X–REF Apple® II Books and Notes

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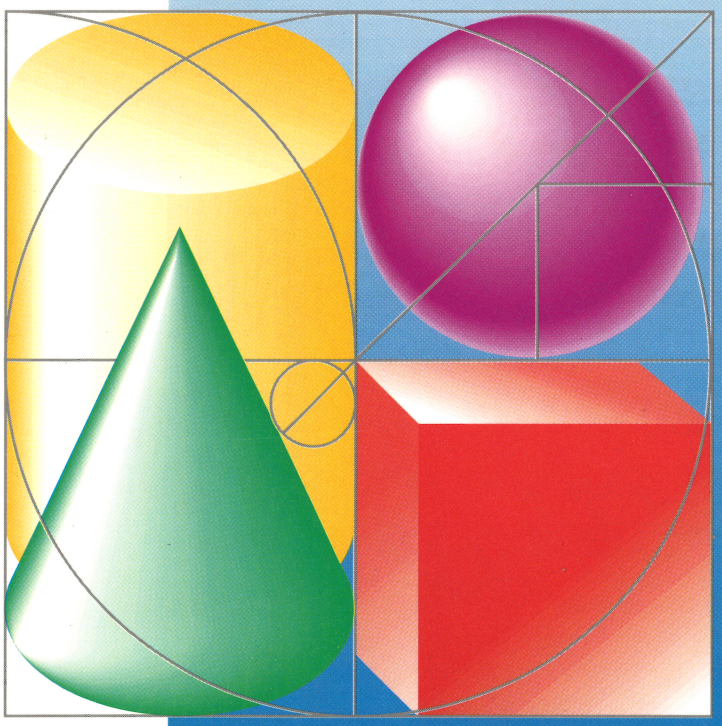

X–REF Apple II Books and Notes

Packing List

This package contains the following items:

1	Manual *X–REF Books and Notes*	A0021LL/A

If you have any questions, please call 1-800-282-2732.

X-Ref (Cross-Reference) to Apple II Programming Books

The X-Ref to Apple II Programming Books is a compilation of the glossaries and indexes from the books and references listed below. It is intended to be a "look here first" book for helping you find the definition to terms used in any of these sources of technical information. In addition, the compiled index will help you find what you are looking for across the entire suite.

The books covered, and the initials used to represent them are:

Apple IIc Technical Reference	CTR
Apple IIe Technical Reference	ETR
Apple IIGS Firmware Reference	GSF
Apple IIGS Hardware Reference	GSH
ProDOS 16 Technical Reference	P16
Programmer's Introduction to the Apple IIGS	PI
Technical Introduction to the Apple IIGS	GST
Apple IIGS Toolbox Reference (treated as a whole)	GSTR
Technical Notes	
Apple IIe Tech Notes	IIe
Apple IIc Tech Notes	IIc
Apple IIGS Tech Notes	IIGS
Apple II Miscellaneous Tech Notes	Miscellaneous
AppleTalk Tech Notes	AppleTalk
GS/OS Tech Notes	GS/OS
ImageWriter Tech Notes	ImageWriter
Memory Expansion Card	Memory Expansion Card
Mouse Tech Notes	Mouse
ProDOS 8 Tech Notes	ProDOS
Pascal Tech Notes	Pascal
SmartPort Tech Notes	SmartPort
UniDisk 3.5 Tech Notes	UniDisk 3.5

The X-Ref contains two sections. The first is the complete glossary from all of the books listed. The second section is the combined index from all of the above technical references.

I hope that you find the X-Ref to be a valuable tool for your programming the Apple II line of computers.

Tom Chavez
Product Manager,
X-Ref (Cross-Reference) to Apple II Programming Books

Glossary

128K Apple II: Any standard Apple II with both main and auxiliary 64K banks of RAM. That includes 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. (GSH, GST)

320 mode: An Apple IIGS video display mode, 320 pixels horizontally by 200 pixels vertically. (GSTR)

640 mode: An Apple IIGS video display mode, 640 pixels horizontally by 200 pixels vertically. (GSTR)

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 Apple Language Card installed. (GSF, GSH, GST)

6502: The microprocessor used in the Apple II, in the Apple II Plus, and in early models of the Apple IIe. The 6502 is an MOS device with 8-bit data registers and 16-bit address registers. (CTR, ETR, GSF, GSH, GST)

65816 assembly language: A low-level programming language written for the 65816 family of microprocessors. (GSTR)

65C02: A CMOS version of the 6502; the microprocessor used in the enhanced Apple IIe, the extended keyboard IIe, and the Apple IIc. (CTR, ETR, GSF, GSH, GST)

65C816: The microprocessor used in the Apple IIGS. The 65C816 is a CMOS device with 16-bit data registers and 24-bit address registers. (GSF, GSH, GST, GSTR)

68000: The microprocessor used in the Macintosh and Macintosh Plus. The 68000 has 32-bit data and address registers. (GSF, GSH, GST, GSTR)

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

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. (CTR, ETR)

A register: See accumulator. (GSTR, PI)

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, position-independent. (GSTR, PI, P16)

absolute addressing: An addressing mode in which instruction operands are interpreted as literal addresses. (GSTR, PI)

absolute clamps: Values that establish the minimum and maximum X and Y coordinates for alternative pointing devices. (GSTR)

access (or access byte): An attribute of a ProDOS file that controls whether the file may be read from, written to, renamed, or backed up. (GSTR, PI)

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. (P16)

accumulator: The register in a computer's central processor or microprocessor where most computations are performed. Also called A register. (CTR, ETR, GSF, GSH, GST, GSTR, PI, P16)

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. (CTR, ETR, GSF, GSH, GST)

acronym: A word formed from the initial letters of a name or phrase, such as ROM (from read-only memory). (CTR, ETR, GST)

activate: To make active. A control or window may be activated. Compare enable. (GSTR, PI)

activate event: A window event that occurs when a window is made either active or inactive. (GSTR, PI)

active: Able to respond to the user's mouse or keyboard actions. Controls and windows that are active are displayed differently from inactive items. (GSTR, PI)

ADB: See Apple DeskTop Bus. (GSF, GSH, GSTR, PI)

ADB commands: Commands that are issued to the Apple Desktop Bus. These are not the same as Apple Desktop Bus Tool Set routines; rather, the tool set routines often include an ADB command as a parameter. The Apple Desktop Bus Tool Set then interprets and issues the ADB command. (GSTR)

ADC: See analog-to-digital converter. (CTR, GST)

address: A number that specifies the location of a single byte of memory. Addresses can be given as decimal or hexadecimal integers. A 64K system has addresses ranging from 0 to 65535 (in decimal) or from $0000 to $FFFF (in hexadecimal). The Apple IIGS has addresses ranging from 0 to 16,777,215 (decimal) or from $00 00 00 to $FF FF FF (hexadecimal). A complete address consists of a 4-bit bank number ($00 to $FF) followed by a 16-bit address within that bank ($00 00 to $FF FF). The letter x in an address stands for all possible values for that digit. For example, $Dxxx means all the addresses from $D000 through $DFFF. (CTR, ETR, GSF, GSH, P16)

address bus: The bus that carries addresses from the CPU to components under its control. (PI)

advanced linker (APW): One aspect of the linker supplied with APW. The operation of the advanced linker is programmable. Compare standard linker. (PI)

alert: A warning or report of an error in the form of an alert box, a sound from the computer's speaker, or both. (GSTR, PI)

alert box: A special type of dialog box that appears on the screen to give a warning or to report an error message during use of an application. (GSTR, PI)

alert sound: A sound generated by a sound procedure that emits a tone or sequence of tones when the user is to be alerted of a condition. (GSTR)

alert stage: One of four stages that correspond to consecutive occurrences of an alert. (GSTR)

alert template: A data structure that conatains an alert ID, a RECT determining the alert window's size and location, information about what should happen at each stage of the alert, and a list of pointers to the item templates. (GSTR)

alert window: The window in which an alert box appears. One of the two predefined window formats. Compare document window. (GSTR, PI)

algorithm: A step-by-step procedure for solving a problem or accomplishing a task. (CTR, ETR)

alternative pointing devices: A device, such as a graphics tablet or trackball, used instead of the mouse. (GSTR)

American Simplified Keyboard: See Dvorak keyboard. (CTR, ETR, GST)

American Standard Code for Information Interchange: See ASCII. (GST)

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. (CTR, ETR, GST)

analog data: Data in the form of continuously variable quantities. Compare digital data. (CTR, ETR)

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. Compare TTL RGB. (GSH, GST, PI)

analog signal: A signal that varies continuously over time, rather than being sent and received in discrete intervals. Compare digital signal. (CTR, ETR, GST)

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 stepwise even when the dial is turned smoothly. (CTR, ETR, GST)

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

ANSI: Acronym for American National Standards Institute, which sets standards for many technical fields and is the most common standard for computer terminals. (CTR, ETR)

Apple Desktop Bus (ADB): An input bus, with its own protocol and electrical characteristics, that provides a method of connecting input devices such as keyboards and mouse devices to personal computers. (GSF, GSH, GSTR, PI)

Apple Desktop Bus Tool Set: The Apple IIGS tool set that facilitates an application's interaction with devices connected to the Apple Desktop Bus. (GSTR, PI)

Apple I: The first Apple computer. It was built in a garage in California by Steve Jobs and Steve Wozniak. (CTR, ETR)

Apple II: A family of computers, including the original Apple II, the Apple II Plus, the Apple IIe, the Apple IIc, and the Apple IIGS. (CTR, ETR, GSF, GSH, GST, GSTR, PI)

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). (CTR, ETR, GST)

Apple II Plus: A personal computer in the Apple II family with expansion slots that allow the user to enhance the computer's capabilities with peripheral and auxiliary cards. (CTR, ETR, GST, GSTR, PI)

Apple IIc: A transportable personal computer in the Apple II family, with a disk drive, serial ports, and 80-column display capability built in. (CTR, ETR, GST, GSTR, PI)

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 memory and video enhancement cards. (CTR, ETR, GSTR, PI)

Apple IIe 80-Column Text Card: A peripheral card that plugs into the Apple IIe's auxiliary memory slot and enables the computer to display text as either 40 or 80 characters per line. (CTR, ETR, GST)

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. (CTR, ETR, GST)

Apple IIGS: The most advanced computer in the Apple II family. It features expanded memory, advanced sound and graphics, and the Apple IIGS Toolbox of programming routines. The Apple IIGS uses a 16-bit microprocessor and has 256K of RAM. It has slots like the Apple IIe and ports like the Apple IIc, and contains a 15-voice custom sound chip. (CTR, ETR, PI, GSTR)

Apple IIGS Debugger: A 65816 machine language code debugger for the Apple IIGS computer. (PI)

Apple IIGS Programmer's Workshop: 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. See APW. (GSF, GSH, GSTR, PI, P16)

Apple IIGS Toolbox: An extensive set of routines that facilitates writing desktop applications and provides easy program access to many Apple IIGS hardware and firmware features. Functions within the toolbox are grouped into tool sets. (GSTR, PI)

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. (CTR, ETR)

Apple key: A modifier key on the Apple IIGS keyboard, marked with both an Apple icon and a spinner, the icon used on the equivalent key on some Macintosh keyboards. It performs the same functions as the Open Apple key on standard Apple II machines. (GSF, GSH, GST, GSTR, PI)

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. See also BASIC, Integer BASIC. (CTR, ETR, GSF)

AppleTalk: Apple's local-area network for Apple II and Macintosh personal computers and the LaserWriter and ImageWriter II printers. Like the Macintosh, the Apple IIGS has the AppleTalk interface built in. (GSF)

AppleTalk connector: A piece of equipment—consisting of a connection box, a short cable, and an 8-pin miniature DIN connector—that enables an Apple IIGS to be part of an AppleTalk network. (GSF, GSH, GST)

application: A stand-alone program that performs a specific function, such as word processing, drawing, or telecommunications. Compare, for example, desk accessory, device driver. (GSTR, PI)

application event: Any of four types of events available for applications to define and respond to as desired. (GSTR)

application prefix: The ProDOS 16 prefix number 1/. It specifies the directory of the currently running application. (PI, GSTR)

application program (or application): (1) A program that performs a specific task useful to the computer user, such as word processing, data base management, or graphics. Compare controlling program, shell application, system program. (2) On the Apple IIGS, a program 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. (CTR, ETR, GSH, GST, P16)

application window: A window in which an application's document appears. (GSTR, PI)

application-defined event: Any of four types of events available for applications to define and respond to as desired. (PI)

APW: See Apple IIGS Programmer's Workshop. (GSF, GSH, PI, P16)

APW (Apple IIGS Programmer's Workshop): A multilanguage development environment for writing Apple IIGS desktop applications. (GSTR)

APW Assembler: The 65816 assembly-language assembler provided with the Apple IIGS Programmer's Workshop. (GSTR, PI)

APW C Compiler: The C-language compiler provided with the Apple IIGS Programmer's Workshop. (GSTR, PI)

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

APW Linker: The linker supplied with Apple IIGS Programmer's Workshop. (PI, P16)

APW Shell: The programming environment of the Apple IIGS Programmer's Workshop. It provides facilities for file manipulation and program execution, and supports shell applications. (GSTR, PI)

APW utility program: Any of various Shell applications supplied with the Apple IIGS Programmer's Workshop that function as APW Shell commands. (PI)

arbitrary mode: In the List Manager, a selection mode that allows the user to select members in a list without deselecting already-selected members. (GSTR)

arc: A portion of an oval; one of the fundamental shapes drawn by QuickDraw II. (GSTR, PI)

argument: 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. (ETR)

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

arithmetic operator: An operator, such as +, that combines numeric values to produce a numeric result. Compare logical operator, relational operator. (CTR, ETR)

ascent: In a font, the distance between the base line and the ascent line. (GSTR, PI)

ascent line: A horizontal line that coincides with the tops of the tallest characters in a font. See also base line, descent line. (GSTR, PI)

ASCII: Acronym for American Standard Code for Information Interchange, pronounced "ASK-ee." A code in which the numbers from 0 to 127 stand for text characters. ASCII code is used to represent text inside a computer and to transmit text between computers or between a computer and a peripheral device. Compare EBCDIC. (CTR, ETR, GSH, GST, GSTR, PI, P16)

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. (GSH, GST)

assembler: A language translator that converts a program written in assembly language into an equivalent program in machine language. The opposite of a disassembler. Compare compiler. (CTR, ETR, GSF, GST, PI, P16)

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. See also machine language. (CTR, ETR, GST)

AsyncADBReceive completion routine: Used in conjunction with the ADB Tool Set routine AsyncADBReceive, the completion routine obtains ADB data from a buffer. Compare SRQ list completion routine. (GSTR)

asynchronous: Not synchronized by a mutual timing signal or clock. Compare synchronous. (CTR, ETR, GST)

Asynchronous Communications Interface Adapter: See ACIA. (GST)

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. (CTR, ETR)

attributes word: Determines how memory blocks are allocated and maintained. Most of the attributes are defined at allocation time and can't be changed after that; other attributes can be modified after allocation. (GSTR, PI)

auto-key: A keyboard feature and an event type, in which a key being held down continuously is interpreted as a rapid series of identical keystrokes. (GSTR, PI)

auxID: A subfield of the User ID. An application may place any value it wishes into the auxID field. (GSTR, PI, P16)

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 also for the RGB monitor card. The slot is labeled "AUX. CONNECTOR" on the circuit board. (CTR, ETR, GSH, GST)

auxiliary type: A secondary classification of ProDOS files. A file's auxiliary type field may contain information of use to the applications that read it. Compare file type. (GSTR, PI)

available font: A font that the Font Manager can use because the font is the ROM font, or a font in the FONTS subdirectory, or a font that the application has added with the Font Manager routine AddFontVar. (GSTR)

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

background: The pixels within a character or other screen object that are not part of the object itself. (GSTR, PI)

background color: The color of background pixels in text; by default it is black. (GSTR, PI)

background pattern: The pattern QuickDraw II uses to erase objects on the screen. (GSTR, PI)

background pixels: In a character image, the pixels that are not part of the character itself. (GSTR, PI)

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

background procedure: A procedure run by the Print Manager whenever the Print Manager has directed output to the printer and is waiting for the printer to finish. (GSTR, PI)

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. (PI, P16)

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 MHz. (CTR)

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. (GSF, GSH, GSTR, PI, P16)

bank $00: The first bank of memory in the Apple IIGS. In emulation mode, it is equivalent to main memory in an Apple IIe or Apple IIc computer. (GSTR, PI)

bank-switched memory: On Apple II computers, that part of the language card memory in which two 4K-portions of memory share the same address range ($D000–$DFFF). (GSF, GSH, PI, P16)

base address: In indexed addressing, the fixed component of an address. (CTR, ETR)

base family: A font family is a base family if it is the ROM font or if a plain-styled example of the family can be found among the fonts in the FONTS subdirectory. (GSTR)

base height: In the LineEdit Tool Set, the distance between the top of the destination rectangle and the base line. This controls where the text is drawn. (GSTR)

base line: A horizontal line that coincides with the bottom of the main body of each character in a font. Character descenders extend below the base line. (GSTR, PI)

BASIC: Acronym for Beginners All-purpose Symbolic Instruction Code. BASIC is 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. (CTR, ETR, GSTR, PI)

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

batch: A mode of executing a computer program in which all code and data required by the program are loaded into the computer at the beginning, the program is run, and all results are output at the end. Batch mode is non-interactive. (PI)

Battery RAM: RAM memory on the Apple IIGS clock chip. A battery preserves the clock settings and the RAM contents when the power is off. Control Panel settings are kept in the Battery RAM. (GSF)

baud: A unit of data transmission speed: the number of discrete signal state changes per second. Often, but not always, equivalent to bits per second. Compare bit rate. (CTR, ETR, GST)

baud rate: The rate at which serial data is transferred, measured in signal transitions per second. It takes approximately 10 signal transitions to transmit a single character. (GSF)

best-fit font algorithm: The algorithm that the Font Manager routine InstallFont uses to look for a font that matches a given set of specifications. (GSTR)

binary: A method of numeric representation using a base-2 system. Valid digits are 0 and 1. Compare hexadecimal, decimal. (GSH) Characterized by having two different components, or by having only two alternatives or values available; sometimes used synonymously with binary system. (CTR, ETR)

binary digit: The smallest unit of information in the binary number system; a 0 or a 1. Also called a bit. (CTR, ETR)

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. (GST, PI, P16)

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. (PI, P16)

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. (CTR, ETR)

binary system: 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, hexadecimal. (CTR, ETR)

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. (CTR, ETR, GSF, GSH, GST, GSTR, PI, P16)

bit image: A collection of bits in memory that have a rectilinear graphical representation. The display on the screen is a visible bit image. (GST)

bit map: A set of bits that represents the positions and states of a corresponding set of items. In graphics, video pixels are represented by a bit or bits in video display memory. See also graphics. (GSH, GST, P16)

bit plane: A method of representing images in computer memory. In a bit plane, consecutive bits in memory specify adjacent pixels in the image; if more than one bit is required to completely specify the state of a pixel, more than one bit plane is used for the image. Compare chunky pixels. (GSTR, PI)

bit rate: The speed at which bits are transmitted, usually expressed as bits per second, or bps. Compare baud. (CTR, ETR, GST)

bits per second: See bit rate. (CTR, ETR)

block: (1) A unit of data storage or transfer, typically 512 bytes. (2) A contiguous region of computer memory of arbitrary size, allocated by the Memory Manager. Also called a memory block. (GSF, GSH, GSTR, PI, P16)

block device: A device that transfers data to or from a computer in multiples of 1 block (512 bytes) of characters at a time. Disk drives are block devices. Also called block I/O device. (GSF, GSTR, PI, P16)

block I/O device: See block device. (GSTR)

board: See printed-circuit board. (CTR, ETR)

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

Boolean logic: A mathematical system in which every expression evaluates to one of two values, usually referred to as TRUE or FALSE. (GSTR, PI)

Boolean variable: A variable that can have one of two values, usually referred to as TRUE or FALSE. (GSTR, PI)

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. (CTR, ETR, GSF, GSH, GST, P16)

boot disk: See startup disk. (CTR, ETR)

boot prefix: The ProDOS 16 prefix number */. It specifies the name of the volume from which the currently running version of ProDOS 16 was started up. (PI)

bootstrap: See boot. (CTR, ETR, GST)

bottom scroll bar: The scroll bar the user selects to scroll horizontally through the data in a window. (GSTR)

boundary rectangle: A rectangle, defined as part of a QuickDraw II LocInfo record, that encloses the active area of the pixel image and imposes a coordinate system on it. Its upper-left corner is always aligned on the first pixel in the pixel map. (GSTR, PI)

boundsRect: The GrafPort field that defines the port's boundary rectangle. (GSTR, PI)

bps: See bit rate. (CTR, ETR)

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

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

breakpoint: A machine-language instruction in a program that causes execution to halt. (PI)

BRK: A "software interrupt." An instruction that causes the 6502 or 65C02 microprocessor to halt. Pronounced "break." (CTR, ETR)

buffer: A holding area in the computer's memory (for example, a print buffer) where information can be stored by one program or device and then read at a different rate by another. (CTR, ETR, GSF, GSH, GST, GSTR, PI)

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-size computer. (CTR, ETR, GST)

bus: A group of wires or circuits that transmit related information from one part of a computer system to another. In a network, a line of cable with connectors linking devices together. A bus network has a beginning and an end. (It's not in a closed circle or T shape.) (CTR, ETR, GST)

Busy word: A firmware flag, consulted by the Scheduler, that protects system software that is not reentrant from being called while processing another call. (GSTR, PI, P16)

button: (1) A pushbutton-like image in dialog boxes where the user clicks to designate, confirm, or cancel an action. See also check box, radio button. (2) A button on a mouse or other pointing device. See also mouse button. (GST, GSTR, PI)

byte: A unit of information consisting of 8 bits. A byte can have any value between 0 and 255, which may represent an instruction, a letter, a number, a punctuation mark, or another character. See also bit, kilobyte, megabyte. (CTR, ETR, GSF, GSH, GSTR, PI, P16)

C: A high-level programming language. One of the languages available for the Apple IIGS Programmer's Workshop. (GSTR, PI)

c flag: See carry flag. (GSTR, PI)

C string: An ASCII character string terminated by a null character (ASCII value = 0). (GSTR, PI)

C string: An ASCII character string terminated by a null character (ASCII value = 0). Compare Pascal string. (GSTR)

C-type string: Same as C string. (GSTR)

C3COUT1: Also called BASICOUT, this is the routine that COUT jumps to when the 80-column firmware is active. (GSF)

cable: An insulated bundle of wires with connectors on the ends; the number of wires varies with the type of connection. Examples are serial cables, disk drive cables, and AppleTalk cables. (CTR, ETR)

call: (v) To request the execution of a subroutine, function, or procedure. (n) A request from the keyboard or from a procedure to execute a named procedure. See procedure. (CTR, ETR, GST, P16)

call block: The sequence of assembly-language instructions used to call ProDOS 16 or System Loader functions. (P16)

Cancel: One of two predefined item ID numbers for dialog box buttons (Cancel = 2). Compare OK. (GSTR, PI)

cancel: To stop an operation, such as the setting of page-setup values in a dialog box, without saving any results produced up to that point. (GSTR, PI)

card: See peripheral card. (PI)

caret: A symbol that indicates where something should or will be inserted in text. On the screen it designates the insertion point, and is usually a vertical bar (|). (GSTR, PI)

carriage return: An ASCII character (decimal 13) that ordinarily causes a printer or display device to place the next character on the left margin; in APW C, equal to newline (). (CTR, ETR, GST, GSH)

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. (CTR, ETR)

carry flag: A status bit in the 6502 or 65C02 microprocessor, used as a ninth bit with the eight accumulator bits in addition, subtraction, rotation, and shift operations. (CTR, ETR)

carry flag: A status bit in the microprocessor indicating whether an accumulator calculation has resulted in a carry out of the register. Also called c flag. (CTR, ETR, GSF, GSH, GST, GSTR, PI, P16)

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 common display device used with personal computers. (CTR, GSH, GST)

CDA: See classic desk accessory. (GSTR, PI)

CDA menu: The menu on which classic desk accessories are listed; the user selects the menu by pressing Control-Apple-Escape. See also classic desk accessory. (GSTR)

central processing unit (CPU): The "brain" of the computer; the microprocessor that performs the actual computations in machine language. See microprocessor. (CTR, ETR, GSF, GSH, GST)

character: (1) 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. Most characters are represented in the computer as 1-byte values. (2) In QuickDraw II, a single ASCII character. (CTR, ETR, GSF, GSH, GST, GSTR)

character bounds rectangle: The rectangle that determines the extent of the background pixels of a character. (GSTR)

character bounds width: The width of a character's character bounds rectangle. (GSTR)

character code: A number used to represent a character for processing by a computer system. (CTR, ETR)

character device: A device that transfers data to or from a computer as a stream of individual characters. Keyboards and printers are character devices. (GSH, GSTR, PI, P16)

character generator: The IC responsible for providing all text and special characters to the computer that may be displayed on the video monitor. (GSH)

character image: An arrangement of bits that defines a character in a font. (PI) The part of a font strike that represents a character in a font. (GSTR)

character image width: The number of columns in a character image. (GSTR)

character origin: The point on the base line used as a reference location for drawing a character. (GSTR, PI)

character position: An index into LineEdit text, with position 0 corresponding to the first character. (GSTR)

character rectangle: A rectangle that encloses a character image. Its width is equal to the image width of the character; its height is equal to the character height. (GSTR)

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. (CTR, ETR)

character width: The number of pixels the pen position is to be advanced after the character is drawn. (GSTR, PI)

check box: A small box associated with an option in a dialog box. When the user clicks the check box, that may change the option or affect related options. See also radio button. (GSTR, PI)

chip: See integrated circuit. (CTR, GST)

Choose Printer dialog box: A Print Manager dialog box that lets the user select a printer or port for printing. (GSTR, PI)

chunkiness: The number of bits required to describe the state of a pixel in a pixel image. (GSTR, PI)

chunky pixels: A method of representing images in computer memory. In chunky pixel organization, a number of consecutive bits in memory combine to specify the state of a single pixel in the image. Consecutive groups of bits (the size of the group is equal to the image's chunkiness) define adjacent pixels in the image. Compare bit plane. (GSTR, PI)

circuit board: A board containing embedded circuits and an attached collection of integrated circuits (chips). (GST)

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

clamp values: The X- and Y-limits, in terms of pixels, on cursor position controlled by mouse movement. (GSTR, PI)

classic desk accessory (CDA): Desk accessories designed to execute in a non-desktop, non-event-based environment. Compare new desk accessory. (GSTR, PI)

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 out. See Data Communication Equipment, Data Terminal Equipment. (CTR, ETR)

click: To position the pointer on something, and then to press and quickly release the button on the mouse or other pointing device. (GSTR, PI)

clip: To restrict drawing to within a particular boundary; any drawing attempted outside that boundary does not occur. (GSTR, PI)

Clipboard: The holding place for the material the user last cut or copied; a buffer area in memory. Information on the Clipboard can be inserted (pasted) into documents. In memory, the contents of the clipboard are called the desk scrap. (GSTR, PI)

clipping region: The region to which an application limits drawing in a GrafPort. (GSTR, PI)

clock: (1) The timing circuit that controls execution of a microprocessor. Also called system clock. (2) An integrated circuit, often with battery-backup memory, that gives the current date and time. Also called clock-calendar. (GSTR, PI)

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. (GST)

clock speed: The frequency of the system clock signal in megahertz. (PI)

close: 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. (P16) To turn a window back into the icon that represents it. (GST)

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

CMOS: Acronym for complementary metal oxide semiconductor, one of several methods of making integrated circuits out of silicon. CMOS devices are characterized by their low power consumption. CMOS techniques are derived from MOS techniques. (GSF, GSH, GST, PI)

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

cold start: The process of starting up the Apple II 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 boot, warm start. (CTR, ETR, GST)

color fringing: The rainbow-like effect that appears around text characters when they are displayed in color on most color video monitors. This fringing is unavoidable because the color-detection circuitry of most composite video color monitors cannot respond fast enough to the changing of the color information during the text portion of the display. Displaying text in monochrome makes it more readable. (GSH)

color table: One table of 16 lookup tables in Apple IIGS memory. The table lists the available color values for a scan line. (GSTR, PI)

column: A vertical arrangement of graphics points or character positions on the display. (CTR, ETR, GST)

command: An instruction that causes the computer to perform some action. A command can be typed from a keyboard, selected from a menu with a hand-operated device (such as a mouse), or embedded in a program. (CTR, ETR, GST) (1) In the Standard C Library, a parameter that tells a function which of several actions to perform. (2) In the APW Shell, a word that tells APW which utility to execute. (GSH)

command character: An ASCII character, usually Control-A or Control-I, that causes the serial port firmware to interpret subsequent characters as commands. (CTR)

command line: (1) In APW, the line of text with which the user invokes a procedure or function or executes a program. The command line often includes both the name of the function to execute and a list of parameters to be passed to the function. (2) The line on the screen on which a command is entered. (PI)

command register: An ACIA location (at $C09A for port 1 and $C0AA for port 2) that stores parity type and RS-232-C signal characteristics. (CTR)

command-line interface: The type of interface between user and program in which information is passed in a command line. (PI)

compact: To rearrange allocated memory blocks in order to increase the amount of contiguous unallocated (free) memory. The Memory Manager compacts memory when needed. (P16)

compaction: The rearrangement of allocated blocks in memory to open up larger contiguous areas of free space. (GSTR, PI)

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. (CTR, ETR, GST) A program that produces object files (containing machine-language code) from source files written in a high-level language such as C. Compare assembler. (GSTR, PI, P16)

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

composite video: A standard video signal that includes all color and timing information that is needed by a composite video monitor. Several video standards are in use around the world: NTSC video is used in northern America and Japan; PAL video is used in much of Europe; SECAM is used in the USSR and many other countries. The Apple IIGS is capable of generating both NTSC and PAL video. Compare RGB. (CTR, ETR, GSH, GST)

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. (CTR, ETR, GST)

computer language: See programming language. (CTR, ETR, GST)

computer system: A computer and its associated hardware, firmware, and software. (CTR)

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. (GST)

conditional branch: A branch whose execution depends on the truth of a condition or the value of an expression. Compare unconditional branch. (CTR, ETR, GST)

configuration: (1) The total combination and arrangement of hardware components—CPU, video display device, keyboard, and peripheral devices—that make up a computer system. (2) The software settings that allow various hardware components of a computer system to communicate with each other. (CTR, ETR, GST)

connector: A plug, socket, jack, or port. (CTR, ETR)

constant: In a program, a symbol that represents a fixed, unchanging value. Compare variable. (CTR, ETR)

content region: The area in a window in which an application presents information to the user. (GSTR, PI)

control: An object in a window with which the user, using the mouse, can cause instant action with visible results or change settings to modify a future action. (GSTR, PI)

control character: A nonprinting character that controls or modifies the way information is printed or displayed. In the Apple II family, control characters have ASCII values between 0 and 31, and are typed from a keyboard by holding down the Control key while pressing some other key. In the Macintosh family, the Command key performs a similar function. (CTR, ETR)

control code: 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 control character. (CTR, ETR)

control definition procedure: A procedure used to define the appearance and behavior of a custom control. (GSTR)

control key: A general term for a key that controls the operation of other keys; for example, Apple, Caps Lock, Control, Option, and Shift. When you hold down or engage a control key while pressing another key, the combination makes that other key behave differently. Also called a modifier key. (CTR, ETR)

Control key: A specific key on Apple II–family keyboards that produces control characters when used in combination with other keys. (CTR, ETR, GST)

Control Manager: The Apple IIGS tool set that manages controls, which are objects on the screen that the user can manipulate with the mouse to cause instant action or change settings. (GSTR, PI)

Control Panel: A desk accessory that lets the user change certain system parameters, such as speaker volume, display colors, and configuration of slots and ports. (GSF, GSH, GST, GSTR, PI)

control record: A data structure that defines the appearance and behavior of a control. (GSTR)

control register: A special register that programs can read and write, similar to a soft switch. 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. (GSF) An ACIA location (at $C09B for port 1 and $C0AB for port 2) that stores data format and baud rate selections. (CTR)

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. (CTR, ETR, GSF, GSH, GST)

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. (CTR, ETR, GSF, GST)

controlling program: A program that loads and runs other programs, without itself leaving memory. 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. (GSH, PI, P16)

coordinate plane: A two-dimensional grid defined by QuickDraw II. All drawing commands are located in terms of coordinates on the grid. (GSTR, PI)

coordinates: X and Y locations on the QuickDraw II coordinate plane. Most QuickDraw II routines accept and return coordinates in the order (Y,X). (GSTR, PI)

copy: To duplicate something by selecting it and choosing Copy from the Edit menu. A copy of the selected portion is placed on the Clipboard, without affecting the original selection. (GSTR, PI)

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. (CTR, ETR)

COUT: The firmware entry point for the Apple II character-output subroutine. COUT is actually an I/O link located in RAM rather than in ROM, and so can be modified to contain the address of the presently active character-output subroutine. (GSF)

COUT1: An entry point within the Apple II character-output subroutine. (GSF)

CPU: See central processing unit and microprocessor. (CTR, ETR, GSH, GST)

crash: To cease to operate unexpectedly, possibly destroying information in the process. (CTR, ETR)

creation date: An attribute of a ProDOS 16 file; it specifies the date on which the file was first created. (PI, P16)

creation time: An attribute of a ProDOS 16 file; it specifies the time at which the file was first created. (PI, P16)

CRT: See cathode-ray tube. (CTR)

CTS: See Clear To Send. (CTR)

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. (P16)

current font: The font currently being used by QuickDraw II to draw text. (GSTR)

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

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

cursor: A graphic icon displayed by the operating system or application program that indicates where the next input from the user is expected. Different styles of cursors are used with the Apple IIGS: an arrow, an underbar, a vertical bar, and an inverse video block. (CTR, ETR, GSH, GST, GSTR, PI)

cursor record: The data structure that defines the height and width of the cursor, the image of the cursor, the mask controlling the appearance of the cursor, and the hot spot defining where the image of the cursor will be placed by the mouse. (GSTR)

cut: To remove something by selecting it and choosing Cut from the Edit menu. The cut portion is placed on the Clipboard. (GSTR, PI)

D register: See direct register. (PI)

DAC: See digital-to-analog converter. (CTR, ETR, GST)

data: Information transferred to or from or stored in a computer or other mechanical communications or storage device. (CTR, ETR, GSF, GSH)

data area: A document as viewed in a window. The data area is the entire document, only a portion of which (the visible region) may be seen in the window at any one time. (GSTR, PI)

data bank register: A register in the 65816 processor that contains the high-order byte of the 24-bit address that references data in memory. (GSTR, PI)

data bits: The bits in a communication transfer that contain information. Compare start bit, stop bit. (CTR, ETR, GST)

data block: A 512-byte portion of a ProDOS 16 standard file that consists of whatever kind of information the file may contain. (GSH, P16)

data bus: A set of the electrical conductors that carry data from one internal part of the computer to another. (PI)

Data Carrier Detect (DCD): A signal from a DCE (such as a modem) to a DTE (such as an Apple IIGS) indicating that a communication connection has been established. See Data Communication Equipment, Data Terminal Equipment. (CTR, ETR, GST)

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. (CTR, ETR, GST)

data format: The form in which data is stored, manipulated, or transferred. For example, when data is transmitted and received serially, it typically has a data format of one start bit, five to eight data bits, an optional parity bit, and one or two stop bits. (CTR, GST)

data set: A device that modulates, demodulates, and controls signals transferred between business machines and communication facilities. A form of modem. (CTR, ETR)

Data Set Ready (DSR): A signal from a DCE to a DTE indicating that the DCE has established a connection. See Data Communication Equipment, Data Terminal Equipment. (CTR, ETR, GST)

data structure: A specifically formatted item of data or a form into which data may be placed. (GSTR, PI)

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. (CTR, ETR, GST)

Data Terminal Ready (DTR): A signal from a DTE to a DCE indicating a readiness to transmit or receive data. See Data Communication Equipment, Data Terminal Equipment. (CTR, ETR, GST)

DB register: See data bank register. (GSTR, PI)

DCD: Abbreviation for Data Carrier Detect, a modem signal indicating that a communication connection has been established. See Data Carrier Detect. (CTR, ETR, GSF, GST)

DCE: See Data Communication Equipment. (CTR, ETR, GST)

dead character: A character with a character width of 0. (GSTR)

debug: A colloquial term that means to locate and correct an error or the cause of a problem or malfunction in a computer program. Compare troubleshoot. See also bug. (CTR, ETR, GST)

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

decimal: A method of numeric representation using a base-10 system. Valid digits are 0 through 9. Compare hexadecimal, binary. (CTR, ETR, GSH)

default: A preset response to a question or prompt. The default is automatically used by the computer if the user doesn't supply a different response. Default values prevent a program from stalling or crashing if no value is supplied by the user. (CTR, ETR, GST)

default button: The button in a dialog box whose action will be executed if the user presses the Return key. (GSTR)

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/. (GSTR, PI, P16)

deferred execution: The execution of a BASIC program instruction that is part of a complete program. The program instruction is executed only when the complete program is run. You defer execution of the instruction by preceding it with a program line number. The complete program executes consecutive instructions in numerical order. Compare immediate execution. (CTR, ETR)

definition procedure: A routine that defines the characteristics of some desktop feature such as a window or control. For example, TaskMaster needs a pointer to a window-content definiton procedure (wContDefProc) in order to draw the contents of windows that it manipulates. (PI)

DefProc: See definition procedure. (PI)

delete: To remove something, such as a character or word from a file, or a file from a disk. (GST)

Delete key: A key on the upper-right corner of the Apple IIe, Apple IIc, and Apple IIGS keyboards that erases the character immediately preceding (to the left of) the cursor. Similar to the Macintosh Backspace key. (CTR, ETR, GSF, GSH, GST)

delimiter: A character that is used for punctuation to mark the beginning or end of a sequence of characters, and which therefore is 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. (CTR, ETR)

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. (GSF)

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. (GST)

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. (CTR, ETR)

dereference: To substitute a pointer for a memory handle, or a value for a pointer. When you dereference a memory block's handle, you access the block directly (through its master pointer) rather than indirectly (through its handle). (GSTR, PI, P16)

descender: Any part of a character that lies below the base line (such as the tail on a lowercase "p") . (GSTR, PI)

descent: In a font, the distance between the base line and the descent line. (GSTR, PI)

descent line: A horizontal line that coincides with the bottoms of character descenders (such as the tail on a lowercase "p") that extends farthest below the base line. See also ascent line, base height, font height. (GSTR, PI)

desk accessories: "Mini-applications" that are available from the computer's menu regardless of which application you're using. The Control Panel is an example of a desk accessory. (GSF, GSH, GST, GSTR, PI, P16)

desk accessory event: An event that occurs when the user enters the special keystroke (Control–Apple–Escape) to invoke a classic desk accessory. (GSTR, PI)

Desk Accessory menu: The menu whose title is a colored apple symbol. (GSTR)

Desk Manager: The Apple IIGS tool set that executes desk accessories and enables applications to support them. (GSTR, PI)

desk scrap: A piece of data, maintained by the Scrap Manager, taken from one application and available for insertion into another. (GSTR, PI)

desktop: The visual interface between the computer and the user. In computers that support the desktop concept, the desktop consists of a menu bar at the top of the screen, and a gray area in which applications are opened as windows. The desktop interface was first developed for the Macintosh computer. (GSF, GST, GSTR, PI, P16)

desktop environment: A set of program features that make user interactions with an application resemble operations on a desktop. 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. (GST)

desktop interface: See desktop. (PI)

desktop user interface: See desktop, desktop environment. (GST, GSTR)

desktop user interface: The visual appearance of a program and the way in which it interacts with the user. In applications that use the desktop user interface, commands appear as options in pull-down menus, and material being worked on appears in rectangular 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. (GSH)

destination: See destination location. (PI)

destination location: The location (memory buffer or portion of the QuickDraw II coordinate plane) to which data such as text or graphics are copied. See also destination rectangle. (GSTR, PI)

destination rectangle: (1) The rectangle (on the QuickDraw II coordinate plane) in which text or graphics are drawn when transferred from somewhere else. Compare source rectangle. (2) In LineEdit, the rectangle that determines where the text will be drawn. (GSTR, PI)

development environment: A program or set of programs that allows you to write applications. It typically consists of a text editor, an assembler or compiler, a linker, and support programs such as a debugger. (PI)

device: A piece of equipment (hardware) used in conjunction with a computer and under the computer's control. Also called a peripheral device because such equipment is often physically separate from, but attached to, the computer. (CTR, ETR, GSF, GSH, GSTR, PI, P16)

device driver: A program that handles the transfer of data to and from a peripheral device, such as a printer or disk drive. (CTR, ETR, GSF, GSH, GST, GSTR, PI, P16)

device driver event: An event generated by a device driver. (GSTR)

device handler: See device driver. (CTR, ETR)

device-driver event: An event generated by a device driver. (PI)

dial: An indicator on the screen that displays a quantitative setting or value. Usually found in analog form, such as a fuel gauge or a thermometer. A scroll bar is a standard type of dial. (GSTR, PI)

dialog: See dialog box. (GSTR, PI)

dialog box: A box on the screen that contains a message requesting more information from the user. See also alert. (GSTR, PI)

Dialog Manager: The Apple IIGS tool set that manipulates dialog boxes and alerts, which appear on the screen when an application needs more information to carry out a command or when the user needs to be notified of an important situation. (GSTR, PI)

dialog pointer: A pointer to a dialog's GrafPort; equivalent to the window pointer for the dialog box. (GSTR)

dialog record: Information describing a dialog window that is maintained by the Dialog Manager. (GSTR, PI)

dialog template: A record that contains information about a dialog to be created. (GSTR)

dialog window: The window in which a dialog box appears. (GSTR, PI)

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. (CTR, ETR, GST)

digital: (adj) 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. (CTR, ETR, GSH, GST)

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

Digital Oscillator Chip (DOC): An integrated circuit in the Apple IIGS that contains 32 digital oscillators, each of which can generate a sound from stored digital waveform data in a wavetable. (GSF, GSH, GST, GSTR, PI)

digital RGB video monitor: A type of RGB video display in which the intensities of the red, green, and blue signals are fixed at discrete values. (PI)

digital signal: A signal that is sent and received in discrete intervals. A signal that does not vary continuously over time. Compare analog signal. (CTR, ETR, GST)

digital-to-analog converter: A device that converts quantities from digital to analog form. (CTR, ETR, GST)

dim: On the Apple IIGS desktop, to display a control or menu item in gray rather than black, to notify the user that the item is inactive. (GSTR, PI)

DIN: Abbreviation for Deutsche Industrie Normal, a European standards organization. (GSF, GSH, GST)

DIN connector: A type of connector with multiple pins inside a round outer shield. (GSF, GSH, GST)

DIP: See dual in-line package. (CTR, ETR, GST)

DIP switches: A bank of tiny switches, each of which can be moved manually one way or the other to represent one of two values (usually on and off). See dual in-line package. (CTR, ETR)

direct memory access (DMA): A means of fast data transfer into or out of computer memory to or from a computer peripheral. A peripheral device, usually a card in a peripheral I/O expansion slot, puts the 65C816 microprocessor in an idle state, and takes control of the computer for a short period of time. Data in memory may be directly accessed without the time-consuming usual handshaking and protocol. (GSH)

direct page: A page (256 bytes) of bank $00 of Apple IIGS memory, any part of which can be addressed with a short (1-byte) address because its high-address byte is always $00 and its middle-address byte is the value of the 65C816 direct register. Coresident 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. (GSF, GSH, GST, GSTR, PI, P16)

direct register: A hardware register in the 65816 processor that specifies the start of the direct page. (GSF, GSH, GSTR, PI, P16)

direct-page/stack segment: A program segment that is used to initialize the size and contents of an application's stack and direct page. (GSTR, PI)

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. (GSF, GSH, GSTR, PI, P16)

directory: A file that contains a list of the names and locations of other files stored on a disk. Directories are either volume directories or subdirectories. A directory is sometimes called a catalog. (GSH, GST)

directory file: A directory. 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. (GSH, P16)

disable: To make unresponsive to user actions. A dialog box control that is disabled does nothing when selected or manipulated by the user. In appearance, however, it is identical to an enabled control. Compare inactive. (GSTR, PI)

disabled menu: A menu that can be pulled down, but in which items are dimmed and not selectable. (GSTR, PI)

disassembler: 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. (CTR, ETR, GSF, GST, PI)

disk: An information-storage medium consisting of a flat, circular, magnetic surface on which information can be recorded in the form of small magnetized spots, in a manner similar to the way sounds are recorded on tape. See floppy disk, hard disk. (CTR, ETR)

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 the Apple IIc, the Apple IIGS, and all Macintosh-family computers.) (CTR, ETR, GST)

disk device: See block device. (P16)

disk drive: A computer peripheral device that stores digital data on a revolving magnetic surface. Disk drives may be floppy disk drives (which use a removable, flexible mylar disk as the medium) or hard disk drives (which use a fixed aluminum platter as the medium). Disk drives retain the information after the computer is turned off, but are capable of altering the data as requested by the computer program. (CTR, ETR, GSH)

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. (CTR, ETR)

Disk II, Disk II drive: A type of disk drive made and sold by Apple Computer, Inc., for use with the Apple II, II Plus, and IIe computers. It uses 5.25-inch disks. (CTR, ETR, GSF, GSH, GST, PI)

disk jacket: A permanent, protective covering for a disk. 5.25-inch disks have flexible, paper or plastic jackets; 3.5-inch disks have hard plastic jackets. The disk is never removed from the jacket. Compare disk envelope. (CTR, ETR)

disk operating system: An operating system whose principal function is to manage files and communication with one or more disk drives. DOS and ProDOS are two families of Apple II disk operating systems. (GSF, GSH, GST, PI, P16)

Disk Operating System (DOS): An optional software system for the Apple II family of computers that enables the computer to control and communicate with one or more disk drives. The acronym DOS rhymes with boss. (CTR, ETR)

disk port: The connector on the rear panel of the Apple IIGS for attaching disk drives. (PI)

disk-based: See disk-resident. (CTR, ETR, GST)

disk-resident: 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. (CTR, ETR, GST)

display: (1) A general term to describe what you see on the screen of your display device when you're using a computer. (2) Short for a display device. (CTR, ETR, GST)

display color: The color currently being used to draw high-resolution or low-resolution graphics on the display screen. (CTR, ETR)

display device: A device that displays information, such as a television set or video monitor. (CTR, ETR, GST)

display mode: A specification for the way in which a video display functions, including such parameters as whether displaying text or graphics, available colors, and number of pixels. The Apple IIGS has two text display modes (40 column and 80 column), two standard Apple II graphics display modes (Hi-Res and Double Hi-Res), and two new Super Hi-Res graphics display modes (320 mode and 640 mode). (GSTR, PI)

display rectangle: A rectangle that determines where an item is displayed within a dialog box. (GSTR, PI)

display screen: The screen of the monitor; the area where you view text and pictures when using the computer. (CTR, ETR)

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. (GSTR, PI, P16)

dithering: A technique for alternating the values of adjacent pixels to create the effect of intermediate values. Dithering can give the effect of shades of gray on a black-and-white display, or more colors on a color display. (GSH, GST, GSTR, PI)

dividing line: A line that divides groups of items in a menu; such a line uses the space of an entire item and requires an item record. Compare underline. (GSTR)

DMA: See direct memory access. (GSH)

DOC: See Digital Oscillator Chip. (GSF, GSH, GST, GSTR, PI)

document: A file created by an application. (GSTR, PI)

document window: A window that displays a document. One of the two predefined window formats. Compare alert window. (GSTR, PI)

dormant: Said of 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 need not be reloaded from disk. (PI, P16)

DOS: Acronym for disk operating system. An Apple II disk operating system. See Disk Operating System. (GSF, GSH, GST, P16)

DOS 3.2: An early Apple II operating system. DOS stands for Disk Operating System; 3.2 is the version number. Disks formatted using DOS 3.2 have 13 sectors per track. (CTR, ETR)

DOS 3.3: An operating system for the Apple II family of computers. DOS stands for Disk Operating System; 3.3 is the version number. (CTR, ETR, GST)

Double Hi-Res: A high-resolution graphics display mode on Apple II computers with at least 128K of RAM, consisting of an array of points 560 wide by 192 high with 16 colors. (GSF, GSH)

double-click: 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. (GSTR, PI)

draft printing: The print method that the LaserWriter uses. QuickDraw II calls are converted directly into command codes the printer understands, which are then immediately used to drive the printer. Compare spool printing. (GSTR, PI)

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 menu selection or move an object to a new location. (GSTR, PI)

drag region: A region in a window (usually on the title bar) in which the mouse pointer must be placed before the user can drag the window. (GSTR, PI)

draw: In QuickDraw II, to color pixels in a pixel image. (GSTR, PI)

drawing environment: The complete description of how and where drawing may take place. Every open window on the Apple IIGS screen is associated with a GrafPort record, which specifies the window's drawing environment. Same as port, graphic port. (GSTR, PI)

drawing mask: An 8-bit by 8-bit pattern that controls which pixels in the QuickDraw II pen will be modified when the pen draws. (GSTR, PI)

drawing mode: One of 16 possible interactions between pixels in QuickDraw II's pen pattern and pixels already on the screen that fall under the pen's path. In modeCopy mode, for example, pixels already on the screen are ignored. In modeXOR mode, on the other hand, bits in pixels on the screen are XOR'd with bits in pixels in the pen; the resulting pixels are drawn on the screen. See also pen mode, text mode. (GSTR, PI)

drawing pen: See pen. (GSTR, PI)

drive: See disk drive. (CTR, ETR)

driver: See device driver. (GSTR, PI)

DSR: Abbreviation for Data Set Ready, a signal indicating that a modem has established a connection. See Data Set Ready. (CTR, ETR, GSF, GSTR)

DTE: See Data Terminal Equipment. (CTR, ETR, GST)

DTR: Abbreviation for Data Terminal Ready, a signal indicating that a terminal is ready to transmit or receive data. See Data Terminal Ready. (CTR, ETR, GSF, GST)

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. (CTR, ETR, GST)

Dvorak keyboard: An alternate keyboard layout, also known as the American Simplified Keyboard, which increases typing speed because the keys most often used are in the positions easiest to reach. Compare QWERTY keyboard. (CTR, ETR, GST)

dynamic ROM: A form of read-only memory (ROM) in which data is retained in memory while the computer power is off, but is lost as soon as the system is turned on. (GSH)

dynamic segment: A load segment capable of being loaded during program execution. Compare static segment. (GSTR, PI, P16)

e flag: A flag bit in the 65C816 that determines whether the processor is in native mode or emulation mode. (P16)

e flag: One of three flag bits in the 65816 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 (6502), or emulation mode (65816). See also m flag and x flag. (GSF, GSH, GST, GSTR, PI, P16)

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. (CTR, ETR)

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

edit record: A complete text editing environment in the Line Edit Tool Set, 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. (GSTR, PI)

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

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. (CTR, ETR, GST)

embedded: Contained within. For example, the string 'HUMPTY DUMPTY' is said to contain an embedded space. (CTR, ETR)

empty handle: A handle pointing to a NIL master pointer. (GSTR)

emulate: To operate in a way identical to a different system. For example, the 65816 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. (GSF, GSH, GST, GSTR, PI)

emulate: To operate in a way identical to a different system. For example, the Apple II 2780/3780 Protocol Emulator and the Apple II 3270 BSC Protocol Emulator, together with the Apple Communications Protocol Card (ACPC), allow the Apple II, Apple II Plus, or Apple IIe to emulate the operations of IBM 3278 and 3277 terminals and 3274 and 3271 control units. (CTR, ETR)

emulation mode: A manner of operating in which one system imitates another. In the Apple IIGS computer, the mode the 65C816 is in when the Apple IIGS is running programs written for Apple II's that use the 6502. (CTR, ETR, GSF, GSH, GST, GSTR, P16)

enable: To make responsive to user manipulation. A dialog or menu that is enabled can be selected by the user. Enabling does not affect how an item is displayed. Compare activate. (GSTR, PI)

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. (CTR, ETR)

end-of-file: See EOF. (GSTR, PI)

end-of-line character: A character that indicates that the preceding text constitutes a full line. (CTR, ETR)

environment: 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. (GSF)

EOF (end-of-file): The logical size of a ProDOS 16 file; it is the number of bytes that may be read from or written to the file. (GSTR, PI, P16)

erase: In QuickDraw II, to color an area with the background pattern. (PI)

erasing: In QuickDraw II, to color an area with the background pattern. (GSTR)

error: The state of a computer after it has detected a fault in one or more commands sent to it. Also called error condition. (GSF, GSTR, PI, P16)

error code: A number or other symbol representing a type of error. (CTR, ETR, P16)

error condition: See error. (GSTR)

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. (CTR, ETR) A message issued by the system or application program when it has encountered an abnormal situation or an error in data. (GSTR, PI)

Esc key: See Escape key. (CTR, ETR)

ESCAPE character: An ASCII character that, with many programs and devices, allows you to perform special functions when used in combination keypresses. (CTR, ETR, GST)

escape code: A key sequence formed by pressing the Esc (Escape) key, followed by pressing another key. Escape codes are used to control the video firmware. (CTR, ETR, GSF)

Escape key: A key on Apple II-family computers that generates the Escape character. The Escape key is labeled Esc. In many applications, pressing Escape allows you to return to a previous menu or to stop a procedure. (CTR, ETR, GST)

escape mode: A 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. (CTR, ETR, GSF)

escape sequence: A sequence of keystrokes, beginning with the Esc key. In escape mode, escape sequences are used for positioning the cursor and controlling the display of text on the screen. Escape sequences are also used as codes to control printers. (CTR, ETR)

even parity: In data transmission, 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. Compare MARK parity, odd parity. (CTR, ETR, GST)

even/odd parity check: In data transmission, 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). (CTR, ETR)

event: A notification to an application of some occurrence (such as an interrupt generated by a keypress) that the application may want to respond to. (GSTR, PI, P16)

event code: A numeric value assigned to each event by the Event Manager. Compare task code. (GSTR, PI)

Event Manager: An Apple IIGS tool set that detects events as they happen, and passes the events on to the application or to the appropriate event handler, such as TaskMaster. (GSTR, PI)

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

event message: A field in the event record that contains additional information about the event. (GSTR)

event queue: A list of pending events maintained by the Event Manager. (GSTR, PI)

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

event type: The type of event reported to the Event Manager. (GSTR)

event-driven: A kind of program that responds to user inputs 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. (GST, PI, P16)

event-driven program: A program that responds to user inputs in real time by repeatedly testing for events. An event-driven program does nothing until it detects an event such as a click of the mouse button. (GSH, GSTR)

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. Compare OR, AND, and NOT. (CTR, ETR)

execute: To perform the actions specified by a program command or sequence of commands. (CTR, ETR)

execution environment: See operating environment. (GSTR)

execution mode: One of two general states of execution of the 65C816 processor: native mode and 6502 emulation mode. (GSTR, PI)

expansion slot: A connector into which you can install a peripheral card. Sometimes called a peripheral slot. See also auxiliary slot, slot. (CTR, ETR, GST, GSTR)

expression: A formula in a program that defines a calculation to be performed. (CTR, ETR)

Extended 80-Column Text Card: See Apple IIe Extended 80-Column Text Card. (GST)

extended SmartPort call: A SmartPort call that allows data transfer to or from anywhere in the Apple IIGS system memory space. Compare standard SmartPort call. (GSF)

extended task event record: A data structure based on the event record that contains information used and returned by TaskMaster. (GSTR, PI)

Extended value: An 80-bit signed floating-point value with 64 bits of fraction. (GSTR)

external device: See device. (GSH, P16)

external reference: A reference to a symbol that is defined in another segment. External references must be to global symbols. (GSH)

FALSE: Zero. The result of a Boolean operation. Opposite of TRUE. (GSTR, PI)

family name: The name identifying a font family. For example, the font family named Helvetica includes 10-point Helvetica, 12-point Helvetica Bold, and 36-point Helvetica Underlined. See also font family. (GSTR)

family number: The number identifying a font family. There is a one-to-one correspondence between family number and family name; that is, any two fonts with the same family number should have the same family name. (GSTR)

FamSpecBits: A bit flag in the Font Manager that restricts the range of font families available to a calling routine. (GSTR)

FamStatBits: A bit flag in the Font Manager that reports on the status of a font family. (GSTR)

fatal error: An error serious enough that the computer must halt execution. (GSH, P16)

field: 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. (GSF)

FIFO: Acronym for "first in, first out" order, as in a queue. (CTR, ETR)

file: A named, ordered collection of information stored on a disk. (CTR, ETR, GSTR, PI, P16)

file control block (FCB): A data structure set up in memory by ProDOS 16 to keep track of all open files. (P16)

file entry or 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. (P16)

file level: See system file level. (PI, P16)

file mark: See Mark. (PI)

file system ID: A number describing the general category of operating system to which a file or volume belongs. The file system ID is an input to the ProDOS 16 FORMAT call, and a result from the VOLUME call. (P16)

file type: 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 oGST, GSTR, PI, P16)

filename: The string of characters that identifies a particular file within its directory. ProDOS filenames may be up to 15 characters long. Compare pathname. (GSTR, PI, P16)

filing calls: Operating system calls that manipulate files. In ProDOS 16, filing calls are subdivided into file housekeeping calls and file access calls. (P16)

fill mode: A display option in Super Hi-Res 320 mode. In fill mode, pixels in memory with the value 0 are automatically assigned the color of the previous nonzero pixel on the scan line; the program thus need assign explicit pixel values only to change pixel colors. (GSTR, PI)

filling: In QuickDraw II, using a specified pattern and the drawing mask to fill the interior of a shape. (GSTR)

filter procedure: A procedure that allows the application programmer to control the types of events handled by the Dialog Manager. (GSTR)

finder: A program that performs file and disk utilities (formatting, copying, renaming, and so on) and also starts applications at the request of the user. (P16)

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. (GST)

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. (CTR, ETR, GSF, GSH, GSTR, PI, P16)

fixed: Not movable in memory once allocated. Also called immovable. Program segments that must not be moved are placed in fixed memory blocks. Opposite of movable. (GSTR, PI, P16)

fixed address: A memory block that must be at a specified address when allocated. (GSTR)

fixed bank: A block of memory that must start in a specified bank. (GSTR)

Fixed value: A 32-bit signed value with 16 bits of fraction. (GSTR)

fixed-address: A memory block that must be at a specified address when allocated. (PI)

fixed-bank: A block of memory that must start in a specified bank. (PI)

fixed-point: 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. (CTR, ETR)

flag: A variable whose value (usually 1 or 0, standing for true or false) indicates whether some condition holds or whether some event has occurred. A flag is used to control the program's actions at some later time. (CTR, ETR, GSTR, PI)

floating-point: 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. (CTR, ETR)

floppy disk: A disk made of flexible plastic, as compared to a hard disk, which is made of metal. The term floppy is now usually applied only to disks with thin, flexible disk jackets, such as 5.25-inch disks. With 3.5-inch disks, the disk itself is flexible, but the jacket is made of hard plastic; thus, 3.5-inch disks aren't particularly "floppy." (CTR, ETR)

flush: To update an open file (write any updated information to disk) without closing it. (P16)

folder: The visual representation of a subdirectory. See also subdirectory. (GSTR, PI)

font: In typography, a complete set of type in one size and style of character. In computer usage, a collection of letters, numbers, punctuation marks, and other typographical symbols with a consistent appearance; the size and style can be changed readily. See also font scaling. (GST, GSTR, PI)

font bounds rectangle: The smallest rectangle that would enclose all the pixels of every character in a font; that is, the rectangle that is the union of all the character bounds rectangles of the characters in the font. (GSTR)

font family: All fonts that share the same name but may vary in size or style. For example, all fonts named Helvetica are in the same family, even though that family contains Helvetica, Helvetica Narrow and Helvetica Bold. (GSTR, PI)

font height: The vertical distance from a font's ascent line to its descent line. (GSTR, PI)

font ID: A number that specifies a font by family, style, and size. (GSTR, PI)

font ID record: A record containing the number that specifies a font by family, style, and size. (GSTR)

Font Manager: The Apple IIGS tool set that allows applications to use different fonts. (GSTR)

font rectangle: The smallest rectangle that would completely enclose all the foreground pixels of the characters of a font if the characters were drawn so that their character origins coincided. (GSTR)

font scaling: A process by which the Font Manager creates a font at one size by enlarging or reducing characters in an existing font of another size. (GSTR, PI)

font size: The size of a font in points, from 1 to 255. The Font Manager defines the font size as a byte; QuickDraw II and the Apple IIGS font record define the font size as a word. (GSTR)

font strike: A 1 bit/pixel pixelmap consisting of the character images of every defined character in the font, placed sequentially in order of increasing ASCII code. (GSTR, PI)

font style: The style in which a font was designed. The Font Manager defines the style style as a byte; QuickDraw II and the Apple IIGS font record define the font style as a word. (GSTR)

font substitution: An option in the LaserWriter style dialog box in the Print Manager, font substitution tells the system to substitute one font for another if the specified font is not available on the LaserWriter. (GSTR)

FontSpecBits: A bit flag in the Font Manager that restricts the range of fonts available to a calling routine. (GSTR)

FontStatBits: A bit flag in the Font Manager that reports on the status of a font. (GSTR)

foreground color: The color of the foreground pixels in text; by default it is white. (GSTR, PI)

foreground pixels: In a character image, the pixels corresponding to the character itself; that is, the bits set to 1 in the image. (GSTR)

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. (CTR, ETR)

format: (n) (1) The form in which information is organized or presented. (2) The general shape and appearance of a printed page, 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; same as initialize. (CTR, ETR, GSF, GST)

Fortran: Short for Formula Translator. A high-level programming language especially suitable for applications requiring extensive numerical calculations, such as in mathematics, engineering, and the sciences. (CTR, ETR)

FPI: Abbreviation for Fast Processor Interface. A custom integrated circuit that incorporates most of the memory organization and address-decoding functions of the Apple IIGS. One of this IC's functions is to slow the system clock to 1.024 MHz whenever access to banks $E0 and E1 is detected. (GSH)

FPT: See function pointer table. (GSTR)

Frac value: A 32-bit signed value with 30 bits of fraction. (GSTR)

fragmentation: A condition in which free (unallocated) portions of memory are scattered due to repeated allocation and deallocation of blocks by the Memory Manager. (GSTR)

frame region: The part of a window that surrounds the window's content region and contains standard window controls. (GSTR, PI)

framing: In QuickDraw II, using the current pen size, pen pattern, drawing mask, and pen mode to draw an outline of a shape. (GSTR)

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

frequency: In alternating current (AC) signals, 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. (CTR, ETR, GSF, GSH, GST)

fringing: Also known as color fringing. The undesirable effect of rainbow-like colors obscuring text on the video monitor. Occurs when 80-column text is displayed in color. (GSH)

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. (CTR, ETR)

full native mode: See native mode. (GSTR)

full pathname: The complete name by which a file is specified, starting with the volume directory name. A full pathname always begins with a slash (/), because a volume directory name always begins with a slash. See also pathname. (GSTR, PI)

function: A preprogrammed calculation that can be carried out on request from any point in a program. A function takes in one or more arguments and returns a single value. It can therefore be embedded in an expression. (CTR, ETR, GST)

function pointer table (FPT): A table, maintained by the Tool Locator, that points to all routines in a given tool set. (GSTR, PI)

game I/O connector: A 16-pin connector inside all the open models of the Apple II, originally designed for connecting hand controls to the computer, but also used for connecting some other peripheral devices. Compare hand control connector. (CTR, ETR, GST)

GCB: See generator control block. (GSTR)

General Logic Unit: A class of custom integrated circuits used as interfaces between different parts of the computer. (GSH)

general logic unit: See GLU. (GSTR, PI)

generator: In the swap mode of the DOC, a functional unit formed from a pair of oscillators. (GSTR)

generator control block (GCB): A 16-byte block in the sound routines' work area that controls one generator. (GSTR)

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

GetNextEvent: The Event Manager call that an application can make on each cycle through its main event loop. Compare TaskMaster. (GSTR, PI)

global coordinates: The coordinate system assigned to a pixel image (such as screen memory) that QuickDraw II draws to. In global coordinates, the boundary rectangle's origin (top left corner) has the value (0,0). Compare local coordinates. (GSTR, PI)

global page: Under ProDOS 8, 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. (P16)

global page bit map: 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 bit map that correspond to memory they have allocated or freed. (P16)

global symbol: A label in a segment that may be referenced by other segments. Compare with local symbol, private symbol. (PI)

GLU: Abbreviation of general logic unit, a class of custom integrated circuits used as interfaces between different parts of the computer. See General Logic Unit. (GSF, GSH, GST, GSTR, PI)

go-away region: A region in a window frame, corresponding to the close box. Clicking inside this region of the active window makes the window close or disappear. (GSTR, PI)

GrafPort: A data structure (record) that specifies a complete drawing environment, including such elements as a pixel image, boundaries within which to draw, a character font, patterns for drawing and erasing, and other pen characteristics. (GSTR, PI)

graph: A pictorial representation of data. (CTR, ETR, GST)

graphic interface: An interface between computer and user in which all screen drawing or other output, including text, is done by graphic routines. Desktop programs use a graphic interface. Compare text-based interface. (PI)

graphic port: A specification for how and where QuickDraw II draws. A graphic port is defined by its GrafPort record; an application may have more that one graphic port open at one time, each defined by its own GrafPort. Same as drawing environment. (GSTR, PI)

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. (CTR, ETR, GST) The display by a computer on a video monitor of data in memory, to visually represent figures, charts, graphs, or icons. In the Apple IIGS, each pixel on the monitor screen is directly controllable by bits in the screen. See also bit map. (GSH)

grow box: A small square in the lower-right corner of some windows, with which the user can resize the window. The grow box corresponds to the grow region. (PI)

grow image: A dotted outline of an entire window plus the lines delimiting the title bar, size box, and scroll bar areas. The image can be pulled around to follow the movements of the mouse until the mouse button is released. (GSTR)

grow region: A window region in which dragging changes the size of the window. (GSTR, PI)

guest file system: A file system, other than ProDOS 16's, whose files can be read by ProDOS 16. (P16)

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

hand control: A hand-held device with a knob and pushbutton that provides the user with a means for inputting stimuli to the computer for the purpose of controlling the application program. Usually used in conjunction with game software. Compare joystick. (GSH)

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. (CTR, ETR, GST)

hand controller: Peripheral devices, with rotating dials and push buttons. Hand controllers are used to control game-playing programs, but they can also be used in other applications. (CTR, ETR, GST)

handle: See memory handle. (GSTR, PI, P16)

handshaking: The exchange of status information between a DCE (Data Comunications Equipment) and a DTE (Data Terminal Equipment), usually a computer and a peripheral device, 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 XOFF, XON. (GSF, GSH, GST)

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. (CTR, ETR)

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 a floppy disk. (CTR, ETR)

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. (CTR, ETR)

hardware: Collectively, electronic circuit components and associated fittings and attachments. In computers, the computer itself (the processor), disk drives, and other peripheral equipment. The saying goes, "If you can touch it, it's hardware. If you can't, it's software." Compare firmware, software. (CTR, ETR, GSH, GSTR, PI)

Heartbeat Interrupt Task Queue: A list of tasks, such as cursor-movement updating or checking stack size, to be performed during vertical blanking. Heartbeat tasks are manipulated by the Miscellaneous Tool Set. (PI)

Heartbeat routines: Routines that execute at some multiple of the heartbeat interrupt signal, which occurs during the vertical blanking interval (every 1/60 of a second). (GSTR, PI)

hertz: The unit of frequency of vibration or oscillation, defined as the number of cycles per second. Named for the physicist Heinrich Hertz and abbreviated Hz. See also kilohertz, megahertz. (GST)

hertz: The unit of frequency of vibration or oscillation, defined as the number of cycles per second. Named for the physicist Heinrich Hertz and abbreviated Hz. The 6502 microprocessor used in the 8-bit 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. (CTR, ETR, GSF, GSH, GST)

hex: See hexadecimal. (GSTR, PI)

hexadecimal: The base-16 system of numbers, using the ten digits 0 through 9 and the six letters A through F. Hexadecimal numbers can be converted easily and directly to binary form, because each hexadecimal digit corresponds to a sequence of 4 bits. In Apple manuals, hexadecimal numbers are usually preceded by a dollar sign ($). (CTR, ETR, GSF, GSH GST, PI, P16)

hexadecimal, hex: The representation of numbers in the base-16 system, using the ten digits 0 through 9 and the six letters A through F. Each hexadecimal digit corresponds to a sequence of four binary digits, or bits. Hexadecimal numbers are usually preceded by a dollar sign ($). (GSTR)

Hi-Res: A high-resolution graphics display mode on the Apple II family of computers, consisting of an array of pixels 140 wide by 192 high in 6 colors or 280 wide by 192 high in monochrome. (GSF, GSH, GST)

hide: To make invisible (but not necessarily to discard) an object on the screen such as a window. (GSTR, PI)

hierarchical file system: A method of organization in which disk files are grouped together within directories and subdirectories. In a hierarchical file system, a file is specified by its pathname, rather than by a single filename. (P16)

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). (CTR, ETR)

high order: 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 8 bits. (GSF)

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. Compare low-level language. (CTR, ETR, GSH, GST)

high-order: Referring to 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 long word consists of the leftmost 8 bits. (GSH, P16)

high-order byte: The more significant half of a memory address or other multi-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.) (CTR, ETR, GST)

high-resolution graphics: On the 8-bit Apple II family 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. (CTR, ETR)

highlight: To make something visually distinct. For example, when a button on a dialog box is selected, it appears as light letters on a dark background, rather than dark on light. An active window or control is highlighted differently than an inactive one. (GSTR, PI)

HodgePodge: A sample Apple IIGS desktop application; the program described in this book. (PI)

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. (CTR, ETR)

horizontal blanking: The interval between the drawing of each scan line on a video display. (GSTR, PI)

hot spot: The interval between the drawing of each scan line on a video display. (GSTR)

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. (GSF, GSTR, PI, P16)

Hz: See hertz. (CTR, ETR, GST)

i flag: A bit in the 65816 microprocessor's Processor Status register that, if set to 1, disables interrupts. (GSTR, PI)

I/O: Input/Output. A general term that encompasses input/output activity, the devices that accomplish it, and the data involved. See input/output. (CTR, ETR, GSH, GST, GSTR, PI, P16)

I/O device: Input/output device. A device that transfers information into or out of a computer. See input, output, peripheral device. (CTR, ETR, GST)

I/O expansion slots: The seven rectangular connectors located on Apple IIGS main logic board. These slots will accept standard Apple II peripheral cards and allow the computer to communicate with peripherals such as printers and disk drives. See also peripheral card. (GSH)

I/O link: A fixed location that contains the address of an input/output subroutine in the computer's Monitor program. (CTR, ETR, GST)

I/O space: The portion of the memory map in a standard Apple II (and in banks $00, $01, $E0, and $E1 of an Apple IIGS) with addresses between $C000 and $CFFF. Programs perform I/O by writing to or reading from locations in this I/O space. (GSTR, PI)

IC: See integrated circuit. (CTR, ETR, GSH, GST, PI)

icon: An image that graphically represents an object, a concept, or a message. (GSF, GST, GSTR, PI)

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. See also pixel image. (GSH, GSTR, PI, P16)

image pointer: In QuickDraw II, the pointer to the first byte of a pixel image. (GSTR)

image width: (1) Part of the QuickDraw II locInfo record that specifies the width of each line of a pixel image; the width must be an even multiple of 8 bytes. (2) For characters, same as character image width. (GSTR)

immediate execution: The execution of a program statement as soon as it is typed. In BASIC, immediate execution occurs when the 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. (CTR, ETR)

immovable: See fixed. (GSTR)

implement: To put into practical effect, as to implement a plan. For example, a language translator implements a particular language. (CTR, ETR, GST)

IN#: This command designates the source of subsequent input characters. It can be used to designate a device in a slot or a machine-language routine as the source of input. (CTR, ETR)

inactive: Controls that have no meaning or effect in the current context, such as an Open button when no document has been selected to be opened. These inactive controls are not affected by the user's mouse actions and are dimmed on the screen. Compare disable. (GSTR, PI)

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. (CTR, ETR)

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. (P16)

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. (CTR, ETR, GSF, GSH, GST, GSTR, PI)

index variable: A variable whose value changes on each pass through a loop. Often called control variable or loop variable. (CTR, ETR)

indexed addressing: A method used in machine language programming to specify memory addresses. See also memory location. (CTR, ETR, GST)

indicator: On a dial type of control, the moving part that displays the current setting. (GSTR)

infinite loop: A section of a program that will repeat the same sequence of actions indefinitely. (CTR, ETR)

information bar: An optional component of a window. If present, the information bar appears just below the title bar. It may contain any information the application that created the window wishes. (GSTR, PI)

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. (P16)

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. (GSTR, PI, P16)

initialization file: A program (in the SYSTEM.SETUP subdirectory of the boot disk) that is loaded and executed at system startup, independently of any application. (PI)

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; see format. (CTR, ETR, GSF)

initialized disk: A disk that has been organized into tracks and sectors by the computer and is therefore ready to store information. (CTR, ETR)

input: (n) Information transferred into a computer from some external source, such as the keyboard, a disk drive, or a modem. (CTR, ETR, GST)

input device: The keyboard is the main input device for the Apple IIGS. Other possible input devices are the mouse and the graphics tablet. Almost any device may be used as an ADB input device, as long as it conforms to the Apple Desktop Bus protocol. Chapter 6 provides details on the ADB. (GSH)

input routine: A machine-language routine; the standard input routine reads characters from the keyboard. A different input routine might, for example, read them from an external terminal. (CTR, ETR)

input/output (I/O): The process by which information is transferred between the computer's memory and its keyboard or peripheral devices. (CTR, ETR, GSH, GST, P16)

insertion point: The place in a document where something will be added; it is selected by clicking and is normally represented by a blinking vertical bar. (GSTR, PI)

instruction: A unit of a machine-language or assembly-language program corresponding to a single action for the computer's processor to perform. (CTR, ETR, GST)

instrument: A data structure, used by the Note Sequencer and Synthesizer, that specifies such parameters as the amplitude envelope, pitchbend and vibrato characteristics, and the specific waveforms that characterize the sound to be played. (PI)

integer: A whole number in fixed-point form. Compare real number. (CTR, ETR, PI)

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. (CTR, ETR)

Integer Math String: An ASCII string with no length indication supplied by the string itself. (GSTR)

Integer Math Tool Set: The Apple IIGS tool set that performs simple mathematical functions on integers and other fixed-point numbers and converts numbers to their ASCII string-equivalents. (GSTR, PI)

Integer value: A 16-bit signed or unsigned value. (GSTR)

integrated circuit: An electronic circuit, including components and interconnections, entirely contained in a single piece of semiconducting material, usually silicon. Often referred to as an IC or a chip. (CTR, ETR, GST, PI) A miniature electronic circuit consisting of many thousands of transistors and other electronic components by processing a chip of semiconductor material. This chip is then cast in a plastic or ceramic package with metal leads or "legs" used to connect it to a circuit board. Categories of ICs are labeled due to their construction process: monolothic, hybrid, and thin-film are some. Almost any electronic circuit may be miniaturized and made into an integrated circuit. (GSH)

intelligent device: A device containing a microprocessor and a program that allows the device to interpret data sent to it as commands that the device is to perform. (GSF)

interactive: Operating by means of a dialog between the computer system and a human user. (GST)

interface: (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 themselves. (CTR, ETR, GST, PI)

interface card: A peripheral card that implements a particular interface (such as a parallel or serial interface) by which the computer can communicate with a peripheral device such as a printer or modem. (CTR, ETR, GST)

interface library: A set of variable definitions and data-structure definitions that link a program (such as a C application) with software written in another language (such as the Apple IIGS Toolbox). (GSTR, PI)

interpreter: A language translator that reads a program instruction by instruction and immediately translates each instruction for the computer to carry out. Compare compiler. (CTR, ETR, GSF)

interrupt: A request made of the microprocessor by a device, either built-in or external, to receive urgent data or respond to a recent event. Disk drives make interrupt requests of the microprocessor, as do the real-time clock and the mouse firmware in the Apple IIGS. (GSH, GSTR, PI, P16) 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. (CTR, ETR, GST)

interrupt environment: The machine state, including register length and contents, that the interrupt handler executes within. (GSTR, PI)

interrupt handler: 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. (GSF, GSH, P16)

interrupt mode: A mode in which interrupts are used to synchronize drawing with vertical blanking. (GSTR)

interrupt vector table: A table maintained in memory by ProDOS 16 that contains the addresses of all currently active (allocated) interrupt handlers. (GSH, P16)

INTERSEG record: A part of a relocation dictionary. It contains relocation information for external (intersegment) references. (P16)

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. (CTR, ETR)

invert: To highlight by changing white pixels to black and vice versa. (PI)

inverting: In QuickDraw II, using the drawing mask to invert the pixels in the interior of a shape. (GSTR)

IRQ: A 65C816 signal line that, when activated, causes an interrupt request to be generated. (GSF)

item: A component of a dialog box, such as a button, a text field, or an icon. (GSTR, PI)

item descriptor: In a dialog box, a pointer or a handle to additional information concerning a dialog item. (GSTR)

item ID: A unique number that defines an item in a dialog box and allows further reference to it. (GSTR, PI)

item line: The line of text that defines a menu item's name and appearance. (GSTR, PI)

item list: A list of information about all the items in a dialog box or an alert box. (GSTR, PI)

item template: A record that contains information about the items in a dialog box. (GSTR)

item type: Identifies the type of dialog item, usually represented by a predefined constant (such as editLine) or a series of constants (such as editLine+itemDisable). (GSTR, PI)

item value: In a dialog box, additional information concerning a dialog item. (GSTR)

IWM: "Integrated Woz Machine"; the custom chip that controls Apple's 3.5-inch disk drives. (CTR, ETR, GSF, GSH, GST)

JML: Unconditional Long Jump; a 65C816 assembly-language op code. It takes a 3-byte address operand. A JML can reach any address in the Apple IIGS memory space. (P16)

JMP: Unconditional Jump; a 6502 and 65C816 assembly-language op code. It takes a 2-byte address operand. A JMP can reach addresses only within a single 64K bank of the Apple IIGS memory space. (P16)

job dialog box: A dialog box presented when the user selects Print from the File menu. (GSTR, PI)

job subrecord: A field in the print record that contains information about a particular printing job. See also print record. (GSTR)

journaling mechanism: A mechanism that can separate the Event Manager from the user and feed the manager events from a file. (GSTR)

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. (CTR, ETR, GSH, GST, PI)

JSL: Jump to Subroutine (Long), a 65816 assembly-language instruction that requires a long (3-byte) address. JSL can be used to transfer execution to code in another memory bank. (PI, P16, GSTR)

JSR: Jump to Subroutine, a 6502 and 65816 assembly-language instruction that requires a 2-byte address. (GSTR, PI, P16) A JSR can access addresses only within a single 64K bank of the Apple IIGS memory space. (P16)

Jump Table: (1) A table constructed 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. (2) The mechanism the Sound Tool Set uses to find a low-level sound routine. (GSH, GSTR, PI, P16)

Jump Table directory: A master list in memory, containing pointers to all segments that make up the Jump Table. (P16)

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. (GSTR, P16)

K: Abbreviation for the prefix kilo-, meaning 1024. A kilobyte (expressed 1K) of memory is 1024 memory locations. See kilobyte. (CTR, ETR, GSH, GSTR, PI, P16)

kernel: The central part of an operating system. ProDOS 16 is the kernel of the Apple IIGS operating system. (P16)

kerning: The situation that occurs when a character has foreground pixels to the left of the old pen position or to the right of the new pen position or both. When kerning occurs, the character images of adjacent characters may overlap. (GSTR)

key block: The first block in any ProDOS 16 file. (P16)

key-down: An event type caused by the user's pressing any character key on the keyboard or keypad. The character keys include all keys except Shift, Caps Lock, Control, Option, and Apple, which are called modifier keys. Modifier keys are treated differently and generate no keyboard events of their own. (PI)

key-down event: An event type caused by the user pressing any character key on the keyboard or keypad. The character keys include all keys except Shift, Caps Lock, Control, Option, and Apple, which are called modifier keys. Modifier keys are treated differently and generate no keyboard events of their own. (GSTR)

keyboard: The set of keys, similar to a typewriter keyboard, used for entering information into the computer. (CTR, ETR, GST)

keyboard equivalent: The combination of the Apple key and another key, used to invoke a menu item from the keyboard. (GSTR, PI)

keyboard input connector: The connector inside the Apple II family of computers by which the keyboard is connected to the computer. (CTR, ETR)

KEYIN: The firmware entry point that a program calls to obtain a keystroke from the currently active input device (normally the keyboard). (GSF)

keyword: A special word or sequence of characters that identifies a particular type of statement or command, such as RUN, BRUN, or PRINT. (CTR, ETR)

kilobit: A unit of measurement, 1024 bits, commonly used in specifying the capacity of memory ICs. Not to be confused with kilobyte. (GSF, GSH, GST)

kilobyte: A unit of measurement, 1024 bytes, commonly used in specifying the capacity of memory or disk storage systems. In this usage, kilo (from the Greek, meaning a thousand) stands for 1024. Thus, 64K memory equals 65,536 bytes. See also megabyte. Compare kilobit. (CTR, ETR, GSF, GSH, GST, GSTR, PI)

kilohertz: A unit of measurement of frequency, equal to 1000 hertz (abbreviated kHz). See also megahertz. (GSF, GSH, GST)

kind: See segment kind. (PI, P16)

KSW: The symbolic name of the location in the computer's memory where the standard input link (namely, to the keyboard) is stored. KSW stands for keyboard switch. (CTR, ETR, GST)

landscape mode: A printing mode in which text is printed top to bottom (that is, longways) on the paper. (GSTR)

language: See programming language. (CTR, ETR, GST)

language card: Memory with addresses between $D000 and $FFFF in 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 the 48K Apple II or Apple II Plus that expanded the computer's memory capacity to 64K and provided space for an additional dialect of BASIC. (CTR, ETR, GSH, GST, PI, P16)

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 interpreter, compiler, assembler. (CTR, ETR)

language-card memory: 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 the 48K Apple II or Apple II Plus computer that expanded the computer's memory capacity to 64K and provided space for an additional dialect of BASIC. (GSF)

last-changeable location: The last location whose value the user inquired about through the Monitor. (GSF)

leading: (Pronounced LED-ing.) The space between lines of text. It is the number of pixels vertically between the descent line of one character and the ascent line of the character immediately beneath it. (GSTR, PI)

leading zero: A zero occurring at the beginning of a decimal number, deleted by most computing programs. (CTR, ETR)

least significant bit: The rightmost bit of a binary number. The least significant bit contributes the smallest quantity to the value of the number. Compare most significant bit. (CTR, ETR)

leftward kern: For characters, the distance in pixels from the character origin to the left edge of the character. (GSTR)

length byte: The first byte of a Pascal string. It specifies the length of the string, in bytes. (GSTR, PI)

level: See system file level. (P16)

library (or 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. (GSTR, PI, P16)

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. (PI)

LIFO: Acronym for "first in, last out" order, as in a stack. (CTR, ETR)

limit rectangle: The rectangle that limits the travel of a region that is being dragged with the mouse. (GSTR)

line: In QuickDraw II, an infinitely thin graphic object that is represented by its ends, which are defined by two points. (GSTR, PI) Also see program line. (CTR, ETR)

line feed: An ASCII character (decimal 10) that ordinarily causes a printer or video display to advance to the next line. (CTR, ETR)

line height: The total amount of vertical space from line to line in a text document. Line height is the sum of ascent, descent, and leading. (GST, GSTR, PI)

line number: A number identifying a program line in an Applesoft BASIC program. (CTR, ETR)

line width: The number of characters that fit on a line on the screen or on a page. (CTR, ETR)

LineEdit Tool Set: The Apple IIGS tool set that provides simple text-editing functions. It is used mostly in dialog boxes. (GSTR, PI)

link: An area in memory that contains an address and a jump instruction. Programs are written to jump to the link address. Other programs can modify this address to make everything behave differently. COUT and KEYIN are examples of I/O links. (GSF)

LinkEd: A command language that can be used to control the APW Linker. (PI)

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. (P16, PI)

Lisa: A model of Apple computer; the first computer that offered windows and the use of a mouse to choose commands. The Lisa is now known as the Macintosh XL. (PI)

list: As defined by the List Manager, a scrollable, vertical arrangement of similar items on the screen; the items are selectable by the user. See list control. (GSTR, PI) To display on a monitor, or print on a printer, the contents of memory or of a file. (CTR, ETR)

list control: A custom control created by the List Manager. It is a scrollable, vertical arrangement of similar items on the screen; the items are selectable by the user. (GSTR, PI)

list control record: A data structure that defines the appearance of a list control after the control has been created. (GSTR)

List Manager: The Apple IIGS Tool set that allows an application to present the user with a list from which to choose (for example, the Font Manager uses the List Manager to arrange lists of fonts). (GSTR, PI)

list record: A data structure that defines the initial appearance of a list control. (GSTR)

Lo-Res: The lowest resolution graphics display mode on the Apple II family of computers, consisting of an array of blocks 48 high by 40 wide with 16 colors. (GSF, GSH, GST)

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. (CTR, ETR, GST, PI)

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. (PI, P16)

load segment: A segment in a load file. Any number of object segments can go into the same load segment. (PI, P16)

loader: A program that brings files from a disk into the computer's memory. (GST)

local: Connected to or close by the host system. (CTR)

local area network: A high-speed data communication channel that provides connections between computers, disk drives, printers, and other peripherals in a limited geographic area, such as within a single building or campus. (GSH)

local coordinates: A coordinate system unique to each GrafPort and independent of the global coordinates of the pixel image that the port is associated with. For example, local coordinates do not change as a window is dragged across the screen; global coordinates do not change as a window's contents are scrolled. (GSTR, PI)

local symbol: A label defined only within an individual segment. Other segments cannot reference the label. Compare with global symbol. (PI)

location: See memory location. (CTR, ETR, GST)

location table: In a font, an array of integers with an entry for each character code. (GSTR)

locInfo: Acronym for location information. The data structure (record) that ties the coordinate plane to an indvidual pixel image in memory. (GSTR, PI)

lock: To prevent a memory block from being moved or purged. A block may be locked or unlocked by a call to the Memory Manager. (GSTR, PI, P16)

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. (CTR, ETR)

logic board: See main logic board. (CTR, ETR, GST)

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. (CTR, ETR)

long (or long word): A double-length word. For the Apple IIGS, a long word is 32 bits (4 bytes) long. (GSH, PI)

Longint value: A 32-bit signed or unsigned value. (GSTR)

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. (CTR, ETR, GSH, GST)

loop variable: See index variable. (CTR, ETR)

low order: 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 8 bits. (GSF)

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. Compare high-level language. (CTR, ETR, GSH, GST)

low-order: Referring to 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 long word consists of the rightmost 8 bits. (GSH, P16)

low-order byte: The least significant byte of a memory address or other multi-byte quantity. In the 6502 and 65C816 microprocessors used in the Apple II family of computers, the low-order byte of an address is usually stored first, and the high-order byte last. (In the 68000 microprocessors used in the Macintosh family, the high-order byte is stored first.) (GST, CTR, ETR)

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. (CTR, ETR)

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. See high-resolution graphics. (CTR, ETR)

LS: See low-power Schottky. (CTR, ETR)

m flag: One of three flags in the 65816 microprocessor's Processor Status register that controls execution mode. When the m flag is set to 1, the accumulator is 8 bits wide; otherwise, it is 16 bits wide. See also e flag, x flag. (GSF, GSH, GST, GSTR, PI, P16)

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 used in 8-bit Apple II computers) has its own form of machine language. (CTR, ETR, GST)

Macintosh: A family of Apple computers built around 68000 microprocessors, having high-resolution black-and-white displays and using mouse devices for choosing commands and for drawing pictures. (GST, GSTR, PI)

macro: 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 language instructions, making assembly-language programs easier to write and complex keystrokes easier to execute. (GST, GSTR, PI, P16)

macro assembler: A type of assembler that allows the programmer to define sequences of several assembly-language instructions as single pseudo-instructions called macros. (GST)

macro library: A file of related macros. (GSTR, PI)

main event loop: The central routine of an event-driven program. During execution, the program continually cycles through the main event loop, branching off to handle events as they occur and then returning to the event loop. (GSTR, PI)

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. (CTR, ETR, GSH, GST)

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, and that's where the computer keeps information while you're working. Sometimes simply called memory. See also read-only memory, read-write memory. (CTR, ETR, GST)

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. (P16)

mainframe computer: A central processing unit or computer that is larger and more powerful than a minicomputer or a personal computer (microcomputer). Frequently called simply a mainframe for short. The Apple Access II program and MacTerminal make it possible to communicate with mainframe computers over telecommunications media. (CTR, ETR)

mainID: A subfield of the User ID. Each running program is assigned a unique mainID. (GSTR, PI, P16)

manager: See tool set. (GSTR, PI)

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. (PI, P16)

Mark List: A table maintained in memory by the System Loader to help it perform relocation rapidly. (P16)

MARK parity: A bit of value 1 appended to a binary number for transmission. The receiving device checks for errors by looking for this value on each character. Compare even parity, odd parity. (CTR, ETR, GST)

mask: (n) A parameter, typically one or more bytes long, whose individual bits are used to permit or block particular features. See, for example, event mask. (v) To apply a mask. (GSTR, PI)

master color value: A 2-byte number that specifies the relative intensities of the red, green, and blue signals output by the Apple IIGS video hardware. (GSTR, PI)

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. (P16)

master pointer: A pointer to a memory block; it is kept by the Memory Manager. 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. See also memory handle. (GSTR, P16)

master User ID: The value of a User ID, disregarding the contents of the auxID field. If an application allocates various memory blocks and assigns them unique ID's consisting of different auxID values added to its own User ID, then all will share the same Master User ID and all can be purged or disposed with a single call. (GSTR, PI)

Mb: See megabyte. (GSTR, PI, P16)

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). (GSF, GSH, GST)

megabit: A unit of measurement equal to 1,048,576 (216) bits, or 1024 kilobits. Megabits are commonly used in specifying the capacity of memory integrated circuits. Not to be confused with megabyte. (GSF, GSH, GST, P16)

megabyte: 1,048,576 bytes or 1024 kilobytes, usually used to describe a range or size of memory. Compare megabit. (GSH)

megabyte: A unit of measurement equal to 1,048,576 (216) bytes, or 1024 kilobytes. Megabytes are commonly used in specifying the capacity of memory or disk storage systems. (CTR, ETR, GSF, GSH, GST, PI)

megahertz (MHz): A unit of measurement of frequency, equal to 1,000,000 hertz (cycles per second). (GSF, GSH, GST, GSTR, PI)

memory: A hardware component of a computer system that can store information for later retrieval. See main memory, random-access memory, read-only memory, read-write memory. (CTR, ETR, GSH, GST)

memory attributes word: A word that determines how a specified memory block is allocated and maintained. (GSTR)

memory block: See block (2). (GSF, GSTR, PI, P16)

memory expansion card: A slot card that contains additional RAM and ROM memory. In the Apple IIGS, this optional expansion card is to be used only in the memory expansion slot. Memory expansion cards for use in the Apple IIe are not to be used in this computer. (GSF, GSH, GSTR, PI)

memory expansion slot: The single slot located on the Apple IIGS main logic board which accepts an Apple IIGS memory expansion card. Memory expansion cards designed for other Apple II computers will not work in this slot. (GSH)

memory fragmentation: A condition in which free (unallocated) portions of memory are scattered because of repeated allocation and deallocation of blocks by the Memory Manager. See fragmentation. (GSTR, PI)

memory handle: A number that identifies a memory block. A handle is a pointer to a pointer; it is the address of a master pointer, which in turn contains the address of the block. Also called simply handle. (GSTR, PI) 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; that way the handle will always be the same though the value of the pointer may change as the block is moved around. (P16)

memory image: See image. (PI)

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. (CTR, ETR, GST)

Memory Manager: 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. (GSF, GSH, GST, GSTR, PI, P16)

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. (PI, P16)

memory-mapped I/O: The method used for I/O operations in Apple II computers, where certain memory locations are attached to I/O devices, and I/O operations are just memory load and store instructions. (GSF, GSH, GST)

memory-resident: (adj) (1) Stored permanently in memory as firmware (ROM). (2) Held continually in RAM even while not in use. DOS is a memory-resident program. Compare disk-resident. (CTR, ETR, GST)

menu: A list of choices presented by a program, from which the user can select an action. See also pull-down menu. (CTR, ETR, GST, GSTR, PI)

menu bar: The horizontal strip at the top of the screen that contains menu titles for the pull-down menus. (GST, GSTR, PI)

menu bar record: A data structure that contains the menu position, color, menu lists, item lists, and other flags the Menu Manager needs to manage menus. (GSTR)

menu definition procedure: A procedure used to define the appearance and behavior of a custom menu. (GSTR)

menu ID: A number in the menu record that identifies an individual menu. (GSTR, PI)

menu item: On a menu, the text of a command or a line dividing groups of choices. (GSTR)

menu line: A line of text plus code characters that defines the appearance of a particular menu title. (GSTR, PI)

Menu Manager: The Apple IIGS Tool Set that maintains the pull-down menus and the items in the menus. (GSTR, PI)

menu record: A data structure that provides information about one of the menus in a menu bar. (GSTR)

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. (GST)

MHz: Abbreviation for megahertz, one million hertz. See hertz. (CTR, ETR, GST, GSTR, PI)

microcomputer: Any small computer whose central processing element is contained on a single small circuit board or within a single integrated circuit. (CTR, ETR, GSH)

microprocessor: The heart of a microcomputer. Usually, a single-chip computer element that contains the control unit, central processing circuitry, and arithmetic and logic functions and is suitable for use as the central processing unit of a microcomputer or a dedicated automatic control system. In the Apple IIGS computer, the microprocessor is the 65C816. Previous Apple II computers utilize the 6502 and 65C02 microprocessors. Some microprocessors used in other computers are the 68000, the 8080, the Z80, and the 8086. (CTR, ETR, GSF, GSH, GST, GSTR, PI)

microsecond: One millionth of a second. Abbreviated µs. (CTR, ETR, GST)

millisecond: One thousandth of a second. Abbreviated ms. (CTR, ETR, GST)

mini-assembler: A part of the Apple IIGS Monitor program that allows the user to create small assembly-language test routines. See also assembler. (GSF)

minimum blink interval: The minimum time between blinks of the caret. (GSTR)

minimum version number: The minimum version of a particular tool set that an application needs to function. (GSTR)

minipalette: In Super Hi-Res 640 mode, a quarter of the color table. Each pixel in 640 mode can have one of four colors specified in a minipalette. (GSTR, PI)

Miscellaneous Tool Set: The Apple IIGS tool set that includes mostly system-level routines that must be available for other tool sets. (GSTR, PI)

missing character: In a font, a character that does not have a defined symbol. (GSTR)

missing symbol: In a font, the symbol substituted for any ASCII value for which the font does not have a defined symbol. In the Apple IIGS system font, the missing symbol is a box containing a question mark. (GSTR, PI)

MLI: Machine Language Interface—the part of ProDOS 8 that processes operating system calls. (P16)

modal dialog box: A dialog box that puts the machine in a state where the user cannot execute functions outside of the dialog box until the dialog box is closed. Compare modeless dialog box. (GSTR, PI)

mode: A state of a computer or system that determines its behavior. A manner of operating. (CTR, ETR, GST, GSTR, PI)

modeless dialog box: A dialog box that does not require the user to respond before doing anything else. Unlike a modal dialog box, it is possible to keep working even if the box is still in use. Compare modal dialog box. (GSTR, PI)

modem: Acronym for modulator-demodulator. A computer peripheral device that allows computers to transfer digital information over conventional telephone lines. Modems usually connect to the computer's serial port, but may instead plug into a peripheral expansion slot. (CTR, ETR, GSH, GST)

modification date: An attribute of a ProDOS 16 file; it specifies the date on which the content of the file was last changed. (PI, P16)

modification time: An attribute of a ProDOS 16 file; it specifies the time at which the content of the file was last changed. (PI, P16)

modifier key: A key (Apple, Caps Lock, Control, Option, Shift) that generates no keyboard events of its own, but changes the meaning of other keys or mouse actions. Also called a control key. (CTR, ETR, GSTR)

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. (CTR, ETR)

monitor: See video monitor. (CTR, ETR, GSH, GST, P16)

Monitor program: A firmware program built into the firmware of Apple II computers, used for directly inspecting or changing the contents of main memory and for operating the computer at the machine-language level. (CTR, ETR, GSF, GST, PI, P16)

monochrome: Displaying video in one color and the background in another, frequently black and white, but not necessarily. The Apple IIGS monochrome default is white characters on a medium blue background. (GSH)

monospaced: Said of a font whose character widths are all identical. Compare proportionally spaced. (GSTR, PI)

MOS: Abbreviation for metal oxide silicon, a method of semiconductor integrated-circuit fabrication on silicon using layers of silicon dioxide in the make-up of the devices. Compare CMOS. (GSF, GSH, GST, PI)

most significant bit: The leftmost bit of a binary number. The most significant bit contributes the largest quantity to the value of the number. For example, in the binary number 10110 (decimal value 22), the leftmost bit has the decimal value 16 (24). Compare least significant bit. (CTR, ETR)

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 menu items, to move data, and to draw with in graphics programs. (CTR, ETR, GSH, GST, GSTR, PI)

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. (CTR, ETR, GST, GSTR, PI)

mouse clamps: Values that establish the minimum and maximum X and Y coordinates for the mouse. (GSTR)

mouse-down: An action or an event, signifying that the user has pressed the mouse button. (GSTR, PI)

mouse-up: An action or an event, signifying that the user has released the mouse button. (GSTR, PI)

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. The opposite of fixed. (GSTR, PI, P16)

move: To change the location of a group of data bytes in memory. The Memory Manager may move blocks to consolidate memory space. (GSH, P16)

nanosecond: One billionth of a second. Abbreviated ns. (CTR, ETR)

native mode: The 16-bit configuration of the 65C816 microprocessor. (GSF, GSH, GSTR, PI, P16)

NDA: See new desk accessory. (GSTR, PI)

nested loop: A loop contained within the body of another loop and executed repeatedly during each pass through the outer loop. See loop. (CTR, ETR)

nested subroutine call: A call to a subroutine from within the body of another subroutine. (CTR, ETR)

new desk accessory (NDA): A desk accessory designed to execute in a desktop, event-driven environment. Compare classic desk accessory. (GSTR, PI)

newline (read) mode: A file-reading mode in which each character read from the file is compared to a specified character (called the newline character); if there is a match, the read is terminated. Newline mode is typically used to read individual lines of text, with the newline character defined as a carriage return. (PI, P16)

NewWindow parameter list: A template describing the features of a window that is to be created. A pointer to a NewWindow parameter list is a required input to the NewWindow call. (PI)

next-changeable location: The memory location that is next to have its value changed. (GSF)

nibble: A unit of data equal to half a byte, or four bits. A nibble can hold any value from 0 to 15 ($0 and $F hexadecimal). (CTR, ETR, P16)

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. Compare null. (GSTR, PI, P16)

NMOS: One of several methods of making integrated circuits out of silicon; a metal-oxide semiconductor device made on a p-type substrate using n-type source and drain contacts. (GSH)

nonspecial, normal memory: Memory that has no special restrictions on it. On the Apple IIGS, such memory includes banks $2–$DF and parts of banks $E0 and $E1. (GSTR)

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, OR, exclusive OR. (CTR, ETR)

Note Sequencer: The Apple IIGS tool set that makes it possible to play music asynchronously in programs. (GSTR, PI)

Note Synthesizer: An Apple IIGS tool set that facilitates creation and manipulation of musical notes. (GSTR, PI)

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 video information, including color, into a single signal. (CTR, ETR, GSF, GSH, GST)

null: Zero. A pointer is null if its value is all zeros. Compare NIL. (GSH, PI, P16)

null event: An event reported when there are no other events to report. (GSTR, PI)

null prefix: A prefix of zero length (and therefore nonexistent). (PI, P16)

object code: See object program. (CTR, ETR, GST)

object file: The output from an assembler or compiler, and the input to a linker. It contains machine-language instructions as well as other information. Also called object program or object code. In APW an object file cannot be loaded into memory. Compare source file, load file. (GSF, PI, P16)

object module format (OMF): The file format used in Apple IIGS object files, library files, and load files. (GSTR, PI, P16)

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. (CTR, ETR, GST)

object segment: A segment in an object file. (PI)

odd parity: In data transmission, the use of an extra bit 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. (CTR, ETR, GST)

offset: The number of character positions or memory locations away from a point of reference. (GSTR, PI)

OK: One of two predefined item ID numbers for dialog box buttons (OK = 1). Compare Cancel. (GSTR, PI)

OMF: See object module format. (GSTR, PI)

OMF file: Any file in object module format. (P16)

op code: See operation code. (CTR, ETR, GSF, GSH, GST, P16)

open: To allow access to a file. A file may not be read from or written to until it is open. (P16)

Open Apple key: A modifier key on some Apple II-family keyboards; on the Apple IIGS keyboard, the equivalent key is marked with both an Apple icon and a spinner, the icon used on some Macintosh keyboards, and called simply the Apple key. (CTR, ETR, GSH, GST)

operand: (1) 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. (2) 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. (GSH, P16) A value to which an operator is applied. The value on which an operation code operates. Compare argument. (CTR, ETR) An item on which an operator (such as + or AND) acts. (GSF)

operating environment: The overall hardware and software setting within which a program runs. Also called execution environment. (GSTR, PI, P16)

operating system: A general-purpose program that manages the actions of the parts of the computer and its peripheral devices for the benefit of the application programs. See disk operating system. (CTR, ETR, GSH, GST, GSTR, PI, P16)

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(P16)

operation code: The part of a machine-language instruction that specifies the operation to be performed. Often called op code. (CTR, ETR, GSF, GSH, GST, P16)

operator: 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. See arithmetic operator, relational operator, logical operator, unary operator, binary operator. (CTR, ETR, GSH)

option: (1) Something chosen or available as a choice; for instance, items in a menu. (2) An argument whose provision is optional. (CTR, ETR)

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 exclusive OR, AND, NOT. (CTR, ETR)

origin: (1) The first memory address of a program or of a portion of one. The first instruction to be executed. (2) The location (0,0) on the QuickDraw II coordinate plane, in either global coordinates or local coordinates. (3) The upper-left corner of any rectangle (such as a boundary rectangle or port rectangle) in QuickDraw II. (4) See character origin. (GSTR, PI)

oscillator: A device that generates a vibration. In the Apple IIGS digital oscillator chip, an oscillator is an address generator that points to the next data byte in memory that represents part of a particular sound wave. (GSH, GSTR, PI)

output: Information transferred from a computer to some external destination, such as the display screen, a disk drive, a printer, or a modem. (CTR, ETR)

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. (CTR, ETR)

oval: A circle or an ellipse, one of the fundamental classes of objects drawn by QuickDraw II. (GSTR, PI)

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. (CTR, ETR)

overlay: One of a set of program segments meant to alternately occupy the same memory space. Use of overlays is one way to minimize the amount of memory a program needs. (PI)

override: To modify or cancel an instruction by issuing another one. (CTR, ETR)

overrun: A 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. (CTR, ETR, GST)

P register: See status register. (PI)

pack: To compress data into a smaller space to conserve storage space. (GSTR, PI)

page: (1) A portion of 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. (2) (usually capitalized) An area of main memory containing text or graphic information being displayed on the screen. (GSF, GSH, GST, GSTR, PI, P16) (1) 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. (2) An area of main memory containing text or graphical information being displayed on the screen. (3) A segment of main memory 256 bytes long and beginning at an address that is an even multiple of 256. (CTR, ETR)

page zero: See zero page. (CTR, ETR, GST)

page-aligned: Said of a memory block that starts at a memory address that is an even multiple of 256 (a memory block attribute). See also page (1). (GSTR, PI)

paging region: In a scroll bar, the area a user clicks to move the view of the data a page at a time. (GSTR)

painting: In QuickDraw II, using the current pen pattern, drawing mask, and pen mode to fill the interior of a shape. (GSTR)

PAL: Acronym for phase alternating lines. A video standard originated in England and used in other European countries. (GSH)

palette: The set of colors from which the user can choose a color to apply to a pixel on the screen. (GSF, GSTR, PI)

parallel: (1) The simultaneous occurrence of more than one phenomenon. (2) The connection of a group of wires for the purpose of conducting bits of data simultaneously, rather than one at a time (via a serial connection). (GSH)

parallel interface: An interface in which several bits of information (typically 8 bits, or 1 byte) are transmitted simultaneously over different wires or channels. Compare serial interface. (CTR, ETR, GST)

parameter: An argument that determines the outcome of a command. For example, in the command write(n,msg), n and msg are parameters. (GSF, GST, GSTR, PI, P16)

parameter block: 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 the program calls. Every call to SmartPort must include a pointer to a properly constructed parameter block. (GSF, P16)

parameter RAM: RAM on the Apple IIGS clock chip. A battery preserves the clock settings and the RAM contents when the power is off. Control Panel settings are kept in battery RAM. (GSTR, PI)

parity: Sameness of level or count, usually the count of 1 bits in each character, used for error checking in data transmission. See even parity, MARK parity, odd parity, parity bit. (CTR, ETR, GST)

parity bit: A bit that is sometimes transmitted along with the other bits that define a serial character. It is used to check the accuracy of the transmission of the character. Even parity means that the total number of 1 bits transmitted, including the parity bit itself, is even. Odd parity means that the total number is odd. The parity bit is generated individually for each character and checked, a character at a time, at the receiving end. (GSF, GST)

part code: A number between 1 and 255 that stands for a particular part of a control. The Control Manager uses part codes to allow different parts of a control to respond in different ways. (GSTR)

partial pathname: A pathname that includes the filename of the desired file but excludes the volume directory name (and possibly one or more of the subdirectories in the path). It is the part of a pathname following a prefix—a prefix and a partial pathname together constitute a full pathname. A partial pathname does not begin with a slash because it has no volume directory name. (GSTR, PI, P16)

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 after the philosopher and mathematician Blaise Pascal. (CTR, ETR, GST, GSTR, PI)

Pascal string: An ASCII character string preceded by a single byte whose numerical value is the number of characters in the string. Compare C string. (GSTR, PI)

Pascal-type string: Same as Pascal string. (GSTR)

pass: A single execution of a loop. (CTR, ETR)

paste: To place the desk scrap (contents of the Clipboard—whatever was last cut or copied) at the insertion point. (GSTR, PI)

patch: 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 the System Loader performs relocation on a file. (PI, P16)

pathname: A name that specifies a file. It is a sequence of one or more filenames separated by slashes, tracing the path through subdirectories that a program must follow to locate the file. See full pathname, partial pathname, prefix. (GSTR, PI, P16)

pathname prefix: See prefix. (GSTR, PI)

Pathname segment: 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. (P16)

Pathname Table: A table constructed in memory by the System Loader. The Pathname Table contains cross-references between load files referenced by number (in the Jump Table) and by pathname (in the file directory). (PI, P16)

pattern: (1) An 8-by-8 pixel image, used to define a repeating design (such as stripes) or color. (2) A series of commands to the Note Synthesizer. (GSTR, PI)

PB register: See program bank register. (GSTR, PI)

PB register: See program bank register. (PI)

PC board: See printed-circuit board. (CTR, ETR)

PC register: A register within the 65816 microprocessor that keeps track of the memory address of the next instruction to be executed. PC stands for program counter. (GSTR, PI)

peek: To read information directly from a location in the computer's memory. (CTR, ETR)

pen: The conceptual tool with which QuickDraw II draws shapes and characters. Each GrafPort has its own pen. (GSTR, PI)

pen location: The position (on the coordinate plane) at which the next character or line will be drawn. (GSTR, PI)

pen mode: One of several Boolean operations that determine how the pen pattern is to affect an existing image. Compare text mode. (GSTR)

pen pattern: See pattern (1). (GSTR, PI)

pen size: The size of the rectangle that will be used as the drawing pen. (GSTR)

peripheral: (adj) At or outside the boundaries of the computer itself, either physically (as a peripheral device) or in a logical sense (as a peripheral card). (n) Short for peripheral device. (CTR, ETR, GST)

peripheral bus: The bus used for transmitting information between the computer and peripheral devices connected to the computer's expansion slots or ports. (CTR, ETR)

peripheral card: A hardware device placed inside a computer and connected to one of the computer's peripheral expansion slots. Peripheral cards perform a variety of functions, from controlling a disk drive to providing a clock/calendar. (CTR, ETR, GST, GSTR, PI) A removable printed-circuit board that plugs into one of the seven I/O expansion slots, allowing the computer to use a peripheral device or to perform some subsidiary or peripheral function. These cards may be self-contained (such as a clock card) or an interface card (such as a disk interface card) with a cable connecting the card and the peripheral. (GSH)

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. They often require peripheral cards. See device. (CTR, ETR, GST) An input or output (or input/output) device, usually external to the computer (but which may reside on a card in a peripheral-expansion slot), that performs some secondary function for the computer. Printers, disk drives, modems, and video monitors are examples of peripheral devices. See device. (GSH, GSTR, PI)

peripheral expansion slot: The seven slots at the rear of the main logic board that will accept most Apple II peripheral expansion cards. Each slot has 50 pins, which carry required power and signals to and from the peripheral cards. (GSH)

peripheral slot: See expansion slot. (CTR, ETR, GST)

phase: (1) A stage in a periodic process. A point in a cycle. For example, the 6502 and 65C816 microprocessors use a clock cycle consisting of two phases called F0 and F1. (2) The relationship between two periodic signals or processes. (CTR, ETR, GSH, GST)

phrase: In music synthesis, a set of pointers to patterns that make it easy to build repetitive, complex passages out of simple patterns. (PI)

picture: 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. (GSTR, PI)

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. (CTR, ETR)

pinning: The process of assigning positive overflows to the largest positive representable value and negative overflows to the largest negative representable value. (GSTR)

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, processors with this feature run faster than those without it. (CTR, ETR)

pixel: A contraction of 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 Super Hi-Res display on the Apple IIGS, each pixel is represented by either 2 or 4 bits. See also pixel image. (CTR, ETR, GSF, GSH, GST, GSTR, PI)

pixel image: A graphics image picture consisting of a rectangular grid of pixels. (GSTR, PI)

pixel map: A set of values that represents the positions and states of the set of pixels making up an image. Compare bit map. (GSF, GSH, GST)

plain-styled: Said of a font or character that is not bold, italicized, underlined, or otherwise styled apart from ordinary text. (GSTR, PI)

plane: The front-to-back position of a window on the desktop. (GSTR, PI)

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. (CTR, ETR)

point: (1) A unit of measurement for type; 12 points equal 1 pica, and 6 picas equal 1 inch; thus, 1 point equals 1/72 inch. (2) A relative measure (taken from the type measure) used to distinguish font size on output devices. (3) In QuickDraw II, the Y and X coordinates of a location on the coordinate plane. (GSTR, PI)

point of call: The point in a program from which a subroutine or function is called. (CTR, ETR)

pointer: (1) An item of information consisting of the memory address of some other item. For example, the 65816 stack register contains a pointer to the top of the stack. (2) The mouse pointer, an arrow-shaped cursor whose screen location is controlled by mouse movements. (CTR, ETR, GSH, GSTR, PI, P16)

pointing device: Any device, such as a mouse, graphics tablet, or light pen, that can be used to specify locations on the computer screen. (GSTR, PI)

poke: To store information directly into a location in the computer's memory. (CTR, ETR)

polygon: Any sequence of connected lines. (GSTR, PI)

pop: To remove the top entry from a stack, moving the stack pointer to the entry below it. Synonymous with pull. Compare push. (CTR, ETR, GSH, GST)

port: (1) A socket on the back panel of the computer where the user can plug in a cable to connect a peripheral device, another computer, or a network. (2) A graphic port (GrafPort). (GST, GSTR, PI) In the Apple IIc, slots are called ports. (CTR)

port rectangle: A rectangle that describes the active region of a GrafPort's pixel map—the part that QuickDraw II can draw into. The content region of a window on the desktop corresponds to the window's port rectangle. (GSTR, PI)

portrait mode: A printing mode in which text prints from left to right on the paper. (GSTR)

portRect: The GrafPort field that defines the port's port rectangle. (GSTR, PI)

position-independent: 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. Compare absolute, relocatable. (PI, P16)

post: To place an event in the event queue for later processing. (GSTR, PI)

power supply: A circuit that draws electrical power from a power outlet and converts it to the kind of power the computer can use. (CTR, ETR) The large metal box inside the Apple IIGS that divides and conditions the household current, supplying the voltages required by the main logic board and some peripheral devices. (GSH) The metal case inside most Apple II and Macintosh computers that houses the power supply. The Apple IIc uses an external power supply case. (CTR, ETR)

PR#: An Applesoft BASIC command that directs output to a slot or a machine-language program. It activates an output routine in the ROM on a peripheral card or in equivalent RAM by changing the address of the standard output routine used by the computer. (CTR, ETR, GST)

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. (CTR, ETR)

prefix: A pathname starting with a volume name and ending with a subdirectory name. It is the part of a full pathname that precedes a partial pathname—a prefix and a partial pathname together constitute a full pathname. A prefix always starts with a slash (/) because a volume directory name always starts with a slash. (GSTR, PI, P16)

prefix number: A code used to represent a particular prefix. Under ProDOS 16, there are nine prefix numbers, each consisting of a number (or asterisk) followed by a slash: 0/, 1/,...,8/, and */. (PI, P16)

prestyled: Said of a font that has a certain style or combination of styles built into the font's design. (GSTR)

Print Manager: The Apple IIGS tool set that allows an application to use standard QuickDraw II routines to print text or graphics on a printer. (GSTR, PI)

print record: A record containing all the information needed by the Print Manager to perform a particular printing job. (GSTR, PI)

printed-circuit board: A hardware component of a computer or other electronic device, consisting of a flat, rectangular piece of rigid material, commonly Fiberglas, to which integrated circuits and other electronic components are connected. (CTR, ETR)

printer information subrecord: A data structure within the print record that contains the information needed for page composition. (GSTR)

printing loop: The page-by-page cycle that an application goes through when it prints a document. (GSTR, PI)

private scrap: A buffer (and its contents) set up by an application for cutting and pasting, analogous to but apart from the desk scrap. (GSTR, PI)

private symbol: A label in a segment that may be referenced by other segments in the same file, but not by segments in other files. (PI)

procedure: In the Pascal and Logo programming languages, a sequence of instructions that work as a unit; approximately equivalent to the term function in C or subroutine in BASIC. (CTR, ETR, GST)

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 microprocessor. (CTR, ETR, GST)

processor status register: See status register. (PI)

ProDOS: A disk operating system for the Apple II family of computers. ProDOS stands for Professional Disk Operating System, and includes ProDOS 8 and ProDOS 16. Compare Disk Operating System (DOS). (CTR, ETR, GSF, GSH, GST, GSTR, PI, P16)

ProDOS 16: A disk operating system developed for 65816 native-mode operation on the Apple IIGS. It is functionally similar to ProDOS 8 but more powerful. (GSF, GSH, GST, GSTR, PI, P16)

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. (GSF, GSH, GST, GSTR, PI, P16)

ProDOS command: Any one of the 28 commands recognized by ProDOS. (CTR, ETR)

program: (n) A set of instructions describing actions for a computer to perform in order to accomplish some task, conforming to the rules and conventions of a particular programming language. (v) To write a program. (CTR, ETR, GST)

program bank register: The 65C816 register whose contents form the high-order byte of all 3-byte code address operands. Also called PB register. (GSTR, PI)

program counter: See PC register. (GSTR, PI)

program line: The basic unit of an Applesoft BASIC program, consisting of one or more statements separated by colons (:). (CTR, ETR)

program status register: A register in the 65C816 microprocessor that contains flags reflecting the various aspects of machine state and operation results. See status register. (GSTR, PI)

programmable read-only memory (PROM): A type of ROM device that is programmed after fabrication, unlike ordinary ROM devices, which are programmed during fabrication. (GSH, GST)

programming language: A set of symbols and associated rules or conventions for writing programs. BASIC, Logo, and Pascal are programming languages. (CTR, ETR, GST)

PROM: See programmable read-only memory. (GSH, GST)

prompt: A message on the screen that a program provides when it needs a response from the user. A prompt is usually in the form of a symbol, a dialog box, or a menu of choices. (CTR, ETR, GSF, GST)

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 (*). (CTR, ETR, GST)

prompt line: A specific area on the display reserved for prompts. (CTR, ETR)

proportionally spaced: Said of a font whose characters vary in width, so the amount of horizontal space needed for each character is proportional to its width. Compare monospaced. (GSTR, PI)

protocol: A formal set of rules for the interchange of information between two programs or devices; for example, the rules for sending and receiving data on a communication line. (CTR, ETR, GSH, GST)

Protocol Converter: A set of machine language routines used in the Apple II family for performing block device I/O. See Smartport. (CTR) A set of ROM-based assembly-language routines used to support external I/O devices such as the Apple Memory Expansion Card and the Apple 3.5 Drive. (GST)

pseudo-type: A type that provides some additional information about a parameter of a toolbox routine. (GSTR)

pull: To remove the top entry from a stack, this instruction moves the stack pointer to the entry below it. Synonymous with pop. Compare push. (GSH, P16)

pull-down menu: A set of choices for actions that appears near the top of the display screen in a desktop application, usually overlaying the present contents of the screen without disrupting them. Dragging through the menu and releasing the mouse button while a command is highlighted chooses that command. (GSTR, PI)

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. (GSTR, PI, P16)

purge level: 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. (PI)

purge level: 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. (GSTR, P16)

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. (P16)

push: To add an item to the top of a stack, moving the stack pointer to the next entry above the top. Compare push. (CTR, ETR, GSH, GST, P16)

Quagmire register: On the Apple IIGS, the name given to the 8 bits comprising the speed-control bit and the shadowing bits. From the Monitor program, the user can read from or write to the Quagmire register to access those bits, even though they are actually in separate registers. (GSF)

queue: A list in which entries are added (pushed) at one end and removed (pulled) at the other end, causing entries to be removed in first-in, first-out (FIFO) order. Compare stack (CTR, ETR, GST, GSTR, PI, P16)

QuickDraw II: The Apple IIGS tool set that controls the graphics environment and draws simple objects and text. Other tools call QuickDraw II to draw such things as windows. (GSTR, PI)

QuickDraw II Auxiliary: An Apple IIGS tool set that provides extensions to the capabilities of QuickDraw II. (PI)

QuickDraw II Auxiliary: The Apple IIGS tool set that provides extensions to the capabilities of QuickDraw II. (GSTR)

QuickDraw II Auxiliary icon record: A data structure that defines the appearance of an icon. (GSTR)

quit: To terminate execution in an orderly manner. Apple IIGS applications quit by making a ProDOS 16 QUIT call or the equivalent. (GSTR, PI)

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. (PI, P16)

QWERTY keyboard: The standard layout of keys on a typewriter keyboard; its name is formed from the first six letters on the top row of letter keys. Compare Dvorak keyboard. (CTR, ETR, GST)

radio button: A common type of control in dialog boxes. Radio buttons are small circles organized into families; clicking any button on turns off all the others in the family, like the buttons on a car radio. See also check box. (GSTR, PI)

radio frequency (RF): Broadcast frequency over which radio and television operate. Generally defined as the radio spectrum between 3 MHz and 3000 MHz. (GSH)

radio-frequency modulator: A device used to raise video signals to a frequency that may be received and displayed by a television, as a substitute for a standard video monitor when one is not available. (CTR, ETR, GSH)

RAM: See random-access memory. (CTR, ETR, GSF, GSH, GST, GSTR, PI)

RAM disk: A feature of some operating systems which makes it possible to use programmable memory (RAM) as a disk volume. Large applications designed for machines with limited amounts of RAM must load program segments from disk as needed; on machines with RAM disk, the entire application is first loaded into RAM, where it runs as if still resident on disk, but much faster. (GSF, GSH, GST)

random-access device: See block device. (GSH, P16)

random-access memory (RAM): Memory in which information can be referred to in an arbitrary or random order. As an analogy, a book is a random-access storage device in that it can be opened and read at any point. RAM usually means the part of memory available for programs from a disk; the programs and other data are lost when the computer is turned off. A computer with 512K RAM has 512 kilobytes available to the user. (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, read-write memory. (CTR, ETR, GSF, GSH, GSTR, GSTR, PI)

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. (CTR, ETR)

range mode: In the List Manager, a selection mode that allows the user to select a range of members in a list. (GSTR)

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. (CTR, ETR)

RDKEY: The firmware routine that a program uses to read a single keystroke from the keyboard. (GSF)

read: To transfer information into the computer's memory from 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). (CTR, ETR)

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 then remains there permanently, even when the computer's power is turned off. Compare random-access memory, read-write memory, write-only memory. (CTR, ETR, GSF, GST, GSTR, PI) Nonvolatile, permanent memory. ROM ICs may be written once, usually in the development of the computer. Data are retained in the memory even after power is disconnected. Special ROM ICs allow you to change the data in them under specific conditions such as ultraviolet light (EPROMs [erasable programmable read-only memory]), or high voltages (EEPROMs [electrically erasable programmable read-only memory]). Normally, however, ROM ICs are written once. (GSH)

read-write memory: Memory whose contents can be both read and changed (or written to); commonly called RAM. 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. Compare random-access memory, read-only memory. (CTR, ETR, GSH, GST)

real font: A font that exists on disk or was added by an application and marked as real. Compare unreal font. (GSTR)

real number: In computer usage, a number that may include a fractional part; represented inside the computer in floating-point form. Because a real number is of infinite precision, this representation is usually approximate. Compare integer. (CTR, ETR)

real-time clock (RTC): A custom IC that, once set, retains the current time of day, day, month, and year. Chapter 7 provides details of the RTC and other built-in I/O devices. (GSH)

receive data register: A read-only register in the serial port ACIA (at $C098 for port 1 and $C0A8 for port 2) that stores the most recent character successfully received. (CTR)

recharge routine: The function that supplies data to the output device when background printing is taking place. (GSF)

record: A component of an load 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. (P16)

rectangle: One of the fundamental shapes drawn by QuickDraw II. Rectangles are completely defined by two points—their upper-left and lower-right corners on the coordinate plane. The upper-left corner of any rectangle is its origin. (GSTR, PI)

reentrant: Said of 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 Apple IIGS Scheduler manages execution of routines that are not reentrant. (GST, GSTR, PI), P16

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. (P16)

region: An arbitrary area or set of areas on the QuickDraw coordinate plane. The outline of a region must be one or more closed loops. (GSTR, PI)

register: A location in a processor or other chip where an item of information is held and modified under program control. (CTR, ETR, GST)

relational operator: An operator, such as >, that operates on numeric values to produce a logical result. Compare arithmetic operator, logical operator. (CTR, ETR)

Reload segment: a load-file segment that is always loaded from the file at program startup, regardless of whether the rest of the program is loaded from file or restarted from memory. Reload segments contain initialization information, without which certain types of programs would not be restartable. (P16) A segment that is always reloaded from disk when a program is executed, even if the program is in a dormant state in computer memory. Some programs require RELOAD segments in order to be restartable. (PI)

RELOC record: A part of a relocation dictionary that contains relocation information for local (within-segment) references. (P16)

relocatable: Characteristic of a load segment or other OMF program code that includes no references to specific address, and so can be loaded at any memory address. A relocatable segment consists of a code image followed by a relocation dictionary. Compare absolute. (GSTR, PI, P16)

relocate: To modify a 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. (P16)

relocation: The act of modifying a program in memory so that its address operands correctly reflect its location and the locations of other segments in memory. Relocation is performed by the System Loader when a relocatable segment is first loaded into memory. (GSTR, PI)

relocation dictionary: A portion of a load segment that contains relocation information necessary to modify the memory image portion of the segment. See relocate. (PI, P16)

repeat delay: The time interval before the first auto-key event is generated. (GSTR)

repeat speed: The time interval between auto-key events, except for the first auto-key event. See also repeat delay. (GSTR)

Request-To-Send: An RS-232-C signal from a DTE to a DCE that serves to prepare the DCE for data transmission. (CTR)

reserved memory: Memory not managed by the Memory Manager; that is, memory that is marked as busy at startup time. (GSTR)

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. (CTR, ETR)

resident: See memory-resident, disk-resident. (CTR, ETR, GST)

resource: A type of organization for certain components of Macintosh files. Resources provide a convenient means for manipulating the fixed (unchanging) parts of a program file. (PI)

resource editor: A program for editing resources, especially data in a program, without having to recompile the program. (GST, PI)

Resource Manager: The Macintosh toolbox component that retrieves, manipulates, and disposes of resources. (GST, PI)

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. (PI, P16)

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. (PI, P16)

result: An item of information returned to a calling program from a function. Compare value. (P16)

return address: The point in a program to which control returns on completion of a subroutine or function. (CTR, ETR, GST)

RF: See radio frequency. (GSH)

RF modulator: See radio-frequency modulator. (CTR, ETR, GSH)

RGB: Abbreviation for red, green, and blue. A method of displaying color video by transmitting these three 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. The Apple IIGS uses analog RGB; connect only RGB monitors using analog RGB to the RGB video connector at the rear of the computer. Compare composite video. (GSF, GSH, GST, PI)

RGB monitor: A type of color monitor that receives separate signals for each color (red, green, and blue). Compare composite video. (CTR, ETR, GST)

right scroll bar: The control the user selects to scroll vertically through the data in the window. (GSTR)

ROM: See read-only memory. (CTR, ETR, GSF, GSH, GST, GSTR, PI)

ROM disk: A feature of some operating systems making it possible to use read-only memory (ROM) as a disk volume. Often used for making applications permanently resident. See also RAM disk. (GSF, GSH, GST)

ROM font: The font contained in system ROM. (GSTR)

rounded result: The nearest representable value to the actual value, with ties going to the value with the larger magnitude. (GSTR)

rounded-corner rectangle: One of the fundamental shapes drawn by QuickDraw II. The rounded corners of this type of rectangle are defined by an oval height and oval width. (GSTR)

routine: A part of a program that accomplishes some task subordinate to the overall task of the program. (CTR, ETR, GST, GSTR, PI)

row: A horizontal arrangement of character cells or graphics pixels on the screen. (CTR, ETR, GST)

RS-232: A common standard for serial data communication interfaces. (GSF, GST)

RS-232 cable: Any cable that is wired in accordance with the RS-232 standard, which is the common serial data communication interface standard. (CTR, ETR)

RS-232-C: A common standard for serial data-communication interfaces. (GSH)

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-C devices. (GSF, GSH, GST)

RTC: See read-only memory. (GSH)

RTI: Return from Interrupt, a 65816 assembly-language instruction. (PI)

RTL (Return from Subroutine Long): Return from subroutine Long; a 65C816 assembly-language instruction. It is used in conjunction with a JSL instruction. (GSTR, PI, P16)

RTS (Return from Subroutine): Return from Subroutine; a 6502 and 65C816 assembly-language instruction. It is used in conjunction with a JSR instruction. (GSTR, PI, P16)

RTS: See Request-To-Send. (CTR)

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. (CTR, ETR)

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. (P16)

S register: See stack register. (GSTR, PI)

SANE (Standard Apple Numeric Environment): 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. See Standard Apple Numeric Environment. (GST, GSTR, PI)

SANE Tool Set: The Apple IIGS tool set that performs high-precision floating-point calculations, following SANE standards. (GSTR, PI)

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. (P16)

save: To store information by transferring the information from main memory to a disk. Work not saved disappears when you turn off the computer or when the power is interrupted. (CTR, ETR)

scaled font: A font that is created by the Font Manager by calculation from a real font of a different size. (GSTR, PI)

scaling: The process of taking all characters of a real font and making them bigger or smaller to generate a requested font. (GSTR)

scan line: A single horizontal line of pixels on the screen. It corresponds to a single sweep of the electron gun in the video display tube. (GSTR, PI)

scan line control byte (SCB): A byte in memory that controls certain properties, such as available colors and number of pixels, for a scan line on the Apple IIGS. Each scan line has its own SCB. (GSTR, PI)

SCB: See scan line control byte. (GSTR)

SCC: Abbreviation for Serial Communications Controller, a type of communications IC used in the Apple IIGS. The SCC can run synchronous data transmission protocol and thus transmit data at faster rates than the ACIA. See Serial Communications Controller. (GSF, GSH, GST)

Scheduler: The Apple IIGS tool set that manages requests to execute interrupted software that is not reentrant. If, for example, an interrupt handler needs to make system software calls, it must do so through the Scheduler because ProDOS 16 is not reentrant. Applications normally need not use the Scheduler because ProDOS 16 is not in an interrupted state when it processes applications' system calls. (GSTR, PI, P16)

schematic diagram: A diagram using special figures to represent ICs, logic functions, and interconnecting wires, to describe a circuit. Schematic diagrams for the Apple IIGS main logic board are located in the Addendum. (GSH)

scrap count: A count that indicates how many times the desk scrap has changed. (GSTR)

Scrap Manager: The Apple IIGS tool set that supports the desk scrap, which allows data to be copied from one application to another (or from one place to another within an application). (GSTR, PI)

screen: See display screen. (CTR, ETR)

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. (GSF, GSH, GST)

scroll: To move all the text on the screen upward or downward, and, in some cases, sideways. See viewport, window. (CTR, ETR, GSTR, PI)

scroll bar: A rectangular bar that may be along the right or bottom of a window. Clicking or dragging in the scroll bar causes the view of the document to change. (GSTR, PI)

SECAM: A French acronym meaning "sequential color with memory." A video standard originating in France and used in the USSR and other countries. (GSH)

sector: A division of a track on a disk. When a disk is formatted, its surface is divided into tracks and sectors. (GSH, P16)

sector: See track. (GSF)

seedling file: An organizational form of a ProDOS 16 standard file. A seedling file consists of a single data block. (P16)

segment: 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. (PI, P16)

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. (PI, P16)

selection range: The series of characters where the next editing action will occur. (GSTR)

self-booting: Said of a program that executes automatically when the computer is turned on or reset. (PI)

semiconductor: A class of materials whose resistivity lies between that of conductors and insulators, for example, germanium and silicon. Solid-state electronics is based on the use of semiconductors. (GSH)

sequence: A series of commands that tells the computer what notes to play and when. (PI)

sequential-access device: See character device. (P16)

serial: A single-wire connection for the purpose of transferring bits of data one at a time, usually between a computer and a peripheral device. Compare parallel. (GSH)

Serial Communications Controller (SCC): A type of communications IC used in the Apple IIGS. The SCC can run synchronous data transmission protocol and thus transmit data at faster rates than the ACIA. Compare ACIA. (GSH, GST)

serial interface: A standard method, such as RS-232, for transmitting data serially (as a sequence of bits). (GSTR, PI) An interface in which information is transmitted sequentially, a bit at a time, over a single wire or channel. Compare parallel interface. (CTR, ETR, GST)

serial port: The connector for a peripheral device that uses a serial interface. (GST, GSTR, PI) The two connectors located at the back of the Apple IIGS main logic board that provide a means for communicating with peripherals (such as printers and local area networks) using a serial interface. (GSH)

setup time: The amount of time a signal must be valid in advance of some event. Compare hold time. (CTR, ETR)

shadowing: The process whereby 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. (GSF, GSH, P16)

Shaston: The Apple IIGS system font. (GSTR, PI)

shell: 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. A shell is one type of controlling program. (PI)

shell application: A type of program that is launched from a shell 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. (PI, P16)

shell call: A request from a program to the APW Shell to perform a specific function. (PI)

shut down: To remove from memory or otherwise make unavailable, as a tool set that is no longer needed or an application that has quit. (GSTR, PI)

silicon: A solid, crystalline chemical element (symbol Si) from which integrated circuits are made. Silicon is a semiconductor; that is, it conducts electricity better than insulators, but not as well as metallic conductors. Silicon should not be confused with silica—that is, silicon dioxide, such as quartz, opal, or sand—or with silicone, any of a group of organic compounds containing silicon. (CTR, ETR, GSH, GST)

simple variable: A variable that is not an element of an array. (CTR, ETR)

Simplified Keyboard: See Dvorak keyboard. (GST)

single mode: In the List Manager, a selection mode that allows the user to select only one member of a list at once; that is, when the user drags the mouse, the selection moves from one member to another. (GSTR)

640 mode: An Apple IIGS video display mode, 640 pixels horizontally by 200 pixels vertically. (PI)

6502: The microprocessor used in the Apple II, in the Apple II Plus, and in early models of the Apple IIe. The 6502 is an NMOS device with an 8-bit data bus and a 16-bit address bus. (PI)

65C816: The version of the 65816 microprocessor used in the Apple IIGS. The 65C816 is a CMOS device. (PI)

65816: A general term for the type of microprocessor used in the Apple IIGS. The 65816 is related to, but more advanced than, the 6502 microprocessor. It has a 16-bit data bus and a 24-bit address bus. (PI)

65816 assembly language: A low-level programming language written for the 65816 family of microprocessors. (PI)

size box: A small region in the lower right corner of a window that the user can drag to change the size of the window. (GSTR)

slop rectangle: The rectangle that allows the user some margin for error when moving the mouse. (GSTR)

slot: A narrow socket inside the computer where the user can install peripheral cards. Also called an expansion slot. (CTR, ETR, GST, GSTR, PI)

SmartPort: A set of firmware routines supporting multiple block devices connected to the Apple IIGS disk port. See also extended SmartPort call and standard SmartPort call. (GSF, GSH, PI)

Smartport: A set of machine language routines used in the Apple II family for performing block device I/O. See Protocol Converter. (CTR)

smoothing: A LaserWriter printing option that asks the system to smooth out any bit-mapped fonts with jagged edges. (GSTR)

soft switch: Also called a software 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. (CTR, ETR, GSF, GSH, GST, P16)

software: A collective term for programs, the instructions that tell the computer what to do. Software is usually stored on disks. Compare firmware, hardware. (CTR, ETR, GST, GSTR, PI) A group of instructions to the microprocessor, instructing it to perform certain functions, such as performing computations, displaying data on a monitor, reading data from and writing data to a disk. The group of instructions is known collectively as a program. Compare application program. (GSH)

sound GLU (general logic unit): The interface chip between the system hardware and the sound hardware. (GSTR)

Sound Tool Set: The Apple IIGS tool set that provides low-level access to the sound hardware. (GSTR, PI)

source: See source location. (PI)

source code: See source program. (CTR, ETR, GST)

ource 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. (GSF, PI, P16)

source location: The location (memory buffer or portion of the QuickDraw II coordinate plane) from which data such as text or graphics are copied. Compare destination location. See also source rectangle, destination rectangle. (GSTR, PI)

source program: The form of a program given to a language translator, such as a compiler or assembler, for conversion into another form; sometimes called source code. Compare object program. (CTR, ETR, GST)

source rectangle: The rectangle (on the QuickDraw II coordinate plane) where text or graphics are drawn when transferred from somewhere else. Compare destination rectangle. (GSTR, PI)

space character: A text character whose printed representation is a blank space, typed from the keyboard by pressing the Space bar. (CTR, ETR)

SPACE parity: A bit value of 0 appended to a binary number for transmission. The receving device can look for this value on each character as a means of error checking. (CTR)

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 the fact 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. (P16)

special memory: On an Apple IIGS, all of banks $00 and $01 and all display memory in banks $E0 and $E1. It is the memory directly accessed by standard Apple II programs running on the Apple IIGS. (GSH, GSTR, PI, P16)

spool printing: A two-step printing method used to print graphics on the ImageWriter. In the first step, it writes out (spools) a representation of your document's printed image to a disk file or to memory. IN the second step, this information is converted into a bit image and printed. Compare draft printing. (GSTR, PI)

SRQ list: A special tool mechanism that can be used to poll the Apple Desktop Bus for data from specific devices. (GSTR)

SRQ list completion routine: Used in conjunction with the ADB Tool Set routine AsyncADBReceive, this completion routine obtains ADB data from a buffer. The only major difference between this routine and the AsyncADBReceive completion routine is that the SRQ list routine has an extra return address on the stack when it is called. Compare AsyncADBReceive completion routine. (GSTR)

SSC: Abbreviation for Super Serial Card, a peripheral card that enables an Apple II to communicate with serial devices. (GSF)

stack: A list in which entries are added (pushed) and removed (pulled) at one end only (the top of the stack), causing entries to be removed 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. (CTR, ETR, GSF, GSH, , GST, GSTR, PI, P16)

stack pointer: See stack register. (GSTR, PI)

stack register: A hardware register in the 65C816 processor that contains the address of the top of the processor's stack. (GSF, GSH)

stack register: A register in the 65816 processor that indicates the next available memory address in the stack. Also called S register. (GSTR, PI, P16)

stage byte: Determines the actions taken by an alert. See also alert stage. (GSTR)

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. (GSF, GSH, GST, GSTR, PI, P16)

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. (GST, GSTR, PI)

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. (P16)

Standard File Operations Tool Set: The Apple IIGS tool set that creates a standard user interface for opening and closing files. (GSTR)

Standard File Operations Tool Set: The Apple IIGS tool set that creates a standard user interface for opening and closing files. (PI)

standard instruction: An instruction automatically present when no superseding instruction has been received. (CTR, ETR)

standard linker (APW): One aspect of the linker supplied with APW. The operation of the standard linker is automatic. Compare advanced linker. (PI)

standard SmartPort call: A SmartPort call that allows data transfer to or from anywhere in standard Apple II memory, or the lowest 64K of Apple IIGS memory. Compare extended SmartPort call. (GSF)

standard window controls: The window controls that allow the user to scroll through the data in the window, change the window's shape, or close the window. They also provide information about the document currently displayed in the window. (GSTR, PI)

START: The name of the program in the SYSTEM/subdirectory of the startup disk that is launched automatically when the system is booted. START is typically a finder or program launcher. (PI)

start bit: A transition from a MARK signal to a SPACE signal for one bit-time, indicating that next string of bits represents a character. (CTR)

start bit: One or two bits that indicate the beginning of a character in a string of serially transmitted characters. (GST)

start up: To get the system or application program running. (PI)

start up: To get the system running. It involves loading system software from disk, and then loading and running an application. Also called boot. (P16)

start up: To get the system running. Starting up involves loading system software from disk, and then loading and running an application. Also called boot. (CTR, ETR, GSF, GSH, GST, GSTR)

starting value: The value assigned to the index variable on the first pass through a loop. (CTR, ETR)

startup disk: A disk with all the necessary program files—such as the Finder and System files contained in the System folder in Macintosh—to set the computer into operation. In Apple II, sometimes called a boot disk. (CTR, ETR, GST)

statement: A unit of a program in a high-level language that specifies an action for the computer to perform. A statement typically corresponds to several instructions of machine language. (CTR, ETR)

static segment: A program segment that must be loaded when the program is started and cannot be removed from memory until execution terminates. Compare dynamic segment. (GSTR, PI, P16)

static text: Text on the screen that cannot be altered by the user. (GSTR, PI)

status register: A location in the ACIA (at $C099 for port 1 and $C0A9 for port 2) that stores the state of two RS-232-C signals and the state of the transmit and receive data registers, as well as the outcome of the most recent character transfer. (CTR) A register in the 65816 microprocessor that contains flags reflecting the various aspects of machine state and operation results. (PI)

step value: The amount by which the index variable changes on each pass through a loop. (CTR, ETR)

stop bit: A bit indicating the end of a character in a string of serially transmitted characters. (GST) A MARK signal following a data string (or the optional parity bit), indicating the end of a character. (CTR)

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). (P16)

string: A sequence of characters. See C string, Pascal string. (CTR, ETR, GSTR, PI)

string bounds rectangle: The smallest rectangle that would enclose all the foreground and background pixels of a string if the string were to be drawn. (GSTR)

strobe: A signal whose change is used to trigger some action. (CTR, ETR, GST)

structure region: An entire window: its content region plus its frame region. (GSTR, PI)

style dialog box: A dialog box that allows the user to specify formatting information, page size, and printer options. (GSTR, PI)

style subrecord: A data structure within the print record that contains information gathered from the user via the style and job dialog boxes. (GSTR)

styled variation: An italicized, bold, underlined, or otherwise altered version of a plain-styled character or font. (GSTR, PI)

subdirectory: A file that contains information about other files. In a hierarchical file system, files are accessed through the subdirectories that reference them. (GST. GSTR, PI, P16)

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. (CTR, ETR, GST, GSTR, PI)

Super Hi-Res: Either of two high-resolution Apple IIGS display modes. 320 mode consists of an array of pixels 320 wide by 200 high, with 16 available colors; 640 mode is an array 640 wide by 200 high, with 16 available colors (with restrictions). (GSF, GSH, GSTR, PI)

swap pair: A pair of oscillators that form a functional unit (called a generator) when the digital oscillator chip (DOC) is in swap mode. (GSTR)

switch event: An event that indicates the application is being returned to after being switched out of by a switcher-type application. (GSTR, PI)

switcher: A controlling program that rapidly transfers execution among several applications. (GSTR, PI, P16)

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. (This process is called relocation.) (PI)

sync signal: A signal which exists for the purpose of synchronizing two devices. Frequently generated by a video generator and used by a video monitor to synchronize the video display to the separate video information. In the Apple IIGS, the sync signal is mixed with the video information resulting in the composite video signal. (GSH)

synchronous: A mode of data transmission in which a constant time interval exists between transmission of successive bits, characters, or events. Compare asynchronous. (CTR, ETR, GST)

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. (CTR, ETR)

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. (CTR, ETR)

synthesizer: (1) A hardware device capable of creating sound digitally and converting it into an analog waveform that you can hear. (2) By analogy, any sound-making entity, such as the Free-Form Synthesizer in the Sound Tool Set. (GSF, GSH, GSTR, PI)

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, disk drive, and software. (CTR, ETR, GST, P16)

system call: See operating system call. (P16)

system clock: See clock (1). (GSTR)

system configuration: See configuration. (CTR, ETR, GST)

system disk: A disk that contains the operating system and other system software needed to run applications. (GSF, GSH, GSTR, PI, P16)

system event mask: A set of flags that control which event types get posted into the event queue by the Event Manager. (GSTR, PI)

system failure: The unintentional termination of program execution due to a severe software error. (GSTR, PI)

System Failure Manager: A firmware program that processes fatal errors by displaying a message on the screen and halting execution. (P16) A part of the Miscellaneous Tool Set that processes fatal errors by displaying a message on the screen and halting execution. (GSTR, PI)

system file: See system program. (P16)

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. (PI, P16)

system folder: The SYSTEM/subdirectory on a ProDOS 16 system disk. (GSTR, PI)

system font: The font that QuickDraw II uses as the default current font when a new GrafPort is opened. (GSTR)

system library prefix: ProDOS 16 prefix number 2/. It specifies the directory containing library files used by system software. (PI)

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. (GSTR, PI, P16)

system menu bar: The menu bar that always appears at the top of the screen in desktop applications. It contains all of the commonly used functions such as File, Edit, and so on. Compare window menu bar. (GSTR, PI)

system prefix (ProDOS 8): The one prefix maintained by ProDOS 8. (PI)

system program: (1) A software component of a computer system that supports application programs by managing system resources such as memory and I/O devices. Also called system software. (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. (CTR, ETR, GST, P16)

system software: The component of a computer system that supports application programs by managing system resources such as memory and I/O devices. (CTR, ETR, GSF, GSH, GST, GSTR, PI, P16)

system window: A window in which a desk accessory is displayed. (GSTR, PI)

TAB: An ASCII character that commands a device such as a printer to start printing at a preset location (called a tab stop). There are two such characters: horizontal tab (hex 09) and vertical tab (hex 0B). TAB works like the tabs on a typewriter. (CTR, ETR)

task code: A numeric value assigned to the result of each event handled by TaskMaster. Compare event code. (GSTR, PI)

task mask: A parameter passed to TaskMaster, specifying which types of events Taskmaster is to respond to. (PI)

TaskMaster: A Window Manager routine that handles many typical events for an application. Applications may call TaskMaster instead of GetNextEvent. (GSTR, PI)

television set: A display device capable of receiving broadcast video signals (such as commercial television broadcasts) by means of an antenna. Can be used in combination with a radio-frequency modulator as a display device for the Apple II family of computers. Compare video monitor. (CTR, ETR)

template: A data structure or set of parameters that defines the characteristics of a desktop feature, such as a window control. The NewWindow parameter list is a template that defines the appearance of a window to be opened by the NewWindow call. (GSTR, PI)

terminal mode: The mode of operation in which the Apple IIGS acts like an intelligent terminal. (GSF)

text: (1) Information presented in the form of readable characters. (2) The display of characters on a display screen. Compare graphics. (CTR, ETR, GST)

text block: A number of ASCII characters in a buffer, with the number specified separately. (GSTR)

text buffer: A 1-bit-per-pixel pixel image reserved for the private use of the QuickDraw II text-drawing call. (GSTR, PI)

text file: A file consisting of the ASCII representation of characters. (PI)

text file format (TFF): A file that consists of ASCII representations of characters. Compare object module format. (GSTR)

text mode: One of 16 possible interactions between pixels in text being drawn to the screen and pixels on the screen that fall under characters being drawn. Compare pen, drawing mode. (GSTR, PI)

Text Tool Set: The Apple IIGS tool set that provides an interface between Apple II character device drivers and applications running in native mode. (GSTR, PI)

text window: A window on the desktop within which text is displayed and scrolled. (GST) An area on the video display screen within which text is displayed and scrolled. (CTR, ETR) That portion of the screen that is reserved for text. After starting the computer, the firmware uses the entire display for text. However, if you wish, you can restrict the text video activity to any rectangular portion of the display. (GSH)

text-based interface: An interface between computer and user in which all screen drawing (or other output) consists of characters. The form of each character is stored in ROM and can be involved with a single byte of data. Compare graphic interface. (PI)

TFF: See text file format. (GSTR)

320 mode: An Apple IIGS video display mode, 320 pixels horizontally by 200 pixels vertically. (PI)

tick count: The (approximate) number of 60th second intervals since system startup. (GSTR, PI)

title bar: The horizontal bar at the top of a window that shows the name of the window's contents. The user can move the window by dragging the title bar. (GSTR, PI)

tool: See tool set. (GSF, GSH, GSTR, PI, P16)

tool call: A call to a function within a tool set. (PI)

Tool Locator: The Apple IIGS tool set that dispatches tool calls. The Tool Locator knows and retrieves the appropriate routine when your application makes a tool call. (GSTR, PI)

tool pointer table (TPT): A table, maintained by the Tool Locator, that contains pointers to all active tool sets. (GSTR, PI)

tool set: A group of related routines (usually in ROM) 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. (GSF, GSH, GSTR, PI, P16)

tool table: A list of all needed tool sets and their minimum required versions. An application constructs this table in order to load its RAM-based tool sets with the LoadTools call. (GSTR, PI)

toolbox: A collection of built-in routines on the Apple IIGS that programs can call to perform many commonly needed functions. Functions within the toolbox are grouped into tool sets. See Apple IIGS Toolbox. (GSF, GSH, GST, GSTR, PI, P16)

TPT: See tool pointer table. (GSTR)

traces: Electrical paths that connect the components on a circuit board. (CTR, ETR)

track: (1) One of a series of concentric circles magnetically recorded on the surface of a disk when it is formatted. Each track is further divided into sectors. Each sector can hold several K of data. (2) A grouping of items in a musical sequence. The Note Sequencer supports multiple tracks to facilitate writing multi-instrument music. (GSF, GSH, PI, P16)

transfer mode: A specification of which Boolean operation QuickDraw II should perform when drawing. See, for example, XOR. (GSTR, PI)

transistor-transistor logic (TTL): (1) A family of integrated circuits having bipolar circuit logic; TTL ICs are used in computers and related devices. (2) A standard for interconnecting such circuits, which defines the voltages used to represent logical zeros and ones. (CTR, ETR, GST)

transmit data register: A location in the ACIA (at location $C098 for port 1 and $C0A8 for port 2) that holds the current character to be transmitted. (CTR)

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. (P16)

troubleshoot: To locate and correct the cause of a problem or malfunction, especially in hardware. Compare debug. (CTR, ETR)

TRUE: Not zero. The result of a Boolean operation. The opposite of FALSE. (GSTR, PI)

TTL: See transistor-transistor logic. (CTR, ETR, GST)

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. Stands for transistor-transistor logic, red, green, blue. Compare analog RGB. (GSH, GST, PI)

turnkey disk: See startup disk. (CTR, ETR)

type-ahead buffer: A buffer that accepts and holds characters that are typed faster than the computer can process them. (GST)

typeID: A subfield of the user ID. The User ID Manager assigns a typeID value based on the type of program (application, tool set, and so on) requesting the memory. (GSTR, PI, P16)

unary operator: An operator that applies to a single operand. For example, the minus sign (–) in a negative number such as –6 is a unary arithmetic operator. Compare binary operator. (CTR, ETR)

unbuffered: A style of input and output that does not use a buffer for I/O; reading and writing is done one character at a time. (GSH)

unclaimed interrupt: This occurs when the hardware Interrupt Request Line is active, indicating that an interrupt-producing device needs attention, but none of the installed interrupt handlers claims responsibility for the interrupt. (GSTR)

unconditional branch: A branch that does not depend on the truth of any condition. Compare conditional branch. (CTR, ETR)

underline: (1) A style of text. (2) A method used to separate groups of items in a menu. An underlined item does not use any more space, on the screen or in memory, than the item does without the underline. Compare dividing line. (GSTR)

unhighlight: To restore to normal display. Selected controls, menu items, or other objects may be highlighted (usually displayed in inverse colors) while in use and unhighlighted when not in use. (GSTR, PI)

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. (GSTR, PI, P16)

unlock: To permit the Memory Manager to move or purge a memory block if needed. Opposite of lock. (GSTR, PI)

unmovable: See fixed. (GSTR, P16, PI)

unpack: To restore to normal format from a packed format. (GSTR, PI)

unpurgeable: Having a purge level of zero. The Memory Manager is not permitted to purge memory blocks whose purge level is zero. (GSTR, PI, P16)

unreal font: A font that was scaled by the Font Manager from a real font of a different size or added by an application and marked as unreal. Compare real font. (GSTR)

update: A type of window event, signifying that all or part of the window needs to be redrawn. (PI)

update event: An event posted by the Window Manager when all or part of a window needs to be redrawn. (GSTR, PI)

update region: A description of the part of a window that needs to be redrawn. The Window Manager keeps track of each open window's update region. (PI)

user: A person operating or controlling a computer system. (GST)

User ID: An identification number that specifies the owner of every memory block allocated by the Memory Manager. User ID's are assigned by the User ID Manager. (GSTR, PI, P16)

User ID Manager: A part of the Miscellaneous Tool Set that is responsible for assigning user ID's to every block of memory allocated by the Memory Manager. (GSTR, PI, P16)

user interface: The rules and conventions by which a computer system communicates with the person operating it. (GST)

utilities: Programs that let you rename, copy, format, delete, and otherwise manipulate files and volumes. (GST)

value: An item of information passed from a calling routine to a function. Compare result. (P16) An item of information that can be stored in a variable, such as a number or a string. (CTR, ETR, GST)

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. (CTR, ETR, GST)

VBL: Short for vertical blanking, an interrupt signal generated by the video timing circuit each time it finishes a vertical scan, 60 times a second. (GSH, GST)

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. (CTR, ETR, GST, GSTR, PI) A location containing a value that, when added to a base address value, provides the address that is the entry point of a specific kind of routine. (GSF)

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. (P16)

vertical blanking: The interval between successive screen drawings on a video display. It is the time between drawing the last pixel of the last scan line of one frame and the first pixel of the first scan line of the next frame. (PI)

VGC: See Video Graphics Controller. (GSH)

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. (CTR, ETR, GST) An electrical signal containing information that may be obtained visually when displayed on a video monitor. Information organized or transmitted in video form. See also NTSC, PAL, SECAM. (GSH)

Video Graphics Controller (VGC): The custom IC on the Apple IIGS main logic board responsible for generating all video used in the Apple IIGS. (GSH)

video monitor: A display device that can receive video signals by direct connection only, and that cannot receive broadcast signals such as commercial television. Can be connected directly to the computer as a display device. Compare television set. (CTR, ETR, GSH, GST, P16)

view rectangle: The rectangle within which text in an edit record is visible; that is, the portion of the text in the destination rectangle that the user can see is determined by the view rectangle. (GSTR)

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. (CTR, ETR)

visible region: The part of a window that's actually visible on the screen. The visible region is a GrafPort field manipulated by the Window Manager. (GSTR, PI)

voice: Any one of 16 pairs of oscillators in the Ensoniq sound chip on the Apple IIGS. (GSTR, PI)

volume: An object that stores data; the source or destination of information. A volume has a name and a volume directory with the same name; information on a volume is stored in files. Volumes typically reside in devices; a device such as a floppy disk drive may contain one of any number of volumes (disks). (CTR, ETR, P16)

volume bit map: A portion of every ProDOS 16-formatted disk that keeps track of free disk space. (P16)

volume control block (VCB): A data structure set up in memory by ProDOS 16 to keep track of all volumes/devices connected to the computer. (P16)

volume directory: A ProDOS 16 directory file that is the principal directory of a volume. It has the same name as the volume. The pathname of every file on the volume starts with the volume directory name. (P16)

volume name: The name by which a particular volume is identified. It is the same as the filename of the volume directory file. (PI, P16)

warm start: The process of transferring control back to the operating system in response to a failure in an application program. Compare cold start. (CTR, ETR, GST)

wavetable: A group of data bytes in memory used as data by the DOC to generate sound. The wavetable is built by using the DOC to digitize an analog input signal and placing the resulting data bytes in sound RAM memory. (GSH)

wedge: A filled arc, one of the fundamental shapes drawn by QuickDraw II. (GSTR, PI)

window: A rectangular 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. The area inside the window's frame corresponds to the port rectangle of the window's GrafPort. (GST, GSTR, PI) The portion of a collection of information (such as a document, picture, or worksheet) that is visible in a viewport on the display screen. Compare viewport. (CTR, ETR)

window definition procedure: A procedure used to define the appearance and behavior of a custom window. (GSTR)

window frame: The outline of the entire window plus certain standard window controls. (GSTR, PI)

Window Manager: The Apple IIGS Tool Set that updates and maintains windows. (GSTR, PI)

window menu bar: A menu bar that appears at the top of the active window, below the system menu bar. It can contain document titles, applications, and functions. Compare system menu bar. (GSTR, PI)

window record: The internal representation of a window, where the Window Manager stores all the information it needs for its operations on that window. (GSTR, PI)

word: A group of bits that is treated as a unit. For the Apple IIGS, a word is 16 bits (2 bytes) long. Compare long, long word. (CTR, ETR, GSF, GSH, GST, GSTR, PI, P16)

wraparound: The automatic continuation of text from the end of one line to the beginning of the next; wraparound means that you don't have to press the Return key at the end of each line as you type. (GST)

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). (CTR, ETR)

write protect: To protect the information on 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. Compare copy protect. (CTR, ETR)

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. (CTR, ETR)

write-only memory: A form of computer memory into which information can be stored but never, ever retrieved. For more information, refer to The Life of Homberg T. Farnsfarfle, by Bruce Tognazzini. (GSH, GST)

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. (CTR, ETR)

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. (GSF, GSH, GST, GSTR, PI)

X register: One of the two index registers in the 6502 OR 65C816 microprocessor. (CTR, ETR, GST, GSTR, PI)

XOFF: A special character (ASCII value $11) used for controlling the transfer of data between a microcomputer and a serial peripheral device. When one piece of equipment receives an XOFF character from the other, it stops transmitting characters until it receives an XON. See handshaking, XON. (GSF, GSH, GST)

XON: A special character (ASCII value $13) used for controlling the transfer of data between a microcomputer and a serial peripheral device. See handshaking, XOFF. (GSF, GSH, GST)

XOR: Exclusive-OR. A Boolean operation in which the result is TRUE if, and only if, the two items being compared are unequal in value. (GSTR, PI)

Y register: One of the two index registers in the 6502 OR 65C816 microprocessor. (CTR, ETR, GST, GSTR, PI)

z flag: A bit in the 65816 processor's Processor Status register that is set to 1 if the last operation resulted in 0 (zero). (GSTR)

zero page: The first page (256 bytes) of memory in a standard Apple II computer (or in the Apple IIGS computer when running a standard Apple II program). Because the high-order byte of any address in this part of memory is zero, only a single byte is needed to specify a zero-page address. Compare direct page. (CTR, ETR, GSF, GSH, GST, GSTR, PI, P16)

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. (GSTR, PI)

zoom region: The window region that corresponds to the zoom box. (GSTR, PI)

: A modifier key on some Apple II keyboards. On the Apple IIGS keyboard, the equivalent key is called simply the Apple key; it is marked with both an Apple icon and a spinner, the icon used on some Macintosh keyboards. (GSF)

Index

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Y

Z

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