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.