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Third Edition

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Microsoft Press

Computer Dictionary

Third Edition

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Contents

Introduction

The *Microsoft Press Computer Dictionary, Third Edition* is designed to be a comprehensive and authoritative source of definitions for computer-related terms and abbreviations. The dictionary includes terms drawn from a wide variety of topics:

Applications
- Databases
- Desktop Publishing
- Multimedia
- Spreadsheets
- Word Processing

Communication and Networks
- E-mail
- Intranet

Data and Data Storage

Games

Graphics

Hardware
- Architecture
- Chips, Cards, and Boards
- Computers
- Disks, Drives, and Other Media
- Peripherals
- Processors

History

Information Processing
- General Computing
- Input/Output
- Memory and Memory Management

Internet
- Protocols
- Security
- Tools (user and developer)
- World Wide Web

Organizations

Software Engineering
- Concepts
- Programming Languages
- Tools and Techniques

Standards

Systems and Environments
- Operating Systems

Although this book covers nearly every aspect of computing, it does not include entries on most companies or on most makes and models of computers, nor does it contain entries on most application software products. The few exceptions to this rule of thumb are key companies and products that have a historical or universal importance within the computing industry.

This dictionary emphasizes terminology that the average computer user will encounter in documentation, online help, computer manuals, marketing and sales materials, the popular media, and the computer trade press. Because most computer users operate personal computers and desktop systems at home, work, or both, the majority of the entries in this dictionary cover the terminology used in describing and working with these systems. However, some specialized or highly technical language is included that pertains to areas of industry, academia, software and hardware development, and research. These terms have been included because they have a bearing on more common computer terminology or because they are of historical significance.

Changes in the Third Edition

The third edition of the *Microsoft Press Computer Dictionary* has been revised and updated to reflect the many advances in the computer field and to include several areas that have come into prominence in the public eye, such as the Internet. Over 2,500 new entries have been added, covering the Internet, the World Wide Web, network computing, hardware and software advances, virtual reality, multimedia, and workgroup computing.

Existing entries from the second edition of the *Microsoft Press Computer Dictionary* have been updated to include changes in the field.

All entries have been styled in a more traditional dictionary format than in previous editions. Pronunciations and parts of speech are given for all terms. Entries that have more than one sense, or definition, are broken into numbered lists.

Order of Presentation

Entries are alphabetized by letter. Spaces are ignored, as are characters such as hyphens and slashes; for example, *Baudot code* falls between *baud* and *baud rate,* and *machine-independent* falls between *machine identification* and *machine instruction*. Numbers and symbols are located at the beginning of the book and are listed in ascending ASCII order. If an entry begins with a letter or letters but contains a number, it is listed alphabetically, according to the initial letter(s), and then according to ASCII order. Thus, *V20* precedes *V.2x,* and both precede *VAB*.

Entries

Entries are of two types: main entries, which contain full definitions, and synonymous cross-references, which contain *See* references to the appropriate main entries. Synonymous cross-references are generally secondary or less common ways of referring to a main entry. The definition at the main entry can be substituted as a definition for the synonymous cross-reference.

Format

Information in each main entry is presented in a consistent format: entry name in boldface, spelling variants (if any), pronunciation, part of speech, definition, illustration or table references (if any), acronym (if any), alternative names (if any), and cross-references (if any).

Main Entries

Entries that are acronyms or abbreviations for one or more words or concatenations of two or more words have those words spelled out at the beginning of the definition. The letters in these words or phrases that make up the acronym, abbreviation, or concatenation are in boldface.

When a main entry is spelled exactly the same as another main entry, the two entries are differentiated by the use of a superscript numeral after each

term. These entries are called homographs, and they are generally different parts of speech. For example,

e-mail[1] (noun)
e-mail[2] (verb)

Spelling Variants

When a main entry has one or more variations in the way it is spelled, each spelling variant follows the main entry, after the word *or*.

Pronunciations

Pronunciation keys appear after all defined terms in the dictionary. Within the pronunciation keys, individual words are separated by word spaces, and syllables within each word are separated by stress marks or hyphens.

Variant Pronunciations

The *Microsoft Press Computer Dictionary, Third Edition* uses a generalized system for representing pronunciations, particularly for the vowels. There are many subtle variations, well known to phonologists in particular, in the ways Americans in different parts of the United States pronounce many vowels. However, most can recognize words that are pronounced slightly differently by others and should be able to interpret the broad category represented for each of the vowel sounds in this dictionary and apply it in their own regional variation or dialect. This dictionary represents only standard American pronunciations, but there are cases in which sufficient divergence in pronunciation exists, even within the United States, so some variant pronunciations have been included.

Variants are separated by commas, and the most common pronunciation may appear first. However, because there are many cases where two pronunciations are (at least roughly) equally widely used, the order in which they appear should not be interpreted to mean that the first one given is more "correct" or common than the other(s). Variants are shown on a word-by-word basis; for a multiword entry, pronunciation keys are given only for the word or words that have variant pronunciations.

For words that are spelled with the letters *wh*, the pronunciation is listed with two variants: one with a simple *w* (w) and one with the *hw* sound (hw).

Words that are spelled with either *au* or *aw* include a variant pronunciation with the letter *o* with a circumflex accent (ô), which represents the vowel sound some Americans (those who make a significant distinction between this sound and a "regular" short *o*) pronounce when they say the word *dawn*. In some parts of the country, this vowel sound is also used in words with other spellings, such as *coffee* or *talk*, but this seems to be a distinctly dialectical variation rather than a standard one. It is therefore very difficult for any individual to predict how any other might pronounce these particular words, so variants have not been included for them.

Stress

The syllable or syllables pronounced with the heaviest, or primary, stress in a term are followed by acute accents (´); those with lighter, or secondary, stress are followed by grave accents (`). For example, in the word *computer*, the second syllable is spoken more forcefully, or with more stress, than the first and third syllables and therefore is followed in the pronunciation key by an acute accent (kəm-py$\overline{oo}$´tər). In the word *engineering*, the third syllable is stressed most heavily, but the first syllable is stressed more than the second or fourth, so the first syllable is followed by a grave accent, indicating secondary stress (en`jə-nēr´ēng).

Special Characters and Diacritics

The dictionary's pronunciation schema keeps the use of technical phonetic characters to a minimum. Instead, a system that is more familiar to most Americans represents short vowels with plain letters (a, e, i, o, u) and long vowels with overbars (ā, ē, ī, ō, $\overline{oo}$). The ligatured *o*'s represent the vowel sounds in the words *foot* ($\breve{oo}$) and *food* ($\overline{oo}$).

The letter *a* with an umlaut (ä) is included as an alternative to the short *o* (o). It is used when the vowel is represented orthographically by some

letter or combination of letters other than the letter *o*, such as *a* (as in *father*), *au* (as in *caught*), or *aw* (as in *dawn*). This is done mainly to avoid confusing the reader visually with pronunciations such as won´dər for the word *wander*.

One other pair of alternative characters is used to represent a single vowel sound: the schwa (ə) and a short u (u). Traditionally, the schwa has been reserved for unstressed, or reduced, vowels, but in recent years it has become much more commonly used in dictionaries to also represent the short, stressed *u*. In this dictionary, the short *u* is used only in words that are spelled with the letter *u*, and the schwa is used for all other spellings except for "syllabic *l*'s," in which cases the vowel is dropped entirely, as in the word *little* (li´tl).

One other diacritic used in the pronunciations is a circumflex over the letter *a* (â). This is used instead of the short *e* only in combination with the letter *r*, to represent the vowel sound heard in words such as *air, software,* and *very*. This is done to avoid representations such as ker´ək-tər for the word *character,* which might lead some readers to believe that the sound should be pronounced as is the *er* in the word *her*.

Acronyms

When acronyms are pronounced as a series of sounded-out letters, capital letters are used to represent the pronunciation of the letters; for example, the pronunciation for the term *EPS* is E`P-S´, not ē`pē-es´. *Note:* Letter-by-letter pronunciations are included for all acronyms in the dictionary, even those that are pronounced as words by most people; for example, the pronunciation for the term *ASCII* includes both a´skē and A`S-C-I-I´.

Pronunciation Symbols

The following charts include the characters used for the pronunciations in the *Microsoft Press Computer Dictionary, Third Edition* (MPCD), the International Phonetic Alphabet (IPA) symbols to which those characters correspond, and some example words in which the letter or letters that represents each sound is underlined. No attempt has been made to represent foreign sounds as they are pronounced in their original language; only Americanized pronunciations are given for foreign words and names.

VOWELS

MPCD	*IPA*	*Representative Words*
a	æ	bat
ā	e	ape
ä	ɑ	father
ô	ɔ	dawn
är	ɔr	dart
âr	ɛr	hair
e	ɛ	let
ē	i	bee, equal
ēr	ir	hear
i	ɪ	sit
ī	aɪ	nice
īr	aɪr	wire
o	ɑ	hot
ō	o	oats, home
ōr	or	torn
o͝o	ʊ	book
o͝or	ʊr	tour
o͞o	u	boot, rule
oi	ɔɪ	oil, boy
ou	aʊ	out
u	ʌ	cup
ur	ɝ	purge
ə	ə	about, item, edible, gallop
ər	ər	ever

CONSONANTS

MPCD	*IPA*	*Representative Words*
b	b	bit
ch	ʧ	child, ratchet
d	d	dog
f	f	fill, phobia, laugh
g	g	gold, ghost
h	h	home
j	ʤ	jail, ledge
k	k	kid, cow, chrome
l	l, ɫ	live, double
m	m	map
n	n	not, know

ng	ŋg , ŋ	finger, sing
p	p	pine, apple
r	r	rat
s	s	soon, cell
sh	ʃ	shoe, notion, charade
t	t	test
th	θ	thin
dh	ð	then
v	v	vine
w	w	wine
hw	ʍ	whine
y	j	yet
z	z	zoom, beds
zh	3	pleasure, collage

Parts of Speech

Entries are broken down into four parts of speech, in addition to prefixes, abbreviated as follows:

n. noun
vb. verb
adj. adjective
adv. adverb

Definitions

Each of the more than 7,300 entries is written in clear, standard English. Many go beyond a simple definition to provide additional detail and to put the term in context for a typical computer user. When an entry has more than one sense or definition, the definitions are presented in a numbered list, to make it easier to distinguish the particular, sometimes subtle, variations in meaning.

Illustration and Table References

Some entries have affiliated illustrations or tables that aid in defining the entry. In most cases, illustrations and tables appear on the same page as the entries to which they apply. In some instances, however, page layout requirements have forced them to a subsequent page. Entries with illustrations or tables usually have references at the end of the definition for an entry, in the following formats:

See the illustration.
See the table.

Acronyms

Some terminology in the computer field, particularly computer standards and Internet slang, can be shortened to form acronyms. Sometimes the acronym is the more common way to refer to the concept or object; in these cases, the acronym is the main entry. In other cases, the acronym is not as commonly used as the words or phrase for which it stands. In these cases, the words or phrase constitute the main entry. The acronym is given after the definition for these entries in the following format:

Acronym:

Alternative Names

Some items or concepts in the computer field can be referred to by more than one name. Generally, though, one way is preferred. The preferred terminology is the main entry. Alternative names are listed after any acronyms; otherwise they are listed after the definition in the following format:

Also called:

Cross-References

Cross-references are of three types: *See, See also,* and *Compare.* A *See* reference is used in an entry that is a synonymous cross-reference and simply points to another entry that contains the information sought. A *See also* reference points to one or more entries that contain additional or supplemental information about a topic and follows any acronyms or alternative names after the definition. A *Compare* reference points to an entry or entries that offer contrast and follows any *See also* references; otherwise it follows any acronyms or alternative names after the definition.

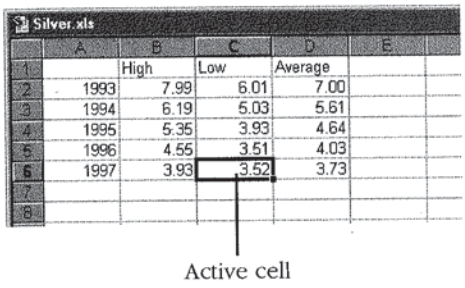
Future Printings and Editions

Every effort has been made to ensure the accuracy and completeness of this book. If you find an error, think that an entry does not contain enough information, or seek an entry that does not appear in this edition, please let us know. Address your letter to:

Dictionary Editor, Microsoft Press, One Microsoft Way, Redmond, WA 98052-8302. Or send e-mail to mspcd@microsoft.com.

Online Updates

Quarterly updates and revisions will be made to the *Microsoft Press Computer Dictionary, Third Edition,* on the Microsoft Press Web site (http://mspress.microsoft.com). These updates are meant to supplement the content of this dictionary and keep it up to date in regard to computer technology, which is one of the fastest-evolving fields in the world today. Simply point your Web browser to http://mspress.microsoft.com/mspress/products/1031 to access the update page for the dictionary. Please note that the content of the updates is in HTML format and is not available in a separate file for downloading. The updates are meant to be viewed on the Microsoft Press Web site.



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.

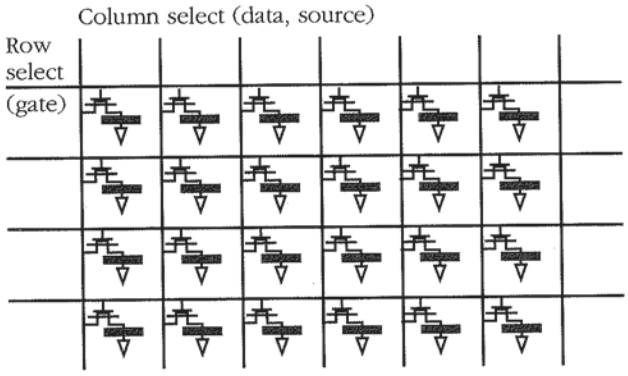
ActiveMovie \ak`tiv-mo͞o´vē\ *n.* Cross-platform digital video technology developed by Microsoft for online and desktop multimedia.

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.

ActiveX controls \ak`tiv-X´ kən-trōlz`\ *n.* Reusable software components that incorporate ActiveX technology. These components can be used to add specialized functionality, such as animation or pop-up menus, to Web pages, desktop applications, and software development tools. ActiveX controls can be written in a variety of programming languages, including C, C++, Visual Basic, and Java. *See also* ActiveX. *Compare* helper program.

activity ratio \ak-tiv´ə-tē rā`shō\ *n.* The number of records in use compared with the total number of records in a database file. *See also* database, record.

ACTOR \ak´tər\ *n.* An object-oriented language developed by The Whitewater Group, Ltd., designed primarily to facilitate Microsoft Windows programming. *See also* object-oriented programming.

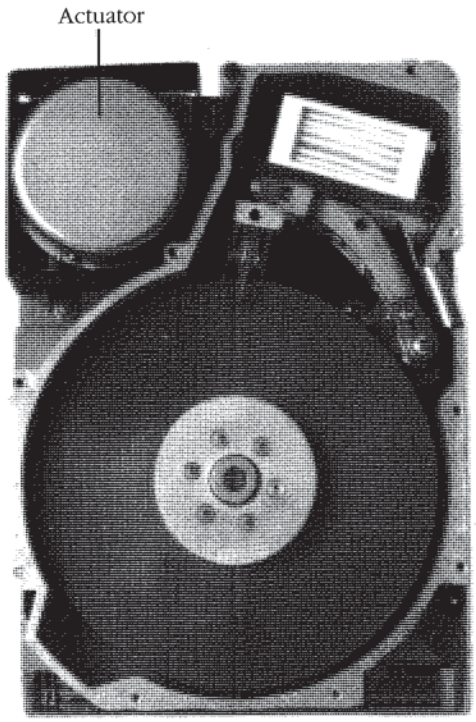
actuator \ak´chōō-ā`tər\ *n.* A disk drive mechanism for moving the read/write head(s) to the location of the desired track on a disk. See the illustration. *See also* disk drive, stepper motor, voice coil.

.ad \dot`A-D´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Andorra.

Ada \ā´də\ *n.* A high-level Pascal-based programming language designed under the direction of the U.S. Department of Defense (DoD) in the late 1970s and intended to be the primary language for DoD software development. Ada was named after Augusta Ada Byron, who assisted Charles Babbage in developing programs for his Analytical Engine, the first mechanical computer, in the nineteenth century. *See also* Pascal.

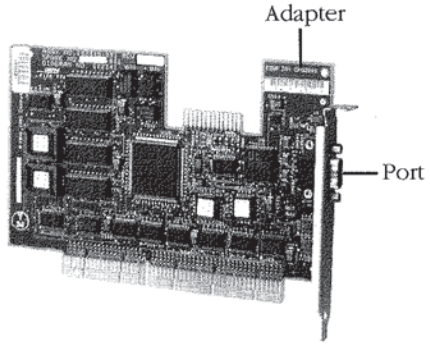
adapter or **adaptor** \ə-dap´tər`\ *n.* A printed circuit board that enables a personal computer to use a peripheral device, such as a CD-ROM drive, modem, or joystick, for which it does not already have the necessary connections, ports, or circuit boards. Commonly, a single adapter card can have more than one adapter on it. See the illustration. *Also called* interface card. *See also* controller, expansion board, network adapter, port, video adapter.

adaptive answering \ə-dap`tiv an´sər-ēng\ *n.* The ability of a modem to detect whether an incoming call is a fax or a data transmission and respond accordingly. *See also* modem.



Actuator. ***A stepper motor actuator.***

adaptive delta pulse code modulation \ə-dap`tiv del`tə puls` kōd´ moj-ə-lā´shən, mo-dyə-lā´shən\ *n.* A class of compression encoding and decoding algorithms used in audio compression and other data compression applications. These algorithms store digitally sampled signals as a series of changes in value, adapting the range of



Adapter.

the change with each sample as needed, thus increasing the effective bit resolution of the data. *Acronym:* ADPCM (A`D-P-C-M´). *See also* pulse code modulation. *Compare* adaptive differential pulse code modulation.

adaptive differential pulse code modulation \ə-dap`tiv dif-ər-en`shəl puls` kōd´ moj-ə-lā´shən, mo-dyə-lā´shən\ *n.* A digital audio compression algorithm that stores a sample as the difference between a linear combination of previous samples and the actual sample, rather than the measurement itself. The linear combination formula is modified every few samples to minimize the dynamic range of the output signal, resulting in efficient storage. *See also* pulse code modulation. *Compare* adaptive delta pulse code modulation.

adaptive system \ə-dap`tiv si´stəm\ *n.* A system that is capable of altering its behavior based on certain features of its experience or environment. *See also* expert system.

ADB \A`D-B´\ *n. See* Apple Desktop Bus.

ADC \A`D-C´\ *n. See* analog-to-digital converter.

A-D converter \A-D´ kən-vər`tər\ *n. See* analog-to-digital converter.

adder \ad´ər\ *n.* **1.** A CPU (central processing unit) component that adds two numbers sent to it by processing instructions. *See also* central processing unit. **2.** A circuit that sums the amplitudes of two input signals. *See also* full adder, half adder.

add-in \ad´in\ *n. See* add-on.

addition record \ə-dish´ən rek`ərd\ *n.* **1.** A file that describes new record entries (such as a new customer, employee, or product) in a database so that they can later be scrutinized and posted. **2.** A record in a change file specifying a new entry. *See also* change file.

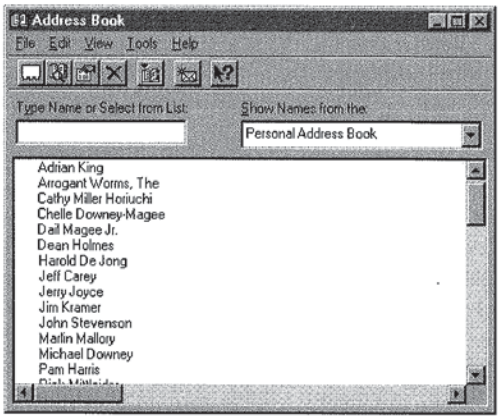
add-on \ad´on\ *n.* **1.** A hardware device, such as an expansion board or chip, that can be added to a computer to expand its capabilities. *Also called* add-in. *See also* open architecture (definition 2). **2.** A supplemental program that can extend the capabilities of an application program. *See also* utility program.

address[1] \a´dres, ə-dres´\ *n.* **1.** A number specifying a location in memory where data is stored. *See also* absolute address, address space, physical address, virtual address. **2.** A name or token specifying a particular site on the Internet or other network. **3.** A code used to specify an e-mail destination.

address[2] \a´dres, ə-dres´\ *vb.* To reference a particular storage location.

addressable cursor \ə-dres`ə-bl kur´sər\ *n.* A cursor programmed so that it can be moved to any location on the screen, as by means of the keyboard or a mouse.

address book \a´dres bo͝ok`, ə-dres´\ *n.* **1.** In an e-mail program, a reference section listing e-mail addresses and individuals' names. **2.** As a Web page, an informal e-mail or URL phone book. See the illustration.



Address book.

address bus \a´dres bus`, ə-dres´\ *n.* A hardware path usually consisting of 20 to 64 separate lines used to carry the signals specifying a memory location. *See also* bus.

address decoder \a´dres dē-kō`dər, ə-dres´\ *n.* An electronic device that converts a numeric address so as to select a memory location on one or more RAM chips.

addressing \ə-dres´ēng, a´dres-ēng\ *n.* The process of assigning or referring to an address. In programming, the address is typically a value specifying a memory location. *See also* address[1].

address mapping table \a´dres map`ēng tā`bl, ə-dres´\ *n.* A table used by routers or Domain Name System (DNS) servers to resolve Internet Protocol (IP) addresses from a text entry such as a name.

bomb[2], crash[2] (definition 1), debug, debugger, hang, inherent error, logic error, semantic error, syntax error. **2.** A recurring physical problem that prevents a system or set of components from working together properly. While the origin of this definition is in some dispute, computer folklore attributes the first use of bug in this sense to a problem in the Harvard Mark I or the Army/University of Pennsylvania ENIAC that was traced to a moth caught between the contacts of a relay in the machine (although a moth is not entomologically a true bug).

buggy \bug´ē\ *adj.* Full of flaws, or bugs, in reference to software. *See also* bug (definition 1).

building-block principle \bil´dēng-blok prin`sə-pəl\ *n. See* modular design.

built-in check \bilt`in chek´\ *n. See* hardware check, power-on self test.

built-in font \bilt`in font´\ *n. See* internal font.

built-in groups \bilt`in grōōps´\ *n.* The default groups provided with Microsoft Windows NT and Windows NT Advanced Server. A group defines a collection of rights and permissions for the user accounts that are its members. Built-in groups are therefore a convenient means of providing access to commonly used resources. *See also* group[1].

bulk eraser \bulk´ ē-rā`sər\ *n.* A device for eliminating all information from a storage medium, such as a floppy disk or a tape, by generating a strong magnetic field that scrambles the alignment of the ferrous materials in the media that encode stored data.

bulk storage \bulk´ stōr`əj\ *n.* Any medium capable of containing large quantities of information, such as tape, fixed disk, or optical disc.

bullet \bōōl´ət, bul´ət\ *n.* A typographical symbol, such as a filled or empty circle, diamond, box, or asterisk, used to set off a small block of text or each item in a list. Round and square bullets are used to set off different levels of information. *See also* dingbat.

bulletin board system \bōōl´ə-tən bōrd si`stəm, bul´ə-tən\ *n. See* BBS.

bulletproof \bōōl´ət-prōōf`, bul´ət-\ *adj.* Capable of overcoming hardware problems that, in another system, could lead to interruption of the task in progress.

bundle \bun´dl\ *vb.* To combine products for sale as a lot. Frequently, operating system software and some widely used applications are bundled with a computer system for sale.

bundled software \bun`dld soft´wâr\ *n.* **1.** Programs sold with a computer as part of a combined hardware/software package. **2.** Smaller programs sold with larger programs to increase the latter's functionality or attractiveness.

burn \burn\ *vb.* To write data electronically into a programmable read-only memory (PROM) chip by using a special programming device known variously as a PROM programmer, PROM blower, or PROM blaster. The term is also used in reference to creating read-only memory compact discs (CD-ROMs). *Also called* blast, blow. *See also* PROM.

burn in \burn in´\ *vb.* **1.** To keep a new system or device running continuously so that any weak elements or components will fail early and can be found and corrected before the system becomes an integral part of the user's work routine. Such a test is often performed at the factory before a device is shipped. **2.** To make a permanent change in the phosphor coating on the inside of a monitor screen by leaving the monitor on and keeping a bright, unchanging image on the screen for extended periods. Such an image will remain visible after the monitor is turned off. Burning in was a danger with older PC monitors; it is no longer a concern with most new PC monitors. *Also called* ghosting.

burst[1] \burst\ *n.* Transfer of a block of data all at one time without a break. Certain microprocessors and certain buses have features that support various types of burst transfers. *See also* burst speed (definition 1).

burst[2] \burst\ *vb.* To break fanfold continuous-feed paper apart at its perforations, resulting in a stack of separate sheets.

burster \bur´stər\ *n.* A device used to burst, or break apart at the perforations, fanfold continuous-feed paper.

burst mode \burst´ mōd\ *n.* A method of data transfer in which information is collected and sent as a unit in one high-speed transmission. In burst mode, an input/output device takes control of a multiplexer channel for the time required to send its data. In effect, the multiplexer, which normally merges input from several sources into a single

high-speed data stream, becomes a channel dedicated to the needs of one device until the entire transmission has been sent. Burst mode is used both in communications and between devices in a computer system. *See also* burst[1].

burst rate \burst´ rāt\ *n.* *See* burst speed (definition 1).

burst speed \burst´ spēd\ *n.* **1.** The fastest speed at which a device can operate without interruption. For example, various communications devices (as on networks) can send data in bursts, and the speed of such equipment is sometimes measured as the burst speed (the speed of data transfer while the burst is being executed). *Also called* burst rate. **2.** The number of characters per second that a printer can print on one line without a carriage return or linefeed. Burst speed measures the actual speed of printing, without consideration of the time taken to advance paper or to move the print head back to the left margin. Almost always, the speed claimed by the manufacturer is the burst speed. By contrast, *throughput* is the number of characters per second when one or more entire pages of text are being printed and is a more practical measurement of printer speed in real-life situations.

bursty \bur´stē\ *adj.* Transmitting data in spurts, or bursts, rather than in a continuous stream.

bus \bus\ *n.* A set of hardware lines (conductors) used for data transfer among the components of a computer system. A bus is essentially a shared highway that connects different parts of the system—including the microprocessor, disk-drive controller, memory, and input/output ports—and enables them to transfer information. The bus consists of specialized groups of lines that carry different types of information. One group of lines carries data; another carries memory addresses (locations) where data items are to be found; yet another carries control signals. Buses are characterized by the number of bits they can transfer at a single time, equivalent to the number of wires within the bus. A computer with a 32-bit address bus and a 16-bit data bus, for example, can transfer 16 bits of data at a time from any of 2^{32} memory locations. Most microcomputers contain one or more expansion slots into which additional boards can be plugged to connect them to the bus.

bus enumerator \bus´ ə-nōō`mər-ā-tər\ *n.* A device driver that identifies devices located on a specific bus and assigns a unique identification code to each device. The bus enumerator is responsible for loading information about the devices onto the hardware tree. *See also* bus, device driver, hardware tree.

bus extender \bus´ eks-ten`dər\ *n.* **1.** A device that expands the capacity of a bus. For example, IBM PC/AT computers used a bus extender to add onto the earlier PC bus and allow the use of 16-bit expansion boards in addition to 8-bit boards. *See also* bus. **2.** A special board used by engineers to raise an add-on board above the computer's cabinet, making it easier to work on the circuit board.

business graphics \biz´nəs graf`iks\ *n.* *See* presentation graphics.

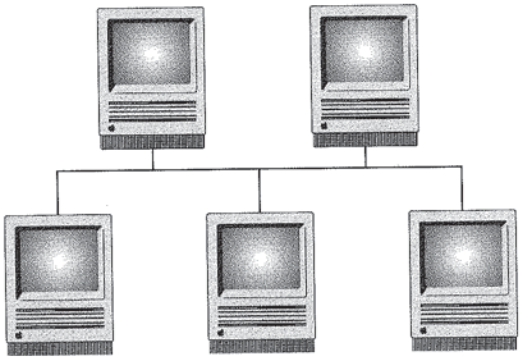
business information system \biz`nəs in-fər-mā´shən si`stəm\ *n.* A combination of computers, printers, communications equipment, and other devices designed to handle data. A completely automated business information system receives, processes, and stores data; transfers information as needed; and produces reports or printouts on demand. *Acronym:* BIS (B`I-S´). *See also* management information system.

business software \biz´nəs soft`wâr\ *n.* Any computer application designed primarily for use in business, as opposed to scientific use or entertainment. In addition to the well-known areas of word processing, spreadsheets, databases, and communications, business software for microcomputers also encompasses such applications as accounting, payroll, financial planning, project management, decision and support systems, personnel record maintenance, and office management.

bus mouse \bus´ mous\ *n.* A mouse that attaches to the computer's bus through a special card or port rather than through a serial port. *See also* mouse. *Compare* serial mouse.

bus network \bus´ net`wərk\ *n.* A topology (configuration) for a local area network in which all nodes are connected to a main communications line (bus). On a bus network, each node monitors activity on the line. Messages are detected by all nodes but are accepted only by the node(s) to which they are addressed. A malfunctioning node ceases to communicate but does not disrupt oper-

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.

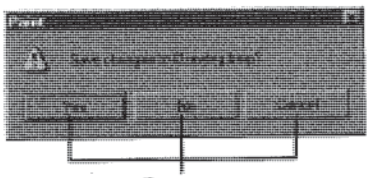


Bus network. ***A bus network configuration.***

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 **by**nar**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

desktop enhancer \desk´top en-han`sər\ *n.* Software that adds functionality to a windows-based operating system such as Microsoft Windows or Mac OS—for example, an enhanced file browser, clipboard, or multimedia player.

Desktop file \desk´top fīl`\ *n.* A hidden file maintained on a particular volume (roughly equivalent to a disk) by the Macintosh operating system for storing information about the files on it, such as version data, lists of icons, and file references.

Desktop Management Interface \desk`top man`əj-mənt in´tər-fās\ *n. See* DMI.

desktop publishing \desk`top pu´bli-shēng\ *n.* The use of a computer and specialized software to combine text and graphics to create a document that can be printed on either a laser printer or a typesetting machine. Desktop publishing is a multiple-step process involving various types of software and equipment. The original text and illustrations are generally produced with software such as word processors and drawing and painting programs and with photograph-scanning equipment and digitizers. The finished product is then transferred to a page-makeup program, which is the software most people think of as the actual desktop publishing software. This type of program enables the user to lay out text and graphics on the screen and see what the results will be; for refining parts of the document, these programs often include word processing and graphics features in addition to layout capabilities. As a final step, the finished document is printed either on a laser printer or, for the best quality, by typesetting equipment.

desktop video \desk`top vid´ē-ō\ *n.* The use of a personal computer to display video images. The video images may be recorded on video tape or on a laser disc or may be live footage from a video camera. Live video images can be transmitted in digital form over a network in video conferencing. *Acronym:* DTV (D`T-V´).

destination \de`stə-nā´shən\ *n.* The location (drive, folder, or directory) to which a file is copied or moved. *Compare* source (definition 1).

destructive read \dis-truk`tiv rēd´\ *n.* An attribute of certain memory systems, notably core systems. In a destructive read of a memory location, the data is passed on to the processor, but the copy in memory is destroyed by the process of reading. Destructive memory systems require special logic to rewrite data back to a memory location after it is read. *Also called* destructive readout. *See also* core. *Compare* nondestructive readout.

detail file \dē´tāl fīl`\ *n. See* transaction file.

detection \də-tek´shən`\ *n.* Discovery of a certain condition that affects a computer system or the data with which it works.

determinant \də-tər´mə-nənt`\ *n.* In database design theory, any attribute or combination of attributes on which any other attribute or combination of attributes is functionally dependent.

determinism \də-tər´mə-ni-zəm`\ *n.* In computing, the ability to predict an outcome or to know in advance how data will be manipulated by a processing system. A deterministic simulation, for example, is one in which a certain input always produces the same output.

developer's toolkit \də-vel`ə-pərz to͞ol´kit\ *n.* A set of routines (usually in one or more libraries) designed to allow developers to more easily write programs for a given computer, operating system, or user interface. *See also* library (definition 1), toolbox.

development cycle \də-vel´əp-mənt sī`kl\ *n.* The process of application development from definition of requirements to finished product, including the following stages: analysis, design and prototyping, software coding and testing, and implementation.

device \də-vīs´\ *n.* A generic term for a computer subsystem. Printers, serial ports, and disk drives are often referred to as devices; such subsystems frequently require their own controlling software, called device drivers. *See also* device driver.

device address \də-vīs´ a`dres, ə-dres`\ *n.* A location within the address space of a computer's random access memory (RAM) that can be altered either by the microprocessor or by an external device. Device addresses are different from other locations in RAM, which can be altered only by the microprocessor. *See also* device, input/output, RAM.

device control character \də-vīs` kən-trōl´ kâr`ək-tər\ *n. See* control character.

device controller \də-vīs´ kən-trō`lər\ *n. See* input/output controller.

device dependence \də-vīs´ də-pen`dəns\ *n.* The requirement that a particular device be present or available for the use of a program, interface, or protocol. Device dependence in a program is often considered unfortunate because the program either is limited to one system or requires adjustments for every other type of system on which it is to run. *Compare* device independence.

device driver \də-vīs´ drī`vər\ *n.* A software component that permits a computer system to communicate with a device. In most cases, the driver also manipulates the hardware in order to transmit the data to the device. However, device drivers associated with application packages typically perform only the data translation; these higher-level drivers then rely on lower-level drivers to actually send the data to the device. Many devices, especially video adapters on PC-compatible computers, will not work properly—if at all—without the correct device drivers installed in the system.

device independence \də-vīs` in-də-pen´dəns\ *n.* A characteristic of a program, interface, or protocol that supports software operations that produce similar results on a wide variety of hardware. For example, the PostScript language is a device-independent page description language because programs issuing PostScript drawing and text commands need not be customized for each potential printer. *Compare* device dependence.

device-independent bitmap \də-vīs`in-də-pen`-dənt bit´map\ *n. See* DIB.

device manager \də-vīs´ man`ə-jər\ *n.* A software utility that allows viewing and changing hardware configuration settings, such as interrupts, base addresses, and serial communication parameters.

Device Manager \də-vīs´ man`ə-jər\ *n.* In Windows 95, a function within the System Properties utility that indicates device conflicts and other problems and allows a user to change the properties of the computer and each device attached to it. *See also* property, property sheet.

device name \də-vīs´ nām`\ *n.* The label by which a computer system component is identified by the operating system. MS-DOS, for example, uses the device name COM1 to identify the first serial communications port.

device resolution \də-vīs` rez`ə-lo͞o´shən\ *n. See* resolution (definition 1).

DFS \D`F-S´\ *n. See* distributed file system.

DGIS \D`G-I-S´\ *n.* Acronym for **D**irect **G**raphics **I**nterface **S**pecification. An interface developed by Graphics Software Systems. DGIS is firmware (generally implemented in ROM on a video adapter) that allows a program to display graphics on a video display through an extension to the IBM BIOS Interrupt 10H interface.

DHCP \D`H-C-P´\ *n.* Acronym for **D**ynamic **H**ost **C**onfiguration **P**rotocol. A TCP/IP protocol that enables a network connected to the Internet to assign a temporary IP address to a host automatically when the host connects to the network. *See also* IP address, TCP/IP. *Compare* dynamic SLIP.

Dhrystone \drī´stōn\ *n.* A general-performance benchmarking test, originally developed by Rheinhold Weicker in 1984 to measure and compare computer performance. The test reports general system performance in dhrystones per second. It is intended to replace the older and less reliable Whetstone benchmark. The Dhrystone benchmark, like most benchmarks, consists of standard code revised periodically to minimize unfair advantages to certain combinations of hardware, compiler, and environment. Dhrystone concentrates on string handling and uses no floating-point operations. Like most benchmarking tests, it is heavily influenced by hardware and software design, such as compiler and linker options, code optimizing, cache memory, wait states, and integer data types. *See also* benchmark[2]. *Compare* sieve of Eratosthenes, Whetstone.

DIA \D`I-A´\ *n.* Acronym for **D**ocument **I**nterchange **A**rchitecture. A document exchange guideline used in IBM's Systems Network Architecture (SNA). DIA specifies methods of organizing and addressing documents for transmission between computers of different sizes and models. DIA is supported by IBM's Advanced Program-to-Program Communication (APPC) and by Logical Unit (LU) 6.2, which establish the capabilities and types of interactions possible in an SNA environment. *See also* DCA (definition 1), SNA.

diacritical mark \dī-ə-krit´i-kəl märk`\ *n.* An accent mark above, below, or through a written character—for example, the acute (´) and grave (`) accents.

dialect \dī´ə-lekt`\ *n.* A variant of a language or protocol. For example, Transact-SQL is a dialect of structured query language (SQL).

dialog \dī´ə-log`\ *n.* **1.** In computing, the exchange of human input and machine responses that forms a "conversation" between an interactive computer and the person using it. **2.** The exchange of signals by computers communicating on a network.

dialog box \dī´ə-log boks`\ *n.* In a graphical user interface, a special window displayed by the system or application to solicit a response from the user. *See also* windowing environment. *Compare* integrator.

dial-up \dīl´up\ *adj.* Of, pertaining to, or being a connection that uses the public switched telephone network rather than a dedicated circuit or some other type of private network.

dial-up access \dīl´up ak`ses\ *n.* Connection to a data communications network through a public switched telecommunication network.

dial-up service \dīl´up sər`vəs\ *n.* A telephone connection provider for a local or worldwide public switched telephone network that provides Internet or intranet access, advertisement via a Web page, access to news services, or access to the stock market and other resources.

DIB \D`I-B´\ *n.* **1.** Acronym for **d**evice-**i**ndependent **b**it map. A file format designed to ensure that bitmapped graphics created using one application can be loaded and displayed in another application exactly the way they appeared in the originating application. *See also* bitmapped graphics. **2.** Acronym for **D**irectory **I**nformation **B**ase. A directory of user and resource names in an X.500 system. The DIB is maintained by a Directory Server Agent (DSA). *Also called* white pages.

DIBengine \D`I-B-en´jən\ *n.* Software, or a combination of hardware and software, that produces DIB files. *See also* DIB (definition 1).

dibit \dī´bit\ *n.* A set of 2 bits representing one of four possible combinations: 00, 01, 10, and 11. In communications, a dibit is a kind of transmission unit made possible by the modulation technique known as differential phase-shift keying, which encodes data by using four different states (phase shifts) in the transmission line to represent each of the four dibit combinations. *See also* phase-shift keying.

dichotomizing search \dī-kot`ə-mī-zēng sərch´\ *n. See* binary search.

DIF \D`I-F´\ *n. See* data interchange format.

difference \di´frəns, dif´ər-əns\ *n.* **1.** The amount by which two values differ. In electronics, differences in physical elements, such as waveforms or voltages, are used in the operation of circuits, amplifiers, multiplexers, communications equipment, and so on. **2.** In database management, it is an operator in relational algebra that is used in sorting record sets (tuples). For example, given two relational tables, A and B, that are union-compatible (contain the same number of fields, with corresponding fields containing the same types of values), the statement

DIFFERENCE A, B

builds a third relation containing all those records that appear in A but not in B. *See also* relational algebra, tuple. *Compare* intersect, union.

Difference Engine \dif´ər-əns en`jin, dif´rəns\ *n.* An early computerlike mechanical device designed by British mathematician and scientist Charles Babbage in the early 1820s. The Difference Engine was intended to be a machine with a 20-decimal capacity capable of solving mathematical problems. The concept of the Difference Engine was enhanced by Babbage in the 1830s in the design of his more famous Analytical Engine, a mechanical precursor of the electronic computer. *See also* Analytical Engine.

differential \dif`ər-en´shəl\ *adj.* In electronics, a reference to a type of circuit that makes use of the difference between two signals rather than the difference between one signal and some reference voltage.

differential phase-shift keying \dif-ər-en`shəl fāz´shift kē`ēng\ *n. See* phase-shift keying.

differentiator \dif`ər-en´shē-ā`tər\ *n.* A circuit whose output is the differential (first derivative) of the input signal. The differential measures how fast a value is changing, so the output of a differentiator is proportional to the instantaneous rate of change of the input signal. See the illustration on the next page. *Compare* integrator.

digest \dī´jest\ *n.* **1.** An article in a moderated newsgroup that summarizes multiple posts submitted to the moderator. *See also* moderator, newsgroup. **2.** A message in a mailing list that is sent to

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.

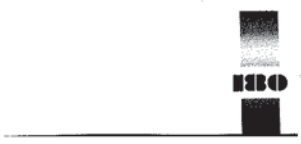
escape code \e-skāp´ kōd`\ *n.* A character or sequence of characters that indicates that a following character in a data stream is not to be processed in the ordinary way. In the C programming language, the escape code is the backslash \, which has several uses, as shown by the statement

```
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.



ESC character \e-skāp´ kâr`ək-tər\ *n.* One of the 32 control codes defined in the ASCII character set. It usually indicates the beginning of an escape sequence (a string of characters that give instructions to a device such as a printer). It is represented internally as character code 27 (hexadecimal 1B). *Also called* escape character.

Esc key \e-skāp´ kē`\ *n. See* Escape key.

ESD \E`S-D´\ *n. See* electronic software distribution, electrostatic discharge.

ESDI \E`S-D-I´, ez´dē\ *n.* Acronym for **E**nhanced **S**mall **D**evice **I**nterface. A device that allows disks to communicate with computers at high speeds. ESDI drives typically transfer data at about 10 megabits per second, but they are capable of doubling that speed.

ESP \E`S-P´\ *n. See* enhanced serial port.

ESP IEEE standard \E`S-P` I-E-E-E´ stan`dərd\ *n.* Short for **E**ncapsulating **S**ecurity **P**ayload **IEEE standard**. A standard for providing integrity and confidentiality to IP (Internet Protocol) datagrams. In some circumstances, it can also provide authentication to IP datagrams. *See also* authentication, datagram, IEEE, IP.

.et \dot`E-T´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Ethiopia.

e-text \E´tekst\ *n.* Short for **e**lectronic **text**. A book or other text-based work that is available on line in an electronic media format. An e-text can be read on line or downloaded to a user's computer for offline reading. *See also* ezine.

Ethernet \ē´thər-net`\ *n.* **1.** An IEEE 802.3 standard for contention networks. Ethernet uses a bus or star topology and relies on the form of access known as Carrier Sense Multiple Access with Collision Detection (CSMA/CD) to regulate communication line traffic. Network nodes are linked by coaxial cable, by fiber-optic cable, or by twisted-pair wiring. Data is transmitted in variable-length frames containing delivery and control information and up to 1,500 bytes of data. The Ethernet standard provides for baseband transmission at 10 megabits (10 million bits) per second. *See also* 10Base2, 10Base5, 10BaseF, 10BaseT, baseband, bus network, coaxial cable, contention, CSMA/CD, IEEE 802 standards, twisted-pair cable. **2.** A widely used local area network system developed by Xerox in 1976, from which the IEEE 802.3 standard was developed.

Ethernet/802.3 \ē`thər-net-āt`-ō-tōō`point-thrē´\ *n.* The IEEE standard for 10- or 100-Mbps transmissions over an Ethernet network. Ethernet/802.3 defines both hardware and data packet construction specifications.

E-time \ē´tīm\ *n. See* execution time.

etiquette \et´ə-kət\ *n. See* netiquette.

ETX \E`T-X´\ *n. See* end-of-text.

Eudora \yōō`dōr´ə\ *n.* An e-mail client program originally developed as freeware for Macintosh computers by Steve Dorner at the University of Illinois, now maintained in both freeware and commercial versions for both Macintosh and Microsoft Windows by Qualcomm, Inc.

EULA \yōō´lə, E`U-L-A´\ *n. See* End-User License Agreement.

European Computer Manufacturers Association \yər-ə-pē`ən kəm-pyōō`tər man`yu-fak´chur-ərz ə-sō-sē-ā`shən\ *n. See* ECMA.

European Laboratory for Particle Physics \yər-ə-pē`ən lab`rə-tōr`ē fōr pär`tə-kl fiz´iks\ *n. See* CERN.

evaluation \i-val`yōō-ā´shən\ *n.* The determination, by a program, of the value of an expression or the action that a program statement specifies. Evaluation can take place at compile time or at run time.

even parity \ē`vən pâr´ə-tē\ *n. See* parity.

event \ə-vent´, ē-vent´\ *n.* An action or occurrence, often generated by the user, to which a program might respond—for example, key presses, button clicks, or mouse movements. *See also* event-driven programming.

event-driven \ə-vent´ driv`ən, ē-vent´\ *adj.* Of, pertaining to, or being software that accomplishes its purpose by responding to externally caused events, such as the user pressing a key or clicking a button on a mouse. For example, an event-driven data entry form will allow the user to click on and edit any field at any time rather than forcing the user to step through a fixed sequence of prompts.

event-driven processing \ə-vent`driv-ən pros´es-ēng, ē-vent`\ *n.* A program feature belonging to more advanced operating-system architectures such as the Apple Macintosh operating system,

Microsoft Windows, UNIX, and OS/2. In times past, programs were required to interrogate, and effectively anticipate, every device that was expected to interact with the program, such as the keyboard, mouse, printer, disk drive, and serial port. Often, unless sophisticated programming techniques were used, one of two events happening at the same instant would be lost. Event processing solves this problem through the creation and maintenance of an event queue. Most common events that occur are appended to the event queue for the program to process in turn; however, certain types of events can preempt others if they have a higher priority. An event can be of several types, depending on the specific operating system considered: pressing a mouse button or keyboard key, inserting a disk, clicking on a window, or receiving information from a device driver (as for managing the transfer of data from the serial port or from a network connection). *See also* autopolling, event, interrupt.

event-driven programming \ə-vent`driv-ən prō´-gram-ēng, ē-vent`\ *n.* A type of programming in which the program constantly evaluates and responds to sets of events, such as key presses or mouse movements. Event-driven programs are typical of Apple Macintosh computers, although most graphical interfaces, such as Microsoft Windows or the X Window System, also use such an approach. *See also* event.

exa- \eks´ə\ *prefix* Abbreviated E. A prefix meaning one quintillion (10^{18}). In computing, which is based on the binary (base-2) numbering system, exa- has a literal value of 1,152,921,504,606,846,976, which is the power of 2 (2^{60}) closest to one quintillion.

exabyte \eks´ə-bīt`\ *n.* Abbreviated EB. Roughly 1 quintillion bytes, or a billion billion bytes, or 1,152,921,504,606,846,976 bytes.

exception \eks-ep´shən`\ *n.* In programming, a problem or change in conditions that causes the microprocessor to stop what it is doing and handle the situation in a separate routine. An exception is similar to an interrupt; both refer the microprocessor to a separate set of instructions. *See also* interrupt.

exception error 12 \eks-ep`shən âr-ər twelv´\ *n.* An error created in DOS environments caused by a stack overflow. This problem may be corrected by modifying the CONFIG.SYS file and editing the STACKS= entries.

exception handling \eks-ep´shən han`-də-lēng, hand`lēng\ *n. See* error handling.

exchangeable disk \eks-chanj`ə-bl disk´\ *n. See* removable disk.

exchange sort \eks-chānj´ sōrt`\ *n. See* bubble sort.

exclusive NOR \eks-klo͞o`siv nōr´\ *n.* A two-state digital electronic circuit in which the output is driven high only if the inputs are all high or all low.

exclusive OR \eks-klo͞o`siv ōr´\ *n.* A Boolean operation that yields "true" if and only if one of its operands is true and the other is false, as shown in the table below. *Acronym:* EOR (E´ōr). *Also* called XOR. *See also* Boolean operator, truth table. Compare AND, OR.

a	*b*	*a XOR b*
0	0	0
0	1	1
1	0	1
1	1	0

.exe \dot`E-X-E´\ *n.* In MS-DOS, a filename extension that indicates that a file is an executable program. To run an executable program, the user types the filename without the .exe extension at the prompt and presses Enter. *See also* executable program.

executable[1] \eks`ə-kyo͞o´tə-bl\ *adj.* Of, pertaining to, or being a program file that can be run. Executable files have extensions such as .bat, .com, and .exe.

executable[2] \eks`ə-kyo͞o´tə-bl\ *n.* A program file that can be run, such as file0.bat, file1.exe, or file2.com.

executable program \eks`ə-kyo͞o`te-bl prō´gram\ *n.* A program that can be run. The term usually applies to a compiled program translated into machine code in a format that can be loaded into memory and run by a computer's processor. In interpreter languages, an executable program can be source code in the proper format. *See also* code (definition 1), compiler (definition 2), computer program, interpreter, source code.

execute \eks´ə-kyo͞ot`\ *vb.* To perform an instruction. In programming, execution implies loading

file fragmentation \fīl´ frag-mən-tā`shən\ *n.* **1.** The breaking apart of files into small, separate segments for storage on disk. The condition is a natural consequence of enlarging files and saving them on a crowded disk that no longer contains contiguous blocks of free space large enough to hold them. File fragmentation is not an integrity problem, although it can eventually slow read and write access times if the disk is very full and storage is badly fragmented. Software products are available for redistributing (optimizing) file storage to reduce fragmentation. **2.** In a database, a situation in which records are not stored in their optimal access sequence because of accumulated additions and deletions of records. Most database systems offer or contain utility programs that resequence records to improve efficiency of access and to aggregate free space occupied by deleted records.

file gap \fīl´ gap\ *n. See* block gap.

file handle \fīl´ han`dl\ *n.* In MS-DOS, OS/2, and Windows, a token (number) that the system uses to identify or refer to an open file or, sometimes, to a device.

file-handling routine \fīl´hand-lēng rōō-tēn`\ *n.* Any routine designed to assist in creating, opening, accessing, and closing files. Most high-level languages have built-in file-handling routines, although more sophisticated or complex file-handling routines in an application are often created by the programmer.

file header \fīl´ hed`ər\ *n. See* header (definition 2).

file layout \fīl´ lā`out\ *n.* In data storage, the organization of records within a file. Frequently, descriptions of the record structure are also included within the file layout.

file librarian \fīl´ lī-brār`ē-ən\ *n.* A person or process responsible for maintaining, archiving, copying, and providing access to a collection of data.

file maintenance \fīl´ mān`tə-nəns\ *n.* Broadly, the process of changing information in a file, altering a file's control information or structure, or copying and archiving files. A person using a terminal to enter data, the program accepting the data from the terminal and writing it to a data file, and a database administrator using a utility to alter the format of a database file are all forms of file maintenance.

file manager \fīl´ man`ə-jər\ *n.* A module of an operating system or environment that controls the physical placement of and access to a group of program files.

filename \fīl´nām\ *n.* The set of letters, numbers, and allowable symbols assigned to a file to distinguish it from all other files in a particular directory on a disk. A filename is the handle by which a computer user saves and requests a block of information. Both programs and data have filenames and often extensions that further identify the type or purpose of the file. Naming conventions, such as maximum length and allowable characters of a filename, vary from one operating system to another. *See also* directory, path (definition 5).

filename extension \fīl´nām eks-ten`shən\ *n. See* extension (definition 1).

file protection \fīl´ prə-tek`shən\ *n.* A process or device by which the existence and integrity of a file are maintained. Methods of file protection range from allowing read-only access and assigning passwords to covering the write-protect notch on a disk and locking away floppy disks holding sensitive files.

file recovery \fīl´ rə-kəv`ər-ē\ *n.* The process of reconstructing lost or unreadable files on disk. Files are lost when they are inadvertently deleted, when on-disk information about their storage is damaged, or when the disk is damaged. File recovery involves the use of utility programs that attempt to rebuild on-disk information about the storage locations of deleted files. Because deletion makes the file's disk space available but does not remove the data, data that has not yet been overwritten can be recovered. In the case of damaged files or disks, recovery programs read whatever raw data they can find, and save the data to a new disk or file in ASCII or numeric (binary or hexadecimal) form. In some instances, however, such reconstructed files contain so much extraneous or mixed information that they are unreadable. The best way to recover a file is to restore it from a backup copy.

file retrieval \fīl´ rə-trē`vəl\ *n.* The act of transferring a data file from a storage location to the machine where it is to be used.

file server \fīl´ sər`vər\ *n.* A file-storage device on a local area network that is accessible to all users on the network. Unlike a disk server, which appears to the user as a remote disk drive, a file server is a sophisticated device that not only stores files but manages them and maintains order as network users request files and make changes to them. To deal with the tasks of handling multiple—sometimes simultaneous—requests for files, a file server contains a processor and controlling software as well as a disk drive for storage. On local area networks, a file server is often a computer with a large hard disk that is dedicated only to the task of managing shared files. *Compare* disk server.

file sharing \fīl´ shâr`ēng\ *n.* The use of computer files on networks, wherein files are stored on a central computer or a server and are requested, reviewed, and modified by more than one individual. When a file is used with different programs or different computers, file sharing can require conversion to a mutually acceptable format. When a single file is shared by many people, access can be regulated through such means as password protection, security clearances, or file locking to prohibit changes to a file by more than one person at a time.

file size \fīl´ sīz\ *n.* The length of a file, typically given in bytes. A computer file stored on disk actually has two file sizes, logical size and physical size. The logical file size corresponds to the file's actual size—the number of bytes it contains. The physical size refers to the amount of storage space allotted to the file on disk. Because space is set aside for a file in blocks of bytes, the last characters in the file might not completely fill the block (allocation unit) reserved for them. When this happens, the physical size is larger than the logical size of the file.

filespec \fīl´spek\ *n. See* file specification (definition 1).

file specification \fīl` spes`ə-fə-kā´shən\ *n.* **1.** Abbreviated filespec. The path to a file, from a disk drive through a chain of directory files to the filename that serves to locate a particular file. **2.** A filename containing wildcard characters that indicate which files among a group of similarly named files are requested. **3.** A document that describes the organization of data within a file.

file structure \fīl´ struk`chur\ *n.* A description of a file or group of files that are to be treated together for some purpose. Such a description includes file layout and location for each file under consideration.

file system \fīl´ si`stəm\ *n.* In an operating system, the overall structure in which files are named, stored, and organized. A file system consists of files, directories, and the information needed to locate and access these items. The term can also refer to the portion of an operating system that translates requests for file operations from an application program into low-level, sector-oriented tasks that can be understood by the drivers controlling the disk drives. *See also* driver.

file transfer \fīl´ trans`fər\ *n.* The process of moving or transmitting a file from one location to another, as between two programs or over a network.

File Transfer Protocol \fīl` trans-fər prō´tə-kol\ *n. See* FTP[1] (definition 1).

file type \fīl´ tīp\ *n.* A designation of the operational or structural characteristics of a file. A file's type is often identified in the filename. With MS-DOS, a file's type is usually reflected in the filename extension. *See also* file format.

fill \fil\ *n.* In computer graphics, to "paint" the inside of an enclosed figure, such as a circle, with color or a pattern. The portion of the shape that can be colored or patterned is the fill area. Drawing programs commonly offer tools for creating filled or nonfilled shapes; the user can specify color or pattern.

film at 11 \film` at ə-lev´ən\ A phrase sometimes seen in newsgroups. An allusion to a brief newsbreak on TV that refers to a top news story that will be covered in full on the 11 o'clock news, it is used sarcastically to ridicule a previous article's lack of timeliness or newsworthiness. *See also* newsgroup.

film recorder \film´ rə-kōr`dər\ *n.* A device for capturing on 35-mm film the images displayed on a computer screen.

film ribbon \film´ rib`ən\ *n. See* carbon ribbon.

filter \fil´tər\ *n.* **1.** A program or set of features within a program that reads its standard or designated input, transforms the input in some desired way, and then writes the output to its standard or

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

external device using infrared light. *See also* infrared, input/output port.

FIRST \fərst, F`I-R-S-T´\ *n.* Acronym for **F**orum of **I**ncident **R**esponse and **S**ecurity **T**eams. An organization within the Internet Society (ISOC) that coordinates with CERT in order to encourage information sharing and a unified response to security threats. *See also* CERT, Internet Society.

first-generation computer \fərst-jen-ər-ā`shən kəm-pyōō´tər\ *n. See* computer.

first in, first out \fərst-in`fərst-out´\ *n.* A method of processing a queue, in which items are removed in the same order in which they were added—the first in is the first out. Such an order is typical of a list of documents waiting to be printed. *Acronym:* FIFO (fī´fō, F`I-F-O´). *See also* queue. *Compare* last in, first out.

first normal form \fərst` nōr-məl fōrm´\ *n. See* normal form (definition 1).

fitting \fit´ēng\ *n.* The calculation of a curve or other line that most closely approximates a set of data points or measurements. *See also* regression analysis.

FIX \fiks, F`I-X´\ *n.* Acronym for **F**ederal **I**nternet **Ex**change. A connection point between the U.S. government's various internets and the Internet. There are two Federal Internet Exchanges: FIX West, in Mountain View, California; and FIX East, in College Park, Maryland. Together, they link the backbones of MILNET, ESnet (the TCP/IP network of the Department of Energy), and NSInet (NASA Sciences Internet) with NSFnet. *See also* backbone (definition 1), MILNET, NSFnet, TCP/IP.

fixed disk \fiksd disk´\ *n. See* hard disk.

fixed-length field \fiksd`length fēld´\ *n.* In a record or in data storage, a field whose size in bytes is predetermined and constant. A fixed-length field always takes up the same amount of space on a disk, even when the amount of data stored in the field is small. *Compare* variable-length field.

fixed-pitch spacing \fikst`pich spā´sēng\ *n. See* monospacing.

fixed-point arithmetic \fiksd`point ər-ith´mə-tik\ *n.* Arithmetic performed on fixed-point numbers. *See also* fixed-point notation.

fixed-point notation \fiksd`point nō-tā´shən\ *n.* A numeric format in which the decimal point has a specified position. Fixed-point numbers are a compromise between integral formats, which are compact and efficient, and floating-point numeric formats, which have a great range of values. Like floating-point numbers, fixed-point numbers can have a fractional part, but operations on fixed-point numbers usually take less time than floating-point operations. *See also* floating-point notation, integer.

fixed space \fiksd´ spās\ *n.* A set amount of horizontal space used to separate characters in text—often, the width of a numeral in a given font. *See also* em space, en space, thin space.

fixed spacing \fiksd` spā´sēng\ *n. See* monospacing.

fixed storage \fiksd` stōr´əj\ *n.* Any nonremovable storage, such as a large disk that is sealed permanently in its drive.

fixed-width font \fiksd`width font´\ *n. See* monospace font.

fixed-width spacing \fiksd`width spā´sēng\ *n. See* monospacing.

fixed-word-length computer \fiksd`wərd`length kəm-pyōō´tər\ *n.* A description that applies to almost all computers and refers to the uniform size of the data units, or words, that are processed by the microprocessor and shuttled through the system over the hardware lines composing the main data bus. Fixed-word-length computers, including IBM and Macintosh personal computers, commonly work with 2 or 4 bytes at a time.

.fj \dot`F-J´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Fiji.

F keys \F´kēz\ *n. See* function key.

flag \flag\ *n.* **1.** Broadly, a marker of some type used by a computer in processing or interpreting information; a signal indicating the existence or status of a particular condition. Flags are used in such areas as communications, programming, and information processing. Depending on its use, a flag can be a code, embedded in data, that identifies some condition, or it can be one or more bits set internally by hardware or software to indicate an event of some type, such as an error or the result of comparing two values. **2.** In the HDLC communications protocol, a flag is the unique

ing errors in the data. *See also* error-correction coding.

forward pointer \fôr`wərd poin´tər\ *n.* A pointer in a linked list that contains the address (location) of the next element in the list.

FOSDIC \foz´dik, F-O-S`D-I-C´\ *n.* Acronym for **f**ilm **o**ptical **s**ensing **d**evice for **i**nput to **c**omputers. A device used by the U.S. government to read documents on microfilm and store them digitally on magnetic tape or on a disk that can be accessed by a computer.

Fourier transform \fo͝or´ē-ā tranz`fōrm\ *n.* A mathematical method, developed by the French mathematician Jean-Baptiste-Joseph Fourier (1768–1830), for signal processing and signal generation tasks such as spectral analysis and image processing. The Fourier transform converts a signal value that is a function of time, space, or both into a function of frequency. The inverse Fourier transform converts a function of frequencies into a function of time, space, or both. *See also* fast Fourier transform.

fourth-generation computer \fōrth`jen-ər-ā`shən kəm-pyo͞o´tər\ *n. See* computer.

fourth-generation language \fōrth`jen-ər-ā`shən lang`wəj\ *n. See* 4GL.

fourth normal form \fōrth nōr`məl fōrm´\ *n.* Abbreviated 4NF. *See* normal form (definition 1).

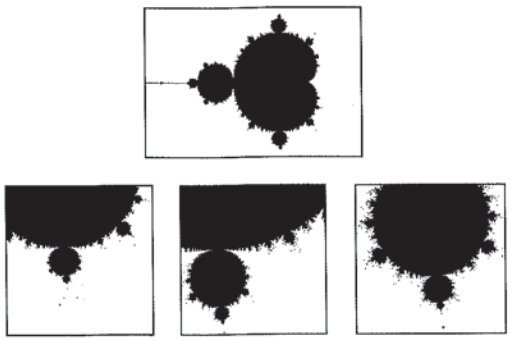
FPD \F`P-D´\ *n. See* full-page display.

FPLA \F`P-L-A´\ *n. See* field-programmable logic array.

FPU \F`P-U´\ *n.* Acronym for **f**loating-**p**oint **u**nit. A circuit that performs floating-point calculations. *See also* circuit, floating-point operation.

.fr \dot`F-R´\ *n.* On the Internet, the major geographic domain specifying that an address is located in France.

fractal \frak´təl\ *n.* A word coined by mathematician Benoit Mandelbrot in 1975 to describe a class of shapes characterized by irregularity, but in a way that evokes a pattern. Computer graphics technicians often use fractals to generate nature-like images such as landscapes, clouds, and forests. The distinguishing characteristic of fractals is that they are "self-similar"; any piece of a fractal, when magnified, has the same character as the whole. The standard analogy is that of a coastline, which has a similar structure whether viewed on a local or continental scale. Interestingly, it is often difficult to measure the length of the perimeter of such a shape exactly because the total distance measured depends on the size of the smallest element measured. For example, one could measure on a given coastline the perimeter of every peninsula and inlet, or at a higher magnification the perimeter of every small promontory and jetty, and so on. In fact, a given fractal may have a finite area but an infinite perimeter; such shapes are considered to have a fractional dimension—for example, between 1 (a line) and 2 (a plane)—hence the name fractal. See the illustration. *See also* cellular automata, graftal.



Fractal. The first figure shows the classical Mandelbrot set; the three below it show successive magnifications of the lobe at the bottom of the first figure.

fractional T1 \frak`shə-nəl T-wən´\ *n.* A shared connection to a T1 line, in which only a fraction of the 24 T1 voice or data channels are used. *Acronym:* FT1 (F`T-wən´). *See also* T1.

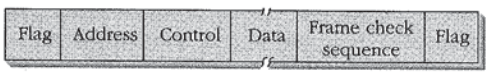
FRAD \frad, F`R-A-D´\ *n. See* frame relay assembler/disassembler.

fragmentation \frag`mən-tā´shən\ *n.* The scattering of parts of the same disk file over different areas of the disk. Fragmentation occurs as files on a disk are deleted and new files are added. Such fragmentation slows disk access and degrades the overall performance of disk operations, although usually not severely. Utility programs are available for rearranging file storage on fragmented disks.

FRAM \F´ram, F`R-A-M´\ *n.* Acronym for **f**erro-magnetic **r**andom **a**ccess **m**emory. A form of data storage technology in which data is recorded

semipermanently on small cards or strips of material coated with a ferric oxide (iron-based) magnetic film. As with tape or disk, the data persists without power; as with semiconductor RAM, a computer can access the data in any order.

frame \frām\ *n.* **1.** In asynchronous serial communications, a unit of transmission that is sometimes measured in elapsed time and begins with the start bit that precedes a character and ends with the last stop bit that follows the character. **2.** In synchronous communications, a package of information transmitted as a single unit. Every frame follows the same basic organization and contains control information, such as synchronizing characters, station address, and an error-checking value, as well as a variable amount of data. For example, a frame used in the widely accepted HDLC and related SDLC protocols begins and ends with a unique flag (01111110). See the illustration. *See also* HDLC, SDLC. **3.** A single screen-sized image that can be displayed in sequence with other, slightly different, images to create animated drawings. **4.** The storage required to hold one screen-sized image of text, graphics, or both. **5.** A rectangular space containing, and defining the proportions of, a graphic. **6.** The part of an on-screen window (title bar and other elements) that is controlled by the operating system rather than by the application running in the window. **7.** A rectangular section of the page displayed by a Web browser that is a separate HTML document from the rest of the page. Web pages can have multiple frames, each of which is a separate document. Associated with each frame are the same capabilities as for an unframed Web page, including scrolling and linking to another frame or Web site; these capabilities can be used independently of other frames on the page. Frames, which were introduced in Netscape Navigator 2.0, are often used as a table of contents for one or more HTML documents on a Web site. Most current Web browsers support frames, although older ones do not. *See also* HTML document, Web browser.



Frame. The fields in an HDLC-SDLC frame.

frame buffer \frām´ buf`ər\ *n.* A portion of a computer's display memory that holds the contents of a single screen image. *See also* video buffer.

frame grabber \frām´ grab`ər\ *n. See* video digitizer.

frame rate \frām´ rāt\ *n.* **1.** The speed at which full, single-screen images are transmitted to and displayed by a raster-scan monitor. Frame rate is calculated as the number of times per second (hertz) the electron beam sweeps the screen. **2.** In animation, the number of times per second an image is updated. When the frame rate exceeds about 14 frames per second, animation seems to blend into smooth motion. *See also* animation.

frame relay \frām´ rē`lā\ *n.* A packet-switching protocol for use on wide area networks. Frame relay transmits variable-length packets at up to 1.544 Mbps. It is a variant of X.25 but dispenses with some of X.25's error detection for the sake of speed. *See also* ATM (definition 1), X.25.

frame relay assembler/disassembler \frām`rē-lā ə-sem`blər-dis´ə-sem`blər\ *n.* A combination channel service unit/digital service unit (CSU/DSU) and router that connects an internal network to a frame relay connection. The device converts data (which may be in the form of IP packets or conform to some other network protocol) into packets for transmission over the frame relay network and converts such packets back to the original data. Since this type of connection is direct, without a firewall, other network protection is necessary. *Acronym:* FRAD (frad, F`R-A-D´). *See also* firewall, frame relay, IP.

frame source \frām´ sōrs\ *n.* In the HTML frames environment, a contents document that will look for the source document to display within a frame drawn by the local browser. *See also* HTML.

frames per second \frāmz` pər sek´ənd\ *n. See* frame rate.

framework \frām´wərk\ *n.* In object-oriented programming, a reusable basic design structure, consisting of abstract and concrete classes, that assists in building applications. *See also* abstract class, object-oriented programming.

FRC \F`R-C´\ *n. See* functional redundancy checking.

fred \fred\ *n.* **1.** An interface utility for X.500. *See also* CCITT X series. **2.** A placeholder string used by programmers in syntax examples to stand for a variable name. If a programmer has used *fred,* the next placeholder needed is likely to be *barney. Compare* foo.

free block \frē´ blok\ *n.* A region (block) of memory that is not currently being used.

FreeBSD \frē`B-S-D´\ *n.* A freely distributed version of BSD UNIX (Berkeley Software Distribution UNIX) for IBM and IBM-compatible PCs. *See also* BSD UNIX.

free-form language \frē`fōrm lang´wəj\ *n.* A language whose syntax is not constrained by the position of characters on a line. C and Pascal are free-form languages; FORTRAN is not.

freenet or **free-net** \frē´net\ *n.* A community-based computer BBS and Internet service provider, usually operated by volunteers and providing free access to subscribers in the community or access for a very small fee. Many freenets are operated by public libraries or universities. *See also* ISP.

.freenet.edu \dot-frē`net-dot-E-D-U´\ *n.* On the Internet, the major domain specifying that an address is located on a freenet. *See also* freenet.

free software \frē` soft´wâr\ *n.* Software, complete with source code, that is distributed freely to users who are in turn free to use, modify, and distribute it, provided that all alterations are clearly marked and that the name and copyright notice of the original author are not deleted or modified in any way. Unlike freeware, which a user might or might not have permission to modify, free software is protected by a license agreement. Free software is a concept pioneered by the Free Software Foundation in Cambridge, Massachusetts. *Compare* freeware, public-domain software, shareware.

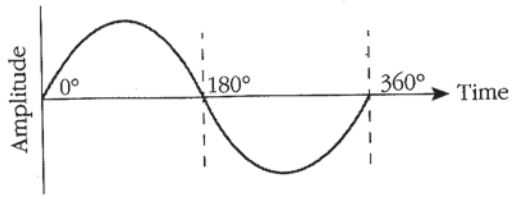
Free Software Foundation \frē soft´wâr foun-dā`shən\ *n.* An advocacy organization founded by Richard Stallman, dedicated to eliminating restrictions on people's right to use, copy, modify, and redistribute computer programs for noncommercial purposes. The Free Software Foundation is the maintainer of GNU software, which is UNIX-like software that can be freely distributed. *See also* GNU.

free space \frē´ spās\ *n.* Space on a floppy disk or a hard drive not currently occupied by data. *See also* floppy disk, hard disk.

freeware \frē´wâr\ *n.* A computer program given away free of charge and often made available on the Internet or through user groups. An independent program developer might offer a product as freeware either for personal satisfaction or to assess its reception among interested users. Freeware developers often retain all rights to their software, and users are not necessarily free to copy or distribute it further. *Compare* free software, public-domain software, shareware.

freeze-frame video \frēz`frām vid´ē-ō\ *n.* Video in which the image changes only once every few seconds. *Compare* full-motion video.

frequency \frē´kwən-sē`\ *n.* The measure of how often a periodic event occurs, such as a signal going through a complete cycle. Frequency is usually measured in hertz (Hz), with 1 Hz equaling 1 occurrence (cycle) per second. In the United States, household electricity is alternating current with a frequency of 60 Hz. Frequency is also measured in kilohertz (kHz, or 1,000 Hz), megahertz (MHz, or 1,000 kHz), gigahertz (GHz, or 1,000 MHz), or terahertz (THz, or 1,000 GHz). See the illustration. *Compare* wavelength.



Frequency.

frequency counter \frē´kwən-sē koun`tər\ *n.* **1.** An item of engineering test equipment that measures and displays the frequencies of electronic signals. **2.** An electronic circuit, often found embedded in process-control computers, that counts the frequency of occurrence of an activity.

frequency-division multiplexing \frē`kwən-sē-də-vizh`ən mul´tē-pleks-ēng, mul´tī-pleks-ēng\ *n.* *See* FDM.

frequency hopping \frē´kwən-sē hop`ēng\ *n.* The switching of frequencies within a given bandwidth during a point-to-point transmission. Frequency hopping reduces the chance of unauthorized signal interception or the effects of single-frequency jamming.

types of liquid crystal displays, an electroluminescent panel is placed behind the screen to illuminate it. Other types of liquid crystal displays are capable of reproducing color. *Acronym:* LCD (L`C-D´).

liquid crystal display printer \li`kwid kri-stəl displā´ prin-tər\ *n. See* LCD printer.

liquid crystal shutter printer \li`kwid kri-stəl shut´ər prin-tər\ *n. See* LCD printer.

LISP \lisp, L`I-S-P´\ *n.* Short for **Lis**t **P**rocessing. A list-oriented programming language developed in 1959–60 by John McCarthy and used primarily to manipulate lists of data. LISP is heavily used in research and academic circles and is considered the standard language for artificial-intelligence research. *See also* artificial intelligence. *Compare* Prolog.

list \list\ *n.* A multi-element data structure that has a linear (first, second, third, . . .) organization but that allows elements to be added or removed in any order. Queues, deques, and stacks are simply lists with restrictions on adding and removing elements. *See also* deque, element (definition 1), linked list, queue, stack.

list box \list´ boks\ *n.* A control in Microsoft Windows that enables the user to choose one option from a list of possibilities. The list box appears as a box, displaying the currently selected option, next to a button marked with a down-arrow. When the user clicks on the button, the list appears. The list has a scroll bar if there are more options than the list has room to show.

listing \li´stēng\ *n.* A printed copy of program source code. Some compilers and assemblers produce optional assembly listings during compilation or assembly. Such listings of code often have additional information such as line numbers, nested block depth, and cross-reference tables. *See also* assembly listing.

list processing \list´ pros`es-ēng\ *n.* The maintenance and manipulation of multi-element data structures. This involves adding and deleting elements, writing data into elements, and traversing the list. List processing is the basis of the artificial-intelligence programming language LISP. *See also* LISP, list, node (definition 1).

LISTSERV \list´sərv\ *n.* One of the most popular commercial mailing list managers, marketed by L-SOFT International in versions for BITNET, UNIX, and Windows. *See also* mailing list, mailing list manager.

literal \lit´ər-əl\ *n.* A value, used in a program, that is expressed as itself rather than as a variable's value or the result of an expression. Examples are the numbers 25 and 32.1, the character *a*, the string *Hello*, and the Boolean value TRUE. *See also* constant, variable.

lithium ion battery \lith`ē-um ī´on bat`ər-ē\ *n.* An energy storage device based on the conversion of chemical to electrical energy in "dry" chemical cells. Despite the higher cost, the laptop industry is quickly adopting lithium ion batteries because of their increased storage capacity over both nickel cadmium and nickel metal hydride batteries, in response to the demand for greater power brought on by higher processor speeds and the use of devices such as CD-ROM drives. *Compare* nickel cadmium battery, nickel metal hydride battery.

little endian \lit`l en´dē-ən\ *adj.* Of, pertaining to, or being a method of storing a number so that the least significant byte appears first in the number. For example, given the hexadecimal number A02B, the little endian method would cause the number to be stored as 2BA0. The little endian method is used by Intel microprocessors. *Also called* reverse byte ordering. *Compare* big endian.

live \līv\ *adj.* **1.** Of or relating to real-world data or a program working with it, as opposed to test data. **2.** Of or relating to audio or video that is transmitted from one site to another as it is being produced, as opposed to being recorded before broadcast time. *See also* synchronous transmission. **3.** Capable of being manipulated by a user to cause changes in a document or part of a document.

Live3D \līv`thrē-D´\ *n.* A Netscape proprietary Virtual Reality Modeling Language (VRML) plug-in for Web browsers that allows users to view and interact with a virtual-reality world. *See also* VRML.

liveware \līv´wâr\ *n.* A slang term for people, to distinguish them from hardware, software, and firmware. *Also called* wetware.

.lk \dot`L-K´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Sri Lanka.

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´ mój`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.

local loop \lō`kəl lo͞op´\ *n.* A telephone connection that runs from the subscriber to the local telephone exchange.

local memory \lō`kəl mem´ər-ē\ *n.* In multiprocessor systems, the memory on the same card or high-speed bus as a particular processor. Typically, memory that is local to one processor cannot be accessed by another without some form of permission.

local newsgroups \lō`kəl no͞oz´gro͞ops\ *n.* Newsgroups that are targeted toward a geographically limited area such as a city or educational institution. Posts to these newsgroups contain information that is specific to the area, concerning such topics as events, meetings, and sales. *See also* newsgroup.

local reboot \lō`kəl rē´bo͞ot\ *n.* A reboot of the machine that one is directly working on, rather than a remote host. *See also* reboot.

LocalTalk \lō´kəl-täk`\ *n.* An inexpensive cabling scheme used by AppleTalk networks to connect Apple Macintosh computers, printers, and other peripheral devices. *See also* AppleTalk.

local variable \lō`kəl vâr´ē-ə-bl\ *n.* A program variable whose scope is limited to a given block of code, usually a subroutine. *See also* scope (definition 1). *Compare* global variable.

location \lō-kā´shən`\ *n.* *See* address[1] (definition 1).

lock \lok\ *n.* **1.** A software security feature that requires a key or dongle in order for the application to run correctly. *See also* dongle. **2.** A mechanical device on some removable storage medium (for example, the write-protect notch on a floppy disk) that prevents the contents from being overwritten. *See also* write-protect notch.

locked file \lokd fīl´\ *n.* **1.** A file on which one or more of the usual types of manipulative operation cannot be performed—typically, one that cannot be altered by additions or deletions. **2.** A file that cannot be deleted or moved or whose name cannot be changed.

locked volume \lokd` vol´yo͞om\ *n.* On the Apple Macintosh, a volume (storage device, such as a disk) that cannot be written to. The volume can be locked either physically or through software.

lockout \lok´out\ *n.* The act of denying access to a given resource (file, memory location, I/O port), usually to ensure that only one program at a time uses that resource.

lock up \lok´ up\ *n.* A condition in which processing appears to be completely suspended and in which the program in control of the system will accept no input. *See also* crash[1].

log \log\ *n.* **1.** A record of transactions or activities that take place on a computer system. **2.** *See* logarithm.

logarithm \log´ər-idh`əm\ *n.* Abbreviated log. In mathematics, the power to which a base must be raised to equal a given number. For example, for the base 10, the logarithm of 16 is (approximately) 1.2041 because $10^{1.2041}$ equals (approximately) 16. Both natural logarithms (to the base *e*, which is approximately 2.71828) and common logarithms (to the base 10) are used in programming. Languages such as C and Basic include functions for calculating natural logarithms.

logic \loj´ik\ *n.* In programming, the assertions, assumptions, and operations that define what a given program does. Defining the logic of a program is often the first step in developing the program's source code. *See also* formal logic.

logical \loj´ə-kəl\ *adj.* **1.** Based on true and false alternatives as opposed to arithmetic calculation of numeric values. For example, a logical expression is one that, when evaluated, has a single outcome, either true or false. *See also* Boolean algebra. *Compare* fuzzy logic. **2.** Of or pertaining to a conceptual piece of equipment or frame of reference, regardless of how it may be realized physically. *Compare* physical.

logical decision \loj`ə-kəl də-sizh´ən\ *n.* Any decision that can have one of two outcomes (true/false, yes/no, and so on). *Compare* fuzzy logic.

logical device \loj`ə-kəl də-vīs´\ *n.* A device named by the logic of a software system, regardless of its physical relationship to the system. For example, a single floppy disk drive can simultaneously be, to the MS-DOS operating system, both logical drive A and drive B.

logical drive \loj`ə-kəl drīv´\ *n.* *See* logical device.

logical error \loj`ə-kəl âr´ər\ *n.* *See* logic error.

logical expression \loj`ə-kəl eks-presh´ən\ *n.* *See* Boolean expression.

logical file \loj´ə-kəl fīl`\ *n.* A file as seen from a conceptual standpoint, without reference to and as

monochrome display \mon´ə-krōm di-splā`\ *n.* **1.** A video display capable of rendering only one color. The color displayed depends on the phosphor of the display (often green or amber). **2.** A display capable of rendering a range of intensities in only one color, as in a gray-scale monitor.

Monochrome Display Adapter \mon`ə-krōm di-splā´ ə-dap-tər\ *n. See* MDA.

monochrome graphics adapter \mon`ə-krōm graf´iks ə-dap-tər\ *n. See* HGC.

monochrome monitor \mon`ə-krōm mon´ə-tər\ *n. See* monochrome display.

monographics adapter \mon`ə-graf´iks ə-dap-tər\ *n.* Any video adapter that can display only monochrome text and graphics; any video adapter functionally compatible with the Hercules Graphics Card (HGC). *See also* HGC.

monospace font \mon´ō-spās font`\ *n.* A font (set of characters in a particular style and size), similar to that used on a typewriter, in which each character occupies the same amount of horizontal space regardless of its width—an *i*, for example, taking as much room as an *m*.

```
This is a sentence in a monospace font.
```

Also called fixed-width font. *See also* monospacing. *Compare* proportional font.

monospacing \mon´ō-spā`sēng\ *n.* A form of print and display spacing in which each character occupies the same amount of horizontal space on the line, regardless of whether the character is wide (such as *m*) or narrow (such as *I*). *Also called* fixed spacing, fixed-pitch spacing, fixed-width spacing. *See also* monospace font. *Compare* proportional spacing.

Monte Carlo method \mon`tē kär´lō meth`əd\ *n.* A mathematical technique that uses repeated calculations and random numbers to find an approximate solution to a complex problem. The Monte Carlo method, named for its relationship to games of chance played in the casinos at Monte Carlo, Monaco, can be used in situations in which it is possible to calculate the probability of a particular event occurring but not to factor in the complex effects of many other contributing factors.

.montreal.ca \dot-mon-trē-äl`dot-C-A´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Montreal, Canada.

MOO \mo͞o, M`O-O´\ *n.* Short for **M**UD, **o**bject **o**riented. A form of multiuser dungeon (MUD) that contains an object-oriented language with which users can create areas and objects within the MOO. Generally, MOOs are more focused on communications and programming and less on games than MUDs are. *See also* MUD.

.moov \dot-mo͞ov´, dot`M-O-O-V´\ *n.* A file extension indicating a QuickTime MooV video file for a Macintosh computer. *See also* MooV.

MooV \mo͞o´V\ *n.* The file format for QuickTime movies that stores synchronized tracks for control, video, audio, and text. *See also* QuickTime.

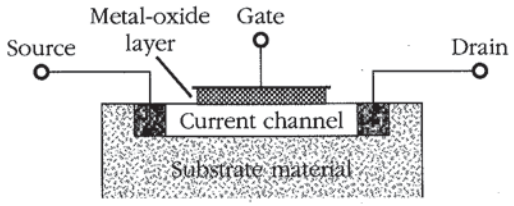
morphing \mōr´fēng\ *n.* Short for **metamorphosing.** A process by which one image is gradually transformed into another, creating the illusion of a metamorphosis occurring in a short time. A common motion picture special-effects technique, morphing is available in many advanced computer animation packages. *See also* tween.

MOS \mos, M`O-S´\ *n.* Acronym for **m**etal-**o**xide **s**emiconductor. An integrated-circuit technology in which field-effect transistors (FETs) are made with an insulating layer of silicon dioxide between a metal gate electrode and a semiconductor channel. MOS designs are widely used both in discrete components and in integrated circuits. MOS integrated circuits have the advantages of high component density, high speed, and low power consumption. MOS devices are easily damaged by static electricity, so before they are inserted in a circuit they should be kept with their connectors embedded in conducting foam to prevent the buildup of static charges. *See also* FET, MOSFET.

Mosaic \mō-zā´ik\ *n.* The first popular graphical World Wide Web browser. Released on the Internet in early 1993 by the National Center for Supercomputing Applications (NCSA) at the University of Illinois at Urbana-Champaign, Mosaic is available as freeware and shareware for Windows, Macintosh, and X Window systems. Mosaic is distinguished from other early Web browsers by its ease of use and its addition of inline images to Web documents. *Also called* NCSA Mosaic.

MOSFET \mos´fet, M-O-S`F-E-T´\ *n.* Acronym for **m**etal-**o**xide **s**emiconductor **f**ield-**e**ffect **t**ransistor.

A common type of field-effect transistor in which a layer of silicon dioxide insulates the metal gate from the semiconductor current channel. MOSFETs have extremely high input impedance and therefore require almost no driving power. They are used in many audio applications, including high-gain amplifier circuits. Like all metal-oxide semiconductor (MOS) devices, MOSFETs are easily damaged by static electricity. See the illustration. *See also* FET, MOS.



MOSFET. A schematic cross section of a MOSFET transistor.

most significant bit \mōst` sig-nif´ə-kənt bit´\ *n.* In a sequence of one or more bytes, the highest-order bit of a binary number, not including the sign bit. *Acronym:* MSB (M`S-B´). *See also* high-order. *Compare* least significant bit.

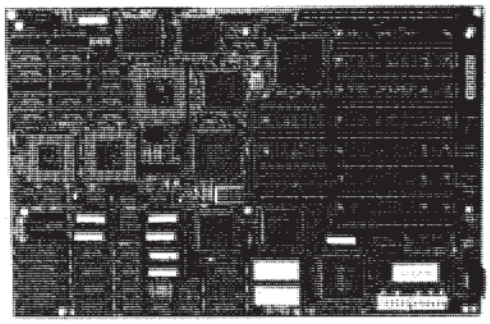
most significant character \mōst` sig-nif´ə-kənt kâr´ək-tər\ *n.* The high-order, or leftmost, character in a string. *Acronym:* MSC (M`S-C´). *See also* high-order. *Compare* least significant character.

most significant digit \mōst` sig-nif´ə-kənt dij´-ət\ *n.* In a sequence of one or more digits, the highest-order digit, which is the leftmost digit. In *456.78, 4* is the most significant digit. *Acronym:* MSD (M`S-D´). *Compare* least significant digit.

MOTD \M`O-T-D´\ *n. See* message of the day.

motherboard \mədh´ər-bōrd`\ *n.* The main circuit board containing the primary components of a computer system. This board contains the processor, main memory, support circuitry, and bus controller and connector. Other boards, including expansion memory and input/output boards, may attach to the motherboard via the bus connector. See the illustration. *See also* expansion slot. *Compare* daughterboard.

Motion JPEG \mō`shən J´peg, J`P-E-G´\ *n.* A standard for storing motion video, proposed by the Joint Photographic Experts Group (JPEG), that uses JPEG image compression for each frame. *See also* JPEG (definition 1). *Compare* MPEG (definition 1).



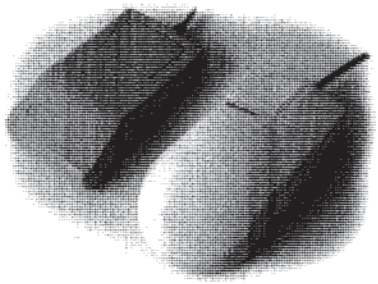
Motherboard.

mount \mount\ *vb.* To make a physical disk or tape accessible to a computer's file system. The term is most commonly used to describe accessing disks in Apple Macintosh and UNIX-based computers.

mouse \mous\ *n.* A common pointing device. The basic features of a mouse are a flat-bottomed casing designed to be gripped by one hand; one or more buttons on the top; a multidirectional detection device (usually a ball) on the bottom; and a cable connecting the mouse to the computer. By moving the mouse on a surface (such as a desktop), the user typically controls an on-screen cursor. A mouse is a relative pointing device because there are no defined limits to the mouse's movement and because its placement on a surface does not map directly to a specific screen location. To select items or choose commands on the screen, the user presses one of the mouse's buttons, producing a "mouse click." See the illustration on the next page. *See also* bus mouse, mechanical mouse, optical mouse, optomechanical mouse, relative pointing device, serial mouse. *Compare* trackball.

MouseKeys \mous´kēz\ *n.* A feature in Microsoft Windows that allows a user to use the numeric keyboard to move the mouse pointer. MouseKeys is primarily intended for people who may have physical limitations that make it difficult to move a conventional mouse. *See also* mouse.

mouse pad \mous´ pad\ *n.* A surface on which a mouse can be moved, typically a rectangular rubber pad covered with fabric, providing more



Mouse. Two types of mouse: for the Apple Macintosh (left) and for IBM PCs and compatibles (right).

traction than a wooden or glass desktop or tabletop. *See also* mouse.

mouse pointer \mous´ poin`tər\ *n.* An on-screen element whose location changes as the user moves the mouse. Depending on the location of the mouse pointer and the operation of the program with which it is working, the area of the screen where the mouse pointer appears serves as the target for an action when the user presses one of the mouse buttons. *See also* block cursor, cursor (definition 3).

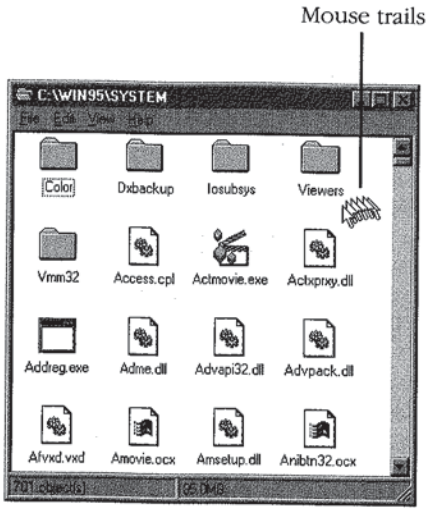
mouse port \mous´ pōrt\ *n.* **1.** In many PC-compatible computers, a dedicated connector where a mouse or other pointing device plugs into the computer. If a mouse port is not available, a serial port can be used to connect the mouse to the computer. *See also* connector, mouse, pointing device, serial port. **2.** In a Macintosh, the Apple Desktop Bus port. *See also* Apple Desktop Bus.

mouse scaling \mous´ skā`lēng\ *n.* *See* mouse sensitivity.

mouse sensitivity \mous` sen-sə-tiv´ə-tē\ *n.* The relationship of mouse movement to screen cursor movement. A more sensitive mouse signals to the computer more "mouse moves" per inch of physical mouse movement than does a less sensitive mouse. Increasing the sensitivity of the program or mouse driver can result in smaller cursor moves for a given mouse move, making it easier for the user to position the cursor precisely. High sensitivity is good for exacting work, such as CAD/CAM and graphic art; low sensitivity is good for tasks in which getting around the screen quickly is important and for applications such as Web browsers, word processors, and spreadsheets, in which the cursor is used mostly to select buttons or text. *Also called* mouse scaling, mouse tracking.

mouse tracking \mous´ trak`ēng\ *n.* *See* mouse sensitivity.

mouse trails \mous´ trālz\ *n.* The creation of a shadowlike trail following the mouse pointer on screen in order to make it easier to see. Mouse trails are useful for laptops and notebooks, particularly ones with passive matrix displays or older models with monochrome screens. The relatively low resolution and contrast of these screens made it easy to lose sight of a small mouse pointer. See the illustration. *See also* mouse pointer, submarining.



Mouse trails.

.mov \dot`M-O-V´\ *n.* A filename extension for a movie file in Apple's QuickTime format. *See also* QuickTime.

move \mo͞ov\ *n.* A command or instruction to transfer information from one location to another. Depending on the operation involved, a move can affect data in a computer's memory or it can affect text or a graphical image in a data file. In programming, for example, a move instruction might transfer a single value from one memory location to another. In applications, on the other hand, a move command might relocate a paragraph of text or all or part of a graphic from one place in a document to another. Unlike a copy procedure, which

.net \dot-net´, -N`E-T´\ *n.* In the Internet's Domain Name System, the top-level domain that identifies addresses of network providers. The designation .net appears at the end of the address. *See also* DNS (definition 1), domain (definition 3). *Compare* .com, .edu, .gov, .mil, .org.

net. \net´dot\ *prefix* A prefix used to describe people and institutions on the Internet. For example, a very well respected person might be described as a net.god.

Net \net\ *n.* **1.** Short for Inter**net**. **2.** Short for Use**net**.

net address \net´ a`dres, ə-dres`\ *n.* **1.** A World Wide Web address (URL). *See also* URL. **2.** An e-mail address. **3.** The DNS name or IP address of a machine. *See also* DNS (definition 1), IP address.

NetBEUI \net`B-E-U-I´\ *n.* Short for **NetB**IOS **E**nhanced **U**ser **I**nterface. An enhanced NetBIOS protocol for network operating systems, originated by IBM for the LAN Manager server and now used with many other networks. *See also* LAN Manager, NetBIOS.

NetBIOS \net´bī`ōs, net`B-I-O-S´\ *n.* An application programming interface (API) that can be used by application programs on a local area network consisting of IBM and compatible microcomputers running MS-DOS, OS/2, or some version of UNIX. Primarily of interest to programmers, NetBIOS provides application programs with a uniform set of commands for requesting the lower-level network services required to conduct sessions between nodes on a network and to transmit information back and forth. *See also* application programming interface.

NetBIOS Enhanced User Interface \net`bī`ōs en-hansd` yōō`zər in´tər-fās, net`B-I-O-S`\ *n. See* NetBEUI.

NetBSD \net`B-S-D´\ *n.* A free version of the BSD UNIX operating system developed as a result of a volunteer effort. NetBSD is highly interoperable, runs on many hardware platforms, and is nearly POSIX compliant. *See also* BSD UNIX, POSIX.

net.god \net`dot-god´\ *n.* A highly respected person within the Internet community.

nethead \net´hed\ *n.* **1.** A person who uses the Internet as if addicted to it. **2.** A Grateful Dead fan who participates in the rec.music.gdead newsgroup or some other forum dedicated to that band.

netiquette \net´ə-kit`, net´ə-kət`\ *n.* Short for **net**work et**iquette**. Principles of courtesy observed in sending electronic messages, such as e-mail and Usenet postings. The consequences of violating netiquette include being flamed and having one's name placed in the bozo filter of one's intended audience. Disapproved behavior includes gratuitous personal insults; posting of large amounts of irrelevant material; giving away the plot of a movie, television show, or novel without warning; posting offensive material without encrypting it; and excessive cross-posting of a message to multiple groups without regard to whether the group members are likely to find it interesting. *See also* bozo filter, flame[2].

netizen \net´i-zən\ *n.* A person who participates in online communication through the Internet and other networks, especially conference and chat services, such as Internet news or Fidonet. *Compare* lurker.

NetPC \net`P-C´\ *n.* A computer platform specification created by Microsoft and Intel in 1996 for systems that use Windows NT server based application programs, rather than applications located on the client computer.

net.personality \net`dot-pər-sə-nal´ə-tē\ *n.* A slang term for a person who has attained some degree of celebrity on the Internet.

net.police \net´dot-pə-lēs`\ *n.* Persons (usually self-appointed) who try to enforce their understanding of the "rules" that apply to conduct on the Internet. Their activities may be directed toward users who violate the rules of netiquette, spammers who send unsolicited advertising as e-mail or to newsgroups, or even people who post "politically incorrect" comments to newsgroups or mailing lists. *See also* netiquette, spam.

Netscape Navigator \net`skāp nav´ə-gā`tər\ *n.* The most widely used family of Web browser programs, made by Netscape Corporation. Versions of Netscape Navigator are available for the Windows 3.1, Windows 95, Windows NT, and Macintosh platforms, and for many varieties of UNIX. Netscape Navigator, which is based on NCSA's Mosaic Web browser, was one of the first commer-

cially available Web browsers. *See also* Mosaic, Web browser.

Netscape Server Application Programming Interface \net-skāp sər-vər a-plə-kā`shən prō-gram-ēng in´tər-fās\ *n.* *See* NSAPI.

Netspeak \net´spēk\ *n.* The set of conventions for writing English in e-mail, IRCs, and newsgroups. Netspeak is characterized by acronyms (such as IMHO or ROFL) and clarifying devices such as emotags and emoticons. Use of Netspeak should be governed by netiquette. *See also* emotag, emoticon, IMHO, IRC, netiquette, ROFL.

Net surfing \net´ sur`fēng\ *n.* The practice of exploring the Internet without a specific goal in mind. The concept of Net surfing is similar to (and probably derived from) "channel surfing" in reference to watching television.

net-top box \net´top boks`\ *n.* A type of personal computer with a reduced number of components that is built primarily to provide a low-cost access terminal to the various services available on the Internet, such as e-mail, Web access, and telnet connectivity. These machines, which are under development, will not have locally addressable hard disks or installable programs, but will obtain any necessary materials for the user from somewhere on a network to which the net-top box is connected. *Compare* Java terminal, NetPC.

Net TV \net` T-V´\ *n.* *See* Internet television.

NetWare \net´wâr\ *n.* Novell's LAN operating system. NetWare runs on many different hardware platforms and network configurations.

network \net´wərk\ *n.* A group of computers and associated devices that are connected by communications facilities. A network can involve permanent connections, such as cables, or temporary connections made through telephone or other communication links. A network can be as small as a local area network consisting of a few computers, printers, and other devices, or it can consist of many small and large computers distributed over a vast geographic area.

network adapter \net´wərk ə-dap`tər\ *n.* An expansion card or other device used to connect a computer to a local area network.

network address translation \net`wərk a´dres tranz-lā`shən, ə-dres`\ *n.* *See* NAT.

network administrator \net`wərk əd-min´ə-strā-tər\ *n.* The person in charge of operations on a computer network. The duties of a network administrator can be broad and might include such tasks as installing new workstations and other devices, adding and removing individuals from the list of authorized users, archiving files, overseeing password protection and other security measures, monitoring usage of shared resources, and handling malfunctioning equipment. *See also* system administrator.

network architecture \net`wərk är´kə-tek-chər\ *n.* The underlying structure of a computer network, including hardware, functional layers, interfaces, and protocols, used to establish communication and ensure the reliable transfer of information. Network architectures are designed to provide both philosophical and physical standards for the complexities of establishing communications links and transferring information without conflict. Various network architectures exist, including the internationally accepted seven-layer ISO Open Systems Interconnection (OSI) model and IBM's Systems Network Architecture (SNA). *See also* ISO/OSI model, SNA.

network card \net´wərk kärd`\ *n.* *See* network adapter.

network computer \net´wərk kəm-pyo͞o`tər\ *n.* A computer having the hardware and software necessary for it to be connected to a network. *Acronym:* NC (N-C´).

network control program \net`wərk kən-trōl´ prō-gram\ *n.* In a communications network that includes a mainframe computer, a program that usually resides in a communications controller and takes over communications tasks such as routing, error control, line control, and polling (checking terminals for transmissions), leaving the main computer free for other functions. *See also* communications controller.

network database \net`wərk dā´tə-bās\ *n.* **1.** A database that runs in a network. **2.** A database containing the address of other users in the network. **3.** In information management, a type of database in which data records can be related to one another in more than one way. A network database is similar to a hierarchical database in the

sense that it contains a progression from one record to another. It differs in being less rigidly structured: any single record can point to more than one other record and, conversely, can be pointed to by one or more records. In effect, a network database allows more than one path between any two records, whereas a hierarchical database allows only one, from parent (higher-level record) to child (lower-level record). *Compare* hierarchical database, relational database.

Network Data Management Protocol \net`wərk dā`tə man´əj-mənt prō`tə-kol, dat`ə\ *n. See* NDMP.

network device driver \net`wərk də-vīs´ drī`vər\ *n.* Software that coordinates communication between the network adapter card and the computer's hardware and other software, controlling the physical function of the network adapter card.

network directory \net`wərk dər-ek´tər-ē\ *n.* On a local area network, a directory on a disk that is located on a computer other than the one the user is operating. A network directory differs from a network drive in that the user has access to only that directory. Whether the rest of the disk is accessible to the user depends on whether he or she has been granted access rights by the network administrator. On the Apple Macintosh, a network directory is referred to as a shared folder. *Also called* networked directory, shared directory. *See also* network drive, shared folder.

network drive \net`wərk drīv´\ *n.* On a local area network, a disk drive whose disk is available to other computers on the network. Access to a network drive might not be allowed to all users of the network; many operating systems contain security provisions that enable a network administrator to grant or deny access to part or all of a network drive. *Also called* networked drive. *See also* network directory.

networked directory \net`wərkd dər-ek´tər-ē\ *n. See* network directory.

networked drive \net`wərkd drīv´\ *n. See* network drive.

Network File System \net`wərk fīl´ si`stəm\ *n.* A distributed file system developed by Sun Microsystems, Inc. that allows users of Windows NT and UNIX workstations to access remote files and directories on a network as if they were local. *Acronym:* NFS (N`F-S´).

network information center \net`wərk in-fər-mā´shən sen`tər\ *n. See* NIC (definition 2).

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

network latency \net`wərk lā´tən-sē\ *n.* The time it takes for information to be transferred between computers in a network.

network layer \net`wərk lâr, lā´ər\ *n.* The third of the seven layers in the ISO/OSI model for standardizing computer-to-computer communications. The network layer is one level above the data-link layer and ensures that information arrives at its intended destination. It is the middle of the three layers (data-link, network, and transport) concerned with the actual movement of information from one device to another. *See also* ISO/OSI model.

network meltdown \net´wərk melt´doun\ *n. See* broadcast storm.

network model \net´wərk mod`əl\ *n.* A database structure, or layout, similar to a hierarchical model, except that records can have multiple parent records as well as multiple child records. A database management system that supports a network model can be used to simulate a hierarchical model. *See also* CODASYL, network database (definition 3). *Compare* hierarchical model.

network modem \net`wərk mō´dəm\ *n.* A modem that is shared by users of a network, for calling an online service provider, an ISP, a service bureau, or other online source. *See also* ISP, modem, online information service, service bureau (definition 2).

network news \net`wərk nōōz´\ *n.* The newsgroups on the Internet, especially those in the Usenet hierarchy.

Network News Transfer Protocol \net`wərk nōōz´ trans`fər prō`tə-kol\ *n. See* NNTP.

network operating system \net`wərk op´ər-ā-tēng si`stem\ *n.* An operating system installed on a server in a local area network that coordinates the activities of providing services to the computers and other devices attached to the network. Unlike a single-user operating system, a network operating system must acknowledge and respond to requests from many workstations, managing such details as network access and communications, resource allocation and sharing, data protection, and error control.

authorized users access to a computer system or its files.

paste \pāst\ *vb.* To insert text or a graphic that has been cut or copied from one document into a different location in the same or a different document. *See also* cut, cut and paste.

patch[1] \pach\ *n.* A piece of object code that is inserted in an executable program as a temporary fix of a bug.

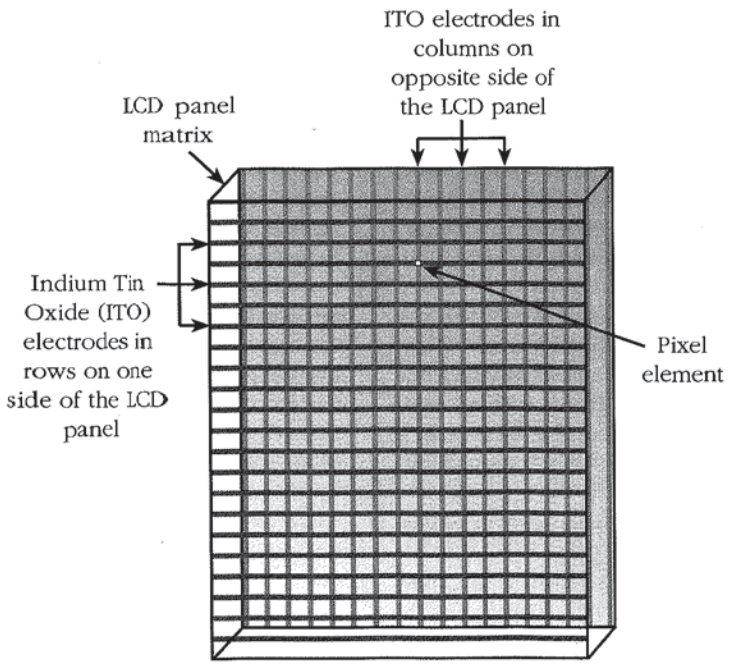
patch[2] \pach\ *vb.* In programming, to repair a deficiency in the functionality of an existing routine or program, generally in response to an unforeseen need or set of operating circumstances. Patching is a common means of adding a feature or a function to a program until the next version of the software is released. *Compare* hack (definition 2), kludge (definition 2).

path \path\ *n.* **1.** In communications, a link between two nodes in a network. **2.** A route through a structured collection of information, as in a database, a program, or files stored on disk. **3.** In programming, the sequence of instructions a computer carries out in executing a routine. **4.** In information processing, such as the theory underlying expert (deductive) systems, a logical course through the branches of a tree of inferences leading to a conclusion. **5.** In file storage, the route followed by the operating system through the directories in finding, sorting, and retrieving files on a disk. **6.** In graphics, an accumulation of line segments or curves to be filled or drawn. See the illustration.

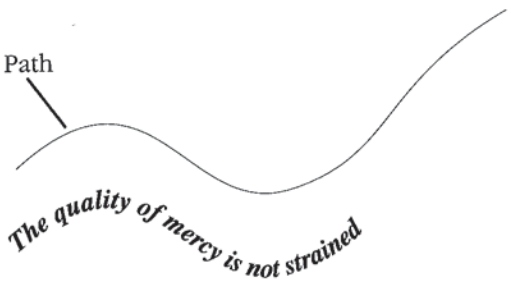
path menu \path´ men`yo͞o\ *n.* In windows environments, the menu or drop box used to enter the universal naming convention path to a shared network resource.

pathname \path´nām\ *n.* In a hierarchical filing system, a listing of the directories or folders that lead from the current directory to a file. *Also called* directory path.

pattern recognition \pat´ərn rek-əg-nish`ən\ *n.* **1.** A broad technology describing the ability of a



Passive-matrix display.



Path.

computer to identify patterns. The term usually refers to computer recognition of visual images or sound patterns that have been converted to arrays of numbers. **2.** The recognition of purely mathematical or textual patterns.

Pause key \päz´ kē, pôz´\ *n.* **1.** A key on a keyboard that temporarily stops the operation of a program or a command. The Pause key is used, for example, to halt scrolling so that a multiscreen listing or document can be read. **2.** Any key that creates a pause in an operation. For example, many game programs have a Pause key, often simply the P key, that temporarily suspends the game.

PBX \P`B-X´\ *n.* Acronym for **P**rivate **B**ranch **Ex**change. An automatic telephone switching system that enables users within an organization to place calls to each other without going through the public telephone network. Users can also place calls to outside numbers.

PC \P-C´\ *n.* **1.** A microcomputer that conforms to the standard developed by IBM for personal computers, which uses a microprocessor in the Intel 80x86 family (or compatible) and can execute the BIOS. *See also* 8086, BIOS, clone, IBM PC. **2.** A computer in IBM's Personal Computer line. *Also called* IBM PC. *See also* PC-compatible (definition 1). **3.** *See* personal computer.

PCB \P`C-B´\ *n. See* printed circuit board.

PC board \P-C´ bōrd`\ *n. See* printed circuit board.

PC Card \P-C´ kärd`\ *n.* A trademark of the Personal Computer Memory Card International Association (PCMCIA) that is used to describe add-in cards that conform to the PCMCIA specification. A PC Card is a removable device, approximately the same size as a credit card, that is designed to plug into a PCMCIA slot. Release 1 of the PCMCIA specification, introduced in June 1990, specified a Type I card that is 3.3 millimeters thick and is intended to be used primarily as a memory-related peripheral. Release 2 of the PCMCIA specification, introduced in September 1991, specifies both a 5-millimeter-thick Type II card and a 10.5-millimeter-thick Type III card. Type II cards accommodate devices such as modem, fax, and network cards. Type III cards accommodate devices that require more space, such as wireless communications devices and rotating storage media (such as hard disks). *See also* PCMCIA, PCMCIA slot.

PC Card slot \P-C` kärd´ slot`\ *n. See* PCMCIA slot.

PC-compatible \P-C` kəm-pat´ə-bl\ *adj.* **1.** Conforming to IBM PC/XT and PC/AT hardware and software specifications, which have been the de facto standard in the computing industry for personal computers that use the Intel 80x86 family or compatible chips. Most PC-compatible computers today are developed outside of IBM; they are still sometimes referred to as clones. *Also called* IBM PC. *See also* 8086, clone, de facto standard, IBM AT. **2.** *See* Wintel.

PC-DOS \P-C`dos´, -D-O-S´\ *n.* Acronym for **P**ersonal **C**omputer **D**isk **O**perating **S**ystem. The version of MS-DOS sold by IBM. MS-DOS and PC-DOS are virtually identical, although filenames of utility programs sometimes differ in the two versions. *See also* MS-DOS.

P-channel MOS \P-chan`əl mos´, M-O-S´\ *n. See* PMOS.

PCI \P`C-I´\ *n. See* PCI local bus.

PCI local bus \P`C-I lō`kəl bus´\ *n.* Short for **P**eripheral **C**omponent **I**nterconnect **local bus.** A specification introduced by Intel Corporation that defines a local bus system that allows up to 10 PCI-compliant expansion cards to be installed in the computer. A PCI local bus system requires the presence of a PCI controller card, which must be installed in one of the PCI-compliant slots. Optionally, an expansion bus controller for the system's ISA, EISA, or Micro Channel Architecture slots can be installed as well, providing increased synchronization over all the system's bus-installed resources. The PCI controller can exchange data with the system's CPU either 32 bits or 64 bits at a

time, depending on the implementation, and it allows intelligent, PCI-compliant adapters to perform tasks concurrently with the CPU using a technique called bus mastering. The PCI specification allows for multiplexing, a technique that permits more than one electrical signal to be present on the bus at one time. *See also* local bus. *Compare* VL bus.

PCL \P`C-L´\ *n. See* Printer Control Language.

PCM \P`C-M´\ *n. See* pulse code modulation.

PCMCIA \P`C-M`C-I-A´\ *n.* Acronym for **P**ersonal **C**omputer **M**emory **C**ard **I**nternational **A**ssociation. A group of manufacturers and vendors formed to promote a common standard for PC Card–based peripherals and the slot designed to hold them, primarily on laptop, palmtop, and other portable computers, as well as for intelligent electronic devices. PCMCIA is also the name of the standard for PC Cards, first introduced in 1990 as release 1. *See also* PC Card, PCMCIA slot.

PCMCIA card \P`C-M`C-I-A´ kärd`\ *n. See* PC card.

PCMCIA connector \P`C-M`C-I-A´ kə-nek`tər\ *n.* The 68-pin female connector inside a PCMCIA slot designed to hold the 68-pin male connector on a PC Card. *See also* PC Card, PCMCIA slot.

PCMCIA slot \P`C-M`C-I-A´ slot`\ *n.* An opening in the housing of a computer, peripheral, or other intelligent electronic device designed to hold a PC Card. *Also called* PC Card slot. *See also* PC Card, PCMCIA connector.

PC memory card \P-C` mem´ər-ē kärd`\ *n.* **1.** An add-in circuit card that increases the amount of RAM in a system. *See also* memory card. **2.** A Type I PC Card as specified by PCMCIA. In this context, such a card consists of conventional static RAM chips powered by a small battery and is designed to provide additional RAM to the system. *See also* PC Card. *Compare* flash memory.

p-code \P´kōd\ *n. See* pseudocode.

PCT \P`C-T´\ *n.* Acronym for **p**rogram **c**omprehension **t**ool. A software engineering tool that facilitates the process of understanding the structure and/or functionality of computer programs.

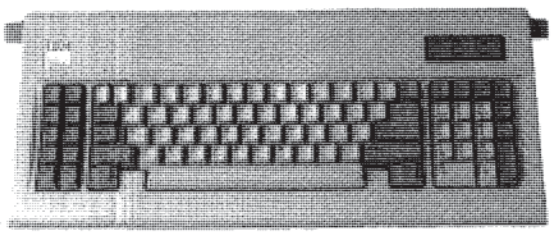
.pcx \dot-P`C-X´\ *n.* The file extension that identifies bitmapped images in the PC Paintbrush file format.

PC/XT \P`C-X-T´\ *n.* The original IBM Personal Computer, introduced in 1981, which used the Intel 8088 CPU. *See also* IBM PC.

PC/XT keyboard \P`C-X-T´ kē`bōrd\ *n.* The original keyboard for the IBM Personal Computer. Strong, reliable, and equipped with 83 keys, the PC/XT keyboard offers a typist an audible click. See the illustration. *See also* IBM PC, PC/XT.

PDA \P`D-A´\ *n.* Acronym for **P**ersonal **D**igital **A**ssistant. A lightweight palmtop computer designed to provide specific functions like personal organization (calendar, note taking, database, calculator, and so on) as well as communications. More advanced models also offer multimedia features. Many PDA devices rely on a pen or other pointing device for input instead of a keyboard or mouse, although some offer a keyboard too small for touch typing to use in conjunction with a pen or pointing device. For data storage, a PDA relies on flash memory instead of power-hungry disk drives. *See also* firmware, flash memory, PC Card, pen computer.

PDC \P`D-C´\ *n. See* Primary Domain Controller.



PC/XT keyboard.

PD-CD drive \P`D-C-D´ drīv\ *n.* Short for **p**hase change rewritable **d**isc–**c**ompact **d**isc **drive.** A storage device that combines a CD-ROM drive and a phase change rewritable disc (PD) drive, which can store up to 650 megabytes of data on cartridges of rewritable optical discs. *See also* phase-change recording.

PDD \P`D-D´\ *n.* Acronym for **P**ortable **D**igital **D**ocument. A graphics file created from a document by QuickDraw GX under Mac OS. PDDs are stored in a form that is independent of printer resolution; they print at the highest resolution available on the printer used; and they can contain the original fonts used in the document. Therefore, a PDD can be printed by a computer other than the one on which it was created.

.pdf \dot`P-D-F´\ *n.* The file extension that identifies documents encoded in the Portable Document Format developed by Adobe Systems. In order to display or print a .pdf file, the user should obtain the freeware Adobe Acrobat Reader. *See also* Acrobat, Portable Document Format.

PDL \P`D-L´\ *n. See* page-description language.

PDM \P`D-M´\ *n. See* pulse duration modulation.

PDO \P`D-O´\ *n. See* Portable Distributed Objects.

PDS \P`D-S´\ *n.* **1.** Acronym for **P**rocessor **D**irect **S**lot. An expansion slot in Macintosh computers that is connected directly to the CPU signals. There are several kinds of PDS slots with different numbers of pins and different sets of signals, depending on which CPU is used in a particular computer. **2.** Acronym for **P**arallel **D**ata **S**tructure. A hidden file, located in the root directory of a disk that is shared under AppleShare, that contains access privilege information for folders.

.pe \dot`P-E´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Peru.

.pe.ca \dot-P-E`dot-C-A´\ *n.* On the Internet, the major geographic domain specifying that an address is located on Prince Edward Island, Canada.

peek \pēk\ *vb.* **1.** To read a byte from an absolute memory location. Peek commands are often found in programming languages such as Basic that do not normally allow access to specific memory locations. **2.** To look at the next character in a buffer associated with an input device without actually removing the character from the buffer.

peer \pēr\ *n.* Any of the devices on a layered communications network that operate on the same protocol level. *See also* network architecture.

peer-to-peer architecture \pēr`tə-pēr` är´kə-tek-chur\ *n.* A network of two or more computers that use the same program or type of program to communicate and share data. Each computer, or *peer,* is considered equal in terms of responsibilities and each acts as a server to the others in the network. Unlike a client/server architecture, a dedicated file server is not required. However, network performance is generally not as good as under client/server, especially under heavy loads. *Also called* peer-to-peer network. *See also* peer, peer-to-peer communications, server. *Compare* client/server architecture.

peer-to-peer communications \pēr`-tə-pēr` kə-myo͞o-nə-kā´shənz\ *n.* Interaction between devices that operate on the same communications level on a network based on a layered architecture. *See also* network architecture.

peer-to-peer network \pēr`tə-pēr` net´wərk\ *n. See* peer-to-peer architecture.

pel \pel\ *n.* Short for **p**icture **el**ement. *See* pixel.

PEM \P`E-M´\ *n. See* Privacy-Enhanced Mail.

pen \pen\ *n. See* light pen, stylus.

pen-based computing \pen`bāsd kəm-pyo͞o´-tēng\ *n.* The process of entering handwritten symbols into a computer via a stylus and pressure-sensitive pad. *See also* pen computer.

pen computer \pen´ kəm-pyo͞o`tər\ *n.* Any of a class of computers whose primary input device is a pen (stylus) instead of a keyboard. A pen computer is usually a smaller, handheld device and has a flat semiconductor-based display such as an LCD display. It requires either a special operating system designed to work with the pen input device or a proprietary operating system designed to work with a specific-purpose device. The pen computer is the primary model for an emerging class of computers known as personal digital assistants (PDAs). *See also* clipboard computer, PC Card, PDA.

pen plotter \pen´ plot`ər\ *n.* A traditional graphics plotter that uses pens to draw on paper. Pen plotters use one or more colored pens, either fiber-tipped pens or, for highest-quality output, drafting pens. *See also* plotter. *Compare* electrostatic plotter.

RJ-11 connector \R`J-ə-lev´ən kə-nek`tər\ *n. See* phone connector.

RJ-11 jack \R`J-ə-lev´ən jak\ *n. See* phone connector.

RLIN \R´lin, R`L-I-N´\ *n. See* Research Libraries Information Network.

RLL encoding \R`L-L´ en-kō-dēng\ *n. See* run-length limited encoding.

rlogin[1] \R`log´in\ *n.* **1.** A protocol used to log in to a networked computer in which the local system automatically supplies the user's login name. *See also* communications protocol, logon. *Compare* telnet[1]. **2.** A UNIX command in BSD UNIX that enables a user to log in to a remote computer on a network using the rlogin protocol. *See also* BSD UNIX.

rlogin[2] \R`log´in\ *vb.* To connect to a networked computer using the rlogin protocol.

RLSD \R`L-S-D´\ *n.* Acronym for **R**eceived **L**ine **S**ignal **D**etect. *See* DCD.

RMM \R`M-M´\ *n. See* real-mode mapper.

.ro \dot`R-O´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Romania.

robopost \rō´bō-pōst`\ *vb.* To post articles to newsgroups automatically, usually by means of a bot. *See also* bot (definition 3), newsgroup, post.

robot \rō´bot\ *n.* **1.** A machine that can sense and react to input and cause changes in its surroundings with some degree of intelligence, ideally without human supervision. Although robots are often designed to mimic human movements in carrying out their work, they are seldom human-like in appearance. Robots are commonly used in manufacturing products such as automobiles and computers. *See also* robotics. **2.** *See* bot, spider.

robotics \rō-bot´iks\ *n.* The branch of engineering devoted to the creation and training of robots. Roboticists work within a wide range of fields, such as mechanical and electronic engineering, cybernetics, bionics, and artificial intelligence, all toward the end of endowing their creations with as much sensory awareness, physical dexterity, independence, and flexibility as possible. *See also* artificial intelligence, bionics, cybernetics.

robust \rō-bust´\ *adj.* Able to function or to continue functioning well in unexpected situations.

ROFL \R`O-F-L´\ Acronym for **r**olling **o**n the **fl**oor, **l**aughing. An expression, used mostly in newsgroups and online conferences, to indicate one's appreciation of a joke or other humorous circumstance. *Also called* ROTFL.

role-playing game \rōl´plā-ēng gām`\ *n.* A game that is played online such as a MUD, in which participants take on the identities of characters that interact with each other. Often these games have a fantasy or science fiction setting and have a set of rules that all players need to follow. *See also* MUD.

rollback \rōl´bak\ *n.* A return to a previous stable condition, as when the contents of a hard disk are restored from a backup after a destructive hard disk error.

ROM \rom, R`O-M´\ *n.* **1.** Acronym for **r**ead-**o**nly **m**emory. A semiconductor circuit into which code or data is permanently installed by the manufacturing process. The use of this technology is economically viable only if the chips are produced in large quantities; experimental designs or small volumes are best handled using PROM or EPROM. **2.** Acronym for **r**ead-**o**nly **m**emory. Any semiconductor circuit serving as a memory that contains instructions or data that can be read but not modified (whether placed there by manufacturing or by a programming process, as in PROM and EPROM). *See also* EEPROM, EPROM, PROM.

roman \rō´mən\ *adj.* Having upright rather than slanted characters in a typeface. *See also* font family. *Compare* italic.

ROM Basic \rom` bā´sik, R-O-M´\ *n.* A Basic interpreter stored in ROM (read-only memory) so that the user can start programming after simply turning on the machine without having to load Basic from a disk or tape. ROM Basic was a feature of many early home computers.

ROM BIOS \rom` bī´ōs, R-O-M´\ *n.* Acronym for **r**ead-**o**nly **m**emory **b**asic **i**nput/**o**utput **s**ystem. *See* BIOS.

ROM card \rom´ kärd, R`O-M´\ *n.* A plug-in module that contains one or more printer fonts, programs, or games or other information stored in ROM (read-only memory). A typical ROM card is about the size of a credit card and several times thicker. It stores information directly in integrated circuit boards. *Also called* font card, game card. *See also* ROM (definition 1), ROM cartridge.

ROM cartridge \rom´ kär`trij, R-O-M´\ *n.* A plug-in module that contains one or more printer fonts, programs, games, or other information stored in ROM (read-only memory) chips on a board enclosed in a plastic case with a connector exposed at one end so that it can easily plug into a printer, computer, game system, or other device. For example, a cartridge that plugs into a game system is a ROM cartridge. *Also called* game cartridge. *See also* ROM (definition 1), ROM card.

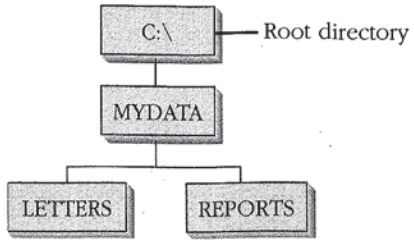
ROM emulator \rom´ em`yə-lā-tər, R-O-M´\ *n.* A special circuit containing RAM memory that is connected to a target computer in place of the target computer's ROM chips. A separate computer writes the contents into the RAM, and then the target computer reads the RAM as if it were ROM. ROM emulators are used to debug ROM-resident software without the high cost and delay of manufacturing chips. Even though the use of a ROM emulator is more expensive than programming an EPROM, it is often preferred today because its contents can be changed much more quickly than those of an EPROM. *Also called* ROM simulator. *See also* EEPROM, EPROM, ROM (definition 1).

ROM simulator \rom´ sim`yə-lā-tər, R`O-M´\ *n.* *See* ROM emulator.

root \rōōt\ *n.* The main or uppermost level in a hierarchically organized set of information. The root is the point from which subsets branch in a logical sequence that moves from a broad focus to narrower perspectives. *See also* leaf, tree.

root account \rōōt´ ə-kount`, rŏŏt´\ *n.* On UNIX systems, the account having control over the operation of a computer. The system administrator uses this account for system maintenance. *Also called* superuser. *See also* system administrator.

root directory \rōōt´ dər-ek`tər-ē\ *n.* The point of entry into the directory tree in a disk-based hierarchical directory structure. Branching from this root are various directories and subdirectories, each of which can contain one or more files and subdirectories of its own. For example, in the MS-DOS operating system the root directory is identified by a name consisting of a single backslash character (\). Beneath the root are other directories, which may contain further directories, and so on. See the illustration.



Root directory. The structure of a hierarchical directory; the root is identified by the backslash.

root name \rōōt´ nām, rŏŏt´\ *n.* In MS-DOS and Windows, the first part of a filename. In MS-DOS and earlier versions of Windows, the maximum length of the root name was eight characters; in Windows NT and later versions of Windows, the root name may be as long as 255 characters. *See also* 8.3, extension (definition 1), filename, long filenames.

ROT13 encryption \R`O-T`thər-tēn´ en-krip`shən\ *n.* A simple encryption method in which each letter is replaced with the letter of the alphabet 13 letters after the original letter, so that A is replaced by N, and so forth; N, in turn, is replaced by A, and Z is replaced by M. ROT13 encryption is not used to protect messages against unauthorized readers; rather, it is used in newsgroups to encode messages that a user may not want to read, such as sexual jokes or spoilers. Some newsreaders can automatically perform ROT13 encryption and decryption at the touch of a key.

rotate \rō´tāt\ *vb.* **1.** To turn a model or other graphical image so that it is viewed at a different angle. **2.** To move bits in a register to the left or to the right. The bit that moves out of the end position rotates to the newly vacated position at the opposite end of the register. *Compare* shift.

rotational delay \rō-tā`shə-nəl də-lā´\ *n.* The time required for a desired disk sector to rotate to the read/write head. *Also called* rotational latency.

rotational latency \rō-tā`shən-əl lā´tən-sē\ *n.* *See* rotational delay.

RO terminal \R-O´ tər`mə-nəl\ *n.* Short for **r**ead-**o**nly **terminal.** A terminal that can receive data but cannot send data. Nearly all printers can be classified as RO terminals.

ROTFL \R`O-T-F-L´\ *See* ROFL.

round \round\ *vb.* To shorten the fractional part of a number, usually increasing the last remaining (rightmost) digit or not, according to whether the deleted portion was over or under 5. For example, 0.3333 rounded to two decimal places is 0.33, and 0.6666 is 0.67. Computer programs often round numbers, sometimes causing confusion when the resulting values do not add up "correctly." Percentages in a spreadsheet can thus total 99 percent or 101 percent because of rounding.

round robin \round` rob´in\ *n.* A sequential, cyclical allocation of resources to more than one process or device.

routable protocol \rou´tə-bl pro`tə-kol, rōō´tə-bl\ *n.* A communications protocol that is used to route data from one network to another by means of a network address and a device address. TCP/IP is an example of a routable protocol.

router \rou´tər\ *n.* An intermediary device on a communications network that expedites message delivery. On a single network linking many computers through a mesh of possible connections, a router receives transmitted messages and forwards them to their correct destinations over the most efficient available route. On an interconnected set of local area networks (LANs) using the same communications protocols, a router serves the somewhat different function of acting as a link between LANs, enabling messages to be sent from one to another. *See also* bridge, gateway.

routine \rōō-tēn´\ *n.* Any section of code that can be invoked (executed) within a program. A routine usually has a name (identifier) associated with it and is executed by referencing that name. Related terms (which may or may not be exact synonyms, depending on the context) are *function, procedure,* and *subroutine. See also* function (definition 3), procedure, subroutine.

row \rō\ *n.* A series of items arranged horizontally within some type of framework—for example, a continuous series of cells running from left to right in a spreadsheet; a horizontal line of pixels on a video screen; or a set of data values aligned horizontally in a table. *Compare* column.

RPC \R`P-C´\ *n. See* remote procedure call.

RPF \R`P-F´\ *n. See* reverse path forwarding.

RPN \R`P-N´\ *n.* Acronym for **r**everse **P**olish **n**otation. *See* postfix notation.

RPROM \R´prom, R`P´rom, R`P-R`O-M´\ *n.* Short for **r**eprogrammable **PROM.** *See* EPROM.

RRSP \R`R-S-P´\ *n. See* Resource Reservation Setup Protocol.

RS-232-C standard \R`S-tōō-thrē-tōō-C´ stan`-dərd\ *n.* An accepted industry standard for serial communications connections. Adopted by the Electrical Industries Association, this Recommended Standard (RS) defines the specific lines and signal characteristics used by serial communications controllers to standardize the transmission of serial data between devices. The letter *C* denotes that the current version of the standard is the third in a series. *See also* CTS, DSR, DTR, RTS, RXD, TXD.

RS-422/423/449 \R`S-fōr-tōō-tōō`fōr-tōō-thrē`fōr-fōr-nīn´\ *n.* Standards for serial communications with transmission distances over 50 feet. RS-449 incorporates RS-422 and RS-423. Macintosh serial ports are RS-422 ports. *See also* RS-232-C standard.

RSAC \R´sak, R`S-A-C´\ *n. See* Recreational Software Advisory Council.

RSA encryption \R-S-A´ en-krip`shən\ *n.* Short for **R**ivest-**S**hamir-**A**dleman **encryption.** The patented public key encryption algorithm, introduced by Ronald Rivest, Adi Shamir, and Leonard Adleman in 1978, on which the PGP (Pretty Good Privacy) encryption program is based. *See also* PGP, public key encryption.

RSI \R`S-I´\ *n. See* repetitive strain injury.

RSN \R`S-N´\ *See* Real Soon Now.

RSVP \R`S-V-P´\ *n. See* Resource Reservation Setup Protocol.

RTF \R`T-F´\ *n. See* Rich Text Format.

RTFM \R`T-F-M´\ Acronym for **r**ead **t**he **f**laming (or **f**riendly) **m**anual. A common answer to a question in an Internet newsgroup or product support conference that is adequately explained in the instruction manual. *Also called* RTM.

RTM \R`T-M´\ Acronym for **r**ead **t**he **m**anual. *See* RTFM.

RTS \R`T-S´\ *n.* Acronym for **R**equest **t**o **S**end. A signal sent, as from a computer to its modem, to request permission to transmit; the signal is often used in serial communications. RTS is a hardware signal sent over pin 4 in RS-232-C connections. *See also* RS-232-C standard. *Compare* CTS.

.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.

thin film transistor \thin`film tranz-i`stər\ *n.* *See* TFT.

ThinNet \thin´net\ *n.* *See* 10Base2.

thin server \thin´ sər`vər\ *n.* A client/server architecture in which most of an application is run on the client machine, which is called a fat client, with occasional data operations on a remote server. Such a configuration yields good client performance, but complicates administrative tasks, such as software upgrades. *See also* client/server architecture, fat client, thin client. *Compare* fat server.

thin space \thin´ spās\ *n.* An amount of horizontal space in a font, equal to one-quarter the point size of the font. For example, a thin space in a 12-point font is 3 points wide. *See also* point[1] (definition 1). *Compare* em space, en space, fixed space.

thin system \thin´ si`stəm\ *n.* *See* thin server.

ThinWire \thin´wīr\ *n.* *See* 10Base2.

third-generation computer \thərd`jen-ər-ā`shən kəm-pyo͞o´tər\ *n.* Any of the computers produced from the mid-1960s to the 1970s that were based on integrated circuits rather than on separately wired transistors. *See also* computer.

third-generation language \thərd`jen-ər-ā`shən lang´wəj\ *n.* A high-level programming language that was designed to run on the third generation of computer processors, built on integrated circuit technology roughly from 1965 to 1970. C, FORTRAN, Basic, and Pascal are examples of third-generation languages still in use today. *Acronym:* 3GL (thrē`G-L´). *See also* 3GL, central processing unit, high-level language, integrated circuit. *Compare* 4GL, low-level language.

third normal form \thərd` nōr´məl fōrm\ *n.* *See* normal form (definition 1).

third party \thərd` pär´tē\ *n.* A company that manufactures and sells accessories or peripherals for use with a major manufacturer's computer or peripheral, usually without any involvement from the major manufacturer.

thrashing \thrash´ēng\ *n.* The state of a virtual memory system that is spending almost all its time swapping pages in and out of memory rather than executing applications. *See also* swap (definition 2), virtual memory.

thread \thred\ *n.* **1.** In programming, a process that is part of a larger process or program. **2.** In a tree data structure, a pointer that identifies the parent node and is used to facilitate traversal of the tree. **3.** In electronic mail and Internet newsgroups, a series of messages and replies related to a specific topic.

threaded discussion \thred`əd di-skush´ən\ *n.* In a newsgroup or other online forum, a series of messages or articles in which replies to an article are nested directly under it, instead of the articles being arranged in chronological or alphabetical order. *See also* newsgroup, thread (definition 3).

threaded newsreader \thred`əd nō͞oz´rē-dər\ *n.* A newsreader that displays posts in newsgroups as threads. Replies to a post appear directly after the original post, rather than in chronological or any other order. *See also* newsreader, post, thread (definition 3).

threaded tree \thred`əd trē´\ *n.* A tree in which the leaf (end) nodes contain pointers to some of the nodes from which they arise. The pointers facilitate searching the tree for information. *See also* thread (definition 2).

threading \thred´ēng\ *n.* A technique used by certain interpretive languages, such as many Forth implementations, to speed execution. The references to other support routines in each threaded support routine, such as a predefined word in Forth, are replaced by pointers to those routines. *See also* Forth, thread (definition 1).

three-dimensional array \thrē`də-men`shə-nəl ər-ā´\ *n.* An ordered arrangement of information in which three numbers (integers) are used to locate a particular item. A three-dimensional array treats data as if it were laid out in rows, columns, and layers. *See also* 3-D array, array, two-dimensional array.

three-dimensional model \thrē`də-men`shə-nəl mod´əl\ *n.* A computer simulation of a physical object in which length, width, and depth are real attributes—a model, with *x*-, *y*-, and *z*-axes, that can be rotated for viewing from different angles.

three-tier client/server \thrē`tēr klī`ənt-sər´vər\ *n.* A client/server architecture in which software systems are structured into three tiers or layers: the user interface layer, the business logic layer, and the database layer. Layers may have one or more components. For example, there can be one or more user interfaces in the top tier, each user interface may communicate with more than one

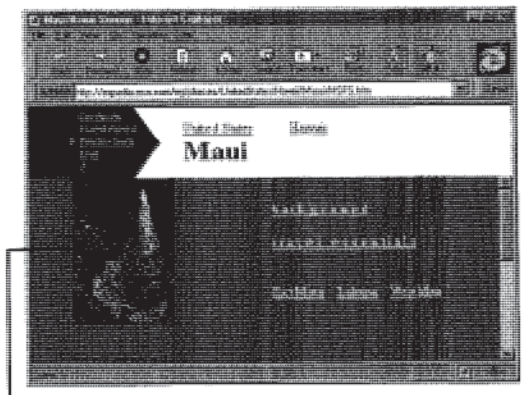
application in the middle tier at the same time, and the applications in the middle tier may use more than one database at a time. Components in a tier may run on a computer that is separate from the other tiers, communicating with the other components over a network. *See also* client/server architecture. *Compare* two-tier client/server.

throttle control \throt´l kən-trōl`\ *n.* A device that enables the user of a flight simulator or game to control simulated engine power. The throttle control is used along with a joystick (which controls the simulated ailerons and elevators) and possibly a rudder control.

throughput \thro͞o´po͝ot\ *n.* A measure of the data transfer rate through a typically complex communications system or of the data processing rate in a computer system.

thumb \thum\ *n. See* elevator.

thumbnail \thum´nāl\ *n.* A miniature version of an image or electronic version of a page that is generally used to allow quick browsing through multiple images or pages. For example, Web pages often contain thumbnails of images (which can be loaded much more quickly by the Web browser than the full-size image). Many of these thumbnails can be clicked on to load the complete version of the image. See the illustration.



Thumbnail.

thumbwheel \thum´hwēl, thum´wēl\ *n.* A wheel embedded in a case so that only a portion of the outside rim is revealed. When rolled with the thumb, the wheel can control an on-screen element such as a pointer or a cursor. Thumbwheels are used with three-dimensional joysticks and trackballs to control the depth aspect of the pointer or cursor. *See also* joystick, relative pointing device, trackball.

TIA \T`I-A´\ *n.* Acronym for **t**hanks **i**n **a**dvance. On the Internet, a popular sign-off to a request of some sort. *Also called* aTdHvAaNnKcSe.

tick \tik\ *n.* **1.** A regular, rapidly recurring signal emitted by a clocking circuit; also, the interrupt generated by this signal. **2.** In some microcomputer systems, notably Macintosh, one sixtieth of a second, the basic time unit used by the internal clock that is accessible by programs.

tiebreaker \tī´brā-kər`\ *n.* A circuit that arbitrates competing circuits and resolves bottlenecks by giving priority to one circuit at a time.

tie line \tī´ līn\ *n.* A private line leased from a communications carrier and often used to link two or more points in an organization.

.tif \dot-tif´, -T`I-F´\ *n.* The file extension that identifies bitmap images in Tagged Image File Format (TIFF). *See also* TIFF.

TIFF or **TIF** \tif\ *n.* Acronym for **T**agged **I**mage **F**ile **F**ormat or **T**ag **I**mage **F**ile **F**ormat. A standard file format commonly used for scanning, storage, and interchange of gray-scale graphic images. TIFF may be the only format available for older programs (such as older versions of MacPaint), but most modern programs are able to save images in a variety of other formats, such as GIF or JPEG. *See also* gray scale. *Compare* GIF, JPEG.

TIGA \tī´gə, T`I-G-A´\ *n.* Acronym for **T**exas **I**nstruments **G**raphics **A**rchitecture. A video adapter architecture based on the Texas Instruments 340x0 graphics processor.

tightly coupled \tīt`lē kəp´ld\ *adj.* **1.** Refers to two computing processes whose successful completion and individual performance rates are highly interdependent. **2.** Of, pertaining to, or characteristic of a relationship of interdependency between computers, as in multiprocessing.

tile \tīl\ *vb.* **1.** In computer-graphics programming, to fill adjacent blocks of pixels on the screen with a design or pattern without allowing any blocks to overlap. **2.** To fill the space on a monitor or within a smaller area with multiple copies of the same

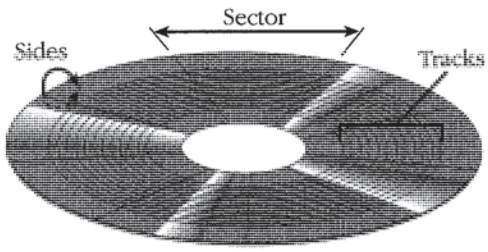
standard that addresses a broad range of decision support applications working with complex data structures. *See also* Transaction Processing Council.

TP monitor \T-P´ mon`ə-tər\ *n.* Short for **t**ele**p**rocessing **monitor** or **t**ransaction **p**rocessing **monitor.** A program that controls the transfer of data between terminals (or clients) and a mainframe (or one or more servers) so as to provide a consistent environment for one or more online transaction processing (OLTP) applications. A TP monitor may also control the appearance of the screen displays and check input data for proper format. *See also* client (definition 3), mainframe computer, OLTP, server (definition 1).

.tr \dot`T-R´\ *n.* On the Internet, the major geographic domain specifying that an address is located in Turkey.

trace \trās\ *vb.* To execute a program in such a way that the sequence of statements being executed can be observed. *See also* debugger, single step.

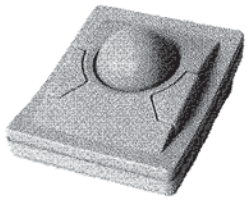
track[1] \trak\ *n.* One of numerous circular data storage areas on a floppy disk or a hard drive, comparable to a groove on a record but not spiral. Tracks, composed of sectors, are recorded on a disk by an operating system during a disk format operation. On other storage media, such as tape, a track runs parallel to the edge of the medium. See the illustration.



Track.

track[2] \trak\ *vb.* **1.** To follow a path. **2.** In data management, to follow the flow of information through a manual or an automated system. **3.** In data storage and retrieval, to follow and read from a recording channel on a disk or a magnetic tape. **4.** In computer graphics, to cause a displayed symbol, such as a pointer, to match on the screen the movements of a mouse or another pointing device.

trackball \trak´bäl\ *n.* A pointing device that consists of a ball resting on two rollers at right angles to each other, which translate the ball's motion into vertical and horizontal movement on the screen. A trackball also typically has one or more buttons to initiate other actions. A trackball's housing is stationary; its ball is rolled with the hand. See the illustration. *Compare* mechanical mouse.



Trackball.

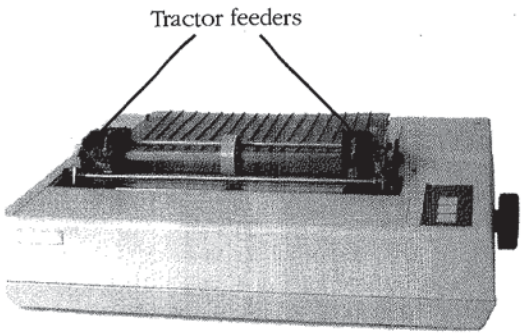
trackpad \trak´pad\ *n.* A pointing device consisting of a small, flat pad that is sensitive to touch. Users move the mouse cursor on screen by touching the trackpad and moving their fingers across the trackpad's surface. Such devices are most commonly installed on laptop computers. *See also* pointing device.

tracks per inch \traks` pər inch´\ *n.* The density with which concentric tracks (data storage rings) are recorded or can be recorded in an inch of radius on a disk. The greater the density (the more tracks per inch), the more information a disk can hold. *Acronym:* TPI (T`P-I´).

tractor feed \trak´tər fēd`\ *n.* A method of feeding paper through a printer using pins mounted on rotating belts. The pins engage holes near the edges of continuous-form paper and either push or pull the paper through. See the illustration on the next page. *See also* continuous-form paper. *Compare* pin feed.

trademark \trād´märk\ *n.* A word, phrase, symbol, or design (or some combination thereof) used to identify a proprietary product, often accompanied by the symbol ™ or ®.

trade show \trād´ shō\ *n.* A multivendor sales event or exposition that showcases companies' products.



Tractor feed. Tractor feeders on a dot-matrix printer.

traditional newsgroup hierarchy \trə-dish`ə-nəl nōōz`grōōp hī´ər-är-kē, hīr´är-kē\ *n.* The seven standard newsgroup categories in Usenet: comp., misc., news., rec., sci., soc., and talk. Newsgroups can be added within the traditional hierarchy only following a formal voting process. *See also* comp. newsgroups, misc. newsgroups, newsgroup, news. newsgroups, rec. newsgroups, Request for Discussion, sci. newsgroups, soc. newsgroups, talk. newsgroups, Usenet. *Compare* alt. newsgroup.

traffic \traf´ik\ *n.* The load carried by a communications link or channel.

trailer \trā´lər\ *n.* Information, typically occupying several bytes, at the tail end of a block (section) of transmitted data and often containing a checksum or other error-checking data useful for confirming the accuracy and status of the transmission. *See also* checksum. *Compare* header (definition 2).

trailer label \trā´lər lā`bəl\ *n.* **1.** A small block of information used in tape processing that marks the end of a file or the end of the tape and that can contain other information, such as the number of records in the file or files on the tape. *Compare* header label. **2.** A label used in communications data frames that follows the data and might contain an end-of-message mark, a checksum, and some synchronization bits.

trailing edge \trā`lēng ej´\ *n.* The latter part of an electronic signal. When a digital signal switches from on to off, the transition is the trailing edge of the signal.

train[1] \trān\ *n.* A sequence of items or events, such as a digital pulse train consisting of transmitted binary signals.

train[2] \trān\ *vb.* To teach an end user how to use a software or hardware product.

transaction \tranz-ak´shən\ *n.* A discrete activity within a computer system, such as an entry of a customer order or an update of an inventory item. Transactions are usually associated with database management, order entry, and other online systems.

transaction file \tranz-ak´shən fīl`\ *n.* A file that contains the details of transactions, such as items and prices on invoices. It is used to update a master database file. *See also* transaction. *Compare* master file.

transaction log \tranz-ak´shən log`\ *n.* *See* change file.

transaction processing \tranz-ak´shən pros`es-ēng\ *n.* A processing method in which transactions are executed immediately after they are received by the system. *See also* transaction. *Compare* batch processing (definition 3).

Transaction Processing Council \tranz-ak`shən pros´es-ēng koun`səl\ *n.* A group of hardware and software vendors with the goal of publishing benchmark standards. *Acronym:* TPC (T`P-C´).

transaction processing monitor \tranz-ak`shən pros-es-ēng mon´ə-tər\ *n.* *See* TP monitor.

transceiver \tran`sē´vər\ *n.* Short for **trans**mitter/re**ceiver.** A device that can both transmit and receive signals. On local area networks, a transceiver is the device that connects a computer to the network.

transceiver cable \tran-sē´vər kā`bl\ *n.* A cable that is used to connect a host adapter within a computer to a local area network (LAN). *See also* AUI cable, LAN.

transducer \tranz`dōō´sər\ *n.* A device that converts one form of energy into another. Electronic transducers either convert electric energy to another form of energy or convert nonelectric to electric energy.

transfer \trans´fər\ *n.* **1.** The movement of data from one location to another. **2.** The passing of program control from one portion of code to another.

transfer rate \trans´fər rāt`\ *n.* The rate at which a circuit or a communications channel transfers information from source to destination, as over a network or to and from a disk drive. Transfer

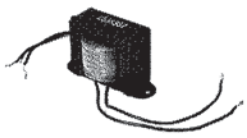
rate is measured in units of information per unit of time—for example, bits per second or characters per second—and can be measured either as a raw rate, which is the maximum transfer speed, or as an average rate, which includes gaps between blocks of data as part of the transmission time.

transfer statement \trans´fər stāt`mənt\ *n.* A statement in a programming language that transfers the flow of execution to another location in the program. *See also* branch instruction, CALL statement, GOTO statement, jump instruction.

transfer time \trans´fər tīm`\ *n.* The time elapsed between the start of a data transfer operation and its completion.

transform \trans-fōrm´\ *vb.* **1.** To change the appearance or format of data without altering its content; that is, to encode information according to predefined rules. **2.** In mathematics and computer graphics, to alter the position, size, or nature of an object by moving it to another location (translation), making it larger or smaller (scaling), turning it (rotation), changing its description from one type of coordinate system to another, and so on.

transformer \trans-fōr´mər`\ *n.* A device used to change the voltage of an alternating current signal or to change the impedance of an alternating current circuit. See the illustration.



Transformer.

transient \tran´zhənt, tran´zē-ənt\ *adj.* **1.** Fleeting, temporary, or unpredictable. **2.** Of or pertaining to the region of memory used for programs, such as applications, that are read from disk storage and that reside in memory temporarily until they are replaced by other programs. In this context, *transient* can also refer to the programs themselves. **3.** In electronics, of or pertaining to a short-lived, abnormal, and unpredictable increase in power supply, such as a voltage spike or surge. *Transient time* is the interval during which a change in current or voltage is building up or decaying.

transient suppressor \tran`zhənt su-pres´ər, tran`zē-ənt\ *n.* A circuit designed to reduce or eliminate unwanted electrical signals or voltages.

transistor \tran`zi´stər\ *n.* Short for **transfer resistor.** A solid-state circuit component, usually with three leads, in which a voltage or a current controls the flow of another current. The transistor can serve many functions, including those of amplifier, switch, and oscillator, and is a fundamental component of almost all modern electronics. See the illustration on the next page. *See also* base (definition 3), FET, NPN transistor, PNP transistor.

transistor-transistor logic \tran-zi`stər-tran-zi´stər loj-ik\ *n.* A type of bipolar circuit design that utilizes transistors connected to each other either directly or through resistors. Transistor-transistor logic offers high speed and good noise immunity and is used in many digital circuits. A large number of transistor-transistor logic gates can be fabricated on a single integrated circuit. *Acronym:* TTL (T`T-L´).

translate \tranz´lāt\ *vb.* **1.** In programming, to convert a program from one language to another. Translation is performed by special programs such as compilers, assemblers, and interpreters. **2.** In computer graphics, to move an image in the "space" represented on the display, without turning (rotating) the image.

translated file \tranz`lā-təd fīl´\ *n.* A file containing data that has been changed from binary (8-bit) format to ASCII (7-bit) format. BinHex and uuencode both translate binary files into ASCII. Such translation is necessary to transmit data through systems (such as e-mail) that may not preserve the eighth bit of each byte. A translated file must be decoded to its binary form before being used. *See also* BinHex, uuencode.

translator \tranz´lā-tər\ *n.* A program that translates one language or data format into another.

transmission channel \tranz-mish´ən chan`əl\ *n. See* channel.

Transmission Control Protocol/Internet Protocol \tranz`mish`ən kən-trōl´ prō`tə-kol-in´tər-net prō`tə-kol\ *n. See* TCP/IP.

transmit \tranz-mit´\ *vb.* To send information over a communications line or a circuit. Computer transmissions can take place in the ways listed on the next page.