Computer Dictionary and Handbook

THIRD EDITION

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exchange device, remote computing system — The exchange device controls the flow of information between the computer and the terminals. Characters typed at the terminals are sent to the computer one line at a time via the exchange device. The computer returns an answer to the exchange device, which, in turn, sends it to the proper terminal. The exchange device allows each terminal to send or receive data independent of all other terminals.

exchange, dial — An exchange where all subscribers originate their calls by dialing.

exchange instruction — An instruction to replace the contents of one register (or set of registers) with the contents of another and vice versa.

exchange, manual — An exchange where calls are routed 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, storage — *Same as* memory exchange.

exclusive NOR gate — *See* gate, exclusive NOR.

exclusive OR — A Boolean logic operation performed between specified registers on a bit-by-bit basis. A logic one is left in the results register if either bit in any bit position of either register is a one. A logic zero is left if both are a logic one or both are a logic zero.

exclusive OR function — A logic operation in which the result is logically true when only one input function is true, and false when both inputs are true or false.

exclusive OR, logical — *Same as* gate, exclusive OR.

exclusive segments — *See* segments, exclusive.

execute — To carry out an instruction or perform a routine. To interpret a machine instruction and perform the indicated operation(s) on the operand(s) specified.

execute cycle — The portion of the operational sequence of a computer when the actions required to perform an instruction are actually accomplished. Occurs after a "fetch" cycle has obtained an instruction from memory.

execute phase — 1. The part of the computer operating cycle wherein a command in the program register is carried out upon the address indicated. 2. The act of performing a command.

execution — The processes which are performed by computer devices and circuitry which accomplish a particular instruction or design.

execution cycle — That portion of a machine cycle during which the actual execution of the instruction takes place. Some operations (e.g., divide, multiply) may need a large number of these operation cycles to complete the operation, and the normal instruction/operation alternation will be held up during this time. Also called operation cycle.

execution-error detection — Detection concerned with those errors detected during the execution of the user's program. They include errors that are detectable only during program execution (e.g., invalid subscript value, reference to an undefined variable, arithmetic spills, etc.) along with those errors of completeness detected because either (1) they were disregarded by the user when previously detected or (2) they were not detected in the first place because the user did not indicate that his program was completed.

execution errors, remote-computing — *See* errors, execution (remote-computing system).

execution, interpretive — Permits retention of all of the information contained in the user's original source statements, thereby making source-language debugging possible. Interpretive execution, plus multiprogramming, make the conversational mode of operation a practical reality.

execution, looping — *See* looping execution.

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 path — The principal course or line of direction taken by a computer in the execution of a routine, directed by the logic of the program and the nature of the data.

execution time — 1. The sum total of the amount of time required to complete a given command. 2. The portion of an instruction cycle during which the ac-

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