



Apple II

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The Apple II Video Overlay Card: Merging Video and Computing

Imagine this: You're watching a video with input coming from your VCR. From your Apple® computer keyboard, you add graphics, titles, diagrams. Sound like the future? It's now. Meet the Apple II Video Overlay Card, the hottest new product for the Apple II family of personal computers.

Using a combination of hardware and software, the Apple II Video Overlay Card offers a wealth of new possibilities for learning and creativity by

merging two powerful channels of communication—video and computing. You can superimpose Apple II screen images you create using painting, animation, or authoring software onto video from a variety of sources: VCR, videodisc, video camera, or television. The combined images are displayed on an RGB or composite monitor and can be recorded on a VCR. The figure below shows the configuration possibilities.

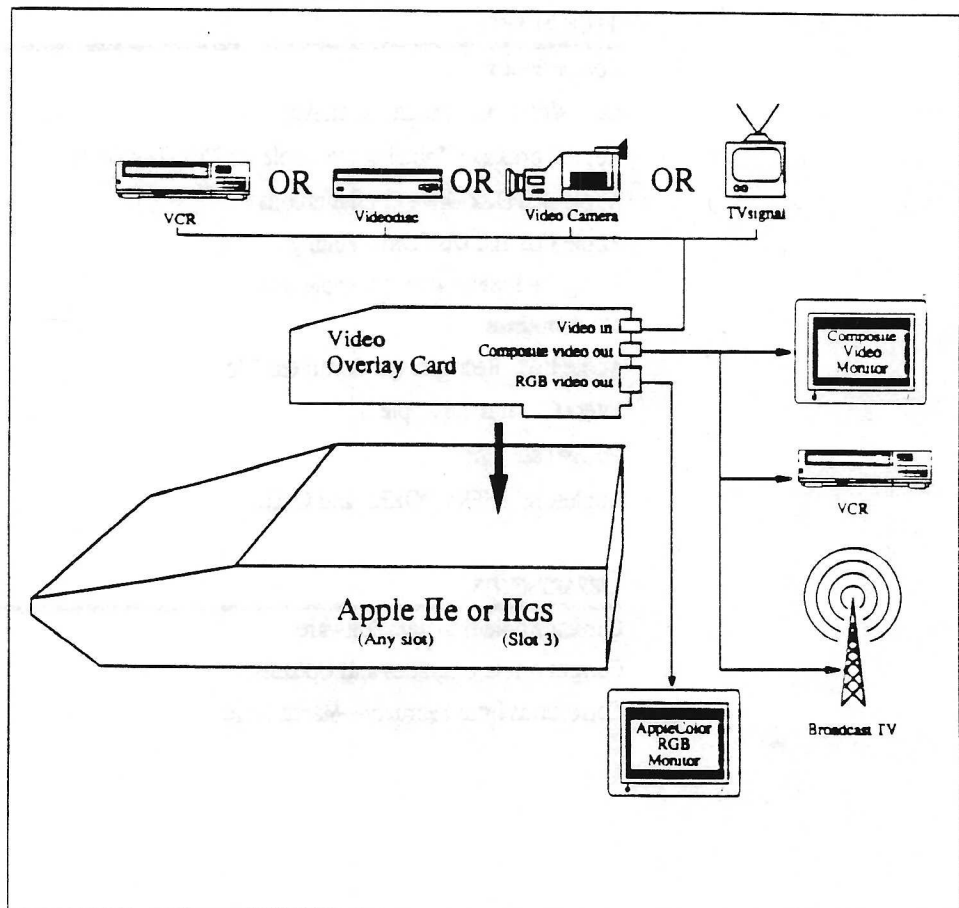


Figure 1. Configuration possibilities.

With the Apple II Video Overlay Card and an Apple IIGS[®] or Apple IIe computer, you can add your own captions and notes to clarify or highlight information. You can also create your own video productions and interactive applications for use at home or in school. The results will be crisp, clear, and professional-looking.

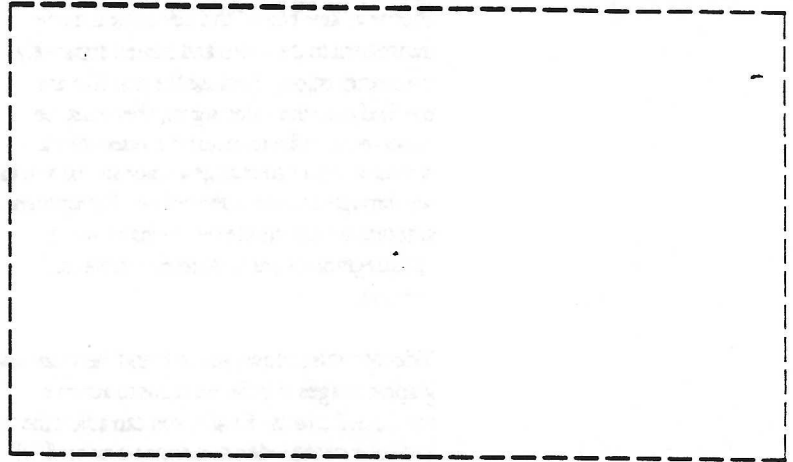
You begin the video overlay process by using the Apple II application of your choice to create your own text, graphics, or animations. Perhaps you're planning a classroom video lecture—you might create subtitles or add formulas that highlight the important parts of the video material. Next you use VideoMix™, the software included with the card, to control where these overlays appear and to blend them with the video to achieve the desired effects.

The Apple II Video Overlay Card package (A2B2092) contains the Video Overlay Card, two VideoMix program disks (a 3.5-inch disk for the Apple IIGS computer, and a 5.25-inch disk for the Apple IIe), the *Apple II Video Overlay Card Owner's Guide*, a video in/out cable, and an RGB cable.

How Overlay Works

To *overlay* is to superimpose the host system graphics (menus, text, and so forth) onto an external video source. The graphics and video can then be output as a merged RGB or composite video signal. Video overlay is a two-part process. First, the incoming video signal is detected, and timing of the Apple II and the video are synchronized through a process called *genlock*. The card is needed to create video overlays because the Apple II video signal is free-running

and cannot genlock to an external video source by itself. The card uses a modified version of the Apple IIGS graphics subsystem (Mega II and VGC chips and supporting circuitry) to provide genlock and overlay capabilities, as well as improved composite video output. The Mega II and VGC chips create an exact duplicate of the Apple II graphics by "eavesdropping" on the bus activity, and they allow the Apple II to display standard graphics when the card is not genlocked to an external video source.



Signal output is provided for both composite and RGB monitors so that overlays can be viewed on an external monitor while they are being recorded to a VCR. If a legal (i.e., meeting RS-170A specifications) NTSC signal (the standard video signal in North America and Japan) is used as input, the composite output is a legal NTSC signal that can be used in professional broadcasting environments.

After the incoming video signal has been genlocked, the program examines the current settings to determine whether each pixel will be video, graphics, or a combination of the two. These settings can be manipulated with the VideoMix software that comes with the card.

Using VideoMix

The VideoMix software is a desk accessory for the Apple IIGS computer and an application for the Apple IIe computer. VideoMix first allows you to choose a "key color;" this key color is made transparent to the video and treated separately from other colors. Because the graphics are overlaid onto the video signal, they must be dissolved in order to reveal the video they are covering. You can change a color so that you can see through it to the video below. *Transparent* graphics are not visible (no overlay), while *opaque* graphics are completely visible (full overlay).

VideoMix then allows you to blend the video and graphic images in different ratios to achieve translucent effects. Finally, you can adjust the tint and color of the video as it appears on an RGB monitor, much as you use the controls on a standard television set.

Product Highlights

The Apple II Video Overlay Card offers you the following features:

- Genlock circuitry that synchronizes Apple II timing to external video timing. Genlock allows you to superimpose Apple II graphics

on video from an external source, for titling and annotating material.

- High-quality video. If you use broadcast-quality video as input, your output will be broadcast-quality video with overlay. The Video Overlay Card also improves the quality of images displayed on Apple IIe and IIGS computers.

- VideoMix software. VideoMix makes it easy to control the mix of video and graphics, and to adjust the tint and color of your video images.

- Accepts input from a VCR, videodisc, camera, or television; displays video with overlay on an RGB or composite monitor, and records it on a VCR. The Video Overlay Card allows you to work with a variety of input and output configurations.

- Apple IIe and IIGS compatibility. You can use the Video Overlay Card with your existing hardware and the large library of Apple II software.

Compatibility

The Apple II Video Overlay Card is designed to work with all Apple II software. Here is a sampling of some applications that are relevant to creating video overlays:

- Animation software
 - Fantavision from Broderbund
 - Art & Film Director from Epyx
 - Cartooners from Electronic Arts
 - Flix from ITDA

- **Painting software**
Deluxe Paint II from Electronic Arts
Paintworks Gold from Mediagenic
Paintworks Plus from Mediagenic
816/Paint from Baudville
- **Presentation software**
Slide Shop from Scholastic
ShowOff! from Broderbund
- **Titling software**
VCR Companion from Broderbund
Home Video Producer from Epyx
Video Title Shop from Intellicreations
- **Authoring software**
MECC Presenter from MECC
VideoLesson Writer 42 from Whitney
Educational Services
Video Studio from Teaching Technologies
- **Miscellaneous**
Information Laboratory: Earth Science from
Addison-Wesley
Information Laboratory: Life Science from
Addison-Wesley

System Requirements

To use the Apple II Video Overlay Card and VideoMix software, you need one of the following systems:

- An Apple IIe personal computer with 128K of RAM and an enhanced main logic board (Revision B); and a VCR, videodisc, or video camera.

To display your videos, you can use either system with the AppleColor™ RGB Monitor or the AppleColor Composite Monitor. The AppleColor RGB Monitor comes with the required DB-15 connector. The AppleColor Composite Monitor comes with the required RCA cable.

NTSC Output

The output of the Apple II Video Overlay Card meets NTSC RS-170A output specifications with RS-170A input.

Networking the Apple II

Setting up a network of Apple II computers and peripherals requires that you investigate and make decisions about a variety of issues, such as cabling, file servers, network-compatible software, and system administration. An overview of these areas of networking can help you to make these decisions.

To set up an AppleTalk® network (AppleTalk is Apple's networking system), you need cables to connect the individual computers and peripherals, and a LocalTalk™ connector box for each computer and peripheral on the network. You also need a file server and software to manage the communications between workstations and peripherals, and you need a network administrator to manage the entire system. An AppleTalk network system typically consists of a Macintosh® file server; Apple IIGS, Apple IIe, Macintosh, or MS-DOS computers; applications software; network services; core protocols; and a cabling system.

Getting Connected

To connect several computers together you need cables. LocalTalk is Apple's cabling scheme; other cabling schemes are available from third-party vendors. Each device you want to connect to a network must have an AppleTalk port. Apple IIGS and Macintosh computers and LaserWriter® printers all have built-in AppleTalk ports. An AppleTalk port can be added to an Apple IIe.

Apple IIGS

To be connected to the network, your Apple IIGS computer must have an Apple IIGS Memory Expansion Card with at least 512K of RAM. To activate the AppleTalk port on an Apple IIGS, you

use the Slots command on the Control Panel to change the Slot 7 option to "Built-in AppleTalk" instead of "Your Card." Then you change the Slot 1 option to "Your Card" instead of "Printer Port." Serial port 1 thus becomes the AppleTalk port.

Apple IIe

Although the Apple IIe computer has no built-in AppleTalk port, you can add one by installing the Apple II Workstation Card. This card attaches to a connector module housing two mini-8 serial ports. One port supports AppleTalk, and the other emulates a Super Serial Card. The card contains AppleTalk code in ROM; this code allows printing over the network, printing at the workstation, and starting up over the network.

Note: The Apple II Workstation Card supports only ProDOS® applications on the network.

Printers

Shared printers must also have LocalTalk capability. The ImageWriter® II printer or ImageWriter LQ printer requires a LocalTalk Option Card, and all Apple LaserWriter printers except the LaserWriter IISC have LocalTalk capability; any third-party printer that emulates a LaserWriter printer should also have it.

Connections

A LocalTalk Connector Kit is required for each node on the network. A *node* is any device, such as a workstation or a peripheral, that is connected to the network. The kit includes a LocalTalk connector box that attaches to the AppleTalk port. Also included is a two-meter LocalTalk cable for joining the box to the next box in the network chain. Additional LocalTalk cabling can be purchased in separate cable kits.

The maximum length of LocalTalk cable that can be used to connect a network to a single server is 1,000 feet. If you want to connect more than 1,000 feet of cable, you can use either a repeater or a router to divide the network into zones. A *repeater* lets you boost the signal so you can extend the network to a maximum cable length of 2,000 feet. (The TOPS Repeater from TOPS and the PhoneNET Repeater from Farallon Computing are two examples of repeaters. The PhoneNET repeater requires PhoneNET cabling.) A *router* is a device used to make a connection between similar networks to create one large internetwork; the networks that make up the larger internetwork are called *zones*. You can use different kinds of cabling, such as Ethernet or PhoneNET. (Interbridge from Hayes, Fastpath from Kinetics, and Liaison from Infosphere are examples of routers.)

Setting Up a File Server

A file server consists of hardware and special server software. The AppleShare[®] File Server Version 2.0.1 software provides the file-sharing capabilities for the AppleTalk network. Because the AppleShare File Server runs only on the Macintosh computer, and because file servers require large storage capacity, you will need both a Macintosh and a hard disk.

Hardware

Which Macintosh computer you choose for the file server depends on the number of workstations you want to run simultaneously. In general, the Macintosh Plus supports 15 to 25 concurrent users, the Macintosh SE supports up to 25 users, and the Macintosh II (with added memory) supports 50 users. A 1-megabyte Macintosh generally supports

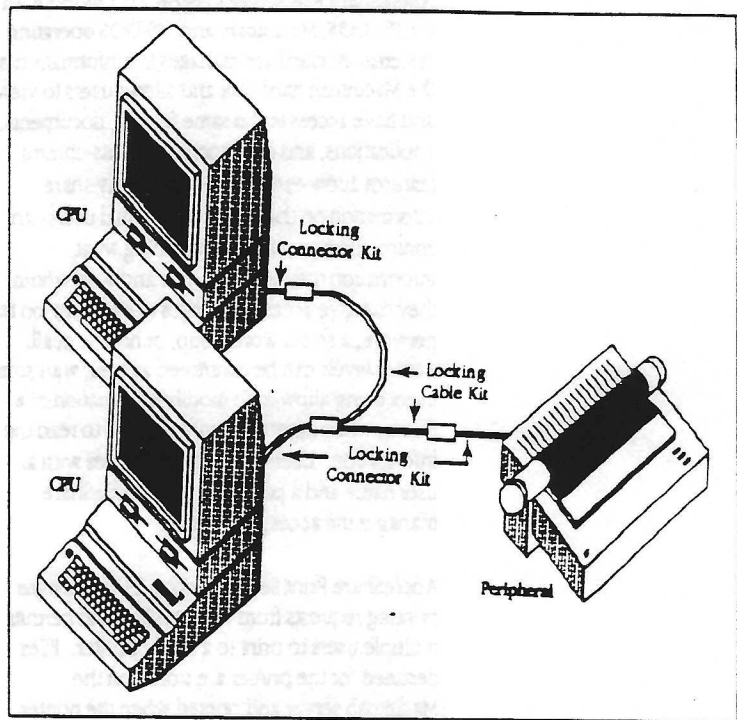


Figure 1. A sample of a basic AppleTalk network.

about 25 users, depending on the number of workstations that are active at one time. If connected workstations are used at different times during the day, you may not need a high-performance server. Keep in mind that more users and more activity may mean slower performance. If you use the server primarily to store applications and files, it may support the maximum number of users without any negative effect on performance. However, if there is a lot of data sharing, printing, and communication between users on the network, you may want to limit the number of users, get a server that provides higher performance, or break the group into zones and add another server.

Software

AppleShare File Server Version 2.0.1 works with the ProDOS, Macintosh, and MS-DOS operating systems. AppleShare manages the information on the Macintosh hard disk and allows users to view and have access to the same folders, documents, applications, and disk storage. Access-control features allow each user to selectively share information on the server. Individual users can control their own folders, deciding what information they want to share and with whom; they can give access privileges to everyone on the network, a select workgroup, or no one at all. Access levels can be controlled as well, with some users being allowed to modify information in a folder, while others are only allowed to read the information. Users identify themselves with a user name and a password, and AppleShare manages the access privileges.

AppleShare Print Server Version 2.0.1 manages printing requests from workstations and permits multiple users to print to a single printer. Files destined for the printer are stored on the Macintosh server and printed when the printer becomes available. The AppleShare Print Server can support up to five printers on a network.

AppleShare Aware

For Apple II computers, AppleShare works only with ProDOS-based software. If you are using DOS 3.3-, Pascal-, or CP/M-based software, you won't be able to take full advantage of these programs on a network. You can, of course, continue to use them from local floppy disk drives. ProDOS-based software that has been designed for use with AppleTalk on an AppleShare file server is called "AppleShare Aware." More than 140 software products (both educational and productivity applications) have been designated as AppleShare Aware. Most

AppleShare Aware applications are classified as *multilaunch* software, which means that the application allows two or more users at a time to launch and use a single copy of the application. AppleShare Aware applications can be priced per server, per school district, or per number of users.

Working on a Network

Before you can access an AppleShare disk volume, you must launch the log-on program either from a local disk or over the network. When the log-on program starts, it scans the network and displays a list of file servers. The user selects the server, enters a user name and password, and selects the server volumes he or she wants to use. From this point on, the user can treat selected volumes as if they were on a disk drive directly connected to the computer.

AppleShare software provides a variety of access-control attributes for folders on the network. Users can be permitted to see folders, to see files, or to make changes to files. The *owner* of a file or folder is the user who created it. When a file or folder is created, only the owner can see the folders, see the files, and make changes to the files. Only the owner can decide whether others are allowed to see or make changes to the file.

Because more than one printer may be connected to a network, users must choose which printer they want to work with before beginning a print job. The Chooser application lets you select a network printer. Application programs should be set up to print to Slot 7.

Apple's Aristotle™ is menu management software, a user interface that was designed

primarily for use in classrooms, but can be used in any school, administrative, or business area. Aristotle allows users to select commands from a menu instead of typing complex path and prefix sequences. The program is divided into two parts: the "Teacher" (menu management) and the "Student" (menu display). The Teacher is used to set up user menu selections. When users log on, they see a list of teachers, who have selected certain students to appear on their menus. The student selects a teacher, sees a class list, and chooses an application. Once the application has been launched and used, quitting it returns students to the Aristotle menu, allowing them to select another application.

Managing a Network

Choosing a network administrator may be one of the most difficult tasks you face in setting up a network. The network administrator is the person who is responsible for setting up network hardware and software, assigning access privileges and passwords, keeping an eye on storage management and system backups, and troubleshooting the system. The network administrator is also the person who teaches everyone else how to use the network. Thus, the network administrator should possess a combination of administrative, technical, and social skills. At least two people should be trained as network administrators.

A network administrator should be:

- Willing to learn about computers. Although the administrator need not be an engineer or technical expert, he or she should know how to use ProDOS and have an understanding of

basic concepts such as pathnames. The network administrator will also need to understand how the system works—he or she may often be called on to answer questions and educate network users.

- A central source of information. The network administrator should be familiar with all computers and applications used on the network, even applications that are not network related.
- Trusted and respected. Because the administrator has control over the network and its users, as well as access to all files, he or she must have a high degree of honesty and integrity. This individual must also be authorized to see even the most confidential information (this requirement may preclude assigning students to the role of network administrator).
- Flexible and good-natured. The network administrator must deal with all levels of personnel, and should be able to remain calm and amiable even under pressure.

Apple Networking Products

- **AppleShare File Server (M0548)**
Software that manages file access and networking tasks
(Requires a dedicated Macintosh and one or more hard disks)
- **AppleShare Print Server (M0576)**
Software that manages printing for up to five printers

- **Apple II Workstation Card (A2B2088)**
Hardware that lets you connect an Apple IIe to LocalTalk cabling
(Available only to K-12 customers)
- **AppleShare IIGS Workstation Software (A2D2060)**
Software that lets Apple IIGS users access AppleShare file servers and networked printers via LocalTalk
(Requires an Apple IIGS Memory Expansion Card with at least 512K of RAM; available only to K-12 customers.)
- **Apple ImageWriter II/LQ LocalTalk Option (A9B0314)**
Hardware that lets you connect ImageWriter II and ImageWriter LQ printers to LocalTalk cabling
- **Aristotle (A2D2059)**
Menu management software for network users
- **LocalTalk™ Locking Connector Kit—DIN-8 (M2068)**
For Apple IIGS, Macintosh Plus, Macintosh SE, Macintosh II, Macintosh IIX, Apple LaserWriter IINT, and LaserWriter IINTX.
(Each device on the network requires a LocalTalk Connector Kit.)
- **LocalTalk Cable Kits**
LocalTalk Locking Cable Kit—10 Meter (M2066)
LocalTalk Locking Cable Kit—25 Meter (M2069)
LocalTalk Custom Wiring Kit (M2070)
(The Custom Wiring Kit contains 100 meters of cable and the necessary assembled plugs, cable splicers, and cable extenders for approximately 20 nodes; does not include connector boxes.)

- **Network Administrator's Guide (A2F2001)**
- **AppleShare Print Server Reference Guide (A2F2031)**
- **Aristotle Reference Guide (A2F2035)**

Sources for AppleShare Aware Software

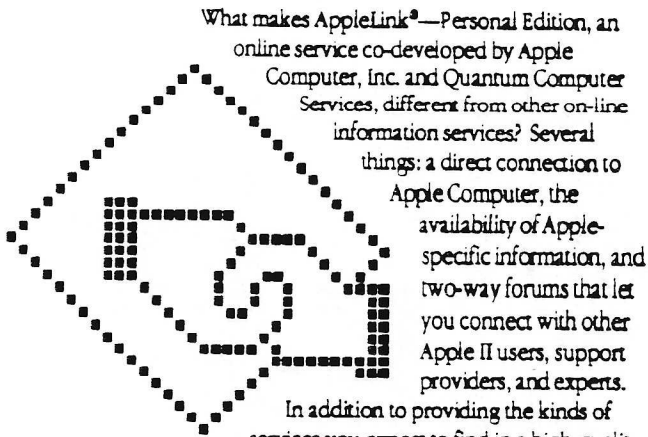
The following companies distribute AppleShare Aware software products.

Advanced Ideas, Inc.
Beagle Bros, Inc.
Claris Corporation
Computer Networking Specialists, Inc.
CONDUTT
Custom Computer Products
DLM, Inc.
Educational Information Systems, Inc.
Focus Media, Inc.
Gessier Educational Software
Harbor Software, Inc.
Hartley Courseware
Houghton Mifflin Company, Educational Software Division
Ideal Learning, Inc.
Learning Technologies, Inc.
LEARNINGWAYS, Inc.
MECC
Milliken Publishing Company
Mindscape, Inc.
Pinpoint Publishing
Random House Media
Roger Wagner Publishing, Inc.
Scholastic, Inc.
Scott Foresman and Company

Sensible Software, Inc.
Silver, Burdett & Ginn
Springboard Software
Stone Edge Technologies, Inc.
Styleware, Inc.
Sunburst Communications
Technical Education Research Centers, Inc.
The Learning Company
TML Systems, Inc.
Tom Snyder Productions, Inc.



AppleLink—Personal Edition



What makes AppleLink®—Personal Edition, an online service co-developed by Apple Computer, Inc. and Quantum Computer Services, different from other on-line information services? Several things: a direct connection to Apple Computer, the availability of Apple-specific information, and two-way forums that let you connect with other Apple II users, support providers, and experts.

In addition to providing the kinds of services you expect to find in a high-quality electronic information service—news, stock quotes, entertainment, and electronic mail—AppleLink offers Apple-specific information direct from Apple to you, as well as the ability for you to ask questions and share information with others on the network. AppleLink—Personal Edition is a two-way electronic link to other Apple II users, developers, and support providers across the nation.

Because AppleLink—Personal Edition is the only online service with a graphic user interface for the Apple II, information is easy to find and share. Designed with traditional Apple ease of use in mind, AppleLink—Personal Edition comes up on your Apple II screen in an icon-based format. You can click your way through the system with a mouse, or use cursor keys to select particular areas of interest. On-line help, pull-down menus, and keywords all make it easy to navigate through the network.

When you connect to the AppleLink—Personal Edition network, you have a choice of two main divisions, the Apple Community and General Services.

The Apple Community

Once you enter the Apple Community, you'll find all the usual online mechanisms for gaining information—forums, message boards, chat areas, software demos, and so on—and all of the information is Apple-specific. Here are some of the things you can find:

- **AppleLink Reference Library.** Get detailed product information or look up answers to your technical questions. Find out about special education software and adaptive hardware, the Apple Programmers and Developers Association (APDA™), and more.
- **AppleLink Forums.** Join with other users in discussions about Apple II and Macintosh products, their development and use. Exchange information and helpful tips through real-time interactive conferencing and message boards. Of special interest is the Apple Development Forum.

The Apple Development Forum provides a support structure for programmers, whether they are beginners dabbling in BASIC for the first time, or Apple Certified Developers putting the finishing touches on a new program. Development Forum Software Libraries offer unique tools for programmers. You can find Apple II Technical Notes, the latest system software, and a source code library. Forum members post tools, applications, and utilities in the Software Libraries, either as freeware or as shareware, for which the author asks a nominal payment.

Other Apple special interest forums include such topics as Music & Sound, Apple II Productivity, Communications & Networking, Art & Graphics, Games, Utilities & Desk Accessories, and Hardware.

- **AppleLink Software Center.** Download public-domain and shareware programs covering a variety of special-interest applications.

A recent list of popular Apple II downloads included these programs:

1. **Music Macro**, a macro that demonstrates how you can create music with **AppleWorks**® software.
 2. **ALU 205**, an Apple Library Utility that allows you to archive files into a single binary file for storage or sending to someone via a modem.
 3. **Control Panel NDA**, a program uploaded by CPOINT that changes Control Panel settings graphically as with a Macintosh.
 4. **Maze Maker IIGS**, a program that creates mazes for the Apple IIGS.
 5. **Race GS**, an arcade race game.
 6. **SuperPatch**, a file that allows you to install and remove patches from **AppleWorks 2.0**.
 7. **Three Column Macro**, which includes a file called **PageFaker** that lets you use three columns in an **AppleWorks** document.
- **AppleLink Headquarters.** Connect to Apple's Customer Relations group to ask a question or offer an opinion. Read press releases on new

products and promotional programs. Chat with Apple employees at the "Apple Café," or join the debates on current computing issues with industry notables in the Apple Auditorium.

- **Industry Connection.** Meet third-party Apple hardware and software developers. Try out demonstration versions of software, peruse product catalogs, and post questions to product support message boards.
- **AppleLink University.** Enroll in on-line courses to learn more about Apple hardware, programming, and applications.

Other Services

In addition to Apple-specific information, **AppleLink—Personal Edition** offers the following areas in its General Services division: People Connection, Financial District, Recreation Center, Club House, Learning Center, News Room, and The Mall. A monthly magazine, *AppleLink Update*™, offered by Quantum Computer Services, is mailed to subscribers and provides feature articles, hot tips from Apple users, and a schedule of upcoming Apple Forums and events. **AppleLink—Personal Edition** also provides an online magazine.

System Requirements

To use **AppleLink—Personal Edition** with an Apple II computer, you'll need:

- One of the following computer systems:
 - An Apple IIe personal computer enhanced with 128K of ROM and equipped

with an 80-column text card, Super Serial Card, disk drive (3.5-inch or 5.25-inch), and monitor

- An Apple IIc or Apple IIc Plus personal computer and monitor
- An Apple IIGS personal computer with disk drive (3.5-inch or 5.25-inch) and monitor
- An Apple Personal Modem or any Hayes-compatible modem (300, 1200, or 2400 baud), plus appropriate cables
- A standard telephone line
- AppleLink—Personal Edition software (available from your authorized Apple dealer).

Beginner's Guide to Arrays in Applesoft BASIC

The array in BASIC can make programming a lot easier by shortening the program size when you are dealing with large amounts of data.

One-Dimensional Arrays

The first array you encounter will probably be the *one-dimensional* array. But first, here's some terminology to learn. The one-dimensional array is written as B\$(X), where X is the numerical value. The X is known as a *subscript*. The entire expression, B\$(X), is known as an *array variable*. Array variables can be either numeric—C(X)—or alphanumeric—C\$(X). The one-dimensional array can also be called a *single-subscripted* array. The choice of terms is up to you, but be sure you let people know what you mean by the terms you use.

The use of an array can best be described through an example. Suppose you want to assign variables to represent your five favorite vegetables: corn, beets, peas, string beans, and carrots. You could assign them off-the-rack variables, such as A\$ = "Corn," B\$ = "Beets," and so on. This is legal, but it could be cumbersome. Every time you wanted to print a list of the vegetable names, you would have to use a separate PRINT statement for each of the five vegetables. A better way is to use a one-dimensional array.

A single-subscripted array will assign an array variable to each of the five vegetables, but in such a way that they will be easier to manipulate. For example, corn will be assigned the variable A\$(1), beets will be A\$(2), and so on. With these assignments, if you want to print all five vegetables, you can do the following:

```
500 FOR X = 1 TO 5
510 PRINT A$(X)
520 NEXT X
```

The variables would be *initialized* (set to a certain value) before they were printed, of course. You could use READ-DATA statements to accomplish this:

```
100 FOR X = 1 TO 5
110 READ A$(X)
120 NEXT X
:
:
800 DATA Corn, Beets, Peas, String
Beans, Carrots
```

In order to use an array, you must *dimension* the array early in your program. That means you have to tell DOS how much memory to set aside for the array variables. You accomplish this with the DIM statement. If you plan to have five items in your array, you would dimension the array to five. If you have 20 items, you would dimension your array to 20, and so on. The DIM statement looks like this:

```
20 DIM A$(5)
```

The Applesoft Tutorial states that you do not have to DIMension an array with ten or fewer subscripts; however, it's a good idea to do so. If nothing else, you'll form a valuable habit.

The array can be economical in terms of variables—just imagine how many variables you'd have to come up with for all the instruments in a marching band. Remembering or noting every variable and its assigned object could become very time consuming.

Two-Dimensional Arrays

The two-dimensional array is expressed as B(X,Y)$, where the subscripts, X and Y, are numerical values. Some programmers prefer to call this the *double-subscripted* array because there are two subscripts associated with this type of array variable. The variable can be numeric— $C(X,Y)$ —or alphanumeric— C(X,Y)$.

A practical example may help you to understand the concept of two-dimensional arrays. Imagine you are the desk clerk who must register each guest at a small hotel. At the end of each day, Fast Eddie, the bookkeeper, picks up all the registration forms and takes them back to his Apple IIe to record the information. In order to keep things simple, let's say that the hotel is a small one, with three floors and three rooms on each floor.

The registration form asks for the following: floor number, room number, and amount. If the guest registers for Room 202, he has the second room on the second floor. Therefore, floor number = 2, room number = 2, and the room charge was \$12.50. (So, it's not luxurious; at least the price is right.)

The second room takes in \$12.50. In other words, $B(2,2) = 12.50$. If the computer operator records all registration forms for a day, a program can be devised showing the daily income for each room on each floor, a subtotal for each floor, and a grand total for the entire hotel. Fast Eddie says this information is important because he wants to raise the rate for some rooms to \$13.00.

In order to get meaningful information from the double-subscripted array, you must have an understanding of nested loops. Simply put, a *nested loop* is one loop inside another loop. In the hotel example, we would need to use one nested loop to print the room totals for one day. The routine would look like this:

```
690 REM * X = FLOOR # Y = ROOM #
700 FOR X = 1 TO 3
710 FOR Y = 1 TO 3
720 PRINT " ROOM NUMBER ";X;"0";Y;"
    S";B$(X,Y)
730 NEXT Y
740 NEXT X
```

Keen observers will note that the PRINT line, 720, will print the floor number, X; a zero; the room number, Y; a space; a dollar sign; and finally the amount. (Upscale hoteliers know that it is classier to use room numbers such as 202, rather than 22.

The preceding example uses an alphanumeric variable to represent the amount. This format presumes that all calculations were done first using numeric variables, and then converted to alphanumeric variables for formatting: B(X,Y) = STR$(B(X,Y))$.

The two-dimensional array is DIMensioned using the total number for each subscript. In the example above, it would be $DIM B$(3,3)$.

If you want to practice a three-dimensional array, imagine Fast Eddie having to keep track of income and expenses for each month of the year. Here's an example of a triple-subscripted array variable: $C(2,10,5)$.

Preventing Electrostatic Discharge Problems

Test Your Knowledge about Electrostatic Discharge

1. True or false: Once a device or peripheral is installed in the computer, it is safe from electrostatic discharge (ESD) damage.
2. True or false: You can feel any discharge that is high enough to damage a part.
3. True or false: Air ionizers will solve most static discharge problems.
4. True or false: A component damaged by ESD will fail a diagnostic test.
5. True or false: You have to actually touch a component before there is a possibility of static discharge damaging the component.

The answer to all of these questions is "false." If you are surprised by this, read on to learn more about electrostatic discharge problems.

Today's high-tech components are much more susceptible to electrostatic discharge than the components of earlier years, and, as a result, the computer industry is much more aware of ESD-related problems than in the past. The simple truth is that ESD may be one of the major causes of some "intermittent" problems that are so hard to diagnose and that plague us all. ESD has become more of a hazard as microcircuits have become smaller and more sensitive. ESD is known to cause at least three kinds of component failures. *Upset failure* is a temporary foul-up that sometimes can be corrected by turning the device off and on again or by rebooting. *Soft failure* causes intermittent malfunctioning of the equipment; this is often the

most frustrating situation for the customer and a difficult troubleshooting challenge for the repair technician. *Hard failure* makes the component and equipment nonfunctional.

What Is ESD?

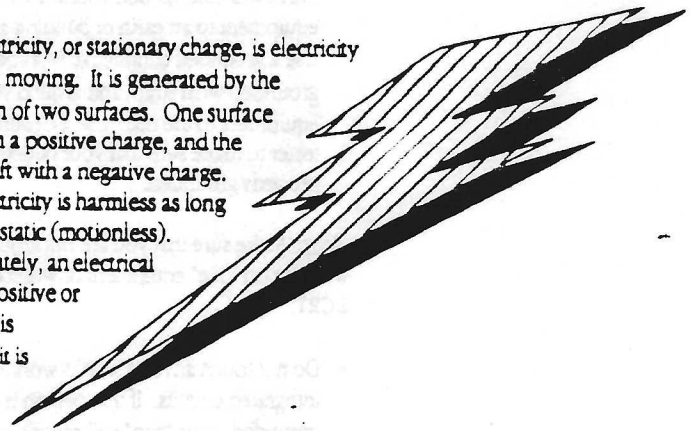
Static electricity, or stationary charge, is electricity that is not moving. It is generated by the separation of two surfaces. One surface is left with a positive charge, and the other is left with a negative charge. Static electricity is harmless as long as it stays static (motionless).

Unfortunately, an electrical charge (positive or negative) is unstable; it is always looking for an

opposite charge to equalize with. We see examples of static discharge in our daily lives: Remember walking along a rug and then touching someone to feel the "zap?" Most static discharges are so small you can't feel them. The smallest charge you can feel is about 3,000 volts, the smallest charge you can see is about 5,000 volts, and the smallest charge you can hear is 10,000 volts. Some of the newest semiconductor devices are susceptible to damage from as little as 10 volts—about the amount you generate by simply raising and lowering your arm 90 degrees.

Preventing ESD Problems

The only way to keep static electricity from arcing out of control is to ground all conductive materials in the area. The simple act of shifting your weight



from one foot to the other can generate static, so momentary "touch" grounding is not enough; you need continuous grounding. Follow the guidelines below to avoid ESD damage.

Working in a Service Environment

- Before working on any device containing a printed circuit, ground yourself and your equipment to an earth or building ground. Use a grounded conductive workbench mat, a grounded wrist strap, and ground your equipment to the mat. Use a Ground/Polarity tester to make sure that your outlets are properly grounded.

Note: Make sure that you are *not* grounded when working on "live" equipment or when discharging a CRT.

- Do not touch anyone who is working on integrated circuits. If that person is properly grounded, your "zap" will probably not cause any damage, but play it safe.
- Use static-shielding bags for printed circuit boards and chips during storage, handling, and transportation.
- Handle all ICs by the body, not by the leads.
- Do not wear polyester clothing or bring plastic, vinyl, or styrofoam into the work environment.
- Never place components on any metal surface.
- If possible, keep the humidity in the service area between 70 percent and 90 percent, and use an ion generator.

Working in a Home Environment

Of course if you are working at home, you may not have the proper equipment or precise control over your environment that can be obtained in a service environment. You can, however, minimize ESD risk by following these precautions:

- Leave your computer plugged in, but turned OFF when you remove or insert cards on your logic board. If possible, let your bare forearm rest gently on the power supply as you remove or insert a card.
- Remove and insert cards in a straight up and down fashion, so that the entire contact surface enters and exits the slot in a single motion. Never rock a card into place.
- Do not touch the logic board or chips or the contacts on the cards. Hold all cards by the edges.
- Never insert or remove a card with the computer's power turned ON.
- Never leave the cover off of your computer while the computer is in operation.

Communications Solutions for Special Situations

In the last issue of the *Apple II Technical Bulletin*, we listed several sources of information about custom input devices for disabled individuals. This month we describe more products that enable extraordinary people to do ordinary things.

Reading and Writing

Keytalk

Keytalk is a beginning reading program designed to teach physically or mentally handicapped students to structure spoken language by using a computer to read and write. The student is encouraged by the teacher to type the names of objects or activities he or she is interested in as a way of communicating those interests. As the student enters letters on the keyboard, they appear on the screen and a speech synthesizer speaks them aloud. The student can press the space bar to hear words and sentences; he or she can enter punctuation marks to hear sentences. Results can also be printed. The five command options—Talk, Print, Save, Find, and New—are constantly shown on the screen. The program can function as an electronic communication aid as well. Keytalk is designed for use by students with a developmental age of three to eight years. An Adaptive Firmware Card is required for operation with the Unicorn Expanded Keyboard. An Echo II or Echo+ speech synthesizer is required to use Keytalk with the Apple IIe or II Plus computer; a Cricket speech synthesizer is required for the Apple IIc.

PEAL Software
(818) 883-7849

Magic Cymbals

Magic Cymbals is a program designed for use as a "vocal" communication system for nonspeaking or

nonreading individuals. Semantically organized pictographic symbols appear on the screen and are selected by single-switch scanning. Single-word utterances or whole phrases constructed from the symbols are spoken by a speech synthesizer (not included). This program is user-alterable. It requires an Echo II or Cricket speech synthesizer that is compatible with the computer used. The Apple IIe version requires an extended 80-column text card.

Enable
(315) 455-7591

Magic Slate

Magic Slate is a word processing package with three levels of proficiency that correspond to three different character sizes displayed on the screen and in hard-copy printout. The three levels of difficulty are 20-column level, with basic features; 40-column level, with more advanced features for students in intermediate grades; and 80-column level; with the features found in most word processing programs. General commands are introduced in the first two levels; additional commands are added at the third level. The elementary level (the 20-column display) provides large print on the display and the printout, making it useful to students with limited vision. A large-print student handbook accompanies the program.

Sunburst Communications
(914) 769-5030

Magic Slate II

Magic Slate II contains all the features of Magic Slate word processing program and has additional capabilities. For example, Magic Slate II is designed for use with a modem. An Apple II computer with at least 128K of memory is required

to run Magic Slate II, and an Apple IIe with an 80-column card, an Apple IIc, or an Apple IIGS is required to run the 80-column level of the program. The 20-column, 40-column, and 80-column versions are available separately, with supporting teacher's guides, for \$65 each; a version that includes all three levels is available for \$99. Owners of Magic Slate may exchange it for Magic Slate II at no charge.

Sunburst Communications
(914) 769-5030

Voice Output

Type & Speak

Type & Speak is a voice output program for the Apple II. The user may choose to have each letter spoken as it is typed, or have an entire message spoken at once. Text may be modified before or after it is spoken, or it may be spoken repeatedly. Type & Speak holds only one message in memory at a time, and does not store text for future retrieval. Input is made to Type & Speak via the Apple keyboard or a single-switch scanning array. Output may be sent to a voice synthesizer or a printer.

Communication Enhancement Clinic
(617) 735-6466

Talk II

Talk II is a speech output communication program for the Apple II family of computers. Talk II stores up to 4,000 words and phrases and 400 sentences. The user may change any of the words, phrases and sentences at any time. Messages can be spoken through a speech

synthesizer or printed to a printer. All messages may also be stored on disk for future reference. An Apple II computer with one disk drive and a speech synthesizer (such as the Echo II) and/or printer are required.

ComputAbility Corporation
1-800-345-4076

Light Talker

Light Talker is an electronic communication aid with synthesized speech output and optional printer or keyboard emulating output. Selection can be direct, with an Optical Headpointer, or scanning with switches (all at extra cost). Automatic scanning (single switch), row-and-column scanning (dual switch), and directed scanning (multiple switches), as well as Morse code input (two or three switches), are all possible. The Light Talker can be used with either Express or Minspeak firmware. Express allows vocabulary to be stored using the following techniques: levels (128 locations on 99 levels), abbreviation expansion, and number encoding. Minspeak allows vocabulary to be stored by abbreviation expansion or semantic compaction. Light Talker can also operate an environmental control system. Options for the Light Talker include an external printer, a keyboard emulation interface for the Apple II family, and the Memory Transfer Interface, which allows vocabulary sets to be stored on Apple disks. Kits are also available to convert the keyboard to 8 or 32 positions (rather than the standard 128).

Prentke Romich Company
(216) 262-1984

Scanning Communication Aids

Zygo Model 100

Zygo Model 100 is a 100-position scanning communication aid. The 10 by 10 array is mounted in a case that stands vertically. Each position has a light, and the user can scan the positions either automatically by row and column (single switch) or manually (multiple switches). Speed of automatic scanning is adjustable. A short-term memory is provided that will hold up to 16 selections; these selections can be played back in the order in which they were made. Alarm, memory, and scanning on/off functions may be set so that they can be controlled by the user. A console with roll paper printer and 16-character LED display is available (at extra cost). This console mounts to the bottom of the Model 100 and is meant for use with an alphanumeric overlay. Computer interfaces are also available that allow the Model 100 to act as an alternate keyboard for an Apple IIe or II Plus (at extra cost).

Zygo Industries, Inc.
(503) 684-6006

ScanPAC-Epson

ScanPAC-Epson is a scanning communication aid with synthesized voice output based on the Epson HX-20 portable computer. Input to ScanPAC can be made using its keyboard or with single switch, joystick, or single- or dual-switch Morse code. Created messages appear on an 80-character LCD display and can be printed on the built-in printer or spoken via a built-in speech synthesizer. The scanning array has 112 programmable positions. Up to 15 different scanning arrays, each with its own vocabulary, can be created, stored, and recalled. Which lamp will scan and the location/

size of the symbols are programmable as well. An abbreviation expansion program is provided. Block scanning of entire rows, then eight, four, and finally one location may also be performed. Scanning rate is user-adjustable. Options for ScanPAC include a program called MathPAC that provides a speech-output calculator; Monitor, which allows a video monitor to be used for output; and an Apple IIe keyboard emulator that allows ScanPAC or ControlPAC to serve as input. The system can be configured with the scanning array separate from or on top of the keyboard surface.

Adaptive Communication Systems, Inc.
(412) 264-2288

Rescue Speech System

The Rescue Speech System is a scanning communication system based on the Apple IIe. The user controls the system by activating any single switch. A special program running on the computer presents the user with menus of letters, phrases or commands. A cursor scans through the choices, and the user activates the switch when the cursor arrives at the desired choice. The menus are set up in a hierarchical system: the user moves to the desired menu of choices (for instance, a set of phrases classified by topic), and then scans those choices for the desired item. The message composed appears on the computer screen, and can also be printed on a printer or spoken by a speech synthesizer. The user can control up to eight electrical appliances. These appliances can be controlled remotely if plugged into remote control modules (at extra cost). An Apple IIe computer can be powered through a wall outlet or a 12 volt-wheelchair battery. The Rescue Speech System includes the computer, monitor, speech synthesizer, switch, software, and printer. It is

available on a cart (\$1,500) or ready to be mounted on a wheelchair (\$1,800).

Dr. Douglas Sorenson
(612) 866-1661

Miscellaneous

Visagraph Eye-Movement Recording System

The Visagraph Eye-Movement Recording System records eye movements during reading and provides analysis of reading performance via a viewer that interfaces with the Apple II Plus and Apple IIe computers. The student's eye movements are sampled 50 times per second. Results are presented in graph form as calculations of reading performance efficiency (number of fixations and regressions, average span of recognition, average duration of fixation, reading rate with comprehension, and so on). The graph can be displayed on the monitor or printed. A simulation of the reader's visual performance can also be displayed. Cost of \$990 includes both the software and the interface board for the Apple II family of computers.

Instructional/Communications Technology, Inc.
1-800-225-5428

Automated IEP System and Professional Goal Banks

The Automated IEP System manages more than 120 files, merges data with student IEPs, and provides unlimited capacity to create and use goal banks and IEPs. The program has a master disk with which teachers create a master IEP form. This form can be used as a template so that standard information does not have to be entered for every student. Student disks store student IEPs

(five students per disk in the Apple II version). The Professional Goal Banks component allows the teacher to create goals or use those provided. The following Goal Bank disks are available: Communication Disorders, Speech/Language/Reading, Mathematics/Spelling/Handwriting, Prevocational Level 1, and Prevocational Level 2. The Automated IEP System costs \$200 for the Apple II family of computers. Goal Bank disks are \$30 each; the complete set costs \$200. The disks are copyable, and the program comes with a master disk.

Harding & Harris, Inc.
(801) 224-2014

Muppet Learning Keys

Muppet Learning Keys is an expanded membrane keyboard for Apple II computers. The keyboard's 83 keys are covered with color cartoons of Jim Henson's Muppets characters, which illustrate the various functions of the keys. Muppet Learning Keys is not equivalent to a standard Apple II keyboard but must be used with a program that defines a meaning for each key or group of keys. The program provided with the keyboard uses color animated graphics and music to teach letters, numbers, and colors. Other programs available that use the Muppet Keys are the PEAL Series (from PEAL Software) and Magic Slate (from Sunburst Communications).

Sunburst Communications
(914) 769-5030

Compatibility

LaserWriter: Connecting to an Apple II

There are several ways to set up a LaserWriter printer for use with Apple II computers.

Apple II with Super Serial Card

A LaserWriter with the mode switch set to Special (Diablo 630 emulation) can be connected to an Apple II with a Super Serial Card (SSC).

From Apple II SSC DB-25 connector			To LaserWriter DB-25 connector	
Signal	Pin	Wiring	Pin	Signal
Tx	2	↔	3	Rx (Receive Data)
Rx	3	↔	2	Tx (Transmit Data)
Signal Ground	7	↔	7	Signal Ground

Apple II DIP Switch Settings (with SSC in DTE)

Switch block 1	Switch block 2
1 off	1 on
2 off	2 off
3 off	3 off
4 on	4 off
5 off	5 off
6 on	6 off
7 on	7 off

The preceding settings result in these parameters:

- 9600 baud, printer mode
- Normal CTS
- 8 data bits, 1 stop bit
- No delay after CR
- 132 characters per line
- No linefeed after CR
- Interrupts off
- Normal CTS

Apple II with Super Serial Card, Apple IIc, Apple IIGS

You can also connect a LaserWriter printer to any Apple II containing a Super Serial Card, or to either of the serial ports (modem port or printer port) in an Apple IIc or Apple IIGS by setting the serial interface to use XON/XOFF protocol. There are two ways to do this.

Method 1

The Super Serial Card must be in communications mode (jumper block set to "modem"). This is because printer mode (jumper block set to "terminal") doesn't support XON/XOFF. Send the following code exactly as shown.

Apple IIc/IIGS printer port:	Control-I X E
Apple IIc/IIGS modem port:	Control-A X E
Super Serial Card:	Control-I X

Control-I (or Control-A) tells the firmware that you are sending a character to act on. The X tells the firmware to use XON/XOFF protocol. The E says, "Enable the function designated by the next printable character."

Method 2

Set up the LaserWriter for DTR handshake (requires Version 2 or greater of the LaserWriter ROMs). You can do that by sending the following code segment to the LaserWriter with the switch set to 9600:

```
serverdict begin 0 exitserver
statusdict begin
25 9600 7 setscbpatch
end
```

Note: All characters must be typed in lower case.

This code sets the 25-pin connector to 9600 baud, DTR flow control, no parity. Substituting 9 for 25 in the third line above, sets the 9-pin connector to the same parameters and makes it active. This change is written into the EEPROM, and remains as what is called a "persistent parameter" until it is changed back, even after powering off the LaserWriter. To change the printer back to XON/XOFF, send this code segment::

```
serverdict begin 0 exitserver
statusdict begin
25 9600 3 setscbpatch
end
```

Note: All characters must be typed in lower case.

Compatibility

AppleWorks 2.0: Labeling the Apple IIc Plus Disk Drive

Unlike the older Apple IIc system, the Apple IIc Plus has an internal 3.5-inch disk drive, and you will find that the drives are labeled incorrectly by AppleWorks 2.0 when running on an Apple IIc Plus. AppleWorks software provides a menu item under "Add Files" for changing the current disk. When chosen, this menu item displays a list of available disks. On an Apple IIc Plus with the internal 3.5-inch drive, AppleWorks 2.0 displays the following list of drives:

1. Built-in disk
2. Ext. disk IIc
3. Disk 3.5 #1
4. ProDOS directory

Note: AppleWorks 2.0 uses the following associations between slot/drive and the labels as displayed above:

- | | |
|---------------------|--|
| 1. Built-in disk | Slot 6, Drive 1 |
| 2. Ext. disk IIc | Slot 6, Drive 2 |
| 3. Disk 3.5 #1 | Slot 5, Drive 1 |
| 4. ProDOS directory | (the pathname typed in response to this selection) |

When AppleWorks is running on an Apple IIc Plus:

1. The built-in disk is actually the first external 5.25-inch drive.
2. The "Ext. disk IIc" is the second external 5.25-inch drive.
3. The "Disk 3.5 #1" label is the internal 3.5-inch drive mounted in the Apple IIc Plus.

These labels are correct for the older Apple IIc systems, but the labels do not correctly identify the internal disk drive for the Apple IIc Plus. Claris has revised AppleWorks 2.0 to correct the associations. Contact Claris for information about the AppleWorks 2.1 update.

Compatibility

Apple IIGS Disk Drive Configurations

The Apple IIGS computer supports a variety of disk drives—the Apple 5.25 Drive, Apple 3.5 Drive, UniDisk™ 3.5, Apple IIc External Drive, UniDisk, and DuoDisk®—as well as RAM disks, provided that the disks are configured properly. The charts in this section show possible disk drive configurations for the Apple IIGS. This list is not exhaustive. It is a representative sampling of the most likely configurations.

Guidelines

In general, you may use only two each of the following drives: Apple 5.25 Drive, UniDisk 5.25, and UniDisk 3.5. You may use only one Apple IIc External Drive and only one DuoDisk. When using Apple 3.5 and UniDisk 3.5 drives, the Apple 3.5 Drive(s) *must* be placed closer to the Apple IIGS in the chain.

The Apple IIc External Drive may be used in place of an Apple 5.25 Drive or a UniDisk 5.25 only if the Apple IIc External Drive is last in the chain. Since the Apple IIc External Drive has no pass-through, it cannot be used as an intermediate drive.

ProDOS 8 can address up to six drives on the SmartPort. ProDOS 16 is not limited as to the number of drives it can support.

The Apple IIGS firmware treats both RAM disks and ROM disks as SmartPort devices.

Common Apple IIGS Disk Drive Configurations Using the Apple IIGS SmartPort

Legend:

A3	Apple 3.5 Drive	UD	UniDisk 3.5	RAM	RAM Disk
A5	Apple 5.25 Drive	UD5	UniDisk 5.25	DD	DuoDisk

One-drive System Without RAM Disk

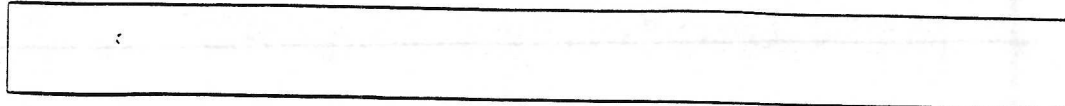
Drive 1	Drive 1 Slot	Drive 1 Drive
A3	5	1
A5	6	1
UD	5	1

One-drive System With RAM Disk

Drive 1	Drive 2	Drive 1 Slot Drive	Drive 2 Slot Drive
A3	RAM	5 1	5 2
A5	RAM	6 1	5 2
UD	RAM	5 1	5 2

Two-drive System

Drive 1	Drive 2	RAM	Drive 1 Slot Drive	Drive 2 Slot Drive	RAM Slot Drive
UD	UD		5 1	5 2	N/A
UD	UD	RAM	5 1	2 1	5 2
UD	A5		5 1	6 1	N/A
UD	A5	RAM	5 1	5 1	5 2
A3	A3		5 1	5 2	N/A
A3	A3	RAM	5 1	2 1	5 2
A3	A5		5 1	6 1	N/A
A3	A5	RAM	5 1	6 1	5 2
A3	UD		5 1	5 2	N/A
A3	UD	RAM	5 1	2 1	5 2
A5	A5		6 1	6 2	N/A
A5	A5	RAM	6 1	6 2	5 2
DD	N/A		6 1	6 2	N/A
DD	N/A	RAM	6 1	6 2	5 2



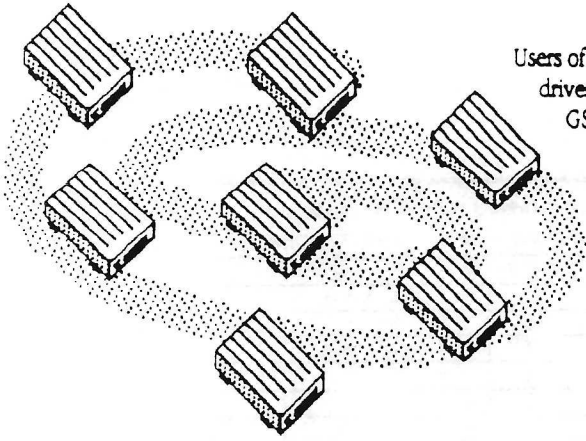
Three-drive System

Drive 1	Drive 2	Drive 3	RAM	Drive 1		Drive 2		Drive 3		RAM	
				Slot	Drive	Slot	Drive	Slot	Drive	Slot	Drive
UD	UD	UD		5	1	5	2	2	1	N/A	
UD	UD	UD	RAM	5	1	2	1	2	2	5	2
UD	UD	A5		5	1	5	2	6	1	N/A	
UD	UD	A5	RAM	5	1	2	1	6	1	5	2
UD	A5	A5		5	1	6	1	6	2	N/A	
UD	A5	A5	RAM	5	1	6	1	6	2	5	2
UD	DD			5	1	6	1	6	2	N/A	
UD	DD		RAM	5	1	6	1	6	2	5	2
A3	UD	UD		5	1	5	2	2	1	N/A	
A3	UD	UD	RAM	5	1	2	1	2	2	5	2
A3	UD	A5		5	1	5	2	6	1	N/A	
A3	UD	A5	RAM	5	1	2	1	6	1	5	2
A3	A5	A5		5	1	6	1	6	2	N/A	
A3	A5	A5	RAM	5	1	6	1	6	2	5	2
A3	A3	A5		5	1	5	2	6	1	N/A	
A3	A3	A5	RAM	5	1	2	1	6	1	5	2
A3	A3	UD		5	1	5	2	2	1	N/A	
A3	A3	UD	RAM	5	1	2	1	2	2	5	2
A3	DD			5	1	6	1	6	2	N/A	
A3	DD		RAM	5	1	6	1	6	2	5	2
A3	A3	UD5		5	1	5	2	6	1	N/A	
A3	A3	UD5	RAM	5	1	2	1	6	1	5	2

Four-drive System

Drive 1	Drive 2	Drive 3	Drive 4	RAM	Drive 1 Slot Drive	Drive 2 Slot Drive	Drive 3 Slot Drive	Drive 4 Slot Drive	RAM
UD	UD	UD	UD		5 1	5 2	2 1	2 2	N/A
UD	UD	UD	A5		5 1	5 2	2 1	6 1	N/A
UD	UD	UD	A5	RAM	5 1	2 1	2 2	6 1	5 2
A3	A3	UD	UD		5 1	5 2	2 1	2 2	N/A
A3	UD	UD	A5	RAM	5 1	2 1	2 2	6 1	5 2
A3	UD	UD	A5		5 1	5 2	2 1	6 1	5 2
A3	UD	A5	A5	RAM	5 1	2 1	6 1	6 2	5 2
A3	UD	A5	A5		5 1	5 2	6 1	6 2	N/A
A3	A3	DD		RAM	5 1	2 1	6 1	6 2	5 2
A3	A3	DD			5 1	5 2	6 1	6 2	N/A

Apple IIGS and Disk Drive Polling



Users of the GS/OS™ operating system software have reported that some disk drives constantly poll for a disk. The polling of a 3.5-inch disk drive under GS/OS is normal. Unlike the Macintosh, which has built-in hardware and firmware to detect whether a disk has been inserted, the Apple IIGS does not. The Apple IIGS, via GS/OS, needs to poll the drives to determine whether a disk has been inserted. There is no way to disable the drive polling.

Compatibility

Using the ProFile with the Apple IIGS

You can use a ProFile™ drive with the Apple IIGS computer if you follow the guidelines below. (Note that the Advanced Disk Utility program is designed for SCSI drives, and does not work with the ProFile drive.)

1. Make sure that the ProFile Interface Card has the latest ROM (341-0299) and that the card has been modified for use with the Apple IIGS computer. Check the card to see that a jumper made of wire-wrap wire is installed between pin 12 of IC C6 (2716 EPROM, Apple part number 341-0299) and pin 1 of IC B4 (74LS368, Apple part number 305-0368) on the non-component side of the board. If needed, the jumper should be installed by a knowledgeable technician to assure proper operation of the ProFile when used with the Apple IIGS computer. The jumper wire should be just long enough to make the connection. The technician should remove the EPROM before soldering, thus preventing any damage to the chip.

If you have an older ROM, or if you don't know whether your card has the modification, you should see your authorized Apple dealer.

2. Install the ProFile Interface Card into the Apple IIGS. Slot 7 is the preferred slot and will be used for this example, although other slots can be used. If you are using AppleTalk for printing, you will need to use a different slot. Enter the Control Panel by pressing Apple-Control-Escape. Under SLOTS, set Slot 7 to "Your Card." Set the startup slot to Slot 5. Press Return to make the changes permanent, then press Escape and Return to exit the Control Panel. Turn off your computer.
3. Insert the Apple IIGS System Disk into the 3.5-inch drive and turn on the computer. If you have a second 3.5-inch drive, insert the System Tools disk to eliminate disk swapping.
4. If the ProFile has not been previously formatted for ProDOS, you will be asked if you want the ProFile to be initialized. Select "Initialize" and name the volume. After initialization is complete, open the System Tools disk and run the Installer program by selecting "Install System Files." (If you have only one disk drive, you will first have to eject the System Disk and then insert the System Tools disk in order to access the Installer program. You will be prompted to insert the appropriate disks as they are needed.) Use the Volume button to bring the ProFile disk name to the top right of the screen. Then select "Install," and the system software will be installed on the ProFile.
5. You can also add other drivers, such as the driver for the SCSI card or 5.25-inch drive, at this time by selecting the item you want to install and clicking the Install button.
6. Finally, return to the Control Panel, and set startup to Slot 7.
7. Restart your computer. It will now start up from the ProFile.

Workarounds

Apple IIGS: Recovering a Corrupted ProFile

In the Apple IIGS computer, the bus's higher "noise" passes on to the ground traces on the ProFile Interface Card, and after use, it corrupts the directory of the ProFile, rendering it invisible to ProDOS and inaccessible to the user. This workaround describes how to recover the directory and make the ProFile usable again.

Before attempting to recover the ProFile, make sure that the ProFile Interface Card has been properly modified for use with the Apple IIGS. The modification lets the card operate correctly with the directory fix. See *Using the ProFile with the Apple IIGS* in this issue of the *Apple II Technical Bulletin*. Do not try to repair a directory with an unmodified ProFile card.

For the recovery, use a disk editor program, such as the ProDOS Machine Language Interface (MLI) Exerciser, which is used in the example below. Follow these steps:

1. Execute the ProDOS MLI Exerciser program with the "Exerciser" command and wait for the main menu.
2. From the main menu, type 80 and press Return to command a read of a block. Then type in the following values at the next screen:

Parameter Count	\$03 (Default)
Unit Number	\$50 (The ProFile card's slot followed by a 0)
Data Buffer	\$00 (This value is where the block to be modified will be loaded)
	\$40
Block Number	\$02 (This is the bad block to load in)
	\$00

After typing in each pair of numbers, press Return to go on to the next prompt. After pressing Return at the last entry, you'll see the message, "PRESS RETURN TO EXECUTE COMMAND." Press Return and you'll see the message, "Error \$00: Call Successful." At this point, press Return to get to the main menu.

3. Type M and press Return to modify the buffer. The default should read:

\$00
\$40

This is the correct setting. Press Return after each entry, and press it once more to go on to Modify mode. At this point, you should see a table of numbers and a blinking cursor on the entry you want to "delete," number 55. Now that we know problems with the directory exist, press Escape to return to the main menu.

If "55" was not in the first position of the table, then this directory recovery procedure will not work. If "55" was not shown at all, your ProFile may be malfunctioning for a different reason.

4. Type 81 and Press Return to write the block out to disk. Press Return through the number entries until you reach the "data buffer" entry. Change it to look like this:

```
$01  
$40
```

Continue to press Return through the block number entries. Press Return again to command the actual block write, after which you will see the message, "Error \$00: Call Successful."

5. You may now reboot your system and check to see whether the Profile is recognized. All of the previously inaccessible data should now be usable.

For further information about using the ProDOS Exerciser Program, see the *ProDOS Technical Reference* manual (Addison Wesley, ISBN 0-201-17757-9).

Workarounds

Inter•Poll and the Apple II

Follow the criteria below to ensure identification of Apple II computers in the Inter•Poll™ Network Administrator's Utility.

Apple IIGS

To ensure that an Apple IIGS computer is listed in the Inter•Poll "Device List" window, be sure to take the following steps:

1. Select "Built-In AppleTalk" from the Control Panel. At the same time, set the port to which the network is connected (generally the printer port) to "Your Card."
2. Shut down and restart the system.
3. Run Inter•Poll on a Macintosh computer and check the network. The Apple IIGS will now be displayed in the "Device List" window.

Apple IIe

Take the following steps to ensure that an Apple IIe computer is listed by Inter•Poll:

1. Install the Apple II Workstation Card in Slot 7 of the Apple IIe, and connect the computer's LocalTalk port to the network.
2. Start up the system and log on to a ProDOS server on the network. Once the system gets past the Password screen, the device shows up in the "Device List" window of Inter•Poll.

Applesoft: PEEKs, POKEs, and CALLs

To make Applesoft programs read data from memory, write data to memory, or pass control to machine language programs, programmers use Applesoft PEEK, POKE, and CALL statements. Here is an explanation of each statement's function.

PEEK makes a program read a memory location. The format of the statement is:

```
PEEK (<memory location>)
```

where <memory location> is a positive integer from 0 to 65535. Programmers use PEEK most commonly with a variable: for example, `X% = PEEK (2048)` assigns the value located at 2048 to the integer variable X%.

POKE makes a program write a value to a memory location. The format of the statement is:

```
POKE <memory location>, <value>
```

where <memory location> is a positive integer from 0 to 65535 and <value> is a positive integer from 0 to 255. Programmers use POKE most commonly to write data directly to memory: for example, `POKE 2048, 128` assigns the value 128 to the memory location 2048.

CALL makes a program pass control to a machine language routine at some memory location. The format of the statement is:

```
CALL <memory location>
```

where <memory location> is a positive or negative integer from -32768 to 32767 or a positive integer from 0 to 65535. (Note that the signed integers from -32768 to 32767 represent exactly the same memory locations as the positive integers from 0 to 65535.) Programmers use CALL most commonly to invoke routines built into the Apple II ROM. For example, the statement `CALL -936` invokes the routine that clears the screen and homes the cursor, a process that is similar to using the Applesoft HOME statement.

To change the screen display or make sounds and other special effects on any of the computers in the Apple II family, Applesoft accesses various memory locations. Each Apple II system's reference manual includes a memory map in which you can find the segments of memory used by text, graphics, Applesoft, the monitor, and peripheral cards.

Apple-published memory locations remain the same for most members of the Apple II family; other internal locations may change. Therefore, to ensure that your programs will work properly on all Apple II computers, do not use entry points other than those listed in the Apple manuals.

Locations used to communicate with interface cards may be found in the manuals for those devices. For example, memory locations used by the Apple 80-column card are found in the *Apple 80-Column Text Card Manual* and the *Apple Extended 80-Column Text Card Supplement*.

Many computer stores and bookstores sell books that list Applesoft, monitor ROM, DOS 3.3, and ProDOS memory locations. You may find the following publications useful:

- *What's Where in the Apple*, by William Luebbert (Micro Ink)
- *Beneath Apple DOS*, by Don Wirth and Pieter Lechner (Quality Software)
- *Beneath Apple ProDOS*, by Don Wirth and Pieter Lechner (Quality Software)
- *The Apple Almanac*, by Eric Goetz and Williams Sanders (Datamost, Inc.)

Current Apple II System Software

Application	Current Version	Date Released
Applesoft BASIC		
ProDOS Applesoft Sampler	1.2	3/5/85
ProDOS BASIC Programmer's Examples	1.1	10/26/84
ProDOS Applesoft Command Interpreter (BASIC.SYSTEM)	1.1	6/18/84
Getting Down to BASIC IIe	1.1	6/12/86
ProDOS Applesoft Programmer's Asst. (APA)	1.4	6/28/84
Apple IIGS BASIC	1.0B4	9/15/87
System Disk (Apple IIe)	3.1	4/14/86
System Disk (Apple IIe, Apple IIc)	3.0	7/17/87
System Disk (Apple IIGS)	4.0	8/18/88
System Utilities (IIc, IIe), 3.5-inch	2.1.2	3/3/86
System Utilities (IIc, IIe), 5.25-inch	2.1.2	3/3/86
Workstation Disk	1.0	4/20/88
Workstation Disk (Apple IIGS)	1.0	6/24/88

Current Apple Upgrades and Updates

An **upgrade** enhances features of existing hardware or software. Generally, an upgrade involves a fee, and any additional Apple hardware must be installed by an authorized Apple service provider.

A software **update** consists of enhancements, fixes, or patches to software. An update to Apple software is handled through an authorized Apple dealer or your Apple sales representative.

Following is a summary of the Apple upgrades and updates currently available for Apple II products.

Enhanced Apple II SCSI Card

An enhanced version of the Apple II SCSI Card, Revision C, was developed to provide better performance with new and more sophisticated Apple II software. The card also increases the system's ability to handle different classes of SCSI peripheral devices.

If you have an Apple II SCSI Card and the ROM part number is not 341-0437, you may want to update the ROM.

Apple IIGS VGC Controller and ROM

Two free upgrades are available to Apple IIGS owners. The Video Graphics Controller (VGC) corrects video display problems that may occur in double high-resolution and standard text mode. The new ROM corrects minor bugs and provides enhancements for future software releases.

Apple IIe to Apple IIGS Upgrade

Your authorized Apple service provider can install a new logic board to upgrade the Apple IIe to an Apple IIGS.

Apple IIe to Enhanced IIe Upgrade (Apple IIe Enhancement Kit)

Your authorized Apple service provider can install the required chips to enhance the Apple IIe.

Apple Access II Version 1.3.1

This version of Apple Access II supports the Apple IIGS and is also compatible with the Apple IIe and Apple IIc. (\$25 coupon required for upgrade; available 1/1/89 through 9/30/89).

ProDOS 1.7

ProDOS Version 1.7 solves the problem that occurred with recognition of 1988 dates when third-party RAM cards were installed.

AppleWriter Version 2.1

AppleWriter™ Version 2.1 solves problems that occurred when non-Apple printers were used with earlier versions. AppleWriter has been discontinued; Version 2.1 is the last update that will be available.

AppleWorks

For information about upgrades for AppleWorks, please contact:

Claris Corporation
440 Clyde Avenue
Mountain View, California 94043
1-800-544-8554

Apple IIGS System Software 4.0

Apple IIGS System Software Version 4.0 is available to owners who purchased an Apple IIGS computer between August 15 and November 7, 1988. Obtain a coupon from your authorized Apple dealer. Owners who purchased the Apple IIGS prior to August 15, 1988 must pay a fee for the new software.

Corrections:

Technical Bulletin,

February—March (Issue 2)

In *Comparing Apples to Apples* (page 2) the Expansion Slots for the Apple IIc were incorrectly listed as 7. The correct number of expansion slots for the Apple IIc is 0.



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The Apple II Technical Bulletin provides users with current technical information about Apple products. Featured topics may be under consideration, and new product versions may be under development. Therefore, it's appropriate to consider this publication as a bulletin that is correct at the date of publication, rather than as a long-term reference source.

Special contributors to this issue

Tom Alexander, Doug Camplejohn, Leslie Dolan, Sue Goodin, Brian Kliment, Jess Wells

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Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, California 95014
(408) 996-1010
TLX 171-576