (storage, secondary).

SECTION, ARITHMETIC, same as (unit, arithmetic).

SEEK, to look for data according to information given regarding that data; occasionally used interchangeably and erroneously for (search), (scan) and (screen).

SEGMENT, (1) to divide a routine in parts, each consisting of an integral number of subroutines, and each part capable of being completely stored in the internal storage and containing the necessary instructions to jump to other segments. (2) That portion of a routine too long to fit into internal storage which is short enough to be stored entirely in the internal storage; such a segment contains the coding necessary to call in other segments automatically. Routines which exceed internal storage capacity may be automatically divided into segments by a compiler.

SEGMENT MARK, see (mark, segment).

SELECT, (1) to take the alternative A if the report on a condition is of one state, and alternative B if the report on the condition is of another state. (2) To choose a needed subroutine from a file of subroutines.

SELECTING, the function of pulling from a mass of data certain items that require special attention. A data processing function. Typical selections are:
Items containing specific digits.
Items for a specific date.
Items higher than a specific number.
Items below a specific number.
Items below two specific numbers. etc.

SELECTION CHECK, see (check, selection).

SELECTIVE CALLING, a form of teletypewriter communications system. One loop may include several machines but, with selective calling, only the machine selected will respond. The device that controls the individual machines in response to a selective call (CDC) is called a stunt box.

SELECTIVE TRACE, see (trace, selective).

SELECTIVITY, ADJACENT CHANNEL, see (adjacent channel selectivity).

SELECTOR, a device which interrogates a condition and initiates one of several alternate operations.

SELECTOR (communications), a way station selector is used on way-operated circuits, where more than two stations share the circuit on a "party-line" basis. The selector provides a means for cutting into the circuit only the calling station and the called station(s), so that stations not concerned are not disturbed.

SELF ADAPTING *, pertaining to the ability of a system to change its performance characteristics in response to its environment.

SELF CHECKING CODE, same as (code, error detecting).

SELF CHECKING NUMBER, see (number, self checking).

SELF DEMARKING CODE, see (code, self demarking).

SELF ORGANIZING, having the capability of classification or internal rearrangement, depending on the environment in accordance with given instructions or a set of rules.

SELF ORGANIZING MACHINE, see (machine, self organizing).

SEMANTICS *, the relationship between symbols and their meanings.

SEMANTIC MATRIX, see (matrix, semantic).

SEMI-AUTOMATIC MESSAGE, see (switching center).

SEMICONDUCTOR, a solid with an electrical conductivity that lies between the high conductivity of metals and the low conductivity of insulators. Semiconductor circuit elements include crystal diodes and transistors.

SEND-ONLY SERVICE, service in which the data communication channel is capable of transmitting signals, but is not equipped to receive signals.

SEND-RECEIVE, AUTOMATIC, see (ASA).

SEND REQUEST CIRCUIT, signals on this circuit are originated in the data terminal equipment to select whether the signal converter is to be conditioned to transmit or to receive. For Half-Duplex service, when the signal on the Send Request circuit is switched to the "on" condition, the signal converter shall switch to the transmit condition, without regard to any signals that may be received from the communication facility. When this signal is switched to the "off" condition, the signal converter shall switch to the receive condition, without regard to any signals on the Transmitted Data circuit. Data terminal equipment intended for use with Send-Only service shall hold the Send Request circuit in the "on" condition at all times. Data terminal equipment intended for use with Receive-Only service shall hold the Send Request circuit in the "off" condition at all times. This circuit is not required for Full-Duplex service.

SENSE, (1) to examine, particularly relative to a criterion. (2) To determine the present arrangement of some element of hardware, especially a manually-set switch. (3) To read punched holes or other marks.

SENSING, MARK, a technique for detecting special pencil marks entered in special places on a punch card and automatically translating the marks into punched holes.

SENSITIVITY, the degree of response of an instrument or control unit to a change in the incoming signal.

SENSITIVITY ANALYSES, in linear programming, a general term including the procedures used to investigate the stability of a linear programming problem relative to local changes in the problem. Examples of these procedures are parametric programming and ranging. Another method, sometimes called sensing, is to compute the rate of change in the objective value for a small change in each non-zero element of the basis vectors.

SENTINEL, same as (flag).

SEPARATOR *, same as delimiter.

SEPTENARY NUMBER, see (number, septenary).

SEQUENCE, (1) to put a set of symbols into an arbitrarily defined order; i.e., to select A if A is greater than or equal to B, or select B if A is less than B. (2) An arbitrarily defined order of a set of symbols; i.e., an orderly progression of items of information or of operations in accordance with some rule.

SEQUENCE, CALLING *, a specified arrangement of instructions and data necessary to set up and call a given subroutine.

SEQUENCE CHECK, see (check, sequence).

SEQUENCE CHECKING ROUTINE, see (routine, sequence checking).

SEQUENCE, COLLATING *, an ordering assigned to a set of items, such that any two sets in that assigned order can be collated.

SEQUENCE, CONTROL, the normal order of selection of instructions for execution. In some computers one of the addresses in each instruction specifies the control sequence. In most other computers, the sequence is consecutive except where a transfer occurs.

SEQUENCE, PSEUDO-RANDOM NUMBER *, 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, e.g., uniform distribution or a normal (Gaussian) distribution.

SEQUENCE, RANDOM NUMBER, an unpredictable array of numbers produced by change, and satisfying one or more tests for randomness.

SEQUENCE REGISTER, a special register which, when activated, designates the address of the next instruction to be performed by the computer.

SEQUENCER, same as (sorter).

SEQUENTIAL ACCESS STORAGE, see (storage, sequential access).

SEQUENTIAL CONTROL, see (control, sequential).

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, see (operation, sequential).

SERIAL *, (1) pertaining to the time-sequencing of two or more processes. (2) Pertaining to the time-sequencing of two or more similar or identical processes, using the same facilities for the successive process. (3) Pertaining to the time-sequential processing of the individual parts of a whole, such as the bits of a character, the characters of a word, etc., using the same facilities for successive parts. Related to (operation, serial) and contrasted with (parallel).

SERIAL ACCESS, see (access, serial).

SERIAL COMPUTER, see (computer, serial).

SERIAL OPERATION, see (operation, serial).

SERIAL-PARALLEL, (1) a combination of serial and parallel; e.g., serial by character, parallel by bits comprising the character. (2) Descriptive of a device which converts a serial input into a parallel output.

SERIAL PROGRAMMING, see (programming, serial).

SERIAL STORAGE, see (storage, serial).

SERIAL TRANSFER, see (transfer, serial).

SERIAL TRANSMISSION, see (transmission, serial).

SERIES, TIME, the discrete or continuous sequence of quantitative data assigned to specific moments in time, usually studied with respect to their distribution in time.

SERVICE BITS, those overhead bits which are not check bits. Example: request for repetition, numbering sequence, etc.

SERVICE, EXCHANGE, see (exchange service).

SERVICE, EXTENDED AREA, an exchange service, without toll charges, which extends over an area where there is a community of interest in return for a somewhat higher exchange service rate.

SERVICE, FOREIGN EXCHANGE, see (foreign exchange service).

SERVICE, FULL-DUPLEX, see (full-duplex service).

SERVICE, HALF-DUPLEX, see (half-duplex service).

SERVICE, PRIVATE LINE (WIRE), a channel or circuit furnished a subscriber for his exclusive use.

SERVICE, RECEIVE-ONLY, see (receive-only service).

SERVICE ROUTINE, see (routine, service).

SERVICE, SEND-ONLY, see (send-only service).

SERVICE, TELEPRINTER GRADE, see (teleprinter grade service).

SERVICE, TELETYPEWRITER EXCHANGE, a form of teletypewriter in which suitably arranged teletypewriter stations are provided with lines to a central office where connections may be established between any such stations and any other similar station in the same city or in other cities under control of the subscriber. See (teletypewriter exchange service).

SERVICE, TELETYPEWRITER PRIVATE LINE, a form of teletypewriter service differing from exchange service in that it is limited to service between certain specified stations. The service may be contracted for on a full-time or part-time basis.

SERVICE, VOICE GRADE, see (voice grade service).

SERVICE, WIDE AREA TELEPHONE, see (wide area telephone service).

SERVICING TIME, same as (time, engineering).

SERVOMECHANISM *, (1) A feedback control system in which at least one of the system signals represents mechanical motion. (2) Any feedback control system. (3) A device to monitor an operation as it proceeds, and make necessary adjustments to keep the operation under control. A furnace thermostat is an example of a servomechanism. Clarified by (hunting).

SET *, (1) a collection. (2) To place a storage device into a specified state, usually other than that denoting zero or blank. (3) To place a binary cell into the "one" state.

SET, CHARACTER, an agreed set of representations, called characters, from which selections are made to denote and distinguish data. Each character differs from all others, and the total number of characters in a given set is fixed; e.g., a set may include the numerals 0 to 9, the letters A to Z, punctuation marks and a blank or space. Clarified by (alphabet).

SET-UP TIME, see (time, set-up).

SEXADECIMAL NUMBER, see (number, sexadecimal).

SHIFT, to move the characters of a unit of information column-wise right or left. For a number, this is equivalent to multiplying or dividing by a power of the base of notation. Related to (shift, arithmetic) and (shift, cyclic).

SHIFT, ARITHMETIC, to multiply or divide a quantity by a power of the number base; e.g., if binary 1101, which represents decimal 13, is arithmetically shifted twice to the left, the result is 110100, which represents 52, which is also obtained by multiplying 13 by 2 twice; on the other hand, if the decimal 13 were to be shifted to the left twice, the result would be the same as multiplying by 10 twice, or 1300. Related to (shift) and (shift, cyclic).

SHIFT, CARRIER see (carrier shift).

SHIFT, CASE, the change-over of the translating mechanism of a telegraph receiving machine from letters-case to figures-case or vice versa. This shift is normally performed in telegraph apparatus by preceding the transmission of letters-case characters or functions by a letters-shift signal, and the transmission of figures-case characters or functions by a figures-shift signal.

SHIFT, CIRCULAR, same as (shift, cyclic).

SHIFT, CYCLIC, a shift in which the digits dropped-off at one end of a word are returned at the other in a circular fashion; e.g., if a register holds eight digits, 23456789, the result of a cyclic shift two columns to the left would be to change the contents of the register to 45678923. Synonymous with (circular shift); (end-around shift); (logical shift); (non arithmetic shift); and (ring shift).

SHIFT, END AROUND, same as (shift, cyclic).

SHIFT, FIGURES, see (figures shift).

SHIFT, FREQUENCY, see (frequency shift).

SHIFT, LETTERS, see (letters shift).

SHIFT, LOGICAL, same as (shift, cyclic).

SHIFT, NON ARITHMETIC, same as (shift, cyclic).

SHIFT, PHASE, the time difference between the input and output signal or between any two synchronized signals, of a control unit, system, or circuit.

SHIFT REGISTER, see (register, shift).

SHIFT, RING, same as (shift, cyclic).

SHOP, CLOSED, the operation of a computer facility where programming service to the user is the responsibility of a group of specialists, thereby effectively separating the phase of task formulation from that of computer implementation. The programmers are not allowed in the computer room to run or oversee the running of their programs. Contrasted with (shop, open).

SHOP, OPEN, the operation of a computer facility where computer programming, coding and operating can be performed by any qualified employee of the organization, not necessarily by the personnel of the computing center itself and where the programmer may assist in, or oversee the running of his program on the computer. Contrasted with (shop, closed).

SHORT WORD, see (word, short).

SIDE CIRCUIT, one of two physical circuits in a phantom group.

SIDEBAND, the frequency band on either the upper or lower side of the carrier frequency within which fall the frequencies produced by the process of modulation.

SIGN, (1) in arithmetic, a symbol which distinguishes negative quantities from positive ones. (2) An indication of whether a quantity is greater than zero, or less than zero. The signs often are the marks = and -, respectively, but other arbitrarily selected symbols may be used; Example: 0 and 1, or 0 and 9, when used as codes at a predetermined location, can be interpreted by a person or machine.

SIGN BIT, see (bit, sign).

SIGN CHECK INDICATOR, see (indicator, sign check).

SIGN DIGIT, see (digit, sign).

SIGNAL, the event, phenomenon or electrical quantity which conveys information from one point to another.

SIGNAL (communications), aggregate of waves propagated along a transmission channel and intended to act on a receiving unit.

SIGNAL ATTENUATION, see (attenuation, signal).

SIGNAL, BELL, see (bell signal).

SIGNAL, CARRY-COMPLETE, a signal generated by a digital parallel adder, indicating that all carries from an adding operation have been generated and propagated and the addition operation is completed.

SIGNAL CONDITIONING, see (conditioning, signal).

SIGNAL, CORRECTING, in synchronous systems, a special signal which may be sent recurrently for correcting purposes.

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 FEEDBACK CONTROL, that portion of the output signal which is returned to the input in order to achieve a desired effect, such as fast response.

SIGNAL GROUND, this conductor establishes the electrical ground reference potential for all interchange circuits except the Frame Grounding Circuit.

SIGNAL, INHIBITING, a signal, which when entered into a specific circuit will prevent the circuit from exercising its normal function; e.g., an inhibit signal fed into an AND gate will prevent the gate grom yielding an output when all normal input signals are present.

SIGNAL TO NOISE RATIO, see (ratio, signal to noise).

SIGNAL, PROCEED-TO-SELECT, the signal returned from distant automatic equipment over the backward signalling path, in response to a calling signal, to indicate that selecting information can be transmitted. Note: In certain signalling systems, this signal can be one and the same as the "call-confirmation signal".

SIGNAL, PROCEED TO TRANSMIT, the signal returned from a distant manual switchboard over the backward signalling path, in response to a calling signal, to indicate that the teleprinter of the distant operator is connected to the circuit.

SIGNAL, PULSING, signals which are transmitted in the forward direction and carry the selective information to route the call in the desired direction.

SIGNAL, RECEIVER, see (receiver signal).

SIGNAL, RELEASE GUARD, a signal sent back in response to the clear-forward signal to indicate that the circuit has become free at its incoming end. This signal is provided to protect the circuit at its outgoing end against subsequent seizing before the release operation, controlled by the clear-forward signal, has been completed at the incoming end.

SIGNAL, SEIZING, in semi-automatic or automatic working, a signal transmitted at the commencement of a call to initiate circuit operation at the incoming end of the circuit.

SIGNAL, START (IN A START-STOP SYSTEM), signal serving to prepare the receiving mechanism for the reception and registration of a character, or for the control of a function.

SIGNAL, START DIALING, see (start dialing signal).

SIGNAL, STOP (IN A START-STOP SYSTEM), signal serving to bring the receiving mechanism to rest in preparation for the reception of the next telegraph signal.

SIGNAL, TELEGRAPH, the set of conventional elements established by the code to enable the transmission of a written character (letter, figure, punctuation sign, arithmetical sign, etc.) or the control of a particular function (spacing, shift, line-feed, carriage return, phase correction, etc.); this set of elements is characterized by the variety, the duration and the relative position of the component elements (or by some of these features).

SIGNALLING, in a telephone system, any of several methods used to alert subscribers or operators.

SIGNALLING, AC, see (AC signalling).

SIGNALLING, BINARY, a communications mode in which information is passed by the presence and absence, or plus and minus variations of one parameter of the signalling medium only.

SIGNALLING, CLOSED CIRCUIT, that type of signalling in which current flows in the idle condition, and a signal is initiated by increasing or decreasing the current.

SIGNALLING, D. C. See (D.C. signalling).

SIGNALLING, FREQUENCY-CHANGE, see (frequency-change signalling).

SIGNALLING, FREQUENCY-EXCHANGE, see (frequency-exchange signalling).

SIGNALLING, OCTONARY, a communications mode in which information is passed by the presence and absence or plus and minus variation of eight discrete levels of one parameter of the signalling medium.

SIGNALLING, OPEN CIRCUIT, that type of signalling in which no current flows while the circuit is in the idle condition.

SIGNALLING, QUATERNARY, an electrical communications mode in which information is passed by the presence and absence, or plus and minus variations of four discrete levels of one parameter of the signalling medium.

SIGNALLING RATE, see (rate, signalling).

SIGNALS, CORRECTION FROM, a system of correction in which the maintenance of synchronism between synchronous equipments is controlled, not by a special correcting signal, but by the position of the characteristic instants of restitution of telegraph signals comprising the text.

SIGNED FIELD, see (field, signal).

SIGNIFICANT CONDITIONS OF A MODULATION, distinct conditions, assumed by the appropriate device of the sending apparatus, which serve to characterize the variety of the elements of the alphabetic telegraph signals to be transmitted.

SIGNIFICANT CONDITIONS OF A RESTITUTION, distinct conditions, assumed by the appropriate device of the receiving apparatus, which serve to characterize the variety of the elements of the alphabetic telegraph signals received.

SIGNIFICANT DIGITS, see (digits, significant).

SIGNIFICANT INSTANTS (OF A MODULATION OR A RESTITUTION), instants limiting significant intervals of modulation or restitution.

SIGNIFICANT INTERVAL see (internal, significant).

SIMPLEX, a circuit capable of one-way operations only. The term is seldom used today because no such circuit is offered by the common carriers. Terminal equipment may limit transmission to one direction only but the circuit used will be half-duplex.

SIMULATION, (1) the representation of physical systems and phenomena by computers, models or other equipment; e.g., an imitiative type of data processing in which an automatic computer is used as a model of some entity; e.g., a chemical process. Information enters the computer to represent the factors entering the real process, the computer produces information that represents the results of the process, and the processing done by the computer represents the process itself. (2) In computer programming, the technique of setting up a routine for one computer to make it operate as nearly as possible like some other computer.

SIMULATOR, (1) a computer or model which represents a system or phenomenon and which mirrors or maps the effects of various changes in the original, enabling the original to be studied, analyzed, and understood by means of the behavior of the model. (2) A program or routine corresponding to a mathematical model or representing a physical model. (3) A routine which is executed by one computer but which imitates the operations of another computer.

SIMULTANEOUS ACCESS, same as (access, parallel).

SINGLE ADDRESS, same as (address, one) (2).

SINGLE CIRCUIT, a telegraph circuit capable of non-simultaneous two-way communications. See half-duplex circuit.

SINGLE ERROR, an erroneous bit, preceded and followed by at least one correct bit.

SINGLE SIDEBAND TRANSMISSION, a transmission technique in which only one sideband is transmitted while the other is suppressed.

SINGLE-STEP OPERATION, see (operation, single-step).

SIZE, ITEM, (1) the magnitude of an item, usually expressed in numbers of words, characters or blocks. (2) The number of characters in an item.

SKELETAL CODE, see (code, skeletal).

SKEW *, (1) In facsimile transmission, skew is the deviation of the received frame from rectangularity due to asynchronism between scanner and recorder. (2) The angular displacement of an individual printed character, group of characters, or other data, from the intended or ideal placement.

SKIP, same as (instruction, skip), and (instruction, no-op) (3).

SKIP CODE, a functional code which instructs the machine to skip certain pre-determined fields.

SKIP INSTRUCTION, see (instruction, skip).

SKIP, TAPE, see (tape skip).

SLACK, in linear programming a type of variable added to an inequality constraint to convert the constraint into an equation. If the coefficient of the variable is plus one, the variable is called a positive slack variable; else the coefficient of the variable is minus one and the variable is called a negative slack variable or surplus variable.

SLACK VECTOR, in linear programming if a slack variable is added to an inequality constraint to convert it to an equivalent equation, the corresponding column vector in the resulting A matrix is a unit vector having its unit element in the given constraint row.

SNAPSHOT DUMP, see (dump, snapshot).

SOFTWARE, the totality of programs and routines used to extend the capabilities of computers, such as compilers, assemblers, narrators, routines, and subroutines. Contrasted with (hardware).

SOLID STATE, the electronic components that convey or control electrons within solid materials; e.g., transistors, germanium diodes, and magnetic cores. Thus, vacuum and gas tubes are not included.

SOLID STATE COMPUTER, see (computer, solid state).

SOLUTION, BASIC, in linear programming, a basic solution is a strictly determined solution to that under-determined system of constraint equations which is represented by the A matrix. The method is to solve the A-matrix in terms of any set of m (linear independent) column vectors, the levels of the remaining n - m vectors being set equal to zero.

SOLUTION, FEASIBLE, in linear programming, a basic solution is feasible if, in the constraint rows of the solution vector, there is (1) no negative element and (2) no non-zero element that corresponds to an artificial vector in the basis. A problem is feasible if the original constraints can be solved in terms of non-negative numbers.

SOLUTION, INFEASIBLE, in linear programming, a basic solution is infeasible if, in the constraint rows of the solution vector, there is (1) at least one negative element or (2) at least one non-zero element that corresponds to an artificial vector in the basis. A problem is infeasible if the original constraints cannot be solved in terms of non-negative numbers.

SOLVER, EQUATION, a calculating device, usually analog, which solves systems of linear simultaneous non-differential equations or determines the roots of polynomials or both.

SONIC DELAY LINE, same as (line, acoustic delay).

SOPHISTICATED VOCABULARY, see (vocabulary, sophisticated).

SORT, to arrange items of information according to rules dependent upon a key or field contained in the items or records; e.g., to digital sort is to sort first the keys on the least significant digit, and to resort on each higher order digit until the items are sorted on the most significant digit.

SORT, a Honeywell systems program which arranges a file of items in a logical sequence according to a designated key word contained within each item (e.g., the arranging of items according to date, code number, etc.).

SORT, BLOCK, a sort of one or more of the most significant characters of a key to serve as a means of making workable sized groups from a large volume of records to be sorted.

SORT, FOUR-TAPE, to four-tape sort is to merge sort in which input data are supplied on two tapes, and are sorted into incomplete sequences alternately on two output tapes, the output tapes are used for input on the succeeding pass, resulting in longer and longer sequences after each pass until the data are all in one sequence on one output tape.

SORT, MERGE, to produce a single sequence of items, ordered according to some rule, from two or more previously un-

ordered sequences, without changing the items in size, structure, or total number; although more than one pass may be required for a complete sort, items are selected during each pass on the basis of the entire key.

SORT, PROPERTY, the selection of items from a group which satisfy a certain criterion.

SORTER, a machine which puts items of information into a particular order; e.g,, it will determine whether A is greater than, equal to or less than B and sort or order accordingly. Synonymous with (sequencer).

SOURCE DATA AUTOMATION, see (automation, source data).

SOURCE DOCUMENT, see (document, source).

SOURCE LANGUAGE, see (language, source).

SOURCE PROGRAM, see (program, source).

SPACE *, (1) A place intended for the storage of data, e.g., a place on a printed page or a location in a storage medium. (2) A basic unit of area on a record, i.e., an area that may contain no more than one printed character. (3) One or more blanks. (4) To move from one place to another according to a prescribed format, e.g., to move horizontally to the right on a printed page or vertically down a page.

SPACE, an impulse which, in a neutral circuit, causes the loop to open; or in a polar circuit, causes the loop current to flow in a direction opposite to that for a mark impulse.

SPACE CODE, similar to Skip Code, but restricted to one space at a time.

SPACE, DEAD, same as (band, dead).

SPACE-TO-MARK TRANSITION, the transition, or switching, from a spacing impulse to a marking impulse.

SPACE, WORKING, same as (storage, temporary).

SPACING, the condition that exists on a telegraph circuit during transmission when a bit of intelligence corresponding to a "No" is being sent.

SPACING BIAS, bias distortion which lengthens the spacing impulse by delaying the space-to-mark transition.

SPACING END DISTORTION, end distortion which lengthens the spacing impulse by advancing the mark-to-space transition.

SPACING, PULSE, see (pulse spacing).

SPAR (Selection Program for Admiral Runs), Honeywell's three-phase utility system that updates Admiral and object program areas of an Admiral run tape (ART) by selecting or deleting programs from a symbolic program tape (SPT).

SPECIAL CHARACTER *, in a character set, a character that is neither a numeral, a letter nor a blank, e.g., a virgule, asterisk, dollar sign, equals sign, comma, or a period.

SPECIAL PURPOSE COMPUTER, see (computer, special purpose).

SPECIFIC ADDRESS, same as (address, absolute).

SPECIFIC CODE, same as (code, absolute).

SPECIFIC PROGRAM, see (program, specific).

SPECIFIC ROUTINE, see (routine, specific).

SPECTRAL RESPONSE *, the variation in sensitivity of a device to light of different wavelengths.

SPEED, TELEGRAPH, see (rate, modulation).

SPEED, TRANSMISSION, the number of information elements sent per unit time, usually expressed as bits, characters, word groups, or records per second or per minute.

SPEED, TRANSMISSION, EFFECTIVE, the rate at which information is processed by a transmission facility, expressed as the average rate over some significant time interval. This quantity is usually expressed as average characters per unit time or average bits per unit time. (Rate of Transmission, Average is more common usage.)

SPOT, FLYING, a small, rapidly moving, spot of light, usually generated by a cathode-ray tube and used to illuminate successive spots of a surface containing dark and light areas. The varying amount of light reflected is detected by a phototube and used to produce a time succession of electronic signals which effectively describe the surface.

SPOT PUNCH, see (punch, spot).

SPREAD, time interval, at either side of an ideal instant of modulation or restitution, in which occurs the actual significant instants of the modulation or restitution.

SPROCKET PULSE, see (pulse, sprocket).

SPT (Symbolic Program Tape), a Honeywell tape which contains a file of programs, each of which is in the original assembly language and also the machine language. From this tape, programs can be selected for either checkout or production runs.

STACKER, CARD, a receptacle that accumulates cards after they have passed through a machine.

STACKER, INPUT, same as (magazine, input).

STACKER, OUTPUT, same as (magazine, output).

STAMP (Systems Tape Addition and Maintenance Program), a Honeywell program that simplifies making up the file of systems programs on the symbolic program tape or master relocatable tape; it reduces significantly the time and effort in updating, correcting and maintaining the systems programs on these tapes.

STANDARD SUBROUTINE, see (subroutine, standard).

STANDARD, WORKING, see (working standard).

STANDARDS, SYSTEM, see (system standards).

STANDARD TEST TONE POWER, one milliwatt (0 dbm) at 1,000 cps.

STANDARDIZE *, (1) to establish standards. (2) To cause conformity with established standards. (3) Same as (normalize).

STANDING-ON-NINES CARRY, see (carry, standing on nines).

STANDBY APPLICATION, see (application, standby).

STANDBY BLOCK, see (block, standby).

STANDBY REGISTER, see (register, standby).

STANDBY TIME, see (time, standby).

STANDBY UNATTENDED TIME, see (time, standby unattended).

START DIALING SIGNAL, in semi-automatic or automatic working, a signal transmitted from the incoming end of a circuit, following the receipt of a seizing signal, to indicate that the necessary circuit conditions have been established for receiving the numerical routine information.

START-STOP SYSTEM, a system in which each group of code elements corresponding to an alphabetical 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.

START TIME, same as (time, acceleration).

STATEMENT *, in computer programming, a meaningful expression or generalized instruction in a source language.

STATIC STORAGE, see (storage, static).

STATIC SUBROUTINE, see (subroutine, static).

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.

STATICIZER, (1) a storage device for converting time sequential information into static parallel information. (2) A type of buffer.

STATION, INQUIRY, the remote terminal device from which an inquiry into computing or data processing equipment is made.

STATION, NET CONTROL, see (net control station).

STATION, REPEATER, see (repeater station).

STATION, SUBSCRIBER, see (subscriber station).

STATION, TAPE *, same as (unit, tape).

STATION, WAY, see (way station).

STEP *, (1) one operation in a computer routine. (2) To cause a computer to execute one operation.

STEP CHANGE, see (change, step).

STEP, PROGRAM, a phase of one instruction or command in a sequence of instructions. Thus, a single operation.

STEPPED START-STOP SYSTEM, a start-stop system in which the start signals occur at regular intervals.

STOP, AUTOMATIC, an automatic halting of a computer processing operation as the result of an error detected by built-in checking devices.

STOP CODE, a code which, when read in the reader of tape-operated equipment (other than tape-to-card converters), stops the reader and suspends machine operations. On some machines (like Flexowriter) it is normally non-reproducing. On Teletype it is usually reproducing.

STOP, CODED, a stop instruction built into the routine.

STOP, FORM, the automatic device on a printer which stops the machine when paper has run out.

STOP, PROGRAM, a stop instruction built into the program that will automatically stop the machine under certain conditions, or upon reaching the end of the processing, or completing the solution of a problem.

STOP TIME, same as (time, deceleration).

STORAGE *, (1) pertaining to a device into which data can be entered and from which it can be retrieved at a later time. (2) Loosely, any device that can store data. Synonymous with (memory).

STORAGE ALLOCATION, see (allocation, storage).

STORAGE, ASSOCIATIVE *, a storage device in which storage locations are identified by their contents. Synonymous with (storage, parallel search) and (storage, content-addressed).

STORAGE, AUXILIARY, a storage device in addition to the main storage of a computer; e.g., magnetic tape, disk or magnetic drum. Auxiliary storage usually holds much larger amounts of information than the main storage, and the information is accessible less rapidly. Contrasted with (storage, main).

STORAGE, BUFFER, (1) a synchronizing element between two different forms of storage, usually between internal and external. (2) An input device in which information is assembled from external or secondary storage and stored ready for transfer to internal storage. (3) An output device into which information is copied from internal storage and held for transfer to secondary or external storage. Computation continues while transfers between buffer storage and secondary or internal storage or vice versa take place. (4) Any device which stores information temporarily during data transfers. Clarified by (buffer).

STORAGE CAPACITY, see (capacity, storage).

STORAGE CELL *, an elementary unit of storage, e.g., a binary cell, a decimal cell.

STORAGE, CIRCULATING, a device or unit which stores information in a train or pattern of pulses, where the pattern of pulses issuing at the final end are sensed, amplified, reshaped and re-inserted into the device at the beginning end.

STORAGE, CONTENT-ADDRESSED *, same as (storage, associative).

STORAGE, CORE, same as (storage, magnetic core).

STORAGE CYCLE, see (cycle, storage).

STORAGE DEVICE *, a device into which data can be inserted, in which it can be retained, and from which it can be retrieved.

STORAGE, DI-CAP, a device capable of holding data in the form of an array of charged capacitors, or condensers, and using diodes for controlling information flow.

STORAGE, DISK, the storage of data on the surface of magnetic disks. Related to (disk, magnetic) and (storage, magnetic disk).

STORAGE DUMP, see (dump).

STORAGE, DYNAMIC, the storage of data on a device or in a manner that permits the data to move or vary with time, and thus the data is not always available instantly for recovery; e.g., acoustic delay line, magnetic drum, or circulating or re-circulating of information in a medium. Synonymous with (dynamic memory).

STORAGE, ELECTROSTATIC *, a storage device that stores data as electrostatically charged areas on a dielectric surface, e.g., a cathode ray tube.

STORAGE, ERASABLE, (1) a storage device whose data can be altered during the course of a computation; e.g., magnetic tape, drum and cores. (2) An area of storage used for temporary storage.

STORAGE, EXTERNAL, (1) the storage of data on a device which is not an integral part of a computer, but in a form prescribed for use by the computer. (2) A facility or device, not an integral part of a computer, on which data usable by a computer is stored such as, off-line magnetic tape units, or punch card devices. Synonymous with (external memory) and contrasted with (storage, internal).

STORAGE, FAST ACCESS, the section of the entire storage from which data may be obtained most rapidly.

STORAGE, FIXED *, a storage device that stores data not alterable by computer instructions, e.g., magnetic core storage with a lockout feature and punched paper tape. Synonymous with (storage, permanent) and (storage, non-erasable).

STORAGE, INTERNAL, (1) in Honeywell systems, the magnetic core memory unit which is an integral physical part of the central processor and directly controlled by it. (2) The storage of data on a device which is an integral part of a computer. (3) The storage facilities forming an integral physical part of the computer and directly controlled by the computer. In such facilities all data are automatically accessible to the computer; e.g., magnetic core, and magnetic tape on-line. Synonymous with (internal memory) and contrasted with (storage, external).

STORAGE, MAGNETIC *, a storage device that utilizes the magnetic properties of materials to store data, e.g., magnetic cores, tapes, and films.

STORAGE, MAGNETIC CORE, a storage device in which binary data is represented by the direction of magnetization in each unit of an array of magnetic material, usually in the shape of toroidal rings, but also in other forms such as wraps on bobbins. Synonymous with (core, storage).

STORAGE, MAGNETIC DISK, a storage device or system consisting of magnetically coated disks, on the surface of which information is stored in the form of magnetic spots arranged in a manner to represent binary data. These data are arranged in circular tracks around the disks and are accessible to reading and writing heads on an arm which can be moved mechanically to the desired disk and then to the desired track on that disk. Data from a given track are read or written sequentially as the disk rotates. Related to (storage, disk).

STORAGE, MAGNETIC DRUM, the storage of data on the surface of magnetic drums. Related to (drum, magnetic).

STORAGE, MAGNETIC TAPE, a storage device in which data

is stored in the form of magnetic spots on metal or coated plastic tape. Binary data are stored as small magnetized spots arranged in column form across the width of the tape. A read-write head is usually associated with each row of magnetized spots so that one column can be read or written at a time as the tape traverses the head.

STORAGE, MAIN, usually the fastest storage device of a computer and the one from which instructions are executed. Contrasted with (storage, auxiliary).

STORAGE, MARK, see (mark, storage).

STORAGE, MERCURY *, a storage device that utilizes the acoustic properties of mercury to store data. Related to (line, mercury delay).

STORAGE, NON-ERASABLE *, same as (storage, fixed).

STORAGE, NON VOLATILE, a storage medium which retains information in the absence of power and which may be made available upon restoration of power; e.g., magnetic tapes, cores, drums, and discs. Contrasted with (storage, volatile).

STORAGE, OFFLINE *, a storage device not under control of the central processing unit.

STORAGE, ONLINE *, a storage device under direct control of the central processing unit.

STORAGE, PARALLEL *, a storage device wherein characters, words, or digits are dealt with simultaneously. Contrasted with (storage, serial).

STORAGE, PARALLEL SEARCH *, same as (storage, associative).

STORAGE, PERMANENT *, same as (storage, fixed).

STORAGE, PRIMARY, the main internal storage.

STORAGE, PROGRAM, a portion of the internal storage reserved for the storage of programs, routines, and subroutines. In many systems protection devices are used to prevent inadvertent alteration of the contents of the program storage. Contrasted with (storage, working).

STORAGE, RANDOM ACCESS, a storage technique in which the time required to obtain information is independent of the location of the information most recently obtained. This strict definition must be qualified by the observation that we usually mean relatively random. Thus, magnetic drums are relatively non-random access when compared to magnetic cores for main storage, but are relatively random access when compared to magnetic tapes for file storage. Synonymous with (random access memory) and contrasted with (storage, sequential access).

STORAGE, RECORDING, (1) a process providing for the preservation, in any form, of telegraph signals, or of elements of telegraph signals. (2) The result of this process.

STORAGE REGISTER, see (register, storage).

STORAGE, SECONDARY, the storage facilities not an integral part of the computer but directly connected to and controlled by the computer; e.g., magnetic drum and magnetic tapes.

STORAGE, SEQUENTIAL ACCESS, a storage technique in which the items of information stored become available only in a one after the other sequence, whether or not all the information or only some of it is desired; e.g., magnetic tape storage. Related to (storage, serial), and contrasted with (storage, random access).

STORAGE, SERIAL, a storage technique in which time is one of the factors used to locate any given bit, character, word, or groups of words appearing one after the other in time sequence, and in which access time includes a variable latency or waiting time of from zero to many word times. A storage is said to be serial by word when the individual bits comprising a word appear serially in time; or a storage is serial by character when the characters representing coded decimal or other non binary numbers appear serially in time; e.g., magnetic drums are usually serial by word but may be serial by bit, or parallel by bit, or serial by character and parallel by bit. Related to (storage, sequential access) and contrasted with (storage, random access and (storage, parallel).

STORAGE, STATIC, the storage of data on a device or in a manner such that information is fixed in space and available at any time; e.g., flip-flop, electrostatic, or magnetic-core storage.

STORAGE, TEMPORARY *, in programming, storage locations reserved for intermediate results. Synonymous with (working storage, and (working space), and contrasted with (storage, program).

STORAGE, VOLATILE *, a storage device in which stored data are lost when the applied power is removed, e.g., an acoustic delay line. Contrasted with (storage, non-volatile).

STORAGE, WILLIAMS TUBE, same as (tube, williams).

STORAGE, WORKING *, same as (storage, temporary).

STORAGE, ZERO ACCESS, the storage for which the latency (waiting time) is small. Though once widely used, this term is becoming less acceptable, since it constitutes a misnomer.

STORE, (1) to transfer an element of information to a device from which the unaltered information can be obtained at a later time. (2) To retain data in a device from which it can be obtained at a later time. (3) The British term for storage. (N). (4) To put in storage. (V).

STORE-AND-FORWARD SWITCHING CENTER, a message switching center in which the message is accepted from the sender whenever he offers it, held in a physical store, and forwarded to the receiver whenever he is able to accept it.

STORED PROGRAM, same as (routine, stored).

STORED PROGRAM COMPUTER, see (computer, stored program).

STORED ROUTINE, see (routine, stored).

STRAIGHT LINE CODE, see (code, straight line).

STREAM, BIT, see (bit stream).

STRING *, a connected sequence.

STROKE *, in character recognition, a straight line or arc used as a segment of a graphic character.

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 perpedicularly to the stroke centerline between the two stroke edges.

STUDY, APPLICATION, the detailed process of determining a system or set of procedures for using a computer for definite functions or operations, and establishing specifications to be used as a base for the selection of equipment suitable to the specific needs.

STUNT BOX, a device used in teleprinters to perform non-readout functions such as carriage return, line feed, ring signal bell, answer CDC's and TSC's etc.

STYLE, CHARACTER *, in OCR, a distinctive construction, with no restriction as to size, that is common to a group of characters. Different sizes of a given character style are proportional in all respects.

SUB-BAND, one half of a V-F band. Usually the upper or lower 1500 cycle portion.

SUBCARRIER, a carrier which is applied as a modulating wave to modulate another carrier.

SUBCARRIER, INTERMEDIATE, see (intermediate subcarrier).

SUBPROGRAM, a part of a larger program which can be converted into machine language independently.

SUBROUTINE, (1) the set of instructions necessary to direct the computer to carry out a well defined mathematical or logical operation. (2) A subunit of a routine. A subroutine is often written in relative or symbolic coding even when the routine to which it belongs is not. (3) A portion of a routine that causes a computer to carry out a well-defined mathematical or logical operation. (4) A routine which is arranged so that control may be transferred to it from a master routine and so that, at the conclusion of the subroutine, control reverts to the master routine. Such a subroutine is usually called a closed subroutine. (5) A single routine may simultaneously be both a subroutine with respect to another routine and a master routine with respect to a third. Usually control is transferred to a single subroutine from more than one place in the master routine and the reason for using the subroutine is to avoid having to repeat the same sequence of instructions in different places in the master routine. Clarified by (routine).

SUBROUTINE, CLOSED *, a subroutine that need not be inserted into the main routine at each place it is used but can be stored at one place and used from that location by linkages. Synonymous with (linked subroutine).

SUBROUTINE, DIRECT-INSERT *, same as (subroutine, open).

SUBROUTINE, DYNAMIC, a subroutine which involves parameters, such as decimal point position or item size, from which a relatively coded subroutine is derived. The computer itself is expected to adjust or generate the subroutine according to the parametric values chosen.

SUBROUTINE, IN-LINE, a subroutine inserted directly into the linear operational sequence. Such a subroutine must be recopied at each point that it is needed in a routine.

SUBROUTINE LIBRARY, see (library, subroutine).

SUBROUTINE, LINKED, same as (subroutine, closed).

SUBROUTINE, OPEN *, a subroutine that must be relocated and inserted into the main routine at each place it is used. Synonymous with (subroutine, direct insert).

SUBROUTINE, STANDARD, a subroutine which is applicable to a class of problems.

SUBROUTINE, STATIC, a subroutine which involves no parameters other than the addresses of the operands.

SUBSCRIBER STATION, the service provided by the common carrier to connect a customer's location to a central office. This always includes the circuit and some circuit termination equipment, but may also include input/output equipment. Sometimes referred to as "local loop".

SUBSET, a contraction of the words "subscriber set" which has been used for many years to refer to the device which is installed on a subscriber's premises. A modulation/demodulation device designed to make business machine signals compatible with communications facilities and vice versa. A data subset accepts digital information, converts it into a suitable form for transmission over the telephone circuits, and reconverts it to its original form at the receiving end.

SUBTRAHEND, the number or quantity which is subtracted from another number, called the minuend, giving a result usually called the difference, or sometimes called the remainder.

SUM, LOGICAL, a result, similar to an arithmetic sum, obtained in the process of ordinary addition, except that the rules are such that a result of one is obtained when either one or both input variables is a one, and an output of zero is obtained when the input variables are both zero. The logical sum is the name given the result produced by the (inclusive or operator).

SUMMARY PUNCH, see (punch, summary).

SUMMATION CHECK, see (check, summation).

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.

SUPERVISOR, a special executive routine.

SUPERVISORY CONTROL, see (control, supervisory).

SUPERVISORY PROGRAM, same as (routine, supervisory).

SUPERVISORY ROUTINE, same as (routine, executive).

SUPPRESSION, an optional function in either on-line or off-line printing devices which permits them to ignore certain characters or groups of characters which may be transmitted through them. See (non print).

SUPPRESSION, ZERO, the elimination of nonsignificant zeros to the left of significant digits usually before printing.

SUPPRESSOR, ECHO, a voice-operated device for connection to a two-way telephone circuit to attenuate echo currents in one direction caused by telephone currents in the other direction.

SWING, FREQUENCY, of a frequency modulated wave. The variation, due to modulation, of the instantaneous frequency above and below the carrier frequency.

SWITCH, (1) a point in a programming routine at which two courses of action are possible, the correct one being determined by a condition prevailing elsewhere in the routine or by a physical disposition of the system. (2) An on-off device to inhibit signal flow.

SWITCH, BREAKPOINT, a manually operated switch which controls conditional operation at breakpoints, used primarily in debugging.

SWITCH, ELECTRONIC, a circuit element causing a start and stop action or a switching action electronically, usually at high speeds.

SWITCH, FUNCTION, a circuit having a fixed number of inputs and outputs designed such that the output information is a function of the input information, each expressed in a certain code, signal configuration, or pattern.

SWITCH, N-WAY, same as (connector, variable) (3).

SWITCH, PROGRAMMED, same as (connector, variable) (3).

SWITCH, TAPE FEED, see (tape feed switch).

SWITCH, TOGGLE, (1) a manually operated electric switch, with a small projecting knob or arm that may be placed in either of two positions, "on" or "off," and will remain in that position until changed.

SWITCHED MESSAGE NETWORK, a service offered by the common carrier in which a customer may communicate with any other customer receiving the same service. Examples are TELEX and TWX.

SWITCHING, operations involved in interconnecting circuits in order to establish a temporary communication between two or more stations.

SWITCHING BLANK, same as (band, dead).

SWITCHING CENTER, a location in which incoming data from one circuit is transferred to the proper outgoing circuit.

SWITCHING CENTER, AUTOMATIC MESSAGE, a location where an incoming message is automatically directed to one or more outgoing circuits according to intelligence contained in the message.

SWITCHING CENTER, SEMIAUTOMATIC MESSAGE, a location where an incoming message is displayed to an operator who directs the message to one or more outgoing circuits according to information read from the message.

SWITCHING CENTER, TORN TAPE, a location where operators tear off the incoming printed and punched paper tape and transfer it manually to the proper outgoing circuit.

SWITCHING, CIRCUIT OR LINE, a switching technique where the connection is made between the calling party and the called party prior to the start of a communication (for example, telephone switching). See (circuit switching).

SWITCHING, MESSAGE, the technique of receiving a message, storing it until the proper outgoing circuit is available, and then retransmitting it.

SWITCHING, PUSH-BUTTON, see (push-button switching).

SWITCHING, STORE AND FORWARD, see (switching, message).

SWITCHING TIME, see (time, switching).

SYMBOL *, a representation of something by reason of relationship, association, or convention.

SYMBOL, BREAKPOINT, a symbol which may be optionally included in an instruction, as an indication, tag, or flag, to designate it as a breakpoint.

SYMBOL, FLOWCHART *, a symbol used to represent operations, data and equipment in problem description.

SYMBOL, LOGIC *, (1) a symbol used to represent a logic element graphically. (2) A symbol used to represent a logic connective.

SYMBOL, TERMINATING, a symbol on the tape indicating the end of a block of information. Related to (gap) (2).

SYMBOLIC ADDRESS, see (address, symbolic).

SYMBOLIC INSTRUCTION, see (instruction, symbolic).

SYMBOLIC LOGIC, see (logic, symbolic).

SYMBOLIC NOTATION, see (notation, symbolic).

SYMBOLIC NUMBER, see (number, symbolic).

SYMBOLIC PROGRAMMING, see (programming, symbolic).

SYNCH, signal which identifies the start of a block.

SYNCHRO-DUPLEXING, the scheme of producing a document on a printing device through the synchronous running of a program tape and either a master tape or a pure data tape, the latter two on a flip-flop basis. The operation is completely controlled by function codes in the program tape. A data processing function.

SYNCHRONIZER, a storage device used to compensate for a difference in a rate of flow of information or time of occurrence of events when transmitting information from one device to another.

SYNCHRONIZING PILOT, a reference pilot for the purpose either of maintaining the synchronization of the oscillators of a carrier system or of comparing, when desired, the frequencies (and possibly the phases) of the currents generated by those oscillators.

SYNCHRONOUS COMPUTER, see (computer, synchronous).

SYNCHRONOUS SYSTEM (communications), a system in which the sending and receiving instruments are operating continuously at substantially the same frequency and are maintained, by means of correction if necessary, in a desired phase relationship.

SYNTAX *, the rules governing the structure of a language.

SYNTHESIS, the combining of parts in order to form a whole; e.g., to arrive at a circuit or a computer or program, starting from performance requirements. This can be contrasted with analysis, which arrives at performance, given the circuit or program.

SYNTHETIC RELATIONSHIP, see (relationship, synthetic).

SYSTEM *, an organized collection of parts united by regulated interaction.

SYSTEM, ACCURACY CONTROL, see (accuracy control system).

SYSTEM, ADDRESSING, the procedure used to label storage locations in a computer; e.g., on a magnetic storage drum, storage locations might be identified by four digit addresses which are numbered consecutively in each band as follows:

First band	0000 - 0199
Second band	0200 - 0399
Third band	0400 - 0599

* * * * *

Twenty-fourth band	4600 - 4799
Twenty-fifth band	4800 - 4999

The consecutively numbered band addresses begin with 0000, to which increments of 200 are added until the address of the last band, 4800 is reached. Within each band, particular locations might be consecutively numbered from 0 to 199 to give each location an address indicative of a position on the drum or drum level. This level is added to the band address to produce the address of a particular storage location. In a magnetic core storage unit, the locations might be addressed consecutively from 0000 to 4,095.

SYSTEM ANALYSIS, synonymous with (analysis, system).

SYSTEM, ASSEMBLY, see (assembly system).

SYSTEM, AUTOMATIC DATA PROCESSING, the term descriptive of an interacting assembly of procedures, processes, methods, personnel and automatic data processing equipment to perform a complex series of data processing operations.

SYSTEM, BATTEN, same as (system, peek-a-boo).

SYSTEM, BINARY NUMBER, see (system, number).

SYSTEM, BINARY WEIGHTED ERROR DETECTION, see (binary weighted error detection system).

SYSTEM, BRIDGE DUPLEX, see (bridge duplex system).

SYSTEM, CARRIER, see (carrier system).

SYSTEM CHECK, see (check, system).

SYSTEM, CORDONNIER, same as (system, peek-a-boo).

SYSTEM, DATA PROCESSING MACHINE, an assembly of data processing machines united by some form of regulated interaction to form an organized whole.

SYSTEM, DECIMAL NUMBERING, a system of reckoning by 10 or the powers of 10 using the digits 0 - 9 to express numerical quantities.

SYSTEM, DETECTION, see (error detecting system).

SYSTEM, ELECTRONIC DATA PROCESSING, the general term used to define a system for data processing by means of machines utilizing electronic circuitry at electronic speed, as opposed to electromechanical equipment.

SYSTEM, ERROR DETECTING, see (error detecting system).

SYSTEM, ERROR CORRECTING TELEGRAPH, a system employing an error-detecting code and so conceived that any false signal initiates a repetition of the transmission of the character incorrectly received.

SYSTEM, ERROR DETECTING AND FEEDBACK, see (error detecting and feedback system).

SYSTEM, EXCEPTION PRINCIPLE, an information system or data processing system which reports on situations only when actual results differ from planned results. When results occur within a normal range they are not reported.

SYSTEM, EXECUTIVE, same as (system, operating).

SYSTEM, FILMOREX, a system for the electronic selection of microfilm cards devised by Jacques Samain. Each card has a micro reproduction of the document or abstract and a field of twenty 5-digit code numbers giving the bibliographic reference and the subjects treated.

SYSTEM, HORIZONTAL, a programming system in which instructions are written horizontally; i.e., across the page.

SYSTEM IMPROVEMENT TIME, see (time, system improvement).

SYSTEM, INFORMATION, the network of all communication methods within an organization. Information may be derived from many sources other than a data processing unit, such as by telephone, by contact with other people, or by studying an operation.

SYSTEM, INFORMATION FEEDBACK, see (information feedback system).

SYSTEM, INFORMATION RETRIEVAL, a system for locating and selecting, on demand, certain documents or other graphic records relevant to a given information requirement from a file of such material. Examples of information retrieval systems are classification, indexing, and machine searching systems.

SYSTEM, IN-PLANT, see (in-plant system).

SYSTEM, MANAGEMENT INFORMATION, a communications process in which data are recorded and processed for operational purposes. The problems are isolated for higher level decision making and information is fed back to top management to reflect the progress or lack of progress made in achieving major objectives.

SYSTEM, MONITOR, same as (system, operating).

SYSTEM, NUMBER, (1) a systematic method for representing numerical quantities in which any quantity is represented as the sequence of coefficients of the successive powers of a particular base with an appropriate point. Each succeeding coefficient from right to left is associated with and usually multiplies the next higher power of the base. The first coefficient to the left of the point is associated with the zero power of the base. For example, in decimal notation 371.426 represents $(3 \times 10^2) + (7 \times 10^1) + (1 \times 10^0) + (4 \times 10^{-1}) + (2 \times 10^{-2}) + (6 \times 10^{-3})$. (2) The following are names of the number systems with bases 2 through 20: 2, Binary; 3, Ternary; 4, Quaternary; 5, Quinary; 6, Senary; 7, Septenary; 8, Octal, or octonary; 9, Novenary; 10, Decimal; 11, Undecimal; 12, Duodecimal; 13, Terdenary; 14, Quaterdenary; 15, Quindenary; 16, Sexadecimal, or Hexadecimal; 17, Septendecimal; 18, Octodenary; 19, Novemdenary; 20, Vicenary. Also 32, Duosexadecimal, or duotricinary; and 60, Sexagenary. The Binary, Octal, Decimal, and Sexadecimal systems are widely used in computers. Synonymous with (duodecimal numbers) and (binary number system) and related to (representation, positional) and clarified by (digit, octal and binary).

SYSTEM, ON-DEMAND, see (on-demand system).

SYSTEM, OPERATING, an integrated collection of service routines for supervising the sequencing of programs by a computer. Operating systems may perform debugging, input-output, accounting, compilation, and storage assignment tasks. Synonymous with (monitor system) and (executive system).

SYSTEM, OUT-PLANT, see (out-plant system).

SYSTEM, PEEK-A-BOO, an information retrieval system which uses peek-a-boo cards; i.e., cards into which small holes are drilled at the intersections of coordinates (column and row designations) to represent document numbers. Synonymous with (batten system) and (cordonnier system) and related to (card, aspect).

SYSTEM, QUADRUPLEX, see (quadruplex system).

SYSTEM, REAL TIME, same as (processing, real time).

SYSTEM, REQUEST REPEAT, see (request repeat system).

SYSTEM STANDARDS, system standards are either of the following: The minimum required electrical performance characteristics of communication circuits which are based on measured performance of developed circuits under the various operating conditions for which the circuits were designed. The specified characteristics not dictated by electrical performance requirements but necessary in order to permit interoperation. (For example, the values for center frequencies for telegraph channels, test tone, etc.)

SYSTEM, START-STOP, see (start-stop system).

SYSTEM, STEPPED START-STOP, see (stepped start-stop system).

SYSTEM, SYNCHRONOUS (communications), see (synchronous system (communications)).

SYSTEM, UNITERM, an information retrieval system which uses uniterm cards. Cards representing words of interest in a search are selected and compared visually. If identical numbers are found to appear on the uniterm card undergoing comparison these numbers represent documents to be examined in connection with the search. Related to (card, aspect) and (indexing, uniterm).

SYSTEM, UPSET DUPLEX, see (upset duplex system).

SYSTEMS ANALYSIS, see (analysis, systems).

SYSTEMS TEST, see (test, systems).

T

TABLE *, a collection of data, each item being uniquely identified either by some label or by its relative position.

TABLE, DECISION *, a table of all contingencies 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.

TABLE, FUNCTION, (1) the two or more sets of information so arranged that an entry in one set selects one or more entries in the remaining sets. (2) A dectionary. (3) 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. (4) A tabulation of the values of a function for a set of values of the variable.

TABLE LOOK UP, to obtain a function value corresponding to an argument, stated or implied, from a table of function values stored in the computer. Also, the operation of obtaining a value from a table. Synonymous with (TLU).

TABLE, TRUTH *, a table that describes a logic function by listing all possible combinations of input values and indicating for each such combination the true output values.

TABLEAU, in linear programming for any basic solution, a tabular display of (1) the updated A-matrix, usually including the D/J's and the objective value, (2) the basis list, and (3) the solution vector.

TABSIM (TABulator SIMulator), Honeywell simulator programs that speed the conversion of tabulating equipment tasks to computer processing. They are "load-and-go" type packages which permit users to run tab jobs, as they exist, on the H-200, H-400 and H-1400 computers.

TABULATE *, to form into a table, usually to print totals, differences or similar data.

TABULATING EQUIPMENT, see (equipment, tabulating).

TABULATOR, a machine which reads information from one medium; e.g., cards, paper tape, and magnetic tape and produces lists, tables, and totals on separate forms or continuous paper. Synonymous with (machine, accounting) (2), and clarified by (equipment, tabulating).

TAG *, same as (flag).

TAKEDOWN, the actions performed at the end of an equipment operating cycle to prepare the equipment for the next setup; e.g., to remove the tapes from the tape handlers at the end of a computer run is a takedown operation.

TAKEDOWN TIME, see (time, take down).

TALK, CROSS, see (cross talk).

TALKER, ECHO, see (echo talker).

TANK, (1) a container usually filled with mercury, and provided with a set of transducers for use as a delay line channel or set of channels, each forming a separate recirculation path for the storage of data. (2) A circuit consisting of inductance and capacitance used for the purpose of sustaining electrical oscillations.

TANK, MERCURY, a container used to hold mercury.

TAPE, a strip of material, which may be punched, coated, or impregnated with magnetic or optically sensitive substances, and used for data input, storage or output. The data are stored serially in several channels across the tape transversely to the reading or writing motion.

TAPE, ADVANCE FEED, see (advance feed tape).

TAPE, CENTER FEED, see (center feed tape).

TAPE, CHADDED PAPER, a paper tape with the holes fully punched.

TAPE, CHADLESS PAPER, a paper tape with the holes partially punched. It is commonly used in teletype operations.

TAPE, CHANGE, a paper tape or magnetic tape carrying information that is to be used to update filed information. This filed information is often on a master tape. Synonymous with (transaction tape).

TAPE DRIVE, same as (transport, tape).

TAPE FEED, see (feed, tape).

TAPE FEED SWITCH, causes reperforator to meter a predetermined length of blank tape.

TAPE-LIMITED, a section of routine on buffered computers in which the time required to read and write tapes exceeds the time required for computation.

TAPE, MAGNETIC *, (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 surface used as the constituent in some forms of magnetic cores.

TAPE MARK, see (mark, tape).

TAPE, MASTER INSTRUCTION, a tape on which all the programs for a system of runs are recorded. Synonymous with (MIT).

TAPE, PAPER, a strip of paper capable of storing or recording information. Storage may be in the form of punched holes, partially punched holes, carbonization or chemical change of impregnated material, or by imprinting. Some paper tapes, such as punched paper tapes, are capable of being read by the input device of a computer or a transmitting device by sensing the pattern of holes which represent coded information.

TAPE, PERFORATED, same as (tape, punch).

TAPE, PROGRAM, a tape which contains the sequence of instructions required for solving a problem and which is read into a computer prior to running a program.

TAPE, PUNCH, a tape, usually paper, upon which data may be stored in the form of punched holes. Hole locations are arranged in columns across the width of the tape. There are usually 5 to 8 positions, channels, per column, with data represented by a binary coded decimal system. All holes in a column are sensed simultaneously in a manner similar to that for punch cards. Synonymous with (perforated tape).

TAPE PUNCH, see (reperforator).

TAPE READER, see (reader, paper tape), (reader, magnetic tape).

TAPE SKIP, TAPE SKIP RESTORE, a function which permits certain portions of tape to be idled through a tape reader without being acted upon. This function is initiated by depressing the Tape Skip key. Skipping continues until the reader finds a Tape Skip Restore character in the tape. This character must have been included in the original programming.

TAPE TO CARD *, pertaining to equipment or methods that transfer data from either magnetic or punched tape to punched cards.

TAPE TO CARD CONVERTER, see (converter, tape to card).

TAPE, TRANSACTION, same as (tape, change).

TAPE TRANSPORT, see (transport, tape).

TAPE UNIT, see (unit, tape).

TARGET LANGUAGE, see (language, target).

TARGET PROGRAM, same as (program, object).

TARIFF, the published rate for a particular approved commercial service of a common carrier.

TELECOMMUNICATIONS *, (1) Any transmission or reception of signals, writing sounds, or intelligence of any nature, by wire, radio, visual or electromagnetic systems. Often used interchangeably with "communication." (2) Pertaining to the transmission of signals over long distances, such as by radio, telegraph, television, or remote terminal devices.

TELEGRAPH CHANNEL, the transmission media and intervening apparatus involved in the transmission of telegraph signals in a given direction between two terminal sets, or more generally, between two intermediate telegraph installations. A means of one-way transmission of telegraph signals. Notes: Separate telegraph channels can have common constituent parts (e.g., side and phantom circuits) or share a common path (as in the case of a multiplex). A channel between two terminal sets can be referred to as a "complete telegraph channel". A transmitter with storage of signals is considered a terminal set and terminates a complete channel. A complete channel may include regenerative repeaters (without storage). A telegraph channel is characterized by the number of significant conditions and by the modulation rate it is designed to transmit. For example: a fifty-baud channel for two-condition modulation.

TELEGRAPH, ERROR RATE OF, see (error rate of a telegraph communication).

TELEGRAPH, ONE-WAY REVERSIBLE OPERATION, see (one-way reversible telegraph operation).

TELEGRAPH, VOICE FREQUENCY CARRIER, see (voice frequency carrier telegraph).

TELEMETER, an electric telemeter is the formulating and reformulation apparatus for indicating and/or recording the value of a measured quantity at a distance by electrical means.

TELEMETERING, the transmission of a measurement over long distances, usually by electromagnetic means.

TELEPHONE LINE, a general term used in communication practice in several different senses, the more important of which are: 1) The conductor or conductors and supporting or containing structures extending between telephone stations and central offices or between central offices whether they be in the same or in different communities. 2) The conductors and circuit apparatus associated with a particular communication channel.

TELEPHONY, QUIESCENT CARRIER, see (quiescent carrier telephony).

TELEPRINTER, an input/output terminal device, normally used on low-speed circuits, which includes at least a page printer and operates at a maximum speed of 10 characters per second.

TELEPRINTER GRADE SERVICE, this term originally referred to a service provided by the common carriers which included a communication circuit of narrow bandwidth which was capable of speeds no greater than 180 bauds per second and furnished a compatible dc signal to the terminal input/output device directly. This definition is no longer completely valid because much of the low speed data transmission is accomplished over circuits utilizing ac signalling so a dataset must be provided between the circuit and the terminal equipment. The term now is used primarily to distinguish this type of service from voice grade service in reference to regulatory agencies' tariffs.

TELEPROCESSING, trademark used by IBM in referring to their equipment used in the data communications field.

TELETYPE, trademark of the Teletype Corporation. A system for transmitting messages over a distance, employing keyboard or paper tape sending and printed receiving.

TELETYPE GRADE, represents the lowest type circuit in terms of speed, cost and accuracy.

TELETYPEWRITER, trade name used by AT&T to refer to telegraph terminal equipment. See service, teletypewriter.

TELETYPEWRITER EXCHANGE SERVICE (TWX), a switched network providing means for interconnecting AT&T teletypewriter subscribers.

TELEX (TEX), an automatic teletype exchange service provided by Western Union and extending into Canada via Canadian Pacific Railroad facilities. Subscribers can dial each other for direct two-way telemeter communications.

TELPAK, a tariff offered by AT&T for the leasing of wide band channels.

Service	Voice Grade	Teletype	Broadband
A	12	X	1
B	24	X	2
C	60	X	5
D	240	X	20

TEMPORARY STORAGE, see (storage, working).

TERACYCLE, a mega megacycle per second, 10^{12} cycles per second.

TERMINAL *, (1) a point in a system or communication network at which data can either enter or leave. (2) A general term referring to the equipment at the end of a telegraph circuit; modems and associated equipment.

TERMINAL, DATA see (data terminal).

TERMINAL DIGIT POSTING, see (posting, terminal digit).

TERMINAL IMPEDANCE, the complex impedance as seen at the unloaded output or input terminals of a transmission equipment or line which is otherwise in normal operating condition.

TERMINAL INSTALLATION FOR DATA TRANSMISSION, installation comprising the data terminal equipment, the signal-conversion equipment, and any intermediate equipment. Note: In some instances, the data terminal equipment may be connected directly to a data processing machine or may be a part of it.

TERMINAL, JOB-ORIENTED, a terminal specially designed to receive source data in an environment associated with the job to be performed and capable of transmission to and from the system of which it is a part

TERMINAL, MULTIPLEX DATA, see (multiplex data terminal).

TERMINAL UNIT, equipment on a communication channel, which may be used for either input or output.

TERMINATING SYMBOL, see (symbol, terminating).

TERNARY *, (1) pertaining to a characteristic or property involving a selection, choice or condition in which there are three possibilities. (2) Pertaining to the number representation system with a radix of three.

TEST, CRIPPLED LEAPFROG, a variation of the leapfrog test, modified so that it repeats its tests from a single set of storage locations rather than a changing set of locations. Related to (test, leapfrog).

TEST DATA, see (data, test).

TEST, DIAGNOSTIC, the running of a machine program or routine for the purpose of discovering a failure or a potential failure of a machine element, and to determine its location or its potential location.

TEST, HIGH-LOW BIAS, same as (check, marginal).

TEST, LEAPFROG, a program designed to discover computer malfunction, characterized by the property that it performs a series of arithmetical or logical operations on one group of storage locations, transfers itself to another group of storage locations, checks the correctness of the transfer, then begins the series of operations again. Eventually, all storage positions will have been occupied and the test will be repeated. Related to (test, crippled leapfrog).

TEST, MARGINAL, same as (check, marginal).

TEST, PROGRAM, a system of checking before running any problem in which a sample problem of the same type with a known answer is run.

TEST ROUTINE, see (routine, test).

TEST RUN, a diagnostic run of the program using manufactured data.

TEST, SYSTEM, (1) the running of the whole system against test data. (2) A complete simulation of the actual running system for purposes of testing out the adequacy of the system. (3) A test of an entire interconnected set of components for the purpose of determining proper functioning and interconnection.

TEST, VOLUME, the processing of a volume of actual data to check for program malfunctions.

TETRAD, a group of four; e.g., four pulses; used to express a decimal digit.

TEX, see (TELEX).

TEXT, that part of the message which contains the information to be conveyed.

THEORY, GAME, a mathematical process of selecting an optimum strategy in the face of an opponent who has a strategy of his own.

THEORY, INFORMATION *, a branch of probability theory that is concerned with the properties of transmitted messages. The bits of data comprising the message are subject to certain probabilities of transmission failure, distortion, and noise.

THEORY, PROBABILITY, a measure of likelihood of occurrence of a chance event, used to predict behavior of a group, not of a single item in the group.

THEORY, QUEUEING, a form of probability theory useful in studying delays or line-ups at servicing points.

THIN-FILM, MAGNETIC, see (magnetic thin-film).

THOR (Tape Handling Option Routines), a Honeywell utility program that positions, copies, corrects or edits tape; it can also locate data on tape, compare the contents of two tapes for discrepancies and perform general tape maintenance. Used with Honeywell 200, 800 and 1800 computers.

THREE ADDRESS, see (address, three).

THREE PLUS ONE ADDRESS, see (address, three plus one).

THREE PLUS ONE ADDRESS INSTRUCTION, same as (instruction, four address).

THRESHOLD *, a logical 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 and only if at least N statements are true, false if less than N statements are true, where N is a specified non negative integer called the threshold condition.

THROUGHPUT, productivity based on all facets of an operation, e.g., a computer with a capability of simultaneous operations (e.g., read/write/compute) would have a high throughput rating.

THROUGH-TRUNK SUPERVISION, the type of supervision used in a trunk switching system in which one operator maintains supervision of a call requiring trunk connections through all long-distance switching centers.

THROW-AWAY CHARACTERS, when transmitting tape over a telegraph channel, certain function codes cause receiving equipment to perform functions which require more time than is allowed between successive characters in the transmission. Examples of these functions are, form feedout, duplicating of card fields, etc. In order to prevent reception of an intelligence character while the machine is in the midst of performing such a function, a calculated number of "throw-away" characters must be inserted into the tape immediately following the function code and ahead of the next printing or function code. Letters codes are usually used as "throw-away" codes.

TIE-LINE, a leased communication channel or circuit between two or more PBX's.

TIME, ACCELERATION, the time between the interpretation of instructions to read or write on tape and the transfer of information to or from the tape into storage, or from storage into tape, as the case may be. Synonymous with (start time).

TIME, ACCESS *, the time interval between the instant at which data are called for from a storage device and the instant at which delivery is completed, i.e., the read time; or, the time interval between the instant at which data are to be stored and the instant at which storage is completed, i.e., the write time. Synonymous with (read time), and related to (time, write) and (time, word).

TIME, ADD SUBTRACT, the time required to perform an addition or subtraction, exclusive of the time required to obtain the quantities from storage and put the sum or difference back into storage.

TIME, AVAILABLE, (1) the number of hours a computer is available for use. (2) The time during which a computer has the power turned on, is not under maintenance, and is known or believed to be operating correctly. Synonymous with (available machine time).

TIME, AVAILABLE MACHINE, same as (time, available) (2).

TIME, CARRY, (1) the time required for transferring a carry digit to the higher column and there adding it. (2) The time required for transferring all the carry digits to higher columns and adding them for all digits in the number.

TIME, CODE CHECKING, the time spent checking out a problem on the machine, making sure that the problem is set up correctly, and that the code is correct.

TIME, DEAD, any definite delay deliberately placed between two related actions in order to avoid overlap that might cause confusion or to permit a particular different event such as a control decision, switching event or similar action to take place.

TIME, DECAY, the time in which a voltage or current pulse will decrease to one-tenth of its maximum value. Decay time is proportional to the time constant of the circuit.

TIME, DECELERATION, the time which elapses between completion of reading or writing of a tape record and the time when the tape stops moving. Synonymous with (time, stop).

TIME DERIVED CHANNEL, any of the channels obtained by time-division multiplexing a channel.

TIME DIVISION, interleaving several message channels, which are separated from each other in time, on a single transmission media.

TIME-DIVISION MULTIPLEX, a system in which a channel is established by connecting intermittently, generally at regular intervals and by means of an automatic distribution, its terminal equipment to a common channel. Outside the times during which these connections are established, the section of the common channel between the distributors can be utilized in order to establish other similar channels in turn.

TIME, DOWN, the period during which a computer is malfunctioning or not operating correctly due to mechanical or electronic failure, as opposed to available time, idle time, or stand-by time, during which the computer is functional. Contrasted with (time, up).

TIME, ENGINEERING, the total machine down time necessary for routine testing, good or bad, for machine servicing due to breakdowns, or for preventive servicing measures; e.g., block tube changes. This includes all test time, good or bad, following breakdown and subsequent repair or preventive servicing. Synonymous with (servicing time).

TIME, EXECUTION, the portion of an instruction cycle during which the actual work is performed or operation executed; i.e., the time required to decode and perform an instruction. Synonymous with (time, instruction) (2).

TIME, IDLE, (1) the period between the end of one programmed computer run and the commencement of a subsequent programmed run. (2) The time normally used to assemble cards, paper, tape reels, and control panels required for the next computer operation. (3) The time between operations when no work is scheduled.

TIME, INSTRUCTION, (1) the portion of an instruction cycle during which the control unit is analyzing the instruction and setting up to perform the indicated operation. (2) Same as (time, execution).

TIME, LATENCY, (1) the time lag between completion of instruction staticizing and the initiation of the movement of data from its storage location. (2) The rotational delay time from a disc file or a drum file.

TIME, MULTIPLICATION, the time required to perform a multiplication. For a binary number it will be equal to the total of all the addition times and all the shift time involved in the multiplication.

TIME, NO CHARGE MACHINE FAULT, the unproductive time due to computer fault such as the following: nonduplication, transcribing error, input-output malfunction and machine malfunction resulting in an incomplete run.

TIME, NO CHARGE NON MACHINE FAULT, the unproductive time due to no fault of the computer such as the following: good duplication, error in preparation of input data, error in arranging the program deck, error in operating instructions or misinterpretation of instructions, and unscheduled good testing time, and a run during a normal production period when machine malfunction is suspected but is demonstrated not to exist.

TIME, NON SCHEDULED MAINTENANCE, the elapsed time during scheduled working hours between the determination of a machine failure and placement of the equipment back into operation.

TIME, OPERATION USE, in Federal Government ADP contracts the time during which the equipment is in operation, exclusive of idle time, standby time, maintenance time, or rerun time due to machine failure. Components not programmed for use in a specific computer run are not considered to be in use even though connected into the computer system.

TIME, PROGRAM TESTING, the machine time expended for program testing, debugging, and volume and compatibility testing.

TIME, PULSE DECAY, see (pulse decay time).

TIME-PULSE DISTRIBUTOR, see (distributor, time-pulse).

TIME, READ, same as (time, access).

TIME, REAL, see (real time). Clarified by (processing, real time) and (operation, real time).

TIME, REFERENCE, an instant near the beginning of switching chosen as an origin for time measurements. It is variously taken as the first instant at which the instantaneous value of the drive pulse, the voltage response of the magnetic cell, or the integrated voltage response reaches a specified fraction of its peak pulse amplitude.

TIME, REIMBURSED, the machine time which is loaned or rented to another office, agency or organization either on a reimbursable or reciprocal basis.

TIME, REPRESENTATIVE CALCULATING, a method of evaluating the speed performance of a computer. One method is to use one-tenth of the time required to perform nine complete additions and one complete multiplication.

A complete addition or a complete multiplication time includes the time required to procure two operands from high-speed storage, perform the operation, and store the result, and the time required to select and execute the required number of instructions to do this.

TIME, RISE, the time required for the leading edge of a pulse to rise from one-tenth of its final value to nine-tenths of its final value. Rise time is proportional to the time constant of the circuit.

TIME, SEARCH, the time required to locate a particular field of data in storage. Searching requires a comparison of each field with a predetermined standard until an identity is obtained. This is contrasted with access time which is based upon locating data by means of the address of its storage location.

TIME SERIES, see (series, time).

TIME, SERVICING, same as (time, engineering).

TIME, SET UP, the portion of the elapsed time between machine operations which is devoted to such tasks as changing reels of tape, and moving cards, tapes, and supplies to and from the equipment.

TIMESHARE *, to use a device for two or more interleaved purposes.

TIME SHARING *, (1) The use of a device for two or more purposes during the same overall time interval, accomplished by interspersing component actions in time. (2) Pertaining to the interleaved use of the time of a device.

TIME, STANDBY, (1) the elapsed time between inquiries when the equipment is operating on an inquiry application. (2) The time during which two or more computers tied together and available to answer inquiries or process intermittent actions on stored data.

TIME, STANDBY UNATTENDED, the time in which the machine is in an unknown condition and not in use working on problems. This includes time in which the machine is known to be defective and work is not being done to restore it to operating condition. It also includes breakdowns which render it unavailable due to outside conditions such as power shortages.

TIME, START, same as (time, acceleration).

TIME, STOP, same as (time, deceleration).

TIME, SWITCHING, (1) the time interval between the reference-time, or time at which the leading edge of switching or driving pulse occurs, and the last instant at which the instantaneous voltage response of a magnetic cell reaches a stated fraction of its peak value. (2) The time interval between the reference time and the first instant at which the instantaneous integrated voltage response reaches a stated fraction of its peak value.

TIME, SYSTEM IMPROVEMENT, the machine down time needed for the installation and testing of new components, large or small, and machine down time necessary for modification of existing components. This includes all programmed tests following the above actions to prove the machine is operating properly.

TIME, TAKEDOWN, the time required to take down a piece of equipment.

TIME, TRAINING, the machine time expended in training employees in the use of the equipment including such activities as mounting, console operation, converter operation, printing operation and related activities and time spent in conducting required demonstrations.

TIME, TURN AROUND, the time required to reverse the direction of transmission in a communication channel.

TIME, UP, the time during which equipment is either producing work or is available for productive work. Contrasted with (time, down).

TIME, WORD *, in a storage device that provides serial access to storage positions, the time interval between the appearance of corresponding parts of successive words. Related to (time, access).

TIME, WRITE, the amount of time it takes to record information. Related to (time, access).

TIPTOP (tape input-tape output), a set of tested Honeywell routines which make it possible for a programmer to handle varied input/output operations with single macro statements. This, in turn, allows time to concentrate on the handling of items, rather than on the handling of the tape records themselves.

TLU, Table Look Up, see (table loop up).

TOGGLE, (1) a flip-flop. (2) Pertaining to a manually operated on-off switch; i.e., a two position switch. (2) Pertaining to a manually operated on-off switch; i.e., a two position switch. (3) Pertaining to flip-flop, see-saw, or bi-stable action.

TOGGLE SWITCH, see (switch, toggle).

TOKEN, a distinguishable unit in a sequence of characters.

TOLL, a charge for making connection beyond an exchange boundary.

TORN TAPE SWITCHING CENTER, see (switching center, torn tape).

TOTAL, BATCH, the sum of certain quantities, pertaining to batches of unit records, used to verify accuracy of operations on a particular batch of records; e.g., in a payroll calculation, the batches might be departments, and batch totals would be number of employees in the department, total hours working in the department, total pay for the department. Batches, however, may be arbitrary, such as orders received from 9 a.m. to 11 a.m. on a certain day.

TOTAL, CONTROL, a sum of numbers in a specified record field of a batch of records, determined repetitiously, during the processing operation so that any discrepancy from the control indicates an error. A control total often has some significance in itself, but may not, as for example, when a control total is determined as the sum of identification numbers of records. Related to (total, hash).

TOTAL, HASH, a sum of numbers in a specified field of a record or of a batch of records used for checking purposes. No attention is paid to the significance of the total. Examples of such numbers are customer numbers or part numbers. If alphabetic characters have a numerical interpretation to a computer, they also could be added. Related to (total, control).

TRACE, an interpretive diagnostic technique which provides an analysis of each executed instruction and writes it on an output device as each instruction is executed.

TRACE, SELECTIVE, a tracing routine wherein only instructions satisfying certain specified criteria are subject to tracing. Typical criteria are: (a) Instruction type; e.g., arithmetic jump. (b) Instruction location; e.g., specific region. (c) Data location; e.g., specific region. For Case a, where tracing is performed on transfer, jump, instructions the term logical trace is sometimes used.

TRACING ROUTINE, see (routine, tracing).

TRACK *, the portion of a moving storage medium, such as drum, tape, disc, that is accessible to a given reading station.

TRAILER RECORD, see (record, trailer).

TRAINING TIME, see (time, training).

TRANSACTION DATA, see (data, transaction).

TRANSACTION TAPE, same as (tape, change).

TRANSCEIVER, a device which transmits and receives data from punch card to punch card. It is essentially a conversion device which at the sending end reads the card and transmits the data over the wire. At the receiving end it punches the data into a card.

TRANSCRIBE *, same as (copy).

TRANSCRIBER, the equipment associated with a computing machine for the purpose of transferring input, or output, data from a record of information in a given language to the medium and the language used by a digital computing machine, or from a computing machine to a record of information.

TRANSCRIPTION MODE, see (mode, transcription).

TRANSDUCER, a device which converts energy from one form to another; e.g., a quartz crystal imbedded in mer-

cury can change electrical energy to sound energy as is done in sonic delay lines in computer storage systems.

TRANSFER, (1) the conveyance of control from one mode to another by means of instructions or signals. (2) The conveyance of data from one place to another. (3) An instruction for transfer. (4) To copy, exchange, read, record, store, transmit, transport, or write data. (5) An instruction which provides the ability to break the normal sequential flow of control. Synonymous with (jump), and (control transfer).

TRANSFER, BLOCK, the conveyance of a group of consecutive words from one place to another.

TRANSFER CARD, same as (card, transition).

TRANSFER CHECK, see (check, transfer).

TRANSFER, CONDITIONAL, an instruction which, if a specified condition or set of conditions is satisfied, is interpreted as an unconditional transfer. If the condition is not satisfied, the instruction causes the computer to proceed in its normal sequence of control. A conditional transfer also includes the testing of the condition. Synonymous with (conditional jump) and (conditional branch) and related to (branch).

TRANSFER CONTROL, same as (transfer) (5).

TRANSFER FUNCTION, see (function, transfer).

TRANSFER INSTRUCTION, same as (instruction, branch).

TRANSFER OF CONTROL CARD, same as (card, transition).

TRANSFER OPERATION, see (operation, transfer).

TRANSFER, PARALLEL, a method of data transfer in which the characters of an element of information are transferred simultaneously over a set of paths.

TRANSFER, SERIAL, a method of data transfer in which the characters of an element are transferred in sequence over a signal path in consecutive time positions.

TRANSFER, UNCONDITIONAL, an instruction which switches the sequence of control to some specified location. Synonymous with (unconditional branch); (unconditional jump) and (unconditional transfer of control).

TRANSFLUXOR, a magnetic core having two or more openings. Control of the magnetic flux in the various legs of the magnetic circuits and the binary magnetic characteristics of the material permits storage.

TRANSFORM *, to change the form of data according to specific rules.

TRANSIENT, (1) a physical disturbance, intermediate to two steady-state conditions. (2) Pertaining to rapid change. (3) A build-up or breakdown in the intensity of a phenomenon until a steady state condition is reached. The time rate of change of energy is finite and some form of energy storage is usually involved.

TRANSISTOR, an electronic device utilizing semiconductor properties to control the flow of currents.

TRANSITION, the change from one circuit condition to the other; that is, the change from "mark" to "space" or from "space" to "mark".

TRANSITION CARD, see (card, transition).

TRANSITION, MARK-TO-SPACE, see (mark-to-space transition).

TRANSITION, SPACE-TO-MARK, see (space-to-mark transition).

TRANSLATE *, to convert from one language to another.

TRANSLATING ROUTINE, same as (translator) (1).

TRANSLATION, the operation which consists in re-establishing the text of a message from the restituted signals; unless otherwise specified, translation includes printing or the transcription of the text.

TRANSLATION, ALGORITHM, a specific, effective, essentially computational method for obtaining a translation from one language to another.

TRANSLATION, ERROR RATE OF, see (error rate of a translation).

TRANSLATION, FREQUENCY, see (frequency translation).

TRANSLATION, MACHINE, the automatic translation from one representation to another representation. The translation may involve codes, languages, or other systems of representation. Related to (dictionary, automatic).

TRANSLATION, MECHANICAL, a generic term for language translation by computers or similar equipment.

TRANSLATOR, (1) a program whose input is a sequence of statements in some language and whose output is an equivalent sequence of statements in another language. Synonymous with (translating routine). (2) A translating device.

TRANSLITERATE *, to convert the characters of one alphabet to the corresponding characters of another.

TRANSMISSION, the electrical transfer of a signal, message or other form of intelligence from one location to another.

TRANSMISSION, ASYNCHRONOUS, see (asynchronous transmission).

TRANSMISSION, DATA, see (data transmission).

TRANSMISSION, DOUBLE SIDEBAND, that method of communication in which the frequencies produced by the process of modulation on opposite sides of the carrier are not related to each other, but are related separately to two sets of modulating signals. The carrier frequency may be either transmitted or suppressed.

TRANSMISSION, EFFECTIVE SPEED OF, see (speed, transmission, effective).

TRANSMISSION LEVEL, the expression in transmission units of the ratio P/Po, where P represents the power at the point in question, and Po the power at the point chosen as the origin of the transmission system.

TRANSMISSION (TELEPHONE), MASTER REFERENCE SYSTEM FOR, see (master reference system for telephone transmission).

TRANSMISSION, PARALLEL, a system of sending all bits of a particular character simultaneously.

TRANSMISSION, POINT-TO-POINT, see (point-to-point transmission).

TRANSMISSION, SERIAL, to move data in sequence, one character at a time as contrasted with parallel transmission.

TRANSMISSION, SINGLE SIDEBAND, that method of communication in which the frequencies produced by the process of modulation on one side of the carrier are transmitted and those on the other side are suppressed. The carrier frequency may be either transmitted or suppressed.

TRANSMISSION SPEED, see (speed, transmission).

TRANSMISSION, SUPPRESSED CARRIER, that method of communication in which the carrier frequency is suppressed either partially or to the maximum degree possible. One or both of the sidebands may be transmitted.

TRANSMISSION, VESTIGIAL SIDEBAND, that method of communication in which frequencies of one sideband, the carrier, and only a portion of the other sideband are transmitted.

TRANSMIT *, to move data from one location to another.

TRANSMITTED DATA CIRCUIT, signals on this circuit are originated by the data terminal equipment for transmission on the data communication channel. This circuit is not required for Receive-Only service.

TRANSMITTER, in telephony, a device to convert sound to electrical energy. In radio and television, a device to generate and radiate electrical energy.

TRANSMITTER DISTRIBUTOR, the device in a teletypewriter which makes and breaks the teletype line in timed sequence. Modern usage of the term refers to a paper tape transmitter.

TRANSMITTER (RADIO), FREQUENCY TOLERANCE OF, see (frequency tolerance of radio transmitter).

TRANSMITTER START CODE, usually a two-letter call that is sent to an outlying machine which automatically turns on its tape transmitter.

TRANSPORT, TAPE, the mechanism which moves magnetic or paper tape past sensing and recording heads and usually associated with data processing equipment. Synonymous with (tape transport), (tape drive), and (feed, tape); related to (unit, tape); (unit, magnetic tape); and (unit, paper tape).

TRANSVERSE CHECK, a system of error-control based on the check that some preset rules for the formation of characters are observed.

TRAP *, an unprogrammed conditional jump to a known location, automatically activated by hardware, with the location from which the jump occurred recorded.

TRAPPING, a feature of some computers whereby an unscheduled; i.e., nonprogrammed, jump is made to a predetermined location in response to a machine condition; e.g., a tagged instruction, or a anomalous arithmetic situation. Such a feature is commonly used by monitor routines to provide automatic checking or for communication between input-output routines and the programs using them.

TRIAD, a group of three bits or three pulses, usually in sequence on one wire or simultaneously on three wires.

TRIBUTARY CIRCUIT, a circuit which connects an individual drop or drops to a switching center.

TRIGGER, ECCLES-JORDAN, same as (flip-flop).

TRIPLE PRECISION, see (precision, triple).

TROUBLE LOCATION PROBLEM, see (problem, trouble location).

TROUBLE-SHOOT *, same as (debug).

TRUNCATE *, to terminate a computational process in accordance with some rule, e.g., to end the evaluation of a power series at a specified time.

TRUNCATION ERROR, see (error, truncation).

TRUNK *, same as (bus).

TRUNK (communications), a trunk is a telephone line or channel, between two central offices or switching devices, which is used in providing telephone connections between subscribers.

TRUNK CIRCUIT, a circuit which connects two switching centers.

TRUNK, FINAL, a group of trunks to the higher class office which has no alternate route.

TRUNK, HIGH USAGE, a group of trunks for which an engineered alternate route is provided, and for which the number of trunks is determined on the basis of relative trunk efficiencies and economic considerations.

TRUNK, INTERCEPTING, see (intercepting trunk).

TRUNK, INTEROFFICE, see (interoffice trunk).

TRUNK, INTERTOLL, see (intertoll trunk).

TRUNK, LD, a long distance (LD) trunk is that type of trunk which permits trunk-to-trunk connection and which interconnects local, secondary, primary, and zone centers.

TRUNK, TERMINAL, a trunk circuit connecting two or more terminals.

TRUNK, TRIBUTARY, a trunk circuit connecting a local exchange with a toll center or other toll office through which access to the LD network is achieved.

TRUTH TABLE, see (table, truth).

TUBE, CATHODE RAY, (1) an electronic vacuum tube containing a screen on which information may be stored by means of a multigrid modulated beam of electrons from the thermionic emitter storage effected by means of charged or uncharged spots. (2) A storage tube. (3) An oscilloscope tube. (4) A picture tube.

TUBE, DISPLAY *, a tube, usually a cathode ray tube, used to display data.

TUBE, WILLIAMS, a cathode ray tube used as an electrostatic storage device and of the type designed by F. C. Williams, University of Manchester, England. Synonymous with (williams tube storage).

TURING MACHINE, see (machine, turing).

TURN AROUND TIME, see (time, turn around).

TV CIRCUIT, see (radio frequencies).

TWELVE PUNCH (12-PUNCH), same as (punch, Y) (2).

TWIN CHECK, see (check, twin).

TWO-OUT-OF-FIVE CODE, see (code, two-out-of-five).

TWO-PHASE MODULATION, a method of phase modulation in which the two significant conditions differ.

TWO STATE VARIABLE, same as (variable, two-valued).

TWO, THREE OR FOUR ADDRESS INSTRUCTION, see (instruction, two, three or four address).

TWO-VALUED VARIABLE, see (variable, two-valued).

TWO-WIRE, see (channel, two-wire).

TWX, a Bell system which provides 60,000 subscribers with two-way communications via teleprinter equipment connected to the general switched telephone network, TWX offers both 60 wpm and 100 wpm source. See (teletypewriter exchange service).

U

TYPE FONT *, - a type face of a given size, e.g., 10-point Bodoni Gothic.

UNBLIND, see (blind).

UNBOUNDED, a linear programming problem is unbounded if the constraints do not confine the objective function to a finite value.

UNDERPUNCH, a punch in one of the lower rows, 1-9, of an 80-column 12-row punch card.

ULTRASONICS, the field of science devoted to frequencies of sound above the human audio range; i.e., above 20 kilocycles per second.

UNCONDITIONAL BRANCH, same as (transfer, unconditional).

UNCONDITIONAL JUMP, same as (transfer, unconditional).

UNCONDITIONAL TRANSFER, see (transfer, unconditional).

UNCONDITIONAL TRANSFER OF CONTROL, same as (transfer, unconditional).

UNDERFLOW, (1) the condition which arises when a machine computation yields a result which is smaller than the smallest possible quantity which the machine is capable of storing. (2) A condition in which the exponent plus the excess becomes negative in a floating point arithmetic operation.

UNDETECTED ERROR RATE, the ratio of the number of bits, unit elements, characters, blocks incorrectly received but undetected or uncorrected by the error-control equipment, to the total number of bits, unit elements, characters, blocks sent.

UNIDIRECTIONAL, a connection between telegraph sets, one of which is a transmitter and the other a receiver.

UNIDIRECTIONAL PULSES, single-polarity pulses which all rise in the same direction.

UNI-POLAR, see (bi-polar).

UNIT, a portion or subassembly of a computer which constitutes the means of accomplishing some inclusive operation or function.

UNIT, ARITHMETIC *, the unit of a computing system that contains the circuits that perform arithmetic operations. Synonymous with (ALU).

UNIT, ASSEMBLY, (1) a device which performs the function of associating and joining several parts or piecing together a program. (2) A portion of a program which is capable of being assembled into a larger whole program.

UNIT, CARD PUNCH, same as (punch, card).

UNIT, CARD READER, same as (reader, card) (2).

UNIT, CENTRAL PROCESSING, same as (frame, main) (1).

UNIT, CODE ELEMENT, the signal elements in an equal-length multi-unit telegraph code from the arrangements of which the alphabet is formed.

UNIT, CONTROL *, the unit of a computing system that contains the circuits that interpret and control the execution of instructions.

UNIT, CONTROL; UNIT, DIALING; UNIT, SIGNALLING (communications), unit associated with a teleprinter and containing the necessary auxiliary equipment for operating this instrument on a switching network.

UNIT, DISPLAY, see (display unit).

UNIT ELEMENT, alphabetic signal element having a duration equal to the unit interval.

UNIT INTERVAL, see (interval, unit).

UNIT, MAGNETIC TAPE, the mechanism, normally used with a computer, which handles magnetic tape and usually consists of a tape transport, reading or sensing and writing or recording heads, and associated electrical and electronic equipments. Most units may provide for tape to be wound and stored on reels; however, some units provide for the tape to be stored loosely in closed bins. Clarified by (transport, tape), and (unit, paper tape).

UNIT, PAPER TAPE, the mechanism which handles punched paper tape and usually consists of a paper tape transport, sensing and recording or perforating heads and associated electrical and electronic equipments. Clarified by (transport, tape), and (unit, magnetic tape).

UNIT, PERIPHERAL CONTROL, see (control unit, peripheral).

UNIT, READ PUNCH, an input-output unit of a computing system which punches computed results into cards, reads input information into the system, and segregates output cards. The read-punch unit generally consists of a card feed, a read station, a punch station, another read station, and two output card stackers.

UNIT RECORD, see (record, unit).

UNIT, TAPE, a device consisting of a tape transport, controls, a set of reels and a length of tape which is capable of recording and reading information on and from the tape, at the request of the computer under the influence of a program. Clarified by (transport, tape); (unit, magnetic tape); and (unit, paper tape).

UNIT, TERMINAL, see (terminal unit).

UNIT, TRANSMISSION, the expression in transmission units of a ratio of two quantities of a similar nature is given by a number proportional to the logarithm (to a specified base) of this ratio followed by a name (considered as the name of the transmission unit used), indicating the base chosen; the factor of proportionality between the number and the logarithm depends upon the base chosen and the nature of the quantities concerned. NOTE: In principle, the simple indication of a number of transmission units (whatever the unit used) is insufficient to indicate the kind of quantities concerned; it is desirable, therefore, to specify these quantities. Examples are nepers and decibels.

UNIT, VOLUME, see (VU).

UNITERM, a word, symbol, or number used as a descriptor for retrieval of information from a collection; especially, such a descriptor used in a coordinate indexing system. Related to (card, aspect); (descriptor); (indexing, coordinate); (docuterm).

UNITERM INDEXING, see (indexing, uniterm).

UNITERM SYSTEM, see (system, uniterm).

UNITERMING, the selection of words, considered to be important and descriptive of the contents of a paper for later retrieval of the articles, reports, or other documents. The selected words are then included in a uniterm index.

UNIVERSAL TURING MACHINE, see (machine, universal turing).

UNPACK *, to separate various sections of packed data. Related to (extract) (3).

UNWIND, to code explicitly, at length and in full all the operations of a cycle thus eliminating all redtape operations in the final problem coding. Unwinding may be performed automatically by the computer during assembly, generation, or compilation of a program.

UPDATE, (1) to put into a master file changes required by current information or transactions. (2) To modify an instruction so that the address numbers it contains are increased by a stated amount each time the instruction is performed. (3) During the checkout period, the updating run deletes and adds programs, corrections, test data, etc. to the master program file.

UPSET DUPLEX SYSTEM, a direct-current telegraph system in which a station between any two duplex equipments may transmit signals by opening and closing the line circuit, thereby causing the signals to be received by upsetting the duplex balance.

UP TIME, see (time, up).

UTILITY PROGRAM, same as (routine, utility).

UTILITY ROUTINE, see (routine, utility).

V

VALIDITY, the correctness; especially the degree of the closeness by which iterated results approach the correct result.

VARIABLE *, a quantity that can assume any of a given set of values.

VARIABLE ADDRESS, same as (address, indexed).

VARIABLE, BINARY, same as (variable, two valued).

VARIABLE CONNECTOR, see (connector, variable).

VARIABLE CYCLE OPERATION, see (operation, variable cycle).

VARIABLE, MANIPULATED, in a process that is desired to regulate some condition, a quantity or a condition that is altered by the computer in order to initiate a change in the value of the regulated condition.

VARIABLE, TWO STATE, same as (variable, two valued).

VARIABLE, TWO VALUED, a variable which assumes values in a set containing exactly two elements, often symbolized as 0 and 1. This is often confused with double value variable; e.g., y=+vx. Synonymous with (binary variable) and (two state variable).

VARIABLE WORD-LENGTH, see (word-length, variable).

VARIOPLEX, a device, used in conjunction with a time-division multiplex system, which enables the multiplexed channels to be distributed between the users in a variable manner, according to the number of users who are transmitting at a given time.

VECTOR, a quantity having magnitude and direction, as contrasted with a scalar which has quantity only.

VENN DIAGRAM, see (diagram, venn).

VERIFIER *, (1) a device used to verify. (2) A device used to verify the results of keypunching.

VERIFY, to check a transcribing operation, by a compare operation. It usually applies to transcriptions which can be read mechanically or electrically.

VERIFYING, CARD, see (card verifying).

VESTIGIAL SIDEBAND TRANSMISSION, see (transmission, vestigial sideband).

V-F BAND, a "Voice Frequency" Band. A transmission facility of approximately 3,000 cycle bandwidth, capable of telephone quality communications.

VOCABULARY, a list of operating codes or instructions available to the programmer for writing the program for a given problem for a specific computer.

VOCABULARY, SOPHISTICATED, an advanced and elaborate set of instructions. Some computers can perform only the more common mathematical calculations such as addition, multiplication, and subtraction. A computer with a sophisticated vocabulary can go beyond this and perform operations such as linearize, extract square root, and select highest number.

VOICE FREQUENCY (V.F.), see (frequency, voice).

VOICE FREQUENCY CARRIER TELEGRAPH (V.F.C.T.), a telegraph transmission system which provides several narrow band individual channels in the voice frequency range.

VOICE FREQUENCY (V.F.) TELEPHONE FREQUENCY, any frequency within that part of the audio-frequency range essential for the transmission of speech of commercial quality, i.e., 300-3400 c/s.

VOICE GRADE SERVICE (VOICE CHANNEL), this term originally referred to a service provided by the common carriers that included a circuit capable of carrying a voice transmission. Now, when used in reference to the transmission of data, it also refers to a circuit of sufficient bandwidth to permit a data transfer rate up to 2400 bits per second. Primarily the term distinguishes this service from teleprinter grade service in reference to regulatory agencies' tariffs.

VOID *, in character recognition, the inadvertent absence of ink within a character outline.

VOLATILE STORAGE, see (storage, volatile).

VOLTAGE LEVEL (REFERRED TO 9.775 VOLT.) the expression in units of transmission of the ratio V/Vr, where V represents the r.m.s. value of the voltage at the point in question and Vr is 0.775 volt (corresponding to the voltage producing 1 milliwatt power in 600 ohms).

VOLUME TEST, see (test, volume).

V.U., VOLUME UNIT, the unit of measurement for electrical speech power in communication work as measured by a vu meter in the prescribed manner. The vu meter is a volume indicator in accordance with American Standards Association C 16. 5-1942. It has a db scale and specified dynamic and other characteristics in order to obtain correlated readings of speech power necessitated by the rapid fluctuation in level of voice currents. Zero vu equals zero dbn in measurement of sine wave test tone power.

W

WADS, Wide Area Data Service. This is similar to the WATS (Wide Area Telephone Service) used today. AT&T is now asking the Federal Communications Commission for approval to lease teletype grade circuits on an unlimited dial-up basis from any points in the country. Teletype grade represents the lowest type circuit in terms of speed, cost and accuracy.

WASTE INSTRUCTION, same as (instruction, no-op) (4).

WATS, Wide Area Telephone Service. A service which provides a special line allowing the customer to call a certain zone(s) or band(s), on a direct distance dialing basis, for a flat monthly charge. The continental United States is divided into six bands for the purpose of rates.

WAVE, CARRIER, the basic frequency or pulse repetition rate of a signal, bearing no intrinsic intelligence until it is modulated by another signal which does bear intelligence. A carrier may be amplitude, phase, or frequency modulated; e.g., in a typical mercury delay line storage of a digital computer, the 8 megacycle/second sound wave carrier is amplitude or pulse-modulated by a 1 megacycle/second pulse code signal, the presence or absence of a pulse determining whether or not a one or a zero is present in the binary number being represented.

WAVES, INTERRUPTED CONTINUOUS, see (interrupted continuous waves).

WAY-OPERATED CIRCUIT, a circuit shared by three or more stations on a "party line" basis. One of the stations may be a switching center. May be single or duplex circuit.

WAY STATION, a telegraph term for one of the stations on a multipoint circuit.

WIDE AREA TELEPHONE SERVICE, see (WATS).

WILLIAMS TUBE, see (tube, Williams).

WILLIAMS TUBE STORAGE, same as (tube, Williams).

WIRE, MAGNETIC, a wire made of or coated with a magnetic material and used for magnetic recording.

WIRE PRINTER, see (printer, wire).

WIRED PROGRAM COMPUTER, see (computer, wired program).

WORD, an ordered set of characters which occupies one storage location and is treated by the computer circuits as a unit and transferred as such. Ordinarily a word is treated by the control unit as an instruction, and by the arithmetic unit as a quantity. Word lengths may be fixed or variable depending on the particular computer. The Honeywell word consists of 48 information bits plus parity bits (24 bits plus 1 parity bit for the H-300).

WORD (communications), in telegraphy, 5 characters plus 1 space or 6 key-strokes.

WORD, DATA, a word which may be primarily regarded as part of the information manipulated by a given program. A data word may be used to modify a program instruction, or to be arithmetically combined with other data words. Honeywell large-computer data-word formats are: (a) Alphanumeric: the 48 informations bits are arranged in 8 groups of 6 bits each. Each six-bit code group can represent one of 56 alphanumeric characters; (b) Binary: the 48 information bits represent 44 signed or 48 unsigned binary digits; (c) Decimal: the 48 information bits are arranged in 12 groups of 4 bits each. Each four-bit code group can represent a decimal digit or a hexadecimal letter (also Numeric); and (d) Mixed: the 48 information bits are arranged to represent some combination of alphanumeric characters and decimal and binary digits.

WORD, DUOPRIMED, a computer word containing a representation of the 6, 7, 8, and 9 rows of information from an 80-column card.

WORD, END-OF-RECORD, see (end-of-record word).

WORD INDEX, see (index, word).

WORD, INFORMATION, an ordered set of characters bearing at least one meaning and handled by a computer as a unit, including separating and spacing, which may be contrasted with instruction words. Related to (word, machine).

WORD, INSTRUCTION, a word whose bits are used to encode machine instructions. The 48 bits of the Honeywell large-computer word are divided into four 12-bit groups used for the command code and three addresses.

WORD LENGTH, see (length, word).

WORD-LENGTH, FIXED, having the property that a machine word always contains the same number of characters or digits.

WORD-LENGTH, VARIABLE, having the property that a machine word may have a variable number of characters. It may be applied either to a single entry whose information content may be changed from time to time, or to a group of functionally similar entries whose corresponding components are of different lengths.

WORD, MACHINE, a unit of information of a standard number of characters which a machine regularly handles in each transfer; e.g., a machine may regularly handle numbers or instruction in units of 36 binary digits; this is then the machine word. Related to (word, information).

WORD-MARK, an indicator to signal the beginning or end of a word.

WORD, SHORT, the fixed word of lesser length in computers capable of handling words of two different lengths. In many computers this is referred to as a half-word because the length is exactly the half-length of the full word.

WORD, TELEGRAPH (CONVENTIONAL), a word comprising five letters together with one letter-space, used in computing telegraph speed in words/minute or traffic capacity.

WORD TIME, see (time, word).

WORKING SPACE, same as (storage, working).

WORKING STANDARD, a specified combination of a transmitting and receiving system, or subscriber's lines and feeding circuits (or equivalent systems), connected by means of a distortionless variable attenuator, and employed under specified conditions to determine by comparison the transmission quality of other telephone systems or parts of systems.

WORKING STORAGE, see (storage, working).

WRITE, (1) to transfer information, usually from main storage, to an output device. (2) To record data in a register, location, or other storage device or medium.

X, Y, Z

X PUNCH, see (punch, X).

XEROGRAPHIC PRINTER, see (printer, xerographic).

XEROGRAPHY, a dry copying process involving the photo electric discharge of an electrostatically charged plate. The copy is made by tumbling a resinous powder over the plate, the remaining electrostatic charge discharged and the resin transferred to paper or an offset printing master.

XY PLOTTER, see (plotter, XY).

Y PUNCH, see (punch, Y).

ZERO, a numeral normally denoting lack of magnitude. In many computers there are distinct representations for plus and minus zero.

ZERO ACCESS STORAGE, see (storage, zero access).

ZERO ADDRESS INSTRUCTION, see (instruction, zero address).

ZERO LEVEL ADDRESS, same as (address, immediate).

ZERO SUPPRESSION, see (suppression, zero).

ZERO TRANSMISSION LEVEL REFERENCE POINT, an arbitrary 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.

ZONE, (1) a portion of internal storage allocated for a particular function or purpose. (2) The three top positions of 12, 11 and 0 on certain punch cards. In these positions, a second punch can be inserted so that with punches in the remaining positions 1 to 9, alphabetic characters may be represented.

ZONE BIT, see (bit, zone).

ZONE, DEAD, same as (band, dead).

ZONE, MINUS, the bit positions in a computer code which represent the algebraic minus sign.

ZONE, NEUTRAL, an area in space or an interval of time in which a state of being other than the implementing state exists; e.g., a range of values in which no control action occurs or a brief period between words when certain switching action takes place. Similar to (band, dead).

ZONE, PLUS, the bit positions in a computer code which represent the algebraic plus sign.

ZONE,PUNCH, *, a punch in the O, X, or Y row on a Hollerith punched card.

APPENDIX I

HONEYWELL CHARACTER CODES

Key Punch	Card Code	Central Processor Code	Octal	High Speed Printer	Key Punch	Card Code	Central Processor Code	Octal	High Speed Printer
0	0	000000	00	0		X, 0 or X†	100000	40	-
1	1	000001	01	1	J	X, 1	100001	41	J
2	2	000010	02	2	K	X, 2	100010	42	K
3	3	000011	03	3	L	X, 3	100011	43	L
4	4	000100	04	4	M	X, 4	100100	44	M
5	5	000101	05	5	N	X, 5	100101	45	N
6	6	000110	06	6	O	X, 6	100110	46	O
7	7	000111	07	7	P	X, 7	100111	47	P
8	8	001000	10	8	Q	X, 8	101000	50	Q
9	9	001001	11	9	R	X, 9	101001	51	R
	8, 2	001010	12	'		X, 8, 2	101010	52	#
#	8, 3	001011	13	=	$	X, 8, 3	101011	53	$
@	8, 4	001100	14	:	*	X, 8, 4	101100	54	*
Space	Blank	001101	15	Blank		X, 8, 5	101101	55	"
	8, 6	001110	16	>		X, 8, 6	101110	56	≠
	8, 7	001111	17	&	-	X or X, 0 †	101111	57	!
&	R, 0 or R†	010000	20	+		8, 5	110000	60	<
A	R, 1	010001	21	A	/	0, 1	110001	61	/
B	R, 2	010010	22	B	S	0, 2	110010	62	S
C	R, 3	010011	23	C	T	0, 3	110011	63	T
D	R, 4	010100	24	D	U	0, 4	110100	64	U
E	R, 5	010101	25	E	V	0, 5	110101	65	V
F	R, 6	010110	26	F	W	0, 6	110110	66	W
G	R, 7	010111	27	G	X	0, 7	110111	67	X
H	R, 8	011000	30	H	Y	0, 8	111000	70	Y
I	R, 9	011001	31	I	Z	0, 9	111001	71	Z
	R, 8, 2	011010	32	;		0, 8, 2	111010	72	@
.	R, 8, 3	011011	33	.	,	0, 8, 3	111011	73	,
□	R, 8, 4	011100	34	)	%	0, 8, 4	111100	74	(
	R, 8, 5	011101	35	%		0, 8, 5	111101	75	^{CR}
	R, 8, 6	011110	36	■		0, 8, 6	111110	76	□
	R or R, 0 †	011111	37	?		0, 8, 7	111111	77	¢

† Special Code. This card code-central processor code equivalency is effective when control character 26 is coded in a card read or punch PCB instruction.

APPENDIX II

STANDARD HONEYWELL TEMPLATE

The purpose of a flow chart is to improve man-to-man communication relative to the description and analysis of an information processing problem. Flow charting is a technique in which symbols represent both the sequence of operations and the flow of data and paper work.

The use of flow charts became widespread in the field of information processing concurrently with the application of electronic computers to problems of business and industry. Occasionally, however, the interpretation of a flow chart has resulted in misunderstanding. A lack of uniformity in the meanings of specific symbols in the flow charts has been a source of misunderstanding. To end such misunderstanding, Honeywell has now accepted a uniform set of flow charting symbols approved by the X3.6 Subcommittee of the American Standards Association.

The American Standard flow chart symbols for information processing are represented as cutouts on the plastic template pictured in Figure 1.* Each symbol found on the template is illustrated with a brief description of its use.

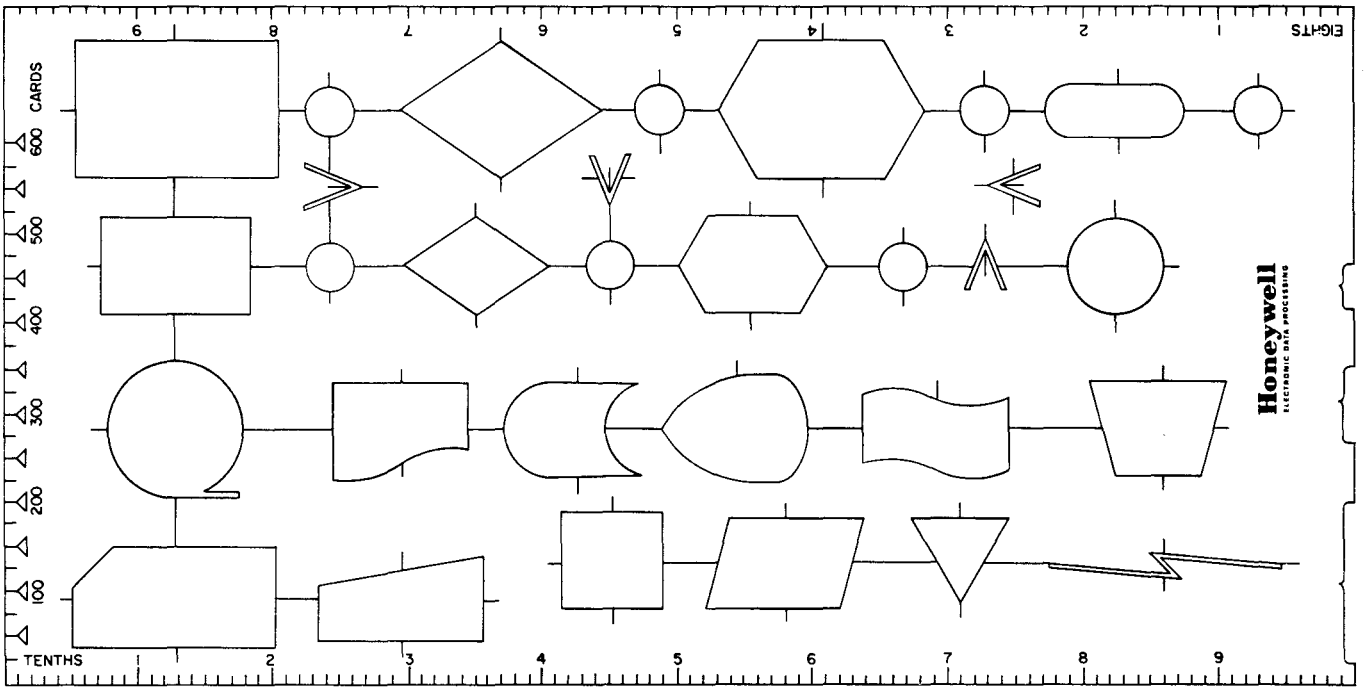
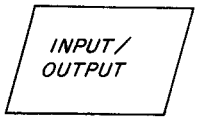


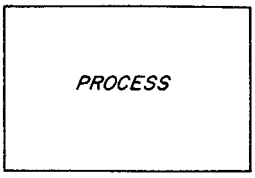
Figure 1. American Standard Flow Chart Symbols for Information Processing

*Template shown is 70% of actual size.

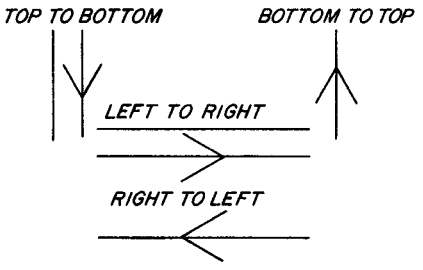
BASIC SYMBOLS



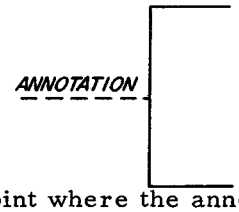
Input/Output Symbol — This symbol represents the input/output function (I/O), i.e., the available information for processing (input) or the record of processed information (output). This is referred to as a basic symbol and is frequently replaced by one of the specialized input/output symbols described below.



Process Symbol — This symbol represents any kind of processing function, e.g., the execution of a defined operation or group of operations resulting in a change in value, form, or location of information, or in the determination of which of several flow directions is to be followed. This is referred to as a basic symbol and is frequently replaced by one of the specialized processing symbols described below.



Direction of Flow Symbol — These symbols represent the function's direction of flow, i.e., the sequence of available information and executable operations. Direction of flow is represented by lines drawn between symbols. Normal direction of flow is from left to right and from top to bottom and may or may not be indicated by open arrow heads. Reversed direction of flow (right to left and bottom to top) must be indicated by open arrow heads. Bidirectional flow is shown either with a single line or with double lines. When flow lines are broken due to page limitations, connector symbols shall be used to indicate the break.



* Annotation Symbol — The addition of descriptive comments or explanatory notes as clarification is done by means of this symbol. The broken line may be drawn either on the left, as shown, or to the right. It is connected to the flow line at a point where the annotation is meaningful by extending the broken line in whatever fashion is appropriate.

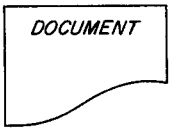
SPECIALIZED SYMBOLS

Input/Output Symbols

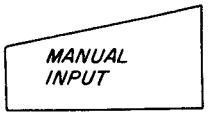
Punched Card Symbol — This symbol represents an I/O function in which the medium is punched cards, including mark sense cards, partial cards, stub cards, etc.

Magnetic Tape Symbol — The medium for this I/O function is, of course, magnetic tape.

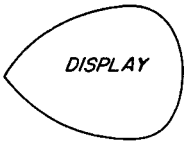
Punched Tape Symbol — The medium in this case is punched tape (normally paper tape).



Document Symbol — The medium here is a printed document.

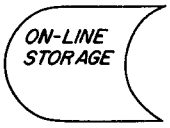


Manual Input Symbol — This symbol represents an I/O function in which the information is entered manually at the time of processing, by means of on-line keyboards, switch settings, push buttons, card readers, etc.



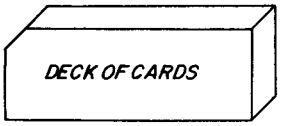
Display Symbol — This symbol represents the display of information for human use at the time of processing, by means of on-line indicators, video devices, console printers, plotters, etc.

Communication Link Symbol — One of these symbols is used to indicate that information is transmitted automatically from one location to another. The symbol is always drawn with superimposed arrowheads to denote the direction of data flow.



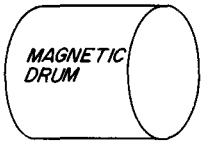
On-Line Storage Symbol — The I/O function represented by this symbol utilizes auxiliary mass storage of information that can be accessed on-line, e.g., magnetic drums, magnetic disks, magnetic tape strips, automatic magnetic card systems, or automatic microfilm chip or strip systems.

Off-Line Storage Symbol — This symbol represents any off-line storage of information, regardless of the medium on which the information is recorded.



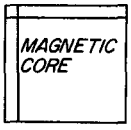
*Deck of Cards Symbol — This symbol represents a collection of punched cards.

*These symbols are not individual forms on the standard Honeywell template, but can be drawn using other forms.

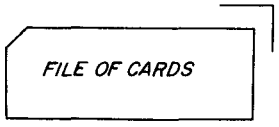


*Magnetic Drum Symbol — This symbol represents an I/O function in which the medium is magnetic drum.

*Magnetic Disk Symbol — This symbol represents an I/O function in which the medium is magnetic disk.

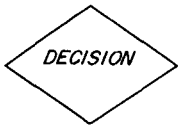


*Magnetic Core Symbol — This symbol represents an I/O function in which the medium is magnetic core.



*File of Cards Symbol — This symbol represents a collection of related punched card records.

Processing Symbols



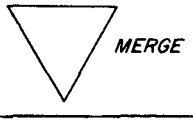
Decision Symbol — This symbol represents a decision type of operation that determines which of a number of alternate paths is to be followed.

This symbol represents modification of an instruction or group of instructions which change the program itself; e.g., set a switch, modify an index register, and initialize a routine.

Predefined Process Symbol — This symbol is used to name a process consisting of one or more operations or program steps that are specified elsewhere, e.g., a subroutine or logical unit.

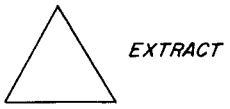
Manual Operation Symbol — Any off-line process geared to the speed of a human being is represented by this symbol.

Auxiliary Operation Symbol — An off-line operation performed on equipment not under direct control of the central processing unit is represented by this symbol.

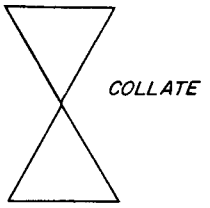


Merge Symbol — This symbol represents the combination of two or more sets of items into one set.

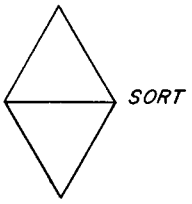
*These symbols are not individual forms on the standard Honeywell template, but can be drawn using other forms.



Extraction Symbol — This symbol represents the removal of one or more specific sets of items from a single set of items.



Collate Symbol — This symbol represents merging combined with extraction, i.e., the formation of two or more sets of items from two or more other sets.



Sort Symbol — This symbol represents the arrangement of a set of items into a particular sequence.

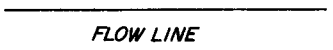
ADDITIONAL SYMBOLS

Connector Symbol — This symbol represents a junction in a line of flow. A set of two connectors is used to represent a continued flow of direction when the flow is broken by the physical limitations of the flow chart. A set of two or more connectors is used to represent the junction of several flow lines with one flow line, or the junction of one flow line with one of several alternate flow lines.

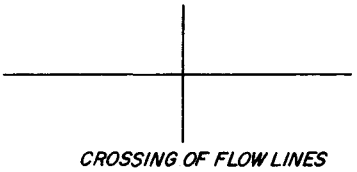
Terminal Symbol — This symbol represents a terminal point in a system or communication network at which information can enter or leave, e.g., start, stop, halt, delay, or interrupt.

Parallel Mode Symbol — This symool represents the beginning or end of two or more simultaneous operations.

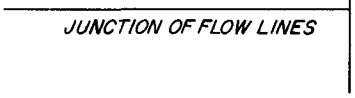
Flow Line Conventions



Flow Line Symbol — This symbol indicates the function of linking symbols. The general direction of flow is from left to right, and from top to bottom. Arrows may be used when flow is contrary to the directions specified, or when clarity may be increased by doing so.



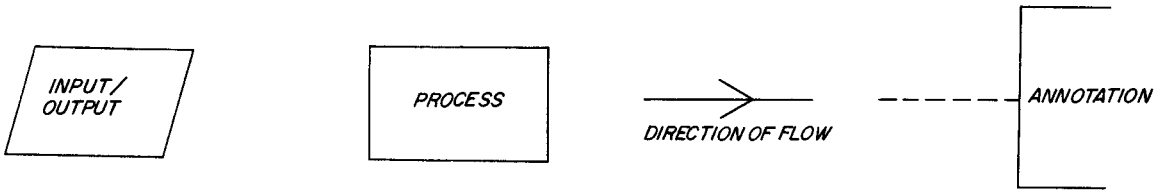
Crossing of Flow Lines Symbol — This symbol indicates that flow lines may cross, and that they have no logical interrelation.



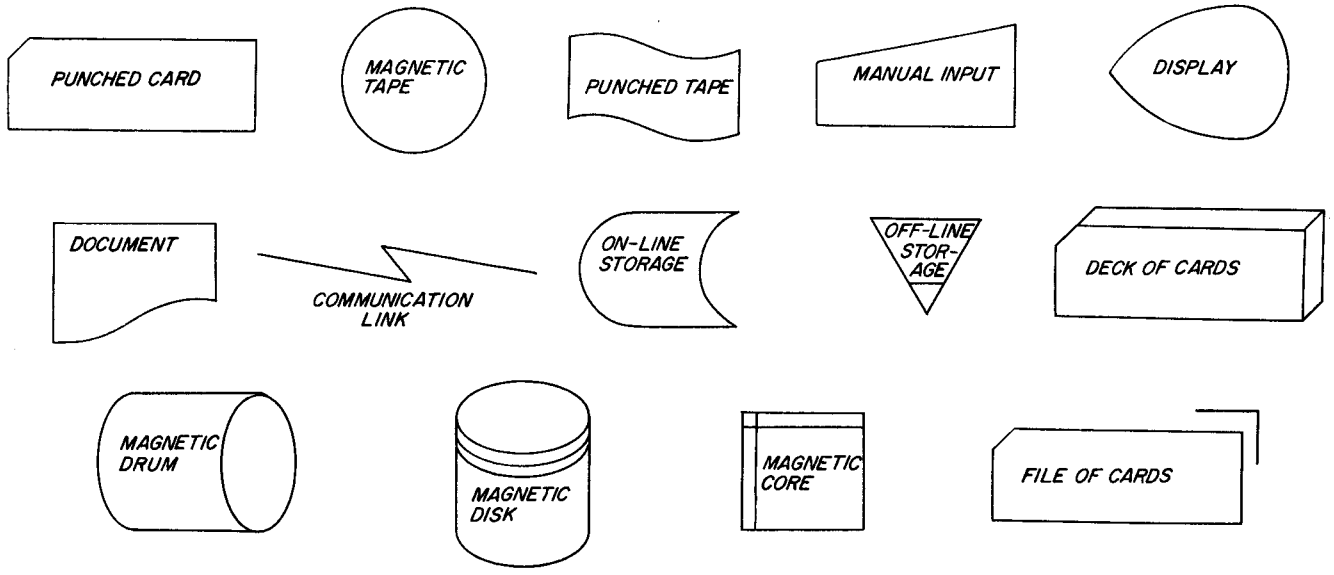
Junction of Flow Lines Symbol — This symbol indicates that two or more incoming flow lines may join with one outgoing flow line.

SUMMARY OF STANDARD FLOW CHART SYMBOLS

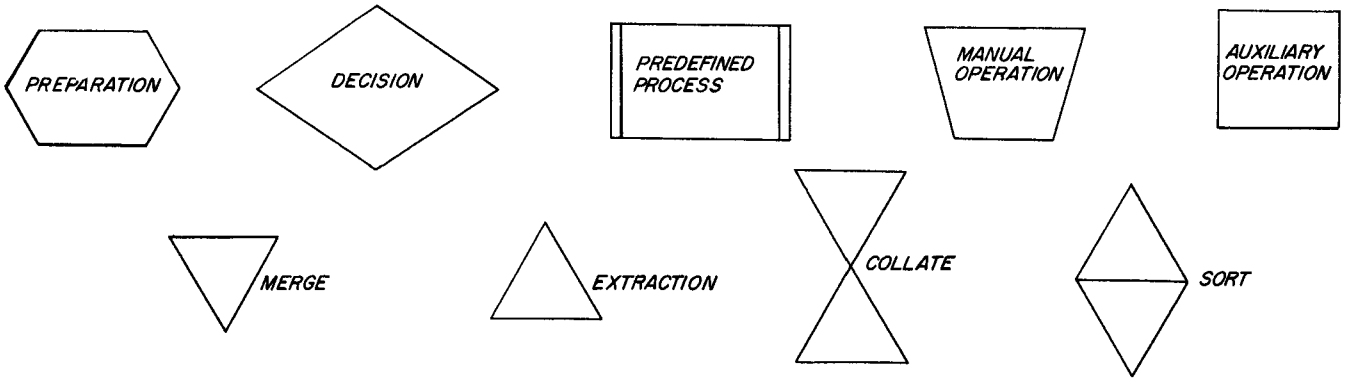
Basic Symbols



Specialized Symbols

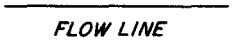


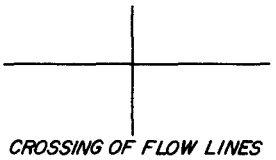
Processing Symbols

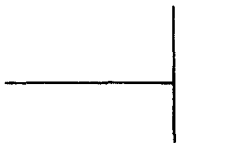


Additional Symbols

Flow Line Conventions







APPENDIX III

OCTAL-DECIMAL CONVERSION TABLE

LOW-ORDER OCTAL DIGIT	DECIMAL INCREMENT																								LOW-ORDER OCTAL DIGIT
0	000	008	016	024	032	040	048	056	064	072	080	088	096	104	112	120	128	136	144	152	160	168	176	184	192	0
1	001	009	017	025	033	041	049	057	065	073	081	089	097	105	113	121	129	137	145	153	161	169	177	185	193	1
2	002	010	018	026	034	042	050	058	066	074	082	090	098	106	114	122	130	138	146	154	162	170	178	186	194	2
3	003	011	019	027	035	043	051	059	067	075	083	091	099	107	115	123	131	139	147	155	163	171	179	187	195	3
4	004	012	020	028	036	044	052	060	068	076	084	092	100	108	116	124	132	140	148	156	164	172	180	188	196	4
5	005	013	021	029	037	045	053	061	069	077	085	093	101	109	117	125	133	141	149	157	165	173	181	189	197	5
6	006	014	022	030	038	046	054	062	070	078	086	094	102	110	118	126	134	142	150	158	166	174	182	190	198	6
7	007	015	023	031	039	047	055	063	071	079	087	095	103	111	119	127	135	143	151	159	167	175	183	191	199	7

DECIMAL BASE NO.																										DECIMAL BASE NO.
0000	0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17	20	21	22	23	24	25	26	27	30	0000
0200	31	32	33	34	35	36	37	40	41	42	43	44	45	46	47	50	51	52	53	54	55	56	57	60	61	0200
0400	62	63	64	65	66	67	70	71	72	73	74	75	76	77	100	101	102	103	104	105	106	107	110	111	112	0400
0600	113	114	115	116	117	120	121	122	123	124	125	126	127	130	131	132	133	134	135	136	137	140	141	142	143	0600
0800	144	145	146	147	150	151	152	153	154	155	156	157	160	161	162	163	164	165	166	167	170	171	172	173	174	0800
1000	175	176	177	200	201	202	203	204	205	206	207	210	211	212	213	214	215	216	217	220	221	222	223	224	225	1000
1200	226	227	230	231	232	233	234	235	236	237	240	241	242	243	244	245	246	247	250	251	252	253	254	255	256	1200
1400	257	260	261	262	263	264	265	266	267	270	271	272	273	274	275	276	277	300	301	302	303	304	305	306	307	1400
1600	310	311	312	313	314	315	316	317	320	321	322	323	324	325	326	327	330	331	332	333	334	335	336	337	340	1600
1800	341	342	343	344	345	346	347	350	351	352	353	354	355	356	357	360	361	362	363	364	365	366	367	370	371	1800
2000	372	373	374	375	376	377	400	401	402	403	404	405	406	407	410	411	412	413	414	415	416	417	420	421	422	2000
2200	423	424	425	426	427	430	431	432	433	434	435	436	437	440	441	442	443	444	445	446	447	450	451	452	453	2200
2400	454	455	456	457	460	461	462	463	464	465	466	467	470	471	472	473	474	475	476	477	500	501	502	503	504	2400
2600	505	506	507	510	511	512	513	514	515	516	517	520	521	522	523	524	525	526	527	530	531	532	533	534	535	2600
2800	536	537	540	541	542	543	544	545	546	547	550	551	552	553	554	555	556	557	560	561	562	563	564	565	566	2800
3000	567	570	571	572	573	574	575	576	577	600	601	602	603	604	605	606	607	610	611	612	613	614	615	616	617	3000
3200	620	621	622	623	624	625	626	627	630	631	632	633	634	635	636	637	640	641	642	643	644	645	646	647	650	3200
3400	651	652	653	654	655	656	657	660	661	662	663	664	665	666	667	670	671	672	673	674	675	676	677	700	701	3400
3600	702	703	704	705	706	707	710	711	712	713	714	715	716	717	720	721	722	723	724	725	726	727	730	731	732	3600
3800	733	734	735	736	737	740	741	742	743	744	745	746	747	750	751	752	753	754	755	756	757	760	761	762	763	3800
4000	764	765	766	767	770	771	772	773	774	775	776	777	1000	1001	1002	1003	1004	1005	1006	1007	1010	1011	1012	1013	1014	4000
4200	1015	1016	1017	1020	1021	1022	1023	1024	1025	1026	1027	1030	1031	1032	1033	1034	1035	1036	1037	1040	1041	1042	1043	1044	1045	4200
4400	1046	1047	1050	1051	1052	1053	1054	1055	1056	1057	1060	1061	1062	1063	1064	1065	1066	1067	1070	1071	1072	1073	1074	1075	1076	4400
4600	1077	1100	1101	1102	1103	1104	1105	1106	1107	1110	1111	1112	1113	1114	1115	1116	1117	1120	1121	1122	1123	1124	1125	1126	1127	4600
4800	1130	1131	1132	1133	1134	1135	1136	1137	1140	1141	1142	1143	1144	1145	1146	1147	1150	1151	1152	1153	1154	1155	1156	1157	1160	4800
5000	1161	1162	1163	1164	1165	1166	1167	1170	1171	1172	1173	1174	1175	1176	1177	1200	1201	1202	1203	1204	1205	1206	1207	1210	1211	5000
5200	1212	1213	1214	1215	1216	1217	1220	1221	1222	1223	1224	1225	1226	1227	1230	1231	1232	1233	1234	1235	1236	1237	1240	1241	1242	5200
5400	1243	1244	1245	1246	1247	1250	1251	1252	1253	1254	1255	1256	1257	1260	1261	1262	1263	1264	1265	1266	1267	1270	1271	1272	1273	5400
5600	1274	1275	1276	1277	1300	1301	1302	1303	1304	1305	1306	1307	1310	1311	1312	1313	1314	1315	1316	1317	1320	1321	1322	1323	1324	5600
5800	1325	1326	1327	1330	1331	1332	1333	1334	1335	1336	1337	1340	1341	1342	1343	1344	1345	1346	1347	1350	1351	1352	1353	1354	1355	5800
6000	1356	1357	1360	1361	1362	1363	1364	1365	1366	1367	1370	1371	1372	1373	1374	1375	1376	1377	1400	1401	1402	1403	1404	1405	1406	6000
6200	1407	1410	1411	1412	1413	1414	1415	1416	1417	1420	1421	1422	1423	1424	1425	1426	1427	1430	1431	1432	1433	1434	1435	1436	1437	6200
6400	1440	1441	1442	1443	1444	1445	1446	1447	1450	1451	1452	1453	1454	1455	1456	1457	1460	1461	1462	1463	1464	1465	1466	1467	1470	6400
6600	1471	1472	1473	1474	1475	1476	1477	1500	1501	1502	1503	1504	1505	1506	1507	1510	1511	1512	1513	1514	1515	1516	1517	1520	1521	6600
6800	1522	1523	1524	1525	1526	1527	1530	1531	1532	1533	1534	1535	1536	1537	1540	1541	1542	1543	1544	1545	1546	1547	1550	1551	1552	6800
7000	1553	1554	1555	1556	1557	1560	1561	1562	1563	1564	1565	1566	1567	1570	1571	1572	1573	1574	1575	1576	1577	1600	1601	1602	1603	7000
7200	1604	1605	1606	1607	1610	1611	1612	1613	1614	1615	1616	1617	1620	1621	1622	1623	1624	1625	1626	1627	1630	1631	1632	1633	1634	7200
7400	1635	1636	1637	1640	1641	1642	1643	1644	1645	1646	1647	1650	1651	1652	1653	1654	1655	1656	1657	1660	1661	1662	1663	1664	1665	7400
7600	1666	1667	1670	1671	1672	1673	1674	1675	1676	1677	1700	1701	1702	1703	1704	1705	1706	1707	1710	1711	1712	1713	1714	1715	1716	7600
7800	1717	1720	1721	1722	1723	1724	1725	1726	1727	1730	1731	1732	1733	1734	1735	1736	1737	1740	1741	1742	1743	1744	1745	1746	1747	7800
8000	1750	1751	1752	1753	1754	1755	1756	1757	1760	1761	1762	1763	1764	1765	1766	1767	1770	1771	1772	1773	1774	1775	1776	1777	2000	8000
8200	2001	2002	2003	2004	2005	2006	2007	2010	2011	2012	2013	2014	2015	2016	2017	2020	2021	2022	2023	2024	2025	2026	2027	2030	2031	8200
8400	2032	2033	2034	2035	2036	2037	2040	2041	2042	2043	2044	2045	2046	2047	2050	2051	2052	2053	2054	2055	2056	2057	2060	2061	2062	8400
8600	2063	2064	2065	2066	2067	2070	2071	2072	2073	2074	2075	2076	2077	2100	2101	2102	2103	2104	2105	2106	2107	2110	2111	2112	2113	8600
8800	2114	2115	2116	2117	2120	2121	2122	2123	2124	2125	2126	2127	2130	2131	2132	2133	2134	2135	2136	2137	2140	2141	2142	2143	2144	8800
9000	2145	2146	2147	2150	2151	2152	2153	2154	2155	2156	2157	2160	2161	2162	2163	2164	2165	2166	2167	2170	2171	2172	2173	2174	2175	9000
9200	2176	2177	2200	2201	2202	2203	2204	2205	2206	2207	2210	2211	2212	2213	2214	2215	2216	2217	2220	2221	2222	2223	2224	2225	2226	9200
9400	2227	2230	2231	2232	2233	2234	2235	2236	2237	2240	2241	2242	2243	2244	2245	2246	2247	2250	2251	2252	2253	2254	2255	2256	2257	9400
9600	2260	2261	2262	2263	2264	2265	2266	2267	2270	2271	2272	2273	2274	2275	2276	2277	2300	2301	2302	2303	2304	2305	2306	2307	2310	9600
9800	2311	2312	2313	2314	2315	2316	2317	2320	2321	2322	2323	2324	2325	2326	2327	2330	2331	2332	2333	2334	2335	2336	2337	2340	2341	9800
10,000	2342	2343	2344	2345	2346	2347	2350	2351	2352	2353	2354	2355	2356	2357	2360	2361	2362	2363	2364	2365	2366	2367	2370	2371	2372	10,000
10,200	2373	2374	2375	2376	2377	2400	2401	2402	2403	2404	2405	2406	2407	2410	2411	2412	2413	2414	2415	2416	2417	2420	2421	2422	2423	10,200
10,400	2424	2425	2426	2427	2430	2431	2432	2433	2434	2435	2436	2437	2440	2441	2442	2443	2444	2445	2446	2447	2450	2451	2452	2453	2454	10,400
10,600	2455	2456	2457	2460	2461	2462	2463	2464	2465	2466	2467	2470	2471	2472	2473	2474	2475	2476	2477	2500	2501	2502	2503	2504	2505	10,600
10,800	2506	2507	2510	2511	2512	2513	2514	2515	2516	2517	2520	2521	2522	2523	2524	2525	2526	2527	2530	2531	2532	2533	2534	2535	2536	10,800
11,000	2537	2540	2541	2542	2543	2544	2545	2546	2547	2550	2551	2552	2553	2554	2555	2556	2557	2560	2561	2562	2563	2564	2565	2566	2567	11,000
11,200	2570	2571	2572	2573	2574	2575	2576	2577	2600	2601	2602	2603	2604	2605	2606	2607	2610	2611	2612	2613	2614	2615	2616	2617	2620	11,200
11,400	2621	2622	2623	2624	2625	2626	2627	2630	2631	2632	2633	2634	2635	2636	2637	2640	2641	2642	2643	2644	2645	2646	2647	2650	2651	11,400
11,600	2652	2653	2654	2655	2656	2657	2660	2661	2662	2663	2664	2665	2666	2667	2670	2671	2672	2673	2674	2675	2676	2677	2700	2701	2702	11,600
11,800	2703	2704	2705	2706	2707	2710	2711	2712	2713	2714	2715	2716	2717	2720	2721	2722	2723	2724	2725	2726	2727	2730	2731	2732	2733	11,800
12,000	2734	2735	2736	2737	2740	2741	2742	2743	2744	2745	2746	2747	2750	2751	2752	2753	2754	2755	2756	2757	2760	2761	2762	2763	2764	12,000
12,200	2765	2766	2767	2770	2771	2772	2773	2774	2775	2776	2777	3000	3001	3002	3003	3004	3005	3006	3007	3010	3011	3012	3013	3014	3015	12,200
12,400	3016	3017	3020	3021	3022	3023	3024	3025	3026	3027	3030	3031	3032	3033	3034	3035	3036	3037	3040	3041	3042	3043	3044	3045	3046	12,400
12,600	3047	3050	3051	3052	3053	3054	3055	3056	3057	3060	3061	3062	3063	3064	3065	3066	3067	3070	3071	3072	3073	3074	3075	3076	3077	12,600
12,800	3100	3101	3102	3103	3104	3105	3106	3107	3110	3111	3112	3113	3114	3115	3116	3117	3120	3121	3122	3123	3124	3125	3126	3127	3130	12,800
13,000	3131	3132	3133	3134	3135	3136	3137	3140	3141	3142	3143	3144	3145	3146	3147	3150	3151	3152	3153	3154	3155	3156	3157	3160	3161	13,000
13,200	3162	3163	3164	3165	3166	3167	3170	3171	3172	3173	3174	3175	3176	3177	3200	3201	3202	3203	3204	3205	3206	3207	3210	3211	3212	13,200
13,400	3213	3214	3215	3216	3217	3220	3221	3222	3223	3224	3225	3226	3227	3230	3231	3232	3233	3234	3235	3236	3237	3240	3241	3242	3243	13,400
13,600	3244	3245	3246	3247	3250	3251	3252	3253	3254	3255	3256	3257	3260	3261	3262	3263	3264	3265	3266	3267	3270	3271	3272	3273	3274	13,600
13,800	3275	3276	3277	3300	3301	3302	3303	3304	3305	3306	3307	3310	3311	3312	3313	3314	3315	3316	3317	3320	3321	3322	3323	3324	3325	13,800
14,000	3326	3327	3330	3331	3332	3333	3334	3335	3336	3337	3340	3341	3342	3343	3344	3345	3346	3347	3350	3351	3352	3353	3354	3355	3356	14,000
14,200	3357	3360	3361	3362	3363	3364	3365	3366	3367	3370	3371	3372	3373	3374	3375	3376	3377	3400	3401	3402	3403	3404	3405	3406	3407	14,200
14,400	3410	3411	3412	3413	3414	3415	3416	3417	3420	3421	3422	3423	3424	3425	3426	3427	3430	3431	3432	3433	3434	3435	3436	3437	3440	14,400
14,600	3441	3442	3443	3444	3445	3446	3447	3450	3451	3452	3453	3454	3455	3456	3457	3460	3461	3462	3463	3464	3465	3466	3467	3470	3471	14,600
14,800	3472	3473	3474	3475	3476	3477	3500	3501	3502	3503	3504	3505	3506	3507	3510	3511	3512	3513	3514	3515	3516	3517	3520	3521	3522	14,800
15,000	3523	3524	3525	3526	3527	3530	3531	3532	3533	3534	3535	3536	3537	3540	3541	3542	3543	3544	3545	3546	3547	3550	3551	3552	3553	15,000
15,200	3554	3555	3556	3557	3560	3561	3562	3563	3564	3565	3566	3567	3570	3571	3572	3573	3574	3575	3576	3577	3600	3601	3602	3603	3604	15,200
15,400	3605	3606	3607	3610	3611	3612	3613	3614	3615	3616	3617	3620	3621	3622	3623	3624	3625	3626	3627	3630	3631	3632	3633	3634	3635	15,400
15,600	3636	3637	3640	3641	3642	3643	3644	3645	3646	3647	3650	3651	3652	3653	3654	3655	3656	3657	3660	3661	3662	3663	3664	3665	3666	15,600
15,800	3667	3670	3671	3672	3673	3674	3675	3676	3677	3700	3701	3702	3703	3704	3705	3706	3707	3710	3711	3712	3713	3714	3715	3716	3717	15,800
16,000	3720	3721	3722	3723	3724	3725	3726	3727	3730	3731	3732	3733	3734	3735	3736	3737	3740	3741	3742	3743	3744	3745	3746	3747	3750	16,000
16,200	3751	3752	3753	3754	3755	3756	3757	3760	3761	3762	3763	3764	3765	3766	3767	3770	3771	3772	3773	3774	3775	3776	3777	4000	4001	16,200
16,400	4002	4003	4004	4005	4006	4007	4010	4011	4012	4013	4014	4015	4016	4017	4020	4021	4022	4023	4024	4025	4026	4027	4030	4031	4032	16,400

HIGH-ORDER OCTAL DIGITS

OCTAL DECIMAL CONVERSION PROCEDURE

Consider the decimal number to be converted as a base and an increment. Locate the base (the next lower number which is evenly divisible by 200) in the margin of the lower chart and the increment in the body of the upper chart. The intersection of the row and column thus defined contains the high-order digits of the octal equivalent. The low-order digit appears in the margins of the upper chart opposite the increment. For example, to convert 7958 to octal, the base is 7800 and the increment is 158. Locate 158 in the upper chart and read down this column to the 7800 row below. The high-order octal result is 1742. Then read out to the margin of the upper chart to obtain the low-order digit of 6. Append (do not add) this digit to 1742 for an octal equivalent of 17,426.

To convert an octal number to decimal, locate the high-order digits in the body of the lower chart and the low-order digit in the margin of the upper chart. Then perform the converse of the above operation.

APPENDIX IV

BINARY EXTENSION TABLE

2^n	n	2^{-n}
1	0	1.0
2	1	0.5
4	2	0.25
8	3	0.125
16	4	0.062 5
32	5	0.031 25
64	6	0.015 625
128	7	0.007 812 5
256	8	0.003 906 25
512	9	0.001 953 125
1 024	10	0.000 976 562 5
2 048	11	0.000 488 281 25
4 096	12	0.000 244 140 625
8 192	13	0.000 122 070 312 5
16 384	14	0.000 061 035 156 25
32 768	15	0.000 030 517 578 125
65 536	16	0.000 015 258 789 062 5
131 072	17	0.000 007 629 394 531 25
262 144	18	0.000 003 814 697 265 625
524 288	19	0.000 001 907 348 632 812 5
1 048 576	20	0.000 000 953 674 316 406 25
2 097 152	21	0.000 000 476 837 158 203 125
4 194 304	22	0.000 000 238 418 579 101 562 5
8 388 608	23	0.000 000 119 209 289 550 781 25
16 777 216	24	0.000 000 059 604 644 775 390 625
33 554 432	25	0.000 000 029 802 322 387 695 312 5
67 108 864	26	0.000 000 014 901 161 193 847 656 25
134 217 728	27	0.000 000 007 450 580 596 923 828 125
268 435 456	28	0.000 000 003 725 290 298 461 914 062 5
536 870 912	29	0.000 000 001 862 645 149 230 957 031 25
1 073 741 824	30	0.000 000 000 931 322 574 615 478 515 625
2 147 483 648	31	0.000 000 000 465 661 287 307 739 257 812 5
4 294 967 296	32	0.000 000 000 232 830 643 653 869 628 906 25
8 589 934 592	33	0.000 000 000 116 415 321 826 934 814 453 125
17 179 869 184	34	0.000 000 000 058 207 660 913 467 407 226 562 5
34 359 738 368	35	0.000 000 000 029 103 830 456 733 703 613 281 25
68 719 476 736	36	0.000 000 000 014 551 915 228 366 851 806 640 625
137 438 953 472	37	0.000 000 000 007 275 957 614 183 425 903 320 312 5
274 877 906 944	38	0.000 000 000 003 637 978 807 091 712 951 660 156 25
549 755 813 888	39	0.000 000 000 001 818 989 403 545 856 475 830 078 125
1 099 511 627 776	40	0.000 000 000 000 909 494 701 772 928 237 915 039 062 5
2 199 023 255 552	41	0.000 000 000 000 454 747 350 886 464 118 957 519 531 25
4 398 046 511 104	42	0.000 000 000 000 227 373 675 443 232 059 478 759 765 625
8 796 093 022 208	43	0.000 000 000 000 113 686 837 721 616 029 739 379 882 812 5
17 592 186 044 416	44	0.000 000 000 000 056 843 418 860 808 014 869 689 941 406 25
35 184 372 088 832	45	0.000 000 000 000 028 421 709 430 404 007 434 844 970 703 125
70 368 744 177 664	46	0.000 000 000 000 014 210 854 715 202 003 717 422 485 351 562 5
140 737 488 355 328	47	0.000 000 000 000 007 105 427 357 601 001 858 711 242 675 781 25
281 474 976 710 656	48	0.000 000 000 000 003 552 713 678 800 500 929 355 621 337 890 625
562 949 953 421 312	49	0.000 000 000 000 001 776 356 839 400 250 464 677 810 668 945 312 5
1 125 899 906 842 624	50	0.000 000 000 000 000 888 178 419 700 125 232 338 905 334 472 656 25
2 251 799 813 685 248	51	0.000 000 000 000 000 444 089 209 850 062 616 169 452 667 236 328 125
4 503 599 627 370 496	52	0.000 000 000 000 000 222 044 604 925 031 308 084 726 333 618 164 062 5
9 007 199 254 740 992	53	0.000 000 000 000 000 111 022 302 462 515 654 042 363 166 809 082 031 25
18 014 398 509 481 984	54	0.000 000 000 000 000 055 511 151 231 257 827 021 181 583 404 541 015 625
36 028 797 018 963 968	55	0.000 000 000 000 000 027 755 575 615 628 913 510 590 791 702 270 507 812 5
72 057 594 037 927 936	56	0.000 000 000 000 000 013 877 787 807 814 456 755 295 395 851 135 253 906 25
144 115 188 075 855 872	57	0.000 000 000 000 000 006 938 893 903 907 228 377 647 697 925 567 626 953 125
288 230 376 151 711 744	58	0.000 000 000 000 000 003 469 446 951 953 614 188 823 848 962 783 813 476 562 5
576 460 752 303 423 488	59	0.000 000 000 000 000 001 734 723 475 976 807 094 411 924 481 391 906 738 281 25
1 152 921 504 606 846 976	60	0.000 000 000 000 000 000 867 361 737 988 403 547 205 962 240 695 953 369 140 625
2 305 843 009 213 693 952	61	0.000 000 000 000 000 000 433 680 868 994 201 773 602 981 120 347 976 684 570 312 5
4 611 686 018 427 387 904	62	0.000 000 000 000 000 000 216 840 434 497 100 886 801 490 560 173 988 342 285 156 25
9 223 372 036 854 775 808	63	0.000 000 000 000 000 000 108 420 217 248 550 443 400 745 280 086 994 171 142 578 125
18 446 744 073 709 551 616	64	0.000 000 000 000 000 000 054 210 108 624 275 221 700 372 640 043 497 085 571 289 062 5
36 893 488 147 419 103 232	65	0.000 000 000 000 000 000 027 105 054 312 137 610 850 186 320 021 748 542 785 644 531 25
73 786 976 294 838 206 464	66	0.000 000 000 000 000 000 013 552 527 156 068 805 425 093 160 010 874 271 392 822 265 625
147 573 952 589 676 412 928	67	0.000 000 000 000 000 000 006 776 263 578 034 402 712 546 580 005 437 135 696 411 132 812 5
295 147 905 179 352 825 856	68	0.000 000 000 000 000 000 003 388 131 789 017 201 356 273 290 002 718 567 848 205 566 406 25
590 295 810 358 705 651 712	69	0.000 000 000 000 000 000 001 694 065 894 508 600 678 136 645 001 359 283 924 102 783 203 125
1 180 591 620 717 411 303 424	70	0.000 000 000 000 000 000 000 847 032 947 254 300 339 068 322 500 679 641 962 051 391 601 562 5
2 361 183 241 434 822 606 848	71	0.000 000 000 000 000 000 000 423 516 473 627 150 169 534 161 250 339 820 981 025 695 800 781 25
4 722 366 482 869 645 213 696	72	0.000 000 000 000 000 000 000 211 758 236 813 575 084 767 080 625 169 910 490 512 847 900 390 625

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