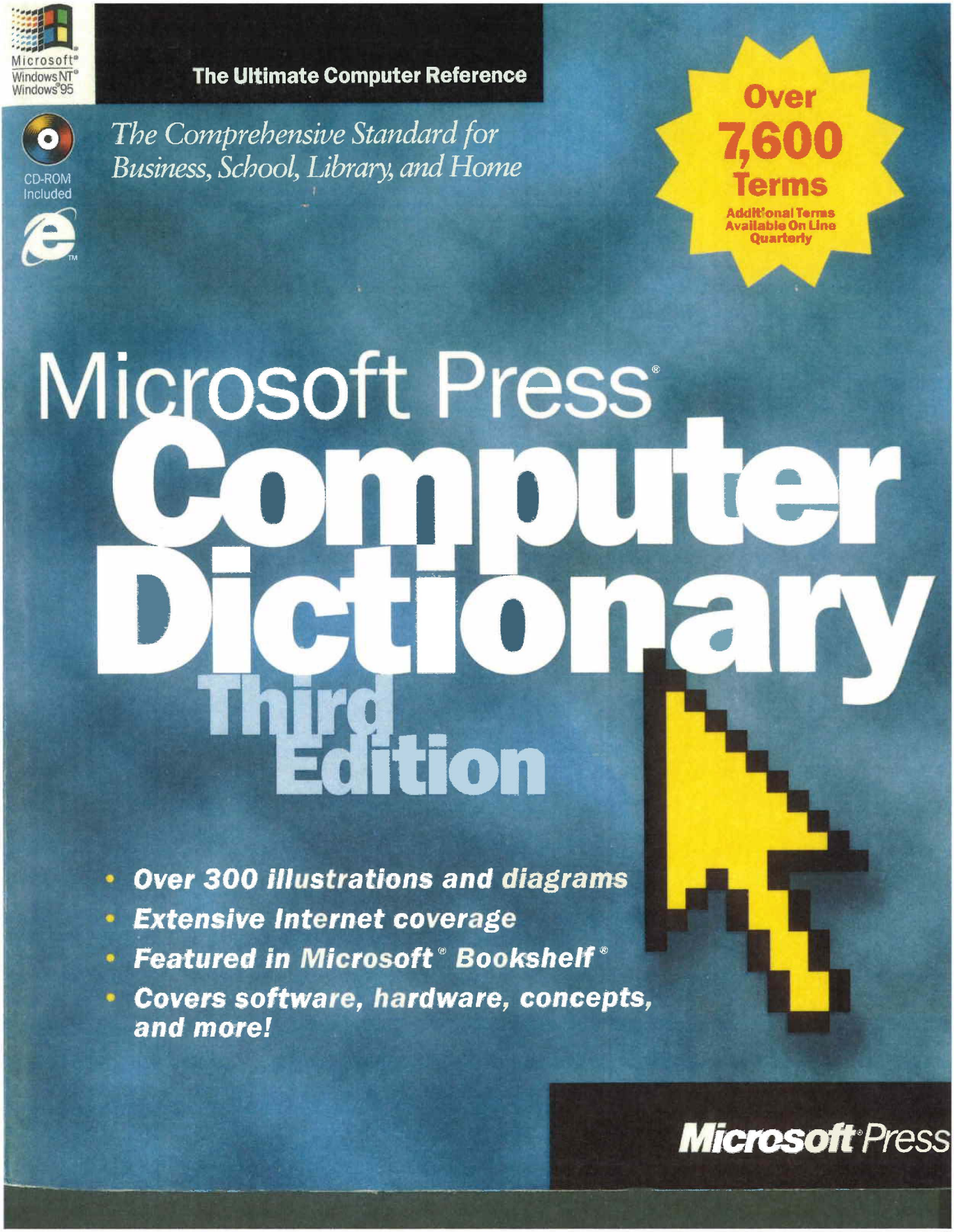

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screen window associated with the pen. *See also* absolute coordinates, graphics tablet. *Compare* relative pointing device.

absolute value \ab`sə-lo͞ot val´yo͞o\ *n.* The magnitude of a number, irrespective of its sign (+ or –). An absolute value is always greater than or equal to zero. For example, 10 is the absolute value of 10 and of –10. Programming languages and spreadsheet programs commonly include functions that return the absolute value of a number.

abstract[1] \ab´strakt\ *adj.* **1.** In character recognition systems, of, pertaining to, or being a type of symbol that, unlike a letter or numeral, has no intrinsic meaning and must be defined before it can be interpreted. **2.** In programming, of, pertaining to, or being a data type defined by the operations that can be performed on objects of that type rather than by the properties of the objects themselves. *See also* abstract data type.

abstract[2] \ab´strakt\ *n.* In information processing and library science, a summary typically consisting of a paragraph or a few paragraphs at the beginning of an investigative document, such as a scientific paper.

abstract class \ab`strakt klas´\ *n.* In the C++ programming language, the opposite of a concrete class (one in which objects can be created). An abstract class is a class of which no objects can be created; rather, the class is used to define subclasses, and objects are created from the subclasses. *See also* object (definition 2).

abstract data type \ab-strakt` dā´tə tīp, dat´ə\ *n.* In programming, a data set defined by the programmer in terms of the information it can contain and the operations that can be performed with it. An abstract data type is more generalized than a data type constrained by the properties of the objects it contains—for example, the data type "pet" is more generalized than the data types "pet dog," "pet bird," and "pet fish." The standard example used in illustrating an abstract data type is the stack, a small portion of memory used to store information, generally on a temporary basis. As an abstract data type, the stack is simply a structure onto which values can be pushed (added) and from which they can be popped (removed). The type of value, such as integer, is irrelevant to the definition.

The way in which the program performs operations on abstract data types is encapsulated, or hidden, from the rest of the program. Encapsulation enables the programmer to change the definition of the data type or its operations without introducing errors to the existing code that uses the abstract data type. Abstract data types represent an intermediate step between traditional programming and object-oriented programming. *See also* data type, object-oriented programming.

abstract machine \ab`strakt mə-shēn´\ *n.* A design for a processor that is not meant for implementation but that represents a model for processing an intermediate language, called abstract machine language, used by an interpreter or compiler. Its instruction set can use instructions that more closely resemble the compiled language than the instructions used by an actual computer. It can also be used to make the implementation of the language more portable to other platforms.

abstract syntax \ab`strakt sin´taks\ *n.* A data structure description that is independent of hardware structures and encodings.

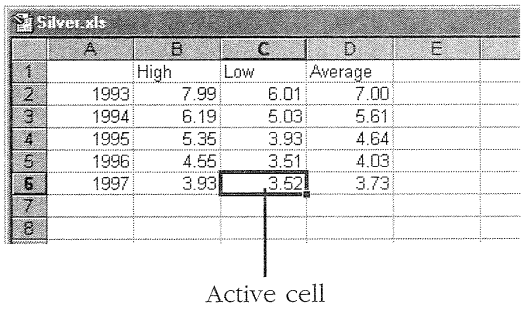
Abstract Syntax Notation One \ab`strakt sin`taks nō-tā`shən wən´\ *n.* The ISO standard notation for independent specification of data types and structures for syntax conversion. *Acronym:* ASN.1 (A`S-N-wən´). *See also* data type, ISO, syntax.

abstract syntax tree \ab`strakt sin´taks trē`\ *n.* A treelike representation of programs used in many integrated programming environments and structure-oriented editors.

A/B switch box \A-B` swich´ boks\ *n.* An enclosure that contains a two-position selector switch. When a user selects a switch setting, the signal passing through the box may be directed either from a single input to one of two outputs, or from the selected input to a single output. See the illustration on the next page. *See also* switch (definition 1).

AC \A-C´\ *n. See* alternating current.

AC adapter \A-C´ ə-dap`tər\ *n.* An external power supply that converts from a 110 VAC or 220 VAC domestic electric supply ("house current" or "main power") to low-voltage DC, which is required to operate solid-state electronic equipment (such as a laptop computer) that does not include an internal power supply. See the illustration on the next page.



Active cell.

data warehousing solution developed by Microsoft and Texas Instruments that represents Microsoft's standard for managing meta data. *Acronym:* AFDW (A`F-D-W´). *See also* ActiveX, meta data.

active hub \ak`tiv hub´\ *n.* The central computer that regenerates and retransmits all signals in an active star network. *See also* active star.

active-matrix display \ak`tiv-mā´triks dis-plā`\ *n.* A liquid crystal display (LCD) made from a large array of liquid crystal cells using active-matrix technology. The active matrix is a method of addressing an array of simple LC cells—one cell per pixel. In its simplest form there is one thin-film transistor (TFT) for each cell. Active-matrix displays are often used in laptop and notebook computers because of their thin width and are notable for their high-quality color displays, which are viewable from all angles, unlike passive-matrix displays. See the illustration. *Also called* TFT, TFT display, TFT LCD. *See also* liquid crystal display, TFT. *Compare* passive-matrix display.

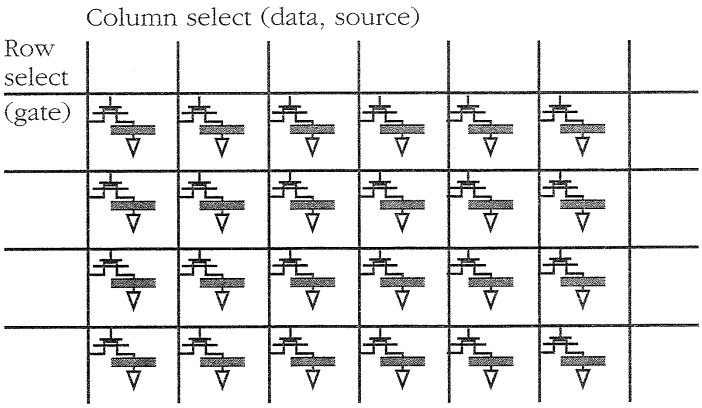
ActiveMovie \ak`tiv-mo͞o´vē\ *n.* Cross-platform digital video technology developed by Microsoft for online and desktop multimedia.

active program \ak`tiv prō´gram\ *n.* The program currently in control of a microprocessor.

active star \ak`tiv stär´\ *n.* A form of the star network topology in which the central computer actively regenerates and retransmits all signals. *See also* star network.

active window \ak`tiv win´dō\ *n.* In an environment capable of displaying multiple on-screen windows, the window containing the display or document that will be affected by current cursor movements, commands, and text entry. *See also* graphical user interface. *Compare* inactive window.

ActiveX \ak`tiv-X´\ *n.* A set of technologies that enables software components to interact with one another in a networked environment, regardless of the language in which the components were created. ActiveX, which was developed as a proposed standard by Microsoft in the mid 1990s and is currently administered by the Open Group, is built on Microsoft's Component Object Model (COM). Currently, ActiveX is used primarily to develop interactive content for the World Wide Web, although it can be used in desktop applications and other programs. ActiveX controls can be embedded in Web pages to produce animation and other multimedia effects, interactive objects, and sophisticated applications. *See also* ActiveX controls, COM. *Compare* applet, plug-in (definition 2).



Active-matrix display.

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long cited as a shortcoming of the Macintosh compared with IBM PCs and compatibles. This feature, along with other layout changes and the addition of new keys and lights, makes the Apple Extended Keyboard quite similar in form to the IBM enhanced keyboard. See the illustration. *See also* enhanced keyboard.

Apple II \ap`l tōō´\ *n.* The second computer introduced by the Apple Computer Corporation, in April 1977. The Apple II featured 4K dynamic RAM, expandable to 48K (with 16K chips), and used the 6502 microprocessor. The Apple II was the first computer to offer a TV video adapter as an optional alternative to a color computer monitor. It also featured sound and eight expansion slots. *See also* 6502.

Apple key \ap´l kē`\ *n.* A key on Apple keyboards labeled with an outline of the Apple logo . On the Apple Extended Keyboard, this key is the same as the Command key, which functions similarly to the Control key on IBM and compatible keyboards. It is generally used in conjunction with a character key as a shortcut to making menu selections or starting a macro.

Apple Macintosh \ap`l mak´ən-tosh\ *n. See* Macintosh.

Apple Newton \ap`l nōō´tən\ *n. See* Newton.

AppleScript \ap´l-skript`\ *n.* A script language used with Macintosh computers running under the System 7 operating system to execute commands and automate functions. *See also* script.

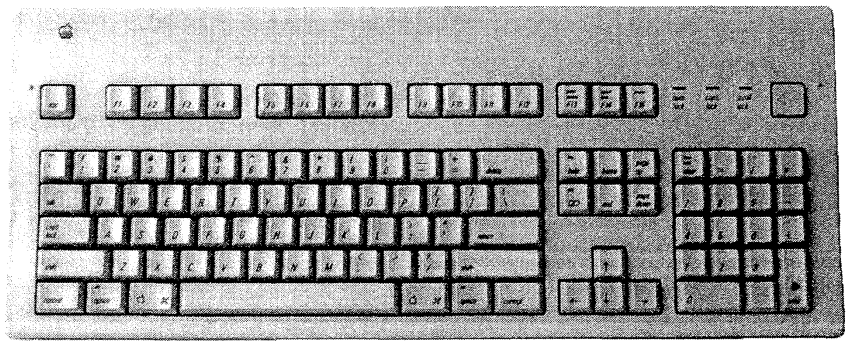
AppleShare \ap´l-shâr`\ *n.* File server software that works with the Mac OS and allows one Macintosh computer to share files with another on the same network. *See also* file server, Mac OS.

applet \a´plət\ *n.* A small piece of code that can be transported over the Internet and executed on the recipient's machine. The term is especially used to refer to such programs as they are embedded in line as objects in HTML documents on the World Wide Web.

AppleTalk \ap´l täk`\ *n.* An inexpensive local area network developed by Apple that can be used by Apple and non-Apple computers to communicate and share resources such as printers and file servers. Non-Apple computers must be equipped with AppleTalk hardware and suitable software. The network uses a layered set of protocols similar to the ISO/OSI model and transfers information in the form of packets called frames. AppleTalk supports connections to other AppleTalk networks through devices known as bridges, and it supports connections to dissimilar networks through devices called gateways. *See also* bridge, frame (definition 2), gateway.

application \a`plə-kā´shən\ *n.* A program designed to assist in the performance of a specific task, such as word processing, accounting, or inventory management. *Compare* utility.

application binary interface \a-plə-kā`shən bī`-nər-ē in´tər-fās, bī`nâr-ē\ *n.* A set of instructions that specifies how an executable file interacts with the hardware and how information is stored. *Acronym:* ABI (A`B-I´). *Compare* application programming interface.



Apple Extended Keyboard.

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application-centric \a`plə-kā`shən-sen´trik\ *adj.* Of, pertaining to, or characteristic of an operating system in which a user invokes an application to open or create documents (such as word processing files or spreadsheets). Command-line interfaces and some graphical user interfaces such as the Windows *3.x* Program Manager are application-centric. *Compare* document-centric.

application developer \a-plə-kā`shən də-vel´ə-pər\ *n.* An individual who designs and analyzes the appearance and operation of an application program.

application development environment \a-plə-kā`shən də-vel´əp-mənt en-vī`rən-mənt, en-vī`ərn-mənt\ *n.* An integrated suite of programs for use by software developers. Typical components of application development environments include a compiler, file browsing system, debugger, and text editor for use in creating programs.

application development language \a-plə-kā`shən də-vel´əp-mənt lang`wəj\ *n.* A computer language designed for creating applications. The term is usually restricted to refer to languages with specific high-level constructs geared toward record design, form layout, database retrieval and update, and similar tasks. *See also* application, application generator, 4GL.

application development system \a-plə-kā`shən də-vel´əp-mənt sis`təm\ *n.* A programming environment designed for the development of an application, typically including a text editor, compiler, and linker, and often including a library of common software routines for use in the developed program.

application file \a`plə-kā´shən fīl`\ *n. See* program file.

application gateway \a-plə-kā´shən gāt`wā\ *n.* Software running on a machine that is intended to maintain security on a secluded network yet allow certain traffic to go between the private network and the outside world. *See also* firewall.

application generator \a-plə-kā`shən jen´ər-ā-tər\ *n.* Software for generating source or machine code for running an application based on a description of the desired functionality. Limited in scope, application generators are included with some database programs and use built-in instruction sets to generate program code. *See also* application.

application heap \a`plə-kā´shən hēp`\ *n.* A block of RAM used by an application to store its code, resources, records, document data, and other information. *See also* heap (definition 1), RAM.

application layer \a`plə-kā´shən lâr`, la`yər\ *n.* The highest layer of standards in the Open Systems Interconnection (OSI) model. The application layer contains signals that perform useful work for the user, such as file transfer or remote access to a computer, as opposed to lower levels, which control the exchange of data between transmitter and receiver. *See also* ISO/OSI model.

application processor \a`plə-kā´shən pros`e-sər\ *n.* A processor dedicated to a single application.

application program \a`plə-kā´shən prō`gram\ *n. See* application.

application programming interface \a-plə-kā`shən prō`gra-mēng in´tər-fās\ or **application program interface** \a-plə-kā`shən prō`gram in´tər-fās\ *n.* A set of routines used by an application program to direct the performance of procedures by the computer's operating system. *Acronym:* API (A`P-I´).

application shortcut key \a-plə-kā`shən shōrt´kut kē`\ *n.* A key or combination of keys that when pressed will quickly perform an action within an application that would normally require several user actions, such as menu selections. *Also called* keyboard shortcut.

application software \a-plə-kā`shən soft´-wâr\ *n. See* application.

application-specific integrated circuit \a-plə-kā`shən-spə-sif`ik in`tə-grā-təd sər´kət\ *n. See* gate array.

application suite \a-plə-kā´shən swēt`\ *n. See* suite (definition 1).

.aq \dot`A-Q´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Antarctica.

.ar \dot`A-R´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Argentina.

arbitration \är`bə-trā´shən\ *n.* A set of rules for resolving competing demands for a machine resource by multiple users or processes. *See also* contention.

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ognizing these differences and adjusting for them. *See also* ASCII, EOL.

ASCII file \a´skē fīl`, A`S-C-I-I`\ *n.* A document file in ASCII format, containing characters, spaces, punctuation, carriage returns, and sometimes tabs and an end-of-file marker, but no formatting information. *Also called* ASCII file, text file, text-only file. *See also* ASCII, text file. *Compare* binary file.

ASCII transfer \a´skē trans`fər, A`S-C-I-I´\ *n.* The preferred mode of electronic exchange for text files. In ASCII mode, character conversions to and from the network-standard character set are performed. *See also* ASCII. *Compare* binary transfer.

ASCIIZ string \a`skē-Z´ strēng, A`S-C-I-I-Z´\ *n.* In programming, an ASCII string terminated by the NULL character (a byte containing the character whose ASCII value is 0). *Also called* null-terminated string.

ASIC \A`S-I-C´\ *n.* Acronym for **a**pplication-**s**pecific **i**ntegrated **c**ircuit. *See* gate array.

ASN.1 \A`S-N-wən´\ *n. See* Abstract Syntax Notation One.

aspect ratio \a´spekt rā`shō\ *n.* In computer displays and graphics, the ratio of the width of an image or image area to its height. An aspect ratio of 2:1, for example, indicates that the image is twice as wide as it is high. The aspect ratio is an important factor in maintaining correct proportions when an image is printed, rescaled, or incorporated into another document.

ASPI \A`S-P-I´, a´spē\ *n. See* Advanced SCSI Programming Interface.

ASR \A`S-R´\ *n. See* automatic system reconfiguration.

assemble \ə-sem´bl\ *vb.* In programming, to convert an assembly language program to equivalent machine language instructions, called object code. *See also* assembler, assembly language, linker, object code.

assembler \ə-sem´blər\ *n.* A program that converts assembly language programs, which are understandable by humans, into executable machine language. *See also* assemble, assembly language, assembly listing, compiler (definition 2), machine code.

assembly language \ə-sem´blē lang´wəj\ *n.* A low-level programming language using abbreviations or mnemonic codes in which each statement corresponds to a single machine instruction. An assembly language is translated to machine language by the assembler and is specific to a given processor. Advantages of using an assembly language include increased execution speed and direct programmer interaction with system hardware. *See also* assembler, compiler, high-level language, low-level language, machine code.

assembly listing \ə-sem´blē li`stēng\ *n.* A file created by an assembler that includes the statements of an assembly language program, the machine language generated by the assembler, and a list of the symbols used in the program. *See also* assembler, assembly language.

assertion \ə-sər´shən\ *n.* A Boolean statement used in a program to test a condition that, if the program is operating correctly, should always evaluate as true; otherwise the program will typically terminate with an appropriate error message. Assertions are used for debugging programs and for documenting how a program should operate.

assignment operator \ə-sīn´mənt op`ər-ā-tər\ *n.* An operator used to assign a value to a variable or data structure. *See also* assignment statement, operator (definition 1).

assignment statement \ə-sīn´mənt stāt`mənt\ *n.* A programming language statement used to assign a value to a variable. It usually consists of three elements: an expression to be assigned, an assignment operator (typically a symbol such as = or :=), and a destination variable. On execution of the assignment statement, the expression is evaluated and the resulting value is stored in the specified destination. *See also* assignment operator, expression, variable.

associate \ə-sō´shē-āt`, ə-sō´sē-āt\ *vb.* To inform the operating system that a particular filename extension is linked to a specific application. When a file is opened that has an extension associated with a given application, the operating system automatically starts the application and loads the file.

Association Control Service Element \ə-sō-sē-ā`shən kən-trōl´ sər-vis el`ə-mənt\ *n.* An Open Systems Interconnection (OSI) method to establish a call between two applications by checking the identities and contexts of the application entities and performing an authentication security check. *Acronym:* ACSE (A`C-S-E´). *See also* ISO/OSI model.

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spoken message for the user, or it responds by receiving and storing the information entered by the user. *Also called* audiotext. *See also* voice mail.

audiotext \ä´dē-ō-tekst`, ô´dē-ō-tekst`\ *n.* *See* audiotex.

Audio Video Interleaved \ä`dē-ō vid`ē-ō in´tər-lēvd, ô`dē-ō\ *n.* *See* AVI.

audiovisual \ä`dē-ō-vizh´o͞o-əl, ô`dē-ō-vizh´o͞o-əl\ *adj.* Relating to or being any material that uses a combination of sight and sound to present information.

audit \ä´dit, ô´dit\ *n.* In reference to computing, an examination of equipment, programs, activities, and procedures to determine how efficiently the overall system is performing, especially in terms of ensuring the integrity and security of data.

auditing \ä´di-tēng, ô´di-tēng\ *n.* The process an operating system uses to detect and record security-related events, such as an attempt to create, to access, or to delete objects such as files and directories. The records of such events are stored in a file known as a security log, whose contents are available only to those with the proper clearance. *See also* security log.

audit trail \ä´dit trāl`, ô´dit\ *n.* In reference to computing, a means of tracing all activities affecting a piece of information, such as a data record, from the time it is entered into a system to the time it is removed. An audit trail makes it possible to document, for example, who made changes to a particular record and when.

AUI cable \A`U-I´ kā-bl\ *n.* Short for **A**ttachment **U**nit **I**nterface **cable.** A transceiver cable used to connect a host adapter within a computer to an Ethernet (10Base5 or 10BaseF) network. *See also* 10Base5, 10BaseF, Ethernet (definition 1), transceiver cable.

AUP \A`U-P´\ *n.* *See* acceptable use policy.

authentication \ä-then`tə-kā´shən, ô-then`tə-kā´shən\ *n.* In a multiuser or network operating system, the process by which the system validates a user's logon information. A user's name and password are compared against an authorized list, and if the system detects a match, access is granted to the extent specified in the permission list for that user. *See also* logon, password, permission, user account, user name.

authoring language \ä´thər-ēng lang`wəj, ô´thər-ēng\ *n.* A computer language or application development system designed primarily for creating programs, databases, and materials for computer-aided instruction (CAI). A familiar example in relation to microcomputers is PILOT, a language used to create lessons. *See also* CAI, PILOT.

authoring system \ä´thər-ēng si`stəm, ô´thər-ēng\ *n.* Application software that enables the operator to create and format a document for a specific kind of computer environment. An authoring system, especially for multimedia work, often consists of several applications within the framework of a single, controlling application. *See also* authoring language.

authorization \ä`thər-ə-zā´shən, ô`thər-ə-zā´shən\ *n.* In reference to computing, especially remote computers on a network, the right granted an individual to use the system and the data stored on it. Authorization is typically set up by a system administrator and verified by the computer based on some form of user identification, such as a code number or password. *Also called* access privileges, permission. *See also* network, system administrator.

authorization code \ä`thər-ə-zā´shən kōd`, ô`thər-ə-zā´shən\ *n.* *See* password.

auto answer \ä´tō an`sər, ô´tō\ *n.* *See* answer mode.

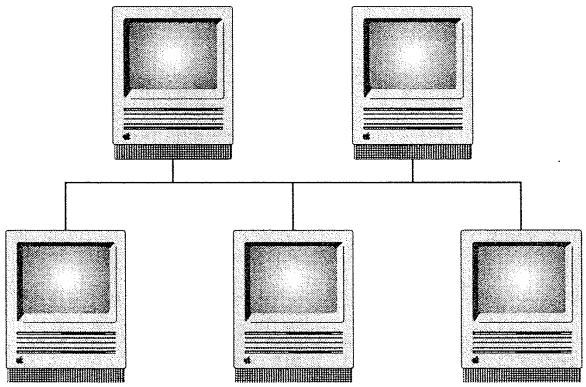
AutoCorrect \ä´tō kər-ekt`, ô`tō kər-ekt`\ *n.* A function in Microsoft Word for Windows that automatically corrects errors and makes other substitutions as soon as a user types text. For example, AutoCorrect can be set up to fix misspellings, such as *teh* for *the*, or to change "straight" (" ") quotation marks to "smart" (“ ”) quotation marks. The user can select which AutoCorrect features to enable. *See also* smart quotes.

auto dial \ä´tō dīl`, ô´tō\ *n.* A feature enabling a modem to open a telephone line and initiate a call by transmitting a stored telephone number as a series of pulses or tones.

AUTOEXEC.BAT \ä`tō-eks-ek´dot-bat, ô`tō-, -B-A-T`\ *n.* A special-purpose batch file (set of commands) that is automatically carried out by the MS-DOS operating system when the computer is started or restarted. Created by the user or (in later versions of MS-DOS) by the operating system at

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ation (as it might on a ring network, in which messages are passed from one node to the next). To avoid collisions that occur when two or more nodes try to use the line at the same time, bus networks commonly rely on collision detection or token passing to regulate traffic. See the illustration. *See also* collision detection, contention, CSMA/CD, token bus network, token passing. *Compare* ring network, star network.

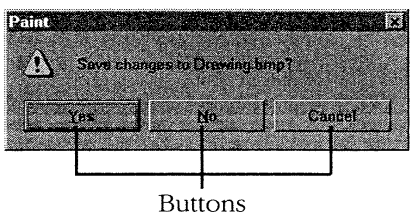


Bus network. ***A bus network configuration.***

bus system \bus´ si`stəm\ *n.* The interface circuitry that controls the operations of a bus and connects it with the rest of the computer system. *See also* bus.

bus topology \bus´ to-pol`ə-jē\ *n. See* bus network.

button \but´ən\ *n.* **1.** A graphic element in a dialog box that, when activated, performs a specified function. The user activates a button by clicking on it with a mouse or, if the button has the focus, by hitting the Return or Enter key. See the illustration. **2.** On a mouse, a movable piece that is pressed to activate some function. Older mouse models have only one button; newer models typically have two or more buttons.



Button.

button bomb \but´ən bom`\ *n.* A button on Web pages with the image of a bomb.

button help \but´ən help`\ *n.* Help information displayed via the selection of buttons or icons. Applications such as the World Wide Web, multimedia kiosks, and computer-aided instruction often use button help icons to ease system navigation.

.bw \dot`B-W´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Botswana.

bypass \bī´pas\ *n.* In telecommunications, the use of communication pathways other than the local telephone company, such as satellites and microwave systems.

byte \bīt\ *n.* Abbreviated B. Short for **b**inar**y** **te**rm. A unit of data, today almost always consisting of 8 bits. A byte can represent a single character, such as a letter, a digit, or a punctuation mark. Because a byte represents only a small amount of information, amounts of computer memory and storage are usually given in kilobytes (1,024 bytes), megabytes (1,048,576 bytes), or gigabytes (1,073,741,824 bytes). *See also* bit, gigabyte, kilobyte, megabyte. *Compare* octet, word.

bytecode \bīt´kōd\ *n.* An encoding of a computer program that a compiler produces when the original source code is processed. This encoding is in an abstract, processor-independent form that cannot be directly executed by most CPUs but is highly suitable for further analysis (for example, compiler optimization), for processing by interpreters (for example, executing Java applets within Web browsers), or for use in generation of binary instructions for the target computer's CPU. Intermediate bytecode production is a feature of the compilers for the Pascal and Java programming languages. *See also* compiler (definition 2), central processing unit, interpreter, Java, Java applet, Pascal.

***BYTE* Information Exchange** \bit` in-fər-mā´shən eks-chānj`\ *n. See* BIX.

byte-oriented protocol \bīt` ōr`ē-en-təd prō´tə-kol\ *n.* A communications protocol in which data is transmitted as a string of characters in a particular character set, such as ASCII, rather than as a stream of bits as in a bit-oriented protocol. To express control information, a byte-oriented

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which have speeds of 500 kilobits per second (Kbps), can generally transmit data faster than current conventional modems. *See also* coaxial cable, modem.

cabling diagram \kā´bə-lēng dī`ə-gram\ *n.* A plan that shows the path of cables that attach computer system components or peripherals. Cabling diagrams are particularly important for explaining the connection of disk drives to a disk controller.

cache \kash\ *n.* A special memory subsystem in which frequently used data values are duplicated for quick access. A memory cache stores the contents of frequently accessed RAM locations and the addresses where these data items are stored. When the processor references an address in memory, the cache checks to see whether it holds that address. If it does hold the address, the data is returned to the processor; if it does not, a regular memory access occurs. A cache is useful when RAM accesses are slow compared with the microprocessor speed, because cache memory is always faster than main RAM memory. *See also* disk cache, wait state.

cache card \kash´ kärd\ *n.* An expansion card that increases a system's cache memory. *See also* cache, expansion board.

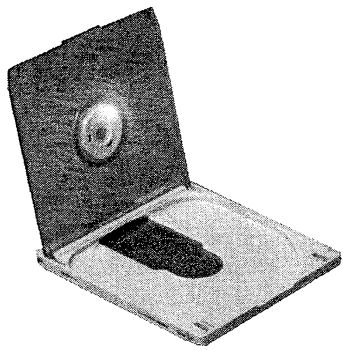
cache memory \kash´ mem`ər-ē\ *n. See* cache.

CAD \kad, C`A-D´\ *n.* Acronym for **c**omputer-**a**ided **d**esign. A system of programs and workstations used in designing engineering, architectural, and scientific models ranging from simple tools to buildings, aircraft, integrated circuits, and molecules. Various CAD applications create objects in two or three dimensions, presenting the results as wire-frame "skeletons," as more substantial models with shaded surfaces, or as solid objects. Some programs can also rotate or resize models, show interior views, generate lists of materials required for construction, and perform other allied functions. CAD programs rely on mathematics, often requiring the computing power of a high-performance workstation. *See also* CAD/CAM, I-CASE.

CAD/CAM \kad´kam, C-A-D`C-A-M´\ *n.* Acronym for **c**omputer-**a**ided **d**esign/**c**omputer-**a**ided **m**anufacturing. The use of computers in both the design and manufacture of a product. With CAD/CAM, a product, such as a machine part, is designed with a CAD program and the finished design is translated into a set of instructions that can be transmitted to and used by the machines dedicated to fabrication, assembly, and process control. *See also* CAD, I-CASE.

CADD \C`A-D-D´, kad-D´\ *n. See* computer-aided design and drafting.

caddy \kad´ē\ *n.* A plastic carrier that holds a CD-ROM and is inserted into a CD-ROM drive. Some personal computers, especially older models, have CD-ROM drives that require the use of a caddy. Most current CD-ROM drives do not require a caddy. See the illustration.



Caddy.

CAE \C`A-E´\ *n.* Acronym for **c**omputer-**a**ided **e**ngineering. An application that enables the user to perform engineering tests and analyses on designs created with a computer. In some instances, capabilities such as logic testing that are generally attributed to CAE applications are also part of CAD programs, so the distinction between CAD and CAE is not a hard-and-fast one. *See also* CAD, I-CASE.

CAI \C`A-I´\ *n.* Acronym for **c**omputer-**a**ided (or **c**omputer-**a**ssisted) **i**nstruction. An educational program designed to serve as a teaching tool. CAI programs typically use tutorials, drills, and question-and-answer sessions to present a topic and to test the student's comprehension. CAI programs are excellent aids for presenting factual material and for allowing students to pace their learning speed. Subjects and complexity range from beginning arithmetic to advanced mathematics, science, history, computer studies, and specialized topics. *See also* I-CASE. *Compare* CBT, CMI.

CAL \C`A-L´\ *n.* Acronym for **c**omputer-**a**ssisted (or **c**omputer-**a**ugmented) **l**earning. *See* CAI.

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computer authentication. Often certification is used with Web sites.

.cf \dot`C-F´\ *n.* On the Internet, the major geographic domain specifying that an address is located in the Central African Republic.

.cg \dot`C-G´\ *n.* On the Internet, the major geographic domain specifying that an address is located in the Congo.

CGA \C`G-A´\ *n.* Acronym for **C**olor/**G**raphics **A**dapter. A video adapter board introduced by IBM in 1981. The CGA is capable of several character and graphics modes, including character modes of 40 or 80 horizontal characters (columns) by 25 vertical lines with 16 colors, and graphics modes of 640 horizontal pixels by 200 vertical pixels with 2 colors, or 320 horizontal pixels by 200 vertical pixels with 4 colors. *See also* graphics adapter, video adapter.

CGI \C`G-I´\ *n.* **1.** Acronym for **C**ommon **G**ateway **I**nterface. The specification that defines communications between information servers (such as HTTP servers) and resources on the server's host computer, such as databases and other programs. For example, when a user submits a form through a Web browser, the HTTP server executes a program (often called a CGI script) and passes the user's input information to that program via CGI. The program then returns information to the server via CGI. Use of CGI can make a Web page much more dynamic and add interactivity for the user. *See also* CGI script, HTTP server (definition 1). **2.** *See* Computer Graphics Interface.

cgi-bin \C`G-I´ bin\ *n.* Short for **C**ommon **G**ateway **I**nterface–**bin**aries. A file directory that holds external applications to be executed by HTTP servers via CGI. *See also* CGI (definition 1).

CGI script \C`G-I´ skript\ *n.* Short for **C**ommon **G**ateway **I**nterface **script**. An external application that is executed by an HTTP server machine in response to a request by a client, such as a Web browser. Generally, the CGI script is invoked when the user clicks on some element in a Web page, such as a link or an image. Communication between the CGI script and the server is carried out via the CGI specification. CGI scripts can be written in many programming languages, including C, C++, and Visual Basic. However, the most commonly used language for CGI scripts is Perl, because it is a small but robust language and it is common on UNIX, which is the platform on which the majority of Web sites run. CGI scripts don't necessarily need to be scripts; they can also be batch programs or compiled programs. CGI scripts are used to provide interactivity in a Web page, including such features as providing a form that users can fill out, image maps that contain links to other Web pages or resources, and links that users can click on to send e-mail to a specified address. ActiveX controls and Java applets can provide much the same functionality as CGI scripts, through different means. *See also* CGI (definition 1), cgi-bin, image map, Perl. *Compare* ActiveX controls, Java applet.

CGM \C`G-M´\ *n. See* Computer Graphics Metafile.

.ch \dot`C-H´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Switzerland.

chad \chad\ *n.* The paper removed when a hole is punched in a card, in a tape, or at the perforated edge of continuous-form paper—the computer equivalent of a doughnut hole.

chaining \chā´nēng\ *n.* In computers, the linking of two or more entities so that they are dependent upon one another for operation. In programming, two or more programs are said to be chained if the first program causes the second program to begin executing. In addition, program statements are said to be chained if each statement, except for the first, relies on the previous statement for input. With batch files, two or more batch files are said to be chained if the completion of the first batch file causes the second batch file to begin executing. With data storage, the term *chained* applies to two or more individual units of storage that are linked together. For example, a single file on a disk may actually be stored on several different sectors of the disk, each of which points to the next sector containing a piece of that file. These sectors are said to be chained together, or, more literally, to be a chain of clusters.

chain printer \chān´ prin`tər\ *n. See* line printer.

chalkware \chäk´wâr, chôk´wâr\ *n. See* vaporware.

Challenge Handshake Authentication Protocol \chal`ənj hand`shāk ə-then`-tə-kā´shən prō`tə-kol\ *n.* An authentication scheme used by

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flicts that lower the performance of the system, make some programs inoperable, or crash the computer. *See also* boot[1], crash[2] (definition 1), operating system.

clean install \klēn` in-stäl´\ *n.* Reinstallation of software in a manner that ensures that no application or system files from a previous installation will remain. The procedure prevents "smart" installer programs from skipping file installations where a file already exists, which could potentially keep a problem from being removed.

clean interface \klēn` in´tər-fās\ *n.* A user interface with simple features and intuitive commands. *See also* user interface.

clean room \klēn´ rōōm\ *n.* A room in which dust and other small particles are filtered from the air and in which protective clothing is worn to avoid contaminating electronic components and other delicate, sensitive equipment.

Clear key \klēr´ kē\ *n.* A key in the upper left corner of the numeric keypad on some keyboards. In many applications, it clears the currently selected menu choice or deletes the current selection.

Clear To Send \klēr` tə send´\ *n. See* CTS.

click \klik\ *vb.* To press and release a mouse button once without moving the mouse. Clicking is usually performed to select or deselect an item or to activate a program or program feature. *See also* right click. *Compare* double-click, drag.

clickable maps \klik`ə-bl maps´\ *n. See* image map.

click speed \klik´ spēd\ *n.* The maximum interval between the first and second time a user presses a button on a mouse or other pointing device that will still identify these actions as a double-click to the computer as opposed to two single-clicks. *See also* double-click, mouse, pointing device.

clickstream \klik´strēm\ *n.* The path a user takes while browsing a Web site. Each distinct selection made on a Web page adds one click to the stream. The further down the clickstream the user goes without finding the sought item, the more likely he or she is to depart to another Web site. Analysis of usage patterns helps Web site designers create user-friendly site structures, links, and search facilities. *See also* Web site.

client \klī´ənt\ *n.* **1.** In object-oriented programming, a member of a class (group) that uses the services of another class to which it is not related. *See also* inheritance (definition 1). **2.** A process, such as a program or task, that requests a service provided by another program—for example, a word processor that calls on a sort routine built into another program. The client process uses the requested service without having to "know" any working details about the other program or the service itself. *Compare* child (definition 1), descendant (definition 2). **3.** On a local area network or the Internet, a computer that accesses shared network resources provided by another computer (called a *server*). *See also* client/server architecture, server.

client error \klī´ənt âr`ər\ *n.* A problem reported by the Hypertext Transfer Protocol (HTTP) client module as the result of difficulty in interpreting a command or the inability to connect properly to a remote host.

client/server architecture \klī`ənt-sər-vər är´kə-tek-chur\ *n.* An arrangement used on local area networks that makes use of distributed intelligence to treat both the server and the individual workstations as intelligent, programmable devices, thus exploiting the full computing power of each. This is done by splitting the processing of an application between two distinct components: a "front-end" client and a "back-end" server. The client component is a complete, stand-alone personal computer (not a "dumb" terminal), and it offers the user its full range of power and features for running applications. The server component can be a personal computer, a minicomputer, or a mainframe that provides the traditional strengths offered by minicomputers and mainframes in a time-sharing environment: data management, information sharing between clients, and sophisticated network administration and security features. The client and server machines work together to accomplish the processing of the application being used. Not only does this increase the processing power available over older architectures but it also uses that power more efficiently. The client portion of the application is typically optimized for user interaction, whereas the server portion provides the centralized, multiuser functionality. *See also* distributed intelligence.

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a circuit that compares two input voltages and indicates which is higher.

compare \kəm-pâr´\ *vb.* To check two items, such as words, files, or numeric values, so as to determine whether they are the same or different. In a program, the outcome of a compare operation often determines which of two or more actions is taken next.

compatibility \kəm-pat`ə-bil´ə-tē\ *n.* **1.** The degree to which a computer, an attached device, a data file, or a program can work with or understand the same commands, formats, or language as another. True compatibility means that any operational differences are invisible to people and programs alike. **2.** The extent to which two machines can work in harmony. Compatibility (or the lack thereof) between two machines indicates whether, and to what degree, the computers can communicate, share data, or run the same programs. For example, an Apple Macintosh and an IBM PC are generally incompatible because they cannot communicate freely or share data without the aid of hardware and/or software that functions as an intermediary or a converter. **3.** The extent to which a piece of hardware conforms to an accepted standard (for example, IBM-compatible or Hayes-compatible). In this sense, compatibility means that the hardware ideally operates in all respects like the standard on which it is based. **4.** In reference to software, harmony on a task-oriented level among computers and computer programs. Computers deemed software-compatible are those that can run programs originally designed for other makes or models. Software compatibility also refers to the extent to which programs can work together and share data. In another area, totally different programs, such as a word processor and a drawing program, are compatible with one another if each can incorporate images or files created using the other. All types of software compatibility become increasingly important as computer communications, networks, and program-to-program file transfers become near-essential aspects of microcomputer operation. *See also* downward compatibility, upward-compatible.

compatibility box \kəm-pat`ə-bil´ə-tē boks`\ *n.* *See* DOS box (definition 1).

compatibility mode \kəm-pat`ə-bil´ə-tē mōd`\ *n.* A mode in which hardware or software in one system supports operations of software from another system. The term often refers to the ability of advanced operating systems designed for Intel microprocessors (for example, OS/2 and Windows NT) to run MS-DOS software or to the ability of some UNIX workstations and of some Apple Macintosh systems to run MS-DOS software.

compile \kəm-pīl´\ *vb.* To translate all the source code of a program from a high-level language into object code prior to execution of the program. Object code is executable machine code or a variation of machine code. More generally, *compiling* is sometimes used to describe translating any high-level symbolic description into a lower-level symbolic or machine-readable format. A program that performs this task is known as a *compiler*. *See also* compile time, compiler (definition 2), high-level language, machine code, source code. *Compare* interpret.

compile-and-go \kəm-pīl`ənd-gō´\ *adj.* Of, pertaining to, or characteristic of a development environment that automatically runs a program after compiling it. *See also* compile, execute.

compiled Basic \kəm-pīld` bā´sik, B-A-S-I-C´\ *n.* Any version of Basic that is translated into machine code prior to execution by a compiler. Basic has traditionally been an interpreted language (translated and executed statement by statement); because compiled Basic generally produces faster-executing programs, it is the technology of choice for professional Basic programmers. *See also* Basic, compiled language, interpreted language.

compiled language \kəm-pīld` lang´wəj\ *n.* A language that is translated into machine code prior to any execution, as opposed to an interpreted language, which is translated and executed statement by statement. *See also* compiler (definition 2). *Compare* interpreted language.

compiler \kəm-pī´lər\ *n.* **1.** Any program that transforms one set of symbols into another by following a set of syntactic and semantic rules. **2.** A program that translates all the source code of a program written in a high-level language into object code prior to execution of the program. *See also* assembler, compile, high-level language,

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interpreted language, language processor, object code.

compile time \kəm-pīl´ tīm`\ *n.* **1.** The amount of time required to perform a compilation of a program. Compile time can range from a fraction of a second to many hours, depending on the size and complexity of the program, the speed of the compiler, and the performance of the hardware. *See also* compiler (definition 2). **2.** The point at which a program is being compiled (i.e., most languages evaluate constant expressions at compile time but evaluate variable expressions at run time). *See also* link time, run time.

compile-time binding \kəm-pīl´tīm bīn`dēng\ *n.* Assignment of a meaning to an identifier (such as a function name or a constant) in a program at the time the program is compiled rather than at the time it is run. *Compare* run-time binding.

complement \kom´plə-ment`\ *n.* Loosely, a number that can be thought of as the "mirror image" of another number written to the same base, such as base 10 or base 2. Complements are commonly used to represent negative numbers. Two types of complements are encountered in computer-related contexts: radix-minus-1 complements and true complements. A radix-minus-1 complement is known in the decimal system as a nine's complement and in the binary system as a one's complement. True complements are known in the decimal system as ten's complement and in binary as two's complement—a form commonly used to represent negative numbers in processing. *See also* complementary operation, nine's complement, one's complement, ten's complement, two's complement.

complementary metal-oxide semiconductor \kom-plə-men`tər-ē met-əl-oks`īd sem´ī kən-duk`tər, sem´ē kən-duk`tər\ *n. See* CMOS.

complementary operation \kom-plə-men`tər-ē op`ər-ā´shən\ *n.* In Boolean logic, an operation that produces the opposite result from that of another operation performed on the same data. For example, if A is true, NOT A (its complement) is false. *See also* Boolean algebra.

completeness check \kəm-plēt´nəs chek`\ *n.* A survey to determine that all data required in a record is present. *Compare* consistency check.

complex instruction set computing \kom-pleks` in-struk`shən set kəm-pyo͞o´tēng\ *n. See* CISC.

complex number \kom`pleks num´bər\ *n.* A number of the form $a + bi$, where a and b are real numbers and i is the square root of –1, called the imaginary unit. Complex numbers can be plotted as points on a two-dimensional plane called the complex plane. The a number is plotted along the plane's horizontal axis (the real axis), and the b number is plotted along the vertical axis (the imaginary axis). *Compare* real number.

comp. newsgroups \komp`dot no͞oz´gro͞ops\ *n.* Usenet newsgroups that are part of the comp. hierarchy and have the prefix comp. These newsgroups are devoted to discussions of computer hardware, software, and other aspects of computer science. Comp. newsgroups are one of the seven original Usenet newsgroup hierarchies. The other six are misc., news., rec., sci., soc., and talk. *See also* newsgroup, traditional newsgroup hierarchy, Usenet.

component \kəm-pō´nənt\ *n.* **1.** A discrete part of a larger system or structure. **2.** An individual modular software routine that has been compiled and dynamically linked, and is ready to use with other components or programs. *See also* compile, component software, link (definition 1), program, routine.

Component Object Model \kəm-pō`nənt ob´jekt mod`əl\ *n. See* COM (definition 2).

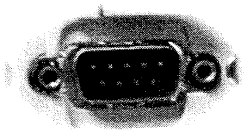
component software \kəm-pō`nənt soft´wâr\ *n.* Modular software routines, or components, that can be combined with other components to form an overall program. A programmer can use and reuse an existing component and not have to understand its inner workings, just how to have another program or component call it and pass data to and from it. *Also called* componentware. *See also* component, program, routine.

componentware \kəm-pō´nənt-wâr`\ *n. See* component software.

COM port or **comm port** \kom´ pōrt\ *n.* Short for **com**munications **port**, the logical address assigned by MS-DOS (versions 3.3 and higher) and Microsoft Windows (including Windows 95 and Windows NT) to each of the four serial ports on an IBM Personal Computer or a PC compatible. COM ports also have come to be known as the actual serial ports

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on a PC's CPU where peripherals, such as printers, scanners, and external modems, are plugged in. See the illustration. *See also* COM (definition 1), input/output port, serial port.



COM port.

composite display \kəm-poz´it di-splā`\ *n.* A display, characteristic of television monitors and some computer monitors, that is capable of extracting an image from a composite signal (also called an *NTSC signal*). A composite display signal carries on one wire not only the coded information required to form an image on the screen but also the pulses needed to synchronize horizontal and vertical scanning as the electron beam sweeps back and forth across the screen. Composite displays can be either monochrome or color. A composite color signal combines the three primary video colors (red, green, and blue) in a color burst component that determines the shade of color displayed on the screen. Composite color monitors are less readable than either monochrome monitors or the RGB color monitors that use separate signals (and wires) for the red, green, and blue components of the image. *See also* color burst, color monitor, monochrome display, NTSC, RGB monitor.

composite key \kəm-poz´it kē`\ *n.* A key whose definition consists of two or more fields in a file, columns in a table, or attributes in a relation.

composite video display \kəm-poz`it vid´ē-ō di-splā`\ *n.* A display that receives all encoded video information (including color, horizontal synchronization, and vertical synchronization) in one signal. A composite video signal under NTSC (National Television System Committee) standards is generally required for television sets and videotape recorders. *See also* NTSC. *Compare* RGB monitor.

compound statement \kom`pound stāt´mənt\ *n.* A single instruction composed of two or more individual instructions.

compress[1] \kəm-pres´\ *n.* A proprietary UNIX utility for reducing the size of data files. Files compressed with this utility have the extension .Z added to their names.

compress[2] \kəm-pres´\ *vb.* To reduce the size of a set of data, such as a file or a communications message, so that it can be stored in less space or transmitted with less bandwidth. Data can be compressed by removing repeated patterns of bits and replacing them with some form of summary that takes up less space; restoring the repeated patterns decompresses the data. Lossless compression methods must be used for text, code, and numeric data files; lossy compression may be used for video and sound files. *See also* lossless compression, lossy compression.

compressed digital video \kəm-presd` dij`i-təl vid´ē-ō\ *n. See* CDV (definition 1).

compressed disk \kəm-presd` disk´\ *n.* A hard disk or floppy disk whose apparent capacity to hold data has been increased through the use of a compression utility, such as Stacker or Double Space. *See also* data compression.

compressed drive \kəm-presd` drīv´\ *n.* A hard disk whose apparent capacity has been increased through the use of a compression utility, such as Stacker or Double Space. *See also* compressed disk, data compression.

compressed file \kəm-presd` fīl´\ *n.* A file whose contents have been compressed by a special utility program so that it occupies less space on a disk or other storage device than in its uncompressed (normal) state. *See also* installation program, LHARC, PKUNZIP, PKZIP, utility program.

Compressed SLIP \kəm-presd` slip´, S-L-I-P´\ *n.* Short for **Compressed S**erial **L**ine **I**nternet **P**rotocol. A version of SLIP using compressed Internet address information, thereby making the protocol faster than SLIP. *Acronym:* CSLIP (C´slip, C`S-L-I-P´). *See also* SLIP.

compression \kəm-presh´ən`\ *n. See* data compression.

compressor \kəm-pres´ər`\ *n.* A device that limits some aspect of a transmitted signal, such as volume, in order to increase efficiency.

CompuServe \kom´pyo͞o-sərv`\ *n.* An online information service that provides information and communications capabilities, including Internet access. It is primarily known for its technical

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where information is concerned, a changeover that affects form but not substance. Types of conversion include:

- Data conversion: Changing the way information is represented—for example, changing binary representation to decimal or hexadecimal.
- File conversion: Changing a file from one format to another. Another, more detailed, type of file conversion involves changing character coding from one standard to another, as in converting EBCDIC characters (which are used primarily with mainframe computers) to ASCII characters. *See also* ASCII, EBCDIC.
- Hardware conversion: Changing all or part of a computer system to work with new or different devices.
- Media conversion: Transferring data from one storage medium to another—for example, from disk to tape or from 3.5-inch Apple Macintosh disk to 5.25-inch MS-DOS disk.
- Software conversion: Changing or moving a program designed to run on one computer to run on another. Usually this involves detailed (professional) work on the program itself.
- System conversion: Changing from one operating system to another—for example, from MS-DOS to UNIX or OS/2.

conversion table \kən-vər´zhən tā`bl\ *n.* A table listing a set of characters or numbers and their equivalents in another coding scheme. Common examples of conversion tables include ASCII tables, which list characters and their ASCII values, and decimal-to-hexadecimal tables. Several conversion tables are in Appendixes A–E.

converter \kən-vər´tər`\ *n.* Any device that changes electrical signals or computer data from one form to another. For example, an analog-to-digital converter translates analog signals to digital signals.

cookbook[1] \ko͝ok´bo͝ok\ *adj.* Of, pertaining to, or characteristic of a book or manual that presents information using a step-by-step approach. For example, a cookbook approach to programming might present a series of sample programs that the reader could analyze and adapt to his or her own needs.

cookbook[2] \ko͝ok´bo͝ok\ *n.* A computer book or manual that presents information using a step-by-step approach. Most often, *cookbook* refers to a programming guide, but it can refer to a book that shows how to accomplish specialized tasks in an application.

cooked mode \ko͝okd´ mōd\ *n.* One of two forms (the other being raw mode) in which an operating system such as UNIX or MS-DOS "sees" the handle, or identifier, for a character-based device. If the handle is in cooked mode, the operating system stores each character in a buffer and gives special treatment to carriage returns, end-of-file markers, and linefeed and tab characters, sending a line of data to a device, such as the screen, only after it reads a carriage-return or end-of-file character. In cooked mode, characters read from standard input are often automatically echoed (displayed) on the screen. *Compare* raw mode.

cookie \ko͝ok´ē\ *n.* **1.** A block of data that a server returns to a client in response to a request from the client. **2.** On the World Wide Web, a block of data that a Web server stores on a client system. When a user returns to the same Web site, the browser sends a copy of the cookie back to the server. Cookies are used to identify users, to instruct the server to send a customized version of the requested Web page, to submit account information for the user, and for other administrative purposes. **3.** Originally an allusion to "fortune cookie," a UNIX program that outputs a different message, or "fortune," each time it is used. On some systems, the cookie program is run during user logon.

cookie filtering tool \ko͝ok`ē fil´tər-ēng to͞ol`\ *n.* A utility that prevents a cookie on a Web browser from relaying information about the user requesting access to a Web site. *See also* cookie (definition 2).

cooperative multitasking \kō-op`ər-ə-tiv mul´tē-ta-skēng, mul´tī-ta-skēng\ *n.* A type of multitasking in which one or more background tasks are given processing time during idle times in the foreground task only if the foreground task allows it. This is the primary mode of multitasking in the Macintosh operating system. *See also* background[1], context switching, foreground[1], multitasking, time slice. *Compare* preemptive multitasking.



CP/M \C`P-M´\ *n.* Acronym for **C**ontrol **P**rogram/**M**onitor. A line of operating systems from Digital Research, Inc., for microcomputers based on Intel microprocessors. The first system, CP/M-80, was the most popular operating system for 8080- and Z80-based microcomputers. Digital Research also developed CP/M-86 for 8086/8088-based computers, CP/M-Z8000 for Zilog Z8000-based computers, and CP/M-68K for Motorola 68000-based computers. When the IBM PC and MS-DOS were introduced, common use of CP/M by end users dwindled. DRI continues to enhance the CP/M line, supporting multitasking with the Concurrent CP/M and MP/M products. *See also* MP/M.

cps \C`P-S´\ *n. See* characters per second.

CPSR \C`P-S-R´\ *n.* Acronym for **C**omputer **P**rofessionals for **S**ocial **R**esponsibility. A public advocacy organization of computer professionals. CPSR was originally formed out of concern over the use of computer technology for military purposes but has extended its interest to such issues as civil liberties and the effect of computers on workers.

CPU \C`P-U´\ *n. See* central processing unit.

CPU-bound \C`P-U´bound\ *adj. See* computation-bound.

CPU cache \C`P-U´ kash\ *n.* A section of fast memory linking the central processing unit (CPU) and main memory that temporarily stores data and instructions the CPU needs to execute upcoming commands and programs. Considerably faster than main memory, the CPU cache contains data that is transferred in blocks, thereby speeding execution. The system anticipates the data it will need through algorithms. *Also called* cache memory, memory cache. *See also* cache, central processing unit, VCACHE.

CPU cycle \C`P-U´ sī-kl\ *n.* **1.** The smallest unit of time recognized by the central processing unit (CPU)—typically a few hundred-millionths of a second. **2.** The time required for the CPU to perform the simplest instruction, such as fetching the contents of a register or performing a no-operation instruction (NOP). *Also called* clock tick.

CPU fan \C-P-U´ fan`\ *n.* An electric fan usually placed directly on a central processing unit (CPU) or on the CPU's heat sink to help dissipate heat from the chip by circulating air around it. *See also* central processing unit, heat sink.

CPU speed \C-P-U´ spēd`\ *n.* A relative measure of the data-processing capacity of a particular central processing unit (CPU), usually measured in megahertz. *See also* central processing unit.

CPU time \C`P-U´ tīm\ *n.* In multiprocessing, the amount of time during which a particular process has active control of the central processing unit (CPU). *See also* central processing unit, multiprocessing.

.cr \dot`C-R´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Costa Rica.

CR \C-R´\ *n. See* carriage return.

cracker \krak´ər\ *n.* A person who overcomes the security measures of a computer system and gains unauthorized access. The goal of some crackers is to obtain information illegally from a computer system or use computer resources. However, the goal of the majority is to merely break into the system. *See also* hacker (definition 2).

crash[1] \krash\ *n.* The failure of either a program or a disk drive. A program crash results in the loss of all unsaved data and can leave the operating system unstable enough to require restarting the computer. A disk drive crash, sometimes called a disk crash, leaves the drive inoperable and can cause loss of data. *See also* abend, head crash.

crash[2] \krash\ *vb.* **1.** For a system or program, to fail to function correctly, resulting in the suspension of operation. *See also* abend. **2.** For a magnetic head, to hit a recording medium, with possible damage to one or both.

crash recovery \krash´ rə-kəv`ər-ē\ *n.* The ability of a computer to resume operation after a disastrous failure, such as the failure of a hard drive. Ideally, recovery can occur without any loss of data, although usually some, if not all, data is lost. *See also* crash[1].

crawler \krä´lər, krô´lər\ *n. See* Web browser, spider.

Cray-1 \krā-wən´\ *n.* An early supercomputer developed in 1976 by Seymour Cray. Extremely powerful in its day, the 64-bit Cray-1 ran at 75 MHz and was capable of executing 160 million floating-point operations per second. *See also* supercomputer.

CRC \C`R-C´\ *n.* Acronym for **c**yclical (or **c**yclic) **r**edundancy **c**heck. A procedure used in checking for errors in data transmission. CRC error checking

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uses a complex calculation to generate a number based on the data transmitted. The sending device performs the calculation before transmission and sends its result to the receiving device. The receiving device repeats the same calculation after transmission. If both devices obtain the same result, it is assumed that the transmission was error-free. The procedure is known as a redundancy check because each transmission includes not only data but extra (redundant) error-checking values. Communications protocols such as XMODEM and Kermit use cyclical redundancy checking.

creator \krē-ā´tər\ *n.* On the Apple Macintosh, the program that creates a file. Files are linked to their creators by creator codes; this link enables the operating system to open the creator application when a document file is opened.

creeping featurism \krē`pēng fē´chur-iz-əm\ *n.* The process by which features are added to a new version of a program by software developers until the program becomes unduly cumbersome and difficult to use. Generally, creeping featurism occurs as developers attempt to enhance the competitiveness of the program with each new release by adding new features.

crippled version \krip`ld vər´zhən\ *n.* A scaled-down or functionally reduced version of hardware or software, distributed for demonstration purposes. *See also* demo.

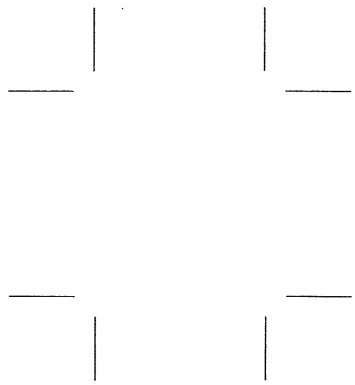
critical error \krit`i-kəl âr´ər\ *n.* An error that suspends processing until the condition can be corrected either by software or by user intervention (for example, an attempt to read to a nonexistent disk, an out-of-paper condition on the printer, or a checksum fault in a data message).

critical-error handler \krit-i-kəl-âr´ər hand`lər\ *n.* A software routine that attempts to correct or achieve a graceful exit from a critical or threatening error. *See also* critical error, graceful exit.

critical path method \krit`i-kəl path´ meth`əd\ *n.* A means of evaluating and managing a large project by isolating tasks, milestone events, and schedules and by showing interrelationships among them. The critical path for which this method is named is a line connecting crucial events, any of which, if delayed, affects subsequent events and, ultimately, completion of the project. *Acronym:* CPM (C`P-M´).

crop \krop\ *vb.* In computer graphics, to cut off part of an image, such as unneeded sections of a graphic or extra white space around the borders. As in preparing photographs or illustrations for traditional printing, cropping is used to refine or clean up a graphic for placement in a document.

crop marks \krop´ märks\ *n.* **1.** Lines drawn at the edges of pages to mark where the paper will be cut to form pages in the final document. See the illustration. *See also* registration marks. **2.** Lines drawn on photographs or illustrations to indicate where they will be cropped, or cut. *See also* crop.



Crop marks.

cross-assembler \kros´ə-sem`blər\ *n.* An assembler that executes on one hardware platform but generates machine code for another. *See also* assembler, compiler, cross-compiler, cross development.

cross-check \kros´chek\ *vb.* To check the accuracy of a calculation by using another method to verify the result. *Compare* cross-foot.

cross-compiler \kros´kəm-pī`lər\ *n.* A compiler that executes on one hardware platform but generates object code for another. *See also* assembler, compiler, cross-assembler, cross development.

cross development \kros` də-vel´əp-mənt\ *n.* The use of one system to develop programs for a different type of system, often because the software development tools of the development system are superior to those of the target system.

cross-foot \kros´fo͝ot\ *vb.* To check the accuracy of a total, as on a ledger sheet, by adding across columns and down rows, all figures contributing to the total.

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Data Carrier Detected \dā´tə kâr´ē-er də-tek´təd, dat´ə\ *n.* *See* DCD.

data chaining \dā´tə chā´nēng, dat´ə\ *n.* The process of storing segments of data in noncontiguous locations while retaining the ability to reconnect them in the proper sequence.

data channel \dā´tə chan´əl, dat´ə\ *n.* *See* channel.

data collection \dā´tə kə-lek´shən, dat´ə\ *n.* **1.** The process of acquiring source documents or data. **2.** The grouping of data by means of classification, sorting, ordering, and other organizing methods.

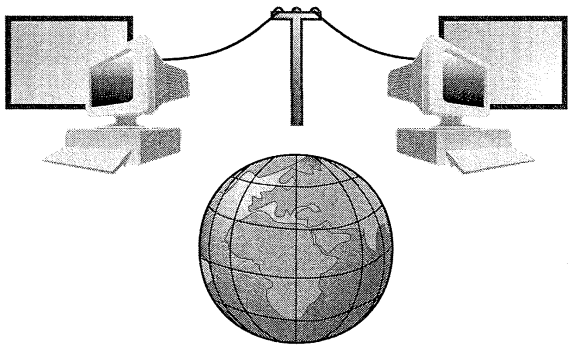
datacom \dā´tə-kom´, dat´ə-kom´\ *n.* Short for **data com**munications. *See* communications.

data communications \dā´tə kə-myōō-nə-kā´shənz, dat´ə\ *n.* *See* communications.

data compaction \dā´tə kəm-pak´shən, dat´ə\ *n.* *See* data compression.

data compression \dā´tə kəm-presh´ən, dat´ə\ *n.* A means of reducing the amount of space or bandwidth needed to store or transmit a block of data, used in data communications, facsimile transmission, and CD-ROM publishing. *Also called* data compaction.

data conferencing \dā´tə kon´frən-sēng, dat´ə\ *n.* Simultaneous data communication among geographically separated participants in a meeting. Data conferencing involves whiteboards and other software that enable a single set of files at one location to be accessed and modified by all participants. See the illustration. *See also* desktop conferencing, whiteboard. *Compare* video conferencing.



Data conferencing.

data control \dā´tə kən-trōl´, dat´ə\ *n.* The aspect of data management concerned with tracking how and by whom data is used, accessed, altered, owned, and reported on.

data corruption \dā´tə kər-up´shən, dat´ə\ *n.* *See* corruption.

data declaration \dā´tə de-klər-ā´shən, dat´ə\ *n.* A statement in a program that specifies the characteristics of a variable. The requirements for data declarations vary among different programming languages but can include such values as variable name, data type, initial value, and size specification. *See also* array, data type, record[1], variable.

data definition language \dā´tə def-ə-nish´ən lang-wəj, dat´ə\ *n.* A language that defines all attributes and properties of a database, especially record layouts, field definitions, key fields, file locations, and storage strategy. *Acronym:* DDL (D´D-L´).

data description language \dā´tə dəs-krip´shən lang-wəj, dat´ə\ *n.* A language designed specifically for declaring data structures and files. *See also* data definition language.

data dictionary \dā´tə dik´shə-nâr-ē, dat´ə\ *n.* A database containing data about all the databases in a database system. Data dictionaries store all the various schema and file specifications and their locations. They also contain information about which programs use which data and which users are interested in which reports.

data directory \dā´tə dər-ek´tər-ē, dat´ə\ *n.* *See* catalog, data dictionary.

data-driven processing \dā´tə-driv-ən pros´es-ēng, dat´ə-driv-ən\ *n.* A form of processing where the processor or program must wait for data to arrive before it can advance to the next step in a sequence.

data element \dā´tə el´ə-ment, dat´ə\ *n.* A single unit of data. *Also called* data item. *See also* data field.

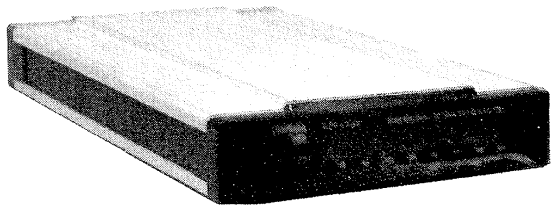
data encryption \dā´tə en-krip´shən, dat´ə\ *n.* *See* encryption.

data encryption key \dā´tə en-krip´shən kē´, dat´ə\ *n.* A sequence of data that is used to encrypt and decrypt other data. *Acronym:* DEK (D´E-K´). *See also* decryption, encryption, key (definition 3).

data encryption standard \dā´tə en-krip´shən stan´dərd, dat´ə\ *n.* *See* DES.

data entry \dā´tə en´trē, dat´ə\ *n.* The process of writing new data to computer memory.

data/fax modem \dā'tə-faks' mō'dəm, dat'ə\ *n.* A modem that can handle both serial data and facsimile images to either send or receive transmissions. See the illustration.



Data/fax modem.

data field \dā'tə fēld', dat'ə\ *n.* A well-defined portion of a data record, such as a column in a database table.

data field masking \dā'tə fēld ma'skēng, dat'ə\ *n.* The process of filtering or selecting part of a data field to control the way it is returned and displayed.

data file \dā'tə fīl', dat'ə\ *n.* A file consisting of data in the form of text, numbers, or graphics, as distinct from a program file of commands and instructions. *Compare* program file.

data flow or **dataflow** \dā'tə flō', dat'ə\ *n.* **1.** The movement of data through a system, from entry to destination. **2.** In parallel processing, a design in which a calculation is made either when all necessary data is available (data-driven processing) or when other processors request the data (demand-driven processing). *See also* parallel processing.

data fork \dā'tə fōrk', dat'ə\ *n.* In Macintosh files, the part of a stored document that contains user-supplied information, such as the text of a word-processing document. A Macintosh file can have a data fork, a resource fork (which contains information such as program code, font data, digitized sound, or icons), and a header. All three parts are used by the operating system in file management and storage. *See also* resource (definition 2), resource fork.

data format \dā'tə fōr'mat, dat'ə\ *n.* The structure applied to data by an application program to provide a context in which the data can be interpreted.

data frame \dā'tə frām', dat'ə\ *n.* A packet of information transmitted as a unit on a network. Data frames are defined by the network's data-link layer and exist only on the wire between network nodes. *See also* data-link layer, frame (definition 2).

data glove \dā'tə gləv', dat'ə\ *n.* A data input device or controller in the form of a glove fitted with sensors that convert movement of the hand and fingers into commands. *See also* virtual reality.

datagram \dā'tə-gram', dat'ə-gram'\ *n.* One packet, or unit, of information, along with relevant delivery information such as the destination address, that is sent through a packet-switching network. *See also* packet switching.

data independence \dā'tə in-də-pen'dəns, dat'ə\ *n.* The separation of data in a database from the programs that manipulate it. Data independence makes stored data as accessible as possible.

data integrity \dā'tə in-te'grə-tē, dat'ə\ *n.* The accuracy of data and its conformity to its expected value, especially after being transmitted or processed.

data interchange format \dā'tə in'tər-chānj fōrmat, dat'ə\ *n.* A format consisting of ASCII codes in which database, spreadsheet, and similar documents can be structured to facilitate their use by and transfer to other programs. *Acronym:* DIF (D'I-F'). *See also* ASCII.

data item \dā'tə ī'təm, dat'ə\ *n. See* data element.

data library \dā'tə lī'brâr-ē, dat'ə\ *n.* A cataloged collection of data files on disk or in another storage medium.

data link \dā'tə lēnk', dat'ə\ *n.* A connection between any two devices capable of sending and receiving information, such as a computer and a printer or a main computer and a terminal. Sometimes the term is extended to include equipment, such as a modem, that enables transmission and receiving. Such devices follow protocols that govern data transmission. *See also* communications protocol, data-link layer, DCE, DTE.

data link escape \dā'tə lēnk' ə-skāp', dat'ə\ *n.* In data transmission, a control character that changes the meaning of the characters immediately following it.

data-link layer \dā'tə-lēnk lâr', dat'ə-, lā'ər\ *n.* The second of seven layers in the ISO/OSI model for standardizing computer-to-computer communications. The data-link layer is one layer above the physical layer. Its concern is packaging and

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DDE \D`D-E´\ *n.* Acronym for **D**ynamic **D**ata **E**xchange. An interprocess communication method featured in Microsoft Windows and OS/2. DDE allows two or more programs that are running simultaneously to exchange data and commands. In Windows 3.1, DDE was largely supplanted by OLE, which is an extension of DDE. In Windows 95 and Windows NT, OLE and ActiveX are more commonly used. *See also* ActiveX, interprocess communication, OLE.

DDL \D`D-L´\ *n.* *See* data definition language.

.de \dot`D-E´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Germany.

dead halt \ded hält´\ *n.* A machine stop with no hope of recovery by either the program or the operating system. The only choice after a dead halt is to reboot. *Also called* drop-dead halt. *See also* hang. *Compare* reboot.

dead key \ded´ kē\ *n.* A key used with another key to create an accented character. When pressed, a dead key produces no visible character (hence its name) but indicates that the accent mark it represents is to be combined with the next key pressed. *See also* key (definition 1).

dead-letter box \ded`let´ər boks`\ *n.* In e-mail or message systems, a file to which undeliverable messages are sent.

deadlock \ded´lok\ *n.* **1.** A situation that occurs when two programs or devices are each waiting for a response from the other before continuing. *Also called* deadly embrace. **2.** In operating systems, a situation in which two or more processes are prevented from continuing while each waits for resources to be freed by the continuation of the other.

deadly embrace \ded`lē em-brās´\ *n.* *See* deadlock (definition 1).

deallocate \dē-al´ə-kāt\ *vb.* To free previously allocated memory. *See also* pointer. *Compare* allocate.

deblock \dē-blok´\ *vb.* To remove one or more logical records (units of stored information) from a block. Application or database systems must often deblock information to make specific units of information available for processing. *Compare* block[2] (definition 1).

debug \dē-bug´\ *vb.* To detect, locate, and correct logical or syntactical errors in a program or malfunctions in hardware. In hardware contexts, the term *troubleshoot* is the term more often used, especially when the problem is a major one. *See also* bug, debugger.

debugger \dē-bug´ər\ *n.* A program designed to aid in debugging another program by allowing the programmer to step through the program, examine the data, and monitor conditions such as the values of variables. *See also* bug (definition 1), debug.

decay \də-kā´\ *n.* A decrease in the amplitude of a signal over time.

DECchip 21064 \D`E-C`chip tōō`wən-ō`siks-fōr´\ *n.* A Digital Equipment Corporation microprocessor introduced in February 1992. The DECchip 21064 is a 64-bit, RISC-based, superscalar, superpipelined chip with 64-bit registers, a 64-bit data bus, a 64-bit address bus, and a 128-bit data path between the microprocessor and memory. It also has a built-in 8-KB instruction cache, a built-in 8-KB data cache, and a floating-point processor. The DECchip 21064 contains 1.7 million transistors and operates at 3.3 volts. The 200-MHz version runs at a peak rate of 400 MPS. The chip's architecture is SMP compliant, so that several chips can be used in a parallel (multiprocessor) configuration. *See also* floating-point processor, MIPS, pipelining (definition 1), RISC, superpipelining, superscalar.

deceleration time \dē-sel`ər-ā´shən tīm`\ *n.* The time required for an access arm to come to a stop as it approaches the desired portion of a disk. The faster the arm moves, the more momentum it gains and the greater the deceleration time.

decentralized processing \dē-sen`trə-līzd pros´es-ēng, dē`-sen-trə-līzd\ *n.* The distribution of computer processing facilities in more than one location. Decentralized processing is not the same as distributed processing, which assigns multiple computers to the same task to increase efficiency.

deci- \des´ə\ *prefix* Metric prefix meaning 10^{-1} (one tenth).

decibel \des´ə-bəl\ *n.* Abbreviated dB. One tenth of a bel (named after Alexander Graham Bell), a unit used in electronics and other fields to measure the strength of a sound or signal. Decibel measurements fall on a logarithmic scale and

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digital linear tape \dij`i-təl lin`ē-ər tāp´\ *n.* A magnetic storage medium used to back up data. Digital linear tape allows for faster transfer of data compared with other tape technologies. *Acronym:* DLT (D`L-T´).

Digital Micromirror Display \dij`i-təl mī`krō-mēr-ər dis-plā´\ *n.* The circuit technology behind Texas Instruments' Digital Projection System. An array of individually addressable mirrors on a chip, each less than 0.002 mm wide, rotate to reflect light into the lens of the projection system, creating a bright, full-color display. Displays can be combined to create high-definition systems of 1,920 × 1,035 (1,987,200) pixels with 64 million colors. *Acronym:* DMD (D`M-D´).

digital photography \dij`i-təl fə-to´grə-fē\ *n.* Photography by means of a digital camera. Digital photography differs from conventional photography in that a digital camera does not use a silver halide–based film to capture an image. Instead, a digital camera captures and stores each image electronically. *See also* digital camera.

digital proof \dij`i-təl prōōf´\ *n. See* direct digital color proof.

digital recording \dij`i-təl rə-kōr´dēng\ *n.* The storage of information in binary-encoded (digital) format. Digital recording converts information—text, graphics, sound, or pictures—to strings of 1s and 0s that can be physically represented on a storage medium. Digital recording media include computer disks and tapes, optical (or compact) discs, and ROM cartridges of the type used for some software and many computer games.

digital signal \dij`i-təl sig´nəl\ *n.* A signal, such as one transmitted within or between computers, in which information is represented by discrete states—for example, high and low voltages—rather than by fluctuating levels in a continuous stream, as in an analog signal.

digital signal processor \dij`i-təl sig´nəl pros`es-ər\ *n.* An integrated circuit designed for high-speed data manipulation and used in audio, communications, image manipulation, and other data acquisition and data control applications. *Acronym:* DSP (D`S-P´).

digital signature \dij`i-təl sig´nə-chur\ *n.* A personal authentication method based on encryption and secret authorization codes used for "signing" electronic documents.

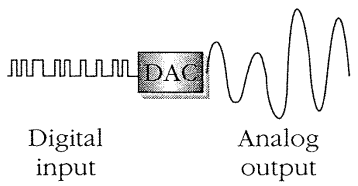
Digital Simultaneous Voice and Data \dij`i-təl sī`mul-tā`nē-əs vois and dā´tə, dat´ə\ *n.* A modem technology, patented by Multi-Tech Systems, Inc., that allows a single telephone line to be used for conversation together with data transfer. This is accomplished by switching to packet-mode communications when the need for voice transfer is detected; digitized voice packets are then transferred along with data and command packets. *Acronym:* DSVD (D`S-V-D´).

digital sort \dij`i-təl sōrt´\ *n.* A type of ordering process in which record numbers or their key values are sorted digit by digit, beginning with the least significant (rightmost) digit. *Also called* radix sort.

digital speech \dij`i-təl spēch´\ *n. See* speech synthesis.

digital subscriber line \dij`i-təl sub-skrī´bər līn`\ *n.* An ISDN BRI (Basic Rate Interface) line or channel. *Acronym:* DSL (D`S-L´). *See also* BRI, ISDN.

digital-to-analog converter \dij`i-təl-tōō-an´ə-log kən-vər´-tər\ *n.* A device that translates digital data to an analog signal. A digital-to-analog converter takes a succession of discrete digital values as input and creates an analog signal whose amplitude corresponds, moment by moment, to each digital value. See the illustration. *Acronym:* DAC (D`A-C´). *Compare* analog-to-digital converter.



Digital-to-analog converter.

digital versatile disc \dij`i-təl vər´sə-təl disk`\ *n. See* digital video disc.

digital video disc \dij`i-təl vid´ē-ō disk`\ *n.* The next generation of optical disc storage technology. With digital video disc technology, video, audio, and computer data can be encoded onto a compact disc (CD). A digital video disc can store greater amounts of data than a traditional CD. A standard single-layer, single-sided digital video

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What the user views as a directory is supported in the operating system by tables of data, stored on the disk, that indicate characteristics and the location of each file. In the Macintosh and Windows 95 operating systems, directories are called *folders.*

Directory Access Protocol \dər-ek`tər-ē ak-ses prō´tə-kol\ *n.* The protocol that governs communications between X.500 clients and servers. *See also* CCITT X series.

Directory Client Agent \dər-ek`tər-ē klī´ənt ā`jənt\ *n. See* DUA.

Directory Information Base \dər-ek`tər-ē in-fər-mā´shən bās`\ *n. See* DIB (definition 2).

directory path \dər-ek´tər-ē path`\ *n. See* pathname.

directory replication \dər-ek´tər-ē re-plə-kā´-shən\ *n.* The copying of a master set of directories from a server (called an *export server*) to specified servers or workstations (called *import computers*) in the same or other domains. Replication simplifies the task of maintaining identical sets of directories and files on multiple computers because only a single master copy of the data must be maintained. *See also* directory, server.

Directory Server Agent \dər-ek`tər-ē sər´vər ā`jənt\ *n. See* DSA.

directory service \dər-ek´tər-ē sər`vəs\ *n.* A service on a network that returns mail addresses of other users or enables a user to locate hosts and services.

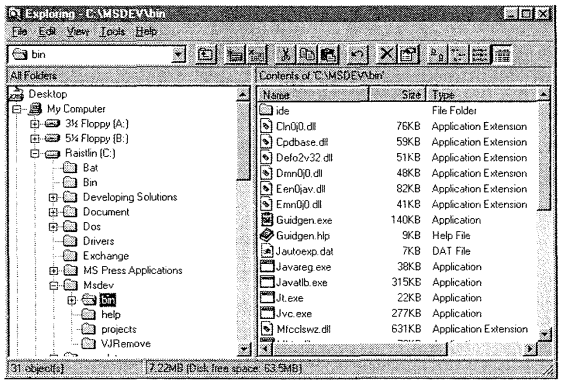
Directory System Agent \dər-ek`tər-ē si´stəm ā`jənt\ *n. See* DSA.

directory tree \dər-ek´tər-ē trē`\ *n.* A graphic display listing the directories and subdirectories on a hard disk in tree form, with subdirectories shown as branches of the main directory. See the illustration. *See also* branch (definition 1), directory, tree structure.

Directory User Agent \dər-ek`tər-ē yo͞o´zər ā`jənt\ *n. See* DUA.

direct processing \dər-ekt` pros´e-sēng\ *n.* Processing of data as it is received by the system, as opposed to deferred processing, in which data is stored in blocks before processing. *Compare* deferred processing.

direct read after write \dər-ekt` rēd af-tər rīt´\ *n. See* DRAW.



Directory tree. An example of a directory tree shown in Windows Explorer.

direct read during write \dər-ekt` rēd dər-ēng rīt´\ *n. See* DRDW.

direct sequence \dər-ekt` sē´kwəns\ *n.* In spread spectrum communication, a form of modulation in which a carrier is modulated by a series of binary pulses. *See also* modulation (definition 1), spread spectrum.

direct view storage tube \dər-ekt` vyo͞o stōr´əj to͞ob\ *n.* A type of cathode-ray tube (CRT) in which the screen can retain images for a long time and in which a beam of electrons from an electron gun can be moved arbitrarily across the screen surface (as opposed to a standard cathode-ray tube, in which the electron beam is moved in a specific pattern). This type of CRT is capable of displaying a precise, detailed image without requiring any screen refresh. However, once the image is drawn, it cannot be changed without a complete erasing of the screen. *Acronym:* DVST (D`V-S-T´). *Also called* storage tube. *Compare* CRT.

DirectX \dər-ekt`X´\ *n.* Windows 95 software that gives applications direct access to a computer's sound and graphics hardware.

dirty \dər´tē\ *adj.* Of, pertaining to, or characteristic of a communications line that is hampered by excessive noise, degrading the quality of the signal. *See also* noise (definition 2).

dirty bit \dər´tē bit`\ *n.* A bit used to mark modified data in a cache so that the modifications may be carried over to primary memory. *See also* bit, cache.

dirty power \dər`tē pou´ər\ *n.* A power source that can cause damage to electronic components,

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large chunk of data is read and stored in the disk buffer. When the program wants information, it is copied from the buffer. Many requests for data can be satisfied by a single disk access. The same technique can be applied to disk writes. When the program has information to store, it writes it into the disk buffer area in memory. When the buffer has been filled, the entire contents of the buffer are written to the disk in a single operation.

disk cache \disk´ kash\ *n.* A portion of a computer's random access memory (RAM) set aside for temporarily holding information read from disk. A disk cache does not hold entire files, as does a RAM disk (a portion of memory that acts as if it were a disk drive). Instead, a disk cache is used to hold information that either has recently been requested from disk or has previously been written to disk. If the required information remains in a disk cache, access time is considerably faster than if the program must wait for the disk drive mechanism to fetch the information from disk. *See also* cache. *Compare* disk buffer.

disk cartridge \disk´ kär`trij\ *n.* A removable disk enclosed in a protective case. A disk cartridge can be used by certain types of hard disk drives and related devices, such as the external data storage units known as Bernoulli boxes.

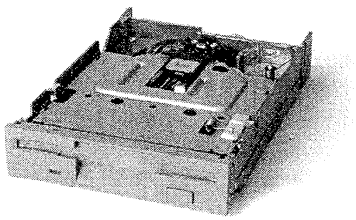
disk controller \disk´ kən-trō`lər\ *n.* A special-purpose chip and associated circuitry that directs and controls reading from and writing to a computer's disk drive. A disk controller handles such tasks as positioning the read/write head, mediating between the drive and the microprocessor, and controlling the transfer of information to and from memory. Disk controllers are used with floppy disk drives and hard disks and can either be built into the system or be part of a card that plugs into an expansion slot.

disk copy \disk´ kop`ē\ *n.* The process of duplicating a source disk's data and the data's organizational structure onto a target disk. *See also* backup.

disk crash \disk´ krash\ *n.* The failure of a disk drive. *See also* crash[1].

disk directory \disk´ dər-ek`tər-ē\ *n.* An index of the files on a disk, analogous to a card catalog. A disk directory includes information about the files, such as their names, sizes, dates of creation, and physical locations on the disk. *See also* directory.

disk drive \disk´ drīv\ *n.* An electromechanical device that reads from and writes to disks. The main components of a disk drive include a spindle on which the disk is mounted, a drive motor that spins the disk when the drive is in operation, one or more read/write heads, a second motor that positions the read/write head(s) over the disk, and controller circuitry that synchronizes read/write activities and transfers information to and from the computer. Two types of disk drives are in common use: floppy disk drives and hard disk drives. Floppy disk drives are designed to accept removable disks in either 5.25-inch or 3.5-inch format; hard disk drives are faster, high-capacity storage units that are completely enclosed in a protective case. See the illustration.



Disk drive. ***A 3.5-inch floppy disk drive.***

disk driver \disk´ drī`vər\ *n.* A device driver that is added to a system to support a specific manufacturer's disk device. *See also* device driver.

disk duplexing \disk´ dō͞o`pleks-ēng\ *n.* *See* disk mirroring.

disk envelope \disk´ en`və-lōp, än`və-lōp\ *n.* The paper container that holds a 5.25-inch floppy disk and its attached jacket. The disk envelope protects exposed surfaces of the disk from dust and other foreign material that can scratch and otherwise damage the surface, resulting in the loss of recorded data. *See also* disk jacket.

diskette \dis-ket´\ *n.* *See* floppy disk.

disk interface \disk´ in`tər-fās\ *n.* **1.** The circuitry that connects a disk drive to a computer system. **2.** A standard for connecting disk drives and computers. The ST506 standard for connecting hard disks to computers is a disk interface standard.

disk jacket \disk´ jak`et\ *n.* The protective plastic sheath that covers a floppy disk.

diskless workstation \disk`ləs wərk´stā-shən\ *n.* A station on a computer network that is not

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common form of dynamic storage, and both dynamic RAM (DRAM) and static RAM (SRAM) are considered forms of dynamic storage. *See also* dynamic RAM, static RAM. *Compare* permanent storage. **2.** In programming, blocks of memory that can be allocated, deallocated, or freely changed in size.

dynamic Web page \dī-nam`ik web´ pāj\ *n.* A Web page that has fixed form but variable content, allowing it to be tailored to a customer's search criteria.

.dz \dot`D-Z´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Algeria.

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PCs that allows for increasing memory beyond the Intel 80x86 microprocessor real-mode limit of 1 megabyte. In earlier versions of microprocessors, EMS bypassed this memory board limit with a number of 16-kilobyte banks of RAM that could be accessed by software. In later versions of Intel microprocessors, including the 80386 and 80486 models, EMS is converted from extended memory by software memory managers, such as EMM386 in MS-DOS 5. Now EMS is used mainly for older MS-DOS applications because Windows and other applications running in protected mode on 80386 and higher microprocessors are free of the 1-MB limit. *Also called* LIM EMS. *See also* expanded memory, protected mode. *Compare* conventional memory, extended memory.

em space \em´ spās\ *n.* A typographical unit of measure that is equal in width to the point size of a particular font. For many fonts, this is equal to the width of a capital M, from which the em space takes its name. *Compare* en space, fixed space, thin space.

emulate \e´myo͞o-lāt`\ *vb.* For a hardware or software system to behave in the same manner as another hardware or software system. In a network, for example, microcomputers often emulate mainframes or terminals so that two machines can communicate.

emulation \e`myə-lā´shən\ *n.* The process of a computer, device, or program imitating the function of another computer, device, or program.

emulator \e´myə-lā`tər\ *n.* Hardware or software designed to make one type of computer or component act as if it were another. By means of an emulator, a computer can run software written for another machine. In a network, microcomputers might emulate mainframes or terminals so that two machines can communicate.

emulsion laser storage \ē-mul`shən lā´zər stōr-`əj\ *n.* A method for recording data in film by selective heating with a laser beam.

enable \e-nā´bl\ *vb.* To activate or turn on. *Compare* disable.

encapsulate \en-kap´sə-lāt`\ *vb.* To treat a collection of structured information as a whole without affecting or taking notice of its internal structure. In communications, a message or packet constructed according to one protocol, such as a TCP/IP packet, may be taken with its formatting data as an undifferentiated stream of bits that is then broken up and packaged according to a lower-level protocol (for example, as ATM packets) to be sent over a particular network; at the destination, the lower-level packets are assembled, re-creating the message as formatted for the encapsulated protocol. In object-oriented programming, the implementation details of a class are encapsulated in a separate file whose contents do not need to be known by a programmer using that class. *See also* ATM (definition 1), object-oriented programming, TCP/IP.

Encapsulated PostScript \en-kap`sə-lā-təd pōst´ skript\ *n.* *See* EPS.

encapsulated type \en-kap`sə-lā-təd tīp´\ *n.* *See* abstract data type.

encipher \en-sī´fər\ *vb.* *See* encryption.

encode \en-kōd´\ *vb.* **1.** In data security, to encrypt. *See also* encryption. **2.** In programming, to put something into code, which frequently involves changing the form—for example, changing a decimal number to binary-coded form. *See also* binary-coded decimal, EBCDIC.

encryption \en-krip´shən\ *n.* The process of encoding data to prevent unauthorized access, especially during transmission. Encryption is usually based on a key that is essential for decoding. The U.S. National Bureau of Standards created a complex encryption standard, Data Encryption Standard (DES), which provides almost unlimited ways to encrypt documents. *See also* DES.

encryption key \en-krip´shən kē`\ *n.* A sequence of data that is used to encrypt other data and that, consequently, must be used for the data's decryption. *See also* decryption, encryption.

end-around carry \end`ə-round kâr´ē\ *n.* A special type of end-around shift operation on a binary value that treats the carry bit as an extra bit; that is, the carry bit is moved from one end of the value to the other. *See also* carry, end-around shift, shift.

end-around shift \end`ə-round shift´\ *n.* An operation performed on a binary value in which a bit is shifted out of one end and into the other end. For example, a right-end shift on the value 00101001 yields 10010100. *See also* shift.

en dash \en´ dash\ *n.* A punctuation mark (–) used to show ranges of dates and numbers, as in

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read-only memory (RPROM). *See also* EEPROM, PROM, ROM.

.eps \dot-E`P-S´\ *n.* The file extension that identifies Encapsulated PostScript files. *See also* EPS.

EPS \E`P-S´\ *n.* Acronym for **E**ncapsulated **P**ost**S**cript. A PostScript file format that can be used as an independent entity. The EPS image must be incorporated into the PostScript output of an application such as a desktop publisher. Many high-quality clip-art packages consist of such images. *See also* PostScript.

EPSF \E`P-S-F´\ *n.* Acronym for **E**ncapsulated **P**ost**S**cript **f**ile. *See* EPS.

equality \ē-kwäl´ə-tē`\ *n.* The property of being identical, used most often in reference to values and data structures.

equalization \ē`kwə-lə-zā´shən\ *n.* A form of conditioning used to compensate for signal distortion and delay on a communication channel. Equalization attempts to maintain the amplitude and phase characteristics of a signal so that it remains true to the original when it reaches the receiving device.

equation \ē-kwā´zhən\ *n.* A mathematical statement that indicates equality with the use of an equal sign (=) between two expressions. In programming languages, assignment statements are written in equation form. *See also* assignment statement.

.er \dot`E-R´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Eritrea.

erasable programmable read-only memory \ər-ā`sə-bl prō-gram`ə-bl rēd`ōn-lē mem´ər-ē\ *n. See* EPROM.

erasable storage \ər-ā`sə-bl stōr´əj\ *n.* Storage media that can be used repeatedly because the user has the ability to erase whatever data was previously there. Most forms of magnetic storage, such as tape and disk, are erasable.

erase \ər-ās´, ēr-ās´\ *vb.* To remove data permanently from a storage medium. This is usually done by replacing existing data with zeros or meaningless text or, in magnetic media, by disturbing the magnetic particles' physical arrangement, either with the erase head or with a large magnet. *Erase* differs from *delete* in that *delete* merely tells the computer that data or a file is no longer needed; the data remains stored and is recoverable until the operating system reuses the space containing the deleted file. *Erase,* on the other hand, removes data permanently. *See also* erase head. *Compare* delete.

erase head \ər-ās´ hed`\ *n.* The device in a magnetic tape machine that erases previously recorded information.

Eratosthenes' sieve \âr-ə-tos`thə-nēz siv´\ *n. See* sieve of Eratosthenes.

ergonomic keyboard \ər-gə-nom`ik kē´bōrd\ *n.* A keyboard designed to reduce the risk of wrist and hand injuries that result from prolonged use or repetitive movement. An ergonomic keyboard can include such features as alternative key layouts and palm rests. *See also* Dvorak keyboard, keyboard, Kinesis ergonomic keyboard.

ergonomics \er`gə-nom´iks\ *n.* The study of people (their physical characteristics and the ways they function) in relation to their working environment (the furnishings and machines they use). The goal of ergonomics is to incorporate comfort, efficiency, and safety into the design of keyboards, computer desks, chairs, and other items in the workplace.

error \âr´ər\ *n.* A value or condition that is not consistent with the true, specified, or expected value or condition. In computers, an error results when an event does not occur as expected or when impossible or illegal maneuvers are attempted. In data communications, an error occurs when there is a discrepancy between the transmitted and received data. *See also* critical error, error message, error rate, error ratio, fatal error, hard error, inherent error, intermittent error, logic error, machine error, overflow error, parity error, propagated error, read error, recoverable error, syntax error, system error, write error. *Compare* fault.

error analysis \âr´ər ə-nal`ə-sis\ *n.* The art and science of detecting errors in numeric calculations, especially in long and involved computations, where the possibility of errors increases.

error checking \âr´ər chek`ēng\ *n.* A method for detecting discrepancies between transmitted and received data during file transfer.

error control \âr´ər kən-trōl`\ *n.* **1.** The section of a program, procedure, or function that checks for

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errors such as type mismatches, overflows and underflows, dangling or illegal pointer references, and memory-use inconsistencies. **2.** The process of anticipating program errors during software development.

error-correcting code \âr`ər-kər-ek`tēng kōd´\ *n.* A code, designed for transmission of electronic data, that encodes data in such a way that transmission errors may be detected and corrected by examination of the encoded data on the receiving end. Error-correcting codes are used by most modems. *See also* modem.

error-correction coding \âr`ər-kər-ek´shən kō`dēng\ *n.* A method for encoding that allows for detection and correction of errors that occur during transmission. Most error-correction codes are characterized by the maximum number of errors they can detect and by the maximum number of errors they can correct. *See also* error detection and correction. *Compare* error-detection coding.

error detection and correction \âr`ər də-tek`shən and kər-ek´shən\ *n.* A method for discovering and resolving errors during file transfer. Some programs only detect errors; others detect and attempt to fix them.

error-detection coding \âr`ər-də-tek´shən kō`dēng\ *n.* A method of encoding data so that errors that occur during storage or transmission can be detected. Most error-detection codes are characterized by the maximum number of errors they can detect. *See also* checksum. *Compare* error-correction coding.

error file \âr´ər fīl`\ *n.* A file that records the time and type of data processing and transmission errors.

error handling \âr´ər han`də-lēng, hand`lēng\ *n.* The process of dealing with errors (or exceptions) as they arise during the running of a program. Some programming languages, such as C++, Ada, and Eiffel, have features that aid in error handling. *See also* bug (definition 1).

error message \âr´ər mes`əj\ *n.* A message from the system or program indicating that an error requiring resolution has occurred.

error rate \âr´ər rāt`\ *n.* In communications, the ratio of the number of bits or other elements that arrive incorrectly during transmission. For a 1,200-bps modem, a typical error rate would be 1 in every 200,000 bits. *See also* parity, parity bit, Xmodem, Ymodem.

error ratio \âr´ər rā`shō\ *n.* The ratio of errors to the number of units of data processed. *See also* error rate.

error trapping \âr´ər trap`ēng\ *n.* **1.** The process by which a program checks for errors during execution. **2.** The process of writing a function, program, or procedure such that it is capable of continuing execution despite an error condition.

.es \dot`E-S´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Spain.

escape character \e-skāp´ kâr`ək-tər\ *n.* *See* ESC character.

escape code \e-skāp´ kōd`\ *n.* A character or sequence of characters that indicates that a following character in a data stream is not to be processed in the ordinary way. In the C programming language, the escape code is the backslash \, which has several uses, as shown by the statement

```
printf ("The backslash \"\\\" is the
escape code.\n");.
```

The last backslash, which is the next-to-last character in the string, indicates that the following *n* is not to be printed, but that the sequence \n represents the newline character. By contrast, the backslashes before the quotation marks indicate that the latter *are* to be printed, rather than marking the end of one string and the beginning of another; similarly, the backslash before a backslash indicates that the second backslash is to be printed, rather than serving as an escape code. The resulting output is *The backslash "\" is the escape code.*

Escape key \e-skāp´ kē`\ *n.* A key on a computer keyboard that sends the escape (ESC) character to the computer. In many applications, the Escape key moves the user back one level in the menu structure or exits the program. *See also* Clear key.

escape sequence \e-skāp´ sē`kwəns\ *n.* A sequence of characters that usually begins with the ESC character (ASCII 27, hexadecimal 1B), which is followed by one or more additional characters. An escape sequence escapes from the normal sequence of characters (such as text) and issues an instruction or command to a device or program.



designated output destination. A database filter, for example, might flag information of a certain age. **2.** In communications and electronics, hardware or software that selectively passes certain elements of a signal and eliminates or minimizes others. A filter on a communications network, for example, must be designed to transmit a certain frequency but attenuate (dampen) frequencies above it (a low-pass filter), those below it (a highpass filter), or those above and below it (a bandpass filter). **3.** A pattern or mask through which data is passed to weed out specified items. For instance, a filter used in e-mail or in retrieving newsgroup messages can allow users to filter out messages from other users. *See also* e-mail filter, mask. **4.** In computer graphics, a special effect or production effect that is applied to bitmapped images; for example, shifting pixels within an image, making elements of the image transparent, or distorting the image. Some filters are built into a graphics program, such as a paint program or an image editor. Others are separate software packages that plug into the graphics program. *See also* bitmapped graphics, image editor, paint program.

filtering program \fil´tər-ēng prō`gram\ *n.* A program that filters information and presents only results that match the qualifications defined in the program.

FilterKeys \fil´tər-kēz`\ *n.* A Windows 95 accessibility control panel feature that enables users with physical disabilities to use the keyboard. With FilterKeys, the system ignores brief and repeated keystrokes that result from slow or inaccurate finger movements. *See also* accessibility. *Compare* MouseKeys, ShowSounds, SoundSentry, StickyKeys, ToggleKeys.

Final-Form-Text DCA \fī`nəl-fōrm-tekst` D-C-A´\ *n.* A standard in Document Content Architecture (DCA) for storing documents in ready-to-print form for interchange between dissimilar programs. A related standard is Revisable-Form-Text DCA (RFTDCA). *Acronym:* FFTDCA (F`F-T`D-C-A´). *See also* DCA (definition 1). *Compare* Revisable-Form-Text DCA.

find \fīnd\ *vb. See* search[2].

Finder \fīn´dər\ *n.* The standard interface to the Macintosh operating system, allowing the user to view the contents of directories (folders); to move, copy, and delete files; and to launch applications. Items in the system are often represented as icons, and a mouse or similar pointing device is used to manipulate these items. The Finder was the first commercially successful graphical user interface, and it helped launch a wave of interest in icon-based systems. *See also* MultiFinder.

finger[1] \fēng´ər\ *n.* An Internet utility, originally limited to UNIX but now available on many other platforms, that enables a user to obtain information on other users who may be at other sites (if those sites permit access by finger). Given an e-mail address, finger returns the user's full name, an indication of whether or not the user is currently logged on, and any other information the user has chosen to supply as a profile. Given a first or last name, finger returns the logon names of users whose first or last names match.

finger[2] \fēng´ər\ *vb.* To obtain information on a user by means of the finger program.

fingerprint reader \fēng´-ər-print rē`dər\ *n.* A scanner that reads human fingerprints for comparison to a database of stored fingerprint images.

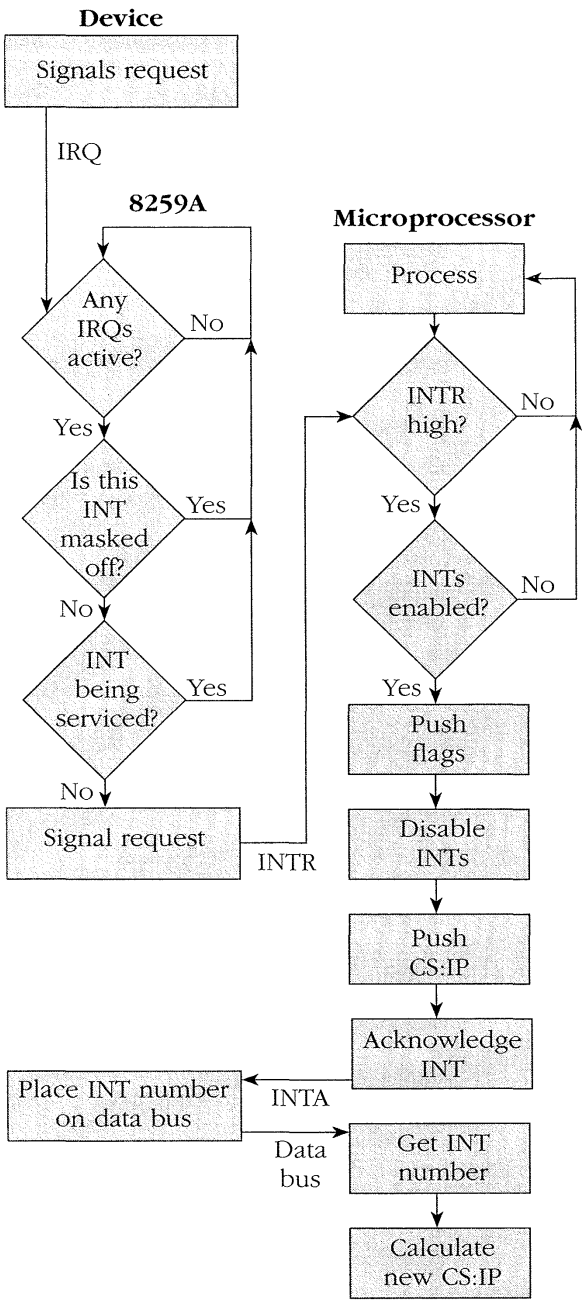
FIPS \fips, F`I-P-S´\ *n. See* Federal Information Processing Standards.

firewall \fīr´wäl\ *n.* A security system intended to protect an organization's network against external threats, such as hackers, coming from another network, such as the Internet. A firewall prevents computers in the organization's network from communicating directly with computers external to the network and vice versa. Instead, all communication is routed through a proxy server outside of the organization's network, and the proxy server decides whether it is safe to let a particular message or file pass through to the organization's network.

firmware \fərm´wâr\ *n.* Software routines stored in read-only memory (ROM). Unlike random access memory (RAM), read-only memory stays intact even in the absence of electrical power. Startup routines and low-level input/output instructions are stored in firmware. It falls between software and hardware in terms of ease of modification. *See also* RAM, ROM.

FIR port \F`I-R´ pōrt\ *n.* Short for **f**ast **i**nfra**r**ed **port**. A wireless I/O port, most common on a portable computer, that exchanges data with an

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Flowchart.

various operations. These symbols are connected by lines and arrows to indicate the flow of data or control from one point to another. Flowcharts are used both as aids in showing the way a proposed program will work and as a means of understanding the operations of an existing program. See the illustration.

.fl.us \dot-F-L`dot-U-S´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Florida, United States.

flush[1] \flush\ *adj.* Aligned in a certain way on the screen or on paper. Flush left, for example, means aligned on the left side; flush right means aligned on the right side. *See also* align (definition 1).

flush[2] \flush\ *vb.* To clear a portion of memory. For example, to flush a disk file buffer is to save its contents on disk and then clear the buffer for filling again.

flux \fluks\ *n.* **1.** The total strength of a magnetic, electric, or radiation field over a given area. **2.** A chemical used to aid the binding of solder to electrical conductors.

flux reversal \fluks´ rə-vər`səl\ *n.* The change in orientation of the minute magnetic particles on the surface of a disk or tape toward one of two magnetic poles. The two different alignments are used to represent binary 1 and binary 0 for data storage: a flux reversal typically represents a binary 1, and no reversal represents a binary 0.

.fm \dot`F-M´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Micronesia.

FM \F-M´\ *n. See* frequency modulation.

FM encoding \F-M´ en-kō`dēng\ *n. See* frequency modulation encoding.

.fo \dot`F-O´\ *n.* On the Internet, the major geographic domain specifying that an address is located in the Faeroe Islands.

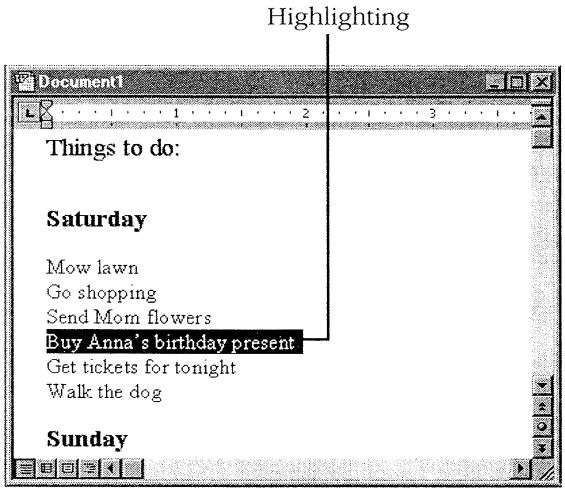
focus \fō´kus,\ *vb.* In television and raster-scan displays, to make an electron beam converge at a single point on the inner surface of the screen.

FOCUS \fō´kus, F`O-C-U-S´\ *n. See* Federation on Computing in the United States.

FOD \F`O-D´\ *n. See* fax on demand.

folder \fōl´dər\ *n.* In the Mac OS, Windows 95, and other operating systems, a container for programs and files in graphical user interfaces, symbolized on the screen by a graphical image (icon) of a file folder. This container is called a directory in other systems, such as MS-DOS and UNIX. A folder is a means of organizing programs and documents on a disk and can hold both files and

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Highlighting.

of conventional memory available for applications. *Acronym:* HMA (H`M-A´). *See also* conventional memory, expanded memory.

high-order \hī´ōr`dər\ *adj.* Having the most weight or significance. The high-order term usually appears first or leftmost in writing systems based on the Roman alphabet or Arabic numerals. For example, in the 2-byte hex value 6CA2, the high-order byte 6C has a value by itself of decimal 108 but counts for 108 × 256 = 27,648 in the group, whereas the low-order byte A2 counts only for decimal 162. *Compare* low-order.

high-order language \hī`ōr-dər lang´wəj\ *n. See* high-level language.

highpass filter \hī´pas fil`tər\ *n.* An electronic circuit that passes all frequencies in a signal that are above a specified frequency. *Compare* bandpass filter, lowpass filter.

High Performance File System \hī` pər-fōr`məns fīl´ si-stəm\ *n. See* HPFS.

High-Performance Parallel Interface \hī`pər-fōr-məns pâr`ə-lel in´tər-fās\ *n. See* HIPPI.

High Performance Serial Bus (1394) \hī` pər-fōr`məns sēr´ē-əl bus` thər`tēn-nīn-tē-fōr´\ *n.* A serial bus interface for both the PC and Macintosh that can support transmission speeds of 100, 200, or 400 Mbps and allows daisy-chaining of up to 63 devices in a branched form. Devices connected in such a way will be able to draw power directly through the interface.

high-persistence phosphor \hī` pər-si`stəns fos´-fər\ *n.* A phosphor that glows for a relatively long time after being struck by electrons. High-persistence phosphors are used in direct view storage tubes, but most CRTs (cathode-ray tubes) use phosphors of relatively low persistence so that their images can be changed quickly without "ghosts" of earlier images remaining on the screen. *See also* CRT, direct view storage tube.

high resolution \hī` rez-ə-lo͞o´shən\ *n.* The capability for reproducing text and graphics with relative clarity and fineness of detail. High resolution is achieved by using a large number of pixels (dots) to create an image in a given area. For screen displays, the resolution is stated in terms of the total number of pixels in the horizontal and vertical dimensions. For example, the VGA video adapter has a resolution of 640 by 480 pixels. In printing, resolution refers to the number of dots per inch (dpi) produced by the printer, such as 300 to 600 dpi for a desktop laser or ink-jet printer or 1,000 to 2,000 dpi for a production-quality imagesetter. *Also called* hi-res.

High Sierra specification \hī` sē-âr´ə spes-ə-fə-kā`shən\ *n.* An industrywide format specification for the logical structure, file structure, and record structures on a CD-ROM. The specification is named after a meeting on CD-ROM held near Lake Tahoe in November 1985. It served as the basis for the international standard, ISO 9660.

high tech \hī tek´\ *n.* **1.** Cutting-edge applied science and engineering, usually involving computers and electronics. **2.** Sophisticated, often complex, specialized technical innovation.

HIPPI \H`I-P-P-I´, hip´ē\ *n.* Acronym for **Hi**gh-**P**erformance **P**arallel **I**nterface. An ANSI communications standard used with supercomputers.

hi-res \hī-rez´\ *n. See* high resolution.

histogram \hi´stə-gram`\ *n.* A chart consisting of horizontal or vertical bars, the widths or heights of which represent the values of certain data.

history \hi´stər-ē`\ *n.* A list of the user's actions within a program, such as commands entered in an operating system shell, menus passed through using Gopher, or links followed using a Web browser.

hit \hit\ *n.* **1.** A successful retrieval of data from a cache rather than from the slower hard disk or

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RAM. *See also* cache, hard disk, RAM. **2.** A successful retrieval of a record matching a query in a database. *See also* query (definition 1), record[1]. **3.** Retrieval of a document, such as a home page, from a Web site.

.hk \dot`H-K´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Hong Kong.

HKEY \H´kē\ *n.* Short for **h**andle **key.** In Windows 95, a handle to a Registry key in which configuration information is stored. Each key leads to subkeys containing configuration information that, in earlier versions of Windows, was stored in .ini files. For example, the handle key HKEY_CURRENT_USER\Control Panel leads to the subkey for the Windows Desktop. *See also* handle (definition 1).

HLS \H`L-S´\ *n.* Acronym for **h**ue-**l**ightness-**s**aturation. *See* HSB.

HMA \H`M-A´\ *n. See* high memory area.

.hn \dot`H-N´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Honduras.

Hollerith tabulating/recording machine \hol`ər-ith ta`byə-lā-tēng-rə-kōr´dēng mə-shēn\ *n.* An electromechanical machine invented by Herman Hollerith in the late 1800s for processing data supplied in the form of holes punched at predetermined locations in cards. Contacts made through the holes completed electrical circuits, allowing signals to be passed to counting and tabulating devices. This machine is considered to have reduced the time required to finish the 1890 U.S. census by two-thirds. Such machines were manufactured in the early 1900s by Hollerith's Tabulating Machine Company, which eventually became the International Business Machines Corporation (IBM).

hologram \hol´ə-gram`\ *n.* A three-dimensional image record created by holography. The hologram consists of a light interference pattern preserved in a medium such as photographic film. When suitably illuminated, it produces an image that changes its appearance as the viewer changes viewing angle. *See also* holography.

holography \hə-lo´grə-fē`\ *n.* A method of reproducing three-dimensional visual images by recording light interference patterns on a medium such as photographic film, creating a hologram.

holy war \hō´lē wōr`\ *n.* **1.** A widespread and acrimonious debate among computer professionals over some aspect of the computer field, such as the debate over use of the GOTO statement in programming or that over big-endian versus little-endian data storage. **2.** An argument in a mailing list, newsgroup, or other forum over some emotional and controversial topic, such as abortion or Northern Ireland. Introducing a holy war that is off the purported topic of the forum is considered a violation of netiquette.

home \hōm\ *n.* A beginning position, such as the top left corner of a character-based display, the left end of a line of text, cell A1 of a spreadsheet, or the top of a document.

homebrew \hōm´brōō\ *n.* Hardware or software developed by an individual at home or by a company for its own use rather than as a commercial product, such as hardware developed by electronics hobbyists when microcomputers first appeared in the 1970s.

home computer \hōm` kəm-pyōō´tər\ *n.* A personal computer designed and priced for use in the home.

home directory \hōm` dər-ek´tər-ē\ *n.* A directory associated with a user account under UNIX. The home directory is the current directory when the user first logs in, and the user can return to it by entering the command *cd* (change directory) without a pathname. The user's files will ordinarily be stored in the home directory and its descendants.

homegrown software \hōm`grōn soft´wâr\ *n.* Software developed by an individual at home rather than in a professional environment. Most public-domain and shareware programs are created this way.

Home key \hōm´ kē\ *n.* A key, found on most keyboards, whose function usually involves sending the cursor to some type of home position in an application. *See also* home.

home office \hōm` of´əs\ *n.* **1.** An office set up within a residence. **2.** The main headquarters of a company.

home page \hōm´pāj\ *n.* **1.** A document intended to serve as a starting point in a hypertext system,

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hot carrier diode \hot` kâr-ē-ər dī´ōd\ *n.* *See* Schottky diode.

hot docking \hot´ dok`ēng\ *n.* The process of attaching a laptop computer to a docking station while the computer is running, and automatically activating the docking station's video display and other functions. *See also* docking station, laptop.

hot insertion \hot` in-sər´shən\ *n.* The insertion of a device or card while there is power to the system. Many newer laptops allow for hot insertion of PCMCIA cards. High-end servers may also allow hot insertion to reduce downtimes.

HotJava \hot´jav`ə\ *n.* A Web browser developed by Sun Microsystems, Inc. that is optimized to run Java applications and applets embedded in Web pages. *See also* applet, Java, Java applet.

hot key[1] \hot´ kē\ *n.* A keystroke or combination of keystrokes that switches the user to a different program, often a terminate-and-stay-resident (TSR) program or the operating system user interface. *See also* TSR.

hot key[2] \hot´ kē\ *vb.* To transfer to a different program by pressing a hot key.

hot link \hot´ lēnk\ *n.* **1.** A connection between two programs that instructs the second program to make changes to data when changes occur in the first program. For example, a word processor or desktop publishing program could update a document based on information obtained from a database through a hot link. **2.** *See* hyperlink.

hotlist \hot´list\ *n.* A list of frequently accessed items, such as Web pages in a Web browser, from which the user can select one. The hotlist of Web pages is called the bookmark list in Netscape Navigator and Lynx and is called the Favorites folder in Microsoft Internet Explorer.

hot plugging \hot´ plug-ēng\ *n.* A feature that allows equipment to be connected to an active device, such as a computer, while the device is powered on.

hot spot \hot´ spot\ *n.* The position in a mouse pointer, such as the position at the tip of an arrow or the intersection of the lines in a cross, that marks the exact location that will be affected by a mouse action, such as a button press.

hot swapping \hot´ swä`pēng\ *n.* *See* hot plugging.

HotWired \hot´wīrd\ *n.* A Web site affiliated with *Wired* magazine that contains news, gossip, and other information about the culture of the Internet: http://www.hotwired.com/frontdoor/.

housekeeping \hous´kē`pēng\ *n.* Any of various routines, such as updating the clock or performing garbage collection, designed to keep the system, the environment within which a program runs, or the data structures within a program in good working order.

HPC \H`P-C´\ *n.* *See* handheld PC.

HPFS \H`P-F-S´\ *n.* Acronym for **H**igh **P**erformance **F**ile **S**ystem. A file system available with OS/2 versions 1.2 and later. *See also* FAT file system, NTFS.

HPGL \H`P-G-L´\ *n.* Acronym for **H**ewlett-**P**ackard **G**raphics **L**anguage. A language originally developed for images destined for plotters. An HPGL file consists of instructions that a program can use to reconstruct a graphical image.

HPIB \H`P-I-B´\ *n.* Acronym for **H**ewlett-**P**ackard **I**nterface **B**us. *See* general-purpose interface bus.

HPPCL \H`P-P-C-L´\ *n.* Acronym for **H**ewlett-**P**ackard **P**rinter **C**ontrol **L**anguage. *See* Printer Control Language.

HP/UX or **HP-UX** \H`P-U-X´\ *n.* Acronym for **H**ewlett-**P**ackard **UNIX.** A version of the UNIX operating system specifically designed to be run on Hewlett-Packard's workstations. *See also* UNIX.

.hqx \dot`H-Q-X´\ *n.* A file extension for a file encoded with BinHex. *See also* BinHex.

.hr \dot`H-R´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Croatia.

HREF \H´ref\ Short for **h**ypertext **ref**erence. An attribute in an HTML document that defines a link to another document on the Web. *See also* HTML.

HSB \H`S-B´\ *n.* Acronym for **h**ue-**s**aturation-**b**rightness. A color model in which hue is the color itself as placed on a color wheel, where 0° is red, 60° is yellow, 120° is green, 180° is cyan, 240° is blue, and 300° is magenta; saturation is the percentage of the specified hue in the color; and brightness is the percentage of white in the color. *Also called* HLS, HSV, hue. *See also* color model. *Compare* CMY, RGB.

HSV \H`S-V´\ *n.* Acronym for **h**ue-**s**aturation-**v**alue. *See* HSB.

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H-sync \H´sēnk\ *n.* *See* horizontal synchronization.

.ht \dot`H-T´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Haiti.

.htm \dot`H-T-M´\ *n.* The MS-DOS/Windows 3.*x* file extension that identifies Hypertext Markup Language (HTML) files, most commonly used as Web pages. Because MS-DOS and Windows 3.*x* cannot recognize file extensions longer than three letters, the .html extension is truncated to three letters in those environments. *See also* HTML.

.html \dot`H-T-M-L´\ *n.* The file extension that identifies Hypertext Markup Language (HTML) files, most commonly used as Web pages. *See also* HTML.

HTML \H`T-M-L´\ *n.* Acronym for **H**ypertext **M**arkup **L**anguage. The markup language used for documents on the World Wide Web. HTML is an application of SGML that uses tags to mark elements, such as text and graphics, in a document to indicate how Web browsers should display these elements to the user and should respond to user actions such as activation of a link by means of a key press or mouse click. HTML 2.0, defined by the Internet Engineering Task Force (IETF), includes features of HTML common to all Web browsers as of 1995 and was the first version of HTML widely used on the World Wide Web. Future HTML development will be carried out by the World Wide Web Consortium (W3C). HTML 3.2, the latest proposed standard, incorporates features widely implemented as of early 1996. Most Web browsers, notably Netscape Navigator and Internet Explorer, recognize HTML tags beyond those included in the present standard. *See also* .htm, .html, SGML, tag (definition 3), Web browser.

HTML+ \H`T-M-L-plus´\ *n.* An unofficial specification for enhancements to the original HTML, such as forms and tables. HTML+ was not adopted as a standard but influenced the HTML 2.0 and HTML 3.2 standards. *See also* HTML.

HTML 2.0 \H`T-M-L` to͞o`point-O´\ *n.* A revised version of the HTML specification that added the capability for forms and eliminated certain little-used tags. Produced as an Internet Draft in mid-1994, HTML 2.0 represented common practice among browser developers at the time. It was standardized as an RFC in November 1995. *See also* HTML, HTML 3.0, HTML 3.2, HTML+, RFC.

HTML 3.0 \H`T-M-L` thrē`point-O´\ *n.* A revised version of the HTML specification. Its primary enhancement to HTML 2.0 is the support of tables. HTML 3.0 was never standardized or fully implemented by a major browser developer. *See also* HTML, HTML 2.0, HTML 3.2, HTML+.

HTML 3.2 \H`T-M-L` thrē`point-to͞o´\ *n.* A World Wide Web Consortium (W3C) recommendation for an HTML standard that supersedes the proposed HTML 3.0 standard and adds features to HTML 2.0 such as applets, sub- and superscripts, tables, and text flow around images. *See also* HTML, HTML 2.0, HTML 3.0.

HTML document \H`T-M-L` dok´yə-mənt\ *n.* **1.** A hypertext document that has been coded with HTML. **2.** *See* Web page.

HTML editor \H`T-M-L´ ed`ə-tər\ *n.* A software program used to create and modify HTML documents (Web pages). Most HTML editors include a method for inserting HTML tags without actually having to type out each tag. A number of HTML editors will also automatically reformat a document with HTML tags, based on formatting codes used by the word processing program in which the document was created. *See also* tag (definition 3), Web page.

HTML page \H`T-M-L´ pāj\ *n.* *See* Web page.

HTML tag \H`T-M-L´tag`\ *n.* *See* tag (definition 3).

HTML validation service \H`T-M-L` val-ə-dā´shən sər`vis\ *n.* A service used to confirm that a Web page uses valid HTML according to the latest standard and/or that its hyperlinks are valid. An HTML validation service can catch small syntactical errors in HTML coding as well as deviations from the HTML standards. *See also* HTML.

HTTP \H`T-T-P´\ *n.* Acronym for **H**ypertext **T**ransfer **P**rotocol. The client/server protocol used to access information on the World Wide Web. *See also* URL.

HTTPd \H`T-T-P-D´\ *n.* Short for **H**ypertext **T**ransfer **P**rotocol **D**aemon. A small, fast HTTP server available free from NCSA. *See also* HTTP server, NCSA (definition 1).

HTTP Next Generation \H`T-T-P` nekst` jen`ər-ā´shən\ *n.* *See* HTTP-NG.

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HTTP-NG \H`T-T-P`N-G´\ *n.* Acronym for **H**yper**t**ext **T**ransfer **P**rotocol **N**ext **G**eneration. A standard under development by the World Wide Web Consortium (W3C) for improving performance and enabling the addition of features such as security. Whereas the current version of HTTP establishes a connection each time a request is made, HTTP-NG will set up one connection (which consists of separate channels for control information and data) for an entire session between a particular client and a particular server.

HTTPS \H`T-T-P-S´\ *n.* Web server software for Windows NT. Developed by the European Microsoft Windows NT Academic Centre (EMWAC) at the University of Edinburgh, Scotland, it is available for download from the Internet and offers such features as WAIS search capability. *See also* HTTP server, WAIS.

HTTP server \H`T-T-P´ sər`vər\ *n.* **1.** Server software that uses HTTP to serve up HTML documents and any associated files and scripts when requested by a client, such as a Web browser. The connection between client and server is usually broken after the requested document or file has been served. HTTP servers are used on Web and Intranet sites. *Also called* Web server. *See also* HTML, HTTP, server (definition 2). **2.** Any machine on which an HTTP server program is running.

HTTP status codes \H`T-T-P` stat´us kōdz`, stā´tus\ *n.* Three-digit codes sent by an HTTP server that indicate the results of a request for data. Codes beginning with 1 respond to requests that the client may not have finished sending; with 2, successful requests; with 3, further action that the client must take; with 4, requests that failed because of client error; and with 5, requests that failed because of server error. *See also* 400, 401, 402, 403, 404, HTTP.

.hu \dot`H-U´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Hungary.

hub \hub\ *n.* In a network, a device joining communication lines at a central location, providing a common connection to all devices on the network. The term is an analogy to the hub of a wheel. *See also* active hub, switching hub.

hue \hyo͞o\ *n.* In the HSB color model, one of the three characteristics used to describe a color. Hue is the attribute that most readily distinguishes one color from other colors. It depends on the frequency of a light wave in the visible spectrum. *See also* color model, HSB. *Compare* brightness, saturation (definition 2).

Huffman coding \huf´mən kō`dēng\ *n.* A method of compressing a given set of data based on the relative frequency of the individual elements. The more often a given element, such as a letter, occurs, the shorter, in bits, is its corresponding code. It was one of the earliest data compression codes and, with modifications, remains one of the most widely used codes for a large variety of message types.

human engineering \hyo͞o`mən en-jə-nēr´ēng\ *n.* The designing of machines and associated products to suit the needs of humans. *See also* ergonomics.

human-machine interface \hyo͞o`mən-mə-shēn` in´tər-fās\ *n.* The boundary at which people make contact with and use machines; when applied to programs and operating systems, it is more widely known as the user interface.

hung \hung\ *adj. See* hang.

hybrid circuit \hī´brid sər`kət\ *n.* A circuit in which fundamentally different types of components are used to perform similar functions, such as a stereo amplifier that uses both tubes and transistors.

hybrid computer \hī`brid kəm-pyo͞o´tər\ *n.* A computer that contains both digital and analog circuits.

hybrid microcircuit \hī`brid mī´krō-sər-kət\ *n.* A microelectronic circuit that combines individual microminiaturized components and integrated components.

HyperCard \hī´pər-kärd`\ *n.* An information-management software tool, designed for the Apple Macintosh, that implements many hypertext concepts. A HyperCard document consists of a series of cards, collected into a stack. Each card can contain text, graphical images, sound, buttons that enable travel from card to card, and other controls. Programs and routines can be coded as scripts in an object-oriented language called HyperTalk or developed as external code resources (XCMDs and XFCNs). *See also* hypertext, object-oriented programming, XCMD, XFCN.

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integral modem \in`tə-grəl mō´dəm\ *n.* A modem that is built into a computer, as opposed to an internal modem, which is a modem on an expansion card that can be removed. *See also* external modem, internal modem, modem.

integral number \in´tə-grəl num`bər\ *n. See* integer (definition 2).

integrated circuit \in`tə-grā-təd sər´kət\ *n.* A device consisting of a number of connected circuit elements, such as transistors and resistors, fabricated on a single chip of silicon crystal or other semiconductor material. Integrated circuits are categorized by the number of elements they contain. *Acronym:* IC (I-C´). *Also called* chip. *See also* central processing unit.

small-scale integration (SSI)	fewer than 10
medium-scale integration (MSI)	10–100
large-scale integration (LSI)	100–5,000
very-large-scale integration (VLSI)	5,000–50,000
super-large-scale integration (SLSI)	50,000–100,000
ultra-large-scale integration (ULSI)	more than 100,000

integrated development environment \in`tə-grā-təd də-vel´əp-mənt en-vī`ən-mənt, en-vī`ərn-mənt\ *n.* A set of integrated tools for developing software. The tools are generally run from one user interface and consist of a compiler, an editor, and a debugger, among others. *Acronym:* IDE (I`D-E´).

Integrated Device Electronics \in`tə-grā-təd də-vīs` ə-lek-tron´iks\ *n. See* IDE (definition 1).

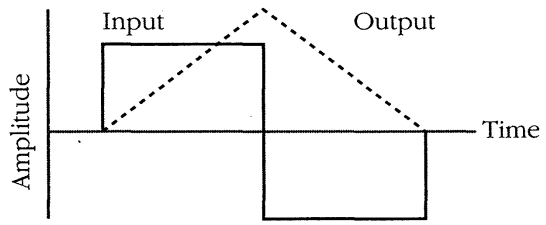
integrated injection logic \in`tə-grā-təd in-jek´-shən loj`ik\ *n.* A type of circuit design that uses both NPN and PNP transistors and does not require other components, such as resistors. Such circuits are moderately fast, consume little power, and can be manufactured in very small sizes. *Acronym:* I^2L (I`tōō-L´), IIL (I`I-L´). *Also called* merged transistor logic. *See also* NPN transistor, PNP transistor.

Integrated Services Digital Network \in`tə-grā-təd sər`və-səz dij`ə-təl net´wərk\ *n. See* ISDN.

integrated software \in`tə-grā-təd soft´wâr\ *n.* A program that combines several applications, such as word processing, database management, and spreadsheets, in a single package. Such software is "integrated" in two ways: it can transfer data from one of its applications to another, helping users coordinate tasks and merge information created with the different software tools; and it provides the user with a consistent interface for choosing commands, managing files, and otherwise interacting with the programs so that the user will not have to master several, often very different, programs. The applications in an integrated software package are often not, however, designed to offer as much capability as single applications, nor does integrated software necessarily include all the applications needed in a particular environment.

integration \in`tə-grā´shən\ *n.* **1.** In computing, the combining of different activities, programs, or hardware components into a functional unit. *See also* integral modem, integrated software, ISDN. **2.** In electronics, the process of packing multiple electronic circuit elements on a single chip. *See also* integrated circuit. **3.** In mathematics, specifically calculus, a procedure performed on an equation and related to finding the area under a given curve or the volume within a given shape.

integrator \in´tə-grā`tər\ *n.* A circuit whose output represents the integral, with respect to time, of the input signal—that is, its total accumulated value over time. See the illustration. *Compare* differentiator.



Integrator. An example of the action of an integrator circuit.

integrity \in-te´grə-tē\ *n.* The completeness and accuracy of data stored in a computer, especially after it has been manipulated in some way. *See also* data integrity.

intelligence \in-tel´ə-jəns\ *n.* **1.** The ability of hardware to process information. A device without intelligence is said to be dumb; for example, a dumb terminal connected to a computer can receive input and display output but cannot

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interapplication communication \in`tər-a-plə-kā`shən kə-myo͞o-nə-kā´shən\ *n.* The process of one program sending messages to another program. For example, some e-mail programs allow users to click on a URL within the message. After the user clicks on the URL, a browser will automatically launch and access the URL.

interblock gap \in`tər-blok gap´\ *n. See* interrecord gap.

Interchange File Format \in`tər-chānj fīl´ fôr-mat\ *n. See* .iff.

Interchange Format \in´tər-chānj fôr`mat\ *n. See* Rich Text Format.

interface \in´tər-fās`\ *n.* **1.** The point at which a connection is made between two elements so that they can work with each other. **2.** Software that enables a program to work with the user (the user interface, which can be a command-line interface, menu-driven, or a graphical user interface), with another program such as the operating system, or with the computer's hardware. **3.** A card, plug, or other device that connects pieces of hardware with the computer so that information can be moved from place to place. For example, standardized interfaces such as RS-232-C standard and SCSI enable communications between computers and printers or disks. *See also* RS-232-C standard, SCSI. **4.** A networking or communications standard, such as the ISO/OSI model, that defines ways for different systems to connect and communicate.

interface adapter \in´tər-fās ə-dap`tər\ *n. See* network adapter.

interface card \in´tər-fās kärd`\ *n. See* adapter.

interference \in`tər-fēr´əns\ *n.* **1.** Noise or other external signals that affect the performance of a communications channel. **2.** Electromagnetic signals that can disturb radio or television reception. The signals can be generated naturally, as in lightning, or by electronic devices, such as computers.

Interior Gateway Protocol \in-tēr`ē-ər gāt`wā prō´tə-kol\ *n. See* IGP.

Interior Gateway Routing Protocol \in-tēr`ē-ər gāt`wā ro͞o´tēng prō`tə-kol, rout´ēng\ *n. See* IGRP.

interlacing \in´tər-lā`sēng\ *n.* A technique used in some raster-scan video displays in which the electron beam refreshes (updates) all odd-numbered scan lines in one vertical sweep of the screen and all even-numbered scan lines in the next sweep. Because of the screen phosphor's ability to maintain an image for a short time before fading and the tendency of the human eye to average or blend subtle differences in light intensity, the human viewer sees a complete display, but the amount of information carried by the display signal and the number of lines that must be displayed per sweep are halved. *Compare* noninterlaced.

interleave \in´tər-lēv\ *vb.* To arrange the sectors on a hard disk in such a way that after one sector is read, the next sector in numeric sequence will arrive at the head when the computer is ready to accept it rather than before, which would make the computer wait a whole revolution of the platter for the sector to come back. Interleaving is set by the format utility that initializes a disk for use with a given computer.

interleaved memory \in`tər-lēvd mem´ər-ē\ *n.* A method of organizing the addresses in RAM memory in order to reduce wait states. In interleaved memory, adjacent locations are stored in different rows of chips so that after accessing a byte, the processor does not have to wait an entire memory cycle before accessing the next byte. *See also* access time (definition 1), wait state.

interlock \in´tər-lok\ *vb.* To prevent a device from acting while the current operation is in progress.

intermediate language \in`tər-mē`dē-ət lang´wəj\ *n.* A computer language used as an intermediate step between the original source language, usually a high-level language, and the target language, usually machine code. Some high-level compilers use assembly language as an intermediate language. *See also* compiler (definition 2), object code.

intermittent \in`tər-mit´ənt\ *adj.* Pertaining to something, such as a signal or connection, that is not unbroken but occurs at periodic or occasional intervals.

intermittent error \in`tər-mit`ənt âr´ər\ *n.* An error that recurs at unpredictable times.

internal clock \in-tər`nəl klok´\ *n. See* clock/calendar.

internal command \in-tər`nəl kə-mand´\ *n.* A routine that is loaded into memory along with the

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about 15 MB of disk space. Features include the Internet Hall of Flame and the Geek of the Week. *Acronym:* ITR (I`T-R´).

Internet telephone \in`tər-net tel´ə-fōn\ *n.* Point-to-point voice communication that uses the Internet instead of the public-switched telecommunications network to connect the calling and called parties. Both the sending and the receiving party need a computer, a modem, an Internet connection, and an Internet telephone software package to make and receive calls.

Internet television \in`tər-net tel´ə-vizh-ən\ *n.* The transmission of television audio and video signals over the Internet.

internetwork \in`tər-net´wərk\ *adj.* Of or pertaining to communications between connected networks. Often used to refer to communication between one local area network and another over the Internet or another wide-area network. *See also* LAN, wide area network.

Internetwork Packet Exchange \in`tər-net-wərk pak´ət eks-chānj`\ *n. See* IPX.

Internet Worm \in`tər-net wərm`\ *n.* A string of self-replicating computer code that was distributed through the Internet in November 1988. In a single night, it overloaded and shut down a large portion of the computers connected to the Internet at that time by replicating itself over and over on each computer it accessed, exploiting a bug in UNIX systems. Intended as a prank, the Internet Worm was written by a student at Cornell University. *See also* back door, worm.

InterNIC \in´tər-nik`, in`tər-N-I-C´\ *n.* Short for NSFnet (**Inter**net) **N**etwork **I**nformation **C**enter. The organization that is charged with registering domain names and IP addresses as well as distributing information about the Internet. InterNIC was formed in 1993 as a consortium involving the U.S. National Science Foundation, AT&T, General Atomics, and Network Solutions Inc. (Herndon, Va.). The latter partner administers InterNIC Registration Services, which assigns Internet names and addresses. InterNIC can be reached by e-mail at info@internic.net or on the Web at http://www.internic.net/.

interoperability \in`tər-op`ər-ə-bil´ə-tē\ *n.* Referring to components of computer systems that are able to function in different environments. For example, Microsoft's NT operating system is interoperable on Intel, DEC Alpha, and other CPUs. Another example is the SCSI standard for disk drives and other peripheral devices that allows them to interoperate with different operating systems. With software, interoperability occurs when programs are able to share data and resources. Microsoft Word, for example, is able to read files created by Microsoft Excel.

interpolate \in-tər´pə-lāt\ *vb.* To estimate intermediate values between two known values in a sequence.

interpret \in-tər´prət\ *vb.* **1.** To translate a statement or instruction into executable form and then execute it. **2.** To execute a program by translating one statement at a time into executable form and executing it before translating the next statement, rather than by translating the program completely into executable code (compiling it) before executing it separately. *See also* interpreter. *Compare* compile.

interpreted language \in-tər`prə-təd lang´wəj\ *n.* A language in which programs are translated into executable form and executed one statement at a time rather than being translated completely (compiled) before execution. Basic, LISP, and APL are generally interpreted languages, although Basic can also be compiled. *See also* compiler. *Compare* compiled language.

interpreter \in-tər´prə-tər\ *n.* A program that translates and then executes each statement in a program written in an interpreted language. *See also* compiler, interpreted language, language processor.

interprocess communication \in`tər-pros`es kə-myōō-nə-kā´shən\ *n.* The ability of one task or process to communicate with another in a multitasking operating system. Common methods include pipes, semaphores, shared memory, queues, signals, and mailboxes. *Acronym:* IPC (I`P-C´).

inter-record gap \in`tər-ek`ərd gap´\ *n.* An unused space between data blocks stored on a disk or tape. Because the speed of disks and tapes fluctuates slightly during operation of the drives, a new data block may not occupy the exact space occupied by the old block it overwrites. The inter-record gap prevents the new block from overwrit-

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J

J \J\ *n.* A high-level programming language created by the developer of APL, Kenneth Iverson. J is a successor language to APL that may be run on many platforms, including DOS, Windows, OS/2, and Macintosh. Like APL, J is used primarily by mathematicians. *See also* APL.

jabber \jab´ər\ *n.* A continuous stream of random data transmitted over a network as the result of some malfunction.

jack \jak\ *n.* A connector designed to receive a plug. A jack is commonly used in making audio and video connections.

jacket \jak´ət\ *n. See* disk jacket.

jack in \jak` in´\ *vb.* **1.** To log on to a computer. **2.** To connect to a network or BBS, especially for purposes of entering an IRC or a virtual reality simulation, such as a MUD (to leave is to *jack out*). *See also* IRC, MUD.

Jacquard loom \jak`ərd lo͞om´\ *n.* The first machine that used punched cards to control its operation. In this loom, developed in 1801 by French inventor Joseph-Marie Jacquard, up to 24,000 cards were placed on a rolling drum. Where a hole was punched on a card, one of a set of rods could pass through and select a particular thread to be woven into the pattern. Jacquard was awarded a medal by the Emperor Napoleon for his invention. Later in the nineteenth century, punched cards were used in Charles Babbage's computer-like Analytical Engine and in Herman Hollerith's statistical tabulating machine. *See also* Analytical Engine, Hollerith tabulating/recording machine.

jaggies \jag´ēz\ *n.* The "stairsteps" that appear in diagonal lines and curves drawn at low resolutions in computer graphics. *Also called* aliasing.

Janet \jan´ət\ *n.* Short for the **J**oint **A**cademic **Net**work. A wide area network in the United Kingdom that serves as the principal backbone for the Internet in that country. *See also* backbone (definition 1).

Java \jä´və\ *n.* An object-oriented programming language, developed by Sun Microsystems, Inc. Similar to C++, Java is smaller, more portable, and easier to use than C++ because it is more robust and it manages memory on its own. Java was also designed to be secure and platform-neutral (meaning that it can be run on any platform) through the fact that Java programs are compiled into bytecodes, which are similar to machine code and are not specific to any platform. This makes it a useful language for programming Web applications, since users access the Web from many types of computers. Currently, the most widespread use of Java is in programming small applications, or applets, for the World Wide Web. *See also* bytecode, Java applet, object-oriented programming.

Java applet \jä´və a`plət\ *n.* A Java class that is loaded and run by an already-running Java application such as a Web browser or an applet viewer. Java applets can be downloaded and run by any Web browser capable of interpreting Java, such as Internet Explorer, Netscape Navigator, and HotJava. Java applets are frequently used to add multimedia effects and interactivity to Web pages, such as background music, real-time video displays, animations, calculators, and interactive games. Applets can be activated automatically when a user views a page, or they may require some action on the part of the user, such as clicking on an icon in the Web page. *See also* applet, Java.

Java chip \jä´və chip`\ *n.* An implementation on a single integrated circuit of the virtual machine specified for execution of the Java programming language. Such chips, which are being developed by Sun Microsystems, Inc., could be used in very small devices and as controllers for appliances. *See also* integrated circuit, Java, virtual machine.

Java-compliant browser \jä`və kəm-plī`ənt brou´zər\ *n.* A Web browser with support for the Java

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Java-compliant browser \jä`və kəm-plī`ənt brou´zər\ *n.* A Web browser with support for the Java

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programming language built into it. Most current Web browsers are Java-compliant. *See also* Java, Web browser.

Java Developer's Kit \jä'və də-vel'ə-pərz kit'\ *n.* A set of software tools developed by Sun Microsystems, Inc., for writing Java applets or applications. The kit, which is distributed free, includes a Java compiler, interpreter, debugger, viewer for applets, and documentation. *Acronym:* JDK (J'D-K'). *See also* applet, Java, Java applet.

Java Management Application Programming Interface \jä'və 'man'əj-mənt a-plə-kā'shən prō'gram-ēng in'tər-fās\ *n.* A set of application programming interface specifications, proposed by Sun Microsystems, Inc., to enable the Java language to be used for network management. *Acronym:* JMAPI (J'map'ē, J'M-A-P-I'). *See also* application programming interface, Java.

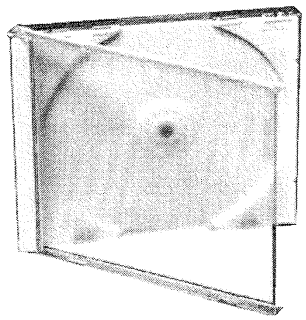
JavaScript \jä'və-skript'\ *n.* A scripting language developed by Netscape Communications and Sun Microsystems, Inc. that is loosely related to Java. JavaScript, however, is not a true object-oriented language, and it is limited in performance compared with Java because it is not compiled. Basic online applications and functions can be added to Web pages with JavaScript, but the number and complexity of available application programming interface functions are fewer than those available with Java. JavaScript code, which is included in a Web page along with the HTML code, is generally considered easier to write than Java, especially for novice programmers. A JavaScript-compliant Web browser, such as Netscape Navigator, is necessary to run JavaScript code. *See also* application programming interface, HTML, scripting language. *Compare* Java.

Java terminal \jä'və tər'mə-nəl\ *n.* A type of personal computer with a reduced number of components that is built primarily to provide an access terminal to the Web, including downloadable Java applets. Typically, such machines will not have locally addressable hard disks or installable programs but will obtain any necessary materials, including Java applets, for the user from somewhere on the network. Centrally obtained software is generally less expensive to administer but usually requires some download delay before usage may begin. Java terminals, currently under development by Sun Microsystems, Inc., are similar in concept to NetPCs. *See also* Java, Java applet, network computer. *Compare* NetPC.

JCL \J'C-L'\ *n.* Acronym for **J**ob **C**ontrol **L**anguage. A command language used in IBM OS/360 mainframe systems. JCL is used to launch applications and specifies information on running time, program size, and the program files used for each application. *See also* command language.

JDK \J'D-K'\ *n.* *See* Java Developer's Kit.

jewel box \jo͞o'əl boks, jo͞ol'\ *n.* A clear plastic container used to package and store a compact disc. See the illustration. *Also called* jewel case.



Jewel box.

.jfif \dot'J-F-I-F'\ *n.* The file extension that identifies graphic image files in the JPEG File Interchange Format. *See also* JPEG.

JIT \J'I-T'\ *n.* *See* just-in-time.

jitter \jit'ər\ *n.* **1.** Small vibrations or fluctuations in a displayed video image caused by irregularities in the display signal. Jitter is often visible in the form of horizontal lines that are of the same thickness as scan lines. **2.** A rough appearance in a fax caused by dots that are incorrectly recorded during the scanning process and thus wrongly positioned in the output. **3.** In digital communication, distortion caused by lack of synchronization of signals.

.jm \dot'J-M'\ *n.* On the Internet, the major geographic domain specifying that an address is located in Jamaica.

JMAPI \J'map'ē, J'M-A-P-I'\ *n.* *See* Java Management Application Programming Interface.

.jo \dot'J-O'\ *n.* On the Internet, the major geographic domain specifying that an address is located in Jordan.

job \job\ *n.* A specified amount of processing performed as a unit by a computer. On early

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mainframe computers, data was submitted in batches, often on punched cards, for processing by different programs; work was therefore scheduled and carried out in separate jobs, or operations.

Job Control Language \jŏb´ kən-trōl` lang`wəj\ *n. See* JCL.

job processing \jŏb´ pros`es-ēng\ *n.* A computing method in which a series of jobs, each consisting of one or more tasks grouped together as a computationally coherent whole, is processed sequentially. *See also* batch processing (definition 2).

job queue \jŏb´ kyōō`\ *n.* A list of programs or tasks waiting for execution by a computer. Jobs in the queue are often ordered according to some basis of priority. *See also* queue.

join \join\ *n.* **1.** A database table operation that creates a resultant entry in another table for each entry in the one table whose key field matches that of an entry in the other. *See also* inner join. **2.** A multiprocessing command that causes a child process to return control to its parent. *See also* child (definition 1), multiprocessing.

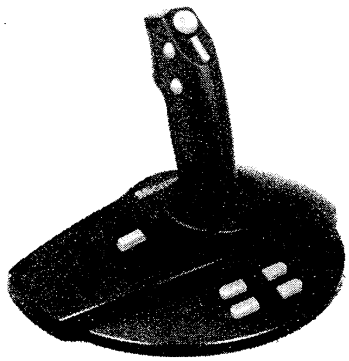
Joint Photographic Experts Group \joint` fō`tə-graf`ik eks´pərts grōōp`\ *n. See* JPEG (definition 1).

Joliet \jō`lē-et´\ *n.* An extension to the ISO 9660 (1988) standard developed to include long filenames or filenames outside the 8.3 convention. This format is used in some new CD-ROMs for operating systems, such as Windows 95, that can handle such filenames. *See also* 8.3, ISO 9660, long filenames.

Josephson junction \jō´zəf-sən junk`shən\ *n.* A cryoelectronic device that can attain extremely high circuit-switching speeds. In the Josephson effect, when two superconducting materials are in close proximity but are separated by an insulator, electric current can jump or tunnel through the gap.

journal \jər´nəl\ *n.* A computer-based log or record of transactions that take place in a computer or across a network. A journal could be used, for example, to record message transfers on a communications network, to keep track of system activities that alter the contents of a database, or to maintain a record of files that have been archived for storage or deleted from the system. A journal is often kept as a means of reconstructing events or sets of data should they become lost or damaged. *See also* audit trail.

joystick \joi´stik`\ *n.* A pointing device used mainly but not exclusively for computer games. A joystick has a base, on which control buttons can be mounted, and a vertical stem, which the user can move in any direction to control the movement of an object on the screen; the stem may also have control buttons. The buttons activate various software features, generally producing on-screen events. A joystick is usually used as a relative pointing device, moving an object on the screen when the stem is moved and stopping the movement when the stem is released. In industrial control applications, the joystick can also be used as an absolute pointing device, with each position of the stem mapped to a specific location on the screen. See the illustration. *See also* absolute pointing device, relative pointing device.



Joystick.

.jp \dot`J-P´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Japan.

.jpeg \dot`J´peg, dot`J-P-E-G´\ *n.* The file extension that identifies graphic images files in the JPEG format. *See also* JPEG.

JPEG \J`peg\ *n.* **1.** Acronym for **J**oint **P**hotographic **E**xperts **G**roup. An ISO/ITU standard for storing images in compressed form using a discrete cosine transform. JPEG trades off compression against loss; it can achieve a compression ratio of 100:1 with significant loss and possibly 20:1 with little noticeable loss. **2.** A graphic stored as a file in the JPEG format.

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.jpg \dot-J`P-G´\ *n.* The file extension that identifies graphic images encoded in the JPEG File Interchange Format, as originally specified by the Joint Photographic Experts Group (JPEG). Inline graphics on World Wide Web pages are often .jpg files, such as coolgraphic.jpg. *See also* JPEG (definition 2).

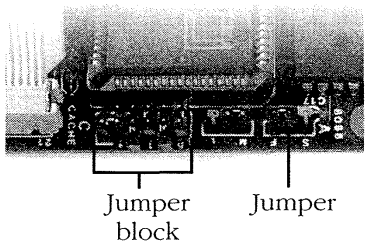
Jughead \jug´hed\ *n.* Acronym for **J**onzy's **U**niversal **G**opher **H**ierarchy **E**xcavation **a**nd **D**isplay. An Internet service that enables a user to locate directories in Gopherspace through a keyword search. A Jughead server indexes keywords appearing in directory titles in top-level Gopher menus but does not index the files within the directories. To access Jughead, users must point their Gopher clients to a Jughead server. *See also* Gopher, Gopherspace. *Compare* Archie, Veronica.

jukebox \jo͞ok´boks\ *n.* Software that is designed to play a list of sound files in a user-specified order reminiscent of jukeboxes used to play vinyl records. *See also* CD-ROM jukebox.

Julian calendar \jo͞o`lē-ən kal´ən-dər\ *n.* The calendar introduced by Julius Caesar in 46 B.C. to replace the lunar calendar. The Julian calendar provided for a year of 365 days with a leap year every 4 years, or an average year length of 365.25 days. Because the solar year is slightly shorter, the Julian calendar gradually moved out of phase with the seasons and was superseded by the Gregorian calendar, introduced by Pope Gregory XIII. *Compare* Gregorian calendar.

Julian date \jo͞o´lē-ən dāt`\ *n.* **1.** A date expressed as the number of days elapsed since January 1, 4713 B.C. (on the Julian calendar)—for example, 2,450,000 for October 9, 1995 (Gregorian). Julian dates are useful for finding elapsed times between events that may be many years apart, as in astronomy. The starting point is the beginning of the Julian Period, defined in 1583 by Joseph Scaliger as the coincidence of several cycles based on the Julian calendar. *Acronym:* JD (J-D´). *See also* Gregorian calendar, Julian calendar. **2.** Often (but incorrectly), a date expressed as the year and the number of days elapsed since the beginning of the year—for example, 91.13 for January 13, 1991.

jumper \jum´pər\ *n.* A small plug or wire that can be connected between different points in an electronic circuit in order to alter an aspect of a hardware configuration. See the illustration. *Compare* DIP switch.



Jumper. A group of jumpers is referred to as a jumper block.

jump instruction \jump´ in-struk`shən\ *n.* An instruction that transfers the flow of execution from one statement or instruction to another. *See also* GOTO statement, transfer statement.

jump table \jump´ tā`bl\ *n. See* dispatch table.

junction \junk´shən\ *n.* **1.** Any point at which two or more electrical components are connected. **2.** The contact between two types of semiconductors, such as N-type and P-type semiconductors. *See also* N-type semiconductor, P-type semiconductor, semiconductor.

justify \jus´tə-fī`\ *vb.* **1.** To align vertically. **2.** To align lines of text evenly along both the left and right margins of a column by inserting extra space between the words in each line. If the spacing is excessive, it can be reduced by rewriting or by hyphenating words at the ends of lines. *See also* align (definition 1). *Compare* rag.

just-in-time \just`in-tīm´\ *adj.* **1.** Describing a system of inventory control and industrial production management based on the Japanese *kanban* system. Under a just-in-time system, workers receive materials from suppliers "just in time" for scheduled manufacturing to take place. Line workers generally signal that they require materials by means of a card or a computerized request system. *Acronym:* JIT (J`I-T´). **2.** Describes a compiler that compiles Java on the fly. *See also* Java, on the fly.

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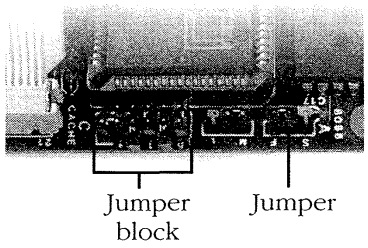
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K

K[1] \K, kil´ō-bīt`\ *n.* Short for **k**ilobyte.

K[2] \K, kil´ō\ *prefix See* kilo-.

K&R C \K`ənd-R C´\ *n.* Short for (Brian W.) **K**ernighan and (Dennis M.) **R**itchie **C**. The version of the C programming language, defined by those two authors, that was the informal C standard until a more formal standard was developed by an ANSI committee. *See also* C.

.k12.us \dot-K-twelv`dot-U-S´\ *n.* On the Internet, the major geographic domain specifying that an address is a U.S. K–12 (kindergarten through high school) educational site.

Kb \kil´ə-bit`, K-B´\ *n. See* kilobit.

KB \kil´ə-bīt`, K-B´\ *n. See* kilobyte.

Kbit \K´bit, kil´ə-bit`\ *n. See* kilobit.

Kbps \K`B-P-S´\ *n. See* kilobits per second.

Kbyte \K´bīt, kil´ə-bīt`\ *n. See* kilobyte.

kc \K-C´\ *n. See* kilocycle.

.ke \dot`K-E´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Kenya.

Kerberos or **kerberos** \kər´bər-os`\ *n.* A network authentication protocol developed by MIT. Kerberos authenticates the identity of users attempting to log on to a network and encrypts their communications through secret-key cryptography. A free implementation of Kerberos is available from MIT (http://web.mit.edu/kerberos/www/), although it is also available in many commercial products. *See also* authentication, cryptography.

Kermit \kər´mit\ *n.* A file transfer protocol used in asynchronous communications between computers. Kermit is a very flexible protocol used in many software packages designed for communications over telephone lines. *Compare* Xmodem, Ymodem, Zmodem.

kern \kərn\ *vb.* To alter selectively the distance between pairs of letters for readability and to make the type spacing more balanced and proportional. See the illustration.

kernel \kər´nəl\ *n.* The core of an operating system—the portion of the system that manages memory, files, and peripheral devices; maintains the time and date; launches applications; and allocates system resources.

key \kē\ *n.* **1.** On a keyboard, the combination of a plastic keycap, a tension mechanism that suspends the keycap but allows it to be pressed down, and an electronic mechanism that records the key press and key release. **2.** In database management, an identifier for a record or group of records in a datafile. *See also* B-tree, hash[2], index[1] (definition 1), inverted list, key field. **3.** The code for deciphering encrypted data. **4.** A metal object used with a physical lock to disable a computer system.

keyboard \kē´bōrd\ *n.* A set of switches that resembles a typewriter keyboard and that conveys information from a user to a computer or data communications circuit. *See also* Alt key, Apple key, arrow key, Backspace key, Break key, Caps Lock key, character code, Clear key, Command key, control character, Control key, Delete key, Dvorak keyboard, End key, enhanced keyboard, Enter key, ergonomic keyboard, Escape key, function key, Help key, Home key, Insert key, keyboard buffer, keyboard controller, keyboard enhancer, keycap, key code, Num Lock key, numeric keypad, Option key, original Macintosh keyboard, Page Down key, Page Up key, Pause key, PC/XT keyboard, Power-on key, Print Screen

AWAKE
AWAKE

Kern. ***The first three letters of the second example are kerned.***

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key, QWERTY keyboard, Return key, scan code, Scroll Lock key, Shift key, Sys Req key, Tab key.

keyboard buffer \kē´bōrd buf`ər\ *n.* A small amount of system memory that stores the most recently typed characters. This buffer is used to store typed characters that have not yet been processed. *Also called* type-ahead buffer.

keyboard controller \kē´bōrd kən-trō`lər\ *n.* A microprocessor installed in a keyboard whose primary function is to wait for and report on keystrokes.

keyboard enhancer \kē´bōrd en-han`sər\ *n.* A program that monitors keystrokes as they are typed and that can be used to redefine the meaning of certain keys or key combinations. Keyboard enhancers are used to create and store macros—sets of keystrokes, mouse actions, menu selections, or other instructions—that are then assigned to keys. *Also called* macro program.

keyboard layout \kē´bōrd lā`out\ *n.* The key arrangement used for a particular keyboard, including such factors as the number of keys (101 is the current standard) and the configuration of the keys (QWERTY is the United States standard). Some proprietary systems use different layouts, and many allow you to map the keys to characters according to your preferences.

keyboard processor \kē´bōrd pros`es-ər\ *n. See* keyboard controller.

keyboard repeat \kē`bōrd rē-pēt´\ *n. See* typematic.

keyboard shortcut \kē`bōrd shōrt´kut\ *n. See* application shortcut key.

keyboard template \kē´bōrd tem`plāt, tem`plət\ *n.* A piece of plastic or heavy paper that fits over or around part of the keyboard, such as the function keys, and has information printed on it about the meanings of the keys.

keycap \kē´kap\ *n.* The plastic piece identifying a key on a keyboard.

key code \kē´ kōd\ *n.* A unique code number assigned to a particular key on a computer keyboard, used to tell the computer which key has been pressed or released. A key code is a special identifier for the key itself and is always the same for a particular key, regardless of the letter, number, or symbol on the key or the character generated by the key. *Compare* character code, scan code.

key escrow \kē` es´krō\ *n.* An encryption method in which a key is provided to a third party approved by a government agency so that any encrypted message can be read by the government. *See also* encryption. *Compare* key recovery.

key field \kē´ fēld\ *n.* A field in a record structure or an attribute of a relational table that has been designated to be part of a key. Any field can be keyed, or indexed, to improve or simplify the performance of retrieval and/or update operations. *See also* attribute (definition 1), field (definition 1), primary key.

key-frame \kē´frām\ *adj.* Describing animation in which starting and ending positions of an object are given, and all frames in between are interpolated by a computer to produce smooth automated animation. Most ray-traced computer animation is created using this technique. *See also* ray tracing.

key in \kē in´\ *vb.* To enter information into a computer by typing it on the computer's keyboard.

keypad \kē´pad\ *n. See* numeric keypad.

keypunch \kē´punch\ *n.* A keyboard-activated device used to punch holes in predetermined locations on paper cards roughly the size of a business envelope. It was used to provide programs and data to early computing systems.

key recovery \kē´ re-kə`vər-ē\ *n.* A private key encryption method that enables an authorized party (such as a government agency), using special software, to recover the key from the encrypted data. Under current law, any encryption software exported from the United States after 1998 must implement key recovery. This requirement supplants an earlier proposed requirement that encryption software for export implement key escrow. *See also* encryption, private key. *Compare* key escrow.

key sort \kē´ sōrt\ *n. See* tag sort.

keystroke \kē´strōk\ *n.* The act of pressing a key on a keyboard to enter a character or initiate a command in a program. The efficiency and ease of use of certain applications is often measured in terms of how many keystrokes it takes to perform common operations. *See also* command, key (definition 1), keyboard.

keyword \kē´wərd\ *n.* **1.** A characteristic word, phrase, or code that is stored in a key field and is

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used to conduct sorting or searching operations on records. *See also* key field. **2.** Any of the set of words that composes a given programming language or set of operating-system routines. *See also* reserved word.

keyword-in-context \kē`wərd-in-kon´tekst\ *n.* An automatic search methodology that creates indexes of document text or titles. Each keyword is stored in the resulting index along with some surrounding text, usually the word or phrase that precedes or follows the keyword in the text or title. *Acronym:* KWIC (kwik, K`W-I-C´).

.kh \dot`K-H´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Cambodia.

Khornerstone \kōr´nər-stōn`\ *n.* A benchmark of floating-point calculation performance used to test UNIX workstations. *See also* benchmark[1], Dhrystone, floating-point operation, Whetstone.

kHz \kil´ə-hərts\ *n. See* kilohertz.

.ki \dot`K-I´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Kiribati.

kill \kil\ *vb.* **1.** To stop or abort a process in a program or operating system. **2.** In file management, to erase a file, often without hope of reversing the action.

killer app \kil`ər ap´\ *n.* **1.** An application of such popularity and widespread standardization that it fuels sales of the hardware platform or operating system for which it was written. *See also* application. **2.** An application that supplants its competition. *See also* application.

kill file \kil´ fīl\ *n. See* bozo filter.

kilo- \kil´ō, kē´lō\ *prefix* **1.** Metric prefix meaning 10^3 (one thousand). **2.** In computer-related terms, a prefix meaning 2^{10} (1,024).

kilobaud \kil´ə-bäd, kil´ə-bôd\ *n.* A unit of measure of the transmission capacity of a communications channel, equal to 2^{10} (1,024) baud. *See also* baud.

kilobit \kil´ə-bit`\ *n.* Abbreviated Kb or Kbit. A data unit equal to 1,024 bits.

kilobits per second \kil`ə-bits pər sek´ənd\ *n.* Abbreviated Kbps. Data transfer speed, as on a network, measured in multiples of 1,024 bits per second.

kilobyte \kil´ə-bīt`\ *n.* Abbreviated K, KB, or Kbyte. A data unit of 1,024 bytes. *See also* kilo-.

kilocycle \kil´ə-sī`kl\ *n.* Abbreviated kc. A unit of measurement representing 1,000 cycles, generally meaning 1,000 cycles per second. *See also* kilohertz.

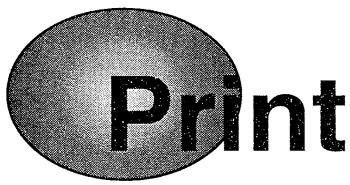
kilohertz \kil´ə-hərts\ *n.* Abbreviated kHz. A measure of frequency equivalent to 1,000 hertz, or 1,000 cycles per second. *See also* hertz.

Kinesis ergonomic keyboard \kə-nē`səs ər-gə-nom`ik kē´bōrd\ *n.* A keyboard designed ergonomically to eliminate repetitive strain injuries. *See also* ergonomic keyboard, repetitive strain injury.

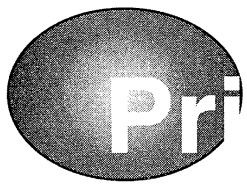
kiosk \kē´osk\ *n.* A freestanding computer or terminal that provides information to the public, usually through a multimedia display.

kludge \klōōj\ *n.* **1.** A short-term or makeshift hardware construction. **2.** A program characterized by a lack of design or forethought, as if written in a hurry to satisfy an immediate need. A kludge basically operates properly, but its construction or design is severely lacking in elegance or logical efficiency. *See also* braindamaged, hack[1] (definition 1), spaghetti code.

knockout \nok´out\ *n.* **1.** In multicolor printing, the process of removing from one image the overlapping parts of a graphic or text that are to be printed in a different color so that ink colors will not mix. See the illustration. *See also* spot color. *Compare* overprint. **2.** In hardware, a section of a panel that can be removed to make space for a switch or other component.



Overprint



Knockout

Knockout. A knockout allows an overlapping image to print in the correct color.

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knowbot \nō´bot\ *n.* Short for **know**ledge ro**bot**. An artificial-intelligence program that follows a set of predetermined rules to perform work, such as searching for files or looking for documents that contain specific pieces of information on a network, such as the Internet. *See also* bot (definition 2).

knowledge acquisition \nol`əj a`kwə-zish´ən\ *n.* The process of translating knowledge from one or more human experts into a form of representation usable by a computer, for the purpose of developing an expert system. *See also* expert system.

knowledge base \nol´əj bās`\ *n.* A form of database used in expert systems that contains the accumulated body of knowledge of human specialists in a particular field. The reasoning ability or problem-solving approach that a specialist would use is contained in the inference engine, which forms another crucial part of an expert system. *See also* expert system, inference engine.

knowledge-based system \nol`əj-bāsd si´stəm\ *n. See* expert system.

knowledge domain \nol´əj dō-mān`\ *n.* The specific area of expertise to which an expert system is devoted. *See also* expert system.

knowledge engineer \nol`əj en-jə-nēr´\ *n.* A computer scientist who builds an expert system by acquiring the needed knowledge and translating it into a program. *See also* expert system.

knowledge representation \nol`əj re-prə-zən-tā´shən\ *n.* The methodology that forms the basis for the decision-making structure in an expert system, usually taking the form of if-then rules. *See also* expert system.

Korn shell \kōrn´ shel\ *n.* A command-line interface, available under UNIX, that combines features of the Bourne and C shells. The Korn shell is fully compatible with the Bourne shell but also offers the history and command-line editing capability of the C shell. *See also* command-line interface, shell[1], UNIX. *Compare* Bourne shell, C shell.

.kp \dot`K-P´\ *n.* On the Internet, the major geographic domain specifying that an address is located in North Korea.

.kr \dot`K-R´\ *n.* On the Internet, the major geographic domain specifying that an address is located in South Korea.

KSR terminal \K`S-R´ tər`mə-nəl\ *n.* Short for **k**eyboard **s**end/**r**eceive **terminal.** A type of terminal that accepts input from a keyboard only and uses an internal printer rather than a screen to display the keyboard input and the output received from the sending terminal. *See also* TTY.

.kw \dot`K-W´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Kuwait.

KWIC \kwik, K`W-I-C´\ *n. See* keyword-in-context.

.ky \dot`K-Y´\ *n.* On the Internet, the major geographic domain specifying that an address is located in the Cayman Islands.

.kz \dot`K-Z´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Kazakhstan.

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L1 cache \L-wən´ kash`\ *n.* A memory cache built into i486 and higher-level processors. The L1 cache, typically containing 8 KB, can be read in a single clock cycle, so it is tried first. The i486 contains one L1 cache; the Pentium contains two, one for code and one for data. *Also called* level 1 cache, on-chip cache. *See also* cache, i486DX, Pentium. *Compare* L2 cache.

L2 cache \L-to͞o´ kash`\ *n.* A memory cache consisting of static RAM on a motherboard that uses an i486 or higher-level processor. The L2 cache, which typically contains 128 KB to 1 MB, is faster than the system DRAM but slower than the L1 cache built into the CPU chip. *Also called* level 2 cache. *See also* cache, dynamic RAM, i486DX, static RAM. *Compare* L1 cache.

L8R \lā´tər\ *adv.* Abbreviation for "later." As in "See you later," an expression often used in e-mail or Usenet groups as a closing remark.

.la \dot`L-A´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Laos.

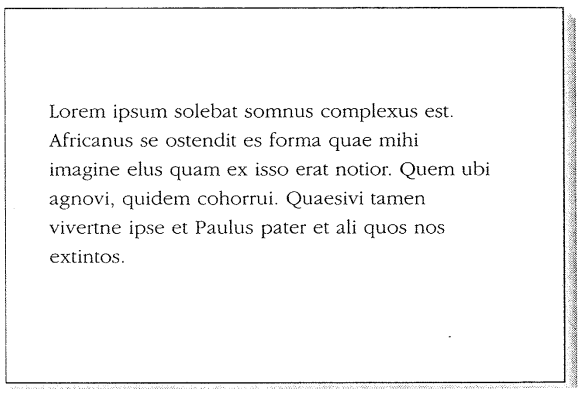
label \lā´bəl\ *n.* An identifier. A label can be a physical item, such as a stick-on tag used to identify disks and other computer equipment, or an electronic label added to floppy disks or hard disks. It can also be a word, symbol, or other group of characters used to identify a file, a storage medium, an element defined in a computer program, or a specific item in a document such as a spreadsheet or a chart. *See also* identifier.

label prefix \lā´bəl prē`fiks\ *n.* In a spreadsheet, a character at the beginning of a cell entry that identifies the entry to the program as a label.

lag \lag\ *n.* The time difference between two events. In electronics, a lag is a delay between a change in input and a change in output. On computer displays, a lag is a fading brightness left on the phosphor coating of the screen after an image changes. *See also* persistence.

LAN \lan\ *n.* Acronym for **l**ocal **a**rea **n**etwork. A group of computers and other devices dispersed over a relatively limited area and connected by a communications link that enables any device to interact with any other on the network. LANs commonly include microcomputers and shared resources such as laser printers and large hard disks. The devices on a LAN are known as nodes, and the nodes are connected by cables through which messages are transmitted. *See also* baseband network, broadband network, bus network, collision detection, communications protocol, contention, CSMA/CD, network, ring network, star network, token bus network, token passing, token ring network. *Compare* wide area network.

landscape mode \land´skāp mōd`\ *n.* A horizontal print orientation in which text or images are printed "sideways"—that is, the width of the image on the page is greater than the height. See the illustration. *Compare* portrait mode.



Landscape mode.

landscape monitor \land´skāp mon`ə-tər\ *n.* A monitor that is wider than it is high. Landscape monitors are usually about 33 percent wider than they are high—roughly the same proportion as a

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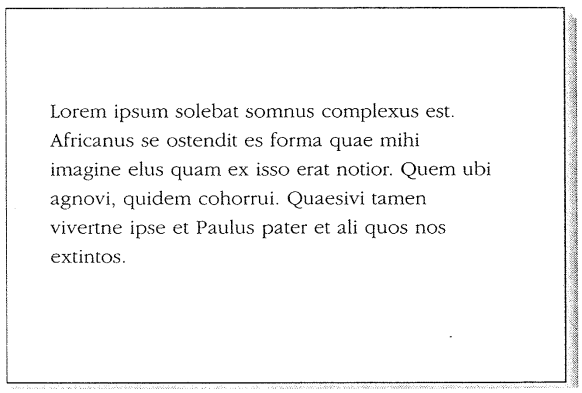
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television screen. *Compare* full-page display, portrait monitor.

language-description language \lang`wəj-də-skrip`shən lang´wəj\ *n.* *See* metalanguage.

language processor \lang´wəj pros`es-ər\ *n.* A hardware device or a software program designed to accept instructions written in a particular language and translate them into machine code. *See also* compiler (definition 2), interpreter.

language translation program \lang`wəj tranz-lā´shən prō`gram\ *n.* A program that translates statements written in one language into another language (usually from one high-level language into another). *See also* high-level language.

LAN Manager \lan´ man`ə-jər\ *n.* A local area network technology developed by Microsoft Corporation and distributed by Microsoft, IBM (as IBM LAN Server), and other original equipment manufacturers. LAN Manager connects computers running the MS-DOS, OS/2, or UNIX operating system and allows users to share files and system resources and to run distributed applications using a client/server architecture. *See also* client/server architecture, LAN.

laptop \lap´top\ *n.* A small, portable personal computer that runs on either batteries or AC power, designed for use during travel. Laptops have flat LCD or plasma screens and small keyboards. Most can run the same software as their desktop counterparts and can accept similar peripherals, such as sound cards, internal or external modems, and floppy disks and CD-ROM drives. Some laptops are designed to be plugged into a docking station, effectively making them desktop computers. Most have connectors for plugging in external keyboards and full-sized monitors. Older laptops weighed as much as 15 pounds; current laptops can weigh as little as 5 pounds, without peripherals such as floppy disk or CD-ROM drives. While *notebook* is the current term for ultralight portable computers, these machines are also commonly referred to as laptops. *See also* portable computer. *Compare* subnotebook computer.

large model \lärj` mod´əl\ *n.* A memory model of the Intel 80x86 processor family. The large model allows both code and data to exceed 64 kilobytes, but the total of both must generally be less than 1 megabyte. Each data structure must be less than 64 kilobytes in size. *See also* memory model.

large-scale integration \lärj`skāl in-tə-grā´shən\ *n.* A term describing the concentration of between 100 and 5,000 circuit elements on a single chip. *Acronym:* LSI (L`S-I´). *See also* integrated circuit. *Compare* medium-scale integration, small-scale integration, super-large-scale integration, ultra-large-scale integration, very-large-scale integration.

laser or **LASER** \lā´zər\ *n.* Acronym for **l**ight **a**mplification by **s**timulated **e**mission of **r**adiation. A device that uses certain quantum effects to produce coherent light, which travels with greater efficiency than noncoherent light because the beam diverges only slightly as it travels. Lasers are used in computer technology to transmit data through fiber-optic cables, to read and write data on CD-ROMs, and to place an image on a photosensitive drum in laser printers.

laser engine \lā´zər en`jən\ *n.* *See* printer engine.

laser printer \lā´zər prin`tər\ *n.* An electrophotographic printer that is based on the technology used by photocopiers. A focused laser beam and a rotating mirror are used to draw an image of the desired page on a photosensitive drum. This image is converted on the drum into an electrostatic charge, which attracts and holds toner. A piece of electrostatically charged paper is rolled against the drum, which pulls the toner away from the drum and onto the paper. Heat is then applied to fuse the toner to the paper. Finally, the electrical charge is removed from the drum, and the excess toner is collected. By omitting the final step and repeating only the toner-application and paper-handling steps, the printer can make multiple copies. The only serious drawback of a laser printer is that it offers less paper-handling flexibility than do dot-matrix printers. Both multipart forms and wide-carriage printing, for example, are better handled by line printers, dot-matrix printers, or daisy-wheel printers. *See also* electrophotographic printers, nonimpact printer, page printer. *Compare* daisy-wheel printer, dot-matrix printer, ion-deposition printer, LCD printer, LED printer.

laser storage \lā´zər stōr`əj\ *n.* The use of optical read/write technology with metallic discs for information storage. *See also* compact disc.

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LaserWriter 35 \lā`zər rī`tər thər`tē-fīv´\ *n.* The standard set of 35 PostScript fonts for the Apple LaserWriter family of laser printers. *See also* laser printer, PostScript font.

last in, first out \last in` fərst out´\ *n.* A method of processing a queue in which items are removed in inverse order relative to the order in which they were added—that is, the last in is the first out. *Acronym:* LIFO (lī´fō, L`I-F-O´). *See also* stack. *Compare* first in, first out.

latch \lach\ *n.* A circuit or circuit element used to maintain a particular state, such as on or off, or logical true or false. A latch changes state only in response to a particular input. *See also* flip-flop.

late binding \lāt´ bīn`dēng\ *n. See* dynamic binding.

latency \lā´tən-sē\ *n.* The time required for a signal to travel from one point on a network to another. *See also* ping[1] (definition 1).

LaTeX[1] or **L^AT_EX** \lä-tek´\ *n.* A document preparation system based on TeX, developed by Leslie Lamport. By using simple, intuitive commands for text elements such as headers, LaTeX lets the user focus more on document content than document appearance. *See also* header (definition 1), TeX.

LaTeX[2] \lä-tek´\ *vb.* To process a LaTeX file. *See also* LaTeX[1].

launch \länch, lônch\ *vb.* To activate an application program (especially on the Macintosh) from the operating system's user interface.

Launcher \län´chər, lôn´chər\ *n.* In Mac OS, a program that organizes frequently used applications and programs and that allows the user to execute them with a single mouse click.

.la.us \dot-L-A`dot-U-S´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Louisiana, United States.

layer \lâr, lā´ər\ *n.* **1.** The protocol or protocols operating at a particular level within a protocol suite, such as IP within the TCP/IP suite. Each layer is responsible for providing specific services or functions for computers exchanging information over a communications network (such as the layers outlined in the ISO/OSI model shown in the table) and information is passed from one layer to the next. Although different suites have varying numbers of levels, generally the highest layer deals with software interactions at the application level, and the lowest governs hardware-level connections between different computers. *See also* ISO/OSI model, protocol stack, TCP/IP. **2.** In communications and distributed processing, a set of rules and standards that handles a particular class of events.

ISO/OSI MODEL

ISO/OSI layer	*Focus*
Application (highest level)	Program-to-program transfer of information
Presentation	Text formatting and display, code conversion
Session	Establishing, maintaining, and coordinating communication
Transport	Accurate delivery, service quality
Network	Transport routes, message handling and transfer
Data-link	Coding, addressing, and transmitting information
Physical	Hardware connections

layered interface \lârd` in´tər-fās, lā`ərd\ *n.* In programming, one or more levels of routines lying between an application and the computing hardware and separating activities according to the type of task the activities are designed to carry out. Ultimately, such an interface makes it easier to adapt a program to different types of equipment. See the illustration.

layering \lâr´ēng, lā´ər-ēng\ *n.* In computer graphics, the grouping of logically related elements in a drawing. Layering enables a program user to view, and work on independently, portions of a graphic instead of the entire drawing.

layout \lā´out\ *n.* **1.** The overall plan or design of a document system. *See also* page layout. **2.** In programming, the order and sequence of input and output. **3.** In computer design, the arrangement of circuits and other components of the system.

lazy evaluation \lā´zē ə-val-yə-wā´shən\ *n.* A programming mechanism that allows an evaluation action to be performed only when needed and only to a certain extent. Lazy evaluation allows a program to handle data objects such as extremely large tables and lists in a timely and effective manner.

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.lb \dot`L-B´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Lebanon.

.lc \dot`L-C´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Saint Lucia.

LCC \L`C-C´\ *n. See* leadless chip carrier.

lcd \L`C-D´\ *n.* In some FTP clients, the command that changes the current directory on the local system. *See also* FTP client.

LCD \L`C-D´\ *n. See* liquid crystal display.

LCD printer \L`C-D´ prin`tər\ *n.* Short for **l**iquid **c**rystal **d**isplay **printer**. An electrophotographic printer similar to a laser printer and often incorrectly labeled as one. LCD printers use a bright light source, typically a halogen lamp. *Also called* liquid crystal shutter printer. *See also* electrophotographic printers, nonimpact printer, page printer. *Compare* ion-deposition printer, laser printer, LED printer.

LCD projector \L-C-D´ prə-jek`tər\ *n.* Short for **l**iquid **c**rystal **d**isplay **projector.** A device that casts an image of a computer's video output from a liquid crystal display onto a screen. *See also* liquid crystal display.

LDAP \L`D-A-P´\ *n. See* Lightweight Directory Access Protocol.

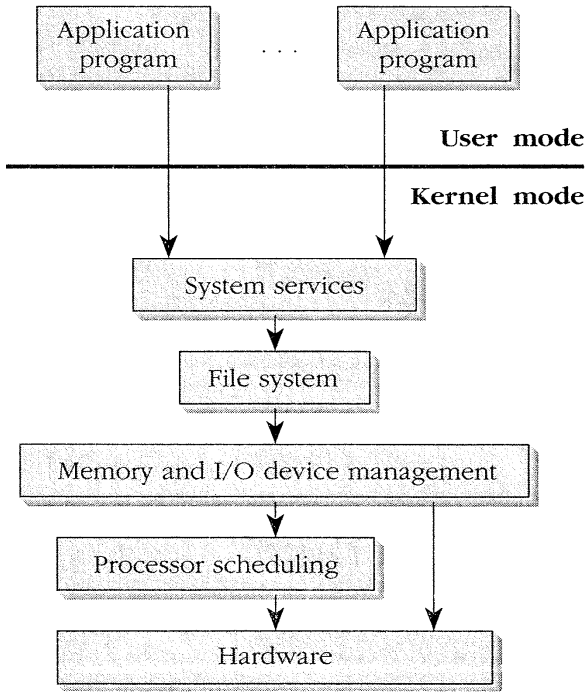
lead[1] \lēd\ *n.* In electronics, the metallic connector of certain components such as resistors and capacitors.

lead[2] \led\ *n.* In typography, the amount of vertical space between two lines of text.

leader \lē´dər\ *n.* A row of dots, hyphens, or other such characters used to lead the eye across a printed page to related information. Leaders can be created by many word processors and other programs.

leading \led´ēng\ *n.* The space, expressed in points, between lines of type, measured from the baseline (bottom) of one line to the baseline of the next. The term is derived from the traditional typesetting practice of inserting a thin bar of lead between lines of metal type. See the illustration on the next page. *See also* point[1] (definition 1).

leading edge \lē`dēng ej´\ *n.* The initial part of an electronic signal. If a digital signal switches from



Layered interface.

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link \lēnk\ *vb.* **1.** To produce an executable program from compiled modules (programs, routines, or libraries) by merging the object code (assembly language object code, executable machine code, or a variation of machine code) of the program and resolving interconnecting references (such as a library routine called by a program). *See also* linker. **2.** To connect two elements in a data structure by using index variables or pointer variables. *See also* index (definition 1), pointer (definition 1).

linkage editor \lēnk´əj ed`ə-tər\ *n. See* linker.

link edit \lēnk´ ed`it\ *vb. See* link (definition 1).

linked list \lēnkt list´\ *n.* In programming, a list of nodes or elements of a data structure connected by pointers. A singly linked list has one pointer in each node pointing to the next node in the list; a doubly linked list has two pointers in each node pointing to the next and previous nodes. In a circular list, the first and last nodes of the list are linked together. *See also* array, key (definition 2), list, node (definition 1), pointer (definition 1). *Compare* linear list.

linker \lēnk´ər\ *n.* A program that links compiled modules and data files to create an executable program. A linker can also have other functions, such as creating libraries. *See also* library, link (definition 1), program creation.

link time \lēnk´ tīm\ *n.* **1.** The length of time required to link a program. *See also* link (definition 1). **2.** The period during which a program is being linked. *See also* compile time (definition 2), link (definition 1), run time (definition 1).

link-time binding \lēnk´tīm bīn`dēng\ *n.* Assignment of a meaning to an identifier (such as a subroutine label) in a program at the time that various files of compiled code are linked together to form an executable program, rather than when the source code is compiled or when the program is run. *Compare* compile-time binding, run-time binding.

Linotronic \lī`nə-tron´ik\ *n.* Any in the series of high-quality typesetting devices known as Linotronic laser imagesetters, which can print at resolutions such as 1,270 and 2,540 dots per inch (dpi). These devices are commonly attached to PostScript raster image processors (RIPs) so that desktop publishing applications can typeset directly from a microcomputer. *See also* imagesetter, PostScript, raster image processor.

Linpack \lin´-pak\ *n.* A benchmarking routine that solves 100 simultaneous equations in a test of CPU, floating-point processor, and memory access speeds. *See also* benchmark[2], central processing unit, floating-point processor.

Linux \lē´nuks, lin´uks\ *n.* A version of the UNIX System V Release 3.0 kernel developed for PCs with 80386 and higher-level microprocessors. Developed by Linus Torvalds of Sweden (for whom it is named) along with numerous collaborators worldwide, Linux is distributed free with source code through BBSs and the Internet, although some companies distribute it as part of a commercial package with Linux-compatible utilities. The Linux kernel works with the GNU utilities developed by the Free Software Foundation, which did not produce a kernel. *See also* free software, GNU, kernel, UNIX.

LIPS \L`I-P-S´\ *n.* **1.** Acronym for **L**anguage **I**ndependent **P**rogram **S**ubtitling. A system developed by the GIST group (C-DAC, India) and used by Indian Television for nationwide broadcast of programs with multilingual subtitles in teletext mode. This system was judged the best design in the VLSI design contest in the VLSI '93 International Conference. Three versions of this application-specific integrated circuit (ASIC) with different features were implemented in Xilinx 3K and 4K series FPLAs. *See also* field-programmable logic array, gate array, very-large-scale integration. **2.** Acronym for **l**inear **i**nferences **p**er **s**econd. A measure of speed for some types of artificial-intelligence machines and expert systems. *See also* artificial intelligence, expert system. **3.** *See* Lightweight Internet Person Schema.

liquid crystal display \li`kwid kri´stəl di-splā`\ *n.* A type of display that uses a liquid compound having a polar molecular structure, sandwiched between two transparent electrodes. When an electric field is applied, the molecules align with the field, forming a crystalline arrangement that polarizes the light passing through it. A polarized filter laminated over the electrodes blocks polarized light. In this way, a grid of electrodes can selectively "turn on" a cell, or a pixel, containing the liquid crystal material, turning it dark. In some

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LLC \L`L-C´\ *n.* *See* IEEE 802 standards.

load[1] \lōd\ *n.* **1.** The total computing burden a system carries at one time. **2.** In electronics, the amount of current drawn by a device. **3.** In communications, the amount of traffic on a line.

load[2] \lōd\ *vb.* To place information from storage into memory for processing, if it is data, or for execution, if it is program code.

load-and-go \lōd`ənd-gō´\ *adj.* In reference to a routine, able to begin execution immediately, once loaded. The term is commonly used in reference to compilers and the machine code they generate.

loaded line \lō`dəd līn´\ *n.* A transmission cable fitted with loading coils, usually spaced about a mile apart, that reduce amplitude distortion in a signal by adding inductance (resistance to changes in current flow) to the line. Loaded lines minimize distortion within the range of frequencies affected by the loading coils, but the coils also reduce the bandwidth available for transmission.

loader \lō´dər\ *n.* A utility that loads the executable code of a program into memory for execution. On most microcomputers, the loader is an invisible part of the operating system and is automatically invoked when a program is run. *See also* load module, loader routine.

loader routine \lō´dər rōō-tēn`\ *n.* A routine that loads executable code into memory and executes it. A loader routine can be part of an operating system or it can be part of the program itself. *See also* loader, overlay[1] (definition 1).

load module \lōd´ moj`ōōl, mo`dyōōl\ *n.* An executable unit of code loaded into memory by the loader. A program consists of one or more load modules, each of which can be loaded and executed independently. *See also* loader.

load point \lōd´ point\ *n.* The beginning of the valid data area on a magnetic tape.

load sharing \lōd´ shâr`ēng\ *n.* A method of managing one or more tasks, jobs, or processes by scheduling and simultaneously executing portions of them on two or more microprocessors.

local \lō´kəl\ *adj.* Close at hand or restricted to a particular area. More specifically, in communications, a local device is one that can be accessed directly rather than by means of a communications line. In information processing, a local operation is one performed by the computer at hand rather than by a remote computer. In programming, a local variable is a variable that is restricted in scope, that is, used in only one part (subprogram, procedure, or function) of a program. *Compare* remote.

local area network \lō`kəl âr`ē-ə net´wərk\ *n.* *See* LAN.

local bus \lō`kəl bus´\ *n.* A PC architecture designed to speed up system performance by allowing some expansion boards to communicate directly with the microprocessor, bypassing the normal system bus entirely. *See also* PCI local bus, VL bus.

local bypass \lō`kəl bī´pas\ *n.* A telephone connection used by some businesses that links separate buildings but bypasses the telephone company.

local group \lō`kəl grōōp´\ *n.* **1.** In Windows NT, a group that is granted permissions and rights to only those resources on the workstation on which the group resides. Local groups provide a convenient means of allowing users both inside and outside the workstation to use resources found only on the workstation containing the local group. *See also* group[1]. **2.** In Windows NT Advanced Server, a group that is granted permissions and rights to only the resources on the servers of its own domain. Local groups in this context provide a convenient means of allowing users from both inside and outside the domain to use resources found only on the servers of the domain. *See also* global group, group[1].

localhost \lō´kəl-hōst`\ *n.* The name that is used to represent the same computer on which a TCP/IP message originates. An IP packet sent to localhost has the IP address 127.0.0.1 and does not actually go out to the Internet. *See also* IP address, packet (definition 1), TCP/IP.

localization \lō`kə-lə-zā´shən\ *n.* The process of altering a program so that it is appropriate for the area in which it is used. For example, the developers of a word processing program must localize the sorting tables in the program for different countries or languages because the correct order of characters in one language might be incorrect in another.

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ments, such as Microsoft Windows, a unit of information passed among running programs, certain devices in the system, and the operating environment itself.

message header \mes´əj hed`ər\ *n.* A sequence of bits or bytes at the beginning of a message that usually provides a timing sequence and specifies such aspects of the message structure as its length, data format, and block identification number. *See also* header (definition 2).

message of the day \mes`əj əv dhə dā´\ *n.* A daily bulletin for users of a network, multiuser computer, or other shared system. In most cases, users are shown the message of the day when they log into the system. *Acronym:* MOTD (M`O-T-D´).

message queue \mes´əj kyo͞o`\ *n.* An ordered list of messages awaiting transmission, from which they are taken up on a first in, first out (FIFO) basis.

message reflection \mes´əj rə-flek`shən\ *n.* In object-oriented programming environments, such as Visual C++, OLE, and ActiveX, a function that allows a control to handle its own message. *See also* ActiveX controls, control (definition 2), OCX, VBX.

Message Security Protocol \mes`əj se-kyər`i-tē prō´tə-kol\ *n.* A protocol for Internet messages that is based on the use of encryption and verification to ensure security. It also allows for permissions at the server level for delivery or rejection of e-mail. *Acronym:* MSP (M`S-P´).

message switching \mes´əj swich`ēng\ *n.* A technique used on some communications networks in which a message, with appropriate address information, is routed through one or more intermediate switching stations before being sent to its destination. On a typical message-switching network, a central computer receives messages, stores them (usually briefly), determines their destination addresses, and then delivers them. Message switching enables a network both to regulate traffic and to use communications lines efficiently. *Compare* circuit switching, packet switching.

messaging \mes´ə-jēng\ *n.* The use of computers and data communication equipment to convey messages from one person to another, as by e-mail, voice mail, or fax.

messaging application \mes´ə-jēng a-plə-kā`shən\ *n.* An application that enables users to send messages (such as e-mail or fax) to each other.

Messaging Application Programming Interface \mes`ə-jēng a-plə-kā-shən prō´gram-ēng in`tər-fās\ *n. See* MAPI.

messaging client \mes´ə-jēng klī`ənt\ *n.* An application program that enables its user to send or receive messages (such as e-mail or fax) to and from other users with the help of a remote server.

metacharacter \met´ə-kâr`ək-tər\ *n.* A character embedded in a program source or a data stream that conveys information about other characters, rather than itself representing a character. A simple example is the backslash (\) character, which, when used in strings in the C programming language, indicates that the letter following the backslash is part of an escape sequence that enables C to display a nongraphic character. *See also* escape character.

metacompiler \met´ə-kəm-pī`lər\ *n.* A compiler that produces compilers. The UNIX utility *yacc* (Yet Another Compiler-Compiler) is a metacompiler. If it is given a language specification, yacc produces a compiler for that language. *See also* compiler (definition 2).

Meta-Content Format \met`ə-kon´tent fôr`mat\ *n.* An open format for describing information about content of a structured body of data such as a Web page, a set of files on a Windows desktop, or a relational database. Meta-Content Format might be used for indexes, data dictionaries, or price lists. *Acronym:* MCF (M`C-F´).

meta data or **metadata** \met´ə dā`tə, dat`ə\ *n.* Data about data. For example, the title, subject, author, and size of a file constitute meta data about the file. *See also* data dictionary, repository.

Metadata Interchange Specification \met`ə-dā`tə in´tər-chānj spes-ə-fə-kā`shən\ *n.* A set of specifications dealing with the exchanging, sharing, and managing of meta data. *Acronym:* MDIS (M`D-I-S´). *See also* meta data.

metafile \met´ə-fīl`\ *n.* A file that contains or defines other files. Many operating systems use metafiles to contain directory information about other files on a given storage device.

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National Information Infrastructure \nash`ə-nəl in-fər-mā`shən in´frə-struk`chur\ *n.* A future high-bandwidth wide area network proposed by the U.S. government to carry data, fax, video, and voice transmissions to users throughout the United States. The network is to be developed mostly by private carriers; the government anticipates that the principal motive will be to deliver movies to homes on demand. Many of the proposed services are or will soon become available on the Internet itself. *Acronym:* NII (N`I-I´). *See also* Information Superhighway. *Compare* Internet.

National Science Foundation \nash`ə-nəl sī´əns foun-dā`shən\ *n.* A U.S. government agency intended to promote scientific research by funding both research projects and projects that facilitate scientific communication, such as NSFnet, the former backbone of the Internet. *See also* backbone (definition 1), NSFnet.

National Television System Committee \nash`ə-nəl tel´ə-vizh`ən si`stəm kə-mit`ē\ *n. See* NTSC.

native \nā´tiv\ *adj.* Of, pertaining to, or characteristic of something that is in its original form. For example, many applications are able to work with files in a number of formats; the format the application uses internally is its native file format. Files in other formats must be converted to the application's native format before they can be processed by the application.

native application \nā`tiv a`plə-kā´shən\ *n.* A program that is designed specifically for a particular type of microprocessor, that is, a program that is binary compatible with a processor. A native application generally will run much faster than a non-native application, which must be run with the help of an emulator program. *See also* binary compatibility, emulator.

native code \nā`tiv kōd´\ *n.* Code specific to a particular machine or processor.

native compiler \nā`tiv kəm-pī´lər\ *n.* A compiler that produces machine code for the computer on which it is running, as opposed to a cross-compiler, which produces code for another type of computer. Most compilers are native compilers. *See also* compiler (definition 2), cross-compiler.

native file format \nā`tiv fīl´ fōr-mat\ *n.* The format an application uses internally to process data. The application must convert files in other formats to the native format before it can work with them. For example, a word processor might recognize text files in ASCII text format, but it will convert them to its own native format before it displays them.

native language \nā`tiv lang´wəj\ *n. See* host language.

natural language \nach`ər-əl lang´wəj\ *n.* A language spoken or written by humans, as opposed to a programming language or a machine language. Understanding natural language and approximating it in a computer environment is one goal of research in artificial intelligence.

natural-language processing \nach`ər-əl-lang`-wəj pros´əs-ēng\ *n.* A field of computer science and linguistics that studies computer systems that can recognize and react to human language, either spoken or written. *See also* artificial intelligence. *Compare* speech recognition.

natural language query \na`chur-əl lang´wəj kwēr´ē, kwâr´ē\ *n.* A query to a database system that is composed in a subset of a natural language, such as English or Japanese. The query must conform to some restrictive syntax rules so that the system can parse it. *See also* parse, syntax.

natural-language recognition \nach`ər-əl-lang`-wəj rek-əg-nish´ən\ *n. See* speech recognition.

natural language support \nach`ur-əl lang´wəj su-pōrt`\ *n.* A voice recognition system that allows the user to use verbal commands in his or her own language to direct a computer's actions. *Acronym:* NLS (N`L-S´).

natural number \nach`ər-əl num´bər\ *n.* An integer, or whole number, that is equal to or greater than zero. *See also* integer (definition 1).

navigation bar \nav`ə-gā´shən bär`\ *n.* On a Web page, a grouping of hyperlinks for getting around in that particular Web site. *See also* hyperlink.

navigation keys \nav-ə-gā´shən kēz`\ *n.* The keys on a keyboard controlling cursor movement, including the four arrow keys and the Backspace, End, Home, Page Down, and Page Up keys. *See also* arrow key, Backspace key, End key, Home key, Page Down key, Page Up key.

Navigator \nav´ə-gā`tər\ *n. See* Netscape Navigator.

.navy.mil \dot-nā`vē-dot-mil´, dot-nā`vē-dot-M-I-L´\ *n.* On the Internet, the major geographic

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it travels down the length of the fiber. Optical fibers are inexpensive, compact, and lightweight and are often packaged many hundred to a single cable. *See also* fiber optics.

optical mouse \op`tə-kəl mous´\ *n.* A type of mouse that uses a pair of light-emitting diodes (LEDs) and a special reflective grid pad to detect motion. The two lights are of different colors, and the special mouse pad has a grid of lines in the same colors, one color for vertical lines and another for horizontal lines. Light detectors paired with the LEDs sense when a colored light passes over a line of the same color, indicating the direction of movement. *See also* mouse. *Compare* mechanical mouse, optomechanical mouse.

optical reader \op`tə-kəl rē´dər\ *n.* A device that reads text from printed paper by detecting the pattern of light and dark on a page and then applying optical character recognition methods to identify the characters. *See also* optical character recognition.

optical recognition \op`tə-kəl rek-əg-nish´ən\ *n.* *See* optical character recognition.

optical scanner \op`tə-kəl skan´ər\ *n.* An input device that uses light-sensing equipment to scan paper or another medium, translating the pattern of light and dark or color into a digital signal that can be manipulated by either optical character recognition software or graphics software. Scanners have different methods for holding the input medium, including flatbed, whereby the medium is held on a piece of glass; sheet-fed, whereby sheets of paper are pulled over a stationary scanning mechanism; handheld, whereby the user moves the device over the document to be scanned; and overhead, whereby the document is placed face up on a stationary bed below a small tower, which moves across the page. *Compare* magnetic-ink character recognition, spatial digitizer.

optimization \op`tə-mə-zā´shən\ *n.* **1.** In programming, the process of producing more efficient (smaller or faster) programs through selection and design of data structures, algorithms, and instruction sequences. **2.** The process of a compiler or assembler in producing efficient executable code. *See also* optimizing compiler.

optimizer \op´tə-mī`zər\ *n.* A program or device that improves the performance of a computer, network, or other device or system. For example, a disk optimizer program reduces file access time.

optimizing compiler \op`tə-mī-zēng kəm-pī´lər\ *n.* A compiler that analyzes its output (assembly language or machine code) to produce more efficient (smaller or faster) instruction sequences.

optional hyphen \op`shə-nəl hī´fən\ *n.* *See* hyphen.

Option key \op´shən kē`\ *n.* A key on Apple Macintosh keyboards that, when pressed in combination with another key, produces special characters—graphics, such as boxes; international characters, such as currency symbols; and special punctuation marks, such as en dashes and em dashes. The Option key serves a purpose similar to that of the Control key or the Alt key on IBM and compatible keyboards in that it changes the meaning of the key with which it is used.

Options \op´shənz\ *n.* *See* Preferences.

optoelectronics \op`tō-ə-lek-tron´iks\ *n.* The branch of electronics in which the properties and behavior of light are studied. Optoelectronics deals with electronic devices that generate, sense, transmit, and modulate electromagnetic radiation in the infrared, visible, and ultraviolet portions of the electromagnetic spectrum.

optomechanical mouse \op`tō-mə-kan`ə-kəl mous´\ *n.* A type of mouse in which motion is translated into directional signals through a combination of optical and mechanical means. The optical portion includes pairs of light-emitting diodes (LEDs) and matching sensors; the mechanical portion consists of rotating wheels with cutout slits. When the mouse is moved, the wheels turn and the light from the LEDs either passes through the slits and strikes a light sensor or is blocked by the solid portions of the wheels. These changes in light contact are detected by the pairs of sensors and interpreted as indications of movement. Because the sensors are slightly out of phase with one another, the direction of movement is determined based on which sensor is the first to regain light contact. Because it uses optical equipment instead of mechanical parts, an optomechanical mouse eliminates the need for many of the wear-related repairs and maintenance necessary with purely mechanical mice, but it does not require the special operating surfaces associated with opti-

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operators appear before the operands. For example, the expression $(a + b) * (c - d)$ would be written in prefix notation as * + *a b* – *c d*. *Also called* Polish notation. *See also* infix notation, postfix notation.

Prefs \prefs\ *n.* *See* Preferences.

PReP \prep, P`R-E-P´\ *n.* *See* Power PC Reference Platform.

preprocessor \prē`pros´es-ər\ *n.* A device or routine that performs preliminary operations on input before passing it on for further processing. *See also* front-end processor (definition 1). *Compare* post-processor.

presentation graphics \prē-zən-tā´shən graf`iks, prez-ən-tā´shən\ *n.* The representation of business information, such as sales figures and stock prices, in chart form rather than as lists of numbers. Presentation graphics are used to give viewers an immediate grasp of business statistics and their significance. Common examples are area charts, bar charts, line charts, and pie charts. *Also called* business graphics.

presentation layer \prē-zən-tā´shən lâr`, prez-ən-tā´shən, lā`ər\ *n.* The sixth of the seven layers in the International Organization for Standardization's Open Systems Interconnection (ISO/OSI) model for standardizing computer-to-computer communications. The presentation layer is responsible for formatting information so that it can be displayed or printed. This task generally includes interpreting codes (such as tabs) related to presentation, but it can also include converting encryption and other codes and translating different character sets. *See also* ISO/OSI model.

Presentation Manager \prē-zən-tā´shən man`ə-jər, prez-ən-tā´shən\ *n.* The graphical user interface provided with OS/2 versions 1.1 and later. The Presentation Manager derives from the MS-DOS–based Windows environment and provides similar capabilities. The user sees a graphical, window-oriented interface, and the programmer uses a standard set of routines for handling screen, keyboard, mouse, and printer input and output, no matter what hardware is attached to the system. *See also* OS/2, Windows.

pressure-sensitive \presh´ər-sen`sə-tiv\ *adj.* Of or pertaining to a device in which pressing on a thin surface produces an electrical connection and causes an event to be registered by the computer. Pressure-sensitive devices include touch-sensitive drawing pens, membrane keyboards, and some touch screens. *See also* touch screen.

Pretty Good Privacy \prit`ē go͝od prī´və-sē\ *n.* *See* PGP.

pretty print \prit´ē print`\ *n.* A feature of some editors used in programming that formats code so that it is easier to read and understand when printed. For example, a pretty-print feature might insert blank lines to set off modules or indent nested routines to make them easier to spot. *See also* code[1] (definition 1), editor, module (definition 1), routine.

preventive maintenance \prə-ven`tiv mān´tə-nəns\ *n.* Routine servicing of hardware intended to keep equipment in good operating condition and to find and correct problems before they develop into severe malfunctions.

preview \prē´vyo͞o\ *n.* In word processors and other applications, the feature that formats a document for printing but displays it on the video monitor rather than sending it directly to the printer.

primary channel \prī`mâr-ē chan´əl\ *n.* The data-transmission channel in a communications device, such as a modem. *Compare* secondary channel.

Primary Domain Controller \prī`mâr-ē dō-mān´kən-trō`lər\ *n.* **1.** In Windows NT, a database providing a centralized administration site for resources and user accounts. The database allows users to log onto the domain, rather than onto a specific host machine. A separate account database keeps track of the machines in the domain and allocates the domain's resources to users. **2.** In any local area network, the server that maintains the master copy of the domain's user accounts database and that validates logon requests. *Acronym:* PDC (P`D-C´).

primary key \prī´mâr-ē kē`\ *n.* In databases, the key field that serves as the unique identifier of a specific tuple (row) in a relation (database table). *Also called* major key. *See also* alternate key (definition 1), candidate key. *Compare* secondary key.

primary storage \prī`mâr-ē stōr´əj\ *n.* Random access memory (RAM); the main general-purpose storage region to which the microprocessor has direct access. A computer's other storage options,

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gramming element is the procedure (a named sequence of statements, such as a routine, subroutine, or function). The most widely used high-level languages (C, Pascal, Basic, FORTRAN, COBOL, Ada) are all procedural languages. *See also* procedure. *Compare* nonprocedural language.

procedural rendering \prə-sē`jər-əl ren´dər-ēng\ *n.* The rendering of a two-dimensional image from three-dimensional coordinates with texturing according to user-specified conditions, such as direction and degree of lighting.

procedure \prə-sē´jər\ *n.* In a program, a named sequence of statements, often with associated constants, data types, and variables, that usually performs a single task. A procedure can usually be called (executed) by other procedures, as well as by the main body of the program. Some languages distinguish between a procedure and a function, with the latter (the function) returning a value. *See also* function, parameter, procedural language, routine, subroutine.

procedure call \prə-sē´jər käl`\ *n.* In programming, an instruction that causes a procedure to be executed. A procedure call can be located in another procedure or in the main body of the program. *See also* procedure.

process[1] \pros´es\ *n.* A program or part of a program; a coherent sequence of steps undertaken by a program.

process[2] \pros´es\ *vb.* To manipulate data with a program.

process-bound \pros´es-bound`\ *adj.* Limited in performance by processing requirements. *See also* computation-bound.

process color \pros´es kəl`ər\ *n.* A method of handling color in a document in which each block of color is separated into its subtractive primary color components for printing: cyan, magenta, and yellow (as well as black). All other colors are created by blending layers of various sizes of halftone spots printed in cyan, magenta, and yellow to create the image. *See also* color model, color separation (definition 1). *Compare* spot color.

processing \pros´es-ēng\ *n.* The manipulation of data within a computer system. Processing is the vital step between receiving data (input) and producing results (output)—the task for which computers are designed.

processor \pros´es-ər\ *n. See* central processing unit, microprocessor.

Processor Direct Slot \pros`es-ər-dər-ekt` slot´\ *n.* See PDS (definition 1).

Prodigy Information Service \prod`ə-jē in-fər-mā´shən sər`vəs\ *n.* An online information service founded by IBM and Sears. Like its competitors America Online and CompuServe, Prodigy offers access to databases and file libraries, online chat, special interest groups, e-mail, and Internet connectivity. *Also called* Prodigy.

product \prod´ukt\ *n.* **1.** An operator in the relational algebra used in database management that, when applied to two existing relations (tables), results in the creation of a new table containing all possible ordered concatenations (combinations) of tuples (rows) from the first relation with tuples from the second. The number of rows in the resulting relation is the product of the number of rows in the two source relations. *Also called* Cartesian product. *Compare* inner join. **2.** In mathematics, the result of multiplying two or more numbers. **3.** In the most general sense, an entity conceived and developed for the purpose of competing in a commercial market. Although computers are products, the term is more commonly applied to software, peripherals, and accessories in the computing arena.

production system \prə-duk´shən si`stəm\ *n.* In expert systems, an approach to problem solving based on an "IF this, THEN that" approach that uses a set of rules, a database of information, and a "rule interpreter" to match premises with facts and form a conclusion. Production systems are also known as rule-based systems or inference systems. *See also* expert system.

Professional Graphics Adapter \prə-fesh`ə-nəl graf´iks ə-dap`tər\ *n.* A video adapter introduced by IBM, primarily for CAD applications. The Professional Graphics Adapter is capable of displaying 256 colors, with a horizontal resolution of 640 pixels and a vertical resolution of 480 pixels. *Acronym:* PGA (P`G-A´).

Professional Graphics Display \prə-fesh`ə-nəl graf´iks dis-plā`\ *n.* An analog display introduced by IBM, intended for use with their Professional Graphics Adapter. *See also* Professional Graphics Adapter.

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presents the user with a tabbed, index-card-like selection of property pages, each of which features standard dialog-style controls for customizing parameters.

proportional font \prə-pōr´shən-əl font`\ *n.* A set of characters in a particular style and size in which a variable amount of horizontal space is allotted to each letter or number. In a proportional font, the letter *i,* for example, is allowed less space than the letter *m. Compare* monospace font.

proportional spacing \prə-pōr`shən-əl spā´sēng\ *n.* A form of character spacing in which the horizontal space each character occupies is proportional to the width of the character. The letter *w,* for example, takes up more space than the letter *i. Compare* monospacing.

proprietary \prə-prī´ə-târ-ē\ *adj.* Of, pertaining to, or characteristic of something that is privately owned. Generally, the term refers to technology that has been developed by a particular corporation or entity, with specifications that are considered by the owner to be trade secrets. Proprietary technology may be legally used only by a person or entity purchasing an explicit license. Also, other companies are unable to duplicate the technology, both legally and because its specifications have not been divulged by the owner. *Compare* public domain.

proprietary software \prə-prī`ə-târ-ē soft´wār\ *n.* A program owned or copyrighted by an individual or a business and available for use only through purchase or by permission of the owner. *Compare* public-domain software.

protected mode \prə-tek´təd mōd`\ *n.* An operating mode of the Intel 80286 and higher microprocessors that supports larger address spaces and more advanced features than real mode. When started in protected mode, these CPUs provide hardware support for multitasking, data security, and virtual memory. The Windows NT and OS/2 operating systems run in protected mode, as do most versions of UNIX for these microprocessors. *Compare* real mode.

protocol \prō´tə-kol`\ *n. See* communications protocol.

protocol layer \prō´tə-kol lā`ər, lâr`\ *n. See* layer.

protocol stack \prō´tə-kol stak`\ *n.* The set of protocols that work together on different levels to enable communication on a network. For example, TCP/IP, the protocol stack on the Internet, incorporates more than 100 standards including FTP, IP, SMTP, TCP, and Telnet. *Also called* protocol suite. *See also* ISO/OSI model.

protocol suite \prō´tə-kol swēt`\ *n. See* protocol stack.

prototyping \prō´tə-tī`pēng\ *n.* The creation of a working model of a new computer system or program for testing and refinement. Prototyping is used in the development of both new hardware and software systems and new systems of information management. Tools used in the former include both hardware and support software; tools used in the latter can include databases, screen mockups, and simulations that, in some cases, can be developed into a final product.

proxy \proks´ē\ *n. See* proxy server.

proxy server \proks´ē sər`vər\ *n.* A firewall component that manages Internet traffic to and from a local area network (LAN) and can provide other features, such as document caching and access control. A proxy server can improve performance by supplying frequently requested data, such as a popular Web page, and can filter and discard requests that the owner does not consider appropriate, such as requests for unauthorized access to proprietary files. *See also* firewall.

PrtSc key \print´ skrēn kē`\ *n. See* Print Screen key.

.ps \dot`P-S´\ *n.* The file extension that identifies PostScript printer files. *See also* PostScript.

PS/2 bus \P`S-to͞o´ bus\ *n. See* Micro Channel Architecture.

psec \pī´kō-sek`ənd\ *n. See* picosecond.

pseudocode \so͞o´dō-kōd`\ *n.* **1.** Abbreviated p-code. A machine language for a nonexistent processor (a pseudomachine). Such code is executed by a software interpreter. The major advantage of p-code is that it is portable to all computers for which a p-code interpreter exists. The p-code approach has been tried several times in the microcomputer industry, with mixed success. The best known attempt was the UCSD p-System. *See also* pseudomachine, UCSD p-System. **2.** Any informal, transparent notation in which a program or algorithm description is written. Many programmers write their programs first in a pseudocode

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that looks much like a mixture of English and their favorite programming language, such as C or Pascal, and then translate it line by line into the actual language being used.

pseudo compiler \sōō´dō kəm-pī`lər\ *n.* A compiler that generates a pseudolanguage. *See also* pseudolanguage.

pseudocomputer \sōō´dō kəm-pyōō`tər\ *n.* *See* pseudomachine.

pseudolanguage \sōō`dō-lang´wəj\ *n.* A nonexistent programming language—that is, one for which no implementation exists. The term can refer either to the machine language for a nonexistent processor or to a high-level language for which no compiler exists. *See also* pseudocode.

pseudomachine \sōō`dō-mə-shēn´\ *n.* Abbreviated p-machine. A processor that doesn't actually exist in hardware but that is emulated in software. A program written for the pseudomachine can run on several platforms without having to be recompiled. *See also* pseudocode, UCSD p-System.

pseudo-operation \sōō`dō-op-ər-ā´shən\ *n.* Abbreviated pseudo-op. In programming, a program instruction that conveys information to an assembler or compiler but is not translated into a machine language instruction—for example, an instruction that establishes the value of a constant or the manner in which Boolean (logical) expressions are to be evaluated.

PSK \P`S-K´\ *n.* *See* phase-shift keying.

PSN \P`S-N´\ *n.* Acronym for **p**acket-**s**witching **n**etwork. *See* packet switching.

p-system \P´si`stəm\ *n.* An operating system based on a pseudomachine implemented in software. A program written for the p-system is more portable than one written for a machine-dependent operating system. *See also* UCSD p-System.

.pt \dot`P-T´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Portugal.

P-type semiconductor \P`tīp sem´ē-kən-duk-tər, sem´ī-kən-duk-tər\ *n.* Semiconductor material in which electrical conduction is carried by holes ("vacancies" left by electrons). Whether a semiconductor is N-type or P-type depends on the kind of dopant added during manufacture. A dopant with a shortage of electrons results in a P-type semiconductor. *Compare* N-type semiconductor.

/pub \slash-pub´\ *n.* Short for **pub**lic. A directory in an anonymous FTP archive that is accessible by the public and that generally contains files available for free download. *See also* anonymous FTP.

pub \pub\ *n.* *See* /pub.

public directory \pu`blik dər-ek´tər-ē\ *n.* A directory on an FTP server that is accessible by anonymous users for the purpose of retrieving or storing files. Often the directory is called /pub. *See also* anonymous FTP, FTP (definition 1), FTP server, /pub.

public domain \pu`blik dō-mān´\ *n.* The set of all creative works, such as books, music, or software, that are not covered by copyright or other property protection. Works in the public domain can be freely copied, modified, and otherwise used in any manner for any purpose. Much of the information, texts, and software on the Internet is in the public domain, but putting a copyrighted work on the Internet does not put it in the public domain. *Compare* proprietary.

public-domain software \pu`blik-dō-mān soft´-wār\ *n.* A program donated for public use by its owner or developer and freely available for copying and distribution. *Compare* free software, freeware, proprietary software, shareware.

public files \pu`blik fīlz´\ *n.* Files with no access restrictions.

public folders \pu`blik fōl´dərz\ *n.* The folders that are made accessible on a particular machine or by a particular user in a shared networking environment. *Compare* private folders.

public key \pu´blik kē`\ *n.* One of two keys in public key encryption. The user releases this key to the public, who can use it for encrypting messages to be sent to the user and for decrypting the user's digital signature. *See also* public key encryption. *Compare* private key.

public key cryptography \pu`blik kē krip-to´grə-fē\ *n.* *See* public key encryption.

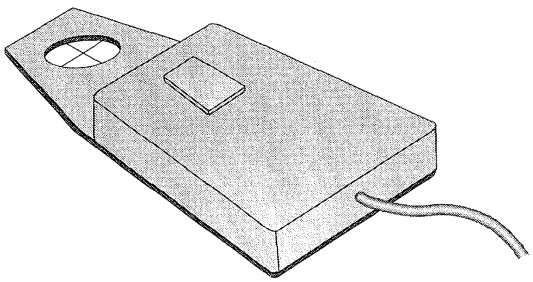
public key encryption \pu`blik kē´ en-krip`shən\ *n.* An asymmetric scheme that uses a pair of keys for encryption: the public key encrypts data, and a corresponding secret key decrypts it. For digital signatures, the process is reversed: the sender uses the secret key to create a unique electronic number that can be read by anyone possessing the corresponding public key, which verifies that the

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message is truly from the sender. *See also* private key, public key.

public rights \pu`blik rīts´\ *n.* In the context of the Internet, the extent to which members of the public are permitted to use (and to place) information on the Internet under intellectual property law. *See also* fair use, public domain, public-domain software.

puck \puk\ *n.* A pointing device used with a graphics tablet. A puck, which is often used in engineering applications, is a mouselike device with buttons for selecting items or choosing commands and a clear plastic section extending from one end with cross hairs printed on it. The intersection of the cross hairs on the puck points to a location on the graphics tablet, which in turn is mapped to a specific location on the screen. Because the puck's cross hairs are on a transparent surface, a user can easily trace a drawing by placing it between the graphics tablet and the puck and moving the cross hairs over the lines of the drawing. See the illustration. *See also* graphics tablet, stylus.



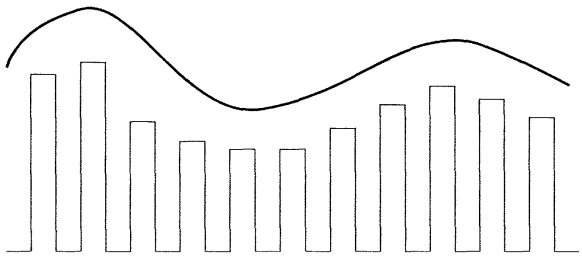
Puck.

pull \pul\ *vb.* **1.** The process of retrieving data from a network server. *Compare* push (definition 2). **2.** *See* pop.

pull-down menu \pul´doun men`yo͞o\ *n.* A menu that is pulled down from the menu bar and that remains available as long as the user holds it open. *Compare* drop-down menu.

pulse \puls\ *n.* A transient signal, usually brief and with a discrete onset and offset.

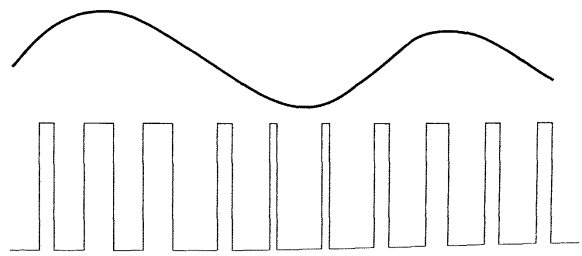
pulse amplitude modulation \puls` am`plə-to͞od mo-dyə-lā´shən, moj`ə-lā´shən\ *n.* A method of encoding information in a signal by varying the amplitude of pulses. The unmodulated signal consists of a continuous train of pulses of constant frequency, duration, and amplitude. During modulation the pulse amplitudes are changed to reflect the information being encoded. See the illustration. *Acronym:* PAM (pam, P`A-M´). *Compare* pulse code modulation, pulse duration modulation, pulse position modulation.



Pulse amplitude modulation.

pulse code modulation \puls` kōd` mo-dyə-lā´shən, moj`ə-lā´shən\ *n.* A method of encoding information in a signal by varying the amplitude of pulses. Unlike pulse amplitude modulation (PAM), in which pulse amplitude can vary continuously, pulse code modulation limits pulse amplitudes to several predefined values. Because the signal is discrete, or digital, rather than analog, pulse code modulation is more immune to noise than PAM. *Acronym:* PCM (P`C-M´). *Compare* pulse amplitude modulation, pulse duration modulation, pulse position modulation.

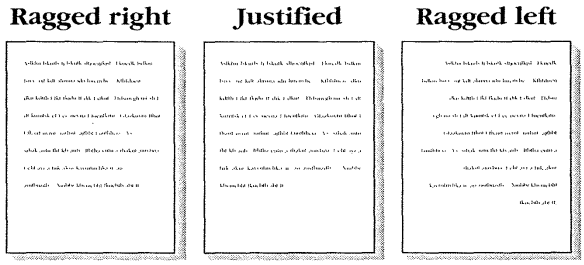
pulse duration modulation \puls` dur-ā´shən mo-dyə-lā´shən, moj-ə-lā´shən\ *n.* A method of encoding information in a signal by varying the duration of pulses. The unmodulated signal consists of a continuous train of pulses of constant frequency, duration, and amplitude. During modulation, the pulse durations are changed to



Pulse duration modulation.

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rag \rag\ *n.* Irregularity along the left or right edge of a set of lines of text on a printed page. Rag complements justification, in which one or both edges of the text form a straight vertical line. See the illustration. *See also* justify, ragged left, ragged right.



Rag.

ragged left \rag`əd left´\ *adj.* Of, relating to, or being lines of text whose left ends are not vertically aligned but form an irregular edge. Text may be right-justified and have a ragged left margin. Ragged-left text is used infrequently—typically, for visual effect in advertisements. *See also* rag, right-justify.

ragged right \rag`əd rīt´\ *adj.* Of, relating to, or being lines of text whose right ends are not vertically aligned but form an irregular edge. Letters and other word-processed documents are commonly left-justified, with ragged-right margins. *See also* left-justify, rag.

RAID \rād, R`A-I-D´\ *n.* Acronym for **r**edundant **a**rray of **i**ndependent **d**isks (formerly called **r**edundant **a**rray of **i**nexpensive **d**isks). A data storage method in which data, along with information used for error correction, such as parity bits or Hamming codes, is distributed among two or more hard disk drives in order to improve performance and reliability. The hard disk array is governed by array management software and a disk controller, which handles the error correction. RAID is generally used on network servers. Several defined levels of RAID offer differing trade-offs among access speed, reliability, and cost. *See also* disk controller, error-correction coding, Hamming code, hard disk, parity bit, server (definition 1).

RAID array \rād´ ə-rā`, R`A-I-D´\ *n. See* RAID.

RAM \ram, R`A-M´\ *n.* Acronym for **r**andom **a**ccess **m**emory. Semiconductor-based memory that can be read and written by the central processing unit (CPU) or other hardware devices. The storage locations can be accessed in any order. Note that the various types of ROM memory are capable of random access but cannot be written to. The term *RAM,* however, is generally understood to refer to volatile memory that can be written to as well as read. *Compare* core, EPROM, flash memory, PROM, ROM (definition 2).

RAM cache \ram´ kash, R`A-M´\ *n.* Cache memory that is used by the system to store and retrieve data from the RAM. Frequently accessed segments of data may be stored in the cache for quicker access compared with secondary storage devices such as disks. *See also* cache, RAM.

RAM card \ram´ kärd, R`A-M´\ *n.* An add-in circuit board containing RAM memory and the interface logic necessary to decode memory addresses.

RAM cartridge \ram´ kär`trij, R`A-M´\ *n. See* memory cartridge.

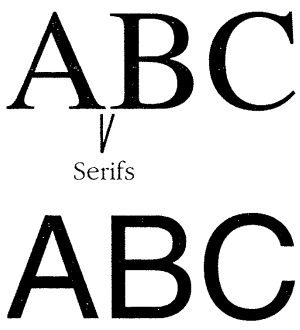
RAM chip \ram´ chip, R`A-M´\ *n.* A semiconductor storage device. RAM chips can be either dynamic or static memory. *See also* dynamic RAM, RAM, static RAM.

RAM compression \ram´ kəm-presh`ən, R-A-M´\ *n.* Short for **r**andom **a**ccess **m**emory **compression.** This technology was an attempt by a number of software vendors to solve the problem of running out of global memory under Windows *3.x.* Compression of the usual contents of RAM may lessen the system's need to read or write to virtual (hard disk–based) memory and thus speed up the system, as virtual memory is much slower than physical RAM. Because of the falling prices of RAM and the introduction of Windows 95 and Windows NT, which handle RAM more effectively, RAM compression is generally used only on older PCs. *See also* compression, RAM, Windows, Windows 95.

RAMDAC \ram´dak, R-A-M`D-A-C´\ *n.* Acronym for **r**andom **a**ccess **m**emory **d**igital-to-**a**nalog **c**onverter. A chip built into some VGA and SVGA video adapters that translates the digital representation of a pixel into the analog information needed by the monitor to display it. The presence of a RAMDAC chip generally enhances overall video performance. *See also* SVGA, VGA.

RAM disk \ram´ disk, R`A-M´\ *n.* Short for **r**andom **a**ccess **m**emory **disk.** A simulated disk drive

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Serif. A serif typeface (top) and a sans serif typeface (bottom).

serif[2] \sâr´if\ *n.* Any of the short lines or ornaments at the ends of the strokes that form a typeface character.

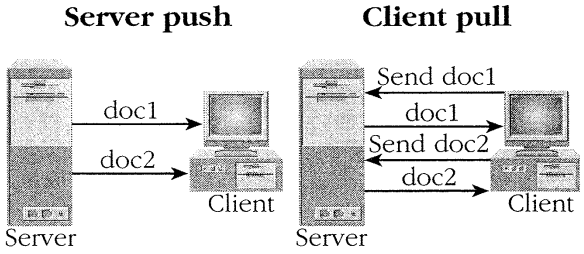
server \sər´vər\ *n.* **1.** On a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network. **2.** On the Internet or other network, a computer or program that responds to commands from a client. For example, a file server may contain an archive of data or program files; when a client submits a request for a file, the server transfers a copy of the file to the client. *See also* client/server architecture. *Compare* client (definition 3).

server-based application \sər`vər-bāsd a-plə-kā´-shən\ *n.* A program that is shared over a network. The program is stored on the network server and can be used at more than one client machine at a time.

server cluster \sər´vər klu`stər\ *n.* A group of independent computers that work together as a single system. A server cluster presents the appearance of a single server to a client.

server error \sər´vər âr`ər\ *n.* A failure to complete a request for information through HTTP that results from an error at the server rather than an error by the client or the user. Server errors are indicated by HTTP status codes beginning with 5. *See also* HTTP, HTTP status codes.

server push-pull \sər`vər pŏŏsh`pul´, pŏŏl´\ *n.* A combination of Web client/server techniques individually called "server push" and "client pull." In server push, the server loads data to the client, but the data connection stays open. This allows the server to continue sending data to the browser as necessary. In client pull, the server loads data to the client, but the data connection does not stay open. The server sends an HTML directive to the browser telling it to reopen the connection after a certain interval to get more data or possibly to open a new URL. See the illustration. *See also* HTML, server (definition 2), URL.



Server push-pull.

server-side includes \sər`vər-sīd in-klōōdz´\ *n.* A mechanism for including dynamic text in World Wide Web documents. Server-side includes are special command codes that are recognized and interpreted by the server; their output is placed in the document body before the document is sent to the browser. Server-side includes can be used, for example, to include the date/time stamp in the text of the file. *See also* server (definition 2).

service \sər´vəs\ *n.* **1.** A customer-based or user-oriented function, such as technical support or network provision. **2.** In reference to programming and software, a program or routine that provides support to other programs, particularly at a low (close to the hardware) level. *See also* utility.

Service Advertising Protocol \sər`vəs ad`vər-tī-zēng prō´tə-kol\ *n.* A method used by a service-providing node in a network (such as a file server or application server) to notify other nodes on the network that it is available for access. When a server boots, it uses the protocol to advertise its service; when the same server goes offline, it uses the protocol to announce that it is no longer available. *Acronym:* SAP (S`A-P´). *See also* server (definition 1).

service bureau \sər´vis byər`ō\ *n.* **1.** A company that provides various services related to publishing, such as prepress production, desktop pub-

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.sgml \dot`S-G-M-L´\ *n.* The file extension that identifies files encoded in Standard Generalized Markup Language. *See also* SGML.

SGML \S`G-M-L´\ *n.* Acronym for **S**tandard **G**eneralized **M**arkup **L**anguage. An information management standard adopted by the International Organization for Standardization (ISO) in 1986 as a means of providing platform- and application-independent documents that retain formatting, indexing, and linked information. SGML provides a grammarlike mechanism for users to define the structure of their documents and the tags they will use to denote the structure in individual documents. *See also* ISO.

.sh \dot`S-H´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Saint Helena.

sh \S´-H´\ *n. See* Bourne shell.

SHA \S`H-A´\ *n.* Acronym for **S**ecure **H**ash **A**lgorithm. A technique that computes a 160-bit condensed representation of a message or data file, called a *message digest.* The SHA is used by the sender and the receiver of a message in computing and verifying a digital signature, for security purposes. *See also* algorithm, digital signature.

shade[1] \shād\ *n.* A particular color variation produced by mixing black with a pure color. *See also* brightness, IRGB.

shade[2] \shād\ *vb.* To give added dimension to an image by including changes in appearance caused by light and shadow. *See also* color model.

shadow memory \shad´ō mem`ər-ē\ *n.* A technique employed by the BIOS in some 80x86-based computers to copy the system's ROM BIOS routines into an unused section of RAM during the computer's startup process. This helps boost system performance by diverting system requests for the BIOS routines to their "shadow" copies. *Also called* shadow RAM, shadow ROM.

shadow print \shad´ō print`\ *n.* A style applied to text in which a duplicate of each character is shifted, typically down and to the right, to create a shadow effect. See the illustration.

shadow RAM \shad´ō ram`, R-A-M`\ *n. See* shadow memory.

shadow ROM \shad´ō rom`, R-O-M`\ *n. See* shadow memory.



Shadow print.

share \shâr\ *vb.* To make files, directories, or folders accessible to other users over a network.

shared directory \shârd` dər-ek´tər-ē\ *n. See* network directory.

shared folder \shârd` fōl´dər\ *n.* On a Macintosh computer connected to a network and running System 6.0 or higher, a folder that a user has made available to others on the network. A shared folder is analogous to a network directory on a PC. *See also* network directory.

shared logic \shârd` loj´ik\ *n.* The use, by multiple circuits or software routines, of common circuits or routines to implement an operation.

shared memory \shârd` mem´ər-ē\ *n.* **1.** Memory accessed by more than one program in a multitasking environment. **2.** A portion of memory used by parallel-processor computer systems to exchange information. *See also* parallel processing.

shared network directory \shârd` net`wərk dər-ek´tər-ē\ *n. See* network directory.

shared printer \shârd´ prin`tər\ *n.* A printer that receives input from more than one computer.

shared resource \shârd` rē´sōrs, rə-sōrs´\ *n.* **1.** Any device, data, or program used by more than one device or program. **2.** In Windows NT, any resource made available to network users, such as directories, files, and printers.

shareware \shâr´wâr\ *n.* Copyrighted software that is distributed on a try-before-you-buy basis. Users who want to continue using the program after the trial period are encouraged to send a payment to the program's author. *Compare* free software, freeware, public-domain software.

sharpness \shärp´nəs\ *n. See* resolution (definition 1).

sheet-fed scanner \shēt`fed skan´ər\ *n.* A scanner with a single-sheet feed mechanism, in which

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synonym \sin´ə-nim`\ *n.* **1.** A word that is an equivalent of another word. The verbs *type* and *keyboard* are synonyms. **2.** In hashing, one of two distinct keys that produce the same hash address. *See also* hash[2].

syntax \sin´taks\ *n.* The grammar of a language; the rules governing the structure and content of statements. *See also* logic, programming language, syntax error. *Compare* semantics (definition 1).

syntax checker \sin´taks chek`ər\ *n.* A program for identifying errors in syntax for a programming language. *See also* syntax, syntax error.

syntax error \sin´taks âr`ər\ *n.* An error resulting from a statement that violates one or more of the grammatical rules of a language and is thus not "legal." *See also* logic, semantics (definition 1), syntax.

synthesis \sin´thə-sis`\ *n.* The combining of separate elements to form a coherent whole, or the result of such a combining (for example, combining digital pulses to replicate a sound, or combining digitized words to synthesize human speech). *See also* speech synthesis.

synthesizer \sin´thə-sī`zər\ *n.* A computer peripheral, chip, or stand-alone system that generates sound from digital instructions rather than through manipulation of physical equipment or recorded sound. *See also* MIDI.

.sys \dot-sis´\ *n.* A file extension for system configuration files.

sysadmin \sis´əd-min`\ *n.* The usual logon name or e-mail address for the system administrator of a UNIX-based system. *See also* system administrator.

sysgen \sis´jen\ *n. See* system generation.

sysop \sis´op\ *n.* Short for **sys**tem **op**erator. The overseer of a BBS or a small multiuser computer system.

Sys Req key \sis` rek kē´\ *n.* Short for **Sys**tem **Req**uest **key**. A key on some IBM and compatible keyboards that is intended to provide the same function as the Sys Req key on an IBM mainframe computer terminal: to reset the keyboard or to change from one session to another.

system \si´stəm\ *n.* Any collection of component elements that work together to perform a task. Examples are a hardware system consisting of a microprocessor, its allied chips and circuitry, input and output devices, and peripheral devices; an operating system consisting of a set of programs and data files; or a database management system used to process specific kinds of information.

system administrator \si`stəm ad-min´ə-strā-tər\ *n.* The person responsible for administering use of a multiuser computer system, communications system, or both. A system administrator performs such duties as assigning user accounts and passwords, establishing security access levels, allocating storage space, and watching for unauthorized access to prevent virus or Trojan horse programs from entering the system. *Also called* sysadmin. *See also* Trojan horse, virus. *Compare* sysop.

system board \si´stəm bōrd`\ *n. See* motherboard.

system clock \si´stəm klok\ *n. See* clock (definition 1).

system console \si`stəm kon´sōl\ *n.* The control center of a computer system, primarily with reference to mainframe and minicomputers. In networked or distributed systems, one workstation is designated as the system administrator's; this workstation is analogous to the LAN system console. *See also* console, LAN.

system development \si`stəm də-vel´əp-mənt\ *n.* The process of defining, designing, testing, and implementing a new system.

system disk \si´stəm disk`\ *n.* A disk that contains an operating system and can be used to boot a computer. *Also called* startup disk. *See also* boot[2], operating system.

system error \si´stəm âr`ər\ *n.* A software condition that renders the operating system incapable of continuing to function normally. This type of error usually requires rebooting the system.

system failure \si´stəm fāl`yər\ *n.* The inability of a computer to continue functioning, usually caused by software rather than hardware.

System file \si´stəm fīl`\ *n.* A resource file on the Macintosh that contains the resources needed by the operating system, such as fonts, icons, and default dialog boxes.

System folder \si´stəm fōl`dər\ *n.* The Macintosh file folder (directory) that contains the System file and other vital files, such as Finder, device drivers, INIT files, and control panel files. *See also* control panel, Finder, INIT, System file.

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.th \dot`T-H´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Thailand.

The Microsoft Network \dhə mī`krə-soft net´wərk\ *n.* Microsoft Corporation's feature-rich online service, launched with the introduction of Windows 95 in August 1995. *Acronym:* MSN (M`S-N´).

thermal printer \thər´məl prin`tər\ *n.* A nonimpact printer that uses heat to generate an image on specially treated paper. The printer uses pins to produce an image, but rather than striking the pins against a ribbon to mark the paper as does a wire-pin dot-matrix printer, it heats the pins and brings them into gentle contact with the paper. The special coating on the paper discolors when it is heated.

thermal transfer printer \thər`məl trans´fər prin`tər\ *n. See* thermal wax-transfer printer.

thermal wax printer \thər`məl waks´ prin`tər\ *n. See* thermal wax-transfer printer.

thermal wax-transfer printer \thər`məl waks´-trans-fər prin`tər\ *n.* A special type of nonimpact printer that uses heat to melt colored wax onto paper to create an image. Like a standard thermal printer, it uses pins to apply the heat. Rather than making contact with coated paper, however, the pins touch a wide ribbon saturated with different colored waxes. The wax melts under the pins and adheres to the paper.

thesaurus \thə-sōr´us`\ *n.* **1.** A book of words and their synonyms. **2.** In microcomputer applications, both a file of synonyms stored on disk and the program used to search the file.

The World—Public Access UNIX \dhə wərld´ pub`lik ak`ses yo͞o´ niks\ *n.* One of the oldest public access Internet service providers, based in Boston. In 1990, The World began offering full dial-up Internet access to the public. Other services include World Wide Web access, Usenet, SLIP/PPP support, telnet, FTP, IRC, Gopher, and e-mail. In 1995, The World began supporting local dial-up access via UUNET. *See also* ISP.

thick Ethernet \thik` ē´thər-net\ *n. See* 10Base5, Ethernet.

thick film \thik´ film\ *adj.* A term describing a method used in the manufacture of integrated circuits. Thick film technology uses a stencil-like technique called *photosilkscreening* to deposit multiple layers of special inks or pastes on a ceramic substrate. The inks or pastes can be conducting, insulating, or resistive. The passive components (wires, resistors, and capacitors) of the integrated circuits are formed by depositing a series of films of different characteristics and patterns. *Compare* thin film.

ThickNet \thik´net\ *n. See* 10Base5.

ThickWire \thik´wīr\ *n. See* 10Base5.

thimble \thim´bl\ *n.* A type element, similar to a daisy wheel, that bears a full character set, with each character on a separate type bar. As with a daisy wheel, the spokes, or type bars, radiate out from a central hub. On a thimble print element, however, each type bar is bent 90 degrees at its halfway point, so the type bars stick straight up with the type facing away from the hub. *See also* thimble printer. *Compare* daisy wheel, daisy-wheel printer.

thimble printer \thim´bl prin`tər\ *n.* A printer that uses a thimble print element, best known in a line of printers from NEC. Because these printers use fully formed characters like those on a typewriter, they generate letter-quality output that is indistinguishable from that of a typewriter. This includes the slight impression created by the type hitting the paper hard through the ribbon, which distinguishes this type of printout from that of laser printers. *See also* thimble. *Compare* daisy-wheel printer.

thin client \thin´ klī`ənt\ *n.* In a client/server architecture, a client computer that performs little or no data processing. The processing is instead performed by the server. *See also* client/server architecture, fat server, thin server. *Compare* fat client.

thin Ethernet \thin` ē´thər-net\ *n. See* 10Base2, Ethernet.

thin film \thin´ film\ *adj.* A method used in the fabrication of integrated circuits. Thin film technology operates on the same basic principles as thick film technology. Rather than using inks or pastes, however, thin film technology uses metals and metal oxides that are "evaporated" and then deposited on the substrate in the desired pattern to form the integrated circuit's passive components (wires, resistors, and capacitors). *See also* molecular beam epitaxy. *Compare* thick film.

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undo \un-dōō´\ *vb.* To reverse the last action—for example, to undo a deletion, thus restoring deleted text to a document. Many application programs enable the user both to undo and to redo an action. *See also* undelete[2].

undock \un-dok´\ *vb.* **1.** To detach a laptop or other portable computer from a docking station. *See also* docking station, laptop. **2.** To move a toolbar from the edge of a window so that the toolbar becomes its own free-floating window. *See also* toolbar.

unerase \un-ē-rās´\ *n. See* undelete[2].

unfold \un-fōld´\ *adj. See* inline (definition 1).

unhandled exception \un-han`dld eks-ep´shən\ *n.* An error condition that an application does not internally resolve. When an unhandled exception occurs, the operating system terminates the application that caused the error.

Unibus \yōō´ni-bus`\ *n.* A bus architecture introduced by Digital Equipment Corporation in 1970.

Unicode \yōō´ni-kōd`\ *n.* A 16-bit character encoding standard developed by the Unicode Consortium between 1988 and 1991. By using two bytes to represent each character, Unicode enables almost all of the written languages of the world to be represented using a single character set. (By contrast, 8-bit ASCII is not capable of representing all of the combinations of letters and diacritical marks that are used just with the Roman alphabet.) Approximately 39,000 of the 65,536 possible Unicode character codes have been assigned to date, 21,000 of them being used for Chinese ideographs. The remaining combinations are open for expansion. *Compare* ASCII.

Uniform Data Transfer \yōō`nə-fōrm dā´tə transfər, dat´ə\ *n. See* UDT.

Uniform Naming Convention \yōō`nə-fōrm nā´mēng kən-ven`shən\ *n.* The system of naming files among computers on a network so that a file on a given computer will have the same pathname when accessed from any of the other computers on the network. For example, if the directory *c:\path1\path2\...pathn* on computer *servern* is shared under the name *pathdirs,* a user on another computer would open *\\servern\pathdirs\filename.ext* to access the file *c:\path1\path2\...pathn\filename.ext* on *servern. See also* URL, virtual path.

Uniform Resource Citation \yōō`nə-fōrm rē´sōrs sī-tā`shən\ *n.* A description of an object on the World Wide Web, consisting of pairs of attributes and their values, such as the Uniform Resource Identifiers (URIs) of associated resources, author names, publisher names, dates, and prices. *Acronym:* URC (U`R-C´).

Uniform Resource Identifier \yōō`nə-fōrm rē´sōrs ī-den`tə-fī`ər\ *n.* A character string used to identify a resource (such as a file) from anywhere on the Internet by type and location. The set of Uniform Resource Identifiers includes Uniform Resource Names (URNs) and Uniform Resource Locators (URLs). *Acronym:* URI (U`R-I´). *See also* relative URL, Uniform Resource Name, URL.

Uniform Resource Locator \yōō`nə-fōrm rē´sōrs lō`kā-tər\ *n. See* URL.

Uniform Resource Name \yōō`nə-fōrm rē´sōrs nām`\ *n.* A scheme for uniquely identifying resources that may be available on the Internet by name, without regard to where they are located. The specifications for the format of Uniform Resource Names are still under development by the Internet Engineering Task Force (IETF). They include all Uniform Resource Identifiers (URIs) having the schemes urn:, fpi:, and path:; that is, those that are not Uniform Resource Locators (URLs). *Acronym:* URN (U`R-N´). *See also* IETF, Uniform Resource Identifier, URL.

UniForum \yōō´ni-fōr`um\ *n.* **1.** The International Association of Open System Professionals, an organization of UNIX users and administrators. **2.** A series of UNIX trade shows sponsored by UniForum and managed by Softbank COMDEX, Inc. *See also* COMDEX.

uninstall \un`in-stäl´\ *vb.* To remove software completely from a system, including the elimination of files and components residing in system locations such as the Registry in Windows 95 or Windows NT. Some applications have built-in uninstall utilities, and in other cases a separate uninstall program can be used. *Also called* deinstall.

uninterruptible power supply \un`in-tər-up`tə-bl pou´ər su-plī`\ *n. See* UPS.

union \yōōn´yən\ *n.* **1.** In set theory, the smallest combination of two sets that contains all elements of both sets. **2.** In logic, an inclusive OR operation.

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computer to a remote computer by means of a modem or network. **2.** The copy of the file that is being or has been transferred.

upload[2] \up´lōd\ *vb.* To transfer a copy of a file from a local computer to a remote computer. *Compare* download.

uppercase \up´ər-kās`\ *adj.* Of, pertaining to, or characterized by capital letters. *Compare* lowercase.

upper memory area \up`ər mem´ər-ē âr`ē-ə\ *n.* *See* UMA.

upper memory block \up`ər mem´ər-ē blok`\ *n.* *See* UMB.

UPS \U`P-S´\ *n.* Acronym for **u**ninterruptible **p**ower **s**upply. A device, connected between a computer (or other electronic equipment) and a power source (usually an outlet receptacle), that ensures that electrical flow to the computer is not interrupted because of a blackout and, in most cases, protects the computer against potentially damaging events, such as power surges and brownouts. All UPS units are equipped with a battery and a loss-of-power sensor; if the sensor detects a loss of power, it switches over to the battery so that the user has time to save his or her work and shut off the computer. *See also* blackout, brownout.

uptime \up´tīm\ *n.* The amount or percentage of time a computer system or associated hardware is functioning and available for use. *Compare* downtime.

upward-compatible \up`wərd-kəm-pat´ə-bl\ *adj.* Of, pertaining to, or characteristic of a computer product, especially software, designed to perform adequately with other products that are expected to become widely used in the foreseeable future. The use of standards and conventions makes upward compatibility easier to achieve.

urban legend \ur`bən lej´ənd\ *n.* A widely distributed story that remains in circulation in spite of the fact that it is not true. Many urban legends have been floating around the Internet and other online services for years, including the request for cards for the sick boy in England (he's long since recovered and grown up), the cookie or cake recipe that cost $250 (it's a myth), and the Good Times or Penpal Greetings virus, which will infect your computer when you read an e-mail message (it does not exist). *See also* Good Times virus.

URC \U`R-C´\ *n.* *See* Uniform Resource Citation.

URI \U`R-I´\ *n.* *See* Uniform Resource Identifier.

URL \U`R-L´, ərl\ *n.* Acronym for **U**niform **R**esource **L**ocator. An address for a resource on the Internet. URLs are used by Web browsers to locate Internet resources. A URL specifies the protocol to be used in accessing the resource (such as http: for a World Wide Web page or ftp: for an FTP site), the name of the server on which the resource resides (such as //www.whitehouse.gov), and, optionally, the path to a resource (such as an HTML document or a file on that server). *See also* FTP[1] (definition 1), HTML, HTTP, path (definition 1), server (definition 2), virtual path (definition 1), Web browser.

URN \U`R-N´\ *n.* *See* Uniform Resource Name.

.us \dot`U-S´\ *n.* On the Internet, the major geographic domain specifying that an address is located in the United States. Because the United States was the only possible location in the older ARPANET naming system, the United States can be regarded as a default location for domain name addresses ending in .com, .gov, .edu, .org, .mil, and .net. *See also* ARPANET, .com, domain name, .edu, .gov, .mil, .net, .org.

usable \yo͞o´zə-bl`\ *adj.* Of, pertaining to, or characteristic of the ease and adaptability with which a product can be applied to the performance of the work for which it is designed. A high degree of usability implies ease of learning, flexibility, freedom from bugs, and good design that does not involve unnecessarily complicated procedures.

USB \U`S-B´\ *n.* Acronym for **u**niversal **s**erial **bus**. A serial bus with a bandwidth of 1.5 megabits per second (Mbps) for connecting peripherals to a microcomputer. USB can connect up to 127 peripherals, such as external CD-ROM drives, printers, modems, mice, and keyboards, to the system through a single, general-purpose port. This is accomplished by daisy chaining peripherals together. USB supports hot plugging and multiple data streams. Developed by Intel, USB competes with DEC's ACCESS.bus for lower-speed applications. *See also* bus, daisy chain, hot plugging, input/output port, peripheral. *Compare* ACCESS.bus.

U.S. Department of Defense \U`S də-pärt`mənt əv də-fens´\ *n.* The military branch of the United

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.wav \dot`W-A-V´\ *n.* The file extension that identifies sound files stored in waveform (WAV) audio format. *See also* WAV.

WAV \wāv, W`A-V´\ *n.* A file format in which Windows stores sounds as waveforms. Such files have the extension .wav. Depending on the sampling frequency, on whether the sound is monaural or stereo, and on whether 8 or 16 bits are used for each sample, one minute of sound can occupy as little as 644 kilobytes or as much as 27 megabytes of storage. *See also* sampling (definition 2), waveform.

wave \wāv\ *n.* **1.** Any disturbance or change that has an oscillatory, periodic nature, for example, a light or sound wave. *See also* waveform. **2.** In electronics, the time-amplitude profile of an electrical signal.

waveform \wāv´fōrm\ *n.* The manner in which a wave's amplitude changes over time. *See also* period, phase, wavelength.

wavelength \wāv´lenkth, wāv´length\ *n.* The distance between successive peaks or troughs in a periodic signal that is propagated through space. Wavelength is symbolized by the Greek letter lambda (λ) and can be calculated as speed divided by frequency.

wavelet \wāv´lət\ *n.* A mathematical function that varies over a limited extent of time. Wavelets are coming into increasing use for analyzing signals (such as sound). They have limited duration and sudden changes in frequency and amplitude rather than the infinite duration and constant amplitude and frequency of the sine and cosine functions. *Compare* Fourier transform.

WBEM \W`B-E-M´\ *n.* Acronym for **W**eb-**B**ased **E**nterprise **M**anagement. A protocol that links a Web browser directly to a device or application that monitors a network. *See also* communications protocol.

WDEF \W`D-E-F´\ *n. See* window definition function.

WDL \W`D-L´\ *n. See* Windows Driver Library.

weak typing \wēk` tī´pēng\ *n.* A characteristic of a programming language that allows the program to change the data type of a variable during program execution. *See also* data type, variable. *Compare* strong typing.

web \web\ *n.* A set of interlinked documents in a hypertext system. The user enters the web through a home page. *See also* World Wide Web.

Web \web\ *n. See* World Wide Web.

Web address \web´ a`dres, ə-dres`\ *n. See* URL.

Web-Based Enterprise Management \web`bāsd en`tər-prīz man´əj-mənt\ *n. See* WBEM.

Web browser \web´ brou`zər\ *n.* A client application that enables a user to view HTML documents on the World Wide Web, another network, or the user's computer; follow the hyperlinks among them; and transfer files. Text-based Web browsers, such as Lynx, can serve users with shell accounts but show only the text elements of an HTML document; most Web browsers, however, require a connection that can handle IP packets but will also display graphics that are in the document, play audio and video files, and execute small programs, such as Java applets or ActiveX controls, that can be embedded in HTML documents. Some Web browsers require helper applications or plug-ins to accomplish one or more of these tasks. In addition, most current Web browsers permit users to send and receive e-mail and to read and respond to newsgroups. *Also called* browser. *See also* ActiveX controls, helper application, hyperlink, Internet Explorer, Java applet, Lynx, Mosaic, Netscape Navigator, plug-in.

WebCrawler \web´krä`lər, krô`lər\ *n.* A World Wide Web search engine operated by America Online. *See also* search engine.

Web development \web´ de-vel`əp-mənt\ *n.* The design and coding of World Wide Web pages.

Web directory \web´ dər-ek`tər-ē\ *n.* A list of Web sites, giving the URL and a description of each. *See also* URL.

Web index \web´ in`deks\ *n.* A Web site intended to enable a user to locate other resources on the Web. The Web index may include a search facility or may merely contain individual hyperlinks to the resources indexed.

Webmaster or **webmaster** \web´ma`stər\ *n.* A person responsible for creating and maintaining a World Wide Web site. A Webmaster is often responsible for responding to e-mail, ensuring the site is operating properly, creating and updating Web pages, and maintaining the overall structure

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point operations. The result of the test is given in units called *whetstones.* The Whetstone benchmark has fallen out of favor because it produces inconsistent results compared with other benchmarks such as the Dhrystone and the sieve of Eratosthenes. *See also* benchmark[1], Dhrystone, sieve of Eratosthenes.

WHIRLWIND \hwərl´wind, wərl´wind\ *n.* A digital computer using vacuum tubes, developed at Massachusetts Institute of Technology in the 1940s and used during the 1950s. The innovations introduced with WHIRLWIND included CRT displays and real-time processing. WHIRLWIND project members included Kenneth H. Olsen, who later founded Digital Equipment Corporation in 1957. *See also* CRT, real-time, vacuum tube.

whiteboard \hwīt´bōrd, wīt´bōrd\ *n.* Software that allows multiple users across a network to work together on a document that is simultaneously displayed on all the users' screens, as though they are all gathered around a physical whiteboard.

white noise \hwīt noiz´, wīt\ *n.* Noise that contains components at all frequencies, at least within the frequency band of interest. It is called "white" by analogy to white light, which contains light at all the visible frequencies. In the audible spectrum, white noise is a hiss or a roar, such as that produced when a television set is tuned to a channel over which no station is broadcasting.

white pages \hwīt´ pā`jəz, wīt´\ *n. See* DIB (definition 2).

white paper \hwīt´ pā`pər, wīt´\ *n.* An informal paper stating a position or proposing a draft specification, usually on a technical topic. *See also* specification (definition 1).

whois \hōō-iz´\ *n.* **1.** An Internet service, provided by some domains, that enables a user to find e-mail addresses and other information for users listed in a database at that domain. **2.** A UNIX command to access the whois service. **3.** A command that displays a list of all users logged onto a Novell network.

whois client \hōō`iz klī´ənt\ *n.* A program (such as the UNIX whois command) that enables a user to access databases of usernames, e-mail addresses, and other information. *See also* whois.

whois server \hōō`iz sər´vər\ *n.* Software that provides the usernames and e-mail addresses from a database (often listing people who have accounts at an Internet domain) to users who request the information using whois clients. *See also* whois.

Whole Earth 'Lectronic Link \hōl` ərth` lek-tron`ik lēnk´\ *n. See* WELL.

whole number \hōl` num´bər\ *n.* A number without a fractional component—for example, 1 or 173; an integer.

Wide Area Information Server \wīd` âr-ē-ə in-fər-mā´shən sər`vər\ *n. See* WAIS.

wide area network \wīd` âr-ē-ə net´wərk\ *n.* A communications network that connects geographically separated areas. *Acronym:* WAN (W`A-N´, wan).

wideband transmission \wīd`band tranz-mish´-ən\ *n. See* broadband network.

Wide SCSI or **Wide SCSI-2** \wīd´ skuz`ē, S-C-S-I`\ *n.* A form of the SCSI-2 interface that can transfer data 16 bits at a time at up to 20 megabytes per second. The Wide SCSI connector has 68 pins. *See also* SCSI, SCSI-2. *Compare* Fast SCSI, Fast/Wide SCSI.

widow \wid´ō\ *n.* A last line of a paragraph, shorter than a full line, appearing at the top of a page. A widow is considered visually undesirable on the printed page. *Compare* orphan.

wildcard character \wīld´kärd kâr`ək-tər\ *n.* A keyboard character that can be used to represent one or many characters. The asterisk (*), for example, typically represents one or more characters, and the question mark (?) typically represents a single character. Wildcard characters are often used in operating systems as a means of specifying more than one file by name.

Win32 \win`thər-tē-tōō´\ *n.* The application programming interface in Windows 95 and Windows NT that enables applications to use the 32-bit instructions available on 80386 and higher processors. Although Windows 95 and Windows NT support 16-bit 80x86 instructions as well, Win32 offers greatly improved performance. *See also* 16-bit machine, 32-bit machine, 80386DX, 8086, application programming interface, central processing unit, Win32s.

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matical formulas, create and print form letters, perform calculations, display documents in multiple on-screen windows, and enable users to record macros that simplify difficult or repetitive operations. *Compare* editor, line editor.

wordwrap or **word wrap** \wərd´rap\ *n.* The ability of a word processing program or a text-editing program to break lines of text automatically to stay within the page margins or window boundaries of a document without the user having to do so with carriage returns, as is typically necessary on a typewriter. *See also* hard return, soft return.

workaround \wərk´ə-round`\ *n.* A tactic for accomplishing a task, despite a bug or other inadequacy in software or hardware, without actually fixing the underlying problem. *See also* kludge.

workbook \wərk´bo͝ok\ *n.* In a spreadsheet program, a file containing a number of related worksheets. *See also* worksheet.

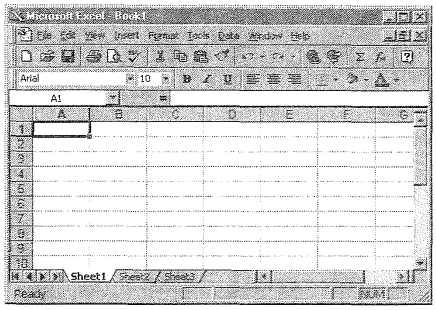
workflow application \wərk´flō a-plə-kā`shən\ *n.* A set of programs that aids in the tracking and management of all the activities in a project from start to finish.

workgroup \wərk´gro͞op\ *n.* A group of users working on a common project and sharing computer files, often over a local area network. *See also* groupware.

workgroup computing \wərk´gro͞op kəm-pyo͞o`-tēng\ *n.* A method of working electronically in which various individuals on the same project share resources and access to files using a network arrangement, such as a local area network, enabling them to coordinate their separate tasks. This is accomplished through using software designed for workgroup computing. *See also* groupware.

Workplace Shell \wərk´plās shel`\ *n.* The graphical user interface of OS/2. Like the Mac OS and Windows 95, the Workplace Shell is document-centric. Document files are displayed as icons; clicking on an icon starts the corresponding application, and the user can print a document by dragging the document's icon to a printer icon. The Workplace Shell uses the graphical functions of Presentation Manager. *Acronym:* WPS (W`P-S´).

worksheet \wərk´shēt\ *n.* In a spreadsheet program, a page organized into rows and columns appearing on screen and used for constructing a single table. See the illustration.



Worksheet.

workstation \wərk´stā`shən\ *n.* **1.** A combination of input, output, and computing hardware that can be used for work by an individual. **2.** A powerful stand-alone computer of the sort used in computer-aided design and other applications requiring a high-end, usually expensive, machine with considerable calculating or graphics capability. **3.** A microcomputer or terminal connected to a network.

World Wide Web or **World-Wide Web** \wərld` wīd web´\ *n.* The total set of interlinked hypertext documents residing on HTTP servers all around the world. Documents on the World Wide Web, called pages or Web pages, are written in HTML (Hypertext Markup Language), identified by URLs (Uniform Resource Locators) that specify the particular machine and pathname by which a file can be accessed, and transmitted from node to node to the end user under HTTP (Hypertext Transfer Protocol). Codes, called tags, embedded in an HTML document associate particular words and images in the document with URLs so that a user can access another file, which may be halfway around the world, at the press of a key or the click of a mouse. These files may contain text (in a variety of fonts and styles), graphics images, movie files, and sounds as well as Java applets, ActiveX controls, or other small embedded software programs that execute when the user activates them by

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clicking on a link. A user visiting a Web page also may be able to download files from an FTP site and send messages to other users via e-mail by using links on the Web page. The World Wide Web was developed by Timothy Berners-Lee in 1989 for the European Laboratory for Particle Physics (CERN). *Acronym:* WWW (W^W-W´). *Also called* w^3, W3, Web. *See also* ActiveX controls, HTML, HTTP, HTTP server (definition 2), Java applet, URL.

World Wide Web Consortium \wərld wīd web´ kən-sōr^shē-əm, kən-sōr^shəm\ *n.* A consortium of commercial and educational institutions that oversees research and promotes standards in all areas related to the World Wide Web. *Acronym:* W3C (W^thrē-C´).

worm \wərm\ *n.* A program that propagates itself across computers, usually by creating copies of itself in each computer's memory. A worm might duplicate itself in one computer so often that it causes the computer to crash. Sometimes written in separate segments, a worm is introduced surreptitiously into a host system either as a prank or with the intent of damaging or destroying information. *See also* bacterium, Internet Worm, Trojan horse, virus.

WORM \wərm\ *n.* Acronym for "**w**rite **o**nce, **r**ead **m**any." A type of optical disc that can be read and reread but cannot be altered after it has been recorded. WORMs are high-capacity storage devices. Because they cannot be erased and rerecorded, they are suited to storing archives and other large bodies of unchanging information. *See also* compact disc.

WOSA \wō´sə, W^O-S-A´\ *n.* Acronym for **W**indows **O**pen **S**ystem **A**rchitecture. A set of application programming interfaces from Microsoft that is intended to enable Windows-based applications from different vendors to communicate with each other, such as over a network. The interfaces within the WOSA standard include Open Database Connectivity (ODBC), the Messaging Application Programming Interface (MAPI), the Telephony Application Programming Interface (TAPI), Windows Sockets (Winsock), and Microsoft Remote Procedure Calls (RPC). *See also* MAPI, ODBC, remote procedure call, TAPI, Winsock.

.wp \dot^W-P´\ *n.* A file extension used to identify files formatted for the WordPerfect word processor.

WP \W-P´\ *n. See* word processing.

WPS \W^P-S´\ *n. See* Workplace Shell.

WRAM \W´ram, W^R-A-M´\ *n.* Acronym for **w**indow **r**andom **a**ccess **m**emory. A type of RAM used in video adapters. Like video RAM (VRAM), WRAM allows the screen to be repainted while a graphical image is being written, but WRAM is faster. *Compare* video RAM.

wrap around \rap´ ər-ound^\ *vb.* To continue movement, as with the cursor or a search operation, to the beginning or to a new starting point rather than stopping when the end of a series is reached. For example, the screen cursor might wrap around to the first column of the next line rather than stopping when it reaches the last column of the current line. Likewise, a program starting a search or replace operation in the middle of a document might be instructed to wrap around to the beginning rather than stop when it reaches the end of the document.

.wri \dot^W-R-I´\ *n.* The file format that identifies document files in the Microsoft Write format.

wrist support \rist´ su-pōrt^\ *n.* A device placed in front of a computer keyboard to support the wrists in an ergonomically neutral position, thereby safeguarding against repetitive strain injuries, such as carpal tunnel syndrome. See the illustration. *Also called* wrist rest. *See also* carpal tunnel syndrome, repetitive strain injury.

write^1 \rīt\ *n.* A transfer of information to a storage device, such as a disk, or to an output device, such as the monitor or printer. For example, a disk write means that information is transferred from memory to storage on disk. *See also* output^1. *Compare* read^1.

write^2 \rīt\ *vb.* To transfer information either to a storage device, such as a disk, or to an output device, such as the monitor or a printer. Writing is the means by which a computer provides the results of processing. A computer can also be said to write to the screen when it displays information on the monitor. *See also* output^2. *Compare* read^2.

write access \rīt´ ak^ses\ *n.* A privilege on a computer system that allows a user to save, change, or delete stored data. Write access is usually set by

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