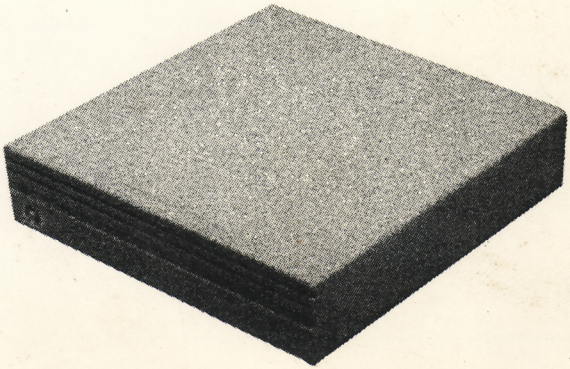
THE Q DRIVE

CARE AND FEEDING MANUAL

APPLE IIe • APPLE IIGS



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Quality Computers™

THE Q DRIVE

CARE & FEEDING MANUAL

Manual written and designed by Jerry Kindall
Revised April, 1993

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Congratulations! Your new Q Drive is a smart choice. It's fast, quiet, and reliable, and it's compatible with all Apple II hardware and software. It comes pre-formatted with system software already installed. The Q Drive will even install your hard drive management system *(EasyDrive, Salvation—Supreme,* or *ProSel)* automatically.

Just follow the installation instructions on the pages that follow. The procedure takes only about fifteen minutes. Then turn on the Q Drive and your computer and *let the Q Drive configure itself.* No Apple II hard drive is easier to set up!

This manual contains more than installation instructions. In fact, the installation instructions take up only a few pages. The rest of this manual provides information you'll find useful in day-to-day use of your Q Drive, now and in the future.

We know you probably hate to read manuals, so here's the information you need to get up and running as quickly as possible. Finish reading this chapter and read the appropriate sections of **Chapter 2** before doing anything inside the computer. (If you've got a Q Drive with removable media, read the included insert sheet which describes how to insert and eject cartridges.) If you don't read at least that much of the manual, you may well deserve the results you get!

CHAPTER ONE
GETTING STARTED

Here are quick answers to commonly-asked technical questions:

- You don't need the included disks to get started. The disks are included to allow you to reinstall the System Software after re-formatting or re-partitioning the drive. They contain the same System 5.04 the Q Drive itself contains. See **Chapter 11** if you are curious.

- The Q Drive automatically configures itself the first time you start it up. You don't have to worry about whether you got a IIe or IIGS drive.

- We include several megabytes worth of useful Apple II software on the Q Drive. All that stuff is *supposed* to be there, although you can delete it if you don't want it. See **Appendix B** for details.

- Your Q Drive has a much greater capacity than floppy disks, so you'll need to adopt a few new organizational tactics if you've never used a hard drive before. You'll want to read **Chapters 4, 8, and 9** in depth. **Chapters 5 and 6** (for IIe users) or **5 and 7** (for IIGS users) will be handy if you're not familiar with ProDOS 8 and GS/OS operations. You could also read this entire manual in order—in fact, we recommend that you do exactly that as soon as you have the chance.

IMPORTANT INFORMATION

See **Appendix E** for warranty information. We back the Q Drive with a 30-day no-hassle money-back guarantee and a 1 year parts-and-labor warranty *Register your Q Drive immediately for your protection.*

If you encounter difficulties, our technical support staff stands ready to assist you. Call (313) 774-7740 from 9 AM to 8 PM on weekdays (10 AM to 4 PM on Saturday). Our technicians can also be reached via:

FAX	(313) 774-2698
Modem	(313) 774-2652 (pro-quality BBS) email: tech
Internet	tech@pro-quality.cts.com
GEnie	QC
Am. Online	QualityCom
US Mail	20200 Nine Mile Rd., St. Clair Shores, MI 48080

The Q Drive works with the Apple IIe and the Apple IIGS. You'll install an Apple II High Speed SCSI Card to control the drive. The table below tells you where to turn for detailed installation instructions for your computer.

You'll need to refer to the Apple II High Speed SCSI Card manual during installation. Keep the manual handy, but don't read it until instructed to do so. You *should not* follow the procedures in the SCSI card manual which partition a hard drive. We've already done that for you, and if you do it again yourself, you'll erase everything that's already on the Q Drive. This would be a bad move.

Read these installation instructions *all the way through* at least once before doing anything. If you have questions about installing your Q Drive, contact Quality Computers Technical Support for clarification before actually beginning the installation.

Interface cards are sensitive to static electricity and require careful handling. Avoid touching the gold "fingers" at the bottom of the card. Be sure the computer and *all* peripherals connected to it are turned off, but leave the power cord connected to the computer to provide an electrical ground. Touch the power supply case (the big metal box inside the computer) before beginning installation, and frequently during installation, to dissipate your body's static electricity charge.

CHAPTER TWO

INSTALLING YOUR Q DRIVE

Now find your model of computer in the table below and turn to the indicated page to begin installation.

APPLE IIE & LASER 128 INSTALLATION

Before you begin, make sure your Apple IIe is *enhanced. The Apple II High Speed SCSI Card requires an enhanced IIe. It won't work in a non-enhanced IIe.* IIes manufactured after about 1984 are enhanced. (The Laser 128 is an enhanced IIe "clone" and will work with the SCSI card.)

If you're not sure if your IIe is enhanced, look at the top of the screen when you turn on the computer, or when you reboot by pressing ⌘-Control-Reset. If the message at the top of the screen reads "Apple //e", you have an enhanced Apple IIe. If the message is "Apple][" with no "e", your IIe is *not* enhanced.

An Apple IIe enhancement kit costs about $50, is easy to install, and will bring you up to the current "state of the art" for the Apple IIe.

1 CONFIGURE THE CARD

Find the four small DIP switches on the SCSI card. These switches should all be set to the "closed" position (i.e., the handles on the switches should all be next to the switch numbers).

If you have a Zip Chip, Rocket Chip, or other accelerator device in your IIe, or if you have an accelerated Laser 128 model (EX or EX/2), move Switch 1 to the "open" position. This disables the card's DMA feature. DMA allows the interface to operate faster, but IIe accelerators are incompatible with DMA.

A few other peripherals you may have installed in your IIe may require that you disable DMA on the SCSI card. One such card is the FingerPrint Plus printer interface card. Most other cards are fully DMA compatible. If you're unsure of the DMA compatibility of a particular peripheral, disable DMA for now and contact Quality Computers Technical Support or the manufacturer of the card in question for further instructions.

2 INSTALL THE CARD

Usually, you'll want to install the SCSI card in your IIe's Slot 7, because the IIe always starts up from the disk controller in the highest numbered slot. If Slot 7 already contains a card, you might be able to move that card to a different slot, or you might need to choose a different slot for the SCSI card. Once you've installed the card, attach the card's SCSI connector to one of the openings in the back of the IIe using the included hex-head screws. See **Pages 4-9** of the Apple II High Speed SCSI Card manual for more detailed installation instructions.

Laser 128-series owners can install the card in the expansion slot on the side of the computer (equivalent to Slot 7 in a IIe) or in an optional Laser 128 Expansion Box. See your Laser manual for details on how to set the switches on the bottom of the computer to activate the expansion slot.

3 CONNECT THE Q DRIVE

Attach the small end of the Q Drive cable to the SCSI card's output and the large end of the cable to the either of the two connectors on the back of the Q Drive. Plug the terminator into the unused SCSI connector. (Some Q Drives are terminated internally; if your Q Drive's serial number ends with the letter "T," you don't need an external terminator, and none is included.) Don't forget to plug in the power cable.

4 BOOT THE Q DRIVE

If you have *EasyDrive* or *ProSel 8*, place the *EasyDrive* or *ProSel* disk in any available drive. (If you're using 5.25" disks, put in the first disk.)

Turn on the Q Drive, wait ten seconds, and turn on the computer. If you installed the SCSI card in Slot 7, the Q Drive will begin booting. If the SCSI card is in another slot, one of your other drives may begin booting. If so, press Control-Reset and, at the] prompt, type **PR#s** (replace the "s"

with the slot number of the SCSI, e.g., PR#2 if you installed the SCSI card in Slot 2) and hit Return.

The Q Drive logo will appear on the screen and the Q Drive will begin to configure itself for your IIe. This process will take several minutes. Do not interrupt the Q Drive during its configuration process.

If you have *EasyDrive* or *ProSel*, the Q Drive will detect the disk and run the installer for your hard drive management system. Proceed with the installation instructions written in the *EasyDrive* or *ProSel* manual.

The Q Drive contains the latest 8-bit system software available at the time the drive was assembled, including ProDOS 2.0.1. If you do not want any system software at all installed on the Q Drive (for example, if it's your second hard drive), disconnect all your other hard drives from the SCSI interface, then start up as described above. Hold down the ♦ or Option key when the Q Drive logo appears. Don't release the ♦/Option key until the message "Configuring Your Q Drive As Blank" appears. You will end up with an unbootable Q Drive without any system software at all.

FINISHED!

Your Q Drive is now operational. Now, each time you turn on the Q Drive and the computer, the Q Drive will boot to a simple program selector called *Sneeze* (or to *EasyDrive* or *ProSel* if you installed either of them), allowing you to select the program you want to use. (If the Q Drive is not the highest numbered disk device in your system, you will need to perform the PR#s instructions in **Step 4** above to boot your Q Drive.)

If you turn on your computer without turning on the Q Drive, the system will seem to "lock up" for about 30 seconds before the next disk drive (usually your floppy drive) boots. If you boot your floppy drive directly with a PR# command, this delay will occur when the ProDOS title screen appears. The SCSI interface card is waiting for the Q Drive to come up to speed, and waits half a minute before deciding that no functioning hard drives are attached. It's simpler to always turn on the Q Drive when you use your computer, even if you plan to use a program from a floppy disk.

Now skip ahead to Chapter 3.

APPLE IIGS INSTALLATION

1 CONFIGURE THE CARD

Find the four small DIP switches on the SCSI card. These switches should all be set to the "closed" position (i.e., the handles on the switches should all be next to the switch numbers).

If you have a Checkmate MemorySaver, a RamKeeper with more than one memory card installed, an early TransWarp GS, or an early Applied Engineering memory card, move Switch 1 to the "open" position. This disables the card's DMA feature. The card will be faster with DMA

enabled, but these peripherals are not DMA compatible. (The TransWarp GS and AE memory cards can be upgraded to DMA-compatible versions. Check with Applied Engineering for details.)

A few other peripherals that you may have in your IIGS (for example, the FingerPrint GSi printer interface and VisionPlus or Visionary video digitizer) also require that you disable DMA on the SCSI card. If you're unsure of the DMA compatibility of a particular peripheral, disable DMA for now and contact Quality Computers Technical Support or the manufacturer of the card in question for further instructions.

2 INSTALL THE CARD

Usually, you'll install the SCSI card in your IIGS's Slot 7. If Slot 7 already contains a card, you might be able to move that card to a different slot, or you might need to choose a different slot for the SCSI card. (If you don't have a modem, Slot 2 is good.) Once you've installed the card, attach the card's SCSI connector to one of the openings in the back of the IIGS using the included hex-head screws. See **Pages 17-21** of the Apple II High Speed SCSI Card manual for more detailed installation instructions.

3 CONNECT THE Q DRIVE

Attach the small end of the Q Drive cable to the SCSI card's output and the large end of the cable to the either of the two connectors on the back of the Q Drive. Plug the terminator into the unused SCSI connector. (Some Q Drives are terminated internally; if your Q Drive's serial number ends with the letter "T," you don't need an external terminator, and none is included.) Don't forget to plug in the power cable.

4 CONFIGURE THE IIGS

Hold down the Option key while turning on the computer, then press 1 to enter the Control Panel when the menu appears. Select "Slots" from the Control Panel menu. Verify that the slot in which you have installed the SCSI card is set to "Your Card" and that the Startup Slot is set to the Q Drive slot. If necessary, use the up and down arrow keys to move the cursor to the item that needs changing and use the left and right arrow keys to change the value. Press Return when the settings are correct.

5 BOOT THE Q DRIVE

If you have Vitesse's *Salvation—Supreme* hard drive management system, place the first disk in any available drive. If you have *ProSel 16,* there's only one disk; put it in any available drive.

Turn on the Q Drive, wait ten seconds, and press Escape followed by Return to exit the Control Panel. In a moment, the Q Drive logo will appear, and the Q Drive will automatically configure itself for your IIGS.

If you have *ProSel 16,* the Q Drive will now detect the disk and run your hard drive manager's installer. Proceed with the installation instructions in the *ProSel* manual. If you have *Salvation—Supreme,* the Q Drive will boot normally. When the IIGS Finder appears, follow the instructions in the *Salvation—Supreme* manual to install the program.

The Q Drive contains the current Apple IIGS System Software, including System 6 and System 5. If you would like to use the Q Drive as a data-only drive, disconnect any other hard drives attached to your SCSI card, then start up as described above. Hold down the Option key when the Q Drive logo appears. Don't release the Option key until the message "Configuring Your Q Drive As Blank" appears. Then you can install whatever system software you like. You can also force the Q Drive to configure itself with only 8-bit (IIe) system software by holding down the ♁ key instead.

FINISHED!

Your Q Drive is now operational. When you turn on your Q Drive and your IIGS, your computer will start up from the Q Drive into GS/OS and the Finder, or to *Salvation—Supreme* or *ProSel 16*. From any of these programs, you can manipulate files and run applications.

Should you need to boot a different device, enter the control panel to set the Startup Slot to 5 (for the 3.5" drive) or 6 (for the 5.25" drive) by pressing Control-♁-Escape and selecting "Control Panel".

If you turn on your computer without turning on the Q Drive, the system will seem to "lock up" for about 30 seconds before your floppy drive boots. If you boot your floppy drive directly with a PR# command or by changing the Startup Slot in the Control Panel, this delay will occur when the ProDOS or GS/OS title screen appears. The SCSI interface card is waiting for the Q Drive to come up to speed, and gives it the benefit of the doubt for half a minute before it decides that no functioning hard drives are attached. It's simpler to always turn on the Q Drive when you use your computer, even if you plan to use a program from a floppy disk.

UNPACKING YOUR SYSTEM 6 DISKS

We include IIGS System Software 5.04 on floppy disks with the Q Drive. Because of the costs involved in duplicating the disks, however, we don't include System 6 on floppies. (System 6 *is* installed on the hard drive in bootable form.) You can make your own set of System 6 floppy disks by unpacking the archives included on the Q Drive. We recommend that you do so *immediately*. All you need is six blank disks.

Boot your Q Drive as usual. In the Finder, double-click the Q1 icon to open the Q1 window. In the Q1 window, you'll find an icon called Disks.SHK Double-click the Disks.SHK icon, and the Finder will automatically launch GS ShrinkIt to unpack the disks.

Once GS ShrinkIt has loaded, a dialog will appear, listing all six System 6 disks and a couple of others, all of which are contained in the same archive file. (Think of an archive file as being like a file cabinet that can hold several disks in a compressed form.)

To extract one of the disks, simply insert a blank disk in your first 3.5" drive, then double-click the name of the disk you want to unpack (e.g., "System.Disk"). When ShrinkIt asks where to unpack the disk, double-click "AppleDisk3.5A". The disk will take several minutes to unpack. Label the new disk immediately.

Repeat the procedure for all the disks in the archive. Once you've unpacked all the disks, Quit GS ShrinkIt (Ö-Q). Once in the Finder, you can delete the Disks archive by dragging it to the trash, then choosing "Empty Trash." This allows you to reclaim the hard drive space these files were using, and use it for your own purposes.

If any of the above procedure is unclear to you, we suggest reading the rest of this manual (particularly the chapters on GS/OS and the Finder) for further illumination. There's a GS ShrinkIt documentation file on the Q Drive (in the "Utilities" folder), which you can read for more information. Our Technical Support department can also help in a pinch.

We do not provide a manual for System 6 with the Q Drive. You may not feel the need for one, since it's very similar in operation to System 5. You can purchase *The System 6 Book* from Quality Computers for $12.95. Call 1-800-777-3642 to order. We also sell the *System 6 Bonus Pack,* which includes the book and six disks full of useful goodies for your IIGS.

SWITCH HITTER

Your Q Drive normally boots into System 5. We set it up this way because not everyone has the memory necessary to use System 6 (Apple recommends two megabytes of memory). If you have the memory and would like to switch your Q Drive over to run System 6, you can use the drive's built-in Switch Hitter software.

To activate Switch Hitter, hold down the Control key while turning on your computer, until the Switch Hitter screen appears. Press the number 6 to switch the drive over to System 6, then press R to restart. Once you have made this change, your Q Drive will boot into System 6 each time you turn it on. You can switch the drive back to System 5 operation with a similar procedure if you need to reclaim some memory or run older software that doesn't work with System 6.

For more information on Switch Hitter's operation (it has many useful features), see **Appendix C.**

Now turn to Chapter 3.

Now that you've got your Q Drive up and running, you may be wondering exactly how it works. Actually, the Q Drive operates on exactly the same magnetic principles as a standard floppy disk, a storage medium most users are familiar with. As in a floppy drive, the hard drive's read/write head imprints and detects magnetic impulses on a magnetic disk surface (the platter) to store and retrieve data.

The platter, the magnetic part of the Q Drive equivalent to a disk in a floppy drive, is divided into imaginary concentric circles called *tracks.* Each track is further divided into sections called blocks. The Q Drive, like most hard drives, has hundreds of tracks on each platter and dozens of blocks on each track. By contrast, 5.25" floppies contain a mere 35 tracks of 8 blocks each. This is even more amazing when you know that the Q Drive's platters are *smaller* than 5.25" floppy disks!

Such data density is possible thanks to extremely precise positioning of the read/write head over the platter, which is performed by stepper motors in older hard drives, or by a voice coil—similar to the magnetic coils found in loudspeakers—in newer drives like the Q Drive. (The voice coil method is faster, quieter, and more reliable than stepper motors.) The read/write head literally hovers a fraction of an inch above the spinning platter, supported by a cushion of air. The head never touches the surface of the platter during normal operation.

CHAPTER THREE

INSIDE THE Q DRIVE

The Q Drive's performance results from several factors. Since data are packed so closely together, the head doesn't have to move very far to get to a particular piece of data. The head assembly is faster and more accurate than that of a floppy drive. The Q Drive's platter rotates ten times faster than 5.25" floppies, so once a block has been located, it can be read very quickly. The Q Drive also includes additional circuitry—a track buffer, a small chunk of memory which allows the drive to read subsequent blocks on the same track without further hard drive access—to make it even faster. In fact, with its Quantum or Conner mechanism, the Q Drive is one of the fastest drives available.

Because the Q Drive consists of extremely precise machinery, the actual platters and head assembly are hermetically sealed inside a sturdy metal casing. The Q Drive is a fairly solid piece of equipment; you don't have to be concerned about bumping it accidentally. Today's hard drives are very reliable. Nevertheless, a severe shock (like dropping the drive on the floor) *can* cause something to break. Treat your Q Drive with a modicum of care, then, and it'll last a long, long time.

Now that your Q Drive is connected and operational, you have vast amounts of disk storage available to hold your programs and data. If you've never used a hard drive, this empty space may seem overwhelming. How will you ever fill it all? (It's easier than you expect!)

Think of your Q Drive as a large, fast, floppy drive which has had a disk locked into place. Although you can't "change disks" with the Q Drive, its speed and capacity more than make up for this minor drawback. (Of course, if you got a removable-media Q Drive, you *can* change disks, but that's outside the scope of this discussion.)

Let's dispel a popular myth: *Hard drives are not RAM.* Your Q Drive will not increase your AppleWorks desktop or give you more "work space" in other programs. A hard drive is *disk* storage. When you add a 3.5" floppy drive to your system, you don't say you added "800K of memory". The Q Drive is just another disk drive as far as your computer cares, although the difference is immediately apparent to creatures of flesh and blood.

The Apple II's operating system, ProDOS, supports disk drives up to 32 megabytes in size. But even the smallest Q Drive exceeds this limit. Therefore, the Q Drive's physical size (e.g., 52 MB) is divided into as many *logical drives* (or *partitions)* as necessary, keeping each partition under 32 megabytes in size.

CHAPTER FOUR

Q DRIVE BASICS

The computer "sees" each partition as a separate drive, even though all the partitions are stored on the same *physical drive.* The 40 megabyte Q Drive is split into two 20 megabyte partitions. The 100 megabyte Q Drive is split into two 20 megabyte partitions and two 30 megabyte partitions.

You can change the Q Drive's partitioning with the Apple II High Speed SCSI Utilities (or the Advanced Disk Utilities), but this is usually unnecessary. Generally, the *only* reason you would want to partition a hard drive is to get around the 32-megabyte limit. Repartitioning the drive will erase everything already stored on it, so it's probably not something you want to do frequently.

The Q Drive's partitions are named /Q1 and /Q2. (This numbering scheme continues on larger drives, as high as necessary.) These partitions will show up in the IIGS Finder as small icons resembling the Q Drive. When running GS/OS programs, you can access an unlimited number of Q Drive partitions connected to a single Apple II High Speed SCSI Card.

When running ProDOS 8, /Q1 and /Q2 can be accessed as drives 1 and 2 of the slot the controller card is installed in (usually Slot 7). Any additional partitions are re-mapped to other slots, generally starting with Slot 4. (This

remapping feature is only present in ProDOS 2.0 or later, which is also a part of IIGS System 6. If you are using an earlier version of ProDOS, booted from a floppy disk or as part of IIGS System 5, you will only be able to use the first two partitions of your hard drive in 8-bit programs.)

The first partition is always booted when you boot the Q Drive. That's why /Q1 contains the system files necessary for starting up GS/OS or ProDOS 8, while other partitions are originally empty. You don't need system files on the other partitions; since you can't boot them, system files would only be wasting space there. You can store programs on other partitions and run them after booting from your first partition—just like keeping a boot disk in your first floppy drive and running programs from your second floppy drive.

If you have a Q Drive with more than two partitions and are using an older version of ProDOS 8 (or are using IIGS System 5), make sure you keep your ProDOS 8 programs and data files on the first two partitions. GS/OS programs (such as AppleWorks GS) and their data files can be on any partition.

Read on to learn about the ProDOS 8 operating system and pathnames. In many programs, you'll use pathnames to indicate exactly where a program or data file is on your Q Drive. You probably didn't need to concern yourself with this information when you only had floppy drives, but you'll find it extremely useful now that you've got a hard drive.

ProDOS (say "Pro Doss" to rhyme with "no boss") is the standard disk operating system for 8-bit Apple II computers (IIe, IIc, etc.), and for running 8-bit programs on a IIGS. (It's often called ProDOS 8 to distinguish it from ProDOS 16, an early IIGS operating system.) ProDOS is also the standard disk format used by all Apple IIs. Even if you have an Apple IIGS and use only GS/OS, your disks (including your Q Drive) are probably in "ProDOS format." This just means that the disk is laid out in a specific manner that ProDOS can recognize and access. (If you have IIGS System 6, you can also format disks in Macintosh format, known as HFS. You'll probably be using the ProDOS format more frequently, though.)

Under ProDOS, each disk has a unique name, called the *disk name* or *volume name.* ("Volume" is just a fancy name for "disk.") You can have more than one disk with the same name, as long as you don't put both disks in a drive at the same time. (For example, if you're using 5.25" disks, your AppleWorks startup and program disks are both named /APPLEWORKS, but only one can be in the drive at a time. If you name your AppleWorks data disk /APPLEWORKS as well, you'll have problems.)

ProDOS disk names must begin with a letter, which may be followed by any combination of letters, numbers, and periods, up to a total of fifteen characters. (All ProDOS names—disk, directory, and file—follow these rules.) Keep disk names simple and easy to remember.

CHAPTER FIVE

PRODOS DISKS & DIRECTORIES

ProDOS keeps track of what files are on a disk by placing an entry for each file in the disk's *main directory,* also called its *volume directory.* The volume directory has room for only 51 entries. Thus, it's possible to fill up the volume directory before actually using up all the storage on the disk. When you do, you'll get the same error message you'd get if you really had filled up the disk ("Disk Full").

SUBDIRECTORIES

But the 51-file limit has a loophole. Some or all of the files in a volume directory can be special files called *subdirectories.* Subdirectories can contain files, just like the volume directory. But unlike the volume directory, the number of files you can store in a subdirectory is unlimited. You can even put subdirectories *inside* another subdirectory. This is called *nesting* because the subdirectories sit "inside" each other like a set of kitchen bowls.

If you use a IIGS, you've already seen subdirectories—they look like little file folders in the Finder. Like folders on a real-life desktop, subdirectories on the Q Drive are used to hold related documents and files. You can use them to organize your data and, for that matter, your whole life.

How do you specify which folder you want to use to save and retrieve files? Traditionally, you do it by typing a *pathname.* A file's pathname is simply a list of the names of the directories the file is in. The names are separated by slashes. When the computer sees a pathname, it starts with the volume name and works its way down to folders inside folders, ending the pathname with the name of the file itself.

Let's try a simple example. If you had a file called MYFILE on your Q1 partition in a directory called AWFILES, the pathname of that file would be **/Q1/AWFILES/MYFILE**. This tells ProDOS to look in /Q1's volume directory for a subdirectory called AWFILES, and to look in that subdirectory for the file called MYFILE. If MYFILE was inside a folder called DOCUMENTS which was inside AWFILES, the pathname of the file would be **/Q1/AWFILES/DOCUMENTS/MYFILE**.

APPLEWORKS AND PATHNAMES

AppleWorks versions prior to 3.0 require you to type in the pathname of the subdirectory or directory *containing* the file you want to use, not the pathname of the file itself. This pathname becomes the "working directory" for all of the program's functions. When you ask AppleWorks to add a file to the desktop, the program displays a list of all the files in the working directory and allows you to select one.

Thus, to load /Q1/AWFILES/MYFILE into AppleWorks, first tell AppleWorks that you want to use a "ProDOS Path" as your data disk, then type in **/Q1/AWFILES** when asked for the pathname. A subsequent *Add Files To Desktop from Current Disk* would list all the AppleWorks files in /Q1/AWFILES, including MYFILE and any other files in that directory. Select MYFILE as usual to load it. To change to a different directory, choose "ProDOS Path" again and type another pathname.

If you tell AppleWorks to use "Drive 1 (Slot 7)" as your data disk, AppleWorks will only look at /Q1—the main directory of the drive—which may or may not contain any AppleWorks files. It certainly does not contain MYFILE, the file you're looking for. Most likely you'll get the misleading message "No AppleWorks Files On This Disk", which really means that there aren't any AppleWorks files in the *directory* AppleWorks was looking at.

AppleWorks 3.0 allows you to select "Drive 1 (Slot 7)" and get a list of subdirectories *and* AppleWorks files. You wouldn't see MYFILE, but you *would* see AWFILES, since AWFILES is a subdirectory in the main directory of /Q1. You would then select AWFILES to get a list of all the files it contains, including MYFILE. If you select a subdirectory and then realize it's not the one you wanted, you can type ♁-< and AppleWorks will "back out" to the previous (or *parent)* directory, /Q1 in this case. This "point-and-shoot" method of selecting pathnames is a *lot* easier than typing pathnames. Most of today's programs offer some equally easy-to-use method of selecting files from subdirectories.

Although you can use upper and lower case letters and spaces in AppleWorks filenames, outside of AppleWorks the names will appear all in uppercase, with periods substituted for spaces. AppleWorks keeps track

of the spaces and lower-case letters in a special part of the file's directory entry. (It isn't really important exactly how AppleWorks does this trick, but just in case you're interested, AppleWorks uses the file's auxiliary type to store an "uppercase/lowercase" flag for each character in the filename.)

Although ProDOS stores all filenames in upper case, you can type pathnames in upper or lower case, or in any combination. ProDOS generally doesn't care whether you use upper or lower case.

TREE DISPLAYS

EasyDrive, from Q Labs and *Copy II Plus*, from Central Point Software both use a tree-style display to allow you to select subdirectories. The disk's main directory appears in the upper left hand corner of the screen. To the right, listed vertically, are the subdirectories contained within the volume directory. To the right of each of these subdirectories are any subdirectories *they* contain, and so on. Here's a small sample.

```
/Q1---+----> SYSTEM ------+----> DESK.ACCS
      |                   +----> FONTS
      |                   +----> SYSTEM.SETUP
      +----> AWFILES
```

In this example, SYSTEM and AWFILES are both subdirectories of Q1. The SYSTEM subdirectory contains three more subdirectories (and possibly other files which aren't subdirectories): DESK.ACCS, FONTS, and SYSTEM.SETUP. Selecting a directory from this "tree" display makes that directory the "working directory."

By the way, in a tree display, the volume directory is also known as the "root." Directories that don't contain any other directories (such as FONTS in our example) are known as "leaves." It's a strange kind of tree that has its root at the top of the screen, so you might want to consider it a kind of "inverted" or "fallen" tree.

THE PREFIX

To avoid typing a file's entire pathname, you can use a ProDOS feature called the *prefix*. ProDOS uses the prefix to keep track of the current working directory. If you don't put a slash at the beginning of the pathname you type, ProDOS adds the prefix to figure out the file's *complete pathname*. (A pathname which starts with a slash is called a complete pathname because it lists every directory the file is in, starting with the disk it's on. A *partial pathname* doesn't start with a slash and lists only some of the directories the file is in.)

Let's try another example. If the prefix were set to /Q1/AWFILES/, typing **MYFILE** would be sufficient to specify /Q1/AWFILES/MYFILE. ProDOS notes that there's no slash at the beginning of "MYFILE" and adds the prefix. (That's an important point: even a simple filename is really a partial pathname.) If the prefix were simply "/Q1/", you'd have to type "AWFILES/MYFILE" to specify the same file. Once again, ProDOS would add the prefix to the beginning of what you typed to get the complete pathname.

If you *had* included a slash at the beginning of the above pathname (.e.g., "/AWFILES/MYFILE"), ProDOS wouldn't have used the prefix at all. Instead, it would have looked for a *disk* called /AWFILES. See how much difference a slash can make!

If the prefix were set to /Q1/SYSTEM, you'd have to type MYFILE's complete pathname to access it, because the prefix doesn't point in the same direction as the file you want to access. (It points to the same volume, but sidetracks into a different folder.) Same thing if the prefix were set to /Q2 or to some other disk entirely. *The prefix is only useful when it's the same as the first part of the complete pathname of the file you want to specify.*

Pathnames are unique identifiers for your files. ProDOS won't let you have two disks with the same name *online* (in drives) at the same time, nor will it allow you to have two files with the same name in the same directory. If you give a new file the same name as an existing one, the new file will take the place of the old one (you'll get a warning message first to make sure that's what you really want to do). Similarly, if you have two disks with the same name online, you may be asked to remove or rename one of them. Otherwise, ProDOS has the potential to become confused about which disk you mean.

Most programs that allow you to point to directories on your disks (such as AppleWorks 3.0 and *EasyDrive,* both of which we mentioned earlier) are actually changing the prefix for you as you point and shoot. This all happens behind the scenes, and you don't need to be aware of it for it to work. But some programs still make you type pathnames, and some programs that do have point-and-shoot file selection allow you to type a pathname manually if you like—which can be just the ticket when you know *exactly* where you want to be on your Q Drive and just want to get there with a minimum of hassle.

Pathnames are your friends! Become acquainted with them.

Sneeze is a public-domain program by Karl Bunker which provides you with the capability to navigate through your disks and directories, launch BASIC and SYS programs, print or display text and AppleWorks word processing files, display graphics files, and copy files. When the Q Drive is configured for an Apple IIe, Sneeze becomes the drive's startup program, meaning that you'll see it every time you boot up your computer—unless, of course, you've installed *EasyDrive* of *ProSel.*

When Sneeze appears, you'll see a list of the files on your Q Drive. The main keys you'll use for navigating through your Q Drive include:

Up/Down Arrows: Move the "light bar" up and down
Return: "Opens" the highlighted file
Escape: Closes the current directory and displays the parent directory
Tab: Change to a different disk (a list of your disks will be displayed)

The Return key is a "smart" command. That is, it looks to see what kind of file is highlighted and performs an appropriate action. If you press Return while a directory (folder) is highlighted, the folder will be opened and its contents displayed. In the case of a program (SYS or BAS), the program will be launched. (When you quit the program, you will return to Sneeze.) If the file is a text, AppleWorks word processing, or graphics file, it will be displayed on the screen.

CHAPTER SIX
USING SNEEZE

If, after running a BASIC program, you find yourself at the Applesoft] prompt, type BYE and press Return to get back to Sneeze.

You'll find Sneeze an invaluable aid for navigating through your Q Drive, even if you never use it for more than a launcher. For further instructions on using its more advanced features, please see the "Sneeze.Docs" file on your Q Drive. (Just highlight it and press Return to display it, or highlight it and press P to print it.)

The Apple IIGS uses a sophisticated operating system known as GS/OS (pronounced Gee Ess Oh Ess—just like it's spelled). It's considerably more flexible and sophisticated than ProDOS 8, while at the same time presenting a visual interface (the Finder desktop and icons) which is easier to use than text-based interfaces where you have to press keys and type things. You can run ProDOS 8 programs like AppleWorks too—GS/OS will automatically switch to ProDOS 8 when necessary.

The IIGS Finder displays the Q Drive as an icon. Finder icons look like the things they represent—for example, file folders for subdirectories, or sheets of paper for document files. Q Drive partitions are displayed as small boxes resembling the Q Drive, Each partition has its own icon. Double-clicking an icon (moving the mouse pointer on top of the icon and clicking the button twice in quick succession) "opens" the icon and displays a window representing the volume directory.

WORKING WITH WINDOWS

All Finder windows can be moved by dragging the Title Bar (position the mouse pointer on the bar at the top of the window, hold down the mouse button while moving the mouse, and release the mouse button). You can scroll the window horizontally and vertically to reveal more files than will fit on one screen by clicking on the Scroll Arrows. To scroll faster, click the gray areas of the scroll bars. To go even faster, drag the white box.

CHAPTER SEVEN

GS/OS AND THE FINDER

To close the window, click the box at the upper left corner of the window (the Close or "go away" box). To open the window to its maximum size, click the box at the upper right corner of the window (the Zoom box). (To restore the window to its original size, click the Zoom box again.) To resize the window to any arbitrary size, drag the box at the lower right of the window (the Resize or "grow" box).

Within the window, your files are displayed as icons. Clicking on an icon highlights it; double-clicking opens it. *Opening* means different things for different types of files. If the file is a GS/OS or ProDOS 8 program, opening the program means running it. If it's a folder (subdirectory), opening means displaying another window to show the contents of that folder. Opening a data file associated with a specific program (such as AppleWorks GS) often causes that program to be run and to open the file for use in that program, *if* the computer knows which program the file goes with. Attempting to open other files will result in the message "An application can't be found for this document."

If you have more than one window open, you can find the active window by looking for the one with stripes in its title bar. (Inactive windows have plain title bars, and don't have the Close and Zoom boxes.) It helps to

think of windows as sheets of paper on your desk. The top sheet—the active window—is the one you're working on. To make an inactive window the active window and bring it to the top of the stack, just click anywhere in that window.

BASIC FINDER TACTICS

To change how files are represented in the active window, pull down the View menu. (Position the mouse cursor on the word "View" at the top of the screen and hold it down.) You can view files by icon (the usual way), by small icon (useful if you have a lot of files in a folder), or arranged by name, date, type, or size (useful if you're looking for a specific file in a large group of files). To select one of these views, continue to hold down the mouse button as you move the pointer downward. When the desired view is selected, release the mouse button. The active window will change to the selected view.

To close all open windows and return to the basic "clean slate" Finder desktop, pull down the File menu and select "Close All".

In the Finder, you often manipulate files by selecting them and then choosing an operation from the pull-down menus. Select icons by clicking them once with the mouse. When an icon is selected, it appears black with a white outline. Selecting one icon unselects any other icons that are selected. To select a group of files, you can use "Select All" in the File pull-down menu, which selects all the icons in the active window. Hold down the Shift key while clicking icons to select and unselect individual icons while leaving any other selected icons alone.

To move an inactive window without making it active, just hold down the ♁ key while dragging it.

Look for keyboard equivalents for many pull-down menu commands, indicated by a ♁ symbol in the pull-down menu. Just hold down ♁ and type the letter to execute the command—for example, ♁-N for new folder. Command keys are real time-savers.

If you've been snooping around in the folders already on your Q Drive, you probably already noticed that GS/OS supports lower case letters in file names. These filenames will usually appear in uppercase if you're using a ProDOS 8 program. (For the technically curious—GS/OS does not use *exactly* the same method AppleWorks uses to display lower case letters, but it's similar.)

Now that you've mastered basic Finder tactics, here are step-by-step instructions for performing specific tasks in the Finder. Once you're familiar with the maneuvers below, you should have a good understanding of how the Finder works.

COPYING A FILE FROM ONE DISK TO ANOTHER

Start with all windows closed. Open the icon of the disk containing the file you want to copy. (If the file you want to copy is in a folder, open folder icons until you get to the appropriate folder.) Now drag the file icon onto the icon of the drive you're copying to. An outline or shadow of the

file you're dragging will follow the mouse pointer. When the drive icon is black, release the mouse button. (If you want to copy the file into a folder, open the icon of the drive you're copying to and find the folder, then drag the file icon onto the folder icon.) Although you moved the icon from one disk to another, the Finder makes a copy—you end up with two files with the same name and same icon, not one.

MOVING A FILE FROM ONE FOLDER TO ANOTHER

Follow the steps outlined above, except drag the file from a window to a folder *on the same drive.* The Finder moves the file to its new home instead of making a copy of it.

COPYING OR MOVING MULTIPLE FILES

Select the files you want to copy or move, either by holding down the Shift key while clicking each file or by dragging a rectangle around them. Then drag one of the files. The outlines of all the files will follow. Position the mouse pointer (not necessarily the file you're dragging) on top of the device or folder icon you wish to copy or move to.

BY THE WAY...

An icon and its window represent the same directory. So you can drag the files on top of the destination icon, *or* into the window associated with that icon. Naturally, you can't drag a folder into its own window, and dragging files from a window onto the icon associated with that window does nothing. Copying or moving a folder moves everything in that folder, including the folders inside it and all their contents.

DELETING FILES

Select the files you wish to remove, then drag them to the trash can icon at the lower right hand corner of the screen. When the trash can is highlighted, release the mouse button. The trash can will bulge. The files you put into the trash aren't actually deleted until the trash is emptied. The trash can is really just a place to put files which you are planning to delete. It's emptied automatically when you launch a program, when you use "Shut Down", or when you select "Empty Trash" on the Special menu.

You can open the trash can like any other icon if you decide you don't want to delete some of the files you put in it. Just select the items you don't want to delete and then select "Put Away" from the File menu.

RENAMING A FILE

Select the file (or volume icon) you wish to rename. (If it's already selected, unselect it by clicking elsewhere then re-select it.) Once the icon is highlighted, simply type the new name and press Return. If you decide you don't want to rename it, just click elsewhere on the desktop.

CREATING NEW FOLDERS

Select "New Folder" from the File menu. A folder called Untitled will be created in the active window. (You may need to scroll the window to find it.) It's highlighted and ready to name—just type the new name as if you were renaming an existing folder.

EJECTING DISKS

You can eject disks in the usual way with the eject button on the 3.5" drive. If you do this, the Finder will "dim" the disk icon. The Finder is now keeping track of the disk and will tell you to put the disk back in if you try to use it. If you only have one 3.5" drive, this helps you copy files to and from a disk that isn't in the drive.

To completely remove a disk from the Finder desktop, drag the disk icon to the trash can. (Don't worry, you're not "trashing" the disk!) The Finder will eject it. (If you've already ejected the disk manually, you can drag the dimmed icon to the trash to make the Finder forget about it.)

A HANDY TRICK

You can drag frequently-used files and programs out of their windows and onto the desktop. These icons will remain on the desktop even when you close the windows they were in. You can open these icons the same way you'd open any other icons, but you won't have to open all the folders to get to them.

FORMATTING DISKS

To format a blank disk for use by the IIGS, just insert the disk. The IIGS will ask you whether you want to initialize or eject the blank disk—select "Initialize." Enter a name for the new disk in the next dialog, then click "OK" to go ahead and initialize the disk.

To reformat an existing disk, click the disk, pull down the Special menu, and select "Initialize disk" (for a full reformat) or "Erase disk" (for a quick reformat). We suggest using "Initialize disk".

SHUTTING DOWN

When you're through using your IIGS, select "Shut Down" from the Special menu. In the window which appears, make sure "Turn off system power" is selected, and click OK. The IIGS will empty the trash, save the positions of all Finder windows, eject your 3.5" disks, and clean up the IIGS memory. Then the Finder will tell you it's safe to turn off your IIGS's power.

You don't always need to shut down in the Finder. In most cases you can turn off the computer in the middle of whatever program you're running. Quitting the program you're using and shutting down the IIGS just insures that you've remembered to save your work and didn't leave any disks in your drives.

GETTING ORGANIZED

Since the Q Drive has a much larger capacity than a floppy drive, it can be difficult to remember where you put everything. It's best to think of a logical scheme before you actually store anything on your Q Drive. Here are some tips: some obvious, some not.

Keep the names of subdirectories concise but clear; you never want to have to bang your head into the wall trying to remember the cryptic way you abbreviated "AppleWorks". The only thing worse is trying to remember the *half-dozen* cryptic ways you abbreviated "AppleWorks", so be consistent too. Use periods to separate words in filenames, e.g., MY.REPORT. Make up (and use) a standard set of abbreviations for common words—e.g., RPT for report, ADR for address, and so forth.

One common organizational scheme is to create a subdirectory for each program you install on your Q Drive. Then, within that subdirectory, create additional subdirectories for the different types of files you will be using with that program. For example, you might create a WORKS subdirectory to hold your AppleWorks program. Within that directory, you might create additional directories called LETTERS, BUDGET, DATABASE, and so on for the different categories of files you use in AppleWorks. You'll find it easy to remember that the pathname to your December, 1990 budget file is /Q1/WORKS/BUDGET/DEC90.

CHAPTER EIGHT
HARD DRIVE MANAGEMENT

If you have a lot of one type of program, make a directory for the category, then make another directory inside it for each program. For example, create a GAMES subdirectory, then create a subdirectory for each game within it. You can use any ProDOS utility program (such as the Apple System Utilities on the Q Drive), the IIGS Finder, or even programs like AppleWorks to create subdirectories.

When installing a program onto your Q Drive, always be sure to read the manual to see if there are any special considerations for hard drive installation. Some older or copy-protected software may not be hard drive installable, or may require special handling. See the next chapter for more information on installing programs.

A hard drive manager can help keep track of your subdirectories. Most have an Index or Find function which makes it easy to locate a file in a hurry. Some also have features to automate installing programs on your Q Drive, along with utilities for hard drive maintenance and troubleshooting. We suggest Q Labs' *EasyDrive* for IIe users, and the *Salvation—Supreme* or *ProSel 16* packages for IIGS users.

BACKUPS

It's extremely unlikely that you'll have a problem with your Q Drive, and it needs very little maintenance. Errors don't crop up any more frequently on the Q Drive than on floppies, but you've got more to lose if something goes wrong. Thus, regular backups are a necessity.

You can perform backups manually by copying your data files to floppies (you don't need to copy your program files because you already have backups of them—the original program disks). But this gets frustrating if you have many data files. That's where the *Backup II* utility, included on the disks that came with your SCSI card, comes in. It'll cram as much data as possible onto your floppy disks, making backing up a little less painful. IIGS System 6 also includes a backup program called Archiver. More powerful backup programs are one component of a good hard drive management system.

How often should you back up? It depends on how much you use your computer and how important your files are to you. You might want to back up your most vital data daily, or even every time you save (by saving to floppy as well as to the Q Drive). Full hard drive backups can be performed weekly or monthly, though we wouldn't recommend waiting longer than that. How long would it take you to recreate all the work saved on your Q Drive if you lost it all? *Think about it.*

OTHER MAINTENANCE

To guard against errors that can sneak up on you then suddenly cause catastrophe, you should verify your Q Drive at least weekly. A full disk verify (Verify under the Disk menu in the Finder, for example) will read every single block on your Q Drive to assure that they're all readable. A file verify (Validate under the File menu in Finder) of all the files on the drive will ensure that there are no ProDOS directory structure errors that could cause data loss in the future. (These errors can arise due to occasional software or hardware "glitches.") Most hard drive managers include a utility specifically designed to detect and correct many of these types of errors before they become a problem.

You should also perform optimization, also known as de-fragmentation, on a regular basis. As you delete files from your Q Drive, the blocks they used are made available for re-use for other files. As you save new files, they will be placed wherever there's room. This can cause the blocks of the file to be widely separated physically on the drive, slowing access to the file because of excessive head movement. The problem can be especially bad when you add extra files to a directory, because ProDOS will add a block to the directory itself wherever there's room, potentially slowing access to *all* the files in the directory.

Most hard drive managers have an optimizer utility which reorganizes the files on the hard drive so that all the blocks for each file are next to each other. This can dramatically improve access speed if your Q Drive is badly fragmented.

This chapter describes the installation of programs from floppy disks to the Q Drive. We've included a set of generic instructions that work with most programs.

AppleWorks and AppleWorks GS are two of the most popular Apple II programs available, so it's no surprise that lots of people want to install one or the other on their Q Drive. Judging by the number of calls our technical support department receives, though, installing these two programs is not quite as simple as it might seem. The plethora of AppleWorks add-ons available (*TimeOut,* etc.) complicates installation. AppleWorks GS isn't any better—the instructions in its manual for hard drive installation aren't quite correct. So here's some help.

GENERIC INSTALLATION INSTRUCTIONS

Most unprotected ProDOS and GS/OS software can be installed on the Q Drive, including most current business, productivity, and utility programs. Many games and educational programs are copy-protected, or run under older operating systems such as DOS 3.3. These programs usually can't be installed on the Q Drive. (DOS 3.3 programs can sometimes be installed by using Glen Bredon's *DOS Master,* but it's usually not worth the bother.)

CHAPTER NINE
INSTALLING PROGRAMS

Start with the program's manual. Some manuals specifically state that the program is hard-drive installable. A few manuals even have specific instructions for installing the program. A very few programs include special software which will do the installation for you. If a program's manual has installation instructions, *follow them.* If a program comes with hard drive installation software or a script, *use it.*

Otherwise, try the following two tests to determine whether a program will run on your Q Drive or not. (These tests aren't conclusive—it's possible that a program could pass both tests but still not work on the Q Drive—but such programs are rare.)

☞ MAKE A COPY FIRST

Make a copy of the original program disk using a utility program like the Apple System Utilities, *Copy II Plus, FastCopy,* or the IIGS Finder. (Don't use a program which can copy protected disks, just use a regular disk copy program. If you use *Copy II Plus,* don't use the Bit Copy option.) If you get an error message during the copy operation, the program may be copy-protected and not hard-drive installable. (It may also indicate that you have a bad disk, but that's antoher topic.)

If you get no errors during the copy operation, but the copy of the disk doesn't boot or otherwise fails to work correctly, this may also be a sign that the disk is copy-protected.

If the copy works, but asks you to insert the original program disk at some point, you may have encountered a program with what's known as *key-disk protection.* The original program disk contains an electronic "signature" which is not duplicated when the disk is copied by normal means. The duplicate disk notices that this "signature" is missing and asks for the original disk to verify that you actually own the program. In most cases, key-disk protected programs can be installed on the Q Drive, but you'll need to keep the original disk handy to run it.

☞ DOES IT RUN WITH THE Q DRIVE?

For this test, boot the Q Drive as if you were going to use it normally. Now put the program you're testing into any disk drive. Use the Mini Selector, *TreeSurgeon,* or the Finder to look at the drive. If you can't read the disk, it's probably a DOS 3.3 or Pascal disk and can't be installed on the Q Drive.

If you have a IIGS, try launching the program from its original disk. Don't boot the disk, but boot the Q Drive first and run the startup program, usually a program whose name ends in ".SYSTEM" or ".SYS16". This test makes sure that the program is compatible with the version of GS/OS installed on the Q Drive. (A few older IIGS programs, such as *PaintWorks Gold* and *Deluxe Paint II,* were written before the days of GS/OS and may not work with the latest versions.)

Assuming that the program has passed these two tests, you can try installing it on your Q Drive. (Remember, it still might not work, but we've now know it's at least worth a try.)

1 CREATE A FOLDER

Create a subdirectory to put the program into, keeping in mind the general organization of your Q Drive. For example, if you've got a subdirectory for games, and you're installing a game, create a new folder inside the games folder for the new game.

2 COPY THE PROGRAM

Copy the program files into their subdirectory. *Do* copy program files, especially files ending in ".SYSTEM" or ".SYS16". *Don't* copy the System folder, the Appletalk folder, the ProDOS file, the BASIC.System file, or any other system files which already exist on your Q Drive. Since your Q Drive already contains system software, duplicate system software only wastes space. You may or may not want to copy the program's sample data files, if any are included, onto your Q Drive.

3 COPY THE ICONS

If you have a IIGS and use the Finder, look for an Icons folder on the disk. Copy any icon files from this folder into the Icons folder on your Q Drive if you want the program's unique icons to appear in the Finder.

MULTIPLE DISK PROGRAMS

If the program you're installing comes on more than one disk, copy the files from the second and subsequent disks into the same folder. Again, don't bother copying ProDOS and other system files.

IF IT STILL DOESN'T WORK...

Some programmers (especially programmers of games) take the easy way out by "hard-coding" pathnames. This means that the program expects to find its files on a disk of a certain name and won't run otherwise. They don't do this because they want to keep you from putting the program on your Q Drive; they're just lazy. Other programs can be installed on the hard drive but may require you to keep your data on a floppy disk—or can store data on the hard drive but must be run from floppy disks.

ALL HOPE IS NOT LOST

If you can't install a program on your Q Drive for whatever reason, whether copy-protection, or a system incompatibility, or a lazy programmer, here are a few other things you can try.

- *Copy II Plus.* This popular utility program can make backup copies of many copy-protected programs. These copies are usually as protected as the original. But *Copy II Plus* does know how to remove the copy protection from certain programs. You make a copy of your original using one of these parameters, and the duplicate is then hard-drive installable. Follow the generic installation instructions after making an unprotected duplicate.

- Patches. A *patch* is a modification you apply to a program to change the way it operates. Applying patches is a fairly technical process, so we won't go into it here. But there are patches available to allow *PaintWorks Gold* to run under newer versions of GS/OS, to remove the "color wheel" copy-protection from *Tunnels of Armageddon,* and more. Your local user group may have more information on these patches and how to apply them. If you have a modem, online services such as CompuServe, GEnie, and America Online also have collections of patches.

INSTALLING APPLEWORKS 3.0

STEP 1—COPY APPLEWORKS TO THE Q DRIVE

Create a new folder on Q1 and call it **APPLEWORKS**. Now copy the AppleWorks program files from the original program disk into the new APPLEWORKS folder. Copy APLWORKS.SYSTEM, all the files whose names begin with SEG, and the two dictionary files. Don't copy PRODOS, FASTCOPY, or the tutorial files—you don't need them. If your AppleWorks is on 5.25" disks, be sure to copy files from all four disk sides. (SEG.AW appears on three of the four 5.25" disk sides to reduce the need to swap disks. You only need to copy it once.)

STEP 2—INSTALL TIMEOUT

If you are using any of Beagle Bros' *TimeOut* programs (or their *Outliner),* install them on the copy of AppleWorks you just put on your Q Drive. See the manual that came with your *TimeOut* applications for more information. Put your TimeOut applications in the same directory as your AppleWorks program files, and tell TimeOut to look on the AppleWorks startup disk for TimeOut applications.

STEP 3—INSTALL *SUPERPATCH*

If you have *SuperPatch* from Q Labs and want to install any of its patches into AppleWorks, do that now. *SuperPatch* will need to know where your AppleWorks program is. Tell it **/Q1/APPLEWORKS** and install the patches you like.

STEP 4—INSTALL *APPLEWORKS COMPANION*

If you have Beagle Bros' *AppleWorks 3.0 Companion* or *Companion Plus* and want to install any of its patches, do that last, following the instructions in the *Companion* manual.

STEP 5—CONFIGURE APPLEWORKS

All you need to do now is configure AppleWorks to look on your Q Drive for its data files. Launch the file APLWORKS.SYSTEM to get to the AppleWorks menu. Choose "Other Activities", then "Select Standard Settings for AppleWorks", then "Select Standard Location of Data Disk". Choose your Q Drive from the list of disk devices shown (usually it will be "Drive 1 (Slot 7)") The "Select Standard Settings" menu will reappear. Choose "Select Standard Location of Data Disk" again, then choose "ProDOS Directory" to see a list of subdirectories on the Q Drive. Choose "APPLEWORKS" and press Return. Now you should see the folders you created for your data files. Press ♁-Return, then press Escape repeatedly to get back to the main menu.

LAUNCHING APPLEWORKS

If you have a hard drive management system, add AppleWorks to its menu for easy access. If you use *EasyDrive,* use the "EasyAdd" feature. If you use *Salvation—Supreme,* click on a blank button, answer "Yes" to check the button's programming, and point to the AppleWorks startup file in the AppleWorks directory. If you use *ProSel,* use the screen editor to select an empty entry and use the automatic mode to find AppleWorks on Q1. If you're using *TimeOut UltraMacros,* choose ULTRA.SYSTEM as the file to be started. If you're not using *UltraMacros,* choose APLWORKS.SYSTEM.

If you don't use a hard drive manager, use the Mini Launcher or the Finder to run ULTRA.SYSTEM or APLWORKS.SYSTEM as appropriate.

INSTALLING APPLEWORKS GS

To make installing AppleWorks GS easier, we've included an installation script on the Q Drive specifically for this task. If you have just started up the Q Drive, you will probably see the Install.AWGS icon on your desktop. If not, double-click the Install.Soft folder in the Q1 window, then double-click the Install.AWGS application icon. Click "AppleWorks GS" on the left side of the screen, then click the Install button. The Installer will ask you to insert your AppleWorks GS (version 1.1) disks and will copy the necessary files to the Q Drive. What could be easier?

Note: The AppleWorks GS Installation Script assumes that you are using Switch Hitter and have both System 5 and System 6 installed on the Q Drive, and furthermore that you are booting into System 5. If you're booting into System 6, use Switch Hitter to change to System 5 and restart before installing. (See ***Appendix C****.) If you don't have both System 5 and System 6 (and Switch Hitter) on your drive, refresh the System Software before attempting installation. (See* ***Chapter 11****.)*

LAUNCHING APPLEWORKS GS

If you use the Finder, open the Q Drive's icon and double-click the AppleWorks.GS file to launch it. (You may find it more convenient to drag the AppleWorks.GS file out of the Q Drive's window onto the desktop and leave it there. That way you won't have to open your Q Drive icon every time you want to run AppleWorks GS.)

You can also launch AppleWorks GS by double-clicking any AppleWorks GS document. AppleWorks GS will run and the file will be opened automatically. You can even open a group of files this way by selecting the desired files in the Finder (with shift-click or by dragging a rectangle around them) then double-clicking one.

If you have a hard drive management system, add AppleWorks GS to its menu for easy access. If you use *EasyDrive,* use the "EasyAdd" feature. If you use *Salvation—Supreme,* click on a blank button, answer "Yes" to check the button's programming, and point to the AWGS.SYS16 file on Q1. If you use *ProSel 16,* use the screen editor's automatic mode to find AppleWorks GS on Q1.

LOCATING THE DICTIONARIES

The first time you spell-check a word-processing document after installing AppleWorks GS on your Q Drive, you may need to tell it where your dictionary files are. After you point to the dictionary files, AppleWorks GS will remember where they are and shouldn't ask you to locate them again.

ADDING MORE STORAGE

We hope the Q Drive satisfies your storage needs for years to come, but we realize that you may need even more storage in the future. Adding another Q Drive (or another type of SCSI storage device) to the SCSI chain is the easiest way to add more disk space to your system. You won't need another interface card or use up another slot. Just plug the new drive into the back of the Q Drive.

You can't have two drives with the same SCSI ID in the same chain. Most drives, including the Q Drive, come configured for SCSI ID 6, although, on the Q Drive, this can be changed with an external switch. Some drives cannot easily have their SCSI ID changed except by a qualified technician. The SCSI ID, by the way, is *independent* of the order the drives are connected together in the SCSI chain.

The computer will boot the drive with the highest SCSI ID, usually 6. You will probably want to keep your original drive at the highest ID and set the new drive to a lower ID, so that you can continue booting as you always have use the new drive only for data and program storage.

By the way—the computer itself is usually SCSI ID 7, unless you've changed it. You should never need to change the computer's SCSI ID. See the Apple II High Speed SCSI Card manual for more details.

CHAPTER TEN
MOVING INTO THE FUTURE

The last drive in the SCSI chain *must* be terminated. All other drives must *not* be terminated. Some models of Q Drive are terminated by external "resistor packs" that connect to the unused connector on the back of the drive. Others have the resistors inside the drive itself. (You can tell which sort you have by looking at your Q Drive's serial number. If it ends in the letter "T", your drive is internally terminated.)

If your drive is internally terminated, you should make sure it's at the end of the chain, or remove the terminators from the hard drive mechanism. To make this simpler, internally-terminated Q Drives have an easily removable "window" on the bottom of the case. Open the window and pull the terminator resistors (usually slim black or yellow parts about an inch long) with tweezers or needle-nose pliers.

Don't forget that the computer can't handle multiple disks with the same name, so you'll need to rename the new Q Drive's partitions. On a IIGS, the Finder will alert you to this situation and allow you to change the name the first time you boot after adding a second Q Drive.

MOVING TO ANOTHER COMPUTER?

Moving the Q Drive to another machine (whether a future Apple II or a totally different system like the Macintosh or the IBM PC) is simple. Some computers will need a SCSI interface; others, like most Macintosh models, have a built-in SCSI port. All you need to do is reformat the drive on the new computer, install an operating system and your programs, and begin using it. The exact details for doing this will vary, depending on which computer system you move to.

If you're moving your Q Drive to a Macintosh, call us and ask for a Q Drive Macintosh Accessory Pack, which includes the software you need to reformat the Q Drive for use on the Macintosh, along with a new manual. It's free, except for a nominal shipping & handling charge.

Or, for a $25 service fee, plus applicable shipping charges, we'll reformat the drive for you and install the same Macintosh software you'd get if you'd bought a Macintosh drive from us in the first place, including the latest System Software and 30 MB of freeware and shareware. The same offer is available to users moving IIe drives to the IIGS.

The Q Drive is shipped ready to use. At some point in the future, however, you may encounter the need to reformat or repartition the drive. (See the Apple II High Speed SCSI Card manual for detailed, step-by-step instructions for performing this procedure.) If you want to be able to boot the drive afterward, you will need to install appropriate system software.

This chapter also contains instructions for restoring your System Software to a "pristine" condition, in case it becomes corrupted or is overwritten by an improperly-written installer. (This can occasionally happen when using old installers with System 6.)

WARNING

Reformatting or repartitioning your Q Drive will erase everything on the drive, including the free software we've included on the /Q2 partition. Copy important information to floppies or use the *Backup II* utility. (We can sell you a set of disks containing a backup of the free software if you forgot to back it up and erase something you wanted to keep.)

Once you have the drive partitioned the way you like it, boot up the Apple System Utilities, *Copy II Plus*, or the Q Drive IIGS System Disk. All of these provide ways to rename your partitions. (The default names are likely to be rather generic.) Name the partitions /Q1, /Q2, etc. Now you're ready to reinstall the system software.

CHAPTER ELEVEN

INSTALLING SYSTEM SOFTWARE

INSTALLING IIE SYSTEM SOFTWARE

Boot the Q Drive IIe System Disk. The Sneeze screen will appear. Use the arrow keys to select COPY.SYSTEM, then press Return. The IIe system files will be copied to /Q1 automatically. (Your first Q Drive partition *must* be named /Q1 for this procedure to work.) After this procedure is complete, the Q Drive contains ProDOS, BASIC.SYSTEM, and Sneeze.

INSTALLING IIGS SYSTEM 5

1 BOOT THE SYSTEM DISK

Hold down the Option key while turning on the computer. Press 1 to enter the Control Panel, select Slots, and change the Startup Slot to 5. Press Return to save your changes on the Slots screen. Put the Q Drive IIGS System Disk in your first 3.5" drive. Press Escape, then Return, to exit the Control Panel. The System Disk will begin booting. Await the Finder.

2 LAUNCH THE INSTALLER

If you have two 3.5" disk drives, insert the System Tools disk in your second drive; otherwise, eject the System Disk and put the System Tools disk in that drive. Double-click the System Tools icon to open its window, then double-click the Installer icon. If you have one 3.5" drive, you'll need to switch disks a few times before the Installer appears.

3 INSTALL SYSTEM SOFTWARE

Click the "Disk" button (in the lower right region of the Installer screen) repeatedly until the "Disk To Update" (upper left region of the Installer screen) reads "Q1". Scroll through the list of system updates in the left-hand window until you find "Latest System Files". Click this item once, then click the "Install" button. Installation will begin. If you have only one 3.5" drive, you'll need to switch disks a few times.

4 ADDITIONAL INSTALLATION

After installing the Latest System Files, you will want to install other system software tools—a driver for your SCSI Hard Drive, for example, and drivers for your printer, 5.25" drives, and so on. "Additional Fonts" is also a good idea. Install the MIDI drivers if you plan to use the *SoundSmith* program included in the free software. The ACE tools are used by some sound programs. (Other than these items, if you don't know what it's for, you probably don't need it.) You can install any of these updates by clicking them once, then clicking "Install".

5 QUIT THE INSTALLER

Press ⌘-Q to quit the Installer. You'll return to the familiar Finder.

6 REBOOT THE IIGS

Enter the Desk Accessory menu with Control-⌘-Escape and select Control Panel. Select Slots and change the Startup Slot back to the slot which contains your SCSI card. Press Return to save your changes, then restart the IIGS with Control-⌘-Reset. If all went as planned, you'll be greeted by the GS/OS thermometer screen and the Finder. If you want to install *Salvation—Supreme* or *ProSel 16,* now's the time to do it.

INSTALLING IIGS SYSTEM 6

Remember, System 6 disks are not included with the Q Drive. If you followed our advice, though, you unpacked them from the Disks archive immediately after connecting your Q Drive for the first time.

1 BOOT THE INSTALL DISK

Hold down the Option key while turning on the computer. Press 1 to enter the Control Panel, select Slots, and change the Startup Slot to 5. Press Return to save your changes on the Slots screen. Put the System 6 Install Disk in your first 3.5" drive. Press Escape, then Return, to exit the Control Panel. The Install disk will begin booting. In a moment, the IIGS Installer screen will appear.

2 INSTALL SYSTEM SOFTWARE

Click the "Disk" button repeatedly until the "Disk To Update" reads "Q1". Then click the "Easy Update" button. Installation will begin. You'll need to switch disks several times.

3 ADDITIONAL INSTALLATION

After installing the Latest System Files, you might want to install other system software tools. To do this, click the "Customize" button and select the updates you want to install. You can select multiple updates by holding down the ♁ key while clicking the second and subsequent items. We suggest considering the Archiver, Teach, and SynthLab applications; the Sound control panel; the Find File and Calculator desk accessories; drivers for any attached disk drives and printers; all FSTs; and all fonts.

Do *not* use the "System 6: Hard Drive" option on the customized installation screen. This option installs the Universal Access suite, a set of tools for physically handicapped users, along with the rest of System 6. These tools have been found to conflict with several popular programs, so we do not recommend them.

4 REBOOT THE IIGS

Enter the Desk Accessory menu with Control-♁-Escape and select Control Panel. Select Slots and change the Startup Slot back to the slot which contains your SCSI card. Press Return to save your changes, then restart the IIGS with Control-♁-Reset. If all went as planned, you'll be greeted by the GS/OS thermometer screen and the Finder. If you want to install *Salvation—Supreme* or *ProSel 16,* now's the time to do it.

INSTALLING BOTH SYSTEM 5 & SYSTEM 6

The Switch Hitter utility allows you to install both System 5 and System 6 on your hard drive. A copy of the Switch Hitter disk is in the Disks archive, which we suggested that you unpack immediately.

First, install System 5 using the above procedure. Then boot the Switch Hitter disk and allow it to move the System 5 files "out of the way" so that installing System 6 doesn't erase System 5. Then install System 6. Finally, boot the Switch Hitter disk once more. This time, it will notice that both System 5 and System 6 are on the drive and offer to install Switch Hitter. Allow it to do so, and you're set.

See **Appendix C** for more information on Switch Hitter's options.

REFRESHING SYSTEM SOFTWARE

As we mentioned at the beginning of the chapter, it is possible for the System Software on the Q Drive to become corrupted or otherwise non-functional. If this happens, the rest of your drive, and the programs and data on it, is probably still OK. You just need fresh System Software. To make it easier to refresh your System Software, we include a "spare" copy right on the Q Drive. If your Q Drive ever fails to boot, or boots part-way and then crashes, and you can't find any other cause, try this procedure.

1 BOOT THE SYSTEM DISK

Hold down the Option key while turning on the computer. Press 1 to enter the Control Panel, select Slots, and change the Startup Slot to 5. Press Return to save your changes on the Slots screen. Put the Q Drive IIGS System Disk in your first 3.5" drive. Press Escape, then Return, to exit the Control Panel. The System Disk will begin booting. Await the Finder.

2 MAKE SURE THE SPARE COPY IS STILL THERE

Pull down the Finder's Special menu and choose "Preferences." Make sure the "Show hidden files" checkbox is turned on. Then click the OK button.

Double-click the Q1 icon. Scroll through the window and verify that the file "Spare.SEA" is there. (This file is normally invisible to the Finder.) If this file is not present, *do not proceed with the rest of these instructions.*

3 DELETE EXISTING SYSTEM SOFTWARE

To return to a clean slate, we'll erase *all* the System Software that's already on the Q Drive. (This includes any additional fonts, desk accessories, and control panels you may have installed, so make sure you have backup copies of these items.) Drag these files or folders from the Q1 window to the Trash: System, System5, System6, Basic.System, Basic.System5, Basic.System6, Basic.Launcher, Basic.Launcher5, Icons, Icons5, and Icons6. (Your Q Drive may not have all these files. Just trash the ones you have.) Then select "Empty Trash" from the Special menu.

4 RESTORE THE SYSTEM SOFTWARE

Double-click the "Spare.SEA" file. This is a GS ShrinkIt self-extracting archive (SEA). When you are asked to specify the destination, simply press Return to tell the computer to begin extracting into Q1.

If, during the extraction process, the computer tells you about a duplicate or existing file and asks you what to do, click "Overwrite."

When the archive has finished extracting, you'll be returned to the Finder. Change the Control Panel startup slot back to its normal value and restart.

BY THE WAY

If you're comfortable with the Q Drive (and have unpacked the System 6 disks from the Disks archive) and don't feel the need to keep the Spare system software on hand, you can delete the Spare.SEA file. Just instruct the Finder to display hidden files (as in Step 2 above), then drag the Spare.SEA file to the trash. You'll free up about two megabytes of storage.

PRODOS ERROR CODES

ProDOS error codes are given in hexadecimal and decimal notation. Hexadecimal notation is usually preceded by a dollar sign.

HEX	DEC.	ERROR
$27	39	I/O Error—Bad disk media or no disk in drive
$28	40	No disk drive connected to specified slot and drive
$2B	43	Disk is write-protected—can't save onto it
$40	64	Invalid pathname—too long, or illegal characters
$44	68	One or more of the subdirectories in the pathname does not exist
$45	69	The volume specified in the pathname is not online
$46	70	The file specified by the pathname does not exist
$47	71	A file with that name already exists in the directory
$48	72	The disk is full
$49	73	The volume directory is full (already contains 51 files)
$4B	75	This file is a GS/OS file or is damaged
$4E	78	File locked—cannot be deleted, renamed, or written
$51	81	Invalid file count in directory—disk may be damaged
$52	82	The disk is not a ProDOS disk or may be damaged
$57	87	Two volumes with the same name are online
$5A	90	Volume bitmap damaged

APPENDIX A

PRODOS & GS/OS ERROR CODES

APPLESOFT ERROR CODES

You may encounter some of the following error codes when running Applesoft BASIC programs.

CODE	ERROR
3	No device connected (see ProDOS error 40)
4	Disk write-protected (see ProDOS error 43)
6	Path not found (see ProDOS error 68, 69, or 70)
8	I/O Error (see ProDOS error 39, 75, 81, 82, or 90)
9	Disk Full (see ProDOS error 72 or 73)
10	File locked (see ProDOS error 78)
19	Duplicate filename (see ProDOS error 71)
21	Files still open at program end (type CLOSE and hit Return)

IIGS ERROR CODES

GS/OS and the IIGS Toolbox use many of the same error codes as ProDOS, except that they are usually displayed with two leading zeroes, in the format $00xx (for example, $0027 for I/O Error). Additional error codes you may see while using IIGS-specific programs include:

CODE	ERROR
$0201	Not enough free memory
$0308	Heartbeat queue damaged (Possible cause: ProDOS 8 startup program conflict with GS/OS thermometer.)
$0911	Can't synchronize with system (Possible cause: heat-related keyboard controller error, usually indicates you need a cooling fan)

Other error codes are possible, and denote specific IIGS toolbox or GS/OS errors which won't mean much to you as a user, but usually indicate that the program you are using is not handling errors gracefully or is performing operations that are incompatible with the current operating system. Contact the publisher of the software in which you encountered the error for more information.

Your Q Drive comes with about fifteen megabytes of public domain and shareware programs. *Public domain* software is software to which the programmer has given up all duplication rights; it belongs to everyone and can be distributed freely. *Freeware,* a similar category, gives the author slightly more control: the software can be given away, but the author still owns the copyright and can stipulate conditions on its distribution. Shareware is software that can be distributed freely, but must be paid for if you find it useful. *If you do find a shareware program useful, pay for it, and support the programmer.* Some demos of commercial programs are also included; most of these are limited in some way to allow you to get a feel for the way the program works without actually allowing you to do much useful work. All this software is provided as-is. We cannot provide technical support for any of it, nor can we guarantee its quality.

While we feel the programs are worthwhile (and, in fact, we added them to the drive at the request of our customers), you may disagree. In that case, the files easily be deleted using any disk utility program, such as the Finder, Copy II Plus, or the Apple System Utilities.

Some of the free programs have no documentation at all. Other programs provide instructions inside the program itself. Some programs have documentation in a disk file. A few even provide a program which will print a "manual" on your printer. A couple have instructions in French!

APPENDIX B

THE FREE SOFTWARE

Some files (such as the pictures, songs, and sounds) must be loaded into appropriate programs in order to use them. Use *SHRConvert* or your favorite paint program to display super-hi-res pictures; use View.Sys16 to view 3200-color pictures. Use *AudioZap* or *Sound Shop* to play back sampled sounds. Use *SoundSmith* to load and play music files. All these programs are included.

We also included programs in archive form. These programs won't work on a hard drive and must be run from a 3.5" disk. Double-click the Disks.SHK archive file to open the archive with GS ShrinkIt, then choose the disks you want to unpack and click Extract. Once you've unpacked the disks, you can delete the archive.

We hope you enjoy the software. If you know of any really good programs that we overlooked, let us know!

Switch Hitter allows you to install both Apple IIGS System 6 and System 5 on the same hard drive, and to switch between them with a few simple keystrokes. (It also allows you to adjust your IIGS's Startup Slot and System Speed and to start up programs loaded in your 3.5" or 5.25" drives from the same screen.)

If you bought one of our Q Drives for your IIGS, it came with Switch Hitter (and System 5 and System 6) already installed, so you can begin using it immediately. We also included the Switch Hitter disk in the Disks.SHK archive file. We suggest you unpack this disk to an actual 3.5" floppy disk so you'll have a backup, just in case you need to re-install later. (Instructions for this operation can be found at the end of Chapter 2.)

After the Q Drive's initial configuration, it is set up to boot into System 5, because not everyone has enough memory to run System 6. If you want the Q Drive to boot into System 6 and have at least 2 megabytes of RAM, hold down the Control key while turning on your computer until the Switch Hitter screen appears. Then press the 6 key, wait a few seconds until Switch Hitter has made the changeover to System 6, and press R to restart.

You only need to do this when you want to switch System Software versions, not each time you start up the computer.

APPENDIX C
USING SWITCH HITTER

USING SWITCH HITTER

Switch Hitter can be activated in two ways. First, you can start up your system as usual and double-click the Switch.Hitter icon on your hard drive. Or second, you can hold down the Control key when turning on the computer, or continue holding down the Control key after pressing ⌘-Control-Reset. This second method has the advantage of being much faster than waiting for the entire System Software to load if you want to switch to the other System version (or perform some other function) at boot time.

Once Switch Hitter is activated, a screen appears that shows you the current System version, the current IIGS speed, and the current Startup Slot. To change the System Software version, press the **5 or 6** key. In a few seconds, Switch Hitter's screen will change to indicate that your hard drive will now start up into the System Software you specified.

You can also adjust the IIGS's System Speed to Fast or Normal by pressing the **F or N** keys. This is a temporary adjustment and is not made permanent in the IIGS Control Panel; when you enter the Control Panel or restart the computer, the speed will be set back to the Control Panel setting. This setting is most useful in conjunction with the Shift-5 and Shift-6 options; usually you won't want to slow your IIGS down.

Adjust the IIGS's Startup Slot with the **left and right arrow** keys. Changing the Startup Slot here is the same as changing it in the Control Panel and is a permanent change (as opposed to using Shift-5 or Shift 6 as below).

Press the **P** key to start up the computer into ProDOS 8, completely bypassing the usual IIGS System Software. ProDOS will load and execute the first file it finds on your hard drive whose name ends with the word "System." In most cases this will be BASIC.System (the Applesoft BASIC application), but you can change this by copying the BASIC.System program to another disk, deleting it from your hard drive, copying the program you want to start up into to your hard drive, and finally copying BASIC.System back. If you have a utility that allows you to sort (reorganize) directories, you can, alternately, use that utility to put the program you want to start up into before BASIC.System in the directory.

Press the **B** key to start up Applesoft BASIC by running BASIC.System. This will always get you into BASIC, even if you've placed some other application first in the directory.

Press the **Q** key to Quit Switch Hitter. If you started Switch Hitter from the Finder, the Q key will take you back to the Finder. If you started Switch Hitter by holding down Control while starting up your system, pressing Q will present the built-in ProDOS selector that allows you to run any 8-bit SYS-type program (like AppleWorks) but not any IIGS-specific programs.

Use the Quit option at boot time when you want to bypass GS/OS entirely and run only ProDOS 8. Note: The Quit option usually will not work properly if you launch Switch Hitter from the Finder and then change to a different version of the System Software, because Switch Hitter has hidden the System Software you started up from and the Finder can no longer be found by the system. Use Restart instead of Quit in these circumstances.

Press **Shift-5 or Shift-6** to restart your system from the 3.5" drive (Shift-5) or 5.25" drive (Shift-6) (assuming Slot 5 and Slot 6 in your IIGS Control Panel are set to SmartPort and Disk Port). Use these options when you want to bypass starting up your hard drive and boot a program directly in one of your disk drives. Combined with the speed control, these options allow you to run even old Apple IIe games (that expect to run at Normal, not Fast speed) without a side trip to the Control Panel. These options do not permanently change the Control Panel startup slot.

Press **R** to restart the IIGS. Usually, after changing to a different version of the System Software, you'll want to restart the system immediately to start up into the System Software you've chosen. This is a shortcut for ⌘-Control-Reset.

HOW IT WORKS

Switch Hitter works by maintaining two separate copies of the System Software on your hard drive. The System Software contains the following files located in your hard drive's main directory:

System 5	System 6
ProDOS	ProDOS
BASIC.System	BASIC.System
System folder	System folder
Icons folder	Icons folder
BASIC.Launcher	
AppleTalk folder (optional)	

The ProDOS files for System 5 and System 6 are identical, but the other files are completely different. (Switch Hitter installs itself into the ProDOS file, since it's the first thing that's loaded by the computer.) Since the names of the files are the same for both System 5 and System 6 but the actual contents of the files are different, Switch Hitter renames the files you're not using so that the system ignores them.

For example, when you're using System 6, the System 5 files are named BASIC.System5, System5, Icons5, BASIC.Launcher5, and AppleTalk5. When you're using System 5, the System 6 files are renamed BASIC.System6, System6, and Icons6. The IIGS always uses the files named System, Icons, and so forth, and it ignores the ones with the numbers at the end. When you switch system versions, Switch Hitter just renames all the files involved so that the System Software you've selected has the names the IIGS expects to find and so that the files you're not using are "out of the way," so to speak.

LIFE WITH TWO SYSTEM FOLDERS

Since the two System folders are completely separate, you must maintain two separate copies of all your Desk Accessories, CDEVs, and so on. There are two Desk.Accs folders, one for System 5 and the other for System 6, and there are two CDEVs folders, etc. If you want access to a Desk Accessory from both System versions, you must place a copy of it in both Desk.Accs folders. Additionally, the two System versions have two separate clipboards, and any programs which store configuration data in the System folder will also have two separate configurations depending on the System Software. There are also two Icons folders.

It's almost like having two separate hard drives connected to the computer and physically unplugging one and plugging in the other to switch systems, except, of course, that only the System Software is affected by the switch. The rest of your programs stay the same.

In most cases the inevitable redundancy of having two copies of all your Desk Accessories and so forth won't be more than a minor headache. It is possible to eliminate some of this, particularly with Desk Accessories, via a System 6 Finder Extension called IR. IR allows you to add DAs to the menu by double-clicking them. Thus, you can keep most of your DAs in the System 5 Desk.Accs folder, then add them to your menu in System 6 by double-clicking them from the Finder.

If you use ProSel-16 or another such program launcher, you can install it under System 5, then switch to System 6 and install it again to make it available under both systems. In the case of ProSel-16, your menu screens will automatically be shared between the two versions; in other program launchers, you may need to build your menus separately in both systems. Be sure to use Switch Hitter to verify the current System version before installing any system updates, Desk Accessories, program selectors, and so forth. This way you'll know exactly which of your two Systems you're updating. Don't re-install System 6 on top of System 5 or vice versa.

Under certain circumstances, installing System Software updates (for example, a new version of System 6 if released) will cause the IIGS to forget how to automatically run Switch Hitter when you hold down the Control key during a boot. (If the update replaces the ProDOS file, this will happen.) If this happens, just run the Switch Hitter installer (INSTALL.SYSTEM) and type in the name of your hard drive. The installer will notice that Switch Hitter is already installed and ask you if you want to re-install. Type "Y" for Yes and the situation will be rectified.

REMOVING SWITCH HITTER & UNNEEDED SYSTEM SOFTWARE

At some point in the future you may decide to simply stick with one System version and Switch Hitter will become unnecessary. If this happens, run Switch Hitter as usual and make sure you've selected the System Software you want to keep. The run the Switch Hitter installer (INSTALL.SYSTEM) and type in the name of your hard drive once again. The installer will notice that Switch Hitter is already installed and ask you if you want to re-install. Type "N" for No at this question. Then the installer will ask you if you want to remove Switch Hitter. Answer "Y" and Switch Hitter will be removed. Restart your system after that and remove the System Software you're not using (instructions below).

First, make sure you've moved anything you want to keep (Desk Accessories, scrapbook files, utilities, etc.) out of the System folder you're not using.

If you are keeping System 6, drag the following files and folders to the Trash: BASIC.System5, BASIC.Launcher5, System5, Icons5, and AppleTalk5 (if that folder exists—it may not on your system).

If you are keeping System 5, drag the following files and folders to the Trash: BASIC.System6, System6, and Icons6.

Finally, select "Empty Trash" and the System Software you're not using will be gone forever.

SWITCH HITTER INSTALLATION

While Switch Hitter is already installed on your Q Drive, you may have a need to re-install it later (for example, if you re-partition the drive or install a System Software update). Most Q Drive owners won't need to re-install Switch Hitter, but for those few of you, here's the scoop.

There are two phases to installation. First, the Switch Hitter installer moves the existing System Software out of the way and you use Apple's

installation procedures to install the other System Software, ending up with both versions of the System Software on your hard drive. Second, again using the Switch Hitter installer, you install Switch Hitter itself on your hard drive.

To begin installation of Switch Hitter, start up the INSTALL.SYSTEM program. You can do this by double-clicking the INSTALL.SYSTEM icon from the Finder or, if you have a bootable Switch Hitter disk, by starting up from the Switch Hitter disk.

In a moment the installer will ask you for the name of the hard drive volume on which you want to install Switch Hitter. Enter Q1 and press Return. The installer will then inspect your hard drive to figure out which System Software is currently installed on it (System 5 or System 6). Note: Before you install Switch Hitter you must have either System 5 or System 6 on your hard drive.

The installer will then tell you what version of the System Software it has found on your hard drive and ask you if you would like to move it "out of the way" so that you can install the other version of the System Software. Usually, installing new System Software removes any older System Software from your hard drive, but once the installer has moved it out of the way, you can install new System Software without removing the old version. Answer "Yes."

Note: Once you've moved the current System Software out of the way, you won't be able to start up from your hard drive until you install new System Software. The original System Software is "hidden" and the computer can no longer find it, not even to start up from it. Therefore, the very next thing you should do is install the other version of the System Software on your hard drive.

So follow the instructions for installing whichever System Software was not originally on your hard drive. We won't repeat those instructions here since you should already have a copy of them elsewhere. If your hard drive originally had System 6, install System 5; if your hard drive originally had System 5, install System 6. When you're completed, you will have both versions of the System Software on one drive!

Now get into the Switch Hitter installer again and tell it which hard drive volume you want to install Switch Hitter on (the same volume as last time). This time the installer will notice that you have both versions of the System Software installed and offer to install Switch Hitter. Tell it "Yes" to go ahead and install Switch Hitter. In a few moments, installation will be complete. Now you're ready to use Switch Hitter!

Complete Pathname: A pathname which begins with a slash and tells ProDOS all the directories which must be searched to get to the desired file. For example, /Q1/AWFILES/MYFILE is a complete pathname. See also *Partial Pathname.*

Defragmenter: See *Optimizer.*

Density: Refers to how much data is stored within a given space. Since hard drives pack more data into a smaller space, they are said to have a higher data density than floppies.

Desktop: The standard IIGS and Macintosh user interface, found in most IIGS-specific programs and many 8-bit programs. The desktop metaphor is used by the Finder and most other IIGS-specific programs. Usually, you interact with the computer by manipulating icons representing objects, files, and tools, and by selecting actions through pull-down menus. See also *Finder* and *WIMP.*

DIP Switches: Four or eight tiny switches jammed into a package the same size as a computer chip, usually found on interface cards and used for configuring the card. (From *Dual Inline Package.)*

Direct Memory Access: A technique which allows a hard drive interface to bypass the computer's main processor for maximum performance. Both the Apple II High Speed SCSI Card and the RamFAST/SCSI Card use DMA. Some peripherals are not DMA-compatible, so both cards have switches to defeat DMA in systems which do not support it. DMA interfacing allows approximately twice the raw data transfer rate of non-DMA SCSI interfacing.

Directory: A generic term which can refer to either a subdirectory (folder) or a volume directory. ProDOS uses directories to keep track of where your files are stored, what their names are, the last time they were changed, and so forth.

Disk Name: See *Volume Name.*

DMA: See *Direct Memory Access.*

Enhanced Apple IIe: A IIe manufactured during or after 1985, or an older IIe which has been upgraded with an enhancement kit. An enhanced IIe has a few minor technological advances which allow it to run slightly faster and to run new programs which take advantage of enhanced IIe features. If your Apple IIe displays "Apple //e" at the top of the screen when you turn it on, it's enhanced. If it just says "Apple][", it's not enhanced.

Error Codes: Obscure numbers which some programs display in place of English error messages. If the programmer is having an especially bad day, error codes will be displayed in hexadecimal.

File: A collection of related data stored on a disk under a file name. Files can contain programs (SYS, S16, BAS files), data (AppleWorks and text files), other files (subdirectories), and almost anything else.

Finder: Part of the IIGS System Software. Allows the manipulation of disks and files using a visual user interface based on windows, icons, menus, and a moving pointer.

Folder: A subdirectory. The GS/OS Finder displays subdirectory files as folder icons, which is a good conceptual representation of what they do and how they work.

Format: As a verb, to prepare a new disk or drive to receive files, or to erase an old disk or drive to allow it to receive new files. As a noun, refers to the type of operating system which will access the disk; for example, you might say that a disk is formatted "in ProDOS format". See also *Low-Level Format* and *High-Level Format.*

Fragmentation: A condition which gradually becomes worse as you use your hard drive. As you add and delete files, your files will end up spread all over the hard drive, significantly degrading performance. Fortunately, *Optimizer* utilities are available.

GS/OS: The Apple IIGS Operating System, specifically designed to take advantage of, and provide user access to, the advanced features of the Apple IIGS. GS/OS manages access to disks and other devices, and is closely knit with the IIGS Toolbox.

Hard Format: See *Low-Level Format.*

Hardware: The physical aspects of your computer system; the stuff that sits on your desk and costs a lot of money.

Head: See *Read/Write Head.* Also, the object atop your neck.

Hexadecimal: A number system in which there are sixteen digits (0-9 and A-F) instead of the normal ten. Because of certain aspects of the way computers work, it makes sense to think of many computer-related numbers in hex instead of decimal, but it's such a strange concept that usually only programmers think in hex. (For example, a kilobyte (a very un-round 1024 in decimal) is a nice, even 400 in hex. Hex numbers are often preceded by a dollar sign , and they can contain letters as digits. $F00D and $BEEF are both valid hex numbers.

High-Level Format: A format procedure which rewrites only the directory blocks on a disk or drive. This will allow the operating system to re-use the blocks which were previously used. However, because only a few blocks are rewritten, a high-level format (also known as a *Soft Format*) is much faster than a low-level format. Use a high-level format when you want to quickly erase all the files on a disk. The IIGS Finder's Erase Disk and *Copy II Plus*'s Delete Disk are high-level formats.

I/O: Input/Output. E.g., an I/O Error refers to an error in reading (input) or writing (output) a block on a hard drive. For some reason most computers say "I/O Error" instead of "I can't access the disk."

Interleave: A term describing how the blocks are arranged on a track. If a hard drive's interleave is 1:1, it means that blocks are numbered

consecutively on each track. Right after block 1 you'll find block 2; after that, block 3, and so on. But every time a block is read, the computer needs a little time to process the data it has just read. In the time it takes to do this, the next block may have already passed by the read/write head. When this happens, the computer has to wait nearly an entire revolution of the platter for the desired block to come around again. This situation is known as "blowing a rev", and indicates that a larger interleave is needed. Larger interleaves give the computer more time to process the data by staggering the block order. For example, with a 2:1 interleave, the blocks might be arranged in the order 1, 15, 2, 16, 3, 17, and so on. While block 1 is being processed, block 15 will pass by, and when the computer is ready to read block 2, it will be able to do so without delay. Another way to think of a 2:1 interleave is to say that the computer reads half the blocks on a track in one revolution, then the rest on the next revolution, taking two revolutions of the platter to read an entire track of data. An interleave that's too small can result in poor performance due to "blowing revs"; an interleave that's too large can result in computer time being wasted by extra delay between blocks. The optimum interleave for a drive varies, depending on the type of drive, interface, and computer. The Q Drive, thanks to its Track Cache, always uses a 1:1 interleave, for the best performance possible on all systems.

Kilobyte: 1024 bytes, equivalent to two ProDOS blocks. One kilobyte of text is approximately equal to half a page. Computer memory, file sizes, and disk drive capacity are often expressed in kilobytes, abbreviated *K*.

Jerry Kindall: The original party animal.

Low-Level Format: A format procedure which completely rewrites every block on a disk or drive, in order to lay down the "markers" which allow the drive to find each block. A low-level format, also called a hard format, will completely erase a hard drive, and may take several minutes. Contrast with *High-Level Format.*

Mechanism: The part of a hard drive that actually stores the data, consisting of a circuit board, the platters and read/write heads, various motors, and other parts. The mechanism is hermetically sealed in a metal case to protect it from dirt and dust.

Megabyte: Roughly one million bytes, or a thousand kilobytes. Abbreviated "meg" or M. (The actual numbers are 1024 kilobytes—a K of K—or 1,048,576 bytes.) Hard drive sizes are usually measured in megabytes. Some manufacturers use the "one million" definition of megabyte, leading to "42 megabyte" drives which are actually only 40 megabytes (41,943,040 bytes) in size. The Q Drive 40 is 40 megabytes using the true 1,048,576 bytes per megabyte definition.

Operating System: A program which controls the operation of the computer system. On a IIGS, the primary operating system is GS/OS, with help from the IIGS Toolbox. On a IIe, the main operating system is ProDOS 8, with help from a set of built-in routines called the Monitor. Other operating systems for the Apple II include DOS 3.3, Pascal, and CP/M, though these are rarely used today. (Other operating systems include MS-DOS for IBMs and System 7 for the Mac.)

Optimizer: A program which rearranges the files on a hard drive for most efficient access. Most hard drive managers include an optimizer.

Partial Pathname: A pathname which does not begin with a volume name. ProDOS adds the prefix to the partial pathname to get the full pathname of the file. See also *Complete Pathname*.

Partition: Since ProDOS and GS/OS only support drives 32 megabytes in size, larger hard drives must be divided into smaller partitions. The operating system sees each partition as a separate volume, even though there's only one box sitting on the desk. "Partition" can also be used as a verb meaning to divide a large drive into smaller volumes, often called "logical drives".

Pathname: The series of directories ProDOS must look in to find a specified file. For example, if a file named MYFILE was inside a subdirectory called AWFILES on the hard drive called /Q1, the pathname of MYFILE would be /Q1/AWFILES/MYFILE.

Platter: The magnetic disc-like surface inside the hard drive where data are stored.

Prefix: The "default directory" which is added to a partial pathname. For example, if the prefix was /Q1/AWFILES, then any pathnames which didn't start with a slash are assumed to start with /Q1/AWFILES (e.g., MYFILE is assumed to be /Q1/AWFILES/MYFILE).

ProDOS 8: The standard operating system for 8-bit Apple IIs (Apple IIe, IIc, and IIGS when running 8-bit software). ProDOS 8 manages disk access and interrupts (and, to a limited extent, memory) for 8-bit programs.

ProDOS 16: The predecessor of GS/OS, ProDOS 16 was essentially ProDOS 8 with a 16-bit "front end". GS/OS is a full 16-bit operating system and should be used in place of ProDOS 16 when possible. (Some old programs don't follow the rules and won't run under GS/OS.)

Q Drive: An inexpensive high performance hard drive specifically designed by Quality Computers for use with Apple computers. But you already know that, because you bought one.

Quality Computers: 1-800-777-3642. What do you mean, this isn't the Yellow Pages?

RamFAST/SCSI: CV Technology's SCSI hard drive interface card which uses advanced technology to provide better performance than Apple's High Speed SCSI Card.

Read/Write Head: The part of a disk drive or hard drive mechanism that senses and imprints data on the floppy disk or platter. In principle, its operation is similar to that of the record and playback head in a tape recorder, except that it operates on a rotating disk or platter instead of a continuous stream of tape.

SCSI ("scuzzy", rhymes with "fuzzy"): An abbreviation for "Small Computer Systems Interface", an industry-wide standard for connecting hard disks (and other devices, such as CD-ROM drives, tape drives, scanners, and printers) to computers. Theoretically, any SCSI hard disk can be used with any computer for which a SCSI interface is available, from the Apple II to the Macintosh to the IBM. In practice, sometimes things get a little more complicated, but for the most part, SCSI devices are interchangeable among computer systems.

Software: The intangible aspects of your computer system. The programs you run that make the computer do useful (and sometimes not-so-useful) things.

Startup: See *boot*. Apple has officially switched over to the term "starting up the computer", but old-timers still call it "booting". And so does nearly everyone else, actually.

Stepper Motor: A mechanism for moving a hard drive's read/write head. Similar to a regular motor except that it moves one "step" for each pulse of electricity it receives. To move the stepper motor a long distance, repeated pulses are needed. Contrast with *Voice Coil*.

Subdirectory: A file which contains other files. Also known as a *folder*.

S16: The filetype of a ProDOS 16 or GS/OS application. These programs can only be run from the Finder or another GS/OS program launcher. They can't be run on an 8-bit computer.

SYS: The filetype of a ProDOS 8 application. These are programs that you can run from the Mini-Selector or by opening them in the Finder. SYS is short for System, but most SYS files are not System Software.

System Software: The software provided with the computer that forms the foundation which all other software works with. Includes ProDOS 8, GS/OS, the Finder, and other programs provided with your computer including the System Utilities, the Installer, and the Advanced Disk Utilities. Contrast with *Application Software*.

Termination: An electrical requirement of the SCSI standard. Each end of a SCSI "chain" must be electrically terminated by resistors. The Apple II High Speed SCSI card and the RamFAST/SCSI both contain a terminator. The last (or only) drive in your SCSI chain must also be terminated. The Q Drive has an external terminator pack which can be added or removed as necessary to put it anywhere in the chain.

Toolbox: The IIGS Toolbox is a set of programs built into the Apple IIGS that handles memory management, user interface, and other common tasks to allow programmers to easily create programs that look and behave similarly. The Macintosh includes a similar toolbox.

Track: A series of invisible concentric circles into which a disk or hard drive platter is divided. The read/write head is moved horizontally to access a particular track on the disk or platter.

Track Buffer: A small amount of memory built into a hard drive mechanism which holds a track's worth of blocks. When the computer requests the first block on a particular track, the drive reads the entire track into the track buffer. When the computer reads subsequent blocks on the same track, the drive can retrieve them from the track buffer, reducing delays caused by waiting for the desired block to pass under the read/write head. The Q Drive includes a track buffer.

Tree Display: A method of graphically displaying a volume's directories so that their relationship is immediately obvious. Actually, it only looks like a tree if you turn it sideways, and then it's all lopsided, but it resembles a tree more than it does anything else.

Voice Coil: A mechanism for positioning a hard drive's read/write head. An electromagnet (a coil of wire similar to that found in a loudspeaker, hence the name "voice coil") is used to move the read/write head horizontally to access a particular track. The Q Drive's mechanism uses a voice coil for speed, accuracy, reliability, and virtual silence. Contrast with *Stepper Motor.*

Volume: A disk (or a hard drive or a RAM disk).

Volume Directory: A volume's main directory. Volume directories can hold only 51 files, but some of the files can be subdirectories, providing a useful loophole.

Volume Name: A unique name assigned to each disk (or hard drive partition). You can't have two volumes with the same name in drives at the same time.

WIMP: Apple's Windows/Icons/Menus/Pointer user interface is often known by its acronym, WIMP. No kidding.

Q DRIVE LIMITED WARRANTY
1 YEAR PARTS AND LABOR

Quality Computers warrants the Q Drive to be free from defects in material and workmanship and to perform in accordance with published specifications for a period of 1 year from the date of our invoice to the Customer.

During the warranty period, Quality Computers, at its option, will repair or replace products that prove to be defective, at no charge, provided that the return procedures (next page) are followed. The Customer pays shipping to Quality Computers. Quality Computers pays return shipping via a comparable method. Gold Star Service (which includes pickup and shipping to Quality Computers via the next-day parcel service of our choice, 24-hour repair or replacement if stock allows, and next-day shipping back to the customer), is available for in-warranty returns from within the continental United States only, for a per-return fee of $50, at the discretion of Quality Computers Technical Support.

This warranty does not cover accidental damage, acts of God, misuse, misapplication, improper installation, connection to interface cards other than those specified or chaining to non-SCSI drives, or damage resulting from modification or service by any organization other than Quality

APPENDIX E
WARRANTY INFORMATION

Computers. In no event shall Quality Computers be liable for any incidental or consequential damages, including (but not limited to) damages for lost data, loss of use, or lost profits. Quality Computers is not responsible for recovery of data stored on a Q Drive.

This warranty is valid only for Q Drive owners who have returned their product registration to Quality Computers within 30 days of original purchase. This warranty is non-transferrable and is not extended by in-warranty repair.

RETURN PROCEDURES

- Call Quality Computers Technical Support. Technical support will attempt to resolve the problem over the phone, and may save the time and trouble of returning the drive for repair. If this is not possible, Technical Support will issue a Return Materials Authorization (RMA) number for return. If you request Gold Star Service, the technician will discuss method of payment with you at this time.

- Pack the Q Drive in the original packaging. Write your customer number and your RMA number prominently on the package, as well as

your address and Quality Computers' address. Be sure to enclose the same information, as well as a brief summary of the problem and a phone number where you can be reached during 9 AM-5 PM Eastern time,*inside* the package.

- You are responsible for shipping and insurance charges when returning the Q Drive to Quality Computers; we will pay for return of the drive to you by a comparable method. If you request Gold Star Service ($50 fee), Quality Computers will send a next-day parcel service (of our choice) to pick up the Q Drive; this is included in the Gold Star Service fee.

- If the drive is not in warranty, a Quality Computers technician will contact you upon receipt of the Q Drive to estimate the time and cost of repairs. The actual cost for repair will not exceed our estimate by more than 10%. If you requested Gold Star Service, your Q Drive will be repaired or replaced within 24 hours of our receipt, assuming sufficient stock, and returned to you by next-day parcel service.

- If these return procedures are not followed, the warranty may be invalidated. Quality Computers is not responsible for recovering the data on a malfunctioning Q Drive. We encourage you to make frequent backups.

Q DRIVE REGISTRATION INFORMATION

(Keep For Your Records)

Q Drive Model (size in MB) _____

❑ Check if Removable Media drive

Q Drive Serial Number _____

Quality Computers "Customer Number" (from Sales Order) _____

Quality Computers "Order Number" (from Sales Order) _____

Date of Sales Order _____

Date registration info mailed to QC _____

Q DRIVE REGISTRATION INFORMATION

(Mail this page to Quality Computers Immediately)

Q Drive Model (size in MB) _____

❑ Check if Removable Media drive

Q Drive Serial Number _____

Quality Computers "Customer Number" (from Sales Order) _____

Quality Computers "Order Number" (from Sales Order) _____

Date of Sales Order _____

THE ABOVE DRIVE IS REGISTERED TO:

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

Country _____

Day Phone (_____) _____-_____

Eve Phone (_____) _____-_____

COMMENTS, QUESTIONS, JOKES...

_____

_____

_____

_____

_____

_____

Remove this page from the manual and mail it to:

Quality Computers, Inc.
20200 Nine Mile Rd.
St. Clair Shores, MI 48080
Attn: Q Drive Registration

Quality Computers™

20200 Nine ' ile Rd. • St. Clair Shores, MI 48080 • 313-774-7200