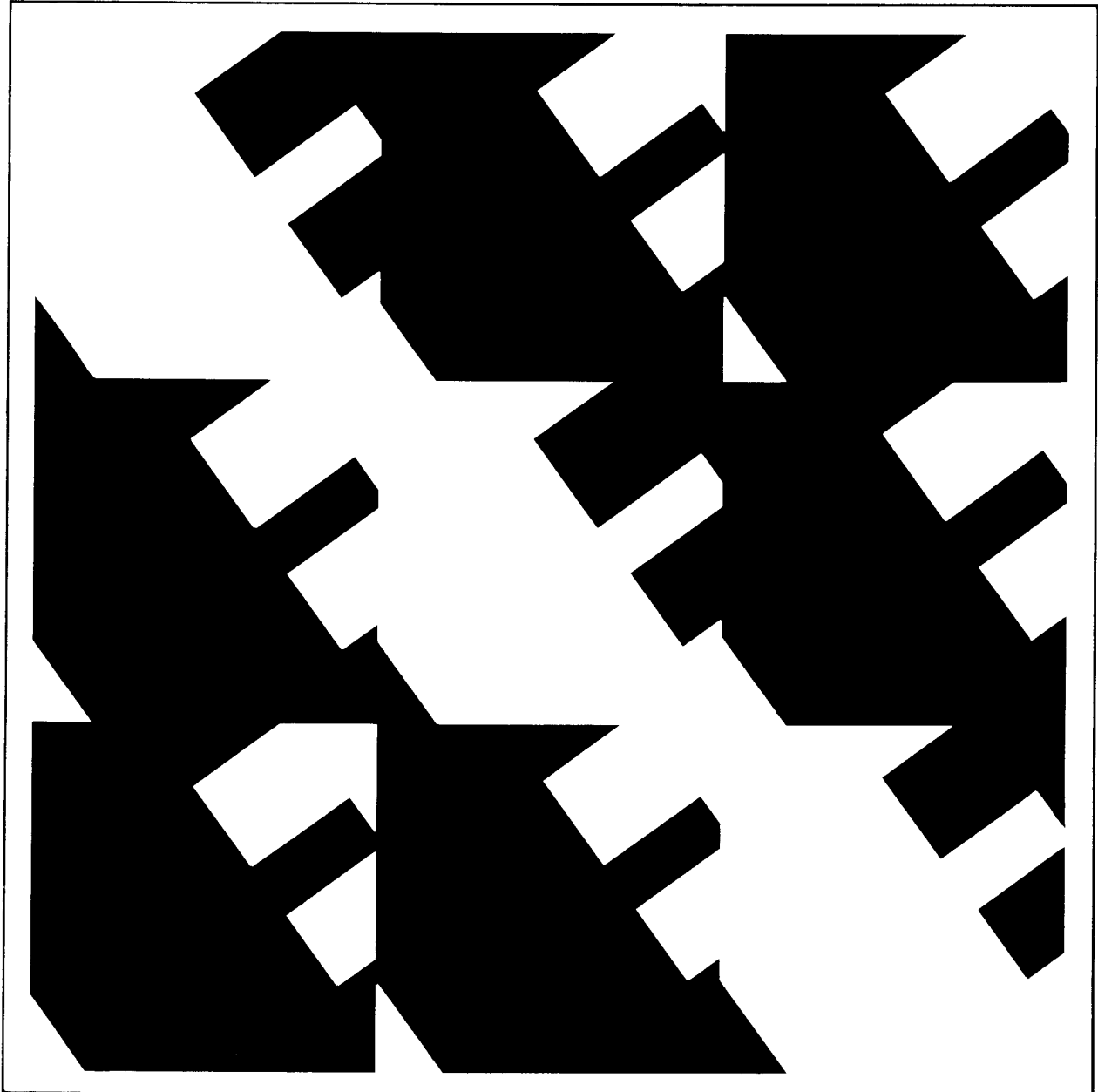


IEEE Standard Definitions of Terms for Electronic Digital Computers

ANSI/IEEE Std 162-1963



Published by The Institute of Electrical and Electronics Engineers, Inc 345 East 47th Street, New York, NY 10017, USA

INTRODUCTORY NOTES

Analog terms have been kept to a minimum because they are included in a different IEEE Standard.

Programming terms have been kept to a minimum because they are not primarily engineering terms and are included in Standards prepared by other professional societies.

Multi-word terms are defined under the first word and cross-referenced by *italics* in an entry under the last word.

Boldface is used for alphabetic entries.

Italics are used to show that the *italicized* term is defined elsewhere in the list of definitions.

ACKNOWLEDGMENT

The Institute wishes to acknowledge its indebtedness to those who have so freely given of their time and knowledge and have conducted experimental work on which many of the IEEE publications are based.

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DEFINITIONS OF TERMS

for

ELECTRONIC DIGITAL COMPUTERS

access time. A time interval that is characteristic of a storage device, and is essentially a measure of the time required to communicate with that device. Many definitions of the beginning and ending of this interval are in common use.

accumulator. 1) A device that retains a number (the augend) adds to it another number (the addend) and replaces the augend with the sum.

2) Sometimes only the part of (1) that retains the sum.

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.

adder. A device whose output is a representation of the sum of the quantities represented by the inputs.

See *half-adder*.

address. An expression, usually numerical, that designates a particular location in a *storage* or memory device or other source or destination of data. See also *instruction*, *address part*.

See *four-address*, *multiple-address*, *one-address*, *one-plus-one-address*, *single-address*, *three-address*, *three-plus-one-address*, *triple-address*, *two-address*, *two-plus-one-address*.

address part. A part of an *instruction* that usually is an *address*, but that may be used in some instructions for another purpose.

AND gate. A *combinational logic element* such that the output channel is in its "one" state if and only if each input channel is in its "one" state.

associative storage. A storage device in which storage locations may be identified by specifying part or all of their contents. Also called *parallel-search storage* or *content-addressed storage*.

automatic check. A *check* performed by equipment built into the computer specifically for that purpose, and automatically accomplished each time the pertinent operation is performed. Sometimes referred to as a built-in check.

band (in Electronic Computers). A group of *tracks* on a moving storage medium such as film, drum, tape, or disc.

base (of Number System). An integer whose successive powers are multiplied by coefficients in a *positional notation* system.

base-minus-ones complement. A number representation

that can be derived from another by subtracting each digit from one less than the base. *Nines complements* and *ones complements* are base-minus-ones complements.

binary. 1) Pertaining to the number-representation system with a *base* of two.

2) Pertaining to the number "two".

binary code. Any *code* employing two *character* designs.

binary-coded-decimal. Pertaining to a number-representation system in which each decimal digit is represented by a unique arrangement of binary digits (usually four), e.g., *excess-three code*.

bit (in Electronic Computers). 1) A binary digit.

2) In a *language* employing exactly two distinct kinds of characters, a single occurrence of a *character*.

3) A unit of *storage capacity*.

See *check bit*.

block. A group of associated *words* or *characters*.

borrow. In direct subtraction, a *carry* that arises when the result of the subtraction in a given digit place is less than zero.

branch (in Electronic Computers). Same as *conditional jump*.

breakpoint. 1) Pertaining to a type of instruction, instruction digit, or other condition used to interrupt or stop a computer at a particular place in a *routine* when manually requested.

2) A place in a *routine* where such an interruption occurs or can be made to occur.

buffer. 1) An isolating circuit used to avoid reaction of a driven circuit on any driving circuit.

2) A storage device used to compensate for a difference in rate of flow of data or time of occurrence of events when transmitting data from one device to another.

bus (in Electronic Computers). One or more conductors used for transmitting signals or power from one or more sources to one or more destinations.

capacity. See *storage capacity*.

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 *base* of the number-representation system.

4) Less commonly, a *borrow*.

5) The act of forwarding a carry.

6) The command directing that a carry be forwarded.

See *cascaded carry*, *complete carry*, *end-around carry*, *high-speed carry*, *partial carry*, *standing-on-nines carry*.

cascaded carry. A carry process that uses the normal means for adding when generating any new carry. Contrasted with *high-speed carry*.

cell. An elementary unit of storage, e.g., binary cell, decimal cell.

channel (in Electronic Computers). 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. See also *track*.

character (in Electronic Computers). 1) An elementary mark or event that may be combined with others, usually in the form of a linear string, to form data or represent information. If necessary to distinguish from (2) below, such a mark may be called a character event.

2) A class of equivalent elementary marks or events as in (1) having properties in common, such as shape or amplitude. If necessary to distinguish from (1) above, such a class may be called a character design. There are usually only a finite set of character designs in a given language.

Note 1: In "bookkeeper" there are six character designs and ten character events, while in "1010010" there are two character designs and seven character events.

Note 2: A group of characters, in one context, may be considered as a single character in another, as in the *binary-coded-decimal* system.

check. A process of partial or complete testing of a) the correctness of machine operations, or b) the existence of certain prescribed conditions within the computer. A check of any of these conditions may be made automatically by the equipment or may be programmed. See also *error-detecting code*, *forbidden combination*, *self-checking code*, *test*, *verify*.

See *automatic check*, *machine check*, *marginal check*, *mathematical check*, *parity check*, *programmed check*, *selection check*, *transfer check*.

check bit. A binary *check digit*.

check digit. A digit used for checking purposes but otherwise *redundant*.

check problem. A routine or problem that is designed primarily to indicate whether a fault exists in the computer, without giving detailed information on the location of the fault. Also called *check routine*. See also *diagnostic*, *test*.

check routine. Same as *check problem*.

circulating register. A register that retains data by inserting it into a delaying means, and regenerating and reinserting the data into the register.

clear. 1) To preset a storage or memory device to a prescribed state, usually that denoting zero.

2) To place a binary cell in the "zero" state.

See *reset*, *set*.

clock. 1) A primary source of synchronizing signals.

2) A device for measuring and indicating time.

code (in Electronic Computers). 1) The characters or expressions of an originating or source language, each correlated with its equivalent expression in an intermediate or target language, e.g., alphanumeric characters correlated with their equivalent 6-bit expressions in a binary machine language.

2) Frequently, an expression in the target language.

3) Frequently, the set of expressions in the target language that represent the set of *characters* of the source language.

4) To *encode*.

5) To translate the program for the solution of a problem on a given computer into a sequence of machine-language or pseudo instructions acceptable to that computer.

See *binary code*, *error-detecting code*, *excess-three code*, *operation code*, *self-checking code*.

column. 1) A vertical arrangement of characters or other expressions.

2) Loosely: *place*.

combination. See *forbidden combination*.

combinational logic element. 1) A device having zero or more input channels and one output channel, each of which is always in one of exactly two possible physical states, except during switching transients. On each of the input channels and the output channel, a single state is designated arbitrarily as the "one" state, for that input channel or output channel, as the case may be. For each input channel and output channel, the other state may be referred to as the "zero" state. The device has the property that the output channel state is determined completely by the contemporaneous input-channel-state combination, to within switching transients.

2) By extension, a device similar to (1) except that one or more of the input channels or the output channel, or both, have a finite number, but more than two, possible physical states each of which is designated as a distinct logic state. The output channel state is determined completely by the contemporaneous input-channel-state combination, to within switching transients.

3) A device similar to (1) or (2) except that it has more than one output channel.

See *AND gate*, *OR gate*.

command. 1) One of a set of several signals (or groups of signals) that occurs as a result of interpreting an