Apple Publications Glossary

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Using the *Apple Publications Glossary*

THIS GLOSSARY IS AVAILABLE ON DISK FOR EASY ELECTRONIC CUTTING and pasting. If you want a disk copy, contact Developer Services.

Use this glossary as a starting point for constructing a glossary for your own manual. Copy those entries you want to include and add any other terms you think your readers will need. If you think other terms should be added to this glossary, pass them on to:

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This glossary includes some basic definitions as well as more technical information. Where there is more than one definition for a term, the first definition is usually the simplest or most general one; the other definitions often give more complex technical meanings. If your manual is intended for beginners, you might want to keep only the first part; if your manual is a reference, you might want to eliminate the simple definition and even expand on the technical definition. Many terms also have a number of definitions depending on the language, system, or other context.

△ Important

The definitions have been compiled from individual glossaries written for Apple manuals. They have not necessarily been verified for technical accuracy. If you find an error, please bring it to our attention.△

Boldfaced terms within a definition are also defined in the glossary: be sure to include those terms in your own manual glossary. (If that's not desirable, change the boldface to plain text so readers won't be confused.)

△ Important

Although usage of a term may be implied by its definition, this glossary is not a guide for correct Apple usage. See the *Apple Publications Style Guide* for usage rules. △

The appendix, "Creating a Glossary for Your Manual," describes Apple standards for glossary sections and how to write glossary entries. It was written by David Bice, Technical Writer, Developer Products Technical Publications, and Jody Larson, Senior Developmental Editor, Publication Services.

Glossary A

absolute: Characteristic of a load segment or other program code that must be loaded at a specific address in memory and never moved. Compare **relocatable.**

absolute pathname: The complete name of a file, given by listing all of the directories leading down to that file, starting from root (/) and concluding with the filename itself. The directories leading to the file are separated from each other and from the filename by slashes. For example, `/etc/passwd` is the absolute pathname of the system password file, `passwd`, located in the `etc` directory beneath the root (/) directory.

accelerator card: An expansion card that contains another processor that shares the work normally performed only by the computer's main microprocessor. An accelerator card speeds up processing time.

access byte: An attribute of a ProDOS 16 file that determines what types of operations, such as reading or writing, may be performed on the file.

accessory: See **desk accessory, peripheral device.**

access privileges: The privileges to open and make changes to folders and their contents; they are given to or withheld from users. By setting access privileges, you can control access to confidential information stored in folders on a server.

Access Privileges window: When using the AppleShare file server, a window that displays the access privileges, owner, group, and other information about a folder or volume. You use the Get Privileges command in the File menu of the Finder or the Access Privileges desk accessory in the Apple menu to display the window and to review, set, or change access privileges for a folder or volume.

accumulator: The register in a computer's central processor or microprocessor where most computations are performed.

ACIA: Abbreviation for *Asynchronous Communications Interface Adapter;* a type of communications IC used in some Apple computers. An ACIA converts data from parallel to serial form and vice versa. It handles serial transmission and reception and RS-232-C signals under the control of its internal registers, which can be set and changed by firmware or software. Compare **SCC.**

ack cycle: The last period of a transaction during which /ACK is asserted by a slave responding to a master.

acoustic coupler: A type of **modem** with a cradle that uses a standard telephone handset for transmission.

ACPC: Acronym for *Apple Communications Protocol Card* (pronounced "ACK-pick"); a parallel interface card that lets an Apple II–family computer communicate and exchange files with other Apple II computers or with most IBM host computers.

acronym: A word formed from the initial letter or letters of the main parts of a compound term, such as ROM (from *read-only memory* or Fortran (from *Formula Translator*).

activate: To make a nonactive window active by clicking anywhere inside it.

activate event: An event generated by the Window Manager when an inactive window becomes the active window.

active window: The frontmost window on the desktop; the window where the next action will take place. An active window's **title bar** is highlighted.

activity report: A report created by the AppleFax application that shows the status of the envelopes in your current document's Envelope View. Each AppleFax document has its own activity report.

actual parameter: A variable within a program that is passed to a procedure for processing. Compare **formal parameter.**

ADB: See **Apple Desktop Bus.**

ADB device table: A structure in the system heap that lists all devices connected to the Apple Desktop Bus.

ADC: See **analog-to-digital converter.**

address: (1) A number that specifies the location of a single byte of memory. Addresses can be given as decimal or hexadecimal integers. The Apple IIgs has addresses ranging from 0 to 16,777,215 (in decimal), or from $00 0000 to $FF FFFF (in hexadecimal). A complete address consists of a 4-bit **bank** number ($00 to $FF) followed by a 16-bit address within that bank ($0000 to $FFFF). (2) In data transmission, a code for a specific terminal. Multiple terminals on one communication line, for example, must have unique addresses. (3) A set of instructions that tell your AppleFax Station where, when, and how to send an envelope. The instructions include such information as the phone number to dial and the receiving fax station's password, if any. You make addresses with the New Address command in the AppleFax application. See also **address book, envelope.**

address book: A file that stores addresses and distribution lists. You make an address book with the Save Address Book command or the Save Address Book As command in the AppleFax application. See also **address, distribution list.**

address-book entry: Either an address or a distribution list in an **address book.**

address bus: The path along which the addresses of specific memory locations are transmitted. The width of the path determines how much memory can be used (addressed) directly by the computer. For an *n*-bit-wide address bus, the computer can use 2^n locations in memory where information can be stored. In the Macintosh II, for example, the 32-bit address bus permits the processor to access 2^{32} (4.3 billion) memory addresses. This is more than 250 times as much memory as computers with a 24-bit bus (or the Macintosh II in 24-bit mode) can address (2^{24} = 16.8 million).

Address List: An area in the lower-left part of the AppleFax document window that displays the addresses and distribution lists for the current address book.

address mapping: Creating a mapped set of 24-bit addresses by ignoring the 8 highest bits of a 32-bit longword. Either of the two memory

management units (MMUs) that can be used on the Macintosh II can accomplish this action when the Macintosh II is operating in 24-bit mode. Address mapping provides compatibility with applications for classic Macintosh machines.

address mark: Information that's used internally by the Disk Driver, including information it uses to determine the position of a **sector** on a disk.

address space: A range of accessible memory.

administrator: The person who sets up a file server, registers users and their passwords, creates AppleShare groups, and maintains the server.

ALAP: See **AppleTalk link Access Protocol.**

Alarm Clock: A desk accessory that displays the current date and time and lets you set an alarm.

alert: A warning or report of an error in the form of an alert box, a sound from the computer's speaker, or both. See also **alert box.**

alert box: A box that appears on the screen to give a warning or to report an error message. Its appearance is usually accompanied by a sound warning such as a beep.

algorithm: A step-by-step procedure for solving a problem or accomplishing a task.

alias: (n.) An alternate name used to invoke or identify a command, a network host, a list of users, or some other applicable entity. (v.) To provide an entity with an alternate name.

alignment notch: A notch on the printer that indicates where to position the left edge of a sheet of paper.

A-line instructions: Unimplemented 68000-family instructions, used by the Macintosh to implement Toolbox and Operating System calls.

allocate: To reserve an area of memory for use.

American Simplified Keyboard See **Dvorak keyboard.**

American Standard Code for Information Interchange See **ASCII.**

amplitude: The maximum vertical distance of a periodic wave from the horizontal line about which the wave oscillates.

AMU: The built-in *address management unit* on the Macintosh II. The AMU handles only 24-to-32-bit address translation and is not a true memory management unit like the optional **PMMU.** Sometimes called the *HMMU.*

analog: (adj.) Varying smoothly and continuously over a range, rather than changing in discrete jumps. For example, a conventional 12-hour clock face is an analog device that shows the time of day by the continuously changing position of the clock's hands. Compare **digital.**

analog data: Data in the form of continuously variable quantities. Compare **digital data.**

analog RGB: A type of color video monitor that accepts separate analog signals for the red, green, and blue color primaries. The intensity of each primary can vary continuously, making possible many shades and tints of color.

analog signal: A signal that varies continuously over time, rather than being sent and received in discrete intervals. Compare **digital signal.**

analog-to-digital converter (ADC): A device that converts quantities from analog to digital form. For example, computer hand controls convert the position of the control dial (an analog quantity) into a discrete number (a digital quantity) that changes in steps even when the dial is turned smoothly.

analog transmission: Transmission of a continuously variable signal as opposed to a discretely variable signal. Compare **digital transmission.**

AND: A logical operator that produces a true result if both of its operands are true, and a false result if either or both of its operands are false. Compare **exclusive OR, NOT, OR.**

ANSI: Acronym for *American National Standards Institute,* which sets standards for many technical fields and provides the most common standard for computer terminals.

Apple Desktop Bus (ADB): A low-speed, input-only serial bus with connectors on the back panel of the computer that you use to attach the keyboard, mouse, and other Apple Desktop Bus devices, such as graphics tablets, hand controls, and specialized keyboards.

AppleFax: The combination of the AppleFax modem, the AppleFax application, and the AppleFax resource. Together with a Macintosh Plus, a Macintosh SE, or a Macintosh II, AppleFax creates a system that links your Macintosh to other AppleFax stations or fax machines.

AppleFax address: An address that represents an AppleFax Station.

AppleFax application: A program that lets you send and receive fax files and Macintosh files.

AppleFax-distribution list: A distribution list that's made up of AppleFax addresses.

AppleFax document: A document that you create with the AppleFax application. An AppleFax document tells your AppleFax Station what files and documents to send, and when, where, and how to send them.

AppleFax Preferences file: A file that stores your station's name, password, phone number, and dialing mode. You can set these options with the Fax Setup command in the AppleFax application.

AppleFax resource: A system file that lets your Macintosh communicate with the AppleFax modem. With the AppleFax resource, you can send a single fax file from within an application to a fax machine or an AppleFax Station. See also **resource.**

AppleFax Station: A Macintosh equipped with a hard disk, the AppleFax modem, the AppleFax application, and the AppleFax resource.

Apple HD SC Setup: A utility program that you use to initialize and test SCSI hard disks.

Apple key: See **Command key, Open Apple key, Solid Apple key.**

Apple menu: The menu farthest to the left in the menu bar, indicated by an Apple symbol, from which you choose **desk accessories.**

Apple I: The first Apple computer. It was built in a garage in California by Steve Jobs and Steve Wozniak.

Applesoft BASIC: The Apple II dialect of the BASIC programming language. An interpreter for creating and executing Applesoft BASIC programs is built into the firmware of computers in the Apple II family. Compare **Integer BASIC.** See also **BASIC.**

AppleTalk Link Access Protocol (ALAP): The lowest-level protocol in the AppleTalk architecture, managing node-to-node delivery of frames on a single AppleTalk network.

AppleTalk Manager: An interface to a set of device drivers that enable programs to send and receive information via an AppleTalk network.

AppleTalk network system: The system of network software and hardware used in various implementations of Apple's communications network.

AppleTalk Transaction Protocol (ATP): An AppleTalk protocol that's a Datagram Delivery Protocol (DDP) client. It allows one ATP client to request another ATP client to perform some activity and to report the activity's result as a response to the requesting socket with guaranteed delivery. See also **Datagram Delivery Protocol.**

Apple II: A family of computers, including the original Apple II, the Apple II Plus, the Apple III, the Apple IIe, the Apple IIc, and the Apple IIgs. Compare **standard Apple II.**

Apple IIc: A transportable personal computer in the Apple II family, with a disk drive and 80-column display capability built in.

Apple IIe: A personal computer in the Apple II family with seven expansion slots and an auxiliary memory slot that allow the user to enhance the computer's capabilities with peripheral and auxiliary cards.

Apple IIe 80-Column Text Card: A peripheral card that plugs into the Apple IIe's auxiliary memory slot and allows the computer to display either 40 or 80 characters per line.

Apple IIe Extended 80-Column Text Card: A peripheral card that plugs into the Apple IIe's auxiliary memory slot and allows the computer to display either 40 or 80 characters per line while extending the computer's memory capacity by 64K.

Apple IIgs: A personal computer in the Apple II family; gs stands for *graphics and sound.* The Apple IIgs features super high-resolution graphics, 15-voice sound capabilities, and 256K of RAM with a memory expansion slot for adding from 1 to 8 megabytes of RAM.

Apple IIgs Interface Libraries: A set of **interfaces** that enable you to access Toolbox routines from C.

Apple IIgs Programmer's Workshop (APW): The development environment for the Apple IIgs computer. It consists of a set of programs that facilitate the writing, compiling, and debugging of Apple IIgs applications.

Apple IIgs tools: See **toolbox.**

Apple II Pascal: A software system for the Apple II family that lets you create and execute programs written in the Pascal programming language. Apple II Pascal was adapted by Apple Computer from the University of California, San Diego, Pascal Operating System (UCSD Pascal).

Apple II Plus: A personal computer in the Apple II family with eight expansion slots and 48K of RAM, expandable to 64K with a language card in slot 0.

Apple III: An Apple computer; part of the Apple II family. The Apple III offered a built-in disk drive and built-in RS-232-C (serial) port. Its memory was expandable to 256K.

application: (1) Short for **application program.** (2) On the Apple IIgs, a program (such as the APW Shell) that accesses ProDOS 16 and the Toolbox directly, and that can be called or exited via the QUIT call. ProDOS 16 applications are file type $B3.

application font: The font your application will use unless you specify otherwise—in Roman-based scripts, the application font is Geneva.

application heap: The portion of the heap available to the running application program and the Toolbox.

application list: A data structure, kept in the Desktop file, for launching applications from their documents in the hierarchical file system. For each application in the list, an entry is maintained that includes the name and signature of the application, as well as the directory ID of the folder containing it.

application program: (1) A program that performs a specific task, such as word processing, database management, or graphics. Also called an **application.** Compare **controlling program, system program.** See also **shell application.** (2) A program that runs stand-alone. An application's file type is `'APPL'`.

application software: A collective term for **application programs.**

application space: Memory that's available for dynamic allocation by applications.

APW: see **Apple IIgs Programmer's Workshop.**

APW Debugger: A 65816 assembly-language code debugger provided with Apple IIgs Programmer's Workshop.

APW Editor: The program within Apple IIgs Programmer's Workshop that allows you to enter, modify, and save source files for all APW languages.

APW Linker: The linker supplied with Apple IIgs Programmer's Workshop.

APW Shell: The shell program of the Apple IIgs Programmer's Workshop. The APW Shell provides the interface between APW programs and ProDOS and between the user and APW.

arbitration contest: The mechanism used to choose which of two or more cards requesting control of the bus will become the next bus master. The arbitration contest requires two bus periods (at 100 µS each).

archive: (n.) (1) A collection of object files, plus a table of contents. Archives are used mainly as libraries to be searched by the link editor `ld`. (2) Any collection of files saved simultaneously for backup purposes,

usually intended for longer storage than are daily backups. Compare **backup.** (v.) To save a collection of files for storage. Compare **back up.**

argument: (1) A value on which a function or statement operates; it can be a number or a variable. For example, in the BASIC statement `VTAB 10`, the number 10 is the argument. Compare **operand.** (2) A piece of information included on the command line in addition to the command; the shell passes this information to the command, which then modifies its execution in some particular way. Filenames, for example, are often supplied as arguments to commands, so that a command will operate on the named file.

argument list: All the arguments passed to a program.

arithmetic expression: A combination of numbers and arithmetic operators (such as 3 + 5) that indicates some operation to be carried out.

arithmetic operation: One of the five actions computers can perform with numbers: addition, subtraction, multiplication, division, and exponentiation.

arithmetic operator: An operator, such as +, that combines numeric values to produce a numeric result. Compare **Boolean operator, relational operator.**

armature: In the ImageWriter print head, the movable member of the mechanism that drives the **striker wire.** The striker wire is attached to one end of the armature at a right angle. The armature with its striker wire is pulled toward the platen by an electromagnet and is pulled back from the platen by a spring.

ARPANET: A wide area network that links government, academic, and industrial installations around the world. Primarily connecting research sites, the ARPANET was developed in the 1960s by the Advanced Research Projects Agency of the U.S. Department of Defense. See also **Defense Data Network.**

array: An ordered collection of information of a given, defined type. Each element of the array can be referred to by a numerical subscript.

arrow keys: The four directional keys in the lower-right corner of the keyboard. You can use the arrow keys to move around in an application.

ascent: The vertical distance from a font's base line to its ascent line.

ascent line: A horizontal line that coincides with the tops of the tallest characters in a **font.** See also **base line, descent line, x-height.**

ASCII: Acronym for *American Standard Code for Information Interchange* (pronounced "ASK-ee"). A standard that assigns a unique binary number to each text character and control character. ASCII code is used for representing text inside a computer and for transmitting text between computers or between a computer and a peripheral device. Compare **EBCDIC.** See also **high ASCII characters, low ASCII characters.**

aspect ratio: The ratio of an image's width to its height. For example, a standard video display has an aspect ratio of 4:3.

assembler: A language translator that converts a program written in assembly language (source code) into an equivalent program in machine language (object code). The opposite of a **disassembler.** Compare **compiler, interpreter.**

assembly: The process of translating source files into object files.

assembly code: A source file written in a low-level programming language that corresponds to a specific computer's binary machine language.

assembly language: A low-level programming language in which individual machine-language instructions are written in a symbolic form that's easier to understand than machine language itself. Each assembly-language instruction produces one machine-language instruction. Because assembly-language programs require very little translation, they can be very fast. See also **machine language.**

asterisk (*): In C, the 32-bit pointer data type.

asynchronous: Not synchronized by a mutual timing signal or clock. Compare **synchronous.**

asynchronous communication: See **asynchronous transmission.**

Asynchronous Communications Interface Adapter: See **ACIA.**

asynchronous execution: A method of routine execution that leaves a program free to perform other tasks until the routine is completed.

asynchronous I/O: The capability to perform an I/O operation while its calling process continues to run. With synchronous I/O, the calling process "sleeps" until the I/O operation is finished.

asynchronous transmission: A method of data transmission in which the receiving and sending devices don't share a common timer, and no timing data is transmitted. Each information character is individually synchronized, usually by the use of start and stop bits. The time interval between characters isn't necessarily fixed. Compare **synchronous transmission.**

ATP: See **AppleTalk Transaction Protocol.**

attention cycle: The name given to a particular kind of start cycle, one in which both /START and /ACK are asserted.

audio jack: A connector on the back panel of the computer to which you can attach headphones or other audio devices.

auto-key event: An event generated repeatedly when the user presses and holds down a character key on the keyboard or keypad.

automatic variable: In C, a dynamic local variable that comes into existence when a function is called and disappears when it is exited.

auto-repeat feature: A feature of keys on computer keyboards; when a key is pressed down and held, the computer will automatically repeat that key's character until the key is released.

A/UX command: The name of a program or a built-in shell command that can be invoked under the A/UX operating system. For example, `ls` is a program that prints directory information to the terminal; typing `ls` as a command causes the program to execute. See also **built-in shell command, program.**

auxiliary slot: The special expansion slot inside the Apple IIe used for the Apple IIe 80-Column Text Card or Extended 80-Column Text Card, and for the **RGB monitor** card. The slot is labeled AUX. CONNECTOR on the circuit board. See also **expansion slot.**

Glossary B

back cover: The cover at the rear of the ImageWriter LQ that protects the forms tractor.

background: (1) A relatively inconspicuous place. A program operates "in the background" if it continues to function automatically while you use another program. See also **background job.** (2) In HyperCard, a card's basic template, which is shared by a number of cards. The background is composed of the **background picture, background fields,** and **background buttons.**

background activity: A program or process that runs while the user is engaged with another application.

background button: In HyperCard, a button that appears on all cards with the same background. The button's actions are the same on all the cards. Compare **card button.**

background field: In HyperCard, a field whose size, position, and text attributes remain constant on all cards associated with a particular background, but whose text changes from card to card. Compare **card field.**

background job: A process executed by the shell in which the shell is not suspended while waiting for the process to finish. By default, a process starts in the foreground, and the shell waits until the process has finished executing before the shell returns its prompt. You run a process in the background by appending an ampersand character (&) to the end of a command line; the shell prompt reappears instantly, allowing you to run multiple processes simultaneously. Compare **foreground job**

background picture: In HyperCard, a picture that applies to a series of cards. You see the Background picture by choosing Background from the Edit menu. Compare **card picture.**

background printing: Printing from one application while another application is running.

background processing: In multitasking environments, the operating system's ability to process lower-priority tasks while you perform other work on the computer.

back out: A method of retracting pin-feed paper, without removing it from the printer, to make printing a single sheet easy.

back panel: The rear surface of the computer, which includes the power switch, the power connector, and connectors for peripheral devices.

backslash (\): The "backward slash" character; often used as an **escape character.**

backspace: To move to the left in a line of text, erasing the character or selection; thus synonymous with *delete.*

Backspace key: A key that backspaces over and erases the previously typed character or the current selection. Its function is identical to that of the Delete key on newer Macintosh keyboards.

backup: (n.) A copy of a disk or of a file on a disk. It's a good idea to make backups of all your important disks and to use the copies for everyday work, keeping the originals in a safe place. (Some program or startup disks cannot be copied.) Compare **archive.**

back up: (v.) To make a spare copy of a disk or of a file on a disk. Backing up your files and disks ensures that you won't lose information if the original is lost or damaged. Compare **archive.**

backup bit: A bit in a file's **access byte** that tells backup programs whether the file has been altered since the last time it was backed up.

bandwidth: The range of frequencies a device can handle. Bandwidth and maximum data transfer rate are directly proportional. For example, a video monitor's greater bandwidth allows it to display more information per scan frame than most home television sets can. To display 80 columns of text, a monitor should have a bandwidth of at least 12 megahertz.

bang: A slang term for the exclamation point (!), used as a syntactical element by the C shell, by uucp, and by other utilities.

bank: A 64K (65,536-byte) portion of the Apple IIgs internal memory. An individual bank is specified by the value of one of the 65C816 microprocessor's bank registers.

bank-switched memory: On Apple II computers, the part of **language card** memory in which two 4K portions of memory have the same address range ($D000 to $DFFF).

banner page: A printed page generated by an AppleShare print server to identify a printed document.

base address: In **indexed addressing,** the fixed component of an address.

base line: A horizontal line that coincides with the bottom of each character in a font, excluding descenders (tails on letters like *p*).

BASIC: Acronym for *Beginners All-purpose Symbolic Instruction Code;* a high-level programming language designed to be easy to learn. Two versions of BASIC are available from Apple Computer for use with all Apple II–family systems: Applesoft BASIC (built into the firmware) and Integer BASIC.

BASICOUT: The routine that outputs a character when the 80-column firmware is active.

battery RAM: RAM on the Macintosh and Apple IIgs clock chips. A battery preserves the clock settings and the RAM contents when the power is off. Control Panel settings are kept in battery RAM.

baud: (1) A unit of data transmission speed: the number of discrete signal-state changes (signal events) per second. Often, but not always, equivalent to *bits per second.* Compare **bit rate.** (2) The maximum speed at which data can be sent down a channel, such as a telephone line; often confused with the actual speed at which the data is transmitted between two computers, measured in bits per second.

BBS: See **bulletin board system.**

BBU: Abbreviation for *Bob Bailey unit;* a custom gate-array chip on the Macintosh SE that handles RAM, video, and sound, and that selects devices and performs other functions.

bidirectional printing A mode of printer operation in which characters are printed both when the print head is moving from left to right and when it is moving from right to left. Bidirectional printing is the default mode for the ImageWriter LQ. Compare **unidirectional printing.**

binary: (adj.) Characterized by having two different components or by having only two alternatives or values available; sometimes used synonymously with **binary system.**

Binary-Decimal ConversionPackage: A Macintosh package for converting integers to decimal strings and vice versa.

binary digit: The smallest unit of information in the binary number system; a 0 or a 1. Also called a *bit.*

binary file: (1) A file whose data is to be interpreted in binary form. Machine-language programs and pictures are stored in binary files. Compare **text file.** (2) A file in **binary file format.**

binary file format: The ProDOS 8 loadable file format, consisting of one absolute memory image along with its destination address. A file in binary file format has ProDOS file type $06 and is referred to as a *BIN file.* The System Loader cannot load BIN files.

binary operator: An operator that combines two operands to produce a result. For example, + is a binary arithmetic operator; < is a binary relational operator; OR is a binary logical operator. Compare **unary operator.**

binary synchronous communication (BSC): A type of protocol developed by IBM that uses synchronization of characters to control the transfer of data over communication lines. Also referred to as *bi-sync communication.* Compare **SNA/SDLC.**

binary system: (1) A number system that uses only 0 and 1 as digits. Because computers can keep track of only two states (on or off), engineers code data in terms of 0's and 1's. (2) The representation of numbers in the base-2 system, using only the two digits 0 and 1. For example, the numbers 0, 1, 2, 3, and 4 become 0, 1, 10, 11, and 100 in binary notation. The binary system is commonly used in computers because the values 0 and 1 can easily be represented in a variety of ways, such as the presence or absence of current, positive or negative voltage, or a white or black dot on the display screen. A single binary digit—a 0 or a 1—is called a *bit.* Compare **decimal system, hexadecimal system.**

BIN file: A file in **binary file format.**

bit: A contraction of *binary digit*. The smallest unit of information that a computer can hold. The value of a bit (1 or 0) represents a simple two-way choice, such as yes or no, on or off, positive or negative, something or nothing. See also **binary system.**

bit image: A collection of bits in memory that represents a two-dimensional surface. For example, the screen is a visible bit image.

bitmap: (1) A set of bits that represents the graphic image of an original document in memory. (2) A set of bits that represents the positions and states of a corresponding set of items, such as pixels. In QuickDraw, a pointer to a bit image, the row width of that image, and its boundary rectangle. Used by the Macintosh to construct graphic images and fonts. Compare **pixel map.** See also **bit image, global page bitmap, volume bitmap.**

bitmapped character: A character that exists in a computer file or in memory as a bitmap, is drawn as a pixel pattern on the graphics screen, and is sent to the printer as graphics data.

bitmapped display: A display whose image is a representation of bits in an area of RAM called the **screen buffer.** With such a display, each dot, or **pixel,** on the screen corresponds, or is "mapped," to a bit in the screen buffer.

bitmapped font: A font made up of bitmapped characters. Fonts stored in a Macintosh system file are bitmapped fonts, for example. Compare **internal font.**

bit rate: The speed at which bits are transmitted, usually expressed as *bits per second,* or *bps.* Compare **baud.**

bits per second: See **bit rate.**

blank: A place to enter information. Task Info windows, dialog boxes, and tables have blanks.

BLOAD: The binary load command; it causes the binary form of a file to be placed in memory. If the file is not a binary file, its uninterpreted image is placed in memory.

block: (1) A unit of data storage or transfer, typically 512 bytes. In BASIC, the CATALOG command reports the sizes of disks and files in blocks. In Pascal, a block is a module of a program that includes a definition part, declaration part, and statement part. (2) A contiguous, page-aligned region of computer memory of arbitrary size, allocated by the Memory Manager. Also called a *memory block.*

block device: A device that reads and writes blocks of bytes at a time. A block device can read from or write to any accessible block on demand. Disk drives are block devices. Also called *block I/O device.*

block I/O: The transfer of data as chunks (blocks) of contiguous information. In A/UX, block I/O consists of 512-byte chunks by default. Compare **character I/O.**

board: See **printed-circuit board.**

board sResource list: A standard Apple sResource list that must be present in every NuBus slot card that communicates with the Macintosh II.

body: In BASIC, the statements or instructions that make up a part of a program, such as a loop or a subroutine.

Boolean operator: An operator, such as AND, that combines logical values to produce a logical result, such as true or false. Named for mathematician and logician George Boole. Also known as a *logical operator.* Compare **arithmetic operator,relational operator.**

boot: Another way to say *start up.* A computer boots by loading a program into memory from an external storage medium such as a disk. Starting up is often accomplished by first loading a small program, which then reads a larger program into memory. The program is said to "pull itself up by its own bootstraps"—hence the term *bootstrapping* or *booting.*

boot block: (1) An area on a formatted disk that signals the computer that the disk contains an application to be started up. (2) The first block of a file system, or the first two logical blocks of a volume. The boot block contains the system's startup instructions.

boot device: The peripheral device that reads an operating system's initial startup instructions.

boot disk: See **startup disk.**

bootstrap: See **boot.**

bottom paper-feed slot: A hole at the bottom of the ImageWriter LQ, indicated by triangular icons on either side of the printer, allowing pin-feed paper to be fed through a slotted table into the printer.

Bourne shell: The standard UNIX System V command interpreter. See also **shell.**

bps (bits per second): See **bit rate.**

branch: (v.) To pass program control to a line or statement other than the next in sequence. (n.) A statement that performs the act of branching. See also **conditional branch, unconditional branch.**

BREAK: A SPACE (0) signal, sent over a communication line, of long enough duration to interrupt the sender; often used to end a session with a time-sharing service. BREAK is also used in BASIC to stop execution of a program. It is generated by pressing Control-C.

break table: A list of templates that determine the general rules for making word divisions in a particular script.

bridge: (1) A device that lets you connect two or more networking systems together. (2) A combination of hardware and software that connects two or more networks in an internet. Bridges are used to increase the number of devices and the distances covered in a network. See also **internet, zone.**

BRK: A "software interrupt"—an instruction that causes the 6502 or 65C02 microprocessor to halt. Pronounced "break."

browse: (1) To wander through HyperCard's stacks. (2) To look through the information on a CD-ROM the way you page through a book or magazine waiting for something to capture your interest.

Browse tool: The tool you use in HyperCard to click buttons and to set the insertion point in fields. Compare **Button tool, Field tool.**

BRUN: The binary run command. BRUN causes a binary program to be brought into memory and run.

BSAVE: The binary save command. BSAVE causes the binary data in a portion of memory to be saved in a disk file.

BSC: See **binary synchronous communication.**

BSD: Abbreviation for *Berkeley Software Distribution;* a version of the UNIX operating system developed at the University of California at Berkeley. The A/UX operating system incorporates many of the features of 4.2 BSD.

buffer: (1) An area of memory set aside for the specific purpose of holding data until it is needed. (2) A "holding area" of the computer's memory where information can be stored by one program or device and then read at a different rate by another; for example, a print buffer. In editing functions, an area in memory where deleted (cut) or copied data is held. In some applications, this area is called the *Clipboard.* See also

type-ahead buffer.

buffer cache: A holding area in main memory where write information for block I/O is temporarily stored.

bug: An error in a program that causes it not to work as intended. The expression reportedly comes from the early days of computing when an itinerant moth shorted a connection and caused a breakdown in a room-sized computer.

Built-in font: See **internal font.**

built-in shell command: A command written into the shell itself; built-in shell commands are generally used for writing shell scripts.

bulletin board system (BBS): A computerized version of the bulletin boards frequently found in grocery stores—places to leave messages and to advertise things you want to buy or sell. One thing you get from a computerized bulletin board that you can't get from a cork board is free software. See also **public-domain software.**

bundle: A resource (of type `'BNDL'`) that maps local IDs of resources to their actual resource IDs. This is used to provide mappings for file references and icon lists needed by the Finder.

bus: (1) A path along which information is transmitted electronically within a computer. Buses connect short-distance networks of computer devices, such as processors, expansion cards, and physical RAM. Information that travels along the bus is transmitted according to a set of rules known as a **protocol.** (2) An electrical or electronic connection between devices. The devices connected by the bus are said to be *resident* on the bus and may be as small as ICs or as large as mainframe computers. A bus provides a means to send the same data, signals, or voltages (for power supply buses) to more than one device across a single carrier (wire, fiber-optic cable, and so forth). See also **Apple Desktop Bus, NuBus, SE bus.**

bus lock: A mechanism for providing continuing tenure (bus ownership) by a single card. The extended tenure may include multiple transactions or attention cycles. One type of attention cycle is called a *resource lock;* therefore a bus lock may or may not include a resource lock.

bus specification: The specification describing the physical characteristics of the bus and the protocol that governs the use of the bus. For example, the NuBus specification defines the clock rate of the bus, the width of the bus (in bits), the maximum rate of information transfer, and so on. It also defines the **protocol,** or set of rules, used to transfer information among the devices using the bus. Understanding the specification for a bus can lead to a better understanding of how the entire computer performs.

Busy word: A firmware flag, consulted by the Scheduler, that protects system software that is not reentrant from being called while processing another call. See also **reentrant, Scheduler.**

button: (1) A pushbutton-like image in dialog boxes where you click to designate, confirm, or cancel an action. Compare **mouse button.** (2) In HyperCard, something that initiates an action (making a connection, launching an application, starting a visual or sound effect, and so on) when you click it. See also **background button, card button.**

Button tool: The tool you use in HyperCard to create, change, and select buttons. Compare **Browse tool, Field tool.**

bypass: When using an AppleShare print server, to print a document from a workstation directly to a captured printer.

byte: A unit of information consisting of a fixed number of **bits.** On Apple II systems, one byte consists of a series of eight bits and can take any value between 0 and 255 ($0 and $FF hexadecimal). The value can represent an instruction, number, character, or logical state. See also **kilobyte, megabyte.**

byte lane: Any of four bytes that make up the NuBus data width. NuBus slot cards may use any or all of the byte lanes to communicate with each other or with the Macintosh II. See also **NuBus.**

Glossary C

C: A portable, high-level language that also offers very low level operations, making it a flexible and efficient language for both application and system programming. A/UX is written almost entirely in C.

cable: An insulated bundle of wires with connectors on the ends. Examples are serial cables, disk drive cables, and LocalTalk cables.

cable extender: A small plastic adapter with a LocalTalk socket on either end that allows you to connect two LocalTalk cables together.

cable terminator: See **SCSI cable terminator.**

caddy: The plastic case that contains the CD-ROM while it's in use with the AppleCD SC. When you insert the caddy into the drive, the metal shutter on the caddy slides away to give the laser access to the disc surface as it spins.

CAI: See **computer-aided instruction.**

Calculator: A desk accessory that works like a four-function pocket calculator. Calculation results can be cut and pasted into your documents using the Edit menu.

call: (n.) (1) A request from the keyboard or from a procedure to execute a named procedure. See also **procedure.** (2) A request issued by the CPU or a program to the SCSI card firmware. A call consists of a **command number,** a **pointer,** and a **parameter list.** (v.) To request the execution of a subroutine, function, or procedure.

Cancel button: A button that appears in a dialog box. Clicking it cancels the command.

canonical: Adhering to standard, accepted, or authoritative procedures or principles.

canonical mode: See **cooked mode.**

Caps Lock key: A key that, when engaged, causes subsequently typed letters to appear in uppercase; its effect is like that of the Shift key except that it doesn't affect numbers and other nonletter symbols.

capture: When using an AppleShare print server, to take control of a printer so that it prints only documents sent by a print server, unless the Bypass option is selected. Opposite of **release.**

card: (1) A printed-circuit board that plugs into one of the computer's expansion slots, allowing the computer to use one or more peripheral devices such as disk drives. (2) A printed-circuit board or card connected to the bus in parallel with other cards. Also called a *peripheral card*, a *device*, or a *module*. (3) HyperCard's basic entity—one screenful of information.

card button: In HyperCard, a button that appears on a single card. The button's actions apply only to that card. Compare **background button.**

card field: In HyperCard, a field whose size, position, text attributes, and contents are limited to the card on which the field is created. Compare **background field.**

card-generic driver: A driver that can be used with a variety of NuBus cards of a given type. Compare **card-specific driver.**

card picture: In HyperCard, a picture that applies to a specific card. Compare **background picture.**

card-specific driver: A driver that can be used with only one specific model of NuBus card. Compare **card-generic driver.**

caret: A generic term meaning a symbol that indicates where something should be inserted in text. The specific symbol used on-screen is a vertical bar (|).

carriage return (CR): A nonprinting ASCII character (decimal 13, hexadecimal $0D) that ordinarily causes a printer or display device to place the next character on the left margin; that is, to end a line of text and start a new one. It's used to end paragraphs. A carriage return, however, does not move the print head or cursor down to the next line; the line feed (LF) character does that. Even though you can't see carriage returns, you can delete them the same way you delete other characters. In APW C, carriage return (\r) is equal to **newline** (\n).

carrier: The background signal on a communication channel that is modified to carry information. Under RS-232-C rules, the carrier signal is equivalent to a continuous MARK (1) signal; a transition to 0 then represents a start bit.

carrier rod: The metal rod on which the print-head assembly rides.

carry flag: A status bit in the microprocessor, used as an additional high-order bit with the accumulator bits in addition, subtraction, rotation, and shift operations.

cartridge support tabs: The two plastic tabs that secure the ImageWriter ribbon cartridge to the ribbon cartridge deck.

case sensitive: Able to distinguish between uppercase characters and lowercase characters. Programming languages are case sensitive if they require all uppercase letters, all lowercase letters, or proper use of uppercase and lowercase. For example, Applesoft BASIC recognizes only uppercase. Instant Pascal, however, is not case sensitive; you can use any combination of uppercase and lowercase letters you like.

CAT: A ProDOS command that displays a list of the names and characteristics of all the files in a directory. This display of information is often referred to as a *catalog.* The CAT command displays a 40-column list.

catalog: A list of all files stored on a disk. Synonymous with **directory.**

CATALOG: A command in DOS and ProDOS that displays a list of the names and characteristics of all the files in a directory. In DOS, the CATALOG command displays a 40-column list; in ProDOS, an 80-column list.

cathode-ray tube (CRT): An electronic device, such as a television picture tube, that produces images on a phosphor-coated screen. The phosphor coating emits light when struck by a focused beam of electrons. A CRT is a common display device used with personal computers.

CCITT: Abbreviation for *Consultative Committee on International Telegraphy and Telephony;* an international committee that sets standards and makes recommendations for international communication. The CCITT interface standard is considered mandatory in Europe; it is very similar to the RS-232 standard used in the United States.

CD: See **CD-ROM, compact disc.**

CD-ROM: Acronym for *compact disc read-only memory;* a compact disc 120 mm (4.72 inches) in diameter that can store 550 MB of information. The information is designated as *read-only memory* because a CD drive can read the information but cannot record new information.

cell: (1) The basic component of a list from a structural point of view. A cell is a box in which a list element is displayed. (2) The intersection of a row and a column in a spreadsheet. A cell can hold a number, label, function, or formula.

central processing unit (CPU): The "brain" of the computer; the microprocessor that performs the actual computations in machine language. See also **microprocessor.**

channel: A queue that's used by an application to send commands to the Sound Manager.

char: In C, an 8-bit character data type whose range is 0 to 255. Same as *unsigned char*.

character: Any symbol that has a widely understood meaning and thus can convey information. Some characters—such as letters, numbers, and punctuation—can be displayed on the monitor screen and printed on a printer. See also **control character.**

character code: An integer representing the character that a key or key combination stands for.

character device: A device that reads or writes a stream of characters, one at a time. It can neither skip characters nor go back to a previous character. Character devices include terminals, modems, keyboards, and network interfaces. Compare **block device.**

character generator: The integrated circuit responsible for printing characters on the screen. Also called *character generator ROM.*

character image: An arrangement of bits that defines a character in a font.

character I/O: The transfer of data one character at a time rather than in blocks of characters. Compare **block I/O.**

character key: (1) Any of the keys on a computer keyboard—such as letters, numbers, symbols, and punctuation marks—used to generate text or to format text; any key except Caps Lock, Command, Control, Esc, Option, and Shift. Character keys repeat when you press and hold them down. (2) A key that generates a keyboard event when pressed; that is, any key other than a **modifier key.**

character limit: The maximum number of characters allowed in a single program statement. In Applesoft, the character limit is 256 (0 through 255 inclusive). Character limit is not applicable to Pascal statements.

character offset: The horizontal separation between a character rectangle and a font rectangle; that is, the position of a given character within the font's bit image.

character origin: The point on a **base line** used as a reference location for drawing a character.

character pitch: The number of characters per inch printed along a horizontal line.

character position: An index into an array containing text, starting at 0 for the first character.

character set: The entire set of characters that can be either shown on a monitor or used to code computer instructions. In a printer, the entire set of characters that the printer is capable of printing.

character string Two or more characters read or sent in sequence; for example, Esc Z 3 Control–4 is a character string.

character style: A set of stylistic variations, such as bold, italic, and underline. The empty set indicates plain text (no stylistic variations).

character width: The distance from one character's origin to the next character's origin.

check box: A small box associated with an option in a dialog box. When you click the check box, you may change the option or affect related options.

checksum: The result of an arithmetic operation on the number of bits in a sequence, used to help verify the integrity of data through stages of processing.

child process: A program submitted for execution by another program. The original program is called the *parent process*, and the child is created by the system call `fork`. See also **exec.**

chip: See **integrated circuit.**

choose: To pick a command by dragging through a menu. You often choose a command after you've selected something for the program to act on; for example, selecting a disk and choosing the Open command from the File menu.

Chooser: A desk accessory that lets you configure your computer system to print on any printer for which there's a printing resource on the current startup disk. If you're part of an AppleTalk network system, you use the Chooser to connect and disconnect from the network and choose among devices connected to the network. You can also specify a user name that the system uses from time to time—when you're printing on a LaserWriter, for example.

chr: A Pascal function. When followed by a number, chr returns the ASCII character represented by that number. For example, `chr(65)` is the character *A*.

CHR$: An Applesoft function. When followed by a number, CHR$ returns the ASCII character represented by that number. For example, `CHR$(4)` returns a Control-D; `CHR$(68)` yields the character *D*.

circuit board: A board containing embedded circuits and an attached collection of integrated circuits (chips). Sometimes called a *printed-circuit board* or *card.*

circuitry: A network of wires, chips, resistors, and other electronic devices and connections.

clamp: A memory location that contains the minimum and maximum excursion positions of the mouse cursor when the desktop is in use.

class: A menu with an associated list of users.

classic Macintosh: A term encompassing the original Macintosh (128K and 512K models), the Macintosh 512K enhanced, and the Macintosh Plus.

clear: (1) To erase information or commands from memory. (2) To erase data from memory or reset a control register. Clearing is usually done by loading the memory location or register to be cleared with zeros.

Clear: A command in the Edit menu that removes selected material without placing it on the Clipboard. You can use the Undo command immediately after using Clear to reverse the action.

Clear key: A key on the numeric keypad that clears the entry in the Calculator desk accessory and in applications that require numeric entry and calculations, such as spreadsheets.

Clear To Send: An RS-232-C signal from a DCE to a DTE that is normally kept false until the DCE makes it true, indicating that all circuits are ready to transfer data. See also **Data Communication Equipment, Data Terminal Equipment.**

click: (v.) To position the pointer on something, and then press and quickly release the mouse button. (n.) The act of clicking.

client: A computer that has access to services on a network. The computers that provide services are called **servers.** A user at a client may request file access, remote log-on, file transfer, printing, or other available services from servers.

clip art: Electronic pictures that you can copy from one disk or document and paste into another. The term comes from using scissors to clip pictures on paper. You can buy disks of clip art and use these professional-quality drawings to illustrate your documents.

Clipboard: The holding place for what you last cut or copied; a buffer area in memory. Information on the Clipboard can be inserted (pasted) into documents.

clipping region: The region to which an application limits drawing within a graphics port.

CLIST: Acronym for *command list;* a sequential set of commands or control statements that is assigned a name. When the CLIST name is invoked, the commands in the list are executed.

clock chip: A special chip in which parameter RAM and the current setting for the date and time are stored. This chip is powered by a battery when the system is off, thus preserving the information.

close: (1) To turn a window back into the icon that represents it by choosing the Close command or by clicking the close box on the left side

of the window's title bar. (2) To terminate access to an open file. When a file is closed, its updated version is written to disk and all resources it needed when open (such as its I/O buffer) are released. The file must be opened before it can be accessed again.

close box: The small white box on the left side of the title bar of an active window. Clicking it closes the window.

closed driver: A device driver that cannot be read from or written to.

closed file: A file without an access path. Closed files cannot be read from or written to.

CMOS: Acronym for *complementary metal oxide semiconductor;* one of several methods of making integrated circuits out of silicon. CMOS devices are characterized by low power consumption. CMOS techniques are derived from **MOS** techniques.

code: (1) A number or symbol used to represent some piece of information. (2) The statements or instructions that make up a program.

code resource: A resource that contains a program's code. It is most commonly a resource of type `'CODE'` (for applications and MPW tools), but other resource types such as `'DRVR'` and `'PDEF'` also contain code.

code segment: (1) An individual `'CODE'` resource, which is part of the code of a Macintosh application. Segments are loaded in and out of memory by the Segment Loader. (2) An object segment that contains program code. Code segments are provided for programs that differentiate between code and data segments.

cold start: The process of starting up the computer when the power is first turned on (or as if the power had just been turned on) by loading the operating system into main memory, and then loading and running a program. Compare **warm start.**

color wheel: A dialog box that appears when you click the Change Color button in the Control Panel desk accessory. The color wheel lets you adjust hue, saturation, and brightness.

column: A vertical arrangement of graphics points or character cells on the display screen.

command: (1) An instruction that causes a device such as a computer or printer to perform some action. A command can be typed from a keyboard, selected from a menu with a hand-held device (such as a mouse), or embedded in a program. (2) In the Standard C Library, a parameter that tells a function which of several actions to perform. (3) In the APW Shell, a word that tells APW which utility to execute. (4) An instruction that causes the target device to perform a specific operation. Commands are passed to the firmware in **calls.**

command code: One or more characters whose function is to change the way a program or device acts (as opposed to text, which is simply printed).

command file: (1) A program that runs other programs. (2) In MPW or A/UX, a file consisting of executable commands that can be run from the shell. Also called a *script*. See also **EXEC file.**

Command key: A key that, when held down while another key is pressed, causes a command to take effect. When held down in

combination with dragging the mouse, the Command key lets you drag a window to a new location without activating it. The Command key is marked with a propeller-shaped symbol. On some machines, the Command key has both the propeller symbol and the Apple symbol on it.

command line: The entire input string that you enter in response to the shell prompt to issue a command or to start a program. The command line includes the command itself and any **arguments** and **flag options.**

command mode: An operating state in which a program (such as a text editor) interprets the characters you type as commands rather than as data to be entered into a file.

command number: A hexadecimal number that corresponds to a specific ProDOS, SmartPort, or SCSI command; each command has a unique command number within its group (SCSI, ProDOS, or SmartPort).

command register: A location in a device controller that stores control information. Compare **data register.**

command structure: The nature and interrelations of all the possible instructions that can be sent to a device such as a computer or printer.

command table: A text file containing a list of command names, command types (internal, or *command;* external, or *utility;* and *language*), and command or language numbers. The APW Shell checks the command table each time you execute a command. If it finds the command in the command table, it executes that command; if it doesn't find the command in the command table, the shell looks for a program with that name and attempts to run that program.

command terminator: See **end-of-command mark.**

comment: Information that is ignored by a program such as a compiler. A comment normally includes instructions, references, or notes for people inspecting a source file.

communication controller: A type of communication control unit with its operations controlled by a program stored and executed at that unit. For example, the IBM 3704 and 3705 are communication controllers.

communication mode: An operating state in which a serial card or port is prepared to exchange data and signals with a modem or other type of data communication equipment (DCE).

communications protocol: See **protocol.**

comp: A 64-bit SANE data type with signed integral values and one **NaN.**

compact: To rearrange allocated memory blocks in order to increase the amount of contiguous unallocated (free) memory. The Memory Manager compacts memory when needed.

compact disc: A metal-and-plastic disk in which information is stored digitally in the form of pits burned into the surface with a laser beam. Compact discs containing music are widely available, but this medium can also be used to store other kinds of data, such as text and images. See also **CD-ROM.**

compaction: The process of moving allocated blocks within a heap zone to collect the free space into a single block.

compatibility: The condition under which devices can work with each other.

compatible: Capable of running without problems on the computer system. Applications are normally written to run on specific types of computers; applications that run on a computer system are said to be "compatible" with the computer.

compile: To convert a program written in a high-level programming language (source code) into a file of commands in a lower-level language (object code) for later execution.

compiler: A language translator that converts a program written in a high-level programming language (source code) into an equivalent program in some lower-level language such as machine language (object code) for later execution. Compare **assembler, interpreter.**

component: A part; in particular, a part of a computer system.

composite video: A video signal that includes both display information and the synchronization (and other) signals needed to display it. See also **RGB monitor.**

computer: An electronic device that performs predefined (programmed) computations at high speed and with great accuracy; a machine that is used to store, transfer, and transform information.

computer-aided instruction (CAI): The use of a computer to help teach people through interaction with educational software.

computer language: See **programming language.**

concatenate: Literally, "to chain together." (1) To combine two or more strings into a single, longer string by joining the beginning of one to the end of the other. (2) To combine two or more files.

concurrent application: An application that runs on a file server at the same time as the AppleShare software.

concurrent processing: The ability of an operating system to execute multiple programs simultaneously.

conditional assembly: A feature of an assembler that allows the programmer to define macros or other pieces of code such that the assembler assembles them differently under different conditions.

conditional branch: A branch whose execution depends on the truth of a condition or the value of an expression. Compare **unconditional branch.**

conditional compilation: In C, use of preprocessor commands (`#if`, `#ifdef`, `#ifndef`, `#else`, and `#endif`) to vary the output depending on compile-time conditions.

configuration: (1) A general-purpose computer term that can refer to the way you have your computer set up. (2) The total combination of hardware components—central processing unit, video display device, keyboard, and peripheral devices—that make up a computer system. (3) The software settings that allow various hardware components of a computer system to communicate with one another.

configuration ROM: A chip on a NuBus expansion card that contains the information the computer's microprocessor needs to communicate with the card, or with peripheral devices attached to the card.

configure: To change software or hardware actions by changing settings. For example, you give software the necessary settings for communicating with a printer. You can configure hardware (a printer or interface card) by resetting physical elements like DIP switches or jumper blocks. Configurations can also be set or reset in software.

connection box: A small box at one end of a LocalTalk connector. Cables plug into the box, allowing network signals to flow through it.

connector: A plug, socket, jack, or port. See also **LocalTalk connector.**

connect time: The amount of time you spend connected to an information service.

console: (1) The main *terminal* (that is, keyboard and screen) of your system. The console must be connected to your system. It receives log and error messages from the operating system that are not sent to any other terminal. (2) The window where a command is entered and executed (*standard input*). Also, the window to which the command's output is returned (*standard output*).

constant: In a program, a symbol that represents a fixed, unchanging value. Compare **variable.**

content region: The area of a window that the application draws in.

context sensitive: Able to perceive the situation in which an event occurs. For example, an application program might present help information specific to the particular task you're performing, rather than a general list of commands; such help would be context sensitive.

continuous-form paper: See **fanfold paper.**

contrast knob: A control on a monitor or other display device that lets you adjust the contrast between light and dark on the screen.

control: (1) The order in which the statements of a program are executed. (2) An object in a window on the Macintosh screen with which the user, by using the mouse, can cause instant action with visible results or change settings to modify a future action. The control is internally represented in a control record.

control character: A nonprinting character that controls or modifies the way information is printed or displayed. In the Apple II computer family, control characters have ASCII values between 0 and 31, and can be typed from a keyboard by holding down the Control key while pressing some other key.

control code: (1) One or more nonprinting characters—included in a text file—whose function is to change the way a printer prints the text. For example, a program may use certain control codes to turn boldface printing on and off. See also **control character.** (2) A hexadecimal number that corresponds to a particular control function for an external SCSI device.

control key: See **modifier key.**

Control key: A specific key on Apple II–family keyboards that produces **control characters** when used in combination with other keys.

controller card: A peripheral card that connects a device such as a printer or disk drive to a computer's main logic board and controls the operation of the device.

controlling program: A program that loads and runs other programs, without itself relinquishing control. A controlling program is responsible for shutting down its subprograms and freeing their memory space when they are finished. A shell, for example, is a controlling program. Compare **application program, system program.**

Control Manager: The part of the Toolbox that provides routines for creating and manipulating controls (such as buttons, check boxes, and scroll bars).

control panel: On ImageWriter printers, the cluster of buttons and lights near the lower-right corner of the printer.

Control Panel: A desk accessory that lets you change the speaker volume, the keyboard repeat speed and delay, mouse tracking, color display, and other features.

control register: A special register that programs can read from and write to; similar to **soft switches.** The control registers are specific locations in the I/O space ($Cxxx) in bank $E0. They are accessible from bank $00 if I/O shadowing is on.

Control-Reset: A combination keystroke on Apple II–family computers that usually causes an Applesoft BASIC program or command to stop immediately. If a program disables the Control-Reset feature, you need to turn the computer off to get the program to stop.

control variable: See **index variable.**

convergence: The correctness of aim of the red, green, and blue beams of an RGB color monitor. When the beams converge properly, the monitor gives the best quality color. You can test your monitor's convergence and adjust it by using the Control Panel desk accessory.

conversion command: A command that allows you to convert a DOS 3.3 file structure to a ProDOS file structure and vice versa. The command also allows you to list the directory or catalog of each type of file.

cooked input: Data that has been processed by a terminal driver's line discipline. Special characters such as the erase and kill characters cause the line discipline to convert the raw data accordingly.

cooked mode: A terminal driver's method of operation that converts data sent from the keyboard or to the terminal screen. This conversion is performed by a line discipline to accommodate interactive use of the system. For example, an erase character sent from the keyboard causes the line discipline to delete the previous character; the terminal driver then sends the converted data to the reading process. Also known as *canonical mode.* Compare **raw mode.**

coordinate: One of a pair of numbers that designates a position on a grid. The numbers correspond to the columns (vertical placement) and rows (horizontal placement) in a display grid.

coordinate axis: A figure used with graphs to define the scale, consisting of a horizontal or vertical line intersected by tick marks at regular intervals.

coordinated font: A font that is assigned to a font class and has a correctly formatted name. Compare **noncoordinated font.**

coordinate plane: A two-dimensional grid. In QuickDraw, the grid coordinates are integers ranging from –32,767 to 32,767, and all grid

lines are infinitely thin.

coprocessor: An auxiliary processor that is designed to relieve the demand on the main processor by performing a few specific tasks. Coprocessors may favor a certain set of operations, like floating-point calculations for graphics instruction looping, and therefore they can optimize the speed at which such operations are processed. Generally, coprocessors handle tasks that could be performed by the main processor running appropriate software but would be performed much more slowly that way.

copy-protect: To make a disk uncopyable. Software publishers frequently try to copy-protect their disks to prevent them from being illegally duplicated by software pirates. Compare **write-protect.** See also **lock.**

courseware: Educational software.

COUT: The firmware entry point for the Apple II character output subroutine. COUT is an **I/O link**—it is in RAM rather than ROM, and so it can be modified to contain the address of any presently active character output subroutine.

COUT1: An entry point within the Apple II character output subroutine.

cover page: A page generated by a workstation's application to identify a printed document.

CPU: See **central processing unit.**

CR: See **carriage return.**

crash: To cease to operate unexpectedly, possibly destroying information in the process. Compare **hang.**

creation date: An attribute of a ProDOS 16 file; it specifies the date on which the file was created.

creation time: An attribute of a ProDOS 16 file; it specifies the time at which the file was created.

crossbar: A type of drawing pointer. A crossbar is used in HyperCard, for example, for using many of the Paint tools.

CRT: See **cathode-ray tube.**

C SANE Library: A set of routines that provides extended-precision mathematical functions.

C shell: The standard **BSD** command interpreter. See also **shell.**

C3COUT1: The routine that **COUT** jumps to when the 80-column firmware is active. Also called *BASICOUT.*

current: (adj.) Describes what you're using now. For example, in HyperCard the current card is the one you can see on your screen.

current application: The application program currently loaded and running. Every application program is identified by a **User ID** number; the current application is defined as that application whose User ID is the present value of the `USERID` global variable.

current directory: In A/UX, the last directory you moved into with the `cd` command; this directory is the starting reference point for all relative

pathnames you enter. Also called the *working directory.*

current input device: The source, such as the keyboard or a modem, from which a program is currently receiving its input.

current language: The APW language type that is assigned to a file opened by the APW Editor. If an existing file is opened, the current language changes to match that of the file.

current line: The data in the print buffer that is currently being processed by the printer; the printer commands in this line are read and acted on as appropriate. The current line is not printed until a print command is received or a full line's worth of text is in the print buffer. Command codes in the line following the current line in the print buffer are not read by the printer until the current line has been printed or canceled.

current output device: The destination, such as the display screen or a printer, currently receiving a program's output.

current prefix: The prefix that is used by the APW Shell if a partial pathname is used.

current startup disk: The disk that contains the system files the computer is currently using. The startup disk icon always appears in the upper-right corner.

cursor: (1) A symbol displayed on the screen marking where the user's next action will take effect or where the next character typed from the keyboard will appear. (2) A mark on the screen that indicates your position on the command line or inside a file. The cursor is usually a small box or an underscore, and it usually blinks. (3) The term used in technical manuals for the **pointer** on the screen.

cut: To remove something by selecting it and choosing Cut from a menu. What you cut is placed on the Clipboard. In other editing applications, "Delete" serves the same function. See also **buffer.**

cut and paste: To move something from one place in a document to another in the same document or a different one. It's the computer equivalent of using scissors to clip something and glue to paste the clipping somewhere else.

Cut Sheet Feeder: An optional feature of the ImageWriter LQ, consisting of one, two, or three bins and a forward collator that automatically feeds and collates stationary, letterhead, and envelopes for you. It holds up to 100 sheets of paper per bin.

cycle: One period of the NuBus clock, nominally 100 nanoseconds in duration, and beginning at the rising edge.

Glossary D

DAC: See **digital-to-analog converter.**

daemon: A noninteractive process that manages services. Network daemons, for example, automatically handle incoming network connection requests.

daisy chain: (n.) A colloquial term for a group of devices connected to a host device, where the first device in the "chain" is connected to the host, the second device is connected to the first, the third device is connected to the second, and so on.

daisy-chain: (v.) To link together sequentially.

daisy wheel: A printing element shaped like a daisy: characters are at the ends of "petals" radiating from a central hub. When installed in the printer, the element spins to move each letter into position as needed for printing.
Sometimes called a *print wheel.*
daisy-wheel printer: A printer that uses a **daisy wheel** to print characters on paper. Compare **dot-matrix printer, laser printer.**

data: Information, especially information used or operated on by a program. The smallest unit of information a computer can understand is a **bit.**

database: (1) A collection of information organized in a form that can be readily manipulated and sorted by a computer user. (2) Short for **database management system.**

database management system: A software system for organizing, storing, retrieving, analyzing, and modifying information in a database.

data bits: In the stream of bits being sent from your computer to a peripheral device or another computer, the bits that contain meaningful information; distinguished from bits used to indicate that a character is about to start, has stopped, or is correct. See also **start bit, stop bit.**

data block: A 512-byte information portion of a ProDOS 16 **standard file.**

data buffer: Heap space containing information to be written to a file or device driver from an application, or read from a file or device driver to an application.

data bus: The path along which general information is transmitted within the computer. The wider the data bus, the more information can be transmitted at once. The Macintosh II, for example, has a 32-bit data bus. Thus, 32 bits of information can be transferred at a time, so that information is transferred twice as fast as in 16-bit computers (assuming equal system clock rates).

data byte: The basic unit of data the computer sends to the printer.

data byte length: The number of bits in a data byte. The ImageWriter LQ receives data in 8-bit data bytes.

Data Carrier Detect (DCD): An RS-232-C signal from a DCE (such as a modem) to a DTE (such as an Apple IIc) indicating that a communication connection has been established. See also **Data Communication Equipment, Data Terminal Equipment.**

Data Communication Equipment (DCE): As defined by the RS-232-C standard, any device that transmits or receives information. Usually this device is a modem.

data cycle: Any period in which data is known to be valid and acknowledged. It includes **ack cycles** as well as intermediate data cycles within a block transfer.

data disk: A disk that contains your work—letters, budgets, pictures, and so on—in the form of files.

data fork: The part of a file that contains data, accessed via the File Manager.

data format: The form in which data is stored, manipulated, or transferred. Serial data transmitted and received typically has a data format of one start bit, five to eight data bits, an optional parity bit, and one or two stop bits.

Datagram Delivery Protocol (DDP): An AppleTalk protocol managing socket-to-socket delivery of datagrams over a networking system.

data register: A location in a device controller that stores data. Compare **command register.**

data segment An object segment that consists primarily of data. Data segments are provided for programs that differentiate between code and data segments.

data set: A device that modulates, demodulates, and controls signals transferred between business machines and communication facilities; a form of **modem.**

Data Set Ready (DSR): An RS-232-C signal from a DCE to a DTE indicating that the DCE has established a connection. See also **Data Communication Equipment, Data Terminal Equipment.**

Data Terminal Equipment (DTE): As defined by the RS-232-C standard, any device that generates or absorbs information, thus acting as an endpoint of a communication connection. A computer might serve as a DTE.

Data Terminal Ready (DTR): (1) One of the handshake lines in a data transmission interface. Also, a name for the default communications protocol for the ImageWriter LQ printer. See also **hardware handshake.** (2) An RS-232-C signal from a DTE to a DCE indicating a readiness to transmit or receive data. See also **Data Communication Equipment, Data Terminal Equipment.**

date/time record: An alternate representation of the date and time (which are stored on the clock chip in seconds since midnight, January 1, 1904).

DCB: See **Device Control Block.**

DCD: See **Data Carrier Detect.**

DCE: See **Data Communication Equipment.**

DDN: See **Defense Data Network.**

DDP: See **Datagram Delivery Protocol.**

debug: A colloquial term that means to locate and correct an error or the cause of a problem or malfunction in a computer program. Often synonymous with *troubleshoot.* See also **bug.**

debugger: A utility that allows you to analyze a program for errors that cause it to malfunction. For example, a debugger may allow you to step through execution of the program one instruction at a time.

decimal system: The commonly used form of number representation, in which numbers are expressed in the base-10 system, using the ten digits 0 through 9. Compare **binary system, hexadecimal system.**

decimal tab: A tab, represented by a decimal tab marker, that aligns columns of numbers at the decimal point position (or columns of words to the left of the tab).

decimal tab marker: An unfilled triangle with a dot in it that you drag from the decimal tab well to a position under the inch scale of a ruler. The decimal tab marker indicates the position to which the insertion point will move when you press Tab.

declaration ROM: Read-only memory on a NuBus slot card that contains information about the card and may also contain code or other data.

decrement: In programming, to decrease the value of a variable used as a counter. Compare **increment.**

default: A value, action, or setting that a computer system assumes, unless the user gives an explicit instruction to the contrary. For example, unless told otherwise, the ImageWriter LQ begins printing with a left margin set to the default value of 0. Default values prevent a program from stalling or crashing if no value is supplied by the user.

default prefix: The pathname prefix attached by ProDOS 16 to a partial pathname when no prefix number is supplied by the application. The default prefix is equivalent to prefix number 0/.

Defense Data Network (DDN): A single, wide area, packet-switching network that integrates the ARPANET research network and the MILNET defense network.

deferred execution: Execution of an instruction only when the complete program of which it's a part is run. In BASIC, you defer execution of an instruction by preceding it with a program line number. The complete program executes consecutive instructions in numerical order. Compare **immediate execution.**

deferred printing: Writing a representation of a document's printed image to a disk or to memory, and then printing it (as opposed to immediate printing).

DEL: See **delete character.**

delete: To remove something, such as a character or word from a file, or a file from a disk. Keys such as the Backspace key and the Delete key can remove one character at a time by moving to the left. The Cut command removes selected text and places it on the Clipboard; the Clear command removes selected text without placing it on the

Clipboard. (The Undo command can reverse the action of Clear and of the Backspace or Delete key if it is used immediately.)

delete character: ASCII code $7F (DEL).

Delete key: A key that moves the insertion point backward, removing the previously typed character, or that removes the current selection. Its function is identical to that of the Backspace key on the original Macintosh keyboards. Compare **Forward Delete key.**

delimiter: A character that is used for punctuation to mark the beginning or end of a sequence of characters and is therefore not considered part of the sequence itself. For example, Applesoft BASIC uses the double quotation mark (") as a delimiter for string constants: the string `"DOG"` consists of the three characters *D, O,* and *G,* and does not include the quotation marks.

delta: The difference from something the program already knows. For example, mouse moves are represented as deltas compared to previous mouse locations. The name comes from the way mathematicians use the Greek letter delta (Δ) to represent a difference.

delta guide: A description of something new in terms of its differences from something the reader already knows about. The name comes from the way mathematicians use the Greek letter delta (Δ) to represent a difference.

demodulate: To recover the information being transmitted by a modulated signal. For example, a conventional radio receiver demodulates an incoming broadcast signal to convert it into the sound emitted by the radio's speaker. Compare **modulate.**

demon: See **daemon.**

demount: See **unmount.**

denormalized number: A number represented in **floating-point notation,** in which the first bit of the significand is 0. Compare **normalized number.**

dereference: In programming, to refer to a block by its master pointer (directly) instead of by its handle (indirectly).

descent: The vertical distance from a font's base line to its descent line.

descent line: A horizontal line that coincides with the bottoms of character descenders (such as the tail on a lowercase *p*) extending farthest below the base line. See also **ascent line, base line, font size, x-height.**

deselect: A command to a device such as a printer to place it into a condition in which it will not receive data. A deselect command has an effect opposite to that of a **select** command.

desk accessory: A "mini-application" that is available from the **Apple menu** regardless of which application you're using—for example, the Calculator, Note Pad, Alarm Clock, Puzzle, Scrapbook, Key Caps, and Chooser. Desk accessories are files of type `'DFIL'` and creator `'DMOV'`, and are installed by using the Font/DA Mover.

Desk Manager: The part of the Toolbox that supports the use of desk accessories from an application.

desk scrap: Synonymous with **buffer.**

desktop: Your working environment on the computer—the menu bar and the gray area on the screen. You can have a number of documents on the desktop at the same time. At the Finder level, the desktop displays the Trash and the icons (and windows) of disks that have been accessed.

Desktop: In AppleWorks, an area of memory where you can keep several files at a time. Once files are in the Desktop, you can switch back and forth between files without having to get files from the data disk.

desktop environment: A set of program features that make user interactions with an application resemble the way people work on a desk top. Commands appear as options in pull-down menus, and material being worked on appears in areas of the screen called **windows.** The user selects commands or other material by using the mouse to move a pointer around on the screen or by using keyboard equivalents.

Desktop file: A resource file in which the Finder stores the version data, bundle, icons, and file references for each application on the volume.

desktop publishing: A system providing you with the ability to produce publication-quality documents. A Macintosh computer, a LaserWriter printer, and page-formatting software provide this capability.

destination: (adj.) Describes the disk or folder that receives a copied or translated file, as in *destination disk.*

destination volume: The duplicate volume, as opposed to the source (original) volume. When you are making a copy of a file or a volume, the destination volume is the volume onto which you are copying. Compare **source volume.** See also **volume.**

device: (1) A hardware component of a computer system, such as a video monitor, a disk drive, or a printer. Also called a *peripheral device* because such equipment is often physically separate from, but attached to, the computer. (2) A part of the computer, or a piece of external equipment, that can transfer information. (3) Any piece of equipment that can be attached to a network—a computer, a printer, a file server, a print server, or any other peripheral device.

device address: A value in the range $00 through $0F assigned to each device connected to the **Apple Desktop Bus.**

Device Control Block (DCB): A block of device-specific data stored on the device itself. Data in the DCB is usually setup information for use in initializing the device after power-up or reset.

device driver: A program that manages the transfer of information between the computer and a peripheral device. See also **resource.**

device driver event: An event generated by one of the computer's device drivers.

device file: A file that represents a device. For example, an A/UX process reading from or writing to the device file `/dev/rfloppy0` is actually reading from or writing to the first floppy disk drive on the Macintosh II. Also called *device special file.*

device handler: See **device driver, resource.**

device handler ID: A value that identifies the kind of device connected to the Apple Desktop Bus.

Device Information Block (DIB): A block of device-specific data stored on the device itself. Data in the DIB is used to construct the SDAT and DIBTAB for the device.

device I/O space: An area of memory that's used for accessing hardware devices, through hardware logic internal to the device.

Device Manager: The part of the operating system that supports device input and output.

device name: The name used in pathnames to refer to a particular device without regard to the files associated with the device.

device number: See **major device number, minor device number.**

device partition: A set of blocks on a device set up for use by one or more operating systems. All the operating systems using a partition must be compatible.

Device Partition Map (DPM): A table made up of a number of 1-block entries called **Partition Descriptor Maps.** The DPM always begins on physical block 1 of any device and is defined as logical block 0.

device resource file: An extension of the printer resource file containing all the resources needed by the Chooser for operating a particular device (including the device driver code).

device switch: A data structure composed of the addresses of routines that manage input and output for a device.

diagnostic output: A file to which error messages are sent by default. Generally merged with **standard output** but can be redirected.

dialog: See **dialog box.**

dialog box: (1) A box that contains a message requesting more information from you. Sometimes the message warns you that you're asking your computer to do something it can't do or that you're about to destroy some of your information. In these cases, the message is often accompanied by a beep. (2) A box that a Macintosh application displays to request information or to report that it is waiting for a process to complete. A dialog box is internally represented in a dialog record.

Dialog Manager: The part of the Toolbox that provides routines for implementing dialog and alert boxes.

dialog record: The internal representation of a dialog box, where the Dialog Manager stores all the information it needs for its operations on that dialog box.

DIB: See **Device Information Block.**

DIBTAB: A software table loaded into SCSI card RAM that contains information on the type and version of the device, as well as the logical size and accessibility of the device. Often this is the same information as that contained in the **DIB.**

digit: (1) One of the characters 0 through 9, used to express numbers in decimal form. (2) One of the characters used to express numbers in some other form, such as 0 and 1 in binary or 0 through 9 and A through F in hexadecimal.

digital: Represented in a discrete (noncontinuous) form, such as numerical digits or integers. For example, contemporary digital clocks

show the time as a digital display (such as 2:57) instead of using the positions of a pair of hands on a clock face. Compare **analog.**

digital data: Data that can be represented by digits—that is, data that are discrete rather than continuously variable. Compare **analog data.**

digital oscillator chip: An integrated circuit in the Apple IIgs that contains 32 digital oscillators, each of which can generate a sound from stored digital waveform data.

digital signal: A signal that is sent and received in discrete intervals, rather than varying continuously over time. Compare **analog signal.**

digital-to-analog converter (DAC): A device that converts quantities from digital to analog form.

digital transmission: Transmission of a discretely variable signal as opposed to a continuously variable signal. Quantities such as temperature are continuously variable—that is, a given temperature value may fall between 2 degrees—and so are described as *analog.* Data characters, on the other hand, are coded in discrete, separate pulses or signal levels—either 0 or 1, on or off, and so on—and are referred to as *digital.* Compare **analog transmission.**

dimension: The maximum size of one of the subscripts of an array.

dimmed: Used to describe words or icons that appear in gray. For example, menu commands appear dimmed when they are unavailable; folder icons are dimmed when they are open.

dimmed icon: An icon that represents an opened disk or folder or a disk that has been ejected. Double-clicking a dimmed disk or folder icon causes the window for the disk or folder to become the frontmost, active window. You can select and open a dimmed icon representing an ejected disk, but you cannot open the folders or documents on it unless you insert the disk.

DIN: Acronym for *Deutsche Industrie Normal,* a European standards organization.

DIN connector: A type of connector with multiple pins inside a round outer shield**.**

DIP: See **dual in-line package.**

DIP switch: A small switch that can be set manually for two different values (usually on or off). There are 24 switches in three DIP switch assemblies inside the case of the Apple ImageWriter LQ.

directive: A source-file instruction to an assembler or compiler. Directives are not translated into machine-language instructions.

directory: (1) A pictorial, alphabetical, or chronological list of the contents of a folder or a disk. (2) A file that contains a list of all the names and locations of other files stored on a disk. These other files may themselves be directories (called *subdirectories*). A directory is sometimes called a *catalog.*

directory dialog box: A type of dialog box you use to work in the hierarchical file system from within an application. Such dialog boxes appear whenever you choose the Open or Save As commands from within an application. See also **hierarchical file system.**

directory file: (1) A file that contains the names and locations of other files. Related files should be grouped together into a single directory file. Compare **volume directory.** (2) One of the two principal categories of ProDOS 16 files. Directory files contain specially formatted entries that give the names and disk locations of other files. Compare **standard file.**

directory hierarchy: The collection of all files on the currently mounted file systems.

directory window: The window that shows you the contents of a disk or folder.

direct page: A page (256 bytes) of bank $00 of Apple IIgs memory, any part of which can be addressed with a short (one-byte) address because its high-order address byte is always $00 and its middle address byte is the value of the 65C816 direct register. Co-resident programs or routines can have their own direct pages at different locations. The direct page corresponds to the 6502 processor's zero page. The term *direct page* is often used informally to refer to any part of the lower portion of the **direct-page/stack space.** See also **direct register, zero page.**

direct-page/stack space: A portion of bank $00 of Apple IIgs memory reserved for a program's direct page and stack. Initially, the 65C816 processor's direct register contains the base address of the space, and its stack register contains the highest address. In use, the stack grows downward from the top of the direct-page/stack space, and the lower part of the space contains direct-page data. See also **direct page, direct register, stack, stack register.**

direct register: A hardware register in the 65C816 processor that specifies the start of the direct page.

disabled: Describes a menu item or menu that cannot be chosen; the menu item or menu title appears dimmed. A disabled item in a dialog or alert box has no effect when clicked.

disassembler: (1) A language translator that converts a machine-language program into an equivalent program in assembly language, which is easier for programmers to understand. The opposite of an **assembler.** (2) A program that examines data in memory and interprets it as a set of assembly-language instructions. Assuming that the data is object code, a disassembler gives the user the source code that could have generated that object code.

disc: See **compact disc.**

disk: A flat, circular, magnetic surface, serving as a medium for storing information. A **RAM disk** is memory that functions as a cross between internal memory (RAM) and a disk. See also **CD-ROM, floppy disk, hard disk.**

disk-based: See **disk-resident.**

disk buffer: An area in RAM used by the operating system as a temporary holding area before it saves the information on a disk.

disk capacity: The maximum amount of data a disk can hold, usually measured in kilobytes (K) or megabytes (MB). For instance, Apple 3.5-inch disks typically have a disk capacity of either 400K or 800K.

disk controller card: A peripheral card that provides the connection between one or two disk drives and the computer. This connection, or interface, is built into both the Apple IIc and the Macintosh family of computers.

disk directory: An index of a disk's contents. It holds the names and locations of every file on its disk.

disk drive: The device that holds a disk, retrieves information from it, and saves information to it.

disk drive light: A light that comes on when your disk drive is loading from or storing on a disk. Sometimes called an *in-use light.* When the light is off, it's safe to put disks in or take disks out. When the light is on, don't remove the disk inside.

Disk Driver: The device driver that controls data storage and retrieval on 3.5-inch disks.

disk envelope: A removable, protective paper sleeve used when handling or storing a 5.25-inch disk. It must be removed before you insert the disk in a disk drive. Compare **disk jacket.**

Disk InitializationPackage: A Macintosh package for initializing and naming new disks; called by the Standard File Package.

disk-insertedevent: An event generated when the user inserts a disk in a disk drive or takes any other action that requires a volume to be mounted.

disk jacket: A permanent, protective covering for a disk. A 5.25-inch disk has a flexible, paper or plastic jacket; a 3.5-inch disk has a hard plastic jacket. The disk is never removed from the jacket. Compare **disk envelope.**

disk operating system (DOS): An operating system whose principal function is to manage files and communication with one or more disk drives. DOS 3.3 and ProDOS 8 are two examples of Apple II disk operating systems.

disk-resident: (adj.) Characterizes a program that does not remain in memory; the computer retrieves all or part of the program from the disk, as needed. Sometimes called *disk-based.* Compare **memory-resident.**

disk space: The amount of space available on a disk for storing or processing a document or an application.

Disk II drive: An older type of disk drive made and sold by Apple Computer for use with the Apple II, II Plus, and IIe. It uses 5.25-inch disks.

disk-use light: See **in-use light.**

display: (1) A general term to describe what you see on the screen of your display device when you're using a computer; from the verb form, which means "to place into view." (2) Short for *display device.*

display color: The color currently being used to draw high-resolution or low-resolution graphics on the display screen.
display device: A device that displays information, such as a television set or video monitor.
displayrectangle: A rectangle that determines where an item is displayed within a dialog or alert box.

display screen: The screen of the monitor; the area where you view text and pictures when using the computer. Also called simply the *screen.*

dispose: To permanently deallocate a memory block. The Memory

Manager disposes of a memory block by removing its master pointer. Any handle to that pointer will then be invalid. Compare **purge.**

disposition: An attribute of the data set where the host components reside.

distribution list: One or more addresses that have been combined together under one name. A distribution list sends one envelope to multiple destinations. You make distribution lists by using the Create Distribution List command in the AppleFax application.

dithering: A technique for alternating the values of adjacent dots or pixels to create the effect of intermediate values. In printing color or displaying color on a computer screen, the technique of making adjacent dots or pixels different colors to give the illusion of a third color. For example, a printed field of alternating cyan and yellow dots appears to be green. Dithering can give the effect of shades of gray on a black-and-white display, or more colors on a color display.

dither pattern: The matrix of threshold values used to represent gray shades in a black-and-white electronic image.

document: Whatever you create with an application program—information you enter, modify, view, or save. See also **file.**

Documenter's Workbench: A group of utilities used for formatting files to be printed on a wide variety of output devices.

document window: The window that displays a document image or a document opened from disk.

dormant: (adj.) Describes a program that is not being executed, but whose essential parts are all in the computer's memory. A dormant program may be quickly restarted because it does not need to be reloaded from disk.

DOS: See **disk operating system.**

DOS 3.3: A disk operating system used by the Apple II family of computers. The number 3.3 indicates the version. Disks formatted with DOS 3.3 have 16 sectors per track.

DOS 3.2: An early Apple II disk operating system. The number 3.2 indicates the version. Disks formatted using DOS 3.2 have 13 sectors per track.

dot column: (1) A horizontal position that can be taken by the print head. The number of dot columns on a page depends on the horizontal resolution set by the character pitch command. (2) A column of dots, as in a graphics pattern specification.

dot-matrix printer: A printer that forms characters with patterns of dots produced by tiny striker wires. Compare **daisy-wheel printer, laser printer.**

dot pitch: A measure of the distance between dots on the screen. The closer the dots, the sharper and clearer the image.

dot space: The horizontal distance between dot centers. This distance depends on the character pitch in effect.

double: In SANE, a 64-bit floating-point data type with IEEE double precision.

double click: (n.) Two clicks in quick succession, interpreted as a single command. The action of a double click is different from that of a single click. For example, clicking an icon selects the icon; double-clicking an icon opens it.

double-click: (v.) To position the pointer where you want an action to take place, and then press and release the mouse button twice in quick succession without moving the mouse.

double-click time: The greatest interval between a mouse-up event and a mouse-down event that would qualify two mouse clicks as a double click.

double high-resolution mode: A graphics mode that can display information using a rectangular array of 560 horizontal by 192 vertical dots for black and white and 140 horizontal by 192 vertical dots for 16 colors.

Double Hi-Res: An Apple II high-resolution display mode, consisting of an array of points 560 wide by 192 high, with 16 available colors.

download: To transfer files or information from one computer to another, or from a computer to a peripheral device such as a printer. A printer will download fonts if a user prints a document containing fonts that are stored on a Macintosh computer but not stored in the printer's memory.

DPM: See **Device Partition Map.**

draft printing: (1) The printing of bitmapped text in which the printer driver sends printer commands and ASCII codes to the printer, which prints using its internal fonts. Draft printing is the fastest way to print a document, but it does not reproduce on paper the appearance of the characters on the screen. Compare **spool printing.** (2) Printing a document immediately as it's drawn in the printing GrafPort. Also known as *immediate printing.*

Draft quality: A high-speed, low-density print quality on the ImageWriter LQ. Draft mode printing is used mainly for quick printouts of documents for review or editing.

drag: To position the pointer on something, press and hold the mouse button, move the mouse, and release the mouse button. When you release the mouse button, you either confirm a selection or move an object to a new location.

drag region: A region in a window frame; usually the title bar. Dragging inside this region moves the window to a new location and makes it the active window unless the Command key was down.

drive: (n.) See **disk drive.** (v.) For a card, to cause a bus signal line to be in a known, determinate state.

drive number: A number used to identify a disk drive. The internal drive is number 1, the external drive is number 2, and any additional drives will have larger numbers.

drive queue: A list of disk drives connected to the Macintosh.

driver: (1) A program, usually in a System Folder, that lets a peripheral device and a computer send and receive files. Printer drivers control printers; a hard disk driver controls exchanges between a hard disk and a computer. (2) Synonymous with **resource.**

Driver Descriptor Map (DDM): A table that contains the starting address, size, and operating-system type of all device drivers resident on the device. Each descriptor is eight bytes long, one descriptor for every driver on the device.

driver I/Oqueue: A queue containing the parameter blocks of all input/output requests for one device driver.

drivername: A sequence of up to 255 printing characters used to refer to an open device driver. Driver names always begin with a period (.).

driver resource: See **driver.**

driving edge: The rising edge (low to high) of the central system clock (/CLK).

DSR: See **Data Set Ready.**

DTE: See **Data Terminal Equipment.**

DTR: See **Data Terminal Ready.**

dual in-line package (DIP): An integrated circuit packaged in a narrow rectangular box with a row of metal pins along each side. DIP switches on the box allow you to change settings. For example, ImageWriter printer DIP switches control functions such as line feed, form length, and baud setting.

duplex transmission: Simultaneous two-way, independent transmission of data between two computers or between a computer and a terminal.

duplicate file: A backup copy of a file or document that is stored in the same folder as the AppleFax application. You create duplicate files with the Copy files button in the Envelope Contents window. Your AppleFax Station sends duplicate files when the original file is not available.

duration: The length or persistence of a signal in time. Compare **frequency.**

Dvorak keyboard: An alternate keyboard layout, which increases typing speed because the keys most often used are in the positions easiest to reach. Also known as the *American Simplified Keyboard.* Compare **QWERTY keyboard.**

DWB: See **Documenter's Workbench.**

dynamic segment: A segment that can be loaded and unloaded during execution as needed. Compare **static segment.**

Glossary E

Easy Access: A feature of system software that assists people who have difficulty typing on the keyboard or manipulating the mouse. See also **mouse keys, sticky keys.**

EBCDIC: Acronym for *Extended Binary-Coded Decimal Interchange Code* (pronounced "EB-si-dik"). A code used by IBM that represents each letter, number, special character, and control character as an 8-bit binary number. EBCDIC has a character set of 256 8-bit characters. Compare **ASCII.**

echo: To send an input character back to the originating device for display or verification; for example, to send each character of your message back to your monitor so you know it's been sent to another computer or to a printer.

edit: To change or modify. For example, to insert, remove, replace, or move text in a document.

Edit menu: A menu in most mouse-based programs that lists editing commands—like Copy, Cut, and Paste.

editor: A program that helps you create and edit information of a particular form; for example, a text editor or a graphics editor.

edit record: A complete editing environment in TextEdit, which includes the text to be edited, the GrafPort and rectangle in which to display the text, the arrangement of the text within the rectangle, and other editing and display information.

effective address: In machine-language programming, the address of the memory location on which a particular instruction operates, which may be arrived at by indexed addressing or some other addressing method.

effective user ID: One of two user IDs associated by the kernel with a process. When necessary for execution, the effective user ID for a process can be changed by programs to temporarily allow different permissions. After completing the task that required the different permission, the effective user ID is set back to its original permission. Compare **real user ID.** See also **user ID.**

e flag: One of three flag bits in the 65C816 processor that programs use to control the processor's operating modes. The setting of the e flag determines whether the processor is in **native mode** or **emulation mode.** See also **m flag, x flag.**

8-bit Apple II: Another way of saying *standard Apple II;* that is, any Apple II with an 8-bit microprocessor (6502 or 65C02).

8-bit microprocessor: A microprocessor that can address 65,536 memory locations directly.

8-pin mini-circular connector: The small, round connector on the serial interface cable that plugs into the printer; the connector on the end of the AppleTalk System Connector that plugs into the Modem port on the Macintosh Plus, Macintosh SE, and Macintosh II. Also known as an *8-pin mini-DIN connector*.

80-column card: Same as **80-column text card.**

80-column display: The screen display format that can fit 80 characters in one line. The other option is 40 columns.

80-column text card: A peripheral card that allows the Apple II, Apple II Plus, and Apple IIe to display text in 80 columns (in addition to the standard 40 columns).

80-Column Text Card: See **Apple IIe 80-Column Text Card.**

80/40-column switch: A switch that controls the maximum number of columns or characters across the screen. A television can legibly display a maximum of 40 characters across the screen, whereas a video monitor can display 80 characters.

eject: (1) To remove a disk from a disk drive. (2) To move paper out of the printer. You can eject paper by pressing the Form Feed button or by turning the platen knob clockwise.

electronic mail (E-mail): A message sent from one computer with a modem to another computer with a modem over phone lines.

electronic worksheet: See **spreadsheet program.**

element: (1) A member of a set or collection; specifically, one of the individual variables making up an array. (2) A string of characters, terminated by a comma or a carriage return, that can be read by using the BASIC statement INPUT. For example, `INPUT A$,B$` reads two elements.

11-pin plug: A standard plug, having a maximum of 11 connector wires (pins), used to connect various devices to the computer. Standard plugs may have fewer than the maximum number of pins. They have an elongated shape like a flattened letter “D”. Compare **DIN connector.**

eligible: In Apple File Exchange, a file is *eligible* if it can be translated with a selected translator or translators.
E-mail: See **electronic mail.**

embedded: Contained within. For example, the string `'HUMPTY DUMPTY'` is said to contain an embedded space.

emptyhandle: A handle that points to a NIL master pointer, signifying that the underlying relocatable block has been purged.

emulate: To operate in a way identical to a different system. For example, the 65C816 microprocessor in the Apple IIgs can carry out all the instructions in a program originally written for an Apple II that uses a 6502 microprocessor, thus emulating the 6502.

emulation mode: A manner of operating in which one system imitates another. For example, a Macintosh computer in emulation mode can imitate the operation of an IBM 3278 terminal. An Apple IIgs computer in emulation mode uses the 8-bit configuration of the 65C816 processor to function like a 6502 processor in all respects except clock speed.

ending value: The value against which the index variable is tested after each pass through a loop. Used to determine when to stop repeating the loop.

end-of-command mark: A punctuation mark used to separate commands sent to a peripheral device such as a printer or plotter. Also called a *command terminator.*

end-of-file (EOF): (1) In A/UX, the position of one byte past the last byte in a file (also known as the *logical end-of-file*); this is equal to the actual number of bytes in the file. If a program calls a routine that uses the physical end-of-file convention, the logical end-of-file is used instead. (2) The logical size of a ProDOS 16 file; it is the number of bytes that may be read from or written to the file. See also **logical end-of-file, physical end-of-file.**

end-of-line character: Any character indicating that the preceding text constitutes a full line. When text is sent to a printer, the end-of-line character indicates that the line may now be printed.

Enter key: A key that confirms an entry or sometimes a command.

enum: In C, an enumerated data type of 8, 16, or 32 bits depending on the range of the enumerated literals.

envelope: A container that holds information about fax files and Macintosh files. Your AppleFax Station sends envelopes to other fax stations. You create an envelope by selecting the New Envelope Stack from the AppleFax document window and dragging it to the Envelope View. See also **fax envelope, plain envelope.**

Envelope Attachment: The attachment to the Cut Sheet Feeder that automatically feeds envelopes into the ImageWriter LQ.

Envelope View: The display area in the AppleFax document window where you create and work with envelopes.

environment: (1) See **operating environment.** (2) In SANE, the rounding direction, rounding precision, exception flags, and halt settings. (3) During program execution, the complete set of machine registers associated with a running program. Saving the environment allows a program to be restored to its original operating mode with all of its registers intact as though nothing had happened. Saving and restoring an environment is most often associated with calling system functions or processing interrupts. (4) A list of characteristics that identifies you to the system and influences and constrains your access to the system. You can modify many of these characteristics. See also **environment variable.**

environment variable: A characteristic controlling your use and access of the system that is available to the current shell and all of the child processes invoked from that shell. Compare **shell variable.**

EOF: See **end-of-file.**

erase character: The keyboard character that, when pressed, erases the last character you typed. By default, this character is Control-H in A/UX.

ergonomics: The science of designing work environments that allow people and things to interact efficiently and safely. Sometimes called *human engineering*.

error code: A number or other symbol representing a type of error.

error condition: The state of the hardware or program after it has detected a fault in one or more commands sent to it.

Error light: The red light that indicates a problem with the printer, such as its being out of paper.

error message: A message displayed or printed to tell you of an error or problem in the execution of a program or in your communication with the system. An error message is often accompanied by a beep.

escape character: ASCII character $1B (ESC). Pressing either the Esc key or Control-[generates an escape character.

escape code: A sequence of characters that begins with an escape character and constitutes a complete command. Escape codes are used to control the video firmware and to send certain commands to a printer. Usually synonymous with *escape sequence.*

Escape key: See **Esc key.**

escape mode: An operating state of the Apple IIe and IIc entered by pressing the Esc key and certain other keys. The other keys take on special meanings for positioning the cursor and controlling the display of text on the screen.

escape sequence: See **escape code.**

Esc key: A key that generates the escape character. In many applications, pressing Esc allows you to return to a previous menu or to stop a procedure. The Esc key can be used with other keys to generate **escape codes.**

Ethernet: A high-speed local area network that consists of a cable technology and a series of communication protocols. The hardware (cable) provides the physical link to connect systems together. The TCP/IP protocol allows different computers to exchange information over a network. The Ethernet specification was developed by Digital Equipment Corporation, Intel Corporation, and Xerox Corporation. Ethernet is a registered trademark of Xerox Corporation.

Ethernet cable system: A system of high-performance coaxial cables widely used in the communications industry. Ethernet cables can be part of an AppleTalk network system.

EtherTalk: A high-speed AppleTalk network system that uses the cables of an Ethernet network. Ethernet is a widely used communications network.

even/odd parity check: A check that tests whether the number of 1 bits in a group of binary digits is even (even parity check) or odd (odd parity check) in data transmission.

even parity: The use of an extra bit set to 0 or 1 as necessary to make the total number of 1 bits an even number; used as a means of error checking in data transmission. Compare **MARK parity, odd parity, space parity.**

event: A notification to an application of some occurrence, such as an interrupt created by a keypress, that the application may want to respond to.

event-driven: (1) Describes a kind of program that responds to user input in real time by repeatedly testing for events posted by interrupt routines. An event-driven program does nothing until it detects an event such as a click of the mouse button. (2) Describes a style of programming in which program actions are based on events generated by the user, rather than on some sort of fixed script.

Event Manager: See **Toolbox Event Manager** or **Operating System Event Manager.**

event mask: A parameter passed to an Event Manager routine to specify which types of events the routine should apply to.

event queue: The Operating System Event Manager's list of pending events.

event record: The internal representation of an event, through which your program learns all pertinent information about that event.

Everyone: The user category to which you can assign privileges for any user with access to an AppleShare file server, whether logged on as a registered user or as a guest.

exception: (1) An error or abnormal condition detected by the processor in the course of program execution; includes interrupts and traps. (2) A condition in the SANE environment that can cause a program halt.

exception event: Any event interpreted by the processor as an exception to normal processing. An exception event could be a reset, an interrupt, or a trap.

exception vector: The first 256 bytes of RAM ($00 0000 through $00 00FF) as used by the 68000 processor. These locations contain the addresses of routines that gain control whenever an exception to normal processing occurs. Exceptions include such events as a reset, an interrupt, or a trap.

exclusive OR: A logical operator that produces a true result if one of its operands is true and the other false, and a false result if its operands are both true or both false. Sometimes written as *XOR.* Compare **AND, NOT, OR.**

exec: A system call or a built-in shell command that loads a program file and executes it by overlaying the address space of the calling process.
EXEC: An Applesoft BASIC command that causes input to be taken from a sequential text file rather than from the keyboard. When you use the EXEC command, you control the operation of the computer by using commands that are stored in a text file.

EXEC file: A text file that runs other programs when it is executed by the EXEC command.

execute: To perform the actions specified by a program command or sequence of commands.

exit function: In C, a function that is registered with `onexit` for execution when the program terminates.

expansion card: A circuit board that implements specialized functions not otherwise supported by the computer. Expansion cards are installed in expansion connectors or expansion slots.

expansion connector: A connector inside the Macintosh SE that lets you install an **expansion card** to enhance the computer's performance.

expansion slot: A narrow socket into which you can install a peripheral card. Sometimes called a *peripheral slot* or just *slot.* See also **auxiliary slot.**

exponent: In scientific notation, a superscripted number denoting a

power to which an immediately preceding number or value is raised. For example, in 2^{10} (2 to the 10th power), 10 is the exponent. In computer notation, 2^{10} is shown as 2E10, where E stands for *exponent.* See also **scientific notation, significand.**

export: (v.) (1) To pass the value of a shell variable to a child process. (2) To make local file systems available to remote users. (n.) (1) The built-in shell command for the Korn or Bourne shell that passes the values of shell variables to child processes. See also **child process, shell variable.** (2) For a computer on a network using the Network File System protocols, the command that makes local file systems available to remote users.

expression: A formula in a program that defines a calculation to be performed.

extended: In SANE, an 80-bit floating-point data type with IEEE extended precision; used for all intermediate results.

extended 80-column card: An interface card used in other models of the Apple II that adds 64K of memory and makes it possible for the computer to display information in 80-column format instead of the standard 40-column format.

Extended 80-Column Text Card: See **Apple IIe Extended 80-Column Text Card.**

extended SmartPort call: A SmartPort call that allows data transfer to or from anywhere in the Apple IIgs memory space. Compare **standard SmartPort call.**

external command: An APW utility program that functions like an APW Shell command.

external drive: Any disk drive attached to the computer through a port or slot; distinguished from a built-in drive in the Apple IIc and Apple IIc Plus.

external device: See **device.**

external reference: (1) A reference to a symbol that is defined in another segment. External references must be to global symbols. (2) A reference to a routine or variable defined in a separate compilation or assembly.

Glossary F

facsimile (fax) machine: A machine that can scan a page and then transmit the image of the page over telephone lines; a receiving fax machine prints an identical copy of the original page.

fanfold paper: Special paper that comes in one continuous sheet, perforated and folded like a fan so that it lies in a stack. Also called *continuous-form paper.* Compare **single-sheet paper.** See also **pin-feed paper.**

fatal error: An error serious enough that the computer must halt execution.

fax: A method of transmitting images by electronic means.

fax-distribution list: A distribution list that's made up of fax-machine addresses.

fax envelope: An envelope that has been addressed with a fax-machine address or a fax-distribution list. Fax envelopes have the word *Fax* written across the front. These envelopes can hold only fax files and must be sent to fax machines.

fax file: A file that contains an image of a document. The file has been formatted for facsimile transmission so you can send it to a fax machine or a computer emulating a fax machine.

fax-machine address: An address that represents a fax machine.

fax station: Either a fax machine or an AppleFax Station.

FCB: See **file control block.**

field: (1) A data item separated from other data by blanks, tabs, or other specific delimiters. A particular type or category of information in a database management program. (2) A specific set of data that is related. A field is always defined by its size, given in bits or bytes, and usually has a name. (3) A string of ASCII characters or a value that has a specific meaning to some program. Fields may be of fixed length, or may be separated from other fields by field delimiters. For example, each parameter in a segment header constitutes a field. (4) In a BASIC file, a string of characters preceded by a return character and terminated by a return character. A field is written to a file by each PRINT statement not terminated by a semicolon. The INPUT command reads an entire field from a file. (5) In Pascal, one discrete variable within a **record.** (6) In HyperCard, the place where you type regular (as opposed to Paint) text. Also, the tool you use to create a field. HyperCard has two kinds of fields: **card fields** and **background fields.**

field delimiter: A character or value that designates the start or end of a field. For example, in a BASIC file each field begins and ends with a return character.

Field tool: In HyperCard, the tool you use to create, change, and select fields. Compare **Browse tool, Button tool.**

file: (1) Any named, ordered collection of information stored on a disk. Application programs and operating systems on disks are examples of files. You make a file when you create text or graphics, give the material a name, and save it to disk; in this sense, *file* is synonymous with **document.** A Macintosh file consists of a **data fork** and a **resource fork.** (2) For UNIX operating systems, an array of bytes; no other structure is implied by UNIX systems as they even treat devices like files.

file-buffered: Describes a buffer style in which characters sent to an output I/O function are queued and written as a block.

file control block (FCB): (1) A data structure set up in memory by ProDOS 16 to keep track of all open files. (2) A fixed-length data structure, contained in the file-control-block buffer, where information about an access path is stored.

file descriptor: A number used to identify a file. In C, a file descriptor is returned by a create or open call.

file directory: The part of a volume that contains descriptions and locations of all the files and directories on the volume. There are two types of file directories: *hierarchical file directories* and *flat file directories.*

file directory entry: The part of a ProDOS 16 directory or subdirectory that describes and points to another file. The file so described is considered to be "in" or "under" that directory. Also called a *file entry.*

file handling system: The set of data structures, commands, and subroutines used to manipulate files and data stored on physical devices.

file I/O queue: A queue containing parameter blocks for all input/output requests to the File Manager.

file level: See **system file level.**

file management: A general term for copying files, deleting files, and other chores involving the contents of disks.

File Manager: The part of the operating system that supports file input and output.

File menu: A menu in mouse-based applications that lists commands that affect whole documents—commands like Save, Print, and Quit.

file mode: See **permissions.**

filename: The name that identifies a file. The maximum character length of a filename and the rules for naming a file vary under different operating systems. Compare **pathname.**

filename expansion: A procedure performed by the shell that derives a list of files from a single, shorthand filename containing metacharacters. Also called *globbing.*

file number: A reference number assigned to a specific file. The Apple IIgs loader assigns a file number to each load file in a program; the MakeLib utility program assigns a file number to each object file incorporated into a library file.

file pointer: In C, a pointer to the next byte to be read or written in a **stream.**

file reference: A resource (type `'FREF'`) that provides the Finder with file and icon information about an application.

file server: (1) A specially equipped computer that allows network users to store and share information. (2) A combination of controller software and a mass-storage device that allows computer users to share common files and applications through a network. AppleShare software, Macintosh computers, and one or more hard disks make up a file server on an AppleTalk network system.

file system: A logical device (such as a disk partition) that contains the data structures that implement all or part of the **directory hierarchy.**

file transfer protocol: A protocol that exchanges files with a host computer.

file type: (1) In a directory listing, the code that characterizes the contents of a file and indicates how the file may be used. (2) An attribute in a ProDOS 16 file's directory entry that characterizes the contents of the file and indicates how the file may be used. On disk, file types are stored as numbers; in a directory listing, they are often displayed as three-character mnemonic codes. (3) A four-character sequence in single quotation marks, specified when a file is created, that identifies the type of file. Examples of file types are `'TEXT'`, `'APPL'`, and `'MPST'`.

FILE variable: In C, a variable containing information about a stream, including the file descriptor and buffer size, location, and style.

filing calls: Operating-system calls that manipulate files. In ProDOS 16, filing calls are subdivided into *file housekeeping calls* and *file access calls*.

filter: A utility that transforms its input in some way and writes this transformed data to the standard output. Lines submitted as input to the `sort` command, for example, are reordered so that the lines in the output are arranged alphabetically or numerically.

filter: A program or "mask" that alters data in accordance with specific criteria, a formula, or an algorithm.

Finder: The application that maintains the Macintosh desktop and starts up other programs at the request of the user. You use the Finder to manage documents and applications, and to get information to and from disks. You see the desktop upon starting up your computer, unless you have specified a different startup application.

Finder information: Information that the Finder provides to an application upon starting it, telling it which documents to open or print.

Find File: A desk accessory that lets you find any folder or file on a disk.

firmware: Programs stored permanently in read-only memory (ROM). Such programs (for example, the Applesoft Interpreter and the Monitor program) are built into the computer at the factory. They can be executed at any time but cannot be modified or erased from main memory. Compare **hardware, software.**

5.25-inch disk: A flexible plastic disk measuring 5.25 inches in diameter and having a thin, flexible paper or plastic jacket. Compare **CD-ROM, hard disk, 3.5-inch disk.**

fixed: Describes blocks that are not movable in memory once allocated; also called *unmovable*. Program segments that must not be moved are placed in fixed memory blocks. Opposite of **movable.**

fixed-point notation: A method of representing numbers inside the computer in which the decimal point (more correctly, the binary point) is

considered to occur at a fixed position within the number. Typically, the point is considered to lie at the right end of the number so that the number is interpreted as an integer. Compare **floating-point notation.**

fixed-point number: A signed 32-bit quantity containing an integer part in the high-order word and a fractional part in the low-order word.

fixed-width font: A font whose characters all have the same width. For example, in Courier font the letter `M` is the same width as the letter `I`. Thus, `MMMMM` takes up the same space as `IIIII`. Same as *monospaced font.* Compare **proportional font.**

flag: A variable whose value indicates whether some condition holds or whether some event has occurred. A flag is used to control the program's actions at a later time. The value of a flag is usually 0 or 1.

flag option: An argument included on the command line that instructs a program to execute a particular deviation of the command. A flag option is usually a hyphen followed by one or more characters. For example, the `-l` flag option to the `ls` command makes this utility print extra information, such as the date a file was last saved. Flag options are sometimes referred to as *keyletters.*

flat file system: The file system used on 400K disks and Macintosh XL hard disks. All files are at the same directory level, even though documents or folders might appear to be inside folders. Compare **hierarchical file system.**

flat panel display: A display device more compact than a video monitor that can be used with the Apple IIc. A flat panel display is easy to carry.

flexible disk: See **5.25-inch disk, 3.5-inch disk.**

float: In C, a 32-bit floating-point data type with IEEE single precision. Equivalent to *single* in SANE.

Floating-Point ArithmeticPackage: A Macintosh package that supports extended-precision arithmetic according to IEEE Standard 754.

floating-point coprocessor (MC68881): A coprocessor on the Macintosh II that provides high-speed support for extended-precision arithmetic.

floating-point notation: A method of representing numbers inside the computer in which the decimal point (more correctly, the binary point) is permitted to "float" to different positions within the number. Some of the bits within the number itself are used to keep track of the point's position. Compare **fixed-point notation.**

floating-point unit (FPU): See **68881.**

floppy disk: A disk made of flexible plastic, as opposed to a hard disk, which is made of metal. The term *floppy* was originally applied to disks with thin, flexible disk jackets, such as 5.25-inch disks, which were literally floppy and could be easily bent. With 3.5-inch disks, the disk itself is flexible, but the jacket is made of hard plastic. Both kinds, however, are called floppy disks. See also **5.25-inch disk, 3.5-inch disk.**

flush: To update an open file (write all information in the I/O buffer to a disk) without closing it.

folder: (1) A holder of documents, applications, and even other folders on the desktop. Folders act as subdirectories, allowing you to organize information in any way you want. (2) The secondary organizing unit on the server. A folder on the server is equivalent to a ProDOS subdirectory.

font: A complete set of characters in one design, size, and style. In

traditional typography usage, *font* may be restricted to a particular size and style or may comprise multiple sizes, or multiple sizes and styles, of a typeface design. See also **bitmapped font, font family, font scaling, internal font, printer font.**

font characterizationtable: A table of parameters in a device driver that specifies how best to adapt fonts to that device.

font class: A group of fonts that all use the same method of implementing different font styles, such as italic or bold.

Font/DA Mover: An application that allows you to add or remove fonts and desk accessories from a disk's System file or from a font or desk accessory file.

font family: A complete set of characters for one typeface design, including all styles and sizes of the characters in that font. For example, the Geneva font family includes 9-point to 36-point characters in italic, bold, outlined, and other styles.

Font file: A specific file used with the Font/DA Mover. You copy fonts to and from this file to the System file of the disk that the Font/DA Mover is on.

font height: The vertical distance from a font's ascent line to its descent line.

Font Manager: The part of the Toolbox that supports the use of various character fonts for QuickDraw when it draws text.

font name: The name, such as Geneva or Times, given to a font family to distinguish it from other font families.

font number: The number by which you identify a font to QuickDraw or the Font Manager.

font record: A data structure, derived from a font resource, that contains all the information describing a font.

font rectangle: The smallest rectangle that would enclose all the character images in a font, if the images were all superimposed over the same **character origin.**

font scaling: A feature that allows Macintosh computers to create all sizes of a font from one size. Scaled fonts in larger sizes are usually not as attractive as the installed font.

font script: The writing system used by the font currently designated by ThePort; hence the system that determines in what form text characters are displayed to the user.

font size: The size of a font of characters in points; equivalent to the distance between the **ascent line** and the **descent line** of one line of text. Examples of font size are 12 point and 18 point. See also **base line, leading, line spacing, point, x-height.**

font style: A set of stylistic variations other than size, such as italic, bold, and underline.

Font Substitution option: A feature that lets you choose whether or not the Macintosh automatically substitutes LaserWriter fonts for equivalent Macintosh fonts.

footer: An identifying line at the bottom margin of a document. A footer can appear on every page and can include text, pictures, page numbers,

the date, and the time. Footers that are repeated throughout a document are called *running footers* or *running feet.* Compare **header.**

foreground job: A process that, while running, does not allow other activities on a terminal. The shell waits until the foreground job has finished executing before the shell returns its prompt and gives you control again of the terminal. Compare **background job.**

fork: (n.) (1) A system call that creates a new process. (2) One of the two parts of a Macintosh file: the *data fork* contains data accessed via the Macintosh File Manager, and the *resource fork* contains data used by the application, such as menus, fonts, and icons. (v.) To create a new process.

formal parameter: In the declaration of a procedure, the parameter that will be used to pass information into the procedure for processing. Compare **actual parameter.**

format: (n.) (1) The form in which information is organized or presented. (2) The general shape and appearance of a printer's output, including page size, character width and spacing, line spacing, and so on. (v.) To divide a disk into tracks and sectors where information can be stored. Blank disks must be formatted before you can save information on them for the first time; synonymous with *initialize.*

format block: A structure in a declaration ROM that provides a standard entry point for other structures in the ROM.

form feed: An ASCII character (decimal 12) that causes a printer or other paper-handling device to advance to the top of the next page.

Form Feed button: A button on the printer's control panel that advances a whole sheet of paper, aligning the top edge of the paper with the top-of-form mark on the paper guide.

formula: An equation. By writing formulas to define relationships between the various numbers in your spreadsheet, you can try out different numbers, and the formulas will recalculate all the totals for you.

Fortran: Acronym for *Formula Translator;* a high-level programming language especially suitable for applications requiring extensive numerical calculations, such as in mathematics, engineering, and other sciences.

40-column display: The screen display format that can fit 40 characters in one line. The other option is 80-column display.

Forward Delete key: A key on the Apple Extended Keyboard that causes the character to the right of the insertion point to be deleted. The insertion point does not move: the characters to its right are "vacuumed" in toward it as each is deleted. Compare **Delete key.**

four-tone record: A data structure describing the tones produced by a **four-tone synthesizer.**

four-tone synthesizer: The part of the Sound Driver used to make simple harmonic tones, with up to four "voices" producing sound simultaneously.

FPU: See **68881.**

frame: (1) The time elapsed from the start bit to the last stop bit during serial communication. (2) In the CloseView utility, a thick rectangular outline that marks off the portion of the screen that will fill the screen when you turn on magnification.

frame pointer: A pointer to the end of the local variables within a routine's stack frame, held in an address register and manipulated with the LINK and UNLK instructions.

framing error: In serial data transfer, the absence of the expected stop bit(s) at the end of a received character.

free block: A memory block containing space available for allocation.

free-form database: A database that lets you enter information in paragraph form (instead of by categories) and designate keywords that you can search for later.

free-form synthesizer: The part of the Sound Driver used to make complex music and speech.

free space: The portion of a disk that is not contained in a **partition.**

frequency: The number of complete cycles transmitted per second. Frequency is usually expressed in hertz (cycles per second), kilohertz (kilocycles per second), or megahertz (megacycles per second). In acoustics, frequency of vibration determines musical pitch. Compare **duration.**

friction feed: A paper lever setting on a printer that turns off the pin-feed mechanism and engages the rollers that drive single sheets of paper using friction between the platen and the paper.

front cover: The lid that covers the front of the ImageWriter LQ. Remove the front cover to gain access to the ribbon cartridge and DIP switches. The front cover must be firmly in place or the printer will not print.

front cover window: The clear plastic piece in the upper portion of the front cover of the ImageWriter II or ImageWriter LQ.

full duplex: A four-wire communication circuit or protocol that allows two-way data transmission between two points at the same time. Compare **half duplex.**

full-duplex communication: A method of data transmission where two devices transmit data simultaneously. This method allows the receiving device to echo back each character of your message as it is received.

full pathname: (1) The complete name by which a file is specified. A full pathname always begins with a slash (/), because a volume directory name always begins with a slash. Also called the *absolute pathname.* (2) A pathname beginning from the root directory. A full pathname is a pathname that contains embedded colons but no leading colon. Compare **partial pathname.**

function: (1) A built-in formula in a spreadsheet you can use to calculate an average, a square root, and the like. (2) In a programming language, an instruction that converts data from one form to another; a preprogrammed calculation that can be carried out on request from any point in a program. The `CHR` and `CHR$` functions, for example, convert an ASCII code number into its corresponding character. Because a function takes in one or more arguments and returns a single value, it can be embedded in an expression.

function key bar: The bottom line of the FT/TSO and FT/CMS screen, which can be set up with buttons for commonly used 3278 function keys.

Fwd Del: See **Forward Delete key.**

Glossary G–H

game I/O connector: A 16-pin connector inside the Apple II, II Plus, and IIe, originally designed for connecting hand controls to the computer, but also used for connecting some other peripheral devices. Compare **hand control connector.**

garbage: A string of meaningless characters that bears no resemblance to your document. It's an indication that your computer and peripheral device are using different transmission rates or data formats.

gateway: A computer that connects two or more networks, especially those using different protocols.

GB: See **gigabyte.**

General tool: Any HyperCard tool that isn't a Paint tool. The General tools are Browse, Button, and Field.

GETLN: The firmware routine that a program calls to obtain an entire line of characters from the currently active input device.

gid: See **group ID.**

gigabyte (GB): A unit of measurement equal to 1024 (2^{10}) megabytes. Compare **byte, kilobyte, megabyte.**

global backup: The process of backing up all the files on a hard disk. Compare **incremental backup.**

global coordinate system: The coordinate system based on the upper-left corner of the bit image being at (0,0).

global page: Under ProDOS 8, a page (256 bytes) of data at a fixed location in memory, containing useful system information (such as a list of active devices) available to any application.

global page bitmap: A portion of the ProDOS 8 global page that keeps track of memory use in the computer. Applications under ProDOS 8 are responsible for marking and clearing parts of the bitmap that correspond to memory they have allocated or freed.

global symbol: A label in a code segment that is either the name of the segment or an entry point to it. Global symbols may be referenced by other segments. Compare **local symbol.**

globbing: See **filename expansion.**

GLU: Acronym for *general logic unit;* a class of custom integrated circuits used as interfaces between different parts of the computer.

go-away region: A region in a window frame. Clicking inside this region of the active window makes the window close or disappear.

GPi: Abbreviation for general purpose input; a pin that receives whatever clock signal frequency an external peripheral device sends to it, allowing the external device to control the timing and the rate of information in and out of the serial port, rather than the rate being controlled by the computer. Theoretically, this results in faster, safer data transfers, because the external peripheral device does not need to have information about the timing and phase synchronization of the clock cycles that occur in the computer.

GrafPort: (1) The data type for a **graphics port.** (2) A shorthand way of referring to a graphics port.

GrafPort record: A data record used by QuickDraw to establish a **graphics port.**

graph: A pictorial representation of data.

graphics: (1) Information presented in the form of pictures or images. (2) The display of pictures or images on a computer's display screen. Compare **text.**

graphics mode: A way of displaying text and graphics on the screen. In graphics mode, images are formed by patterns of dots. Compare **text mode.**

graphics port: A complete drawing environment in QuickDraw (data type GrafPort), including such elements as a bitmap, a character font, patterns for drawing and erasing, and other graphics characteristics. Sometimes called a *GrafPort.*

gray scale: Shades of gray on the screen that are created by varying the intensity of the screen's pixels, rather than by using a combination of only black and white pixels to produce shading.

grounding plug: A plug that has a third (grounding) pin for safety.

group: A named collection of one or more registered file server users. Groups are created for users who usually have common interests and share information.

Group: The user category to which you can assign access privileges for members of groups created by the AppleShare administrator. The administrator creates groups of registered users only.

group ID (gid): In A/UX, a number that indicates a group to which you belong at login time. As a member of a group, you have access to certain files and directories shared by other members of your group. Each user login name has at least one group ID associated with it.

Group 2 and Group 3 fax machines: Two different categories of fax machines that work with AppleFax. See also **facsimile machine.**

grow region: A window region, usually within the content region, where dragging changes the size of an active window.

guest: A user who is logged on to a server without a registered user name and password. A guest cannot own a private folder.

guest file system: A file system, other than that of ProDOS 16, whose files can be read by ProDOS 16.

half duplex: A two-wire communication circuit or protocol designed for data transmission in either direction but not both directions simultaneously. Compare **full duplex.**

half-duplex communication: A way of communicating between your computer and another computer or a peripheral device in which you can only send data or receive it at one time—not both. The other computer cannot echo back each character of your message as it is received.

hand control connector: A 9-pin connector on the back panel of the Apple IIe and IIc computers, used for connecting hand controls to the computer. Compare **game I/O connector.**

hand controls: Peripheral devices with rotating dials and push buttons. Hand controls are used with game-playing programs, but they can also be used in other applications.

handle: A pointer to a master pointer, which designates a relocatable block in the heap by double indirection. See also **memory handle.**

handshaking: The exchange of status information between a **DCE** and a **DTE** used to control the transfer of data between them. The status information can be the state of a signal connecting the DCE and the DTE, or it can be in the form of a character transmitted with the rest of the data. See also **Data Carrier Detect, Data Set Ready, Data Terminal Ready, XOFF, XON.**

hang: To cease operation because either an expected condition is not satisfied or an infinite loop is occurring. A computer that's hanging is called a *hung system.* Compare **crash.**

hard copy: Information printed on paper, as opposed to being stored on disk.

hard disk: A disk made of metal and sealed into a drive or cartridge. A hard disk can store very large amounts of information compared to 3.5-inch or 5.25-inch disks. See also **compact disc.**

hard disk drive: A device that holds a hard disk, retrieves information from it, and saves information to it. Hard disks made for microprocessors are permanently sealed into the drives.

hardware: Those parts of the computer that you can see and touch. The computer and the machines that attach to it: the disk drive, printer, and other peripheral devices. Compare **software.**

hardware handshake: A protocol that tells the computer to start or stop sending data by setting the DTR (Data Terminal Ready) line logic state. The ImageWriter LQ changes the line's state depending on the capacity of its input buffer. Also known as the *Data Transfer Ready* protocol. Compare **XON/XOFF.**

hardware overrun error: The condition that occurs when the SCC's buffer becomes full.

hardware reset: The act of resetting the printer to its default settings by turning the printer off and back on. A hardware reset clears any data in the print buffer. Compare **software reset.**

header: An identifying line at the top margin of a document. A header can appear on every page and can include text, pictures, page numbers, the date, and the time. Headers that are repeated throughout a document are called *running headers* or *running heads.* Compare **footer.**

header file: A file whose contents will be included with the source file at compile time—it contains function declarations, macros, types, and defines used by the compiler. Also called *include file*.

heap: The area of memory in which space is dynamically allocated and released on demand, using the Memory Manager.

heap zone: An area of memory initialized by the Memory Manager for heap allocation.

here document: Input to a shell script that is embedded inside the script itself.

hertz (Hz): The unit of frequency of vibration or oscillation, defined as the number of *cycles per second.* Named for the physicist Heinrich Hertz. The 6502 microprocessor used in the Apple II systems operates at a clock frequency of about 1 million hertz, or 1 megahertz (MHz). The 68000 microprocessor used in the Macintosh operates at 7.8336 MHz.

hexadecimal system: The representation of numbers in the base-16 system, using the ten digits 0 through 9 and the six letters A through F. For example, the decimal numbers 0, 1, 2, 3, 4, . . . 8, 9, 10, 11, . . . 15, 16, 17 would be shown in hexadecimal notation as 00, 01, 02, 03, 04, . . . 08, 09, 0A, 0B, . . . 0F, 10, 11. Hexadecimal numbers are easier for people to read and understand than are binary numbers, and they can be converted easily and directly to binary form. Each hexadecimal digit corresponds to a sequence of four binary digits, or *bits.* Hexadecimal numbers are usually preceded by a dollar sign ($). Compare **binary system, decimal system.**

HFS: See **hierarchical file system.**

hierarchical file system (HFS): A feature of system software that lets you use folders to organize documents, applications, and other folders on a disk. Folders (analogous to subdirectories) can be nested in other folders to create as many levels as you need. In a hierarchical file system, a file is specified by its pathname rather than by a single filename.

hierarchical menu: A menu in which one or more individual menu items can themselves contain a submenu.

high: For an active-low signal, synonymous with inactive, deasserted, unasserted, false, and released.

high ASCII characters: ASCII characters with decimal values of 128 to 255. Called *high ASCII* because their high bit (first binary digit) is set to 1 (for *on*) rather than 0 (for *off*). Compare **low ASCII characters.**

high-level language: A programming language that is relatively easy for people to understand. A single statement in a high-level language typically corresponds to several instructions of machine language. High-level languages include BASIC, Pascal, Logo, Pilot, SuperPILOT, and Fortran. Compare **low-level language.**

highlight: To make something visually distinct. For example, when you select a block of text using MacWrite, the selected text is highlighted—it appears as light letters on a dark background, rather than dark-on-light. Highlighting is accomplished by inverting the display. See also **inverse video.**

high-order: (adj.) Describes the most significant part of a numerical quantity. In normal representation, the *high-order bit* of a binary value is in the leftmost position; likewise, the *high-order byte* of a binary word or longword quantity consists of the leftmost eight bits. Compare **low-order.**

high-order byte: The more significant half of a memory address or other two-byte quantity. In the 6502 microprocessor used in the Apple II family of computers, the low-order byte of an address is usually stored first, and the high-order byte second. In the 68000 microprocessors used in the Macintosh family, the high-order byte is stored first. Compare **low-order byte.**

High Sierra format: The standard proposed by a number of computer and CD-ROM companies to specify a way of organizing information on a CD-ROM. The information is laid out in files located in a series of volumes, directories, and files. The High Sierra standard makes it possible to use the same CD-ROM with different kinds of computers. Only the retrieval software needs to be geared to the computer and its operating system.

high-resolution graphics: (1) The display of graphics on a screen as a six-color array of points, 280 columns wide and 192 rows high. When a text window is in use, the visible high-resolution graphics display is 280 by 160 points. Compare **low-resolution graphics.** (2) For the ImageWriter LQ printer, graphics printed at a vertical resolution of 216 dots per inch. Each dot column of high-resolution graphics is represented by three bytes of data. Compare **standard-resolution graphics.**

high-resolution mode: A graphics mode that can display information using a rectangular array of 280 horizontal by 192 vertical dots. Compare **low-resolution mode.**

Hi-Res: A high-resolution display mode on the Apple II family of computers, consisting of an array of points, 280 wide by 192 high, with six colors.

hold time: In computer circuits, the amount of time a signal must remain valid after some related signal has been turned off. Compare **setup time.** See also **valid signal.**

hollow: (adj.) Sometimes used to describe a disk icon that has been opened. See **dimmed.**

Home card: In HyperCard, a special card that acts as a pictorial index to stacks. Choose Home from the Go menu to get to Home (or press Command-H).

home computer: A computer that is small enough and affordable enough to have in your house. (When you take a "home computer" to the office, it becomes a "productivity tool.")

home control device: A device that can regulate the temperature of your home, turn lamps on and off, or monitor smoke detectors and burglar alarms.

home directory: The directory named by your environment variable `$HOME`. The home directory is usually the first directory you enter upon login, as designated in the file `/etc/passwd`. You can tailor your environment by modifying various files in your home directory.

home row: The row of keys on the keyboard where the fingers of touch-typists rest when they aren't reaching for other keys. In the standard keyboard layout, the home row contains A, S, D, F, G, and so on. In the Dvorak keyboard layout, the home row contains what August Dvorak determined were the most frequently used keys (A, O, E, U, I, and so on).

horizontal blankinginterval: The time between the display of the rightmost pixel on one line and the leftmost pixel on the next line.

host: See **host computer.**

host command: The command that invokes the DCA file transfer program on the host, which is required by FT/TSO and FT/CMS to transfer files.

host computer: The computer that receives information from and sends data to terminals over telecommunication lines. The computer that is in control in a data communication network. The host computer may be a mainframe computer, minicomputer, or microcomputer.

hotSpot: The point in a cursor (such as the arrow pointer) that's aligned with the mouse location.

Human Interface Guidelines: A set of software development guidelines designed by Apple Computer to support the desktop concept and to promote uniform user interfaces in Apple II and Macintosh applications.

See also **desktop.**

HyperTalk: HyperCard's built-in script language for HyperCard users.

Hz: See **hertz.**

Glossary I–J

I-beam: A type of pointer shaped like the capital letter “I” and used in entering and editing text.

IC: See **integrated circuit.**

icon: An image that graphically represents an object, a concept, or a message. Icons on the outside of the computer can be used to show you where to plug cables, such as the disk drive icon on the back panel that marks the disk drive connector. Screen icons in mouse-based applications represent disks, documents, application programs, or other things you can select and open. A screen icon is a 32-by-32-bit image.

icon list: A resource (type `'ICN#'`) consisting of a list of icons.

icon number: A digit from 1 to 255 to which the Menu Manager adds 256 to get the resource ID of an icon associated with a menu item.

image: A representation of the contents of memory. A code image consists of machine-language instructions or data that may be loaded unchanged into memory.

image width: The width of a character image.

ImageWriter II/LQ LocalTalk Option: A peripheral card that enables the printer to serve up to 31 computers on an AppleTalk network system.

ImageWriter II SheetFeeder: A device that holds up to 100 sheets of paper, feeds them individually into the printer, and stacks the printed pages.

ImageWriter II 32K Memory Option: A peripheral card that gives the ImageWriter II a 32,000-character memory buffer. This memory holds documents of up to 16 to 20 pages, freeing you to work at the computer while the printer prints.

immediate execution: The execution of a program statement as soon as it is typed. In BASIC, immediate execution occurs when a line is typed without a line number. Immediate execution allows you to try out nearly every statement immediately to see how it works. Compare **deferred execution.**

immediate printing: See **draft printing.**

impact dot-matrix printer: A printer, such as the ImageWriter LQ, that forms characters with patterns of dots.

implement: To put into practical effect, as to implement a plan. For example, a language translator implements a particular language.

inactive: For an active-low signal, synonymous with high.

in-care-of address: The address of an AppleFax Station that temporarily stores an envelope before sending the envelope to its final destination.

include file: In C, a file whose contents will be included with the source file at compile time—it contains function declarations, macros, types, and `#define` directives used by the compiler. Also called a *header file.*

increment: In programming, to increase the value of a variable used as a counter. Compare **decrement.**

incremental backup: The process of backing up all files on a hard disk that have been created, modified, or copied onto the disk since the last **global backup.**

indentation marker: In MacWrite, a triangular marker that marks the position of the first word in a paragraph, to the left or the right of the left margin marker. In a new document, the indentation marker is stacked with the left margin marker.

index: (1) A number used to identify a member of a list or table by its sequential position. (2) A list or table whose entries are identified by sequential position. (3) In machine-language programming, the variable component of an indexed address, contained in an index register and added to the base address to form the effective address.

index block: A 512-byte part of a ProDOS 16 standard file that consists entirely of pointers to other parts (data blocks) of the file. See also **data block, standard file.**

indexed addressing: A method used in machine-language programming to specify memory addresses. See also **memory location.**

index register: A register in a computer processor that holds an index for use in indexed addressing. The 6502 and 65C816 microprocessors used in the Apple II family of computers have two index registers, called the *X register* and the *Y register.* The 68000 microprocessor used in Macintosh-family computers has 16 registers that can be used as index registers.

index system: Like the index in a book, a list that shows the location of all the relevant information on the disc. CD-ROM retrieval software uses the index to find the information you ask for. An index can take up as much room on a CD-ROM as the information it points to.

index variable: A variable whose value changes on each pass through a loop. Often called a *control variable* or *loop variable.*

indirect recursion: A condition in which a procedure calls a second procedure, which in turn calls the first procedure. Synonymous with *mutual recursion.* See also **recursion.**

infinite loop: A section of a program that will repeat the same sequence of actions indefinitely.

infinity: A special bit pattern produced by the **Standard Apple Numerics Environment (SANE)** when a mathematical calculation should result in an exact mathematical infinity, or when a calculation produces a number with magnitude too great for the intended real-number format.

information service: A large database that you can subscribe to for news, stock quotations, and other services and information. You communicate with these services through your computer equipped with a modem.

information window: The window that appears when you select an icon and choose Get Info from the File menu. It supplies information such as size, type, and date, and it includes a comment box for adding information.

initialization segment: A segment in an initial load file that is loaded and executed independently of the rest of the program. It is commonly executed first, to perform any initialization that the program may require.

initialize: (1) To set to an initial state or value in preparation for some computation. (2) To prepare a blank disk to receive information by organizing its surface into tracks and sectors; same as *format.*

initialized disk: A disk that has been organized into tracks and sectors by the computer and is therefore ready to store information.

initial load file: The first file of a program to be loaded into memory. It contains the program's main segment and the load file tables (Jump Table segment and Pathname segment) needed to load dynamic segments and run-time libraries.

inode: A data structure that defines a file by describing the disk layout of the file data, its permissions, and its access times.

input: (n.) Information transferred into a computer from some external source, such as the keyboard, a disk drive, or a modem. (v.) To transfer information in such a way. Compare **output.**

input buffer. See **print buffer.**

input device: A device that sends information to the microprocessor. The mouse and keyboard are the Macintosh's primary input devices. Compare **output device.**

input driver: A device driver that receives serial data via a serial port and transfers it to an application.

input mode: The state whereby a program (such as a text editor) accepts the characters you type as data rather than commands. Also called *insert mode.*

input/output (I/O): The process by which information is transferred between the computer's memory and its keyboard or peripheral devices.

input routine: A machine-language routine that performs the receiving of characters. The standard input routine reads characters from the keyboard. A different input routine might, for example, read them from an external terminal. Compare **output routine.**

insertion point: (1) The place in a document where something will be added, represented by a blinking vertical bar. You select the insertion point by clicking where you want to make the change in the document. (2) An empty selection range.

insert mode: See **input mode.**

installation: The process of adding or changing information in the System Folder or System file of a disk. For example, the Installer on the *Workstation Installer* disk installs AppleShare software and updates the system files.

installed font: A font in a specific size that you install in the System file of a startup disk by using installation software or the Font/DA Mover.

Installer: A utility program that lets you choose an Installation script for updating your system software or adding resources.

instruction: A unit of a machine-language or assembly-language program corresponding to a single action for the computer's processor to perform.

instruction set: The complete range of instructions a microprocessor can interpret. Each brand of microprocessor has its own instruction set.

int: In C, a 16-bit integer data type whose range is –32,768 to 32,767.

integer: A whole number in fixed-point form. Compare **real number.**

Integer BASIC: A version of the BASIC programming language used by the Apple II family of computers. Integer BASIC is older than Applesoft BASIC and is capable of processing numbers in integer (fixed-point) form only. Many games are written in Integer BASIC because its instructions can be executed very quickly. Compare **Applesoft BASIC.** See also **BASIC.**

integrated circuit (IC): An electronic circuit—including components and interconnections—entirely contained in a single piece of semiconducting material, usually silicon. Often referred to as a *chip.*

integrated software: A group of application programs, usually on one disk, designed to share data.

intelligent card: A card containing one or more processors that can work independently from the main processor of the computer.

intelligent device: A device that contains a microprocessor and a program that allows the device to interpret data sent to it as commands that the device is to perform.

interactive: Operating by means of a dialog between a computer system and a human user.

interactive editor: A utility for entering and manipulating text while you view the text. The `vi` and `ed` editors are both interactive. Compare **stream editor.**

interactive program: A program that allows you to enter additional commands and data during its execution instead of making you enter all of your commands and data as flag options and arguments on the command line. The `vi` and `mail` utilities are examples of interactive programs.

interactive protocol: A protocol that lets you communicate interactively with a host computer. In this kind of protocol, part or all of the contents of the screen memory are sent to the host when you press the Return key. You do not have to communicate with the host by sending it disk files.

interface: (n.) (1) The point at which independent systems or diverse groups interact. The devices, rules, or conventions by which one component of a system communicates with another. Also, the point of communication between a person and a computer. (2) The part of a program that defines constants, variables, and data structures, rather than procedures. In C, the compile-time and run-time linkage between your program and Toolbox routines. (3) The equipment that accepts electrical signals from one part of a computer system and renders them into a form that can be used by another part. (4) Hardware or software that links the computer to a device. (v.) To convert signals from one form to another and pass them between two pieces of equipment.

interface card: A card that handles the interface (or connection) between the computer and a particular peripheral device, such as a printer, a disk drive, or a modem.

interface routine: A routine called from Pascal whose purpose is to trap to a certain ROM or library routine.

interlock: In a machine such as a printer, a safety device that prevents operation under certain conditions, such as when the cover is open.

internal command: An APW Shell command that is executed by the shell program itself, rather than by a utility program.

internal font: A font stored in the printer's internal read-only memory. An internal font is printed when the printer is in text mode (that is, not printing graphics) and receives printable ASCII characters. Also called a *built-in font.* Compare **bitmapped font.** See also **printer font, screen font.**

International Utilities package: A Macintosh package that gives you access to country-dependent information such as the formats for numbers, currency, dates, and times.

internet: (1) A worldwide, interconnected group of networks. Internally, the internet is composed of heterogeneous networks (such as ARPANET and CSNET) that use different message formats and protocols. Through the use of gateways that convert formats and protocols between networks, the internet appears externally as a single network, with hosts on interconnected networks appearing as interconnected hosts. (2) Any interconnected group of networks, whether or not it's on the worldwide internet; for example, an interconnected group of AppleTalk network systems. Network users in an internet can share information and network devices.

internet address: (1) An address for a computer on a network. The internet address consists of a network number and a host number that is unique for that network. (2) The AppleTalk address and network number of a socket.

interpreter: A language translator that reads a program instruction-by-instruction and immediately translates each instruction for the computer to carry out. Compare **compiler, assembler.**

interrupt: (1) An electronic attention-getter; a signal sent to the microprocessor that is intended to force the microprocessor to stop its current activity and accept input from the device that sent the interrupt. (2) A temporary suspension in the execution of a program that allows the computer to perform some other task, typically in response to a signal from a peripheral device or other source external to the computer. (3) An exception that's signaled to the processor by a device, to notify the processor of a change in condition of the device, such as the completion of an I/O request.

interrupt character: The keyboard character that, when pressed, interrupts execution of a program and returns you to the shell prompt. By default, Control-C is A/UX's interrupt character.

interrupt handler: A routine that services interrupts. A program, associated with a particular external device, that executes whenever that device sends an interrupt signal to the computer. The interrupt handler performs its tasks during the interrupt, then returns control to the computer so it may resume program execution.

interrupt priority level: A number identifying the importance of the interrupt. It indicates which device is interrupting and which interrupt handler should be executed.

interrupt vector: A pointer to an interrupt handler.

interrupt vector table: A table maintained in memory by ProDOS 16 that contains the addresses of all currently active (allocated) interrupt handlers.

INTERSEG record: A part of a relocation dictionary. It contains relocation information for external (intersegment) references.

inumber: The offset of a particular **inode** within the ilist.

in-use light: A light that comes on when your disk drive is in use; sometimes called the *disk-use light.* When the light is off, it's safe to put disks in and take disks out of the drive. When the light is on, don't try to eject the disk or open the disk drive door.

inverse video: The display of text on the computer's display screen in the form of dark dots on a light (or other single phosphor color) background, instead of the usual light dots on a dark background. See also **highlight.**

invert: To highlight by changing white pixels to black and vice versa.

I/O: See **input/output.**

I/O device: Input/output device. A device that transfers information into or out of a computer. See **input, output, peripheral device.**

I/O error message: A message you get when there's a problem with the way information is being exchanged with peripheral devices.

I/O link: A fixed location that contains the address of an input/output subroutine in the computer's Monitor program.

I/O queue: See **driver I/Oqueue, file I/O queue.**

I/O redirection: See **redirection.**

I/O request: A request for input from or output to a file or device driver; caused by calling a File Manager or Device Manager routine asynchronously.

IRQ: A 65C816 signal line that, when activated, causes an interrupt request to be generated.

ISO: Acronym for *International Standards Organization.* ISO standard 9660 is very similar, but not identical, to the **High Sierra format.**

item: In dialog and alert boxes, a control, icon, picture, or piece of text, each displayed inside its own display rectangle. See also **menu item.**

item list: A list of information about all the items in a dialog or alert box.

IWM: "Integrated Woz Machine"; the custom chip that controls the Apple 3.5-inch disk drives.

jacket: See **disk jacket.**

jewel case: A plastic case that protects the disc when it's not in use. When you buy a CD-ROM or an audio CD, it comes in a jewel case.

job: A process that can be stopped, restarted, and moved between foreground and background processing from the C shell.

job dialog: A dialog box that sets information about one printing job; associated with the Print command.

job number: The identification number of a process executed in background under the C shell. The job number appears next to the command name when you execute the `jobs` command.

journaling mechanism: A mechanism that allows a program to feed events to the Toolbox Event Manager from some source other than the user.

joystick: A peripheral device with a lever, typically used to move creatures and objects in game programs. A joystick can also be used in

applications such as computer-aided design and graphics programs.

jump table: A table that contains one entry for every routine in an application or MPW tool, and is the means by which the loading and unloading of segments is implemented.

Jump Table: A table contructed in memory by the System Loader from all Jump Table segments encountered during a load. The Jump Table contains all references to dynamic segments that may be called during execution of the program.

Jump Table directory: A master list in memory, containing pointers to all segments that make up the **Jump Table.**

Jump Table segment: A segment in a load file that contains all references to dynamic segments that may be called during execution of that load file. The Jump Table segment is created by the linker. In memory, the loader combines all Jump Table segments it encounters into the **Jump Table.**

justification: The horizontal placement of lines of text relative to the edges of the rectangle in which the text is drawn.

justification gap: The number of pixels that must be added to a line of text to make it exactly fill a given measure. Called *slop* in the interface code.

Glossary K–L

K: See **kilobyte.**

Kbit: See **kilobit.**

Kbyte: See **kilobyte.**

kern: To draw part of a character so that it overlaps an adjacent character.

kernel: (1) The central part of an operating system. ProDOS 16 is the kernel of the Apple IIgs operating system. (2) A UNIX program that manages the system hardware. For example, the kernel manages files, communicates with peripherals, and handles other low-level resource management tasks.

key block: The first block in any ProDOS 16 file.

keyboard: The set of keys, similar to a typewriter keyboard, used for entering information into the computer. See also **numeric keypad.**

keyboard-based application: An application that accepts input only from a keyboard, as compared with a mouse-based application.

keyboardconfiguration: A resource that defines a particular keyboard layout by associating a character code with each key or combination of keys on the keyboard or keypad.

keyboardequivalent: The combination of the Command key and another key, used to invoke a menu item from the keyboard. Also called a *Command-key equivalent.*

keyboard equivalent key: A key you press in conjunction with the Command key to issue a menu command.

keyboardevent: An event generated when the user presses a character key on the keyboard. A *key-down event* is generated when the user presses a character key; a *key-up event* is generated when the user releases a character key. *Auto-key events* are repeatedly generated when the user holds down a character key.

keyboard input connector: The connector inside Apple II–family computers by which the keyboard is connected to the computer.

keyboard shortcut: A keystroke that you can use instead of a mouse action to perform a task. For example, pressing the Command and the X keys at the same time is the same as choosing the Cut command from the Edit menu.

keyboard switch: A switch above the Apple IIc keyboard that allows you to change from the **QWERTY keyboard** to the **Dvorak keyboard** and vice versa.

Key Caps: A desk accessory that shows you the optional character set available for a given font family.

key code: An integer representing a key on the keyboard or keypad, without reference to the character that the key stands for.

key-downevent: An event generated when the user presses a character key on the keyboard or keypad. Compare **key-up event.**

KEYIN: The firmware entry point that a program uses to obtain a keystroke from the currently active input device (normally the keyboard).

keyletter: See **flag option.**

key script: The system that determines the keyboard layout and input method for the user interface. It may be different from the **font script,** which determines how text is displayed.

keystroke: A key or key combination that you assign to a **macro.** When pressed, it triggers the playing of the macro's **script.**

key-up event: An event generated when the user releases a character key on the keyboard or keypad. Compare **key-down event.**

keyword: (1) A word that is likely to appear in the file you're trying to find. (2) A special word or sequence of characters that identifies a particular type of statement or command, such as `RUN`, `BRUN`, or `PRINT`.

keyword search: A method of locating information on a CD-ROM. You type the word and the retrieval software searches for that word or derivatives of it.

kHz: See **kilohertz.**

kilobit (Kbit): A unit of measurement, 1024 bits, commonly used in specifying the capacity of memory integrated circuits. Not to be confused with **kilobyte.**

kilobyte (K): A unit of measurement consisting of 1024 (2^{10}) bytes. Thus, 64K memory equals 65,536 bytes. The abbreviation *K* can also stand for the number 1024, in which case *Kbyte* is used for kilobyte. See also **megabyte.**

kilohertz (kHz): A unit of measurement of frequency, equal to 1000 **hertz.** See also **megahertz.**

kind: See **segment kind.**

Korn shell: A command interpreter that combines many of the best features found in the standard System V shell (the Bourne shell) and the standard BSD shell (the C shell). See also **shell.**

KSW: Abbreviation for *keyboard switch;* the symbolic name of the location in the computer's memory where the standard input link (namely, to the keyboard) is stored.

LAN: See **local area network**

land: The area between pits on a CD-ROM track. See also **optical storage, pit.**

language: See **programming language.**

language card: Memory with addresses between $D000 and $FFFF on any Apple II–family computer. It includes two RAM banks in the $Dxxx space, called **bank-switched memory.** The language card was originally a peripheral card for slot 0 of the 48K Apple II or Apple II Plus that expanded memory capacity to 64K and provided space for an additional dialect of BASIC. The langauge card was also necessary for these machines to use ProDOS.

language command: A command that changes the APW current language.

language translator: A system program that reads another program written in a particular programming language and either executes it directly or converts it into some other language (such as machine language) for later execution. See also **assembler, compiler, interpreter.**

laser: An acronym for *light amplification by simulated emission of radiation.* A device that produces an intense source of light that can be focused to a tiny spot.

laser printer: A printer that uses laser light to transfer a page image (sent by a computer) onto an electrostatically charged, light-sensitive drum. A black powder called *toner* adheres to the areas of the drum where the laser has drawn the image. Paper then passes over the drum, picking up the toner, and the toner is heat-fused to the paper as it rolls out of the printer. The Apple LaserWriter and LaserWriter Plus are examples of laser printers. Compare **daisy-wheel printer, dot-matrix printer.**

LaserWriter Namer: An application on the *LaserWriter Installation Disk* that you use to name and rename LaserWriter printers.

last-opened location: The last location whose value you inquired about through the Monitor.

layer: In HyperCard, the order of a button or field relative to other buttons or fields on the same card and background. The object created most recently is ordinarily the topmost object (that is, on the front layer).

leading: Pronounced "LED-ing"; the amount of blank vertical space between the **descent line** of one line of text and the **ascent line** of the next line of single-spaced text. In early typesetting, strips of lead were placed between lines of type for spacing, hence the term. Compare **line spacing.**

leading zero: A zero occurring at the beginning of a number, as when a number must be sent to the printer as a certain number of digits. For example, 20 can be written as a three-digit number with one leading zero: 020.

leafname: A partial pathname that contains no colons. See also **pathname.**

least significant bit: The binary digit in a number or data byte that contributes the smallest quantity to the value of the number; usually written at the right end of the number. Compare **most significant bit.**

Letter Quality: A high-density print quality on the ImageWriter LQ.

level: See **system file level.**

lever: The little flag-like indicator that appears to the right of the time when you choose the Alarm Clock desk accessory. When you click the lever, two panels appear that let you set the time, the date, and the alarm.

library: A collection of related functions or declarations available to a program for linking at compile time.

library dictionary segment: The first segment of a library file; it contains a list of all the symbols in the file, together with their locations in the file. The linker uses the library dictionary segment to find the segments it needs.

library file: An object file containing program segments, each of which can be used in any number of programs. The linker can search through the library file for segments that have been referenced in the program source file.

ligature: A character that combines two letters. For example, the letters *f* and *i* are sometimes combined into a ligature: fi.

line: See **program line.**

line break: The end of a line of text on the screen or on a printed page. You can force a line break by pressing Return, or you can let an application break lines for you.

line-buffered: Describes a buffer style in which each line of output is queued for writing as soon as a newline character is written.

line editor: A utility for entering and manipulating text. The commands to add or change text are entered from a command prompt; they operate only on the lines you specify, and you cannot always see the results of your changes right away. The `ed` and `ex` utilities in A/UX are line editors. Compare **screen editor.**

line feed (LF): (1) An ASCII character (hex $0A) that instructs a printer or video display to advance to the next line. (2) A vertical motion of the platen, moving the paper up or down one print line.

Line Feed button: A button on the control panel of a printer that advances paper one line at a time.

line feed pitch: The number of lines printed per vertical inch.

line kill character: The keyboard character that, when pressed, erases the current command line from the shell. After you press the line kill character, the cursor moves to a new line, and you can enter a new command. Control-U is A/UX's default line kill character.

line length: The number of characters that fit in a line on the screen or on a page.

line number: A number identifying a program line in an Applesoft BASIC program.

line spacing: The vertical distance between two lines of type measured from base line to base line. For example, "10/12" indicates 10-point type with 12 points base-to-base (that is, with 2 points leading). Compare **leading.** See also **base line, point.**

link: (v.) (1) In programming, to collect one or more routines into an executable program. Also, to connect programs compiled or assembled at separate times so that they can be executed together. See also **compiler.** (2) To give an alternative name to a file. Compare **unlink.** (n.) An area in memory that contains an address and a jump instruction to a subroutine. Programs are written to jump to the link address; other programs can modify this address to substitute their own subroutines. COUT and KEYIN are examples of I/O links.

LinkEd: A command language that can be used to control the APW Linker.

linker: A program that combines files generated by compilers and assemblers, resolves all symbolic references, and generates a file that can be loaded into memory and executed.

link map: A listing, produced by the linker, that gives the name, length, and starting location of each segment in a load file.

liquid crystal display: See **flat panel display.**

Lisa: A model of Apple computer; the first computer that offered windows and the use of a mouse to choose commands. The Lisa was later known as the Macintosh XL.

list: To display on a monitor, or print on a printer, the contents of memory or of a file.

List Manager: The part of the Operating System that provides routines for creating, displaying, and manipulating lists.

list record: The internal representation of a list, where the List Manager stores all the information it requires for its operations on that list.

load: To transfer information from a peripheral storage medium (such as a disk) into main memory for use; for example, to transfer a program into memory for execution.

LOAD: An Applesoft BASIC command that clears the current program and variables from memory and brings a new program into memory from a file.

loader: A program that brings files from a disk into the computer's memory.

load file: The output of the linker. Load files contain memory images that the System Loader can load into memory, together with **relocation dictionaries** that the loader uses to relocate references.

load segment: (1) A segment in a load file. Any number of object segments can go into the same load segment. (2) In C, a part of a load file corresponding to one or more functions. Object segments are assigned to load segments at compile time by means of the `#overlay` preprocessor directive or at link time by LinkEd commands. Compare **object segment.**

local: (adj.) Nearby. Capable of direct connection using wires only, as opposed to *remote*, in which case communication devices are necessary.

local area network(LAN): A group of computers connected for the purpose of sharing resources. The computers on a local area network are typically joined by a single transmission cable and are located within a small area such as a single building or section of a building.

local coordinate system: The coordinate system local to a GrafPort, imposed by the boundary rectangle defined in its bit map.

localization: The process of adapting an application to different languages, including converting its user interface to a different script.

local symbol: A label defined only within an individual segment. Other segments cannot access the label. Compare **global symbol.**

local system: The computer from which a user originates a network command. Compare **remote system.**

local system administration: Management of a single computer. This includes such functions as starting up and shutting down the system, adding and removing user accounts, and backing up and restoring data. Compare **network administration.**

LocalTalk cable system: A system of cables, cable extenders, and connector boxes that connect computers and network devices as part of the AppleTalk network system.

LocalTalk connector: A piece of equipment consisting of a connection box, a short cable, and a machine-specific connector, that enables an Apple computer to be part of an AppleTalk network system. Also called a *LocalTalk connector box.*

LocalTalk Option Card: An interface card that enables a printer to serve as many as 31 computers on an AppleTalk network system.

location: See **memory location.**

lock: (1) To prevent documents, files, or entire disks from being altered. Files can be locked with software commands; for example, to lock a document select it and choose Get Info from the File menu, then click the Locked check box in the upper-right corner of the Info window. An entire disk can be physically locked by sliding the small tab on the back of the plastic case of a 3.5-inch disk, or by using a write-protect tab on the disk jacket of a 5.25-inch disk; in this sense *lock* is synonymous with *write-protect.* Compare **unlock.** (2) To prevent a memory block from being moved or purged. A block may be locked or unlocked by the Memory Manager, or by an application through a call to the System Loader. (3) To temporarily prevent a relocatable block from being moved during heap compaction.

locked file: A file whose data cannot be changed.

locked volume: A volume whose data cannot be changed. Volumes can be locked by either a software flag or a hardware setting.

logic: (1) In microcomputers, a mathematical treatment of formal logic using a set of symbols to represent quantities and relationships that can be translated into switching circuits, or *gates.* AND, OR, and NOT are examples of logical gates. Each gate has two states, open or closed, allowing the application of binary numbers for solving problems. (2) The systematic scheme that defines the interactions of signals in the design of an automatic data processing system.

logical block: (1) Volume space composed of 512 consecutive bytes of standard information and an additional number of bytes of information specific to the Disk Driver. (2) A block on a device that can be used by software to store data. Logical blocks on a device are numbered consecutively from 0, but may not directly correspond to their physical block number because of block sparing conducted during initialization of the device. Compare **physical block.**

logical disk: A disk partition that is treated by the operating system as a separate disk. See also **partition.**

logical element: The smallest building block in a computer system that operators can still represent symbolically. The AND gate (switch) is a logical element.

logical end-of-file: The position of one byte past the last byte in a file; equal to the actual number of bytes in the file. Compare **physical end-of-file.**

logical name: The name of a block, file, table, device, or other entity in software that may or may not correspond to its physical name. Compare **physical name.**

logical operator: An operator, such as AND, that combines logical values to produce a logical result, such as true or false; sometimes called a *Boolean operator.* Compare **arithmetic operator, relational operator.**

logic board: See **main logic board.**

log in: To identify yourself to the system by entering the **login name** of your account and your account password. Synonymous with *log on;* opposite of *log off.*

login name: In UNIX systems, the name of a user's account. Used for identification purposes.

login prompt: The prompt (usually `login:` on UNIX systems) by which a system tells you it is ready to accept your login name.

login shell: The shell that automatically runs after you successfully log in. See also **shell.**

Logo: A computer language that encourages learning through discovery. Logo is easy and fun to learn, but powerful enough for application programming. Logo's main feature is turtle graphics; a triangular shape on the screen, called a "turtle," acts as a pen to draw lines and patterns according to Logo instructions the user creates.

log off: To indicate to a system or network that you have completed your work and are terminating interaction.

log on: To identify yourself to a system or network and start to use it. Usually logging on requires a password, depending on the system. Same as *log in;* opposite of *log off.*

long: In C, a 32-bit integer data type. Its range is –2,147,483,648 to 2,147,483,647.

longword: A double-length word. For the Apple IIgs, a longword is 32 bits (4 bytes) long. In 68000 terminology (including the 68020), a longword is two 16-bit words.

loop: A section of a program that is executed repeatedly until a limit or condition is met, such as an index variable's reaching a specified ending value. See **loop.**

loop variable: See **index variable.**

Lo-Res: The lowest-resolution graphics mode on the Apple II family of computers, consisting of an array of blocks 48 rows high by 40 columns wide, with 16 available colors.

low: For an active-low signal, synonymous with active and asserted.

low ASCII characters: Characters with decimal equivalents between 0 and 127, inclusive. Called *low ASCII* because the high bit (leftmost binary digit) is set to 0 rather than 1. The low ASCII characters make up the standard ASCII character set. Compare **high ASCII characters.**

low-level language: A programming language that is relatively close to the form the computer's processor can execute directly. One statement in a low-level language corresponds to a single machine-language instruction. Examples are 6502 machine language, 6502 assembly language, and 68000 machine and assembly languages. Compare **high-level language.**

low-order:(adj.) Describes the least significant part of a numerical quantity. In normal representation, the *low-order bit* of a binary number is in the rightmost position; likewise, the *low-order byte* of a binary word or longword quantity consists of the rightmost eight bits. Compare **high-order.**

low-order byte: The less significant half of a memory address or other two-byte quantity. In the 6502 microprocessor used in the Apple II family of computers, the low-order byte of an address is usually stored first, and

the high-order byte second. The opposite is true for Macintosh computers. Compare **high-order byte.**

low-power Schottky (LS): A type of **transistor-transistor logic (TTL)** integrated circuit having lower power and higher speed than a conventional TTL integrated circuit; named for Walter Schottky (1886–1956), a semiconductor physicist.

low-resolution graphics: The display of graphics on a display screen as a 16-color array of blocks, 40 columns wide and 48 rows high. For example, on a Macintosh when the text window is in use, the visible low-resolution graphics display is 40 by 40 plotting points—that is, 40 by 40 **pixels.** Compare **high-resolution graphics.** Compare **high-resolution mode.**

low-resolution mode: A graphics mode that can display information using a rectangular array of 40 horizontal by 48 vertical blocks. Compare **high-resolution mode.**

`lp` system: A collection of programs and files that are used to manage printer operations. These include the print spooler and a series of maintenance commands.

LQ: Letter Quality; one of the character fonts available on the ImageWriter LQ.

LQ (letter-quality) fonts: Times, Helvetica, Courier, and Symbol fonts in very large sizes. Your Macintosh uses the LQ fonts to produce high-quality output when sending fax files to fax machines.

LS: See **low-power Schottky.**

Glossary M

MacBinary: The default file transfer type used by FT/TSO and FT/CMS (labeled MACBIN in the setup screens).

machine language: The form in which instructions to a computer are stored in memory for direct execution by the computer's processor. Each model of computer processor (such as the 6502 microprocessor or the 68000 microprocessor) has its own form of machine language. See also **assembly language.**

Macintosh: A family of Apple computers, including the Macintosh 128K, Macintosh 512K, Macintosh 512K enhanced, Macintosh Plus, Macintosh SE, and Macintosh II. Macintosh computers have high-resolution screens and use mouse devices for choosing commands and for drawing pictures.

Macintosh Operating System: The combination of ROM-based and disk-based routines that together perform basic tasks such as starting the computer, moving data to and from disks and peripheral devices, and managing memory space in RAM.

Macintosh Programmer's Workshop (MPW): Apple's software development environment for the Macintosh family.

Macintosh User Interface: The standard conventions for interacting with Macintosh computers. The interface ensures users a consistent means of interacting with all Macintosh computers and the applications designed to run on them.

MacPaint document: A document created by the Macintosh MacPaint application, or any application that creates MacPaint-compatible graphics.

macro: (1) A user-defined command that tells an application to carry out a series of commands when you type the macro. (2) A recorded sequence of characters and commands, identified by a name and possibly triggered by a **keystroke.**Using MacroMaker, you can call upon a macro to play while you're working in an application. See also **script.** (3) A single keystroke or command that a program replaces with several keystrokes or commands. For example, the APW Editor allows you to define macros that execute several editor keystroke commands; the APW Assembler allows you to define macros that execute instructions and directives. Macros are almost like higher-level instructions, making assembly-language programs easier to write and complex keystrokes easier to execute.

macro assembler: A type of assembler that allows the programmer to define sequences of several assembly-language instructions as single pseudo-instructions called **macros.**

macro call: A request to execute a macro.

macro header: In an APW macro definition, the directive MACRO.

macro model statement: The line in an APW macro immediately following a MACRO directive.

magnitude: The vertical distance between any given point on a wave and the horizontal line about which the wave oscillates.

mail-merge application: An application that takes names and addresses from a database and puts them into form letters.

main: The name of the function that is the entry point for every C program.

main event loop: In a standard Macintosh application program, a loop that repeatedly calls the Toolbox Event Manager to get events and then responds to them as appropriate.

mainframe computer: A central processing unit or computer that is larger and more powerful than a minicomputer or a personal computer (microcomputer). Frequently called *mainframe* for short.

main logic board: A large circuit board that holds RAM, ROM, the microprocessor, custom-integrated circuits, and other components that make the computer a computer.

main memory: The part of a computer's memory whose contents are directly accessible to the microprocessor; usually synonymous with random-access memory (RAM). Programs are loaded into main memory, where the computer keeps information while you're working. Sometimes simply called *memory*. See also **random-access memory, read-only memory, read-write memory.**

main menu: The top level of options in a program having several levels of options. Making a choice from a main menu takes you to another menu.

main segment: The first static segment (other than initialization segments) in the initial load file of a program. It is loaded at startup and never removed from memory until the program terminates.

main unit: The computer "box," which contains the processor, memory, the built-in disk drive(s), the optional internal hard disk, and, on the Macintosh Plus and SE, the screen.

major device number: One of two numbers contained in the inode for a device. The major device number identifies the class of device (such as terminal or disk). Compare **minor device number.**

Make Changes: The AppleShare file server access privilege that gives the right to make changes to a folder's contents.

makefile: A file containing a collection of operations used by the `make` utility to construct related files.

MakeLib utility: A program that creates library files from object files.

manager: A set of data structures and routines that perform a set of related Toolbox or Operating System functions. For instance, the Window Manager handles the display and manipulation of windows on the screen.

manager workstation: A specially equipped workstation that is used to run the AppleShare menu management program.

margin marker: In MacWrite, a black triangle on each side of a ruler that you can move to mark the left or right margin of text. In a new document, the left margin marker is stacked, or aligned, with the **indentation marker.**

Mark: The current position in an open file. It is the point in the file at which the next read or write operation will occur.

MARK parity: A method of error checking in data transmission in which the most significant bit of every byte is set to 1. The receiving device checks for errors by looking for this value on each character. Compare

even parity, odd parity, space parity.

master: (1) A card that initiates the addressing of another card or the central processor on the main logic board. The card addressed is at that time acting as a slave. (2) The glass model that is used to make the metal molds for mass-producing compact discs.

master index block: The key block in a ProDOS 16 tree file, the largest organization of a standard file that ProDOS 16 can support. The master index block consists solely of pointers to one or more index blocks. See also **standard file, tree file.**

master pointer: A single pointer to a relocatable block, maintained by the Memory Manager and updated whenever the block is moved, purged, or reallocated. Each allocated memory block has a master pointer, but the block is normally accessed through its memory handle (which points to the master pointer), rather than through the master pointer itself.

MB: See **megabyte.**
Mbit: See **megabit.**

MC68000, MC68020, MC68851 . . . : See **68000, 68020, 68851. . . .**

megabit (Mbit): A unit of measurement equal to 1,048,576 (2^{16}) bits, or 1024 kilobits, commonly used in specifying the capacity of memory ICs. Not to be confused with **megabyte.**

megabyte (MB): A unit of measurement equal to 1024 kilobytes, or 1,048,576 bytes. See also **kilobyte.**

megahertz (MHz): One million **hertz.** See also **kilohertz.**

Mega II: A custom large-scale integrated circuit that incorporates most of the timing and control circuits of the standard Apple II. It addresses 128K of RAM organized as 64K main and auxiliary banks and provides the standard Apple II video display modes, both text (40-column and 80-column) and graphics (Lo-Res, Hi-Res, and Double Hi-Res).

memory: A hardware component of a computer system that can store information for later retrieval. See also **main memory, random-access memory, read-only memory, read-write memory.**

memory block: A contiguous, page-aligned region of computer memory of arbitrary size, allocated by the Memory Manager. Sometimes simply called a *block.*

memory expansion card: A circuit board that adds extra random-access memory (RAM) to your computer; the card comes with 256K of RAM but can be expanded to 512K, 768K, or 1 megabyte. Also known as a *RAM disk.* Like a disk, it must be formatted with a particular disk operating system to store data. Unlike a disk, it acts like the random-access memory inside the computer, so that any data or program you put on the card can be read and used almost immediately, without making you wait while data comes in from a disk in an external disk drive.

memory handle: The identifying number of a particular block of memory. It is a pointer to the master pointer to the memory block. A handle rather than a simple pointer is needed to reference a movable memory block.

memory image: A portion of a disk file or segment that can be read directly into memory.

memory location: A unit of main memory that is identified by an address and can hold a single item of information of a fixed size. In the Apple II family of computers, a memory location holds one byte, or eight bits, of

information.

Memory Manager: (1) A program in the Apple IIgs Toolbox that manages memory use. The Memory Manager keeps track of how much memory is available and allocates memory blocks to hold program segments or data. (2) The part of the Macintosh Operating System that dynamically allocates and releases memory space in the heap.

memory-mapped I/O: The method used for input and output operations in Apple II computers. Certain memory locations are attached to I/O devices, and I/O operations are just memory load and store instructions.

memory-resident: (adj.) (1) Stored permanently in memory as firmware (ROM). (2) Held continually in memory even while not in use. For example, DOS is a memory-resident program. Compare **disk-resident.**

Memory Segment Table: A linked list in memory, created by the loader, that allows the loader to keep track of the segments that have been loaded into memory.

menu: A list of choices presented by a program, from which you can select an action. In the desktop interface, menus appear when you point to and press menu titles in the **menu bar.** Dragging through the menu and releasing the mouse button while a command is highlighted chooses that command.

menu bar: The horizontal strip at the top of the screen that contains menu titles.

menu definition procedure: A procedure called by the Menu Manager when it needs to perform type-dependent operations on a particular menu (for example, when it needs to draw the menu).

menu item: A choice in a menu, usually a command to the current application. See also **item.**

Menu Manager: The part of the Toolbox that deals with setting up menus and letting the user choose from them.

menu record: The internal representation of a menu, where the Menu Manager stores all the information it needs for its operations on that menu.

menu title: A word, phrase, or icon in the menu bar that designates one menu. Pressing on the menu title causes the title to be highlighted and its menu to appear below it.

message: A command you send to HyperCard through a script or through the Message box. Some examples of HyperTalk messages are `Go`, `Show`, `Hide`, `Pop Card`, and `Push Card`.

message list: An argument that allows you to specify a group of mail messages by number or name to various `mailx` commands.

messages: A group of system calls that allow processes to communicate by sending formatted data streams to each other.

metacharacter: A character interpreted by a program as standing for other characters or as designating a special function. For example, the ampersand (&) metacharacter at the end of a command line causes the shell to run the command as a background job.

m flag: One of three flag bits in the 65C816 processor that programs use to control the processor's operating modes. In **native mode,** the setting of the m flag determines whether the accumulator is 8 bits wide or 16 bits wide. See also **e flag, x flag.**

MHz: See **megahertz.**

microcomputer: A computer, such as any of the Apple II or Macintosh computers, whose processor is a **microprocessor.**

microprocessor: An integrated circuit on the computer's main circuit board. The microprocessor carries out software instructions by directing the flow of electrical impulses through the computer. The microprocessor is the **central processing unit (CPU)** of the microcomputer. Examples are the 6502 or 65C02 microprocessor used in the Apple IIe, the 65C816 microprocessor used in the Apple IIgs, and the 68000 microprocessor used in the Macintosh Plus. See also **processor.**

microsecond (ms): One millionth of a second.

MIDI: Acronym for *Musical Instrument Data Interface;* a standard interface for electronically created music.

MIDI synthesizer: A Sound Manager synthesizer that interfaces with external synthesizers via a Musical Instrument Data Interface (MIDI) adapter connected to one of the serial ports.

millisecond (ms): One thousandth of a second.

mini-assembler: A part of the Apple IIgs **Monitor program** that allows you to create small assembly-language test routines. See also **assembler.**

mini-window: A type of box that has some but not all features of a regular window. You can reposition a mini-window by dragging its top bar and close it by clicking its close box; however, a mini-window does not have a title and is nonscrolling. In HyperCard, the Message box, Patterns palette, and Tools palette are examples of mini-windows.

minor device number: One of two numbers contained in the inode for a device. The minor device number provides a unit number for the device. Compare **major device number.**

missing symbol: A character that is drawn in the case of a request to draw a character that's missing from a particular font.

MLI: Abbreviation for *Machine Language Interface;* the part of ProDOS 8 that processes operating-system calls.

mnemonic: A type of abbreviation consisting of a series of letters and/or numbers that represent a longer or more complicated name or title. A mnemonic is characterized by being relatively easy to remember.

mode: (1) Any of several ways a computer interprets information. (2) A state of a computer or system that determines its behavior. A manner of operating.

modem: Short for *modulator/demodulator;* a peripheral device that links your computer to other computers and information services using the telephone lines.

modem command: An instruction to a computer system, usually typed from the keyboard, that directs a modem attached to the computer to perform some immediate action.

modem eliminator: A short cable for connecting two Data Terminal Equipment (DTE) devices together without a Data Communication Equipment (DCE) device.

modem port: One of two serial interface ports on the Macintosh computers and on the Apple IIc and IIgs. May be marked by a telephone handset icon.

mode switch: A four-position switch on the back of the LaserWriter that lets you place the LaserWriter in another mode of operation for programming the printer, for emulating a Diablo 630, and so on.

modification date: An attribute of a ProDOS 16 file; it specifies the date on which the content of the file was last changed.

modification time: An attribute of a ProDOS 16 file; it specifies the time at which the content of the file was last changed.

modifier: A program that interprets and processes Sound Manager commands as they pass through a channel.

modifier key: A general term for a key that generates no keyboard events of its own but changes the meaning of other keys or mouse actions; for example, Caps Lock, Command, Control, Apple, Option, and Shift. When you hold down or engage a modifier key while pressing another key, the combination makes that other key behave differently. Sometimes called a *control key.* Compare **character key.**

modulate: To modify or alter a signal so as to transmit information. For example, conventional broadcast radio transmits sound by modulating the amplitude (amplitude modulation, or AM) or the frequency (frequency modulation, or FM) of a carrier signal. Compare **demodulate.**
monitor: See **video monitor.**

Monitor program: A system program built into the firmware of some computers, used for directly inspecting or changing the contents of main memory and for operating the computer at the machine-language level. The Monitor program activates the disk drive when you turn on the computer.

monochrome monitor: A monitor capable of displaying in only one color; a black-and-white, amber-and-black, or green-and-black monitor.
monospaced font: See **fixed-width font.** Compare **proportional font.**

MOS: Acronym for *metal oxide semiconductor;* a method of making semiconductor integrated circuits using layers of silicon and silicon dioxide. See also **CMOS.**

most significant bit: The binary digit in a number or data byte that contributes the largest quantity to the value of the number; usually written at the left end of the number. For example, in the binary number 10110 (decimal value 22), the leftmost bit has the decimal value 16 (2^4). Compare **least significant bit.**

mount: To install a file system onto the directory hierarchy. Compare **unmount.**

mounted volume: A volume that has been inserted into a disk drive and has had descriptive information read from it by the File Manager.

mouse: A small device you move around on a flat surface next to your computer. The mouse controls a pointer on the screen whose movements correspond to those of the mouse. You use the pointer to select operations, to move data, and to draw with in graphics programs.

mouse-based application: An application that accepts input from a mouse, as compared with a keyboard-based application.

mouse button: The button on the top of the mouse. In general, pressing the mouse button initiates some action on whatever is under the pointer, and releasing the button confirms the action. Compare **button.**

mouse-down event: An event generated when the user presses the mouse button.

mouse event: An event generated when the user presses and releases the mouse button. A *mouse-down event* is generated when the user presses the mouse button. A *mouse-up event* is generated when the user releases the mouse button.

mouse keys: An Easy Access feature that lets you manipulate the pointer using the 10-key numeric keypad instead of the mouse. See also **Easy Access.**

mouse scaling: A feature that causes the cursor to move farther during a mouse stroke than it would have otherwise, provided the change in the cursor's position exceeds the mouse-scaling threshold within one tick after the mouse is moved.

mouse-scaling threshold: A number of pixels that, if exceeded by the sum of the horizontal and vertical changes in the cursor position during one tick of mouse movement, causes mouse scaling to occur (if that feature is turned on); normally six pixels.

MouseText: Special characters, like check marks and little apples, used in some mouse-based applications.

mouse-up event: An event generated when the user releases the mouse button.

movable: A memory block attribute, indicating that the Memory Manager is free to move the block. Opposite of **fixed.** Only **position-independent** program segments may be in movable memory blocks. A block is made movable or fixed through Memory Manager calls.

move: To change the location of a memory block. The Memory Manager may move blocks to consolidate memory space.

MPW: See **Macintosh Programmer's Workshop.**

MPW Shell: The application that provides the environment within which the other parts of the Macintosh Programmer's Workshop operate. The shell combines an editor, command interpreter, and built-in commands.

MPW tool: An executable program (type `'MPST'`) that is integrated with the MPW Shell environment, as opposed to an **application,** which runs stand-alone.

MS-DOS: The Microsoft Disk Operating System. This is the operating system that governs the IBM PC (under the version PC-DOS) and compatible computers.

MultiFinder: A first-generation multitasking operating system for Macintosh computers that makes it possible to have several applications open at the same time, including background applications that let you perform one task while the computer performs another.

multilaunch application: An application stored on a server that several users can open and use at the same time.

multipart forms: Preprinted forms consisting of an original and one or more attached copies. Such forms can be purchased in pin-feed paper format for use with computer printers.

multiplex: To encode information so that fewer wires are needed to transmit it, and the same cable wires and connector pins can transmit different kinds of information. The NuBus multiplexes information so that

32-bit address and data communication can be performed using a single 96-pin connector and still have adequate pins available for other necessary functions. Specifically, 32 pins are used to transmit a memory address and the same 32 pins (at a different time) to transmit data.

multitasking: A process that allows a computer to perform two or more tasks during a given period of time; it is accomplished by alternating the actions of the computer between tasks. The method by which operating systems, such as A/UX, allow the user to open and run several applications at the same time. For example, multitasking would allow you to receive information from AppleLink, write a memo in MacWrite, and print an Excel spreadsheet—all at the same time.

multi-user: (adj.) Characterizes a mode or ability of an operating system to support several people using the same computer at once.

multi-user document: A document stored on a server that more than one user can open and make changes to at the same time.

multi-user system: An operating system, such as A/UX, that allows many users to access application software simultaneously.

mutual recursion: See **indirect recursion.**

Glossary N–O

NaN: “Not a Number”; a SANE representation produced when an operation cannot yield a meaningful result.

nanosecond (ns): One billionth of a second.

native mode: The 16-bit operating configuration of the 65C816 microprocessor.

Near Letter Quality: A medium-speed, medium-density print quality on the ImageWriter LQ.

nest: To place folders inside other folders. See also **hierarchical file system.**

nested loop: A loop contained within the body of another loop and executed repeatedly during each pass through the outer loop. See also **loop.**

nested subroutine call: A call to a subroutine from within the body of another subroutine.

network: A collection of interconnected, individually controlled computers, together with the hardware and software used to connect them. A network allows users to share data and peripheral devices such as printers and storage media, to exchange electronic mail, and so on.

network administration: Management of the software and hardware that connects computers in a network. This includes such functions as assigning addresses to hosts, maintaining network data files across the network, and setting up internetwork routing. Compare **local system administration.**

network administrator: The person who is responsible for setting up and maintaining the network.

network connection: A combination of hardware and software that lets you set up a particular implementation of the AppleTalk network system, such as LocalTalk or EtherTalk.

networkevent: An event generated by the AppleTalk Manager.

Network File System (NFS): A protocol suite developed and licensed by Sun Microsystems that allows different makes of computers running different operating systems to easily share files and disk storage.

New Envelope Stack: An icon in the upper-left part of the AppleFax document window. Dragging the New Envelope Stack to the Envelope View creates an envelope.

newline: Any character, but usually the return character (ASCII code $0D), that indicates the end of a sequence of bytes. A/UX interprets the ASCII line feed character ($0A) as newline, which can be invoked by pressing Return or by pressing Control-J. On the terminal, this character starts a new line by moving the cursor to the first position of the next line. In APW C, newline (`\n`) is equivalent to **carriage return**(`\r`).

newline mode: A mode of reading data in which the end of the data is indicated by a newline character (and not by a specific byte count).

next changeable location: The memory location immediately following the **last opened location.**

NFS: See **Network File System**

nibble: A unit of data equal to half a byte, or four bits. A nibble can hold any value from 0 to 15.

NIL: Pointing to a value of 0. A memory handle is NIL if the address it points to is filled with zeros. Handles to purged memory blocks are NIL.

9-pin plug: A standard plug, having a maximum of nine connector wires (pins), used to connect various devices to a computer. Standard plugs may have fewer than the maximum number of pins. They have an elongated shape like a flattened letter "D". Compare **DIN connector.**

NLQ: See **Near Letter Quality.**

node: A device that's attached to an AppleTalk network and communicates by means of the network.

nonbreaking space: The character with ASCII code $CA; drawn as a space the same width as a digit but interpreted as a nonblank character for the purposes of word wrap and selection.

noncoordinated font: A font that either is not assigned to a font class or does not have a correctly formatted name. Compare **coordinated font.**

non-HFS: See **flat file system.**

nonrelocatable block: A block whose location in the heap is fixed and can't be moved during heap compaction.

normalized number: A number represented in **floating-point notation** in which the first bit of the significand is a 1. Compare **denormalized number.**

NOT: A unary logical operator that produces a true result if its operand is false, and a false result if its operand is true. Compare **AND, exclusive OR, OR.**

Note Pad: A desk accessory that allows you to enter and edit small amounts of text while working on another document.

note synthesizer: A synthesizer (functionally equivalent to the old square-wave synthesizer) that lets you generate simple melodies and informative sounds such as error warnings.

NTSC: (1) Abbreviation for *National Television Standards Committee,* which defined the standard format used for transmitting broadcast video signals in the United States. (2) The standard video format defined by the NTSC, also called *composite* because it combines all the video information, including color, into a single signal.

NuBus: An **address bus** and **data bus** incorporated into the system architecture of the Macintosh II. The NuBus architecture lets you add a variety of components to the system, by means of **expansion cards** installed in **NuBus expansion slots** inside the Macintosh II. NuBus is a trademark of Texas Instruments.

NuBus expansion slots: The six slots on the main circuit board of the Macintosh II to which you add cards for video monitors and peripheral devices, coprocessors, and network interfaces. See **expansion card.**

NUL: Refers to ASCII character $00; not to be confused with zero, which is ASCII character $30.

null: (1) An undefined value. Null is different from 0; 0 is a value just like other numbers, whereas null means no value at all (of the expected type). A *null string* does not contain anything. For example, `' '` is not a null string because it contains a space character; `''` represents a null string. (2) Any character or character code that has no meaning to the operating system or program interpreting it. (3) A type of attention cycle.

null event: An event reported when there are no other events to report.

null prefix: A prefix of zero length (and therefore nonexistent).

number class: In SANE, a floating-point number can be characterized as zero, normalized, denormalized, infinity, or NaN.

numeric keypad: A calculator-style keypad, either built-in or peripheral, that you can use to type numbers. The layout of numbers on the keypad makes it easier and faster to use than the regular keyboard. Some application programs designate the keys of a numeric keypad as special function keys. See also **keyboard.**

object code: See **object program.**

object file: The form of a routine produced by a language translator such as a compiler or assembler. An object file can be linked to other object files to build a program. Compare **source file.**

object module format (OMF): The general format used in Apple IIgs object files, library files, and load files.

object program: The translated form of a program produced by a language translator such as a compiler or assembler. Also called *object code*. Compare **source program.**

object segment: A segment in an object file. In C, an object segment corresponds to a single function. Compare **load segment.**

odd parity: The use of an extra bit in data transmission set to 0 or 1 as necessary to make the total number of 1 bits an odd number; used as a means of error checking. Compare **even parity, MARK parity, space parity.**

off-line: (adj.) Not currently connected to or under the control of the computer. Used to refer to equipment such as printers and disk drives, information storage media such as disks, and the information they contain. Compare **on-line.**

off-line volume: A mounted volume with all but the volume control block released.

OMF: See **object module format.**

OMF file: Any file in **object module format.**

128K Apple II: Any **standard Apple II** with both main and auxiliary 64K banks of RAM: all models of the Apple IIc and some models of the Apple IIe, including those with the Extended 80-Column Text Card installed. The Apple IIgs is not a 128K Apple II in the strict sense, even though it includes both 64K banks of RAM and is capable of running programs designed for a 128K Apple II.

on-line: (adj.) Currently connected to and under the control of the computer. Used to refer to equipment such as printers and disk drives,

information storage media such as disks, and the information they contain. Compare **off-line.**

on-line help: Assistance you can get from an application program while it's running; for example, HyperCard's disk-based Help system.

on-line volume: A mounted volume with its volume buffer and descriptive information contained in memory.

on/off switch: A switch located on the right side of the ImageWriter LQ, behind the platen knob, that you press to turn the printer on or off.

opcode: See **operation code.**

open: To make available. You open files or documents in order to work with them. A file may not be read from or written to until it is open. In the desktop interface, opening an icon causes a window with the contents of that icon to come into view. You may then perform further actions in the window when it's active.

Open Apple key: A modifier key on the Apple II–family keyboards, marked with an outlined Apple symbol; on newer keyboards, called the *Command key*. The key on the Apple IIgs keyboard is marked with both an Apple symbol and a propeller symbol. Compare **Solid Apple key.**

open architecture: A computer system's ability to use a variety of optional components designed to meet specialized needs, such as video, coprocessing, networking, and so on. An "open" system is one to which a user with no technical background can easily add devices and expansion cards to customize the system.

open collector: A bus driver that drives a line low or doesn't drive it at all.

open driver: A driver that can be read from and written to.

open file: A file with an access path. Open files can be read from and written to.

open permission: Information about a file that indicates whether the file can be read from, written to, or both.

operand: (1) A value to which an operator is applied. Compare **argument.** See also **operator.** (2) In assembly language, the part of an instruction that follows the **operation code.** The operand is used as a value or an address, or to calculate a value or an address. (3) In object module format, an operation code that is followed by a single value that constitutes part of an expression. The value following the operand opcode is acted on by an operator.

operating environment: The overall hardware and software setting within which a program runs. Also called *execution environment.*

operating system: (1) A program that organizes the actions of the parts of the computer and its peripheral devices. (2) Low-level software that controls a computer by performing such basic tasks such as input/output, memory management, and interrupt handling. See also **disk operating system.**

operating-system call: A request to execute a named operating-system function; also, the name of the function itself. OPEN, GET_FILE_INFO, and QUIT are ProDOS 16 operating-system calls.

Operating System Event Manager: The part of the Macintosh Operating System that reports hardware-related events such as mouse-button presses and keystrokes.

Operating System Utilities: Operating-system routines that perform miscellaneous tasks such as getting the date and time, finding out the user's preferred speaker volume and other preferences, and doing simple string comparison.

operation code: The part of a machine-language instruction that specifies the operation to be performed. Often called *opcode.*

operator: (1) A symbol or sequence of characters, such as + or AND, specifying an operation to be performed on one or more values (the operands) to produce a result. (2) In object module format, an operation code that specifies an arithmetic or logical operation in an expression to be performed on one or two variables that precede it. The variables acted on by an operator are identified by **operand** opcodes that precede them. See also **arithmetic operator, binary operator, Boolean operator, relational operator, unary operator.**

optical storage: An information medium in which stored information is readable by a light detector. Information is recorded on CD-ROM discs as a pattern of pits and land (unpitted areas). The photodetector in the optical read head can tell the difference between pits and land by sensing the difference in the amount of light that is reflected.

option: (1) Something chosen or available as a choice; for instance, one of several check box or radio button options. (2) An **argument** whose provision is optional.

optional character set: An alternate character set that includes special symbols, and foreign characters and accents. You view it with the Key Caps desk accessory.

option card: A card that contains electronic circuits that implement specialized functions. Some examples are coprocessors and accelerators.

Option key: A modifier key that gives a different meaning or action to another key you press or to mouse actions you perform. For example, you can use it to type foreign characters or special symbols contained in the optional character set. On the Apple IIgs and some models of the Apple IIe, the Option key replaces the Solid Apple key.

OR: A logical operator that produces a true result if either or both of its operands are true, and a false result if both of its operands are false. Compare **AND, exclusive OR, NOT.**

output: (n.) Information transferred from a computer to some external destination, such as the display screen, a disk drive, a printer, or a modem. Compare **input.** (v.) To transfer information in such a way.

output device: A device that receives information from the microprocessor. The monitor is the Macintosh's primary output device. Compare **input device.**

output driver: A device driver that receives data via a serial port and transfers it to an application.

output routine: A machine-language routine that performs the sending of characters. The standard output routine sends characters to the screen. A different output routine might, for example, send them to a printer. Compare **input routine.**

overflow: The condition that exists when an attempt is made to put more data into a given memory area than it can hold; for example, a computational result that exceeds the allowed range.

override: To modify or cancel an instruction by issuing another one. For example, you might override a DIP switch setting on a printer with an escape sequence.

overrun: The condition that occurs when the processor does not retrieve a received character from the receive data register of the Asynchronous Communications Interface Adapter (ACIA) before the subsequent character arrives. The ACIA automatically sets bit 2 (OVR) of its status register; subsequent characters are lost. The receive data register contains the last valid data word received.

overrun error: See **hardware overrun error, software overrun error.**

owner: The registered AppleShare file server user who created a folder or was assigned ownership of a folder or volume. The owner is named in the Access Privileges window.

Owner: The AppleShare user category that the owners of folders or volumes use to assign access privileges to themselves.

Glossary P–Pk

package: A set of routines and data types that forms a part of the Toolbox or Operating System and is stored as a resource. On the original Macintosh, all packages were disk-based and brought into memory only when needed; some packages are now in ROM.

Package Manager: The part of the Toolbox that lets you access Macintosh RAM-based packages.

packed: (adj.) Describes the condition of a space in memory, allocated to a variable, from which all the unused area has been removed.

packet: A unit of data and its control information transmitted across a network. A single message may be carried by one or more packets.

page: (1) The text and/or graphics that fits on a sheet of paper when printed, depending on the page format. (2) A screenful of information on a video display. In the Apple II family of computers, a page consists of 24 lines of 40 or 80 characters each. (3) (usually Page) An area of main memory containing text or graphic information being displayed on the screen. (4) A segment of main memory 256 bytes long and beginning at an address that is an even multiple of 256. Memory blocks whose starting addresses are an even multiple of 256 are said to be page-aligned. (5) In A/UX, a 4-kilobyte portion of a program that is defined by the kernel for transfer between main memory and disk storage. See also paging.

page fault: An interrupt that causes the page of data or code needed by a program to be read from disk storage into main memory. See also page, paging.

page offset: The left margin of a printed page. The default page offset for both nroff and troff is 1 inch.

page rectangle: The rectangle marking the boundaries of a printed page image. The boundary rectangle, PortRect, and ClipRgn of the printing GrafPort are set to this rectangle.

page swapping: See paging.

page zero: See zero page.

paging: A method by which some operating systems like A/UX store processes that are too large to be held in main memory. When a process is executing, a portion of its code and data resides in main memory. Other portions, divided into pages, are automatically read in from disk storage as needed. When the system runs low on free main memory, the kernel makes more available by writing unneeded pages back out to disk. The kernel shuffles pages in and out of main memory and disk storage like this until the process has executed. Also called page swapping.

Paint text: In HyperCard, text you type using the Paint Text tool. Paint text can appear anywhere, whereas regular text must appear in a field created with the Field tool. When you finalize Paint text by clicking, it becomes part of a picture.

Paint tool: Any HyperCard tool you use to make pictures. Tools include Lasso, Brush, Spray, Eraser, Paint Text, and many others.

palette: (1) The name for a HyperCard tear-off menu when it's been torn off. A palette remains visible on the screen so you can use it without having to pull down the menu. HyperCard has two palettes: Tools and Patterns. (2) The full set of colors available for an individual screen pixel.

paper bail: In the ImageWriter LQ printer, the small metal bar that runs across the top of the platen. Its rollers hold the paper next to the platen. paper clamps: The clamps that keep pin-feed paper from popping off the form-feed tractors in the ImageWriter LQ printer.

paper feed selector: See paper lever.

paper guide: The clear plastic plate that rides between the print head and the platen in the ImageWriter LQ printer.

paper lever: The lever next to the platen knob in the ImageWriter LQ printer. The lever's position determines how the printer moves paper. In its forward position the lever is set for pin feed; in its back position the lever is set for friction feed.

paper load: In the ImageWriter LQ, a function performed on single sheets of paper by the Form Feed button. The paper load function loads and aligns a sheet of paper with the top-of-form line on the printer paper guide; printing begins 1⁄6 inch below the top edge of the paper.

paper rectangle: The rectangle marking the boundaries of the physical sheet of paper on which a page is printed.

paper separator: In the ImageWriter LQ printer, the wire form that keeps incoming paper entering from the rear on the pull tractor separate from paper exiting to the rear.

paper thickness lever: In the ImageWriter LQ printer, the lever at the left end of the platen that sets the friction-feed mechanism for one to six sheets of paper. The rear position is for a single sheet of 16- to 24-pound bond.

parallel communication: A form of data communication in which the eight bits in each byte of data move along eight separate parallel lines inside a single cable.

parallel interface: An interface in which several bits of information (typically eight bits, or one byte) are transmitted simultaneously over different wires or channels. Compare serial interface.

parallel printer: A printer that accepts information from the computer by way of a parallel interface.

parameter: (1) A value passed to or from a function or other routine. (2) An argument that determines the outcome of a command. For example, in the command write(n,msg), n and msg are parameters.

parameter block: (1) A data structure used to transfer information between applications and certain Operating System routines. (2) A set of contiguous memory locations, set up by a calling program to pass parameters to and receive results from an operating-system function that it calls. Every call to ProDOS 16, to the APW Shell, or to SmartPort must include a pointer to a properly constructed parameter block.

parameter list: The list of characteristics whose value or condition determines the precise execution of a SCSI command.

parameter RAM: Battery-powered RAM (20 bytes) contained in the clock chip, where settings such as those made with the Control Panel

desk accessory are preserved.

parent: (1) For a given file or directory, the directory immediately above it in the tree. (2) In Commando, an option or control whose status determines whether a dependent option of control is enabled or disabled.

parity: The sameness of level or count, usually the count of 1-bits in each character, used for error checking in data transmission. See also even parity, MARK parity, odd parity, parity bit, space parity.

parity bit: A redundant bit added to a data byte to check for transmission errors. See also even parity, MARK parity, odd parity, space parity.

parity error: The condition resulting when the parity bit received by a device isn't what was expected.

partial assembly: A procedure by which only specific segments of a program are assembled. If you have performed one full compile followed by one or more partial assemblies on a program, the linker extracts only the latest version of each object segment to be included in the load file.

partial compile: A procedure by which only specific segments of a program are compiled. If you have performed one full assembly followed by one or more partial compiles on a program, the linker extracts only the latest version of each object segment to be included in the load file.

partial pathname: The portion of the pathname following the prefix; a pathname beginning from any directory other than the root directory. When you use a partial pathname in a command, the program usually attaches the prefix to form a full pathname. Compare full pathname.

partition: (n) A portion of a memory device—such as a hard disk or tape—that is treated like a device itself. For example, if you select the 50% Macintosh partition scheme provided by Apple HD SC Setup, your Macintosh volume, shown as a hard disk in the Finder, will take up about half your hard disk. (v) To create partitions.

Partition Descriptor Map (PDM): A 1-block entry in the Device Partition Map consisting of a series of data fields describing the state of a specific partition.

Pascal: A high-level programming language with statements that resemble English phrases. Pascal was designed to teach programming as a systematic approach to problem solving. Named for the philosopher and mathematician Blaise Pascal.

Pascal-compatible function: A function written in Pascal that can be declared in C using the pascal specifier.

pass: A single execution of a loop.

password: (1) A secret word that gives you, but no one else, access to your data or to messages sent to you through an information service. (2) A unique word or set of characters that must be entered before a registered user at a workstation can access a volume on a server.

paste: To place the contents of the Clipboard—whatever was last cut or copied—at the insertion point.

patch: (v.) (1) To replace one or more bytes in memory or in a file with other values. The address to which the program must jump to execute a subroutine is patched into memory at load time when a file is relocated. (2) To replace a piece of ROM code with other, RAM-based system code by means of a new entry into the trap dispatch table. (n.) A resource of type 'PTCH' containing the patched code.

patch code: Software instructions contained in the System file that override some routines in ROM. Patch code is used for periodic upgrades of ROM routines.

pathname: The complete name of a document beginning with the name of the disk (also called the volume name), the name of the subdirectory it's in (if it's in one), and the name of the document. The pathname begins with a slash, and the parts of the pathname are separated by slashes. It's called a pathname because it describes the route to the document. Compare filename. See also full pathname, partial pathname.

Pathname segment: A segment in a load file that contains the cross-references between load files referenced by number (in the Jump Table segment) and their pathnames (listed in the file directory). The Pathname segment is created by the linker.

Pathname Table: A table constructed in memory from all individual Pathname segments encountered during loads. It contains the cross-references between load files referenced by number (in the Jump Table) and their pathnames (listed in the file directory).

path reference number: A number that uniquely identifies an individual access path; assigned when the access path is created.

pattern: An 8-by-8-bit image used to define a repeating design (such as stripes) or tone (such as gray).

PBX: Abbreviation for Private Branch Exchange; an automatic switchboard for handling large concentrations of telephones.

PC board: See printed-circuit board.

PDM: See Partition Descriptor Map.

PEEK: An Applesoft BASIC command that reads information directly from a location in the computer's memory.

period: (1) The time elapsed during one complete cycle of a wave. (2) The 100 nanosecond (ns) period of /CLK consisting of a 75-ns high state and a 25-ns low state.

peripheral: (adj.) At or outside the boundaries of the computer itself, either physically (as a peripheral device) or logically (as a peripheral card). (n.) Short for peripheral device.

peripheral bus: The group of circuits used for transmitting information between the computer and peripheral devices connected to the computer's expansion slots or ports.

peripheral card: A removable printed-circuit board that plugs into one of the computer's expansion slots, allowing the computer to use a peripheral device or to perform some subsidiary or peripheral function.

peripheral device: A piece of hardware—such as a video monitor, disk drive, printer, or modem—used in conjunction with a computer and under the computer's control. Peripheral devices are often (but not necessarily) physically separate from the computer and connected to it by wires, cables, or some other form of interface. Such devices often require peripheral cards.
peripheral interface cable: See SCSI peripheral interface cable.
peripheral slot: See expansion slot.

permissions: Authorization to read, write, or execute a file or directory. Under UNIX operating systems, each capability is assigned on an individual, group, and system-wide basis. Also called the file mode.

phase: (1) A stage in a periodic process; a point in a cycle. For example, the 65C816 microprocessor uses a clock cycle consisting of two phases called F 0 and F1. (2) The relationship between two periodic signals or processes. (3) The amount by which the cycles of one wave precede or lag behind the cycles of another wave of the same frequency. (4) Some fraction of a wave cycle (measured from a fixed point on the wave).

photodetector: A device that detects the light reflected from CD-ROM discs and converts it into signals to the computer for further processing.

photoresist layer: A thin layer of material that is sensitive to light. A laser burns information into the photoresist layer on a glass disk to make a master.

physical block: The blocks on the disk itself, created during initialization, that represent a specific storage capacity on the device medium. A physical block may or may not be a logical block. Compare logical block.

physical disk: The entire set of disk blocks that exist on the actual disk drive hardware.

physical end-of-file: The position of one byte past the last allocation block of a file; equal to one more than the maximum number of bytes the file can contain. Compare logical end-of-file.

physical name: The name of a block, file, table, device, or other entity, used for convenience. A physical name may or may not correspond to the logical name. Compare logical name.

physical size: The actual number of bytes a memory block occupies within its heap zone.

picture: (1) In HyperCard, any graphic or part of a graphic created with a Paint tool. Also, an imported MacPaint document or part of a MacPaint document. (2) A saved sequence of QuickDraw drawing commands (and, optionally, picture comments) that you can play back later with a single procedure call. Also, the image resulting from these commands.

picture comments: Data stored in the definition of a picture that doesn't affect the picture's appearance but may be used to provide additional information about the picture when it's played back.

picture frame: A rectangle, defined as part of a picture, that surrounds the picture and gives a frame of reference for scaling when the picture is played back.

PID: See process ID.

PILOT: Acronym for Programmed Inquiry, Learning, or Teaching; a high-level programming language designed for teachers and used to create computer-aided instruction (CAI) lessons that include color graphics, sound effects, lesson text, and answer checking. SuperPILOT is an enhanced version of the original Apple II PILOT programming language.

pin feed: In the ImageWriter LQ, a paper lever setting that turns on the tractor pin-feed mechanism to drive pin-feed paper into the printer.

pin-feed alignment icon: The icon on the rear of the ImageWriter LQ printer case that shows you where to position the left edge of a sheet of pin-feed paper.

pin-feed paper: Special paper with sprocket holes along both edges that are used to advance paper automatically on a printer. See also fanfold paper.

pipe: (n.) (1) A command line that connects two or more commands in a series so that the output of one command becomes the input to the next. (2) An intermediate file in which data is passed from one process to another. (v.) To connect two or more commands in a series so that the output of one command becomes the input to the next. Synonymous with pipeline.

pipeline: (v.) To automatically execute two or more programs in sequence, where the output of the first file is the input to the next file and so on. Synonymous with pipe. (n.) The entire sequential set of programs executed in this way. A program or file being processed by this sequence of programs is said to be in the pipeline or in the pipe.

pipelining: A feature of a processor that enables it to begin fetching the next instruction before it has finished executing the current instruction. All else being equal, a processor with this feature runs faster than one without it.

pit: A microscopic divot on a CD-ROM track designed to be detected by a photo detector. See also land, optical storage.

pitch: The distance between printed characters. ImageWriter LQ pitch is either fixed or proportional.

pixel: Short for picture element; the smallest dot you can draw on the screen. Also a location in video memory that corresponds to a point on the graphics screen when the viewing window includes that location. In the Macintosh monochrome display, each pixel can be either black or white, so it can be represented by a bit; thus, the display is said to be a bitmap. For color or gray-scale video, several bits in RAM may represent the image; in the Super Hi-Res display on the Apple IIgs, each pixel is represented by either two or four bits. Thus, the display is not a bitmap but rather a pixel map.

pixel map: A set of values that represents the positions and states of the set of pixels making up an image. Compare bitmap.

Glossary Pl–Pz

plain envelope: An envelope that has been addressed with an AppleFax address or an AppleFax-distribution list. Plain envelopes can hold fax files and Macintosh files; plain envelopes must be sent to AppleFax Stations.

plain text document: A document that you can open, read, and print without having to use a full-feature word processing application. To read plain text documents, use the TeachText application on the *System Tools* disk. See also **Read Me document.**

plane: The front-to-back position of a window on the desktop.

platen: The rubber roller in a printer that provides support for the paper while the printhead prints on it.

platen knob: The knob at the right side of the ImageWriter LQ printer. Turning the knob clockwise advances paper into and out of the printer.

plotter: A peripheral device that allows you to draw charts and graphs by means of pens whose movements are controlled by the computer.

plotting vector: A code representing a single step in drawing a shape on the high-resolution graphics screen. The plotting vector specifies whether to plot a point at the current screen position, and in what direction to move (up, down, left, or right) before processing the next vector. See also **shape definition, shape table.**

PMMU: The Motorola 68851 Paged Memory Management Unit, which allows an operating system to quickly reconfigure the arrangement of memory without physically moving data, so that different tasks can be "swapped" within the same space. The PMMU chip is needed with multitasking operating systems such as A/UX.

point: (1) A unit of measurement for type. Twelve points equal 1 pica, and 6 picas equal 1 inch; thus, 1 point equals approximately 1/72 inch. (2) The intersection of a horizontal grid line and a vertical grid line on the coordinate plane, defined by a horizontal and a vertical coordinate.

pointer: (1) A small shape on the screen that follows the movement of the mouse or shows where your next action will take place. The pointer can be an arrow, an I-beam, a crossbar, or a wristwatch. (2) An item of information consisting of the memory address of some other item. For example, Applesoft BASIC maintains internal pointers to the most recently stored variable, the most recently typed program line, and the most recently read data item, among other things. The 6502 uses one of its internal registers as a pointer to the top of the stack.

point of call: The point in a program from which a subroutine or function is called.

POKE: An Applesoft BASIC command that stores information directly into a location in the computer's memory.

polling: An option that enables a fax station at one location to automatically retrieve files and documents from a fax station at another location.

polygon: A sequence of connected lines, defined by QuickDraw line-drawing commands.

pop: To remove the top entry from a **stack,** moving the stack pointer to the entry below it. Synonymous with *pull.* Compare **push.**

port: (n.) (1) A socket on the back panel of a computer where you plug in a cable for connection to a network or a peripheral device. (2) A connection between the central processor unit and main memory or a device (such as a terminal) for transferring data. (v.) To move software from one hardware architecture to another.

positional parameter: A variable set on the command line of a shell script and operating as an argument to the script. This variable is called by number, usually 0 through 9, within the shell script. The number refers to the position of the parameter on the command line.

position independent: Describes code that is written specifically so that its execution is unaffected by its position in memory. It can be moved without needing to be **relocated.**

post: To place an event in the event queue for later processing.

postfix notation: In programming languages, a type of notation in which the variable is followed by the operator (either ++ to increment the variable or – – to decrement the variable). Postfix notation changes the value of the variable after the value has been used. Compare **prefix notation.**

postfix operator: See **postfix notation.**

postprocessor: A utility that accepts as its input the output from another utility. For example, `psdit` is a postprocessor that accepts `troff` output and transforms it into a form suitable for printing on Apple LaserWriters and other PostScript-supported printers.

power: In the CloseView utility, the level of magnification. For example, with the power set at 4x, screen images appear four times as large when magnified.

power cord: A cord used solely to connect a device to its source of electricity. Some devices, such as most disk drives, do not require a separate power cord.

powerkey: In HyperCard, one of a number of keys on the Macintosh keyboard you can press to initiate a menu action when a Paint tool is active. Power keys are enabled when you choose Power Keys from the Options menu or check Power Keys on the User Preferences card in the Home stack.

power light: A light that glows when a computer or peripheral device is turned on.

Power On key: A key on the keyboard that starts the MacintoshII.

power socket: The socket at the back of a device such as a hard disk, computer, or printer into which you plug the power cord.

power strip: A device that plugs into one three-hole, grounded outlet but can accommodate four or six three-pronged plugs. A power strip is a must if you have more than two devices that need to be plugged into a three-hole, grounded outlet.

power supply: A circuit that draws electrical power from a power outlet and converts it to the kind of power the computer can use.

power supply case: The metal case inside most Apple II and Macintosh computers that houses the power supply. The Apple IIc uses an external power supply case.

power switch: A switch on the computer or printer that you turn on when you want to use it.

PR#: An Applesoft BASIC command that sends output to a slot or a machine-language program; it specifies an output routine in the ROM on a peripheral card or in a machine-language routine in RAM by changing the address of the standard output routine used by the computer. For example, in the Apple II family of computers `PR#1` sends output to the device located in slot 1, and `PR#0` returns output to the video display.

precedence: The order in which operators are applied in evaluating an expression. Precedence varies from language to language but usually resembles the precedence rules of algebra.

prefix: (1) The first part of a pathname—the name of the disk and, if you like, the name of a subdirectory. Applications that ask you to type a pathname usually let you set a prefix so you don't have to type the complete pathname every time you want to work with a document on a particular disk or in a particular subdirectory. Once the prefix is set, all you do is type the rest of the pathname. (2) A designation for a place that an application can store files. Many applications require the prefix to be the same as the pathname. Some applications allow you to set the prefix from within the application. See also **full pathname, partial pathname.**

prefix notation: In programming languages, a type of notation in which the variable is preceded by the operator (either ++ to increment the variable or – – to decrement the variable). Prefix notation changes the value of the variable before using its value. Compare **postfix notation.**

prefix number: A code used to represent a particular prefix. Under ProDOS 16, there are nine prefix symbols, consisting of the numerals 0 through 7 and the asterisk followed by a slash: `0/`, `1/`, ... `7/`, and `*/`.

premastering: The process of writing information onto a 9-track tape, which is then used to create a master compact disc.

preprocessor: (1) A utility used to transform data that is then written to another utility. For example, `tbl` is a preprocessor that formats tables from properly coded text files; the output of this processor is usually piped to a more general text formatter like `troff`. (2) A function of certain compilers that provides file inclusion, comment deletion, and macro substitution.

preprocessor symbol: In C, one of a set of constants defined to be 1, equivalent to writing `#define` *symbol* `1` at the beginning of the source file.

press: (1) To position the pointer on something on the screen and then hold down the mouse button without moving the mouse. (2) To push a key down and then release it; you hold a key down only if you want to repeat a character or if you are using a modifier key with another key.

primary group: The AppleShare group with whom you'll most often be sharing the documents you store on a server. Primary groups are specified by the administrator.

print buffer: Memory in the printer that stores text until it can be printed, as when the data transmission rate exceeds the printing speed. The last line remaining in the print buffer is not printed until a print command is received or a full line of text has been received. The print buffer is sometimes called the *input buffer*. See also **current line, print command.**

print command: A command that causes printing, such as a carriage return. Data in the print buffer is not printed until the buffer contains a full line of text or a print command is received.

print density dial: A dial on the back of the LaserWriter printer that allows you to change how dark or light the image will be on the printed page.

printed-circuit board: A hardware component of a computer or other electronic device, consisting of a flat, rectangular piece of rigid material, commonly fiber glass, to which integrated circuits and other electronic components are connected.

printer: A device that produces a paper copy of the text or graphics you create using your computer. See also **daisy wheel printer, dot matrix printer, laser printer.**

printer command: One or more characters sent to the printer to control some function, such as turning boldface printing on or off, or to cause some action, such as a line feed.

printer driver: A program that controls the exchange of information between a printer and the computer. You must have a separate printer driver for each type of printer that you want to use. See also **print manager.**

printer font: A bitmapped font intended for use by the printer rather than for use on the screen. Compare **screen font.** See also **internal font.**

printer port: A socket on the back panel of the computer marked by a printer icon. In addition to being a connection for a printer, a printer port also serves as the usual attachment point for an LocalTalk connector on Macintosh computers.

printer resource file: A file containing all the resources needed to run the Apple IIgs Printing Manager with a particular printer.

printer software: See **resource.**

print head: In the Apple ImageWriter LQ, the part that moves horizontally along the platen and performs the actual printing.

printing GrafPort: A special GrafPort customized for printing instead of drawing on the screen.

Printing Manager: The routines and data types that enable applications to communicate with the Apple IIgs Printer Driver to print on any variety of printer via the same interface.

printing resource: A system file that lets you print on a corresponding printer attached to the computer. Sometimes called a *printer driver*. See also **resource.**

print line: The bottom line on the paper guide that indicates where the printer begins printing on the paper. The print line is 1⁄6 inch below the top-of-form line and the top edge of the paper.

print log: A chronological list of documents formerly in the print queue.

print manager: A firmware or software program that provides routines for controlling printing. Your program calls the print manager routines, and the print manager calls the **printer driver** for the appropriate printer; this procedure makes it unnecessary for your program to include a separate printing routine for each type of printer you want to support.

PrintMonitor: An application that monitors background printing and provides options intended to give you additional control over what happens to documents you are printing. See also **background processing.**

printout: A paper copy of text and graphics; that which is produced by a printer.

Print Quality light: A set of indicators on the ImageWriter LQ control panel that show whether Draft Quality, Near Letter Quality, or Letter Quality printing is selected for a document produced on an Apple II. Macintosh print quality is determined by software settings.

print queue: A collection of spooled documents, awaiting printing, stored on the print server disk and printed in order.

printrecord: A record containing all the information needed by the Printing Manager to perform a particular printing job.

print server: A combination of software and hardware that stores documents sent to it over the AppleTalk network and manages the printing of those documents on a LaserWriter.

print spooler: A utility that writes a representation of a document's printed image to disk or to memory, schedules it to print in a queue of other jobs, and then prints it.

print wheel: See **daisy wheel.**

procedure: In the Pascal and Logo programming languages, a set of instructions that work as a unit; approximately equivalent to the term **subroutine** in BASIC.

process: An instance of a program in execution. Usually one copy of a program is stored on a UNIX system like A/UX, but multiple instances of the program—each having its own address space—can be executed simultaneously as separate processes.

process ID (PID): A unique number assigned to each process being executed on the system. The PID is listed with its associated command when you enter the `ps` command. The PID is sometimes called a *process number.*

processor: The hardware component of a computer that performs the actual computation by directly executing instructions represented in machine language and stored in main memory. See also **microprocessor.**

processorpriority: Bits 8 to 10 of the 68000 status register, indicating which interrupts will be processed and which will be ignored.

process scheduling: Multitasking process management performed by the kernel. The central processor unit (CPU) can only execute processes one at a time. By equitably scheduling their execution, the kernel lets multiple processes share the CPU efficiently.

process status: The names, states, and process numbers of commands submitted for execution; the `ps` command displays this information.

ProDOS: A family of disk operating systems developed for the Apple II family of computers. ProDOS stands for *Professional Disk Operating System* and includes both **ProDOS 8** and **ProDOS 16.** Compare **DOS 3.3, DOS 3.2.**

ProDOS 8: A disk operating system developed for standard Apple II computers. It runs on 6502-series microprocessors and on the Apple IIgs when the 65C816 processor is in 6502 **emulation mode.**

ProDOS 16: A disk operating system developed for 65C816 **native mode** operation on the Apple IIgs. It is functionally similar to **ProDOS 8** but more powerful.

program: (n.) (1) A set of instructions describing actions for a computer to perform to accomplish some task, conforming to the rules and conventions of a particular programming language. (2) A file containing coded instructions to the computer. A *compiled program* is a file first created in source code and then transformed by the compiler into object code. A *shell program* is a text file that does not need to be compiled, because it is interpreted by the shell. (v.) To write a program.

program disk: A disk that contains an operating system and a self-starting application program.

program line: The basic unit of an Applesoft BASIC program, consisting of one or more statements separated by colons (:).

programmable read-only memory (PROM): A type of ROM device that is programmed after fabrication, unlike ordinary ROM devices, which are programmed during fabrication.

programmer: The author of a program; someone who writes programs.

programming language: A set of symbols and associated rules or conventions for writing programs. For example, BASIC, Logo, and Pascal are programming languages.

program segment: One or more code segments and, optionally, data segments assembled together to perform a function.

PROM: See **programmable read-only memory**

prompt: (1) A message on the screen that tells you of some need for response or action. A prompt is usually in the form of a symbol, a message, a dialog box, or a menu of choices. (2) Short for **prompt character.**

prompt character: A text character displayed on the screen, usually just to the left of a **cursor,** where your next action is expected. The prompt character often identifies the program or component of the system that's prompting you. For example, Applesoft BASIC uses a square bracket prompt character (]); Integer BASIC, an angle bracket (>); and the system Monitor program, an asterisk (*). The Bourne and Korn shells are set by default to display the dollar sign ($) as their prompts; the C shell is set by default to display the percent sign (%) as its prompt.

prompt line: A specific area on the display reserved for a prompt.

proportional font: (1) Any font in which different characters have different widths; thus, the space taken up by words having the same number of letters may vary. For example, in the typeface used here the letter M is wider than the letter I, so that MMMMM produces a wider string than IIIII. (2) A font whose characters all have character widths that are proportional to their image width. Compare **fixed-width font.**

protocol: Short for *communications protocol;* a formal set of rules for sending and receiving data on a communication line. For example, binary synchronous communications (BSC) is a protocol.

Protocol Converter: A set of ROM-based assembly-language routines used to support external input/output devices, such as the Apple Memory Expansion Card and the Apple 3.5 Drive.

protocol handler: A software process in a node that recognizes different kinds of frames by their ALAP type and services them.

pseudorandom numbers: A sequence of numbers, determined by some defined arithmetic process, that is satisfactorily close to a true random

sequence for a given purpose. Microcomputers can generate pseudorandom numbers and thus can simulate games of chance, such as dice-based games and card games.

public-domain software: Software that is free for the taking. You can get it at user group meetings or through computer bulletin boards.

pull: To remove the top entry from a **stack,** moving the stack pointer to the entry below it. Synonymous with *pop.* Compare **push.**

pull-down menu: A menu that is hidden until you move the pointer to its title and press the mouse button.

pull tractor: In the ImageWriter LQ printer, a tractor that pulls pin-feed paper into the printer from either the rear or the bottom of the printer, and feeds it out the rear.

purge: To temporarily deallocate a memory block. The Memory Manager purges a block by setting its master pointer to NIL (0). All handles to the pointer are still valid, so the block can be reconstructed quickly. Compare **dispose.**

purgeable: A memory block attribute, indicating that the Memory Manager may purge the block if it needs additional memory space. Purgeable blocks have different **purge levels,** or priorities for purging; these levels are set by Memory Manager calls.

purgeable block: A relocatable block that can be purged from the heap.

purge level: An attribute of a memory block that sets its priority for purging. A purge level of 0 means that the block cannot be purged.

push: To add an entry to the top of a **stack,** moving the stack pointer to point to it. Compare **pull.**

push tractor: In the ImageWriter LQ printer, a tractor that pushes pin-feed paper under the platen when the paper is fed into the rear of the printer, and feeds it out the top.

Glossary Q–R

Quagmire register: On the Apple IIgs, the name given to the eight bits consisting of the speed control bit and the shadowing bits. Although Quagmire is not a real register, the Monitor program allows you to access those bits as if they were in a single register.

queue: A list in which entries are added at one end and removed at the other, causing entries to be removed in first-in, first-out (FIFO) order. Compare **stack.**

QuickDraw: The part of the Toolbox that performs all graphic operations on the Macintosh screen.

quit return stack: A stack maintained in memory by ProDOS 16. It contains a list of programs that have terminated but are scheduled to return when the presently executing program is finished.

quoting mechanism: Special syntax in the command line that tells the shell to interpret metacharacters literally, or to control the type of substitution allowed in the command.

QWERTY keyboard: The standard layout of keys on a typewriter keyboard; named for the first six letters on the top row of letter keys. Compare **Dvorak keyboard.**

radio-frequency (RF) modulator: A device that makes your television set work as a monitor.

radix: The number of digits in a number system; synonymous with *base.* For example, the base-10 system we commonly use has ten digits (0 through 9); thus, the radix is 10.

radix point: The symbol that separates the integer and fractional parts of a real number. In the base-10 system, the symbol is called the *decimal point;* in the base-2 system, the *binary point.*

RAM: See **random-access memory.**

RAM cache: Random-access memory you can designate to store certain information an application uses repeatedly. Using the RAM cache can greatly speed up your work, but may need to be used sparingly or not at all with applications that require large amounts of memory. You set the RAM cache in the Control Panel.

RAM disk: (1) A memory expansion card, used as a temporary storage area for data. Like a disk, it must be formatted with a particular disk operating system to store data. Unlike a disk, it acts like the random-access memory inside the computer, so that any data or program you put on the RAM disk can be read and used almost immediately, without making you wait while data comes in from a disk in an external disk drive. (2) A portion of RAM that appears to the operating system to be a disk volume. Files in a RAM disk can be accessed much faster than the same files on a disk. See also **ROM disk.**

random-access device: See **block device.**

random-access memory (RAM): The part of the computer's memory that stores information temporarily while you're working on it. A computer with 512K RAM has 512 kilobytes of memory available to the user. Information in RAM can be referred to in an arbitrary or random order, hence the term

random-access. (As an analogy, a book is a random-access storage device in that it can be opened and read at any point.) RAM can contain both application programs and your own information. Information in RAM is temporary, gone forever if you switch the power off without saving it on a disk or other storage medium. An exception is the *battery RAM*, which stores settings such as the time and which is powered by a battery. (Technically, the read-only memory (ROM) is also *random access*, and what's called RAM should correctly be termed *read-write memory.*) Compare **read-only memory.**

random-access text file: A text file that is partitioned into an unlimited number of uniform-length compartments called **records.** When you open a random-access text file for the first time, you must specify its record length. No record is placed in the file until written to. Each record can be individually read from or written to—hence, *random-access.* Compare **sequential-access text file.**

raster: The pattern of parallel lines making up the image on a video display screen. The image is produced by controlling the brightness of successive points on the individual lines of the raster.

raw I/O: Data transferred directly between a device and user address space. Raw I/O bypasses kernel buffers, resulting in faster data transfer.

raw mode: A method of device driver operation that passes data between a terminal and a process without performing any conversions on the data. Compare **cooked mode.**

RDKEY: The firmware routine that a program uses to read a single keystroke from the keyboard.

read: To transfer information into the computer's memory from a source outside the computer (such as a disk drive or modem) or into the computer's processor from a source external to the processor (such as the keyboard or main memory).

Read Me document: A **plain text document** that is included on application and system software disks and provides you with late-breaking information about the product. You'll usually find Read Me documents in the Update Folder on the disk.

read-only memory (ROM): Memory whose contents can be read but not changed; used for storing **firmware.** Information is placed into read-only memory once, during manufacture. It remains there permanently, even when the computer's power is turned off. Compare **random-access memory.**

read-write head: The mechanism in a disk drive that reads data from a disk or writes information to it.

read-write memory: Memory whose contents can be both read and changed (or *written to*). The information contained in read-write memory is erased when the computer's power is turned off and is permanently lost unless it has been saved on a disk or other storage device. Used synonymously with *random-access memory.* Compare **read-only memory.**

read/writepermission: Information associated with an access path that indicates whether the file can be read from, written to, or both read from and written to.

reallocate: To allocate new space in the heap for a purged block, updating its master pointer to point to its new location.

real number: In computer usage, a number that may include a fractional part; represented inside the computer in floating-point notation. Because a

real number is of infinite precision, this representation is usually approximate. Compare **integer.**

real user ID: One of two user IDs associated by the kernel with a process. The real user ID identifies the user who is responsible for the process. Compare **effective user ID.** See also **user ID.**

Recent: In HyperCard, a special dialog box that holds pictorial representations of the last 42 unique cards viewed. Choose Recent from the Go menu to get the dialog box.

recharge routine: The function that supplies data to the output device when **background printing** is taking place.

record: (1) All the information about one person or one thing in a database. (2) A unit of storage in a random-access text file. Every random-access text file can contain a large number of records; each record holds the same number of characters. A program specifies a file's record length (in bytes) when the file is first opened; it must subsequently read and write to specific records within the file. (3) A component of an **object module format** (OMF) segment. All OMF file segments are composed of records, some of which are program code and some of which contain cross-reference or relocation information. Each record begins with an **operation code** that indicates the type of information to follow.

record length: The length of a random-access text file's records, in bytes. The maximum record length is 65,535 bytes in a 16-bit addressable system with all memory free; the minimum is 1 byte.

recursion: The continued repeating of an operation or a group of operations. A recursive procedure or function is one that, while running, calls itself. See also **indirect recursion.**

redirection: A feature of the shell that allows you to pass the output of a command to a file or device instead of to the terminal screen, and to supply a command with input from a file or device instead of from the keyboard.

Reduce or Enlarge: An option in the Page Setup dialog box (File menu) that lets you reduce or enlarge the print on a page, as many copying machines do.

reentrant: (adj.) Describes a routine that is able to accept a call while one or more previous calls to it are pending, without invalidating the previous calls. Under certain conditions, the **Scheduler** manages execution of programs that are not reentrant.

reference: (n.) The name of a segment or entry point to a segment; same as *symbolic reference.* (v.) To refer to a symbolic reference or to use one in an expression or as an address.

region: An arbitrary area or set of areas on the QuickDraw coordinate plane. The outline of a region should be one or more closed loops.

register: A memory location of a specific size in which each bit (or byte, depending on the size and design of the register) has some meaning to a microprocessor, program, or "smart" IC. IC registers are sometimes internal to the IC.

register-basedroutine: A Toolbox or Operating System routine that receives its parameters and returns its results, if any, in registers.

registered user: A user who has been given a user name and password by the AppleShare administrator.

regular expression: A notation that uses a special set of metacharacters for specifying a text pattern. For example, the `vi` and `ex` editors use the caret (^) metacharacter at the beginning of a regular expression to stand for the beginning of a line; therefore, the regular expression ^A stands for the set of all lines that begin with an uppercase *A*.

regular text: In HyperCard, text you type inside a field. You use the Browse tool to set an insertion point in a field and then type. Regular text is editable and searchable, whereas **Paint text** is not.

relational operator: An operator, such as > (greater than), that operates on numeric values to produce a logical result. Compare **arithmetic operator, Boolean operator.**

relative pathname: The name of a file, given by listing the directories leading to that file in relation to the current working directory. Directories common to both the working directory and the file are not included in the relative pathname. Compare **absolute pathname.**

release: When using an AppleShare print server, to remove a printer from a print server's control so that documents can be printed directly. Opposite of **capture.**

released: For an active-low signal, synonymous with high, inactive, deasserted, unasserted, and false.

release lever: The lever on the front of the LaserWriter's upper unit that you unlatch to open the LaserWriter.

relocatable: Characteristic of a load segment or other **OMF** program code that includes no references to specific address and so can be relocated at load time. A relocatable segment can be static, dynamic, or position independent. It consists of a code **image** followed by a **relocation dictionary.** Compare **absolute.**

relocatable block: A block that can be moved within the heap during compaction.

relocate: To modify an **OMF file** or segment at load time so that it will execute correctly at its current memory location. Relocation consists of **patching** the proper values onto address operands. The loader relocates load segments when it loads them into memory. See also **relocatable.**

relocation dictionary: In object module format, a portion of a load segment that contains relocation information necessary to modify the memory image portion of the segment. See also **relocate.**
RELOC record: A part of a relocation dictionary that contains relocation information for local (within-segment) references.

remote: (adj.) At a distance. Unable to be connected directly using wires only, but requiring communications devices. Compare **local.**

remote computer: A computer other than your own but in communication with yours through telephone lines or other communication links. A remote computer can be at any distance from your computer, from right beside it to thousands of miles away.

remote system: On a network, any computer other than the **local system.**

report: A subset of the information in a database. You may have a database with information about your employees—like their names, addresses, phone numbers, birthdays, social security numbers, and salaries. There are times when you want only a list of names and salaries—that's one report. Other times you want names and phone numbers—that's another report. You can generate all sorts of different

reports from one database.

representative area: A small portion of the image that you can use to test changes to any settings. You can display the new results on the screen or print them.

reserved word: A word or sequence of characters reserved by a programming language for some special use and therefore unavailable as a variable name in a program.

reset: To restore all the default settings for a device with one action or command. The ImageWriter LQ can be reset by turning it off and back on (hardware reset) or by sending it an Esc C command (software reset).

Reset key: A key, labeled "Reset" or marked with a triangular symbol, whose function varies depending on the application you're using. On the Macintosh II, you can press Reset in combination with Control and Command to restart an application.

resident: (adj.) Present on; connected to. See **disk-resident, memory-resident.**

resolution: The degree of clarity of your display. A monitor has better resolution than a television set used as a monitor. Resolution is usually specified in dots per inch (dpi). The higher the value, the finer the detail of the image.

resolve: To find the segment and offset in a segment at which a symbolic reference is defined. When the linker resolves a reference, it creates an entry in a **relocation dictionary** that allows the loader to **relocate** the reference at load time.

resource: (1) A file contained in the System Folder that provides information the microprocessor needs to communicate with certain devices attached to the computer system. A *printing resource* is a system file that lets you print on a corresponding printer attached to the computer. (2) Data or code stored in a resource file and managed by the Resource Manager. Synonymous with **driver.**

resource attribute: One of several characteristics, specified by bits in a resource reference, that determine how the resource should be dealt with.
resource compiler: A program that creates resources from a textual description. The MPW Resource Compiler is named *Rez.*

resource data: In a resource file, the data that makes up a resource.

resource description file: In MPW, a text file that can be read by the Resource Compiler and compiled into a resource file. The Resource Decompiler disassembles a resource file, producing a resource description file as output.

resource file: Common usage for the **resource fork** of a Macintosh file.

resource fork: The part of a file that contains data used by an application, such as menus, fonts, and icons. An executable file's code is also stored in the resource fork. Sometimes called a *resource file.*

resource header: At the beginning of a resource file, data that gives the offsets to and lengths of the resource data and resource map.

resource ID: A number that, together with the resource type, identifies a resource in a resource file. Every resource has an ID number.

Resource Manager: A Macintosh tool for editing data in program segments without recompiling them.

resource map: In a resource file, data that is read into memory when the file is opened and that, given a resource specification, leads to the corresponding resource data.

resource name: A string that, together with the resource type, identifies a resource in a resource file. A resource may or may not have a name.

resource reference: In a resource map, an entry that identifies a resource and contains either an offset to its resource data in the resource file or a handle to the data if it's already been read into memory.

resource type: The type of a resource in a resource file, designated by a sequence of four characters (such as `'MENU'` for a menu).

restart: To reactivate a dormant program in the computer's memory. The System Loader can restart dormant programs if all their static segments are still in memory. If any critical part of a dormant program has been purged by the Memory Manager, the program must be reloaded from disk instead of restarted. See also **dormant.**

restartable: Said of a program that reinitializes its variables and makes no assumptions about machine state each time it gains control. Only restartable programs can be resurrected from a **dormant** state in memory.

retrieval engine: See **retrieval software.**

retrieval software: Software designed to locate and display information on a CD-ROM.

return address: The point in a program to which control returns on completion of a subroutine or function.

Return key: A key that causes the cursor or insertion point to move to the beginning of the next line. It's also used in some cases to confirm a command.

RF modulator: See **radio-frequency (RF) modulator.**

RGB: Abbreviation for *red-green-blue;* a method of displaying color video by transmitting the three primary colors as three separate signals. There are two ways of using RGB with computers: *TTL RGB,* which allows the color signals to take on only a few discrete values; and *analog RGB,* which allows the color signals to take on any values between their upper and lower limits, for a wide range of colors.

RGB monitor: A type of color monitor that receives separate signals for each color (red, green, and blue). See also **composite video.**

ribbon cartridge deck: The platform inside the printer that holds the ribbon cartridge.

ribbon guide: The rectangle of plastic that rises over the print head. The ribbon travels *between* the ribbon guide and the paper guide.

rollers: The rollers inside the LaserWriter (under the green cover) that help in the process of fusing toner to paper. The rollers should be cleaned when the toner cartridge is changed.

ROM: See **read-only memory.**

ROM disk: A feature of some operating systems making it possible to use ROM as a disk volume. Often used for making applications permanently resident. See also **RAM disk.**

root: (1) Short for **root directory.** (2) Short for *root user;* the user with unlimited system privileges. Also called the *superuser.*

root directory: (1) The directory at the base of a file catalog. (2) The top directory in a UNIX directory hierarchy. Written as a slash (/), it is the first element in every absolute pathname.

root filename: The filename of an object file minus any filename extensions added by the assembler or compiler. For example, a program that consists of the object files `MYPROG.ROOT`, `MYPROG.A`, and `MYPROG.B` has the root filename `MYPROG`.

root file system: The file system that is always present on a UNIX system; the root file system can never be unmounted.

root user: See **root.**

routine: A part of a program that accomplishes some task subordinate to the overall task of the program.

routine selector: A value pushed on the stack to select a particular routine from a group of routines called by a single trap macro.

row: A horizontal arrangement of character cells or graphics **pixels** on the screen. Compare **column.**

row width: The number of bytes in each row of a bit image.

RS-232: A common standard for serial data communication interfaces.

RS-232 cable: Any cable that is wired in accordance with the **RS-232** standard.

RS-422: A standard for serial data communication interfaces, different from the RS-232 standard in its electrical characteristics and in its use of differential pairs for data signals. The serial ports on the Apple IIgs use RS-422 devices modified so as to be compatible with RS-232 devices.

ruler: In MacWrite, Microsoft Word, and other word processing programs, a graphic representation of a ruler on which you set the format for the document, such as right and left margins, line spacing, and tabs.

run: (1) To execute a program. When a program runs, the computer performs the instructions. (2) To load a program into main memory from a peripheral storage medium, such as a disk, and execute it.

RUN: An Applesoft BASIC command that clears the current BASIC program and variables from memory, brings a BASIC program into memory from a file, and runs it. You can specify the starting point by indicating the first program line to be run.

run-time library file: A load file containing program segments—each of which can be used in any number of programs—that the System Loader loads dynamically when they are needed.

Glossary S–Sk

sampled sound synthesizer: A synthesizer (functionally equivalent to the Sound Driver's free-form synthesizer) that can play prerecorded or application-generated sounds.

sample edge: The falling edge (high to low) of the central system clock.

SANE: See **Standard Apple Numerics Environment.**

sans serif: Without serifs; *serifs* are fine lines that finish off the main strokes of a letter—like the little "feet" on the bottom of the vertical strokes in the letter M (Garamond). Avant Garde is a sans-serif font; the Avant Garde M looks like this: M.

sapling file: An organizational form of a ProDOS 16 standard file. A sapling file consists of a single index block and up to 256 data blocks. See also **data block, index block, standard file.** Compare **tree file.**

save: To store information by transferring it from main memory to a disk. Work not saved disappears when you switch off the computer or when the power is interrupted.

SAVE: An Applesoft BASIC command that lets you save the BASIC program currently in memory as a BASIC program file.

scaling factor: A value, given as a fraction, that specifies the amount a character should be stretched or shrunk before it's drawn.

scanner: Any graphic input device that converts printed matter into bit (digital) data.

scanning order: The order in which the operating system scans the disk drives looking for a startup disk.

scatter graph: A graph in which data are depicted as points in a two-dimensional field.

SCC: Abbreviation for *Serial Communications Controller;* a type of communications IC used in the Apple IIgs. An SCC can do the same things as an **ACIA,** but it also supports synchronous data transmission protocol and thus can transmit data at faster rates. An SCC handles serial I/O through the modem and printer ports.

SCCS: See **Source Code Control System.**

Scheduler: A firmware program that manages requests to execute interrupted software that is not **reentrant.** If, for example, an interrupt handler needs to make ProDOS 16 calls, it must do so through the Scheduler because ProDOS 16 is not reentrant. Applications need not use the Scheduler because ProDOS 16 is not in an interrupted state when it processes applications' system calls.

scientific notation: A method of expressing numbers in terms of powers of 10, useful for expressing very small or very large numbers. For example, 6.02E23, means 6.02 times 10 to the 23rd power. (The E stands for *exponent.*) The number is easier to understand in this form than in the form 602000000000000000000000. Applesoft BASIC uses this method to display real (floating-point) numbers with more than nine digits.

scrambled: Coded, to avoid detection.

scrap: A place where cut or copied data is stored.

Scrapbook: A desk accessory in which you can save frequently used pictures or passages of text.

scrap file: The file containing the desk scrap (usually the Clipboard).

Scrap Manager: The part of the Toolbox that enables cutting and pasting between applications, desk accessories, or an application and a desk accessory.

scratch: Disk space not normally available in the Macintosh operating system, but requested by some programs—Macintosh and non-Macintosh—for use as temporary storage.

screen: The part of the monitor where information is displayed. Like a movie screen, it's the place where things are projected. Also called the *display screen.*

screen buffer: A block of memory from which the video display reads the information to be displayed.

screen editor: A utility for entering and manipulating text. A screen editor displays the contents of a file by a full screen at a time. The commands to add or change text are entered anywhere on the screen, and the screen changes immediately to reflect the changes. The `vi` utility, for example, is a screen editor. Compare **line editor.**

screen font: A bit-mapped font intended for use on the computer screen. Compare **internal font, printer font.**

screen holes: Locations in the text display buffer (text Page 1) used for temporary storage either by I/O routines running in peripheral-card ROM or by firmware routines addressed as if they were in card ROM. Text Page 1 occupies memory from $0400 to $07FF; the screen holes are locations in that area that are neither displayed nor modified by the display firmware.

screen keypad: A feature of FT/TSO and FT/CMS used to duplicate 3278 function keys on the Macintosh.

screen shot: A MacPaint document that is like a snapshot of your Macintosh screen. You make a screen shot by holding down the Command and Shift keys and pressing 3.

script: (1) A writing system, such as Cyrillic or Arabic. The English language uses Roman script. (2) In HyperCard, a series of commands written in HyperTalk and associated with a particular object (such as a button, a field, a card, or a stack). (3) A file containing commands. See also **shell script.** (4) In MacroMaker, a recorded sequence of characters and commands, part of a **macro.**

script interface system: Special software that supports the display and manipulation of a particular script.

screen fonts: The fonts you see on the Macintosh screen, of which the LaserWriter has equivalent built-in fonts.

scroll: (1) To move a document or directory in its window so that a different part of it is visible. (2) To move all the text on the screen upward or downward, and in some cases sideways.

scroll arrow: An arrow at either end of a scroll bar. Clicking a scroll arrow moves a document or directory one line. Pressing a scroll arrow moves a document continuously.

scroll bar: A rectangular bar that may be along the right or bottom of a window. Clicking or dragging in the scroll bar causes your view of the document to change.

scroll box: The white box in a scroll bar. The position of the scroll box in the scroll bar indicates the position of what's in the window relative to the entire document.

SCSI: An acronym for *Small Computer System Interface* (pronounced "SKUH-zee"). An industry standard interface that provides high-speed access to peripheral devices.

SCSI cable terminator: A plug that absorbs the signals traveling along a SCSI cable, keeping the path open for new signals. If you have only one device, use one cable terminator. If you have two or more SCSI devices, put one cable terminator at the beginning and one at the end of the chain. Do not use more than two cable terminators.

SCSI chain: A group of SCSI devices linked to each other through SCSI peripheral interface cables and linked to the SCSI port on the computer through a SCSI system cable.

SCSI device access table (SDAT): A software table stored in the SCSI card RAM that contains a set of parameters for each SCSI device connected to the Apple II.

SCSI devices: Devices, such as hard disks and tape backup units, that use the Small Computer System Interface.

SCSI ID indicator: The small square hole on the back of an Apple SCSI device through which you can view the SCSI ID number as you change it with the SCSI ID switch.

SCSI ID number: (1) A number assigned to each SCSI device connected to a computer. The device with the highest number has priority if a conflict occurs while sending or receiving data. Some devices, such as internal hard disks, have preset SCSI ID numbers. On others, such as external hard disks, you use a SCSI ID switch to set the ID number. (2) The number assigned to a SCSI device based on the position of a hardware strap, jumper, or switch on the device itself. Compare **unit number.**

SCSI ID switch: The small hole below the SCSI ID indicator on the back of Apple SCSI devices. You insert a pushpin or straightened paper clip into the hole and press to change the SCSI ID number, shown on the indicator.

SCSI Manager: The part of the Macintosh Operating System that controls the exchange of information between a Macintosh and peripheral devices connected through the Small Computer Standard Interface (SCSI).

SCSI peripheral interface cable: The cable that links SCSI devices to each other. A peripheral interface cable has a 50-pin connector at each end.

SCSI port: The port on the back panel of the computer to which you connect SCSI devices.

SCSI system cable: The cable that links the first SCSI device with the computer. The system cable has a 50-pin connector at one end and a 25-pin connector at the other, which attaches to the computer.

search path: The route the computer must follow to retrieve a file you ask for.

search system: Same as **retrieval software.**

SE Bus: A direct data path to the microprocessor, implemented through a 96-pin expansion connector inside the Macintosh SE. Expansion cards for the SE Bus include accelerator cards and coprocessor cards.

SE Bus access port: An insert on the back panel of the Macintosh SE that allows access to the SE Bus expansion connector inside the computer. Used only for cables that run between an **expansion card** and a **peripheral device.**

secondary memory: Data and program storage for a computer. Secondary memory stores its information on physical media such as disk or tape. Secondary memory offers slower access time to data than main memory but provides more capacity. Compare **main memory.**

secondary shell prompt: A character displayed by the Bourne or Korn shell when the shell expects further input from you. This character is set by default to be the greater-than sign (>); the prompt appears, for example, when you use a multiline construct at the initial shell prompt. The secondary shell prompt reappears on each line until the final delimiter or the interrupt character is entered.

sector: (1) Part of a **track** on a disk; when a disk is formatted, its recording surface is divided into tracks and sectors. See also **DOS 3.3, DOS 3.2.** (2) Disk space composed of 512 consecutive bytes of standard information and 12 bytes of file tags.

seed: A value used to begin a repeatable sequence of **pseudorandom numbers.**

seedling file: An organizational form of a ProDOS 16 standard file. A seedling file consists of a single data block.

See Files: The AppleShare file server access privilege that gives the right to open and copy documents and applications in a folder.

See Folders: The AppleShare file server access privilege that gives the right to see folders within a folder.

segment: (1) One of several parts into which the code of an application may be divided. Not all segments need to be in memory at the same time. (2) A component of an OMF file, consisting of a header and a body. In object files, each segment incorporates one or more subroutines. In load files, each segment incorporates one or more object segments.

segment body: The part of a segment that follows the segment header and that contains the program code, data, and relocation information for the segment.

segment header: The first part of a program segment, containing such information as the segment name and the length of the segment.

segment kind: A numerical designation used to classify a segment in object module format. It is the value of the KIND field in the segment's header.

Segment Loader: The part of the Operating System that loads the code of an application into memory, either as a single unit or divided into dynamically loaded segments.

segment number: A number corresponding to the relative position of the segment in a file, starting with 1.

select: (v.) To designate where the next action will take place. To select

using a mouse, you click an icon or drag across information. In some applications, you can select items in menus by typing a letter or number at a prompt, by using a combination keypress, or by using arrow keys. (n.) A command to a device such as a printer to place it into a condition to receive data.

Select button: A button on a printer that determines whether the printer should accept data from the computer or instructions from other buttons on the printer control panel (such as the line-feed button or form-feed button).

selection: (1) The information or items that will be affected by the next command. The selection is usually highlighted. (2) A series of characters, or a character position, at which the next editing operation will occur. Selected characters in the active window are inversely highlighted. Also called *selection range.*

Select light: A light on the control panel of the ImageWriter printer that indicates that the printer can receive data from a computer. None of the other control panel buttons work when the Select light is on. When the Select light is off, all buttons work, but the printer cannot print.

select switch: The switch on the AppleFax modem's front panel that lets you select either the AppleFax modem or an extra piece of equipment that's connected to the modem.

SE logic unit (SELU): See **BBU.**

semaphores: A group of system calls that allow processes to synchronize execution.

separation belt: In the LaserWriter, a small, clear plastic belt, located toward the back of the inside of the printer. When it breaks or is improperly installed, paper jams in the printer.

sequence symbol: In APW Assembler source files, a special kind of comment line that is not printed in the listing. These symbols are used by conditional assembly directives as branching destinations. The format consists of a period (.) followed by a label (the label may not contain any symbolic
parameters).

sequential-access device: See **character device.**

sequential-access text file: A text file made up of a sequence of fields. A field is a string of characters terminated by a return character. Sequential text files are best used for types of data that will be stored and retrieved sequentially. Compare **random-access text file.**

serial communication: Data communicated over a single-path communication line, one bit at a time.

Serial CommunicationsController: See **SCC.**

serial data: Data communicated over a single-path communication line, one bit at a time.

Serial Driver: A device driver that controls communication, via serial ports, between applications and serial peripheral devices.

serial interface: An interface in which information is transmitted sequentially, one bit at a time, over a single wire or channel. Compare **parallel interface.**

serial interface cable: The cable that connects the serial ports of two devices, such as those of a computer and a printer. See **serial interface.**

serial interface socket: The ImageWriter LQ socket that accepts the serial interface cable's 8-pin mini-circular connector.

serial ports: The connectors on the back panel of the computer for devices that use a **serial interface.** See also **modem port** and **printer port.**

serial printer: A printer that accepts information from the computer by way of a serial interface.

serif: See **sans serif.**

server: A computer that provides a particular service across a network. The service may be file access, log-in access, file transfer, printing, and so on. Computers from which users initiate the service are called **clients.**

service request enable: A bit set by a device connected to the Apple Desktop Bus to tell the system that it needs servicing.

session: A series of transactions between two sockets, characterized by the orderly sequencing of requests and responses.

setup string: A group of characters that sends a format command to a printer. Some application programs, such as spreadsheets, give you the option of changing format, such as character width, by entering a setup string before printing.

setup time: The amount of time a signal must be valid in advance of some event. Compare **hold time.** See also **valid signal.**

shadowing: (1) The process by which any changes made to one part of the Apple IIgs memory are automatically and simultaneously copied into another part. When shadowing is on, information written to bank $00 or $01 is automatically copied into equivalent locations in bank $E0 or $E1. Likewise, any changes to bank $E0 or $E1 are immediately reflected in bank $00 or $01. (2) A process through which the SCSI card takes over an additional slot to work with ProDOS in supporting four external device ports.

shape definition: A coded description, consisting of one or more plotting vectors, of a shape to be drawn on a high-resolution graphics screen. See also **plotting vector, shape table.**

shape table: A collection of one or more shape definitions, together with their indexes.

shape table index: A list that gives the memory addresses of the shape definitions in a shape table.

shared memory: A mechanism that allows processes to share parts of their virtual address space.

shareware: Software you can copy and try before sending payment to the author.

shell: (1) A utility that accepts your commands, interprets them, and passes them on to the appropriate programs for execution. A/UX provides three shells: Bourne, C, and Korn. Each can be used as an interpreted programming language. Through **shell variables** and **environment variables,** you can tailor the environment of your shell for your own needs. (2) A program that provides an operating environment for other programs, and that is not removed from memory when those programs are running. For example, the APW Shell provides a command processor interface between the user and the other components of APW, and remains in memory when APW utility programs are running.

shell application: A type of program that is launched from a controlling program and runs under its control. Shell applications are ProDOS 16 file type $B5. In APW, compilers and certain shell commands are shell applications that are launched from the APW Shell.

shell call: A request from a program to the APW Shell to perform a specific function.

shell-call block: A set of instructions and directives used to make a shell call from an assembly-language program.

shell command: See **built-in shell command.**

shell layer: An instance of a shell, invoked by the `shl` program. Through this program, you can simultaneously run up to seven shell layers.

shell load file: A load file designed to be run under a shell program.

shell program: A series of commands to be executed by the shell. A shell program may be entered at the shell prompt or stored in a file. Shell programs that are stored in a file are referred to as **shell scripts.**

shell prompt: A character or string of characters displayed on the terminal to show that the shell is waiting for input from the user. The Bourne and Korn shells, for example, are set by default to display the dollar sign ($) as their prompts; the C shell is set by default to display the percent sign (%) as its prompt.

shell script: A shell program contained in a text file. Entering the name of the shell script from the command line executes the commands listed in the script.

shell variable: A variable local to the shell. A shell variable is available only to the current invocation of the shell, not to any of its subshells or spawned processes. Compare **environment variable.**

shielded cable: A cable with a special metallic wrapping around its wires. This wrapping reduces radio-frequency interference.

Shift-click: A technique that allows you to extend or shorten a selection by positioning the pointer at the end of what you want to select and holding down the Shift key while clicking the mouse button.

Shift-drag: A technique that allows you to select multiple objects by holding down the Shift key while you drag diagonally to enclose the objects in a rectangle.

Shift key: A key that, when pressed, causes the subsequent letter you type to appear in uppercase or the top symbol on a two-character key to be produced. The Shift key can also modify mouse actions. See **Shift-click, Shift-drag.**

short: In C, a 16-bit integer data type whose range is –32,768 to 32,767.

short name: A valid MS-DOS (or PC-DOS) filename that a server creates for every Macintosh or ProDOS volume name, folder name, or filename on the AppleShare file server.

shutdown: The temporary closing of a file server so it’s not available on the network.

signal: A software interrupt that causes a program to be temporarily diverted from its normal execution sequence. A/UX uses both System V and BSD signals. Signals can be issued, handled, and otherwise manipulated via a set of **system calls.**

signal catcher: A function that detects the interrupt sent from a signal system call. See also **signal.**

signal handler: A function that performs the required processing upon receipt of a signal. See also **signal.**

single-sheet alignment icon: An icon on the single-sheet guide for aligning the left paper edge.

single-sheet guide: A movable plastic piece in the rear panel of the printer, used for loading single-sheet paper.

single-sheet paper: Any standard-sized paper that is unconnected to other sheets. Compare **fanfold paper.**

signature: A four-character sequence that uniquely identifies an application to the Finder.

significand: In scientific notation, the number that is acted upon by the exponent to yield the final value of the number. For example, in 6.02E23, 6.02 is the significand. See also **exponent, scientific notation.**

silicon (Si): A solid, crystalline chemical element from which integrated circuits are made. Silicon is a *semiconductor;* that is, it conducts electricity better than an insulator, but not as well as a metallic conductor. Silicon should not be confused with silica (silicon dioxide, such as quartz, opal, or sand) or with silicone (any of a group of organic compounds containing silicon).

SIMM: An acronym for *Single In-line Memory Module;* a circuit board that contains eight RAM chips. SIMMs attach to SIMM sockets on the computer's main circuit board.

Simplified Keyboard: See **Dvorak keyboard.**

simulation: A computerized representation of some process in action; for example, a flight simulation.

68000: The microprocessor used in the Macintosh, Macintosh Plus, and Macintosh SE. The 68000 has 32-bit data and address registers.

68020: The microprocessor in the Macintosh II. The Motorola 68020 can also be added to the Macintosh SE by means of an accelerator card installed in the SE Bus expansion connector.

68851: An optional coprocessor available for the Macintosh II that allows paged memory management, a technique that lets the microprocessor access a much larger body of data than can fit in RAM at one time. Sometimes referred to as the *Paged Memory Management Unit*, or *PMMU*.

68881: A coprocessor that provides high-speed support for processing scientific computations. Sometimes referred to as the *floating-point unit,* or *FPU*.

6502: The microprocessor used in the Apple II, the Apple II Plus, and early models of the Apple IIe. The 6502 is a **MOS** device with 8-bit data registers and 16-bit address registers.

65C02: A **CMOS** verson of the 6502; the microprocessor used in the Apple IIc and Apple IIe.

65C816: The microprocessor used in the Apple IIgs. The 65C816 is a **CMOS** device with 16-bit data registers and 24-bit address registers.

64K Apple II: Any standard Apple II that has at least 64K of RAM. That includes the Apple IIc, the Apple IIe, and an Apple II or Apple II Plus with 48K of RAM and the language card installed.

size box: A box in the lower-right corner of some active windows. Dragging the size box resizes the window.

Glossary Sl–Ss

slave: A card that responds to being addressed by another card acting as a master. The Macintosh II main logic board is a card that may be either master or slave. Some cards may be slave-only in function because they lack the circuitry to arbitrate in a bus ownership contest.

slide-show option: A feature of some applications that lets you arrange displays in a sequence so you can use them in presentations. The application changes "slides" after a certain time interval or when you press a certain key.

slop: See **justification gap.**

slot: A narrow socket inside some models of Apple computers for connecting circuit boards known as *interface cards;* each card handles communication between the computer and a peripheral device, sending and receiving data through a port or connector on the outside of the computer.

slot exec parameter block: A data structure that provides communication with the Slot Manager routines sMacBoot and sPrimaryInit.

slot ID: The hexadecimal number ($9 through $E in the Macintosh II) corresponding to each card slot. Each slot ID is established by the backplane (the main logic board of the Macintosh II) and communicated to the card through the /IDx lines.

Slot Manager: A set of Macintosh II ROM routines that let applications access declaration ROMs on slot cards.

slot number: A way an application might ask you to describe the location of a peripheral device. In some models of the Apple II, there are seven general-purpose slots on the main circuit board for connecting peripheral devices to the computer. They are numbered from 1 to 7 with 1 on the left as you face the front of the computer. If your device is connected to a port instead of a slot, you can still use the application by typing the slot number that corresponds to the port.

slot parameter block: A data structure that provides communication with all Slot Manager routines except sMacBoot and sPrimaryInit.

slot resource: A software structure in the declaration ROM of a slot card. Not to be confused with a **resource.**

slot space: NuBus address space $F900 0000 through $FEFF FFFF. It is divided into six regions, allocated for use by cards in the six Macintosh II slots. The upper 1/16th of each card's allocation is addressable by the Macintosh II in 24-bit mode.

Small Computer System Interface (SCSI): A specification of mechanical, electrical, and functional standards for connecting peripheral devices such as certain kinds of hard disks, printers, and optical disks to small computers.

SmartPort: A set of firmware routines supporting multiple block devices connected to the Apple IIgs disk port. See also **extended SmartPort call, standard SmartPort call.**

SNA/SDLC: Abbreviation for *Systems Network Architecture/Synchronous Data Link Control.* SNA is a set of rules for controlling the transfer of

information in a data communication network. SDLC is a protocol that uses commands to control data transfer over a communication line. IBM telecommunications products manufactured after 1978 use this protocol. Compare **binary synchronous communication.**

socket: On a network, a communication mechanism originally implemented on the BSD version of the UNIX operating system. Sockets are used as endpoints for sending and receiving data between computers.

soft switch: A means of changing some feature of the computer from within a program. For example, **DIP switch** settings on ImageWriter printers can be overridden with soft switches. Specifically, a soft switch is a location in memory that produces some special effect whenever its contents are read or written. Also called a *software switch.*

software: A collective term for programs, the instructions that tell the computer what to do. Software is usually stored on disks. Compare **firmware, hardware.**

software overrun error: The condition that occurs when an input driver's buffer becomes full.

software pirate: A person who copies applications without the permission of the author. To copy software without permission is illegal.

software reset: The act of resetting the ImageWriter LQ printer to its default settings by sending the printer an Esc C command. A software reset does not clear any data in the print buffer. Compare **hardware reset.**

solenoid: A coil used as an electromagnet. In the BusinessWriter printer, the **paper bail** is opened and closed by a solenoid.

Solid Apple key: A modifier key on Apple IIc and older Apple II–family keyboards, marked with a filled-in Apple symbol. On newer keyboards, the Option key replaces the Solid Apple key. Compare **Open Apple key.**

sound buffer: A block of memory from which the sound generator reads the information to create an audio waveform.

Sound Driver: The device driver that controls sound generation in an application. (Superseded by the Sound Manager on the Macintosh II.)

sound procedure: A procedure associated with an alert that will emit one of up to four sounds from the Macintosh's speaker. Its integer parameter ranges from 0 to 3 and specifies which sound.

source: (n.) The original volume. When you are making a copy of a file or a volume, the source volume is the volume you are copying from; the **destination** volume is the disk you're placing the copy on. (adj.) Describes files that are being copied or translated as well as the disk or folder containing source files.

source code: See **source file.**

Source Code Control System (SCCS): A collection of commands used to control changes to text files, such as source code and documentation. SCCS protects files by controlling access and update privileges, and by preventing more than one user at a time from updating a file; SCCS also maintains an audit trail of revisions.

source file: An ASCII file consisting of instructions written in a particular language, such as Pascal or assembly language. An assembler or compiler converts source files into **object files.**

source program: The form of a program given to a language translator, such as a compiler or an assembler, for conversion into another form; sometimes called *source code.* Compare **object program.**

source volume: The original volume, as opposed to the duplicate (destination) volume. When you are making a copy of a file or a volume, the source volume is the volume from which you are copying. Compare **destination volume.** See also **volume.**

Space bar: The long, unlabeled bar along the bottom of the keyboard that you press to generate a **space character.**

space character: A text character whose printed representation is a blank space. You generate the character when you press the Space bar.

space parity: A method of error checking in data transmission in which the most significant bit of every byte is set to 0. The receiving device checks for errors by looking for this value on each character. Compare **even parity, MARK parity, odd parity.**

sparse file: A variation of the organizational forms of ProDOS 16 standard files. A sparse file may be either a **sapling file** or a **tree file;** what makes it sparse is that its logical size (defined by its EOF) is greater than its actual size on disk. This occurs when one or more data blocks contain nothing but zeros. Those data blocks are considered to be part of the file, but they are not actually allocated on disk until nonzero data is written to them.

spawn: To create and execute a new process with the **fork** and **exec** system calls.

special file: See **device file.**

special memory: On an Apple IIgs, all of banks $00 and $01, and all display memory in banks $E0 and $E1. So called because it is the memory directly accessed by **standard Apple II** programs running on the Apple IIgs.

spool: To send documents to the print server disk to be stored until they are printed. The word's origin is SPOOL, which stands for *simultaneous peripheral operations on line*.

spooler: See **print spooler.**

spool printing: (1) Writing a representation of a document's printed image to disk or to memory, and then printing it (as opposed to immediate draft printing). (2) The printing of bitmapped text in which the print manager writes QuickDraw commands to a file or to memory, and then the printer driver converts these commands into a bit image it sends as graphics data to the printer. Spool printing reproduces on paper the appearance of the characters on the screen. Compare **draft printing.**

spool programming: A programming technique that allows access to more information that can be stored in memory at one time. By storing on disk the majority of the image data, you need to have in memory only as much as you want to display. The rest of the picture data can be read into memory (spooled) from the disk and can replace the old displayed portion of the picture.

spreadsheet program: A type of application program that simplifies financial planning, cost estimating, and other number-crunching tasks. In a spreadsheet, information is laid out in columns and rows. Also called an *electronic worksheet.*

sprockets: The toothed wheels above or at the back of an ImageWriter printer that engage pin-feed paper and guide it through the machine.

square-wavesynthesizer: The part of the Sound Driver used to produce less harmonic sounds than the four-tone synthesizer, such as beeps.

sResource: See **slot resource.**

sResource directory: The structure in a declaration ROM that provides access to its sResource lists.

sResource list: A list of characteristics of a slot resource.

SSC: Abbreviation for *Super Serial Card;* a peripheral card that enables an Apple II to communicate with serial devices.

Glossary St–Sz

stack: (1) In a computer, a portion of memory that is used for temporary storage of operating data during operation of a program. The data on the stack are added (pushed) and removed (pulled or popped) in last-in, first-out (LIFO) order. *The stack* usually refers to the particular stack pointed to by the 65C816's **stack register.** Compare **queue.** (2) A HyperCard document; a group of cards based on the same theme. See also **card.**

stack-based routine: A Toolbox or Operating System routine that receives its parameters and returns its results, if any, on the stack.

stack frame: The area of the stack used by a routine for its parameters, return address, local variables, and temporary storage.

stack register: A hardware register in the 65C816 processor that contains the address of the top of the processor's **stack.**

stand-alone computer: A computer that has its own disk drive and that can operate independently of the network.

Standard Apple Numerics Environment (SANE): The set of methods that provides the basis for floating-point calculations in Apple computers. SANE meets all requirements for extended-precision, floating-point arithmetic as prescribed by IEEE Standard 754 and ensures that all floating-point operations are performed consistently and return the most accurate results possible.

standard Apple II: Any computer in the Apple II family except the Apple IIgs. That includes the Apple II, the Apple II Plus, the Apple IIe, and the Apple IIc. See also **128K Apple II.**

standard ASCII character: Synonymous with **low ASCII character.**

Standard C: A de facto standard definition of the C programming language, based on the most widely used implementation, the Berkeley VAX Portable C Compiler.

Standard C Library: A collection of routines for input and output, string manipulation, data conversion, memory management, and Integrated Environment support.

standard error output: The data stream used for error messages returned by a program. By default, the shell directs error output to your terminal screen. In APW C, synonymous with **diagnostic output.**

standard file: One of the two principal categories of ProDOS 16 files. Standard files contain whatever data they were created to hold; they have no predefined internal format. Compare **directory file.**

StandardFile Package: A Macintosh package for presenting the standard user interface when a file is to be saved or opened.

standard input: The data stream used for input to a command. By default, the shell accepts as input the characters you type from your keyboard. The less-than sign (<) directs the shell to accept input from a file or device.

standard instruction: Synonymous with **default.**

standard output: The data stream used for output from a command. By default, the shell directs this to the terminal screen. The greater-than sign (>) directs the shell to write the output to a file or device.

standard-resolution graphics: For the ImageWriter LQ printer, graphics printed at a vertical resolution of 72 dots per inch, or 144 dots per inch for two-pass standard resolution graphics. Each dot column of standard-resolution graphics is represented by one byte of data. Compare **high-resolution graphics.**

standard SmartPort call: A SmartPort call that allows data transfer to or from anywhere in standard Apple II memory, or the lowest 64K of the Apple IIgs memory. Compare **extended SmartPort call.**

start bit: One or two bits that indicate the beginning of a character in a string of serially transmitted characters. Compare **stop bit.** See also **data bits.**

start cycle: The first period of a transaction during which /START is asserted. The start cycle is one bus clock period long; the address and transfer type are valid during this cycle.

starting value: The value assigned to the index variable on the first pass through a loop.

START13: An application on the *DOS 3.3 System Master* disk that makes it possible to run DOS 3.2-based applications.

start up: To get the system running. Starting up is the process of first reading an operating-system program from the disk and then running an application program. Synonymous with **boot.**

startup disk: A disk with all the necessary program files—such as the Finder and System files contained in the System Folder for the Macintosh—to set the computer into operation. Sometimes called a *boot disk.*

startup drive: The disk drive from which you started your application.

statement: A unit of a program in a high-level language that specifies an action for the computer to perform; it typically corresponds to several instructions of machine language.

static segment: A segment that is loaded only at program boot time and is not unloaded during execution. Compare **dynamic segment.**

status lights: Lights on the front of the LaserWriter printer that indicate the status of the printer—power on, paper jam, processing a job, and so on.

status line: The line on the Macintosh screen (located just below the host-data view area) used to display various symbols indicating the status of the host/Macintosh communications session.

status message: A message the LaserWriter sends to your computer when you confirm the Print command. The message may tell you the status of your job or alert you to a problem with the printer.

step value: The amount by which the index variable changes on each pass through a loop.

stepwise refinement: A technique of program development in which broad sections of the program are laid out first and then refined step by step until the program is complete.

sticky keys: An Easy Access feature that lets you type combination keystrokes without actually pressing the keys simultaneously. See also **Easy Access.**

stop bit: One or two bits that indicate the end of a character in a string of serially transmitted characters. Compare **start bit.** See also **data bits.**

storage type: An attribute of a ProDOS 16 file that describes the file's organizational form (such as directory file, seedling file, or sapling file).

store: See **save.**

stream: In C, a file with associated buffering.

stream editor: A utility for manipulating text. Rather than allowing you to move back and forth within a file interactively, a stream editor processes the text in a single pass. The `sed` utility, for example, is a stream editor. Compare **interactive editor.**

Streams: A collection of tools that assist programmers to modularize data transfer between device drivers and processes.

striker wire: A pin in the print head that strikes the ribbon to place a dot on the paper. The ImageWriter LQ print head contains a vertical column of 27 striker wires that are used to make columns of dots when printing characters and graphics.

string: An item of information consisting of a sequence of text characters (a *character string*) or a sequence of bits or bytes.

string option: A setting specified by a set of characters.

strobe: A signal whose change is used to trigger some action.

struct: In C, a record data type. Equivalent to *record* in Pascal.

structured language: A type of programming language in which programs are built out of smaller subprograms. Pascal is an example of a structured programming language.

style: See **character style.**

style dialog box: A dialog box that sets options affecting the page dimensions; associated with the Page Setup command.

subdirectory: A directory within a directory; a file (other than the volume directory or root directory) that contains the names and locations of other files. Every ProDOS 16 directory file is either a volume directory or a subdirectory. Equivalent to **folder** in some systems and applications.
subroutine: A part of a program that can be executed on request from another point in the program and that returns control, on completion, to the point of the request.

subscript: (1) An index number used to identify a particular element of an array. (2) A letter or number printed lower than the base line of the text that surrounds it. Compare **superscript.**

subshell: A new shell that is created from an existing shell; the subshell, or "child" shell, inherits the environment of its parent.

substring: A string that is part of another string.

superblock: The block following the boot block on every file system. The superblock contains the main information about the file system, such as its name, its size, and lists of the free blocks and free inodes.

super high-resolution mode: A graphics mode supported by the Apple IIgs that can display information using a rectangular array of 640 horizontal by 200 vertical dots in 4 colors or 320 horizontal by 200 vertical dots in 16 colors.

Super Hi-Res: Either of two high-resolution Apple IIgs display modes. One consists of an array of pixels 320 wide by 200 high, with 16 available colors; the other is an array 640 wide by 200 high, with 16 available colors (with restrictions).

SuperPILOT: An enhanced version of the original Apple II PILOT programming language. See also **PILOT.**

superscript: A letter or number printed higher than the base line of the text that surrounds it; for example, in the value 2^4, the 4 is a superscript. Compare **subscript.**

superslot space: NuBus address space $9000 0000 through $EFFF FFFF. It is divided into six regions, allocated for intercard communication or other purposes by cards in the six Macintosh II slots.

superuser: See **root.**

supervisory program: A computer program whose primary function is scheduling, allocating, and controlling system resources, rather than processing information to get results. Compare **application program, support program.**

support program: A program that includes diagnostics, testing aids, data generation, terminal simulators, and so on. Support programs support the supervisory and application programs in a system. Compare **application program, supervisory program.**

suspend character: A character (by default, Control-Z under A/UX) that stops the foreground job and returns you to the shell. Entering the command `fg` brings the suspended job back to the foreground, where it resumes execution.

SVID: See **System V Interface Definition.**

swap space: A disk partition used for temporarily storing unneeded pages of code and data. See also **page, paging.**

switcher: A controlling program that rapidly transfers execution among several applications.

symbol: A character or string of characters that represents an address or numeric value; a symbolic reference or a variable.

symbolic parameter: In the APW Assembler, a variable character or character string that represents addresses or values declared in the prototype statement of a macro definition. There are three types of symbolic parameters: A (arithmetic), B (Boolean), and C (character). Symbolic parameters are assigned values by the SETA, SETB, or SETC directive.

symbolic reference: A name or label, such as the name of a subroutine, that is used to refer to a location in a program. When a program is linked, all symbolic references are **resolved;** when the program is loaded, actual memory addresses are **patched** into the program to replace the symbolic references.

symbol table: A table of symbolic references created by the linker when it links a program. The linker uses the symbol table to keep track of which

symbols have been resolved. At the conclusion of a link, you can have the linker print out the symbol table.

synchronous: Able to perform two or more processes at the same time, such as sending and receiving data, by means of a mutual timing signal or clock. Compare **asynchronous.**

synchronous communication: See **synchronous transmission.**

synchronous execution: After calling a routine synchronously, an application cannot continue execution until the routine is completed.

synchronous modem: A modem that provides two clocks for synchronous communication with its host computer: one clock for sending data from the host computer to the modem, and a second clock for sending data from the modem to the host computer.

synchronous system: A system in which the sending and receiving units are operating continuously at substantially the same frequency.

synchronous transmission: A transmission process that uses a clocking signal to ensure an integral number of unit (time) intervals between any two characters. Compare **asynchronous transmission.**

syntax: (1) The rules governing the structure of statements or instructions in a programming language. (2) A representation of a command that specifies all the possible forms the command can take.

syntax error message: A message you get when the computer can't understand a command. The cause could be anything from mistyping a word to using a nonexistent command.

synthesizer: (1) A hardware device capable of creating sound digitally and converting it into an analog waveform that you can hear. (2) A program that interprets Sound Manager commands and produces sound. See also **four-tone synthesizer, free-form synthesizer, square-wave synthesizer.**

synthesizer buffer: A description of the sound to be generated by a synthesizer.

SYSOP: See **system operator.**

system: A coordinated collection of interrelated and interacting parts organized to perform some function or achieve some purpose—for example, a computer system comprising a processor, keyboard, monitor, and disk drive.

system cable: See **SCSI system cable.**

system call: Synonymous with **operating-system call.**

system configuration: See **configuration.**

system disk: A disk that contains the operating system and other system software needed to run applications.

system error alert: An alert box displayed by the System Error Handler.

system error alert table: A resource that determines the appearance and function of system error alerts.

System Error Handler: The part of the Operating System that assumes control when a fatal system error occurs.

system error ID: An ID number that appears in a system error alert to identify the error.

system eventmask: A global event mask that controls which types of events get posted into the event queue.

System Failure Manager: A firmware program that processes fatal errors by displaying a message on the screen and halting execution.

system file: Any file the computer uses to start itself up or to provide systemwide information. Although system files are represented by icons just as documents and applications are, they can't be opened in the usual way. You can, however, alter the contents of system files. See also **startup disk.**

System file: A file Macintosh computers use to start up and to provide systemwide information. The System file contains **system programs.**

system file level: A number between $00 and $FF associated with each open ProDOS 16 file. Every time a file is opened, the current value of the system file level is assigned to it. If the system file level is changed (by a `SET_LEVEL` call), all subsequently opened files will have the new level assigned to them. By manipulating the system file level, a controlling program can easily close or flush files opened by its subprograms.

System V: The AT&T standard UNIX operating system. System V Release 2 forms the foundation of the A/UX system.

System V Interface Definition (SVID): AT&T's formal specification for compatibility with the UNIX operating system. A/UX adheres fully to the SVID.

system font: The font that the system uses (in menus, for example). In Roman-based writing systems, the system font is Chicago, and the system font size is 12 points.

system font size: The size of text drawn by the system in the system font; 12 points.

system heap: The portion of the heap reserved for use by the operating system.

System Loader: The program that manages the loading and relocation of load segments (programs) into the Apple IIgs memory. The System Loader works closely with ProDOS 16 and the Memory Manager.

system mailbox: A file in `/usr/mail` for holding your incoming electronic mail messages until you read them, at which time they are appended by default to the file `mbox` in your **home directory** and deleted from `/usr/mail`.

system operator (SYSOP): The human operator of a computerized bulletin board.

system program: (1) A program that makes the resources and capabilities of the computer available for general purposes, such as an operating system or a language translator. Compare **application program, controlling program.** (2) Under ProDOS 8, a stand-alone and potentially self-booting application. A ProDOS 8 system program is of file type $FF; if it is self-booting, its filename has the extension `.SYSTEM`.

system resource: A resource in the **System Resource File.**

System Resource File: A resource file containing standard resources, accessed if a requested resource wasn't found in any of the other resource files that were searched. Also called the *System file.*

system software: The component of a computer system that supports application programs by managing system resources such as memory and I/O devices.

system startup information: Certain configurable system parameters that are stored in the first two logical blocks of a volume and read in at system startup.

system window: A window in which a desk accessory is displayed.

Glossary T

tab: (1) Short for *tabulator;* on typewriter keyboards, a key that allows you set automatic stops (*tab stops*) or margins for columns, as in a table of figures. (2) An ASCII character that commands a device such as a printer to start printing at a preset location (a *tab stop*). There are two such characters: horizontal tab (hex 09) and vertical tab (hex 0B). The horizontal tab character gives the same action as pressing the tab key on a typewriter.

Tab key: A key that, when pressed, generates the horizontal tab character. The key's action is to move the insertion point or cursor to the next tab marker, or, in a dialog box with more than one place to enter information, to the next rectangle. The Tab key thus works essentially like a typewriter tab key.

tab marker: In MacWrite, an unfilled triangle under the inch scale of a ruler that marks the position to which the Tab key will move the insertion point. You get additional tabs by dragging them from the **tab well.**

tab well: In MacWrite, either of two boxes on the lower-left side of a ruler that hold regular and decimal tabs.

TCP/IP: Abbreviation for *Transmission Control Protocol/Internet Protocol;* a suite of networking protocols developed at the University of California for the U.S. Department of Defense.

TeachText: An application on the System Tools disk that lets you read **plain text documents.**

tear-off menu: Any menu that you can detach from the menu bar by pressing the menu title and dragging beyond the menu's edge. The torn-off menu appears in a window or a **mini-window** on the desktop. HyperCard has two tear-off menus: Tools and Patterns; once torn off they are called *palettes.*

telecommunication: Transmitting information across varying distances, such as over telephone lines.

telecommunications: The science and technology of communication by electrical or electronic means.

television set: A display device capable of receiving broadcast video signals (such as commercial television broadcasts) by means of an antenna; it can be used in combination with a radio-frequency modulator as a display device for the Apple II family of computers. Compare **video monitor.**

template: A predefined set of contents (numbers, text, and formulas) for a spreadsheet, designed for some specific purpose or task—for example, a budget template.

tenure: A time period of unbroken bus ownership by a single **master.** A master may lock the bus and, during one tenure, perform several transactions.

terminal: Synonymous with **console.**

terminal emulation window: The portion of the Macintosh screen used for host data and for the status line when in 3278 emulation mode.

terminal mode: The mode of operation in which the Apple IIgs acts like an intelligent terminal.

terminator: (1) A Setup menu option used to reset the AppleLine. (2) A device used in a SCSI chain to maintain the integrity of the signals passing along the SCSI chain. A SCSI chain should never have more than two terminators, one at each end of the chain. Also called a *cable terminator.*

test print: A printed page produced by the LaserWriter each time you switch it on.

text: (1) Information presented in the form of readable characters. (2) The display of characters on a display screen. Compare **graphics.**

text box: The place or places in any dialog box where you can type information.

TextEdit: The part of the Toolbox that supports the basic text entry and editing capabilities of a standard Macintosh application.

TextEditscrap: The place where certain TextEdit routines store the characters most recently cut or copied from text.

text field: (HyperCard) See **field.**

text file: A file that contains information stored in the form of readable characters encoded using the ASCII format. On the Macintosh, they are known as *Text Only documents.* On the Apple II, they are called *TXT files.*

text file format: The Apple IIgs standard format for text files and program source files.

text generator: Firmware that prints characters on the screen in response to keypresses.

text mode: Information that is sent to the display in the form of characters that fit in a 40-column by 24-line grid or in an 80-column by 24-line grid. Compare **graphics mode.**

text property: A quality or attribute of a character's appearance. Properties include style, font, and size.

text window: (1) A window on the desktop within which text is displayed and scrolled. (2) The portion of the Apple II screen that is reserved for text. At startup, the firmware initializes the entire display to text. However, applications can restrict text to any rectangular portion of the display.

thermal printer: A printer that prints by heating small points that consequently produce colored dots on special heat-sensitive paper.

3.5-inch disk: A flexible, plastic disk measuring 3.5 inches in diameter and having a hard-shell plastic jacket. In spite of the hard cover, 3.5-inch disks are often called *floppy disks* as contrasted with hard disks. Two-sided 3.5-inch disks can store almost six times more data than single-sided 5.25-inch disks. Compare **CD-ROM, 5.25-inch disk, hard disk.**

three-state: A bus driver that drives a line low or high or doesn't drive it at all.

3x font: A font that is reduced in size from the font installed in a System file for high-density printed output. The Macintosh uses a ratio of 3:1 for ImageWriter LQ fonts.

threshold: The parameter that determines the level at which a gray shade is recorded as either black or white during a Line Art mode scan. A high value of the Threshold parameter results in a lighter overall image. A low value of the Threshold parameter results in a darker overall image.

thumb: The Control Manager's term for the scroll box (the indicator of a scroll bar).

tick: A 60th of a second.

tilde escape: The tilde character (~), used as an escape character to signal that the next input string is a command.

Time Manager: The part of the Macintosh Operating System that lets you schedule a routine to be executed after a given number of milliseconds have elapsed.

time sharing: Sharing a computer between two or more users, usually through **multitasking.**

title bar: The horizontal bar at the top of a window that shows the name of the window's contents. You can move the window by dragging the title bar.

TOF: See **Top of Form.**

toggle option: See **toggle variable.**

toggle variable: A setting for the shell environment that may be turned on or off with the `set` or `unset` command. For example, the `set noclobber` command entered from the C shell turns on a toggle variable that helps ensure existing files are not accidentally overwritten.

token: (1) An abbreviation of a string of characters. For example, Applesoft BASIC stores commands internally as single-character tokens. (2) A sequence of characters delimited so as to be identified by a compiler.

tool: (1) See **toolbox, tool set.** (2) An implement you use to do work. HyperCard has tools for browsing through cards and stacks, creating text fields, editing text, making buttons, and creating and editing pictures.

toolbox: A collection of built-in routines that programs can call to perform many commonly needed functions. Functions within the Apple IIgs Toolbox are grouped into **tool sets.** Compare **User Interface Toolbox.**

Toolbox Event Manager: The part of the Toolbox that allows your application program to monitor the user's actions with the mouse, keyboard, and keypad.

Toolbox Utilities: The part of the Toolbox that performs generally useful operations such as fixed-point arithmetic, string manipulation, and logical operations on bits.

tool set: A group of related routines (usually in firmware) that perform necessary functions or provide programming convenience. They are available to applications and system software. The Memory Manager, the System Loader, and QuickDraw II are Apple IIgs tool sets.

top margin: The distance from the top edge of a page to the first printed line of text.

Top of Form (TOF): The position of the print line relative to the top edge of the paper when you turn on the printer.

Top-of-Form command: A command causing a printer to feed paper until the paper advances to a preset position relative to the top of a single sheet.

traces: The electrical paths that connect the components on a circuit board.

tracks: A series of concentric circles that are magnetically drawn on the recording surface of a disk when it is formatted. Tracks are further divided into 8 to 12 consecutive *sectors*. A track corresponds to one ring of constant radius around the disk. See also **DOS 3.3, DOS 3.2.**

tractor: A belt with pins that guides pin-feed paper into the printer. The ImageWriter LQ has two tractors, one for each column of pin holes.

tractor release lever: A lever that, in the down position, locks its tractor into position. The up position frees the tractor for adjustment to a different paper width.

transaction: A complete NuBus operation such as read or write. In the Macintosh II, a transaction is made up of an address cycle, wait cycles as required by the responding card, and a data cycle. *Address cycles* are one clock period long and convey address and command information. *Data cycles* are also one clock period long and convey data and acknowledgement information.

TranscendentalFunctions package: A Macintosh package that contains trigonometric, logarithmic, exponential, and financial functions, as well as a random number generator.

transfer parameter: A characteristic of a file transfer type that can be modified for the file transfer process (for example, record size).

transfer type: The specific type of file being transferred as defined by the operating system or application program (for example, COBOL or MacBinary).

transistor-transistor logic (TTL): (1) A family of integrated circuits having bipolar circuit logic. TTLs are used in computers and related devices. (2) A standard for interconnecting such circuits, which defines the voltages used to represent logical 0s and 1s.

translate table: The table that controls character conversion between the Macintosh and the IBM host.

translation menu: A menu, such as “Mac to MS-DOS” or “Mac to Mac,” that appears when two disks are shown in the Apple File Exchange window.

translator: The information that the Apple file exchange utility needs to translate a document created with an application on one operating system into a document that can be used with a similar application on another operating system.

translator file: A file containing one or more Apple File Exchange translators.

trap dispatcher: The part of the Operating System that examines a trap word to determine what operation it stands for, looks up the address of the corresponding routine in the trap dispatch table, and jumps to the routine.

trap dispatch table: A table in RAM containing the addresses of all Toolbox and Operating System routines in encoded form.

trap macro: A macro that assembles into a trap word, used for calling a Toolbox or Operating System routine from assembly language.

trap number: The identifying number of a Toolbox or Operating System routine; an index into the trap dispatch table.

trap word: An unimplemented instruction representing a call to a Toolbox or Operating System routine.

Trash: An icon on the desktop that you use to discard documents, folders, and applications.

tree file: An organizational form of a ProDOS 16 standard file. A tree file consists of a single master index block, up to 127 index blocks, and up to 32,512 data blocks. **Compare sapling file.** See also **standard file.**

tree structure: The layout of a UNIX directory hierarchy. Organized like an inverted tree, the directory hierarchy begins with the root directory at the top. Branching downward from the root are the rest of the directories and files in the system.

troubleshoot: To locate and correct an error or the cause of a problem or malfunction in hardware or software. When referring to software, synonymous with *debug.*

truncate: (1) To shorten by discarding a part. (2) To convert a real number to the next lower integer.

TTL: See **transistor-transistor logic.**

TTL RGB: A type of video monitor that can accept only a limited number of digital values and display only a correspondingly limited number of colors. Compare **analog RGB.**

tty: A terminal; abbreviated from *teletypewriter,* which was the first terminal device used on UNIX operating systems.

turnkey disk: See **startup disk.**

25-pin plug: A standard plug, having a maximum of 25 connector wires (pins), used to connect various devices to the computer. Standard plugs may have fewer than the maximum number of pins. They have an elongated shape like a flattened letter “D”. Compare **DIN connector.**

2x font: Fonts that are twice the size (and therefore contain twice the amount of information about the shape of the image) as the fonts shown on your screen. Macintosh computers use 2x fonts when printing to an ImageWriter II in Best quality mode to create a higher-resolution image of each character.

type: (n.) Printed or typewritten characters. (v.) To produce characters by pressing keys on a keyboard.

type-ahead buffer: A **buffer** that accepts and holds characters that are typed faster than the computer can process them.

typehead: See **print head.**

Glossary U–Z

uid: See **user ID.**

umount: A system administration command that removes a local file system.

unary operator: An operator that applies to a single operand. For example, the minus sign (–) in a negative number such as –3 is a unary arithmetic operator. Compare **binary operator.**

unasserted: For an active-low signal, synonymous with high, deasserted, false, inactive, and released.

unbuffered: A buffer style that does not use a buffer for I/O; reading and writing is done one character at a time.

unconditional branch: A branch that does not depend on the truth of any condition. Compare **conditional branch.**

unidirectional printing: A mode of printer operation in which characters are printed only when the print head is moving from left to right. Compare **bidirectional printing.**

unimplementedinstruction: An instruction word that doesn't correspond to any valid machine-language instruction but instead causes a trap.

unit number: A hexadecimal number assigned to a SCSI device by the firmware, based on the device's SCSI ID number. Compare **SCSI ID number.**

UNIX operating system: A general-purpose time-sharing system and related set of utilities, originally developed at AT&T Bell Laboratories. A/UX is an enhanced version of the UNIX operating system for the Macintosh II computer. UNIX is a registered trademark of AT&T Information Systems.

unlink: To remove a directory entry for a file.

unload: To remove a load segment from memory. To unload a segment, the System Loader does not actually "unload" anything; it calls the Memory Manager to either **purge** or **dispose** of the memory block in which the code segment resides. The loader then modifies the Memory Segment Table to reflect the fact that the segment is no longer in memory.

unlock: (1) To remove the restriction on the use of a disk or a file so that it can once again be changed, deleted, or renamed. Compare **lock.** (2) To allow a relocatable block to be moved during heap compaction.

unmount: To remove a file system from the directory hierarchy. Local file systems are unmounted with the `umount` command; remote file systems accessed via the Network File System are unmounted with the `unmount` command. Compare **mount.**

unmounted volume: A volume that hasn't been inserted into a disk drive and had descriptive information read from it, or a volume that previously was mounted and has since had the memory used by it released.

unmovable: See **fixed.**

unordered: In SANE, the result of a comparison between two NaNs, even identical ones. See also **NaN.**

unpurgeable: Having a **purge level** of 0. The Memory Manager is not permitted to purge memory blocks whose purge level is 0.

unpurgeable block: A relocatable block that can't be purged from the heap.

unsigned char: In C, an 8-bit character data type whose range is 0 to 255. Same as *char*.

unsigned int: In C, a 16-bit integer data type whose range is 0 to 65,535. Same as *unsigned short.*

unsigned long: In C, a 32-bit integer data type whose range is 0 to 4,294,967,295.

unsigned short: In C, a 16-bit integer data type whose range is 0 to 65,535. Same as *unsigned int*.

update event: An event generated by the Window Manager when a window's contents need to be redrawn.

Update Folder: A folder on the System Tools disk, and on other application and system disks, that contains **Read Me documents.**

update region: A window region consisting of all areas of the content region that have to be redrawn.

user: A person operating or controlling a computer system.

user group: A computer club in which computer users exchange tips and information, usually about a particular brand of computer.

user ID: (1) A number that identifies you as a subscriber to an information service. (2) In A/UX, a number that identifies a user at the time of login. Abbreviated **uid.**

User ID: An identification number that specifies the owner of every memory block allocated by the Memory Manager. User IDs are assigned by the User ID Manager.

User ID Manager: A tool set that is responsible for assigning User IDs to every block of memory allocated by the Memory Manager.

user interface: The rules and conventions by which a computer system communicates with the person operating it.

User Interface Toolbox: The software in the Macintosh ROM that helps you implement the standard Macintosh user interface in your application.

user level: The setting on the User Preferences card in the Home stack that lets you use HyperCard's tools and abilities. Five user levels are available: Browsing, Typing, Painting, Authoring, and Scripting.

user name: (1) A unique name assigned to a registered user and used to identify that user on the network. (2) See **login name.**

user prefix: The prefix of a fully qualified TSO filename designating the user ID of the file's owner.

utility: In general, an application program that performs a relatively simple function or set of functions. Examples are the Font/DA Mover and the Installer. An APW utility is a program that runs under the APW Shell and that performs a function not handled by the shell itself. MakeLib is an example of an APW utility.

valid partition: A device partition that has a **Partition Descriptor Map** created for it in the **Device Partition Map.**

valid signal: A signal whose voltage is a valid representation of the logic variable it portrays. See also **hold time, setup time.**

value: An item of information that can be stored in a variable, such as a number or a string.

variable: (1) A location in the computer's memory where a value can be stored. (2) The symbol used in a program to represent such a location. Compare **constant.**

VBL: Abbreviation for *vertical blanking;* an interrupt signal generated by the video timing circuit each time it finishes a vertical scan, 60 times a second.

VCB: See **volume control block.**

vector: (1) The starting address of a program segment, when used as a common point for transferring control from other programs. (2) A memory location used to hold a vector, or the address of such a location. (3) A location that contains a value that, when added to a base address value, yields the entry point address of a subroutine.

vector table: A table of interrupt vectors in low memory.

Versatile Interface Adapter (VIA): The I/O chip that handles the Apple Desktop Bus, real-time clock, and various other control signals and interrupts. In the Macintosh II, a second VIA handles control and interrupts for RAM, SCSI, and NuBus.

version: A number indicating the release edition of a particular piece of software. Version numbers for most system software (such as ProDOS 16 and the System Loader) are available through function calls.

version data: In an application's resource file, a resource that has the application's signature as its resource type; typically a string that gives the name, version number, and date of the application.

vertical retrace interrupt: An interrupt generated 60 times a second by the built-in Macintosh video circuitry while the beam of the display tube returns from the bottom of the screen to the top. (In the Macintosh II, a virtual vertical retrace interrupt is generated by the VIA.)

Vertical Retrace Manager: The part of the Operating System that schedules and executes tasks during the vertical retrace interrupt.

VIA: See **Versatile Interface Adapter.**

video: (1) A medium for transmitting information in the form of images to be displayed on the screen of a cathode-ray tube. (2) Information organized or transmitted in video form.

videodisc: A double-sided optical disc capable of storing and playing back full-motion video.

video driver: In the Macintosh II, the device driver that handles the interface between QuickDraw and a slot-based video device.

video monitor: A display device that can receive video signals by direct connection only and cannot receive broadcast signals such as commercial television; it can be connected directly to the computer. Compare **television set.**

viewport: All or part of the display screen used by an application program

to display a portion of the information (such as a document, picture, or worksheet) on which a program is working. Compare **window.**

virtual memory: Memory space that is separate from the main memory (physical RAM) and is instead located in auxiliary memory media (usually disks). The ability of a system to address virtual memory space is important for multitasking operating systems and applications too large to be handled in RAM alone.

void: In C, a data type used to declare a function that does not return a value.

volume: A general term referring to a storage device or to part of a storage medium formatted to contain files; a source of or a destination for information. A volume can be an entire disk or only part of a disk. A volume has a name and a volume directory with the same name. Its information is organized into files.

volume attributes: Information contained on volumes and in memory indicating whether the volume is locked, whether it's busy (in memory only), and whether the volume control block matches the volume information (in memory only).

volume bitmap: A portion of every ProDOS 16-formatted disk that keeps track of free disk space.

volume control block (VCB): (1) A nonrelocatable block that contains volume-specific information, including the volume information from the master directory block. (2) A data structure set up in memory by ProDOS 16 to keep track of all volumes and devices connected to the computer.

volume directory: The main directory file of a volume. It contains the names and locations of other files on the volume, any of which may themselves be directory files (called **subdirectories**). The name of the volume directory is the name of the volume. The pathname of every file on the volume starts with the volume directory name. See also **directory file, subdirectory.**

volume name: (1) The name of the volume directory. (2) A sequence of up to 27 printing characters that identifies a volume; followed by a colon (:) in File Manager routine calls, to distinguish it from a filename. (3) The name of a disk or its main directory. Compare **pathname.**

warm start: The process of transferring control back to the operating system in response to a failure in an application program. Compare **cold start.**

Wastebasket: An icon shaped like a wastepaper basket in the AppleFax document window. Dragging an address or distribution list to the Wastebasket removes the address-book entry. Dragging an envelope to the Wastebasket deletes the envelope and removes it from the activity report.

waveform: The shape of a wave (a graph of a wave's amplitude over time).

waveform description: A sequence of bytes describing a waveform.

wavelength: The horizontal extent of one complete cycle of a wave.

wave-table synthesizer: Similar to the old four-tone synthesizer, the wave-table synthesizer produces complex sounds and multipart music.

wide area network: A system of interconnected local area networks that spans a wide geographical area.

wildcard character: A character that may be used as shorthand to represent a sequence of characters in a pathname. A common wildcard character is the asterisk (*). As an example, if you were to request a listing of `*.TEXT` files in a particular application, you would see a list of all files ending with the suffix `TEXT`. In APW, the equal sign (=) and the question mark (?) can be used as wildcard characters.

window: (1) The area that displays information on a desktop; you view a document through a window. You can open or close a window, move it around on the desktop, and sometimes change its size, scroll through it, and edit its contents. See also **mini-window.** (2) The portion of a collection of information (such as a document, picture, or worksheet) that is visible in a viewport on the display screen. Each window is internally represented in a window record. Compare **viewport.**

window class: In a window record, an indication of whether a window is a system window, a dialog or alert window, or a window created directly by the application.

window definition function: A function called by the Window Manager when it needs to perform certain type-dependent operations on a window (for example, drawing the window frame).

Window Manager: The part of the Toolbox that provides routines for creating and manipulating windows.

Window Manager port: A GrafPort that has the entire screen as its PortRect and is used by the Window Manager to draw window frames.

window template: A resource (type `'WIND'`) that contains information from which the Window Manager can create a window.

wire: See **striker wire.**

word: (1) The computer's native unit of data. The Macintosh II uses a 32-bit word. A NuBus word is 32 bits long; a half-word is 16 bits. An SE Bus or 68000 word is 16 bits long; a half-word is 8 bits. For the Apple IIgs, a word is 16 bits (2 bytes) long. (2) For the shell and other programs, a string of nonblank characters bounded by the space character, the tab character, or the beginning or the end of the input line.

word processor: A type of application program designed to make writing and editing easier and faster.

word search: See **keyword search.**

word-selection break table: A **break table** that is used to find word boundaries for word selection, spelling checking, and so on.

word wrap: The automatic continuation of text from the end of one line to the beginning of the next. Word wrap lets you avoid pressing the Return key at the end of each line as you type.

word-wrapping break table: A **break table** that is used to find word boundaries for screen wrapping of text.

working directory: See **current directory.**

workstation: (1) A Macintosh, Apple II, or IBM PC that you can use to do your work and send or receive information over a network. AppleShare workstations are connected to the AppleTalk network system. (2) An individual work area that includes one or more devices on a network. (3) A node through which a user can access a server or other nodes.

WORM: Acronym for *write once, read many* times. WORM is a type of

optical drive that allows the user to save his own data to the disc once and access the information as often as he wants. This type of drive gives the user an economical way of storing archival information for repeated access.

wraparound: See **word wrap.**

wristwatch: The icon you see on the screen in place of the arrow pointer when the computer is performing an action that causes you to wait.

write: To transfer information from the computer to a destination external to the computer (such as a disk drive, printer, or modem) or from the computer's processor to a destination external to the processor (such as main memory).

write-enable notch: The square cutout on one edge of a 5.25-inch disk's jacket. If there is no write-enable notch, or if it is covered with a write-protect tab, the disk drive can read information from the disk but cannot write on it.

write-protect: To protect the information on a disk. You write-protect a 5.25-inch disk by covering the write-enable notch with a **write-protect tab,** preventing the disk drive from writing any new information onto the disk. You lock (write-protect) a 3.5-inch disk by sliding the small tab in the left corner on the back of the disk toward the disk's edge. Compare **copy-protect, lock.**

write-protect tab: (1) A small adhesive sticker used to write-protect a 5.25-inch disk by covering the write-enable notch. (2) The small plastic tab in the corner of a 3.5-inch disk jacket. You lock (write-protect) the disk by sliding the tab toward the edge of the disk; you unlock the disk by sliding the tab back so that it covers the rectangular hole.

x flag: One of three flag bits in the 65C816 processor that programs use to control the processor's operating modes. In **native mode,** the setting of the x flag determines whether the index registers are 8 bits wide or 16 bits wide. See also **e flag, m flag.**

x-height: The height of a lowercase "x" in a given font; the height, measured from the base line, of the main portion of most lowercase letters in a font, excluding ascenders and descenders. See also **ascent line, base line, descent line.**

XOFF: A special character (value $11) used for controlling the transfer of data between a **DTE** and a **DCE.** When one piece of equipment receives an XOFF character from the other, it stops transmitting characters until it receives an XON. See also **handshaking, XON.**

XON: A special character (value $13) used for controlling the transfer of data between a **DTE** and a **DCE.** See also **handshaking, XOFF.**

XON/XOFF: A communications protocol that tells the computer to start or stop sending data by sending the appropriate character: either an XON or an XOFF. The ImageWriter LQ sends an XOFF when its input buffer is nearly full and an XON when it has room for more data. Compare **hardware handshake.**

XOR: See **exclusive OR.**

X register: One of the two index registers in the 6502 microprocessor.

Yellow Pages: A Network File System protocol for sharing a common database of user information across a local area network.

Y register: One of the two index registers in the 6502 microprocessor.

zero page: The first page (256 bytes) of memory in a standard Apple II computer (or in the Apple IIgs when running a standard Apple II program); also called *page zero.* Because the high-order byte of any address in this page is zero, only the low-order byte is needed to specify a zero-page address. This makes zero-page locations more efficient to address, in both time and space, than locations in any other page of memory. Compare **direct page.**

zone: (1) One or more networks, collectively identified by a zone name, that are part of a larger, interconnected network. Users in a zone can easily share network services such as printers or servers. (2) A network in a series of interconnected networks, joined through **bridges.**

zone record: A data structure representing a heap zone.

zoom box: A small box with a smaller box enclosed in it found on the right side of the **title bar** of some windows. Clicking the zoom box expands the window to its maximum size; clicking it again returns the window to its original size.

A P P E N D I X

Creating a Glossary for Your Manual

A GOOD GLOSSARY CAN ENHANCE A MANUAL'S USEFULNESS TO READERS MUCH as do the table of contents and a good index. Here are some guidelines for preparing a glossary.

❖ *Note: Glossary,* as used here, refers to an alphabetized list of terms with definitions—not the collections of keywords used in Microsoft Word for formatting a document.

Audience considerations

Keep in mind the needs of the people for whom you are writing. Follow the guidelines in this section.

Know your audience

If your manual is intended for first-time computer users or first-time Apple product users, you'll probably have to include terms you might think of as having obvious meanings—such as *disk drive, 3.5-inch disk, System file, window, screen, menu, start up,* and *command.* Earlier user manuals can serve as guides when deciding what to include; developmental editors can also make helpful suggestions.

Technical manuals needn't assume computer illiteracy on the part of readers—you may not have to define general computer terms like *silicon* or *application program.* However, you should probably assume that some readers will be ignorant of Apple terminology. Terms like *language card, Finder,* or *IWM* (*Integrated Woz Machine*) should probably be in the glossary if your manual uses them. Again, it depends on your audience; for example, the glossary of *Inside Macintosh,* Volumes I–III, does not include *Finder* but does include *File Manager.*

Intermediate manuals or installation manuals for peripheral devices lie in a gray area. Can you assume, for example, that the person buying a hard disk has already learned how to use the computer? Perhaps not. But some hard disk buyers will be highly advanced users. When deciding which terms to include, you should probably err on the side of including terms that most readers might already know, rather than leaving out those that some readers won't know, insofar as the terms belong in the manual's context.

Make definitions explanatory as well as correct

Give an example where appropriate; if possible, make that example specific to the system about which you're writing. Where helpful, refer to other glossary terms for further information or contrast.

Make the context clear

Is your definition general to all computers, specific to Apple computers, specific to a particular device or system, or somewhere in between? If a term has two or more meanings that are relelvant (such as *format,* the noun referring to page appearance, and *format,* the verb referring to the action performed on a blank disk), provide all definitions.

Connect ordinary usage with technical meaning

Many ordinary English words have specific meanings with regard to computer products. In manuals for first-time users, it's helpful to show the connection between the ordinary meaning of the word and its new, technical meaning. For example, here's the *Apple Publications Glossary* definition of *open:*

> **open:** To make available. You open files or documents in order to work with them. A file may not be read from or written to until it is open. In the desktop interface, opening an icon causes a window with the contents of that icon to come into view. You may then perform further actions in the window when it's active.

The initial definition of *open,* "to make available," is one of the meanings given the verb in *The American Heritage Dictionary.* It provides a conceptual link to the reader.

Matters of form

These guidelines tell how entries should be formatted and structured and what conventions we follow in Apple manuals.

Galaxy Design

The current version, version 3.0, is in Galaxy Design using Microsoft Word 3.02. You may have to reformat entries that you paste into Grand Design, Nova Design, or other designs.

The Microsoft Word glossary macro sets up the entire Glossary section and page format for you, including the opening, footers, and division break. Once your glossary document is set up, you can type your own entries or cut and paste entries from the *Apple Publications Glossary* disk. See the design documentation for specs and sample pages.

Format of an entry

The term to be defined is in boldface, followed by a boldface colon and one plain space. Do not capitalize the term unless it is a proper noun.

The definition, in plain text, starts with a capital letter and ends with a period. The first clause of the definition is a sentence fragment. Other parallel phrases in the definition may also be sentence fragments; otherwise, use complete sentences.

Alphabetization

Alphabetize entries letter by letter up to a punctuation mark; spaces do not count. For example, *controller* comes before *control panel.* Numerical entries are ordered as though they were spelled out. For example, *6502* comes between *shell* and *soft switch.* Where there are several similar numeric entries, however, such as *68000, 68020, 68851,* and so on, order the entries numerically within the group. This is a change to the previous rule; *Apple III* now comes after *Apple II.*

Parts of speech

If the term is a verb, start the definition with an infinitive ("To make available") and not a gerund ("Making available"). If the term is an adjective, you may have to start the definition with wording such as "Said of . . . ," "Characteristic of . . . ," "Used to

describe . . . ," or some such. You may also use (n.), (v.), or (adj.) for noun, verb, or adjective to distinguish the part of speech.

Pronunciation

When defining acronyms or other terms with unusual or unclear pronunciation, provide a key in this form:

> **ASCII:** Acronym for *American Standard Code for Information Interchange* (pronounced "ASK-ee").
> **EBCDIC:** Acronym for . . . (pronounced "EB-si-dik").
> **leading:** Pronounced "LED-ing"; the amount of blank vertical space between. . . .

The pronunciation key is inside quotation marks; hyphens separate the syllables, and all-caps indicates the stress.

Cross-references

Within your definition, use boldface for other terms in the glossary *that you want the reader to consult in relation to this definition.* Use italics for terms that are synonyms or antonyms but that don't need to be looked up separately (or don't appear in your glossary). If you use a term that appears in the glossary but do not want to draw particular attention to it, just use roman (plain text). Avoid making entries look like this:

> (Cluttered)
> **open:** To make available. You open **files** or **documents** in order to work with them. A file may not be read from or written to until it is open. In the desktop interface, opening an **icon** causes a **window** with the contents of that icon to come into view. You may then perform further actions in the window when it's **active.**

If you think cross-referencing is needed, it's often better to do so this way, with cross-references at the end:

> (Better)
> **open:** To make available. You open files or documents in order to work with them. A file may not be read from or written to until it is open. In the desktop interface, opening an icon causes a window with the contents of that icon to come into view. You may then perform further actions in the window when it's active. Compare **close.** See also **icon, window.**

△ Important

Make sure all cross-referenced terms are in your glossary. △
"See" means that the definition for a term is given elsewhere.
"See also" means that additional relevant information is given elsewhere.
"Compare" means that a contrasting or complementary term is defined elsewhere. It isn't necessary to say "Compare *with*. . . ." You may also use "Same as" and "Opposite of" for synonyms and antonyms. △

Multiple definitions

Each definition in a sequence is preceded by a number in parentheses followed by a single space:

> **graphics:** (1) Information presented in the form of. . . . (2) The display of pictures. . . .

If the definitions are for different parts of speech, each one is preceded by the part-of-speech abbreviation in parentheses with a period:

> **branch:** (v.) To pass program control to a line or statement

other than the next in sequence. (n.) A statement that performs the act of branching. See also **conditional branch, unconditional branch.**

More complexity is possible; consult your developmental editor, if necessary, when dealing with complex entries.

Independence

Your glossary should stand alone. Don't include references to text sections or to other publications.

Assembling the glossary

First, decide which terms you need to include and define for your readers.

Second, check specific glossaries for your group. The Networking and Communications Group and the technical writers working on the Apple IIgs books, for example, have assembled specialized glossaries with definitions that may not appear in the *Apple Publications Glossary.*

Third, look in the *Apple Publications Glossary,* and cut and paste any entries you want from the disk. Your Area Associate should have a copy of the disk files.

❖ *By the way:* It's not necessary to copy the entire *Apple Publications Glossary* into your document.

Fourth, check other Apple manuals for highly specific definitions that may not have been included in the specialized glossaries or general *Apple Publications Glossary.*

Finally, look in other dictionaries or write your own definition. You don't necessarily have to use an existing definition verbatim. Make up your own variant or examples if appropriate. If an entry contains both a simple definition and a complex one, and you don't need both, pick out the part that is applicable. Feel free to correct errors or misconceptions if you find them, and please pass the correct information on to your developmental editor.