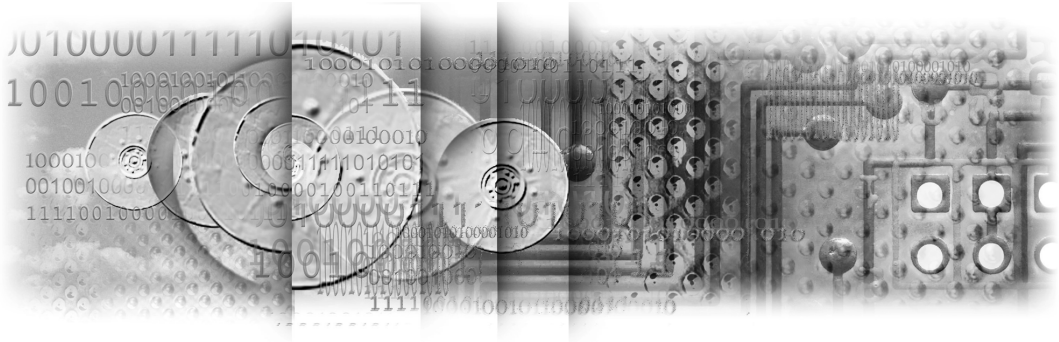


Drive Image® 4.0



User Guide

Drive Image 4.0

User Guide

Drive Image by PowerQuest

Manual Version 1—September 2000

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Glossary

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Introduction

What Is Drive Image?

Drive Image is a fast, inexpensive, and complete hard-disk imaging solution. Unlike file-by-file copying utilities, Drive Image uses SmartSector® imaging to create an exact image of a hard disk or partition.

With Drive Image, you can create and restore a compressed image file of an entire hard disk or individual partitions of a hard disk on a network, Jaz, Zip, MO, CD or other removable media device. Because Drive Image uses SmartSector imaging, your Windows optimizations are preserved when you restore an image. Drive Image provides SmartSector imaging support for FAT, FAT32, NTFS, HPFS, Linux Ext2, and Linux Swap, and sector-by-sector support for UNIX and NetWare. (PowerQuest ServerMagic includes Server Image, a product optimized for imaging NetWare servers.)

Because of operating system conflicts that can result from different hardware configurations, Drive Image was not intended to copy or image a hard drive that will be used in a system with different hardware configurations.

What's New in 4.0?

- CD-R and CD-RW support
- Image size estimator
- Ability to create images on hidden FAT, FAT32, and NTFS partitions
- Image integrity checker
- Improved Drive Image File Editor
- Support for Windows Me

In addition, the Drive Image CD includes PowerQuest® DataKeeper™. You can use DataKeeper to monitor drives on your system and back up your files continuously. See “PowerQuest DataKeeper” on page 79.

Drive Image System Requirements

Hardware/Software	Requirement
Processor	Intel 386SX (Intel 486 or above recommended)
RAM	16 MB (32 MB recommended; 32 MB required for FAT32 or NTFS)
3.5-inch diskette drive	3.5-inch diskette drive (DOS-only or OS/2 machines)
CD-ROM drive	Any speed; IDE or SCSI CD-R or CD-RW drive for creating images directly to CD
Hard disk free space	8 MB
Operating system	Windows 95, 98, Windows Me, NT 3.51 or 4.0 Workstation, Windows 2000 Professional, DOS 5.0, OS/2
Monitor	VGA (SVGA recommended)
Pointing device	None required (Mouse recommended)

IMPORTANT! Drive Image is not supported for use with Windows NT Server, Windows 2000 Server, or Windows 2000 Advanced Server.

If you use Drive Image on a DOS or OS/2 machine, you must run it from rescue disks. See “Installing on an OS/2 or DOS-Only Computer” on page 6.

Drive Image File Editor requires Windows 95, Windows 98, or Windows NT Workstation.

Getting Started

This chapter includes the following information:

- Installing Drive Image
- Creating Rescue Diskettes under Windows
- Installing on an OS/2 or DOS-Only Computer
- Installing Removable Device Drivers
- Before Running Drive Image
- Running Drive Image
- Uninstalling Drive Image
- Getting Online Help

Installing Drive Image

You can install Drive Image from any of the following operating systems:

- Windows 95/98
- Windows Me
- Windows NT 4.0 Workstation
- Windows 2000 Professional

If you are using DOS or OS/2, see “Installing on an OS/2 or DOS-Only Computer” on page 5.

- 1** Insert the Drive Image CD into your CD-ROM drive.
- 2** If CD auto-run is enabled, the installation program automatically launches when you place the Drive Image CD in your CD-ROM drive. If the CD auto-run is not enabled, insert the CD, click **Start ► Run**, then type `drive:\SETUP` (where *drive* is the drive letter of your CD-ROM drive), then click **OK**.

You will be presented with the following options:

- **Install Drive Image**—Install Drive Image to a local hard disk.
 - **Create Rescue Diskettes**—Create a set of diskettes including a bootable floppy and a program disk that enable you to run Drive Image from DOS.
 - **Documentation**—Display PDF manuals for Drive Image, error messages, or basic concepts about hard disks.
- 3** Select the option you want, and follow the on-screen instructions.
 - 4** At the end of the installation process, you will have an opportunity to create rescue diskettes.

PowerQuest recommends that you create rescue diskettes. Then if your hard disk becomes unbootable or you do not have access to Windows, you can boot your computer and run Drive Image from the rescue disks.

Note that Drive Image 4.0 will not overwrite previous versions of Drive Image that you have installed on your machine. To uninstall earlier versions, see “Uninstalling Drive Image” on page 10.

Creating Rescue Diskettes under Windows

You can create Drive Image rescue diskettes under Windows 95 or later. There are two diskettes for Drive Image. The first is a DOS boot diskette. The second includes the Drive Image program. If you experience a hard disk failure or are unable to access Windows, you can run Drive Image from the rescue disks.

- 1 Choose the **Create Rescue Diskettes** option in the Drive Image installation program.

Rescue Diskette Limitations (Windows NT/Windows 2000)

On Windows 95, Windows 98, and Windows Me systems, Drive Image uses the operating system's DOS files to build the first rescue disk. On Windows NT and Windows 2000 systems, Drive Image uses Caldera DOS.

When you boot from a rescue disk with Caldera DOS, Drive Image is subject to the following limitations:

- Cannot see NTFS partitions
- Cannot see any partition that crosses or exists past the 1024 cylinder boundary
- Cannot see any partition that resides in an extended partition that crosses or exists past the 1024 cylinder boundary

You can avoid these limitations by using a Windows 95/98 startup disk in place of the Drive Image bootable diskette (diskette 1 of the 2-diskette set).

Aside from these limitations, the features in Drive Image running from the rescue diskettes are the same as those running it from a hard disk.

Installing on an OS/2 or DOS-Only Computer

Because OS/2 and DOS-only computers cannot run the Windows-based installation program, you should run the MAKEDISK.BAT file (found on the Drive Image CD in the SETUP\OS2DOS directory) to install Drive Image on OS/2 or DOS-only systems.

This batch file creates two rescue diskettes. The first diskette is a DOS boot diskette. It also contains the removable media device drivers. The second diskette includes the Drive Image program. You should be aware of the limitations of the rescue diskettes as listed above.

Installing Removable Device Drivers

During Setup, Drive Image allows you to install drivers for Iomega and Magneto-Optical removable media storage devices.

- To install Iomega drivers, select Iomega drivers during installation.
- To install Magneto-Optical drivers, select MO drivers and then the required drive type (ATAPI or SCSI).

For specific information on individual device drivers, contact your manufacturer directly. For more information on setting up Iomega and Magneto-Optical drivers, see “Setting Up Removable Storage Devices” on page 101.

Using Parallel Port Devices with a NetWare Client

Loading a parallel port device driver with a network client installed may cause the system to hang. To successfully load the device driver for a parallel port drive, you must reboot the system without loading the network client. You can use the boot diskette set created by the install program to do this. For more information to resolve this problem, contact your network administrator.

Before Running Drive Image

Before running Drive Image, PowerQuest recommends that you:

- Run a disk utility such as a thorough ScanDisk (Windows 95/98) or CHKDSK /F (Windows NT Workstation or Windows 2000 Professional) on each partition of the source drives to check for file system errors.
- Verify that each FAT partition containing OS/2 extended attributes has a minimum of 5 MB of unused space within the partition if it will be resized during the restore process.
- Create Drive Image rescue diskettes. See “Installing on an OS/2 or DOS-Only Computer” on page 5.

Running Drive Image

You can run Drive Image from the hard disk or a floppy diskette.

Running Drive Image from a Hard Disk

- 1 Shut down applications you are running under Windows.
- 2 Click **Start ► Programs ► PowerQuest ► Drive Image 4.0 ► Drive Image 4.0**.

Running Drive Image from Rescue Diskettes

- 1 Insert a bootable diskette (such the first Drive Image rescue diskette).

To create a boot diskette and a Drive Image floppy (rescue diskettes), see “Installing on an OS/2 or DOS-Only Computer” on page 5.

If you plan to create images to CD-R, you must load PQPACKET.EXE before running Drive Image. If you use your own boot diskette instead of the first Drive Image rescue diskette, you must load PQPACKET.EXE manually.

- 2 Reboot your machine.

DOS loads and displays an A: prompt.

- 3 Insert the Drive Image program floppy (Diskette #2 of the Drive Image rescue diskette set).
- 4 Type PQDI, then press <Enter>.

Be aware that Drive Image has some limitations when you run from the rescue diskettes. See “Rescue Diskette Limitations (Windows NT/Windows 2000)” on page 5. Aside from these limitations, the features in Drive Image running from the rescue diskettes are the same as those running it from a hard disk.

Running Drive Image at Scheduled Times

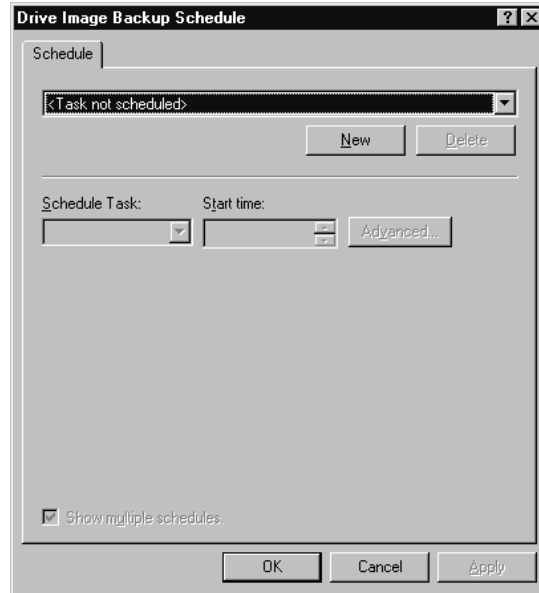
Use the Drive Image Scheduler to run Drive Image at the time and frequency you specify. Be aware that Drive Image Scheduler only prompts you to start Drive Image. It does not automate backing up specified drives on your computer.

IMPORTANT! The Drive Image Scheduler is based on the Scheduled Tasks feature in Windows. Therefore, if you did not install Scheduled Tasks when you installed Windows, the Drive Image Scheduler will not be available to you.

Starting Drive Image Scheduler

- 1 From the Windows Start menu, click **Programs ► PowerQuest Drive Image 4.0 ► Drive Image Scheduler**.

The **Drive Image Backup Schedule** dialog appears.



Scheduling a Backup Task

- 1** From the **Drive Image Backup Schedule** dialog box, make sure the **Show multiple schedules** check box is selected.

To create only one backup schedule, deselect **Show multiple schedules**, then continue with step 3.

- 2** Click **New**.
- 3** Select how often you want the back up to run from the **Schedule Task** drop-down list.

Choose an option to specify how frequently to run Drive Image. Then specify details about the option you choose.

Option:	Details:
Daily	<ul style="list-style-type: none">• Start time• Which days (every day, every 2 days, etc.)
Weekly	<ul style="list-style-type: none">• Start time• Which weeks (every week, every 2 weeks, etc.)• Which days of the week

Option:	Details:
Monthly	<ul style="list-style-type: none"> • Start time • Numeric date (such as 1 or 15) or relative date (such as first Monday of the month). If you select a numeric date of 29, 30, or 31, the task will only run on months that include that date. • Months you want task to run (January, February, etc.)
Once	<ul style="list-style-type: none"> • Time of day • Exact date you want backup to occur
At System Startup	Choosing this option will launch Drive Image when you turn on your computer.
At Logon	Choosing this option will launch Drive Image when you log onto your computer.
When idle	Choosing this option will launch Drive Image when your computer is idle for the number of minutes you specify.

The daily, weekly, monthly, and once options include optional advanced settings where you can specify a start date and end date for the task.

4 Click **OK**.

The scheduled task will now appear in the Windows Scheduled Tasks folder. To see scheduled tasks, right-click **My Computer** on the Windows desktop, click **Open**, then double-click **Scheduled Tasks**.

You can create additional backup schedules by repeating the steps above. For each new backup schedule you create, the task is added to the drop-down list at the top of the Schedule tab. (**Show multiple schedules** must be selected.) When you want to trigger a specific scheduled task, just select the one you want from the drop-down list, then click **OK**.

To edit an existing scheduled backup task, double-click **Drive Image Backup** in the Windows Scheduled Tasks folder, then click the **Schedule** tab.

Deleting a Scheduled Task

If you have created multiple schedules, you can delete the schedules you no longer use from the drop-down list.

- 1 From the Drive Image Backup Schedule dialog, make sure the **Show multiple schedules** check box is selected.
- 2 Select the scheduled task from the drop-down list at the top of the **Schedule** tab.
- 3 Click **Delete**.

Uninstalling Drive Image

- 1 Click **Start ► Programs ► PowerQuest ► Drive Image 4.0 ► Uninstall Drive Image**.

You can also click **Start ► Settings ► Control Panel ► Add/Remove Programs ► Drive Image 4.0**.

- 2 Follow the instructions on the screen.

Getting Online Help

- 1 Click **Help ► Contents** to display general instructions for using Drive Image help, or press <F1> at any time to access the help index.

The Drive Image File Editor is a Windows program and includes a full Windows help system.

Creating Image Files

This chapter includes the following information:

- Overview
- Image Files and Hardware Configurations
- Copying Windows NT or Windows 2000 Partitions
- Preparation
- Creating an Image File
- Advanced Options
- Scenarios

Overview

You can use Drive Image to create image files on any physical or logical drive that DOS has assigned a drive letter, including floppy drives, secondary hard drives, CD-R or CD-RW drives, network drives, and removable media storage devices such as Jaz, Zip, and MO drives.

You can also create image files on hidden NTFS, FAT, and FAT32 partitions and IDE or SCSI CD-R or CD-RW drives that have not been assigned drive letters.

If you are unsure whether a drive is available to save an image file, click **Browse** and all of the available drives will display.

Image Files and Hardware Configurations

Because of operating system conflicts that can result from different hardware configurations, Drive Image was not intended to copy or image a hard drive that will be used in a system with different hardware configurations.

If you create an image on one machine and restore the image on a machine with a different configuration (for example, a different motherboard or video card), the operating system may not boot correctly. Therefore, PowerQuest recommends imaging and restoring only to machines with identical hardware configurations.

Any discussion of imaging assumes that the software, including the operating system, is being copied in accordance with the license agreement with the software manufacturer.

Copying Windows NT or Windows 2000 Partitions

If you are using Drive Image to copy Windows NT or Windows 2000 partitions (where Windows is installed), you may experience problems related to the BOOT.INI file. The BOOT.INI file includes information about the boot options for Windows' loader and the order of the Windows partition. If you have used Drive Image to copy a Windows partition, and the partition order has changed from the original order, then the BOOT.INI file may not be updated to reflect the new order of the Windows NT/2000 operating system files. Therefore, you will be unable to boot your Windows partition.

PowerQuest has developed a solution that will allow you to update and edit the BOOT.INI file. The executable is NTFSINI.EXE. For additional information (in English), see the PowerQuest web site www.powerquest.com/support/pm/pm6076.html.

Preparation

- 1 Before creating an image with Drive Image, use a disk utility program such as a thorough ScanDisk or Norton's Disk Doctor to identify and repair any errors on your hard disk.

Windows NT Workstation and Windows 2000 users should run CHKDSK /F.

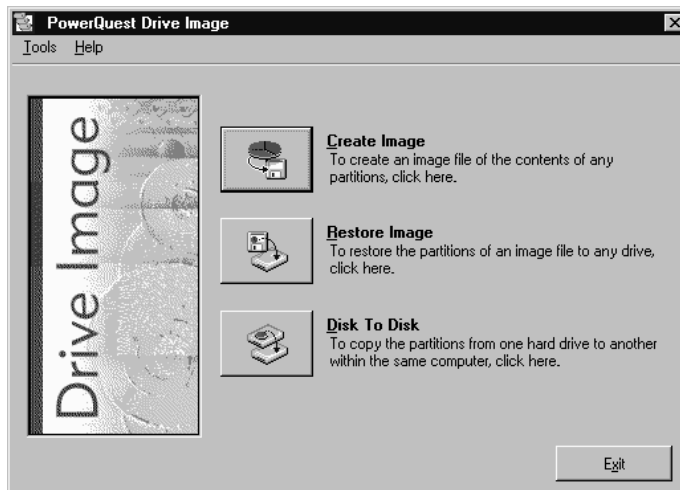
- 2 You may also choose to run a disk defragmenting utility to further optimize your hard drive.
- 3 You should disable virus detection in the BIOS before creating an image file.
If virus protection is enabled, Drive Image may hang after you click **Finish**.
- 4 Check to ensure that the drive where you want to create an image is available under DOS. You can see the available drives by clicking **Browse** at the Name Image File screen. (See step 6 on page 16 for additional information.) You may need to set up removable media or create boot disks to access network drives before you can create an image.

Creating Image Files on CD-R or CD-RW

Drive Image enables you to create image files directly on CD-R media. However, you must meet the following requirements, or your CD-R drive will not be available as a destination for an image file.

- You must have an IDE or SCSI CD-R or CD-RW drive. USB and FireWire CD-R drives are not supported.
- Load HIMEM.SYS in your CONFIG.SYS file.
- **Do not** load EMM386.EXE in your CONFIG.SYS file.
- Run PQPACKET.EXE before running the Drive Image executable, PQDI. If you run Drive Image from the main installation directory or from the rescue disks, PQPACKET will run automatically. If you run Drive Image from a different directory, you should browse for PQPACKET and run it manually before running Drive Image. If you run Drive Image from a different drive, you may want to create a batch file to run PQPACKET and then start Drive Image.
- If you create an image on CD-RW media, it must be empty and unformatted.

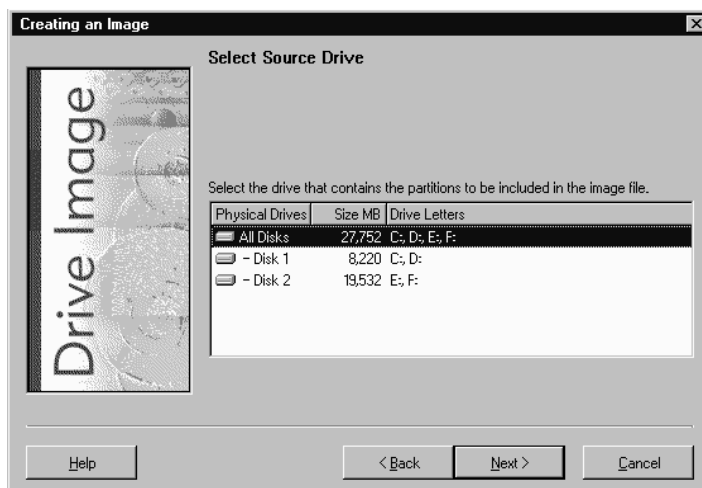
Creating an Image File



1 Run a thorough ScanDisk on your drives before imaging them.

2 At the Drive Image main screen, click **Create Image**.

The **Select Source Drive** screen appears.



3 Select the disks that include the partitions you want to include in the image file.

You can click **All Disks** to select partitions from every hard disk on your machine.

4 Click Next.

The **Select Source Partitions** screen appears. It displays all the partitions on the disks that you selected. The partition map near the top of the screen is a graphic display of your hard disk. It includes a blue indicator for the 2 GB boot code boundary and a black indicator for the 1024 cylinder limit. The indicators can be useful when you are creating partitions that need to be bootable, since many operating systems require that boot code be located somewhere within the first 2 GB of the disk.

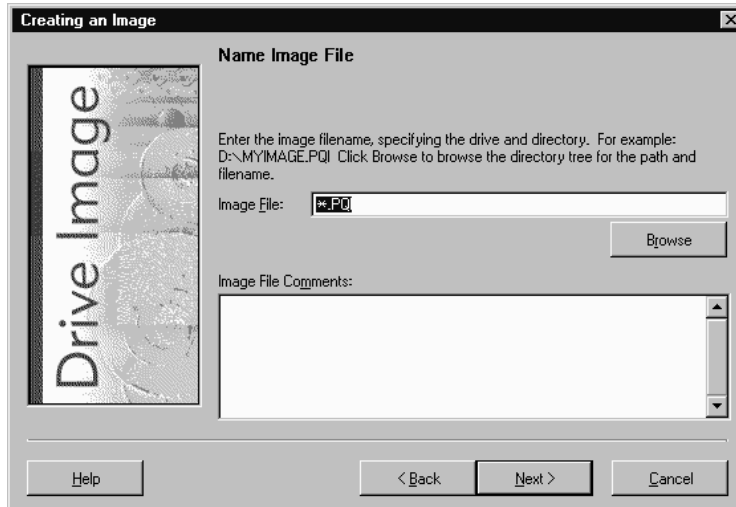


5 Select the partitions you wish to include in the image file (the source partitions) from the partition list, or click **Select All** to automatically select all partitions.

You may need to scroll to view all the partitions on your machine. Note that if you have more than one hard disk on your machine, the first column in the partition list shows the physical hard disk where the partition is located.

To deselect partitions, click again on a partition or click **Select None** to deselect all partitions at once.

6 Click Next.



- 7 Type the desired path and image filename in the **Image File** field (for example, D:\MYIMAGE.PQI).

You must save your image file to a partition that you are *not* including in your image file. You can click **Browse** to find the directory where you want to save the image file. You should click **Browse** to select a CD-R or CD-RW drive because you cannot just type the CD-R drive letter to save an image to CD. CD drives will appear in the list as \\.\pqcdx\name of drive, where *x* is the number of the CD drive.

You can save an image to a hidden NTFS, FAT, or FAT32 partition by choosing it from the **New Image File** dialog box that appears when you click **Browse**. A hidden NTFS partition will appear in the Drives list as \\.\Disk*n*.Part*m*, where *n* is the number of the disk and *m* is the number of the partition on that disk. Drive and partition numbers begin with zero, so if an NTFS partition were the third partition on the first disk, it would appear as \\.\Disk0.Part2. To further identify the hidden partition, the volume label will display, if available.

Make sure there is no existing file with the same name, unless you want the existing file to be overwritten. Drive Image uses .PQI as the default image filename extension.

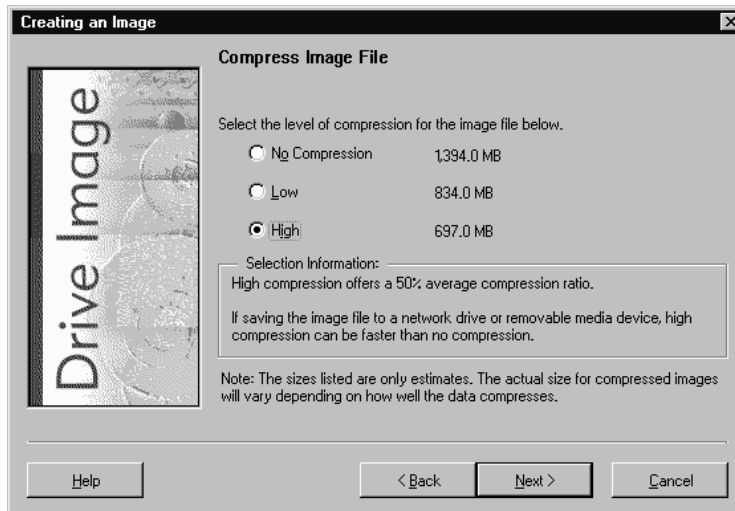
IMPORTANT! Do not include spaces or extended characters in the filename, or you may not be able to access the image file from Drive Image, DOS, or the Drive Image File Editor.

You may need to create DOS boot diskettes to access network drives while running Drive Image. Your network administrator can help you get the correct network drivers to copy onto the first Drive Image rescue disk.

- 8 (Optional) Type brief comments about your image file in the **Image File Comments** field.

Image file comments cannot exceed 232 characters. Drive Image will automatically insert information about the drive, partition, and label.

- 9 Click **Next**.



- 10 Select the desired compression level.

Drive Image estimates the size of the image file for each level of compression. If you are creating an image file on removable media, Drive Image also estimates the number of media that will be required to save the image file. The numbers displayed are only estimates; the actual size for compressed images will vary according to how well the data on the disk compresses.

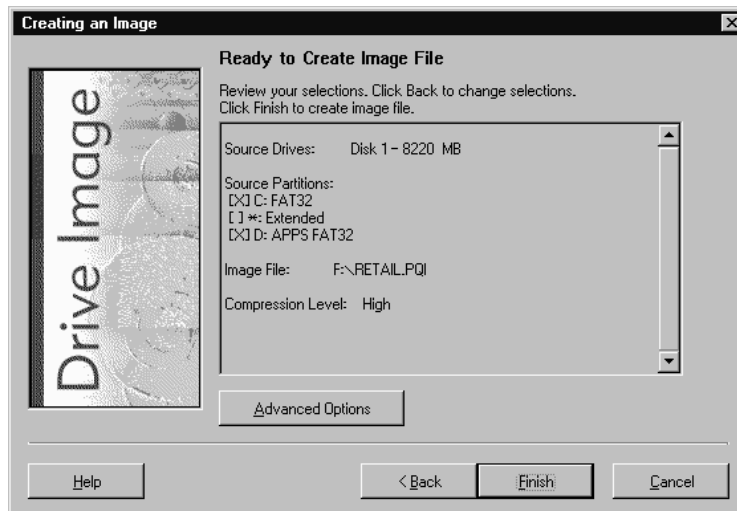
- **No Compression** is usually the fastest method for creating an image file and is useful if storage space is not an issue. However, if you are saving your image file to a busy network drive or to a relatively slow removable media device, high compression may be faster than no compression since there is less data to write to the file. Drive Image selects **No Compression** by default.
- **Low** compression offers a 40% average compression ratio.

- **High** compression offers a 50% average compression ratio.

Image files created with the current version of Drive Image are not compatible with earlier versions. That is, you cannot read Drive Image 4.0 images with earlier versions of Drive Image. Drive Image 4.0 can read images created with earlier versions of Drive Image.

11 Click **Next**.

Drive Image displays all the information you have entered to this point.



To modify any settings, click **Back**.

12 (Optional) Click **Advanced Options** to split an image file into multiple files (for removable media), to disable file system error-checking or SmartSector copying, to password protect your image file, to verify the integrity of the image file after it is created, or to verify disk writes.

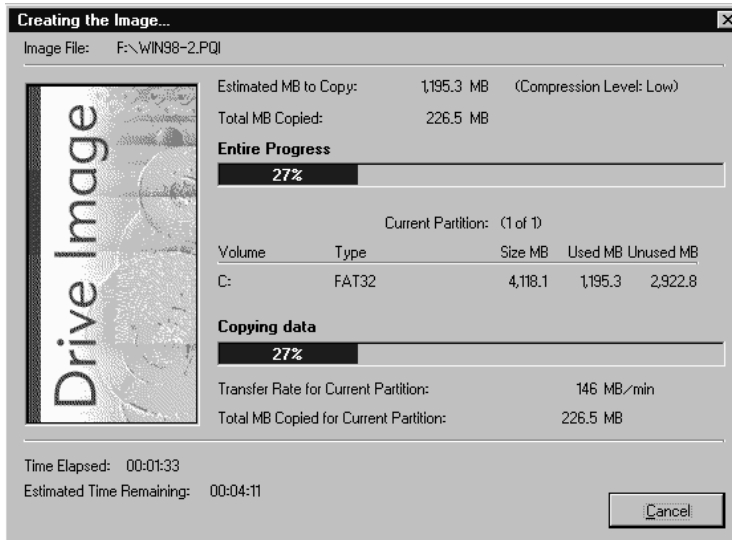
See “Advanced Options” on page 20 for additional information.

13 Click **Finish** to begin creating the image file.

If you entered a name of a current file (step 6), Drive Image displays a message that *<path and filename>* already exists. You can replace the existing file or choose a new filename. **If you click Replace, the existing image file will be deleted immediately.**

If Drive Image detects that you are saving your image file to a floppy drive or removable media, it enables a media-spanning feature that spreads the image file over a series of disks. You must have at least 100K of available space on each disk in the series. If you use the media-spanning feature, be sure to number the disks in order, since you must insert them in sequence when restoring the image file.

The **Creating the Image** dialog appears:



Upon completion, the following message appears: “Image was copied successfully to file: <image filename>.”

14 Click **OK** to return to the Drive Image main screen.

IMPORTANT! Because operating system conflicts can result from different hardware configurations, you should not restore the image you just created on a system with different hardware.

Advanced Options

The **Create Image Advanced Options** dialog appears when you click **Advanced Options** at the **Ready To Create Image File** screen.

Select this:	To do this:
Check for File System Errors	<p>Clear the Check for File System Errors check box if you want to disable error checking.</p> <p>If you have already used a disk utility program such as ScanDisk to check your hard disk for errors, it is not necessary to have Drive Image check for file system errors. Clearing Check for File System Errors saves time in copying the partitions.</p> <p>If you did not run a disk utility program before loading Drive Image, leave the Check for File System Errors check box selected. Be aware that ScanDisk finds more errors than the Check feature in Drive Image.</p>
Disable SmartSector Copying	<p>Drive Image's SmartSector technology speeds up the copying process by only copying clusters and sectors that contain data. However, in some cases, such as high-security environments, it may be desirable to copy all clusters and sectors in their original layout, whether or not they contain data.</p> <p>If you wish to copy both used and unused clusters and sectors, click Disable SmartSector Copying. Disabling SmartSector Copying increases processing time and image file size.</p>
Verify Disk Writes	<p>Select this option if you want Drive Image to verify that data is being written to disk. Verifying disk writes is not necessary and can slow image file creation substantially.</p> <p>If you are creating an image file to CD-R, this option is selected by default and performs a different function. After burning the image file to a CD, Drive Image will check to see that the image file can be read from the CD. If there is a problem with the image, you will have an opportunity to recreate it. Having this option selected for CD-R does not affect the size of the image file.</p>

Select this:	To do this:
Verify Image Contents	<p>If you select this option, Drive Image:</p> <ul style="list-style-type: none"> • Checks to see that all of the files in the image are available for you to open. • Checks to see that the internal data structures in the image file match the data that is available. • Checks to see that the image file can be uncompressed and create the expected amount of data. • Checks that the data in the image file you created matches the contents of the disk that was just imaged. <p>Drive Image reports whether the image file passes or fails the integrity check.</p>
Password Protect Image File	<p>To password-protect your image file, click Password Protect Image File and type a password in the Password field. Passwords are case-sensitive. To change or undo a password, use the Drive Image File Editor. See “Adding a Password to an Image” on page 72.</p> <p>IMPORTANT! Store image file passwords in a safe place. If you forget the password, you cannot restore the file.</p>
Split Image File Into Multiple Files	<p>If you plan to copy an image file to removable media after creating it, you can force Drive Image to split a large image file into smaller files. To do so, click Split Image File Into Multiple Files and enter the maximum byte size for each file in the File Size (bytes) field. To save the files to CDs, specify a file size of 670,000,000 bytes (approximately 670 MB) or less.</p>

Scenarios

Creating an Image File on a Zip Drive

Sample System Configuration

One 1.2 GB hard drive containing:

- One 800 MB active primary FAT partition (C:) running Windows 95; 300 MB used and 500 MB unused.
- One extended 400 MB partition containing one logical FAT partition (D:); 350 MB used and 50 MB unused.

One Zip drive (E:) with 250 MB cartridges.

Objective

Create an image file of your hard drive's logical partition (D:) and store it on your Zip drive.

Procedure

- 1** When you install Drive Image on your computer, select the option to install Iomega drivers.
- 2** Run a thorough ScanDisk to identify and repair any errors on the D: partition.
- 3** Since the image file will be too large to fit on one Zip disk, you must create a series of Zip disks.

Label the first Zip disk as "MYIMAGE DISK #1." During image file creation, Drive Image prompts you to insert new media as needed. Label each successive disk "MYIMAGE DISK #2," "MYIMAGE DISK #3," etc.
- 4** Format the Zip disks to identify and repair any errors on the cartridges.
- 5** Run Drive Image.

As Drive Image automatically loads the Zip drivers, be sure to note the drive letter assigned to the Zip drive. In this case, we are referring to the Zip drive as E:.
- 6** Insert the Zip disk labeled "MYIMAGE DISK #1" into your Zip drive.
- 7** On the title screen, click **Create Image**.
- 8** **Disk 1** should already be selected. Click **Next**.

This step is skipped if you only have one hard disk.

- 9** Select the logical partition (D:), then click **Next**.
- 10** In the **Image File** field, type E:\MYIMAGE.PQI, or click **Browse**, select Drive E:, type the image filename, and click **OK**.
- 11** Click **Next**.
- 12** Select **High** compression.
High compression compacts the image of your 400 MB logical partition by approximately 50%.
- 13** Click **Next**.
- 14** Click **Finish**.
- 15** When Drive Image prompts you to insert the next media in the series, wait until the busy light on the Zip drive goes out, remove “MYIMAGE DISK #1” from the Zip drive, and insert “MYIMAGE DISK #2”.
- 16** After Drive Image has completed the image create process, click **OK** to return to the Drive Image main screen and exit the program.

Result

Your 400 MB logical partition is stored on two Zip disks in a spanned image file. You can restore this logical partition to any hard drive that has at least 400 MB of available (unpartitioned) space.

For information about restoring images from a Zip drive, see “Restoring an Image File from a Zip Drive” on page 37.

Creating an Image File on a CD-R

Sample System Configuration

One 3 GB hard drive containing one active 1.8 GB primary FAT partition (C:) running Windows 95; 1.5 GB used and 300 MB unused.

One CD-R or CD-RW drive (E:).

Objective

Create an image file of your hard drive's active primary partition (C:) and store it on CD-R or CD-RW.

Procedure

- 1** If you are using CD-RW media that already includes data, you must delete the existing files from the CD.
- 2** Since the image file will be too large to fit on one CD (~900 MB), you must create a series of two CDs.
- 3** Run a thorough ScanDisk to identify and repair any errors on your C: partition.
- 4** Run Drive Image.

Ensure that PQPACKET runs before Drive Image, or your CD-R drive will not be visible. See “Creating Image Files on CD-R or CD-RW” on page 13.

- 5** On the Drive Image title screen, click **Create Image**.
- 6** **Disk 1** (your hard drive) should already be selected.
- 7** Click **Next**.
- 8** Select the active primary C: partition, then click **Next**.
- 9** Click **Browse**, then choose your CD-R drive from the list of available drives.

The name will be in the form `\\.\pqcd0\drive name`. If your CD drive is not listed, see “Creating Image Files on CD-R or CD-RW” on page 13 for information about making Drive Image recognize your CD drive.

- 10** Under **File Name**, type a name for your image file, then click **OK**.
- 11** Click **Next**.
- 12** Select **Low** compression.

Low compression compacts the image of your 1.8 GB primary partition by approximately 40%.
- 13** Click **Next**.
- 14** Click **Finish**.

- 15** After Drive Image has completed the image create process, click **OK** to return to the Drive Image main screen and exit the program.

You will now have at least two CDs containing image files. Label them clearly, so you can restore the image file later.

Result

Your 1.8 GB primary partition is stored on two CDs in two separate image files. You can restore this primary partition to any hard disk that has at least 1.8 GB of available (unpartitioned) space. For information about restoring images from CDs, see “Restoring an Image File from a CD Drive” on page 39.

Creating an Image File on a Secondary Hard Drive

Sample System Configuration

Disk 1 — One 3.5 GB hard drive containing:

- One active 1.5 GB primary FAT32 partition (C:) running Windows 98; 500 MB used and 1 GB unused.
- One 1 GB extended partition containing one logical FAT partition (E:); 400 MB used and 600 MB unused.
- 1 GB unpartitioned free space.

Disk 2 — One 2 GB hard drive containing:

- One 1 GB primary FAT partition (D:); 1 GB unused.
- One 1 GB extended FAT partition containing one logical partition (F:); 600 MB used and 400 MB unused.

Objective

Create an image file of the 1 GB logical partition (E:) that is on Disk 1 and store it in the primary partition (D:) on Disk 2.

- 1** Run a thorough ScanDisk to identify and repair any errors on both hard drives.
- 2** Run Drive Image.
- 3** From the Drive Image title screen, click **Create Image**.
- 4** Select **Disk 1**.

5 Click **Next**.

6 Select the **E:** partition.

7 Click **Next**.

8 In the **Image File** field, type `D:\MYIMAGE.PQI`.

9 Select **No Compression**.

No Compression is the fastest method for creating an image file. You may use it if space is not an issue.

10 Click **Next**.

11 Click **Finish**.

12 After Drive Image has completed the image create process, click **OK** to return to the Drive Image main screen and exit the program.

Result

An image of your 1 GB logical partition (E:) from Disk 1 is stored in an image file named MYIMAGE.PQI on the primary partition (D:) of Disk 2. You can restore the logical partition to any hard drive that has at least 1 GB of available (unpartitioned) space.

Restoring Image Files

This chapter includes the following information:

- Overview
- Restoring Images from CD Drives
- Restoring an Image File
- Resize Options
- Advanced Options
- Scenarios

Overview

This chapter describes restoring a Drive Image file to a different drive or partition.

If you received a demo version of Drive Image, you cannot restore image files.

IMPORTANT! If you create an image on one machine and restore the image on a machine with a different configuration (for example, a different motherboard or video card), the operating system may not boot correctly. Therefore, PowerQuest recommends restoring only to machines with similar hardware configurations.

Related Tasks

- To restore selected files from a compressed or spanned image file, see “Restoring Files or Partitions” on page 73.
- If you are restoring an image file to set up a new hard drive on a machine with a BIOS older than 1994, see “Using Drive Image with Drive Overlay Software” on page 92.
- To restore image files created with Ghost, see “Converting Ghost Image Files to Drive Image” on page 97.

Restoring Images from CD Drives

Run PQPACKET.EXE before running the Drive Image executable, PQDI. If you run Drive Image from the main installation directory or from the rescue disks, PQPACKET will run automatically. If you run the Drive Image from a different directory, you should browse for PQPACKET and run it manually before running Drive Image.

When you click **Browse** at the Select Image File screen, your CD drive will display as \\.\pqcdx, where *x* is the number of the CD drive. Select the drive, and the image file will display so you can restore it.

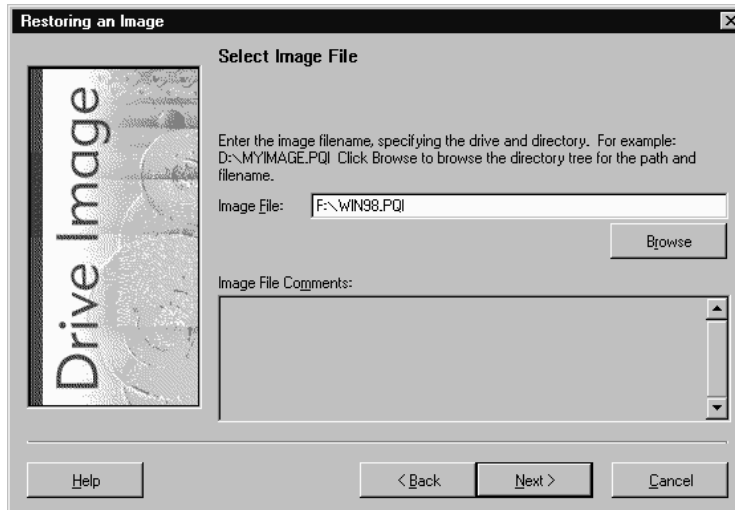
Your CD drives may also display with drive letters. However, you should not choose the drive letter. Instead choose the \\.\pqcdx designation.

Restoring an Image File

- 1 Disable virus detection in the BIOS.

If virus protection is enabled, Drive Image may hang after you click **Finish** to restore an image file.

- 2 At the Drive Image main screen, click **Restore Image**.
- 3 In the **Image File** field, enter the path and filename of the image file you want to restore, or click **Browse** to select the path and image file.



You can restore an image file from any physical or logical drive that DOS has assigned a drive letter, including floppy drives, secondary hard drives, network drives, and most removable media storage devices.

If you are restoring an image from a CD, refer to “Restoring Images from CD Drives” on page 28.

You may need to run Drive Image from DOS boot diskettes to access network drives while running Drive Image.

You can restore an image from a hidden NTFS, FAT, or FAT32 partition by choosing it from the **Open Image File** dialog box that appears when you click **Browse**. A hidden NTFS partition will appear in the **Drives** list as `\\.\Disk n .Part m` , where n is the number of the disk and m is the number of the partition on that disk. The disk and partition numbering begins with zero, so the first partition on the first hard disk would be identified as `\\.\Disk0.Part0`. To further identify the hidden partition, the volume label will display, if available.

If you click **Browse** and select an image file, you will have an option to verify the integrity of an image file before you attempt to restore it. Click **Verify**, and Drive Image will check to see that all of the segments of the image (such as myfile.pqi, myfile.002, myfile.003, and so forth) are available for you to open, the internal data structures in the image file match the data that is available, and the image file can be uncompressed and create the expected amount of data. Drive Image reports whether the image file passes or fails the integrity check.

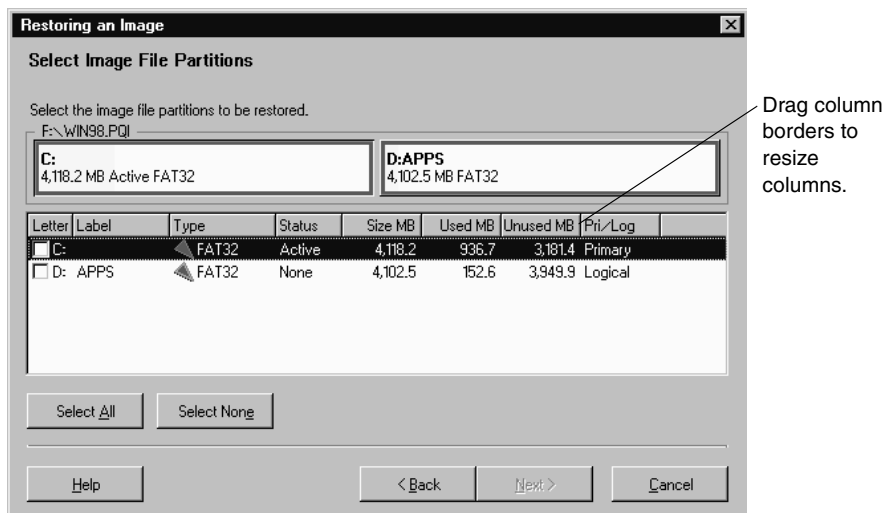
4 Click **Next**.

At any point prior to actual image file restore, you can click **Back** to return to the previous step and change your settings.

5 From the **Select Destination Drive** dialog, select the disk that includes the unallocated space or partitions where you want to restore the image file.

If you only have one hard disk, this step is omitted.

6 If you have more than one partition, you can select the partitions you want to restore. Click partitions to select them individually, or click **Select All**.

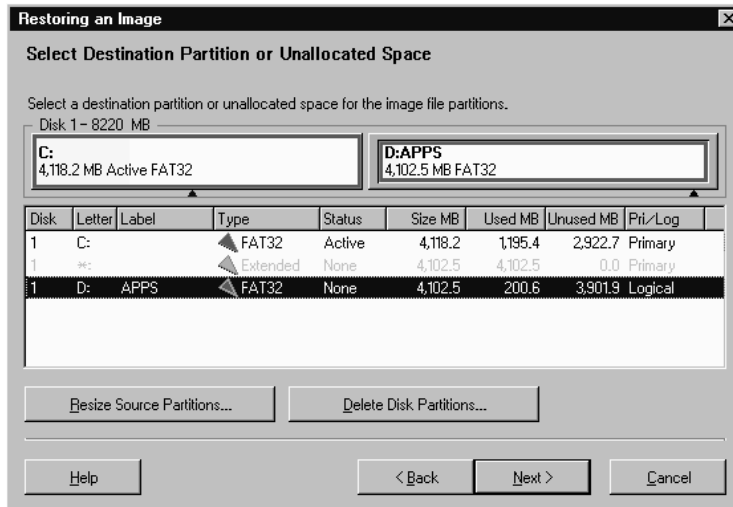


To deselect partitions, click again on a partition or click **Select None**.

7 Click **Next**.

8 Select an existing partition or unallocated space where you want to restore the image.

The partition list includes all the partitions on your machine. If you have more than one hard disk, the first column in the partition list shows the disk on which a partition is located.



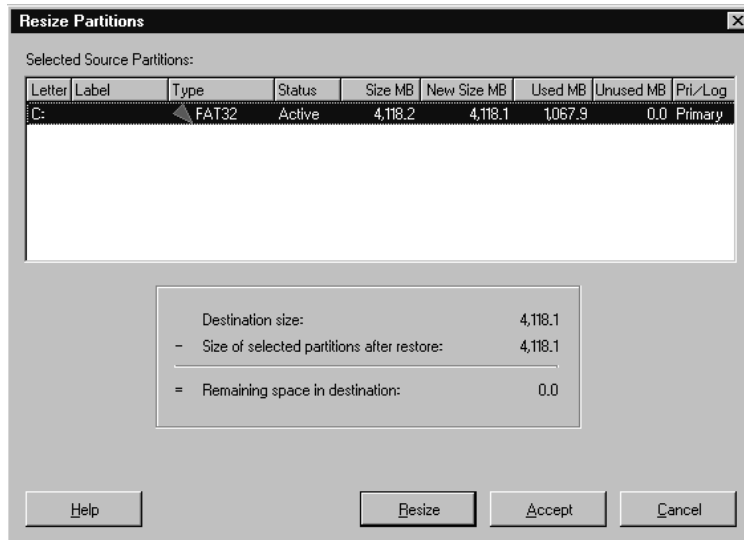
When you restore an image to unallocated space, Drive Image creates a new partition for the image. The unallocated space where you restore an image must be at least as large as the used space required by the image. For example, if you created an image of a 500 MB FAT32 partition that included 300 MB of data, the unallocated space where you restore the image must be at least 300 MB. If you are restoring an NTFS partition, note that NTFS partitions require some unused space to facilitate resizing and cannot be resized below the master file table (MFT), regardless of how much data is included in the partition.

If the destination partition or unallocated space is not large enough to accommodate the partitions you wish to restore, or if you are restoring the image file to a larger drive and want to set a specific size for partitions rather than use the proportional resize option, you may want to resize the partitions.

If you do not want to resize the partitions, go to step 14.

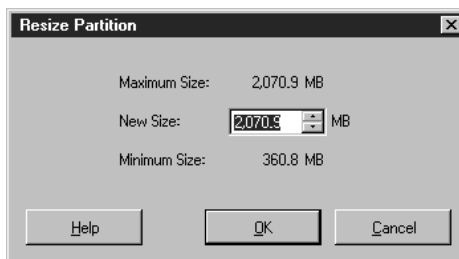
9 Click **Resize Source Partitions**.

The **Resize Partitions** window displays, and the **Selected Source Partitions** group box displays the partitions you selected to restore.



10 Click **Resize.**

The **Resize Partition** window appears.



11 In the **New Size field, enter the size for the new partition (in MB), then click **OK**.**

The size you enter must be equal to or larger than the Minimum Size and less than or equal to the Maximum Size displayed in the dialog. Since partitions must end on a cylinder boundary, Drive Image rounds the new size up to the next cylinder boundary.

12 Click **Accept.**

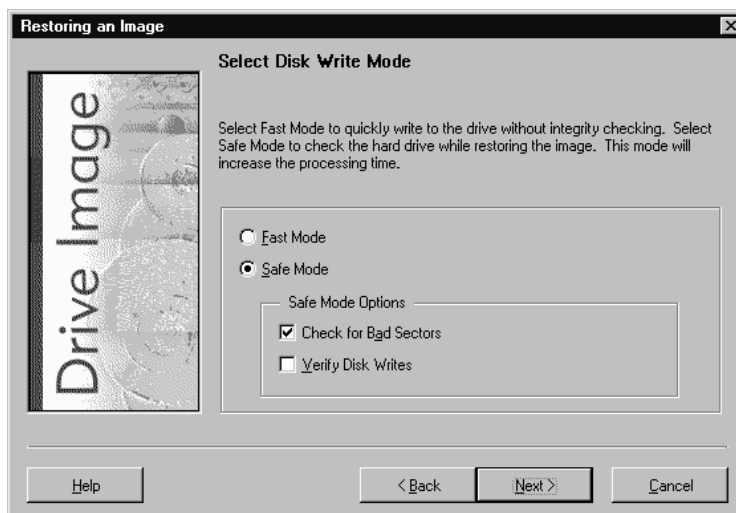
When you restore the image file, Drive Image will resize the partition.

13 Click Next.

If you selected an existing partition as the destination, a message appears to remind you that the existing partition will be deleted before your image is restored. Drive Image does not delete the partition until you click **Finish** on the **Ready to Restore Image File** screen; if you cancel the restore process before clicking Finish, your existing partition will still be there.

If the unallocated space on the destination drive is greater than the space required to restore the selected partitions, the **Resize Options** dialog appears. For more information, see “Resize Options” on page 35.

The **Select Disk Write Mode** screen appears.

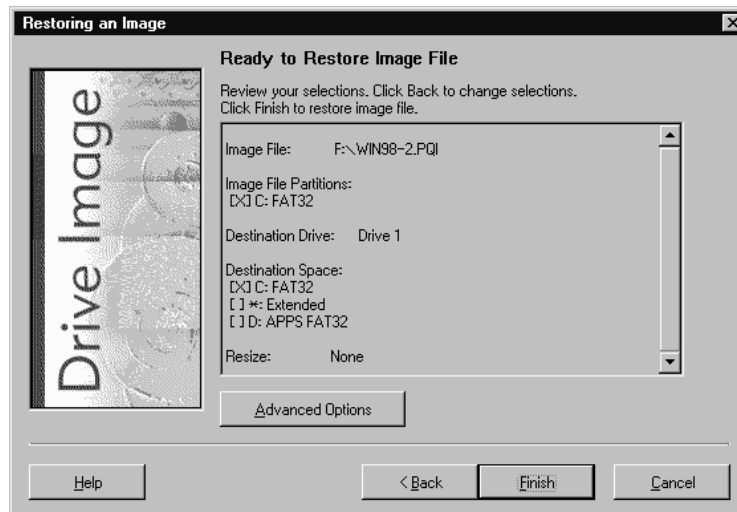


14 Click Fast Mode to copy data as quickly as possible without integrity checks, or click **Safe Mode** to choose integrity checks for Drive Image to perform while copying the data.

Be aware that choosing Safe Mode can increase the time necessary to copy data. If you choose Safe Mode, you can choose to check the hard disk for bad sectors and verify disk writes. Checking for bad sectors is a good idea if your destination disk is an older model or if you are not sure it is in good condition. If you choose verify disk writes, Drive Image will check the data after it is copied to make sure it is readable. Verifying disk writes greatly increases the time required to copy data and is optional.

15 Click Next.

Drive Image displays all the information you have entered to this point. To change any settings, click **Back**.



- 16** (Optional) To enable bad-sector checking, turn on DOS disk-write verification, check for file system errors, or hide partitions after restore, click **Advanced Options**. For more information, see “Advanced Options” on page 36.

IMPORTANT! Restoring partitions can cause the drive letters of subsequent partitions to change. This may make the computer unbootable or cause applications to fail.

IMPORTANT! If you are restoring a primary partition that contains an operating system, and it will not replace your existing primary partition, you must click **Advanced Options** and choose to hide the partition after restoring it. Otherwise, data corruption could occur.

- 17** Click **Finish** to begin restoring the image file.

If you assigned a password to the image file when you created it, the **Get Image File Password** dialog appears. You must enter the password to restore the image file. PowerQuest does not maintain image file passwords or have a workaround for restoring password-protected images without the password.

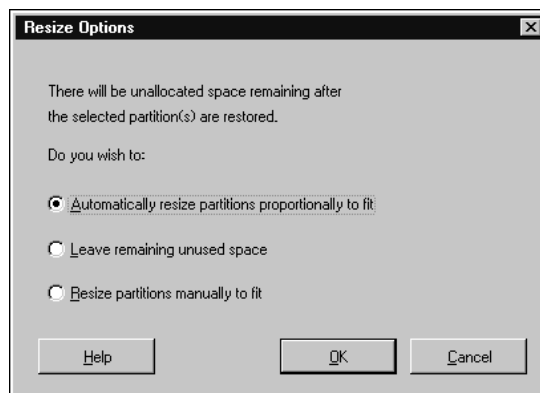
If Drive Image detects that you are restoring your image file from removable media, it enables a media-spanning feature that is capable of reading the image file from a series of disks. As Drive Image prompts you for each media, be careful to insert them sequentially.

The Restoring the Image dialog appears, tracking the progress of the image restore. Upon completion, the following message appears: “Image was restored successfully.”

18 Click **OK** to return to the Drive Image main screen.

Resize Options

If the unallocated space on the destination drive is greater than the space required by the partitions you are restoring, you have three options for how to handle the extra space.

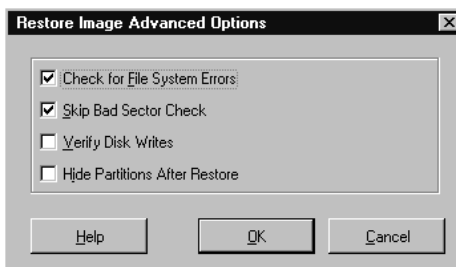


Click this option:	To do this:
Automatically resize partitions proportionally to fit	Allow Drive Image to automatically expand the partitions in equal proportions to occupy the destination drive's remaining free space.
Leave remaining unused space	Leave any remaining free space unused (unpartitioned) on the destination drive after the partitions are restored. This option will retain the original partition size.
Resize partitions manually to fit	Display the Resize Partition window where you can manually set the size of the partitions to fit in the destination drive's remaining free space.

For more information on resizing partitions, see step 9 of “Restoring an Image File” on page 28 (beginning of steps).

Advanced Options

At the **Ready To Restore Image File** screen, click **Advanced Options** to access the following:



Option:	Description:
Check for File System Errors	<p>Clear the Check for File System Errors check box to disable error checking.</p> <p>If you leave this option selected, Drive Image will check your disk for errors after restoring the image file.</p>
Skip Bad Sector Check	<p>This is selected by default to save time in restoring the image file.</p> <p>Although most drives do not have bad sectors, the potential for problems increases during the lifetime of the hard drive. If you have an older hard drive, it is wise to enable bad-sector checking by clearing the Skip Bad Sector Check box.</p>
Verify Disk Writes	<p>Click Verify Disk Writes if you want to enable DOS disk write verification. Disk write verification is not critical to safely restore image files. Enabling disk write verification can slow the image restore process significantly.</p>

Option:	Description:
Hide Partition After Restore	<p>Restoring multiple logical partitions can cause the drive letters of subsequent partitions to change. This may make the computer unbootable or cause applications to fail.</p> <p>Most operating systems only allow one primary partition to be visible (bootable) at a time. If you are restoring an image of a primary partition, and you do not want to make that partition your visible (bootable) partition, click Hide Partition After Restore. Failing to do so could cause data corruption.</p> <p>For example, if you are using your secondary hard drive as a complete backup of your primary drive, clicking Hide Partition After Copy preserves all the secondary drive information without changing any drive letters. When the computer boots up, a drive letter will not be assigned to the hidden partition. For more information about hiding partitions, see “Hiding Partitions” on page 63.</p>

Scenarios

Restoring an Image File from a Zip Drive

Sample System Configuration

One 2.1 GB hard drive containing:

- One 1.1 GB active primary FAT partition (C:) running Windows 95; 600 MB used and 500 MB unused.
- 1 GB unpartitioned free space.

One CD-ROM drive (D:).

One Zip drive (E:).

Objective

Restore a 400 MB logical FAT partition from an image file (MYIMAGE.PQI) that spans two Zip disks. You wish to restore the logical partition to the unpartitioned free space on your hard drive and to resize it to 1 GB.

Procedure

- 1 Run Drive Image.

As Drive Image automatically loads the Zip drivers, be sure to note the drive letter assigned to the Zip drive. In this case, we will refer to the Zip drive as E:.

- 2 From the Drive Image main screen, click **Restore Image**.
- 3 Insert the Zip disk you labeled as “MYIMAGE DISK #1” into your Zip drive.
- 4 In the Image File field, type E : \MYIMAGE . PQI.

You may also click **Browse** to browse the directory tree for your Zip drive and the desired image file.

- 5 Click **Next**.
- 6 Select the 400 MB logical partition.
- 7 Click **Next**.
- 8 **Disk 1** should already be selected. Click **Next**.

This step is skipped if you only have one hard disk.

- 9 Select the 1 GB unpartitioned free space.
- 10 Click **Next**.
- 11 When the **Resize Options** window appears, select **Automatically resize partitions proportionally to fit**, then click **OK**.

For information about other options, see “Resize Options” on page 35.

- 12 Click **Finish**.
- 13 When Drive Image prompts you to insert the next media in the series, remove “MYIMAGE DISK #1” from the Zip drive and insert “MYIMAGE DISK #2”.
- 14 After Drive Image has completed the image restore, click **OK** to return to the Drive Image main screen and exit the program.
- 15 Reboot your computer.

Result

After reboot, your hard drive has an active primary partition (C:) and an extended partition containing a 1 GB logical partition (D:). Your CD-ROM has changed to drive E: and your Zip drive is F:.

For information about why drive letters change, run Setup from the Drive Image CD, then click **Documentation ► Understanding Hard Drives**.

Restoring an Image File from a CD Drive

Sample System Configuration

One 3 GB hard drive containing:

- One 1.8 GB damaged, unbootable active primary FAT partition (C:) containing Windows 95; 1 GB used and 800 MB unused.
- One 1.2 GB extended partition containing one logical partition (D:); 1.2 GB unused.

One CD-ROM drive (E:).

Objective

Replace your damaged active primary partition (C:) with a backup image of the partition stored on CD-ROM.

Procedure

- 1 Ensure you run PQPACKET before starting Drive Image, so Drive Image can recognize your CD drive.
- 2 Type PQDI and press <Enter>.
- 3 From the Drive Image main screen, click **Restore Image**.
- 4 Insert the CD-ROM you labeled as “MYIMAGE DISK #1” into your CD-ROM drive.
- 5 Click **Browse** to browse the directory tree for your CD drive and the desired image file.

CD drives display as \\.\pqcdx, where *x* is the number of the drive, beginning with zero. The name of the drive is also displayed.

If you have a spanned image file, Drive Image will prompt you to insert media when it needs to display the image filename. You should insert the last media in the series. (The prompt may appear at this point or after you click **Next** in step 6.)

- 6** Click **Next**.
- 7** Select the 1.8 GB primary partition (C:).
- 8** Click **Next**.
- 9** **Disk 1** should already be selected.
- 10** Click **Next**.
- 11** Select the 1.8 GB damaged primary partition (C:) on your hard drive.
- 12** Click **Next**.

The following message appears:

“Item selected is not unallocated space. Disk Images can only be restored into existing unallocated space. Drive Image will delete this partition before restoring disk image. WARNING: Deleting a partition will DESTROY any existing data on that partition.”

- 13** Click **OK**.
- 14** Click **Finish**.

Drive Image deletes the C: partition and labels it as unallocated space.
- 15** When Drive Image prompts you to insert the next media in the series, remove “MYIMAGE DISK #1” from the CD-ROM drive and insert “MYIMAGE DISK #2.”
- 16** After Drive Image has completed the image restore, it prompts you to select a primary partition to set active (bootable). Select the partition you just restored.
- 17** Click **OK** to return to the Drive Image main screen and exit the program.
- 18** Reboot your computer.

Result

The restored primary partition (C:) has replaced the damaged active primary partition (C:). You should now be able to boot to Windows 95 and operate normally again. Your C: partition contains all the data that was present on it when you originally created the image file.

If your computer supports booting from CD, you can also boot your computer with the Drive Image CD, run Drive Image from the CD, and restore your image file.

Restoring an Image File from a Secondary Hard Disk

Sample System Configuration

Disk 1—One 3.5 GB hard drive containing:

- One 1.5 GB active primary FAT partition (C:) running Windows 95; 500 MB used and 1 GB unused.
- One 1 GB extended FAT32 partition containing one logical partition (E:); 400 MB used and 600 MB unused.
- 1 GB unpartitioned free space.

Disk 2 — One 2 GB hard drive containing:

- One 1 GB primary FAT partition (D:); 1 GB used by the image file, MYIMAGE.PQI, and 0 MB unused.
- One 1 GB extended partition containing one logical partition (F:); 600 MB used and 400 MB unused.

Objective

Restore the 1 GB logical partition from the image file, D:\MYIMAGE.PQI to the unpartitioned free space on Drive 1.

Procedure

- 1** Run Drive Image.
- 2** From the Drive Image title screen, click **Restore Image**.
- 3** In the **Image File** field, type D: \MYIMAGE . PQI.
You may also click **Browse** to browse the directory tree for your secondary drive and the desired image file.
- 4** Click **Next**.
- 5** Select the 1 GB logical partition.
- 6** Click **Next**.
- 7** Select **Disk 1**.
- 8** Click **Next**.

- 9** Select the 1 GB unpartitioned free space.
- 10** Click **Next**.
- 11** Click **Finish**.
- 12** After Drive Image has completed the image restore, click **OK** to return to the Drive Image main screen and exit the program.
- 13** Reboot your computer.

Result

After reboot, Disk 1 has a 1.5 GB active primary partition (C:) and an extended partition containing two 1 GB logical partitions (E: and F:). Disk 2 has a 1 GB primary partition (D:) and an extended partition containing one 1 GB logical partition (G:).

Copying Disk to Disk

This chapter includes the following information:

- Preparation
- Procedure
- Advanced Options
- Scenarios

Preparation

If you are upgrading to a new hard drive, refer to “Using Drive Image with SCSI Hard Disks” or “Using Drive Image with Drive Overlay Software” on page 92 if needed.

It is strongly recommended that you perform the following steps before upgrading to a new hard drive or using Drive Image to copy disk to disk.

- Create a set of Drive Image rescue diskettes. See “Creating Rescue Diskettes under Windows” on page 5.
- Before running Drive Image, use a disk utility program such as a thorough ScanDisk or Norton’s Disk Doctor to identify and repair any errors on your hard drive.
- Verify that the destination drive or partition is the same size or larger than the source drive. You can copy a partition or drive from a larger to a smaller partition or drive. However, there must be enough unallocated space on the smaller destination to accommodate the used space on the larger source.

If you are copying from one partition to another partition on the same hard disk, go directly to the steps outlined under “Procedure” on page 45.

IMPORTANT! If you are using Drive Image to copy a Windows NT partition, refer to “Copying Windows NT or Windows 2000 Partitions” on page 12 for information about the BOOT.INI.

Setting Up a Dual Hard Disk System

- 1 Get the manufacturer’s installation guides for both drives.

The installation guides provide information on installing the drives, setting up the BIOS, and changing the jumper settings. If you do not have access to these guides, contact the hard drive manufacturers directly. Most drive manufacturers maintain sites on the Internet that offer setup information.

- 2 Turn off the computer’s power.
- 3 Discharge static electricity by touching a grounded metal object such as a metal filing cabinet.

IMPORTANT! Do not allow static electricity to contact the inner parts of your computer. Static electricity can damage or destroy your computer’s electronic components.

- 4 Remove the computer’s cover.

5 Determine which drive you want to be master and which drive you want to be slave, then follow the manufacturer's instructions to change the jumper settings on your hard drives accordingly.

6 Attach the interface cable and the power supply cable to the second drive.

7 Mount the second drive.

8 Start the computer and enter its Basic Input/Output System (BIOS) Setup program before the computer completes startup.

This is usually accomplished by pressing , <F1>, or <F2>, according to the prompt that appears at the bottom of your screen during initial startup.

9 If the BIOS Setup program includes an **Auto-Detect** option, select it to detect both the master and slave drives.

If there is no **Auto-Detect** option, you may be required to enter the specific number of heads, cylinders, and megabytes of the drives. This information is usually printed on the drive's outside cover. If it is not, contact the drive manufacturer.

10 If the BIOS does not support hard drives larger than 504 megabytes, follow the destination drive manufacturer's instructions to install any software included with the drive.

Computer BIOSs made before 1994 usually do not support the EIDE standard and cannot address hard drives larger than 504 MB. Hard drives larger than 504 MB typically include software such as OnTrack Disk Manager, Maxtor Max-Blast Disk Manager, or Micro House EZ-Drive which allow computers to see larger hard drives.

If your machine does not support the EIDE standard, make sure the software included with the destination drive is correctly installed.

If Drive Image lists a drive size that is much smaller than its actual size, the EIDE support software is not functioning properly.

11 Turn off the computer, then restart it.

Procedure

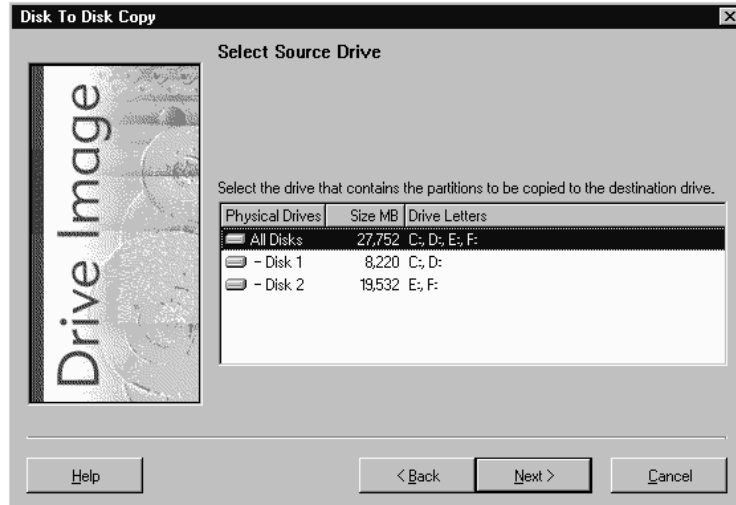
The Disk to Disk feature copies partitions directly from one place to another without creating an image file.

If you received a demo version of Drive Image, you cannot use the Disk to Disk feature.

It is not necessary to format your destination partition or to partition your hard drives before performing a Disk to Disk copy. Drive Image automatically performs both these functions.

- 1 At the Drive Image main screen, click **Disk To Disk**.

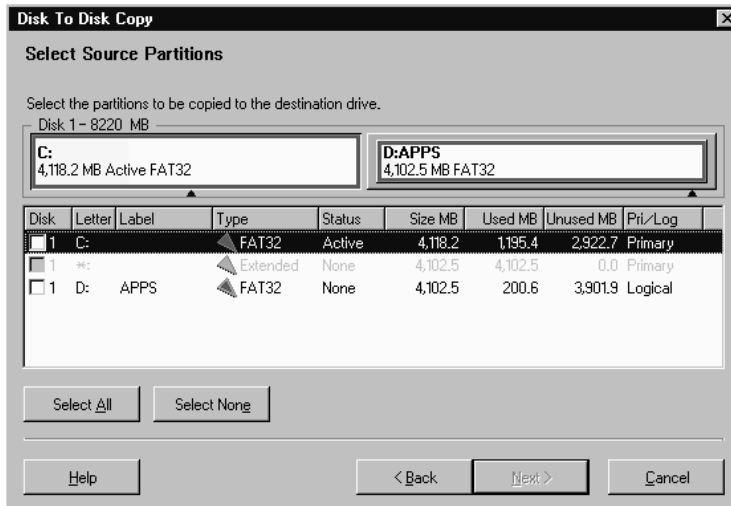
The **Select Source Drive** screen appears.



- 2 Select the disk or disks that include partitions you want to copy, then click **Next**.

At any point prior to actually copying partitions, you can click **Back** to change your settings.

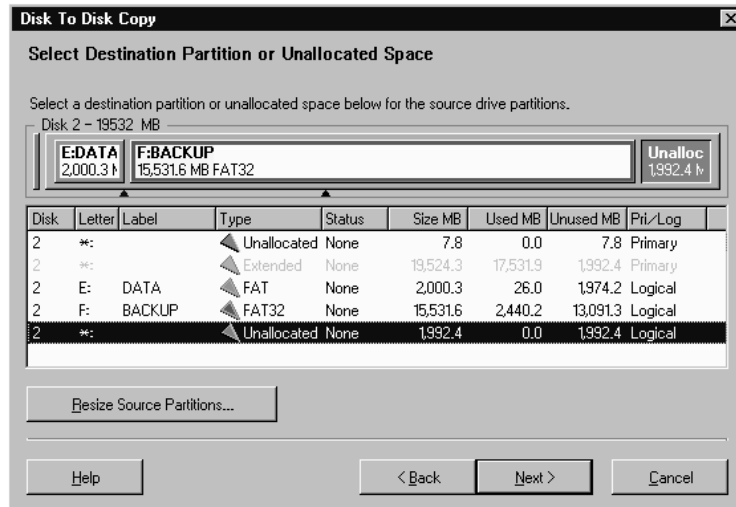
- 3 Select the source partition you wish to copy, or click **Select All** to select all partitions.



You may need to scroll to view all the partitions in the list. Note that if you have more than one hard disk on your machine, the first column in the partition list shows the physical hard disk where the partition is located.

A check appears to the left of selected partitions. To deselect partitions, click again on a partition or click **Select None** to deselect all partitions at once.

- 4** Click **Next**.
- 5** Select the destination drive that includes the partitions or unallocated space where you want the copied partitions to be stored, then click **Next**.
- 6** Select the destination partition or unallocated space, then click **Next**.



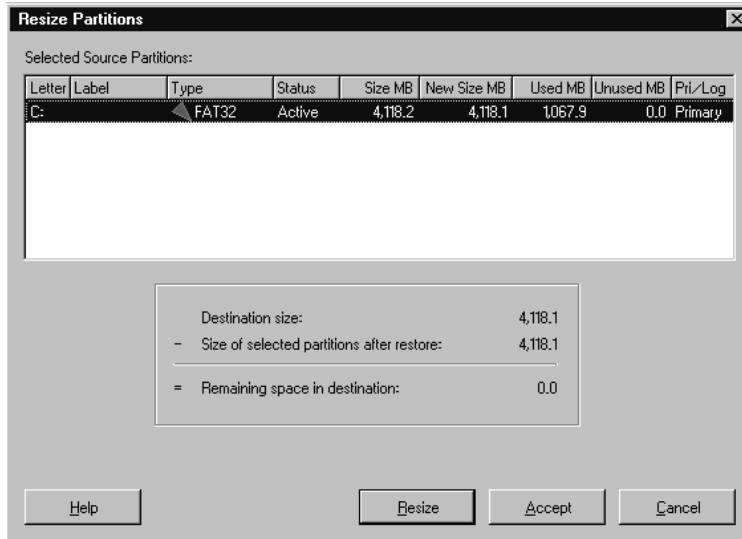
You may need to scroll to view all the partitions in the list. Note that if you have more than one hard disk on your machine, the first column in the partition list shows the physical hard disk where the partition is located.

IMPORTANT! To copy partitions, the destination partition or drive must have unallocated space equivalent to the total used space of the selected source partition. If you copy to a partition that already includes data, the existing data will be replaced.

- 7 If the destination partition or unallocated space is not large enough to accommodate the partition you wish to copy, or if you are copying the partition to a larger drive and want to set a specific size for the partition rather than use the proportional resize option, you can click **Resize Source Partitions** to specify a different size for the copied partition. If you do not want to resize the source partition, go to step 12.

- 8 Click **Resize Source Partitions**.

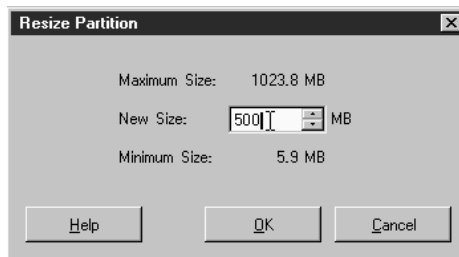
The **Resize Partitions** window appears.



The **Selected Source Partitions** group box displays the partition you selected to copy. The screen also displays the destination size, current size of selected partition, and remaining free space in the destination.

- 9 Otherwise, Click **Resize**. (If you do not want to make changes, click **Accept**.)

The **Resize Partition** window appears.



- 10 In the **New Size** field, type the size for the partition (in MB), then click **OK**.

The size you enter must be equal to or larger than the Minimum Size and less than or equal to the Maximum Size displayed in the dialog.

Since partitions must end on a cylinder boundary, Drive Image rounds the **New Size** up to the nearest cylinder boundary.

NTFS partitions require some unused space to facilitate resizing and cannot be resized below the master file table (MFT), so the minimum size may appear larger than is necessary to accommodate the data in the partition.

11 Click **OK, then click **Accept**.**

Later, when you copy the partition, Drive Image resizes it.

12 Click **Next.**

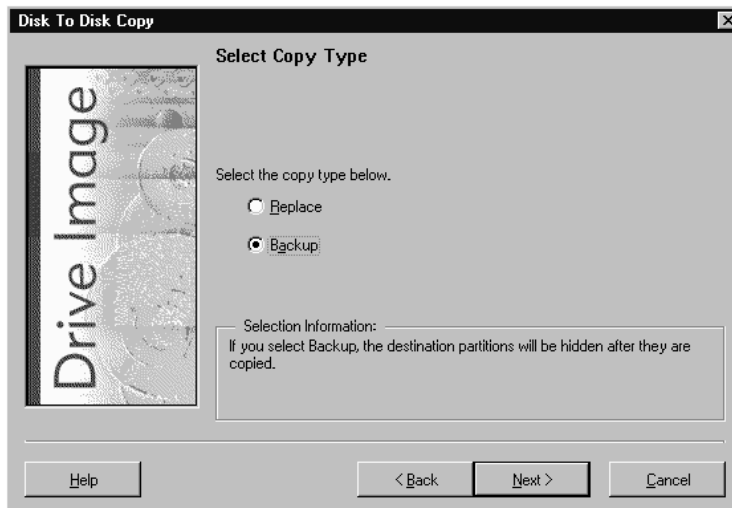
If you selected an existing partition as the destination, a prompt will appear reminding you that the existing partition will be deleted before copying.

Drive Image does not delete the partition until you click **Finish** on the **Ready to Copy Disk to Disk** screen.

13 If the unallocated space on the destination drive is greater than the space required to copy the selected partition, the **Resize Options dialog appears. Click the option you want, then click **OK**.**

Select this option:	To do this:
Automatically resize partitions proportionally to fit	Allow Drive Image to automatically expand the partitions in equal proportions to occupy the destination drive's remaining unallocated space.
Leave remaining unused space	Leave any remaining unallocated space unused on the destination drive after the partitions are copied.
Resize partitions manually to fit	Display the Resize Partitions window where you can manually set the size of the partitions to fit in the destination drive's remaining unallocated space. (See step 8 for additional information about the Resize Partition window.)

The **Select Copy Type** screen appears.



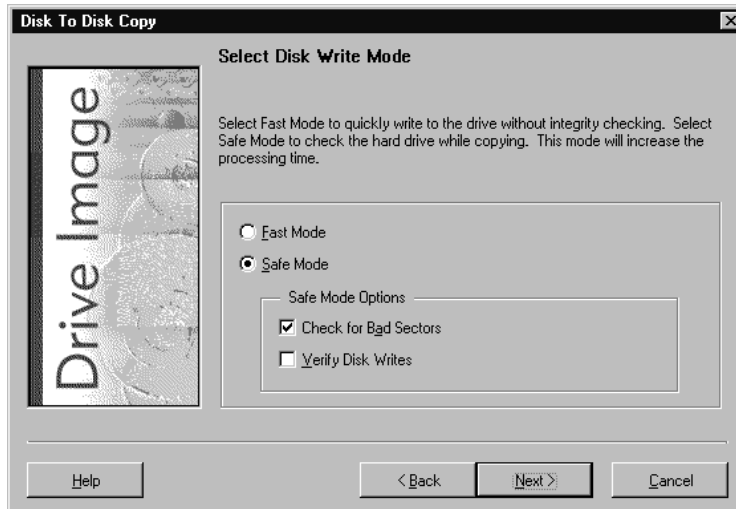
- 14** Select **Replace** or **Backup** to indicate why you are running Drive Image, then click **Next**.

Select **Replace** if you are adding a hard disk to your system and using Drive Image to copy information from your old drive to the new drive.

If you select **Replace**, Drive Image will hide the source partitions after copying them. If you select **Backup**, Drive Image will hide the destination partitions after copying them.

By hiding either the source or destination partitions, Drive Image ensures that your drive letters will not change when you reboot your computer. Hiding partitions can also avoid problems that result when two identical operating system partitions are visible when you reboot. If you are confident that having both your source and destination partitions visible will not make your computer unbootable or cause problems because of drive letter changes, you can click **Advanced Options** at the Ready to Copy Disk to Disk screen (see step 17) and change Drive Image's default settings.

The **Select Disk Write Mode** screen appears.

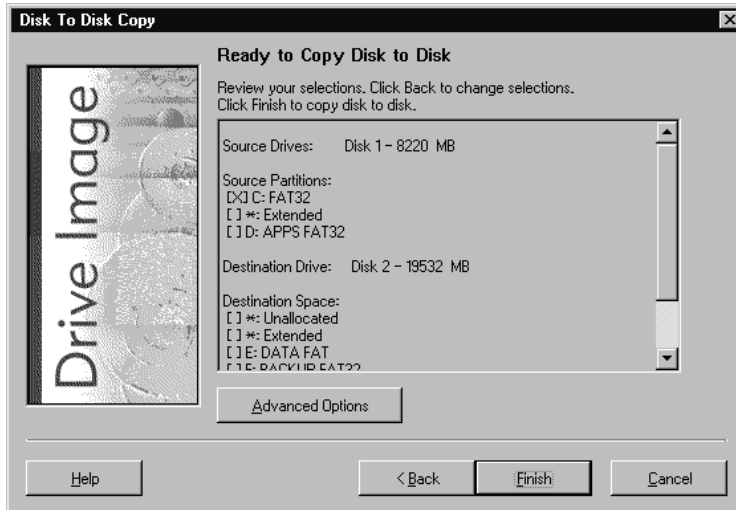


- 15** Click **Fast Mode** to copy data as quickly as possible without integrity checks, or click **Safe Mode** to choose integrity checks for Drive Image to perform while copying the data.

Be aware that choosing Safe Mode can increase the time necessary to copy data. If you choose Safe Mode, you can choose to check the hard disk for bad sectors and verify disk writes. Checking for bad sectors is a good idea if your destination disk is an older model or if you are not sure it is in good condition. If you choose verify disk writes, Drive Image will check the data after it is copied to make sure it is readable. Verifying disk writes greatly increases the time required to copy data and is optional.

- 16** Click **Next**.

Drive Image displays all the information you have entered to this point.



- 17** (Optional) To alter any settings, click **Back**. To set options such as disabling file system error-checking or hiding partitions after copy, click **Advanced Options**. For more information, see “Advanced Options” on page 54.

Copying multiple logical partitions can cause the drive letters of subsequent partitions to change. This may make the computer unbootable or cause applications to fail. For information on why drive letters change, run Setup on the Drive Image CD, then click **Documentation ► Understanding Hard Drives**.

- 18** Click **Finish** to begin copying the selected partition.

The **Copying Disk To Disk** dialog tracks the progress. Upon completion, the following message appears: “Selected partition(s) copied successfully. Would you like to view the results?”

- 19** Click **OK** to return to the Drive Image main screen.

If you ever want to replace the active partition with a hidden backup partition (for instance, if you lose data from your C: partition), run Drive Image **Disk To Disk** again. Select the hidden partition as the source and the active partition as the destination. After Drive Image completes the copying process, it prompts you to set an active partition. Select the newly copied partition.

Advanced Options

The **Disk to Disk Advanced Options** dialog appears when you click **Advanced Options** at the **Ready To Copy Disk To Disk** screen.



Select this:

To do this:

Source Options

Check for File System Errors

Clear the **Check for File System Errors** check box if you want to disable error checking.

If you have already used a disk utility program such as ScanDisk to check your hard disk for errors, it is not necessary to have Drive Image check for file system errors. Clearing **Check for File System Errors** saves time in copying the partitions. If you did not run a disk utility program before loading Drive Image, leave the **Check for File System Errors** check box selected.

Disable SmartSector Copying

Drive Image's SmartSector technology speeds up the copying process by only copying clusters and sectors that contain data. However, in some cases, such as high-security environments, it may be desirable to copy all clusters and sectors in their original layout, whether or not they contain data.

If you wish to copy both used and unused clusters and sectors, click **Disable SmartSector Copying**. Disabling SmartSector copying increases processing time.

Select this:	To do this:
Hide Source Partitions After Copy	<p>If you selected Replace at the Select Copy Type screen, this option is selected by default. Hiding the source partition will ensure that your drive letters do not change when you reboot your computer. It can also avoid problems caused by having two identical operating systems visible when you reboot.</p> <p>You can use this option to copy an operating system to a new disk and hide the original partitions. The new partitions will be active. You can set the new drive to master and the old drive to slave, reboot and test the new operating system with the old drive still in place in case something goes wrong.</p>
<i>Destination Options</i>	
Skip Bad Sector Check	<p>This option is selected by default to save time in copying the partitions. Although most drives do not have bad sectors, the potential for problems increases during the lifetime of the hard drive. If you have an older hard drive, it is wise to enable bad-sector checking by clearing the Skip Bad Sector Check box.</p>
Verify Disk Writes	<p>Click Verify Disk Writes if you want to enable DOS disk write verification.</p> <p>Disk write verification is not critical to safely copy files. Enabling disk write verification can slow the copying process dramatically.</p>
Hide Destination Partitions After Copy	<p>If you selected Backup at the Select Copy Type screen, this option is selected by default. Most operating systems only allow one primary partition to be visible (bootable) at a time. If you are copying a primary partition and you do <u>not</u> want to make that partition your bootable partition, the Hide Destination Partitions After Copy box should be selected.</p> <p>If you are using your secondary hard drive as a complete backup of your primary drive, selecting Hide Destination Partitions After Copy preserves all the secondary drive information without changing any drive letters. When the computer boots up, a drive letter will not be assigned to the hidden hard drive. For additional information about hiding partitions, see “Hiding Partitions” on page 63.</p>

Scenarios

Copying from Partition to Partition in a Single Hard Disk System

Sample System Configuration One 2 GB hard disk containing one 2 GB active primary partition (C:) running Windows 98; 500 MB used and 1.5 GB unused.

Objective Create a backup of the active partition by copying it to the same hard disk.

- 1** Use PowerQuest's PartitionMagic to resize the existing primary partition to about half the total size of the hard drive (1 GB).
- 2** Run Drive Image.
- 3** From the Drive Image main screen, click **Disk To Disk**.
- 4** **Disk 1** should already be selected. Click **Next**.
- 5** Select the primary partition (C:), then click **Next**.
- 6** **Disk 1** should already be selected, then click **Next**.
- 7** Select the unallocated space you created when you resized the primary partition, then click **Next**.

If the **Resize Options** window appears, select **Automatically resize partitions proportionally to fit**, then click **OK**.
- 8** From the **Ready To Copy Disk To Disk** screen, click **Advanced Options**.
- 9** Under the **Source Options**, clear the **Check for File System Errors** box.
- 10** Under the **Destination Options**, click **Hide Destination Partition(s) After Copy**, then click **OK**.
- 11** Click **Finish**.
- 12** After Drive Image has completed the copying process, click **OK** to return to the Drive Image main screen and exit the program.

The computer reboots and returns to Windows 98. Because only one primary partition may be visible at a time, the new partition does not appear in Windows Explorer.

Copying from Drive to Drive in a Dual Hard Disk System

Sample System Configuration

Disk 1 — One 3 GB hard drive containing:

- One active 1.5 GB primary partition (C:) running Windows 98; 500 MB used and 1 GB unused.
- One extended 1 GB partition containing one logical partition (E:); 400 MB used and 600 MB unused.
- 500 MB unpartitioned free space.

Disk 2 — One 2 GB hard drive containing:

- One primary 1 GB partition (D:); 400 MB used and 600 MB unused.
- One extended 1 GB partition containing one logical partition (F:); 200 MB used and 800 MB unused.

Objective

Copy the E: partition from Disk 1 to the F: partition on Disk 2.

1 Run Drive Image.

2 From the Drive Image main screen, click **Disk To Disk**.

3 Select **Disk 1**, then click **Next**.

4 Select the E: partition, then click **Next**.

5 Select **Disk 2**. then click **Next**.

6 Select the F: partition, then click **Next**.

A message indicates that the selected partition will be deleted before copying.

7 Click **OK**.

8 From the **Ready To Copy Disk To Disk** screen, click **Advanced Options**.

9 Under **Source Options**, clear the **Check for File System Errors** box, then click **OK**.

10 Click **Finish**.

11 After Drive Image has completed the copying process, click **OK** to return to the Drive Image main screen and exit the program.

The computer reboots and returns to Windows 98. Drive letters stay the same, but the F: partition now contains the same data as the E: partition.

Common Partition Management Tasks

This chapter includes the following information about the Tools menu:

- Displaying Drive Information
- Creating Extended Partitions
- Deleting Partitions
- Hiding Partitions
- Setting the Active Partition

The **Tools** drop-down menu on the Drive Image main screen lets you manually perform some common partition-management tasks that Drive Image automatically performs when it processes image files or when it copies partitions. The **Tools** menu gives you access to these useful features without requiring you to create or restore image files or copy partitions.

Displaying Drive Information

The **Display Drive Information** option lets you view information about the partitions on your current hard drive.

- Drive letters
- Volume (partition) labels
- Color-coded volume (partition) types
- Status (active partition)
- Partition size
- Used MB in partitions
- Free MB in partitions
- Primary or logical drive

- 1 At the Drive Image main screen, click **Tools ► Display Drive Information**.
- 2 From the **Physical Drives** drop-down list, choose the drive where the partition you want information about is located.
- 3 Select the partition from the partition list.

Drive Information Displayed on the Screen (Partition Map)

Several Drive Image dialog boxes include a partition map that shows the partitions on your hard disk. If the selected hard disk includes logical partitions, they are shown within an extended partition. Partitions are color coded to indicate the file system type each uses. For example, dark green indicates a FAT32 partition. In addition, each partition is shaded to show used and unused space within the partition.

The partition map also shows unallocated space (space not assigned to any partition).

There are triangle indicators on the partition map to mark the 2 GB boot code boundary and the 1024 cylinder limit. The boundary markers can help you as you restore image files or set a new partition active. If your operating system requires the boot code to be within the first 2 GB of the hard disk, for example, you can tell at a glance if the partition is located in a place that will make it bootable.

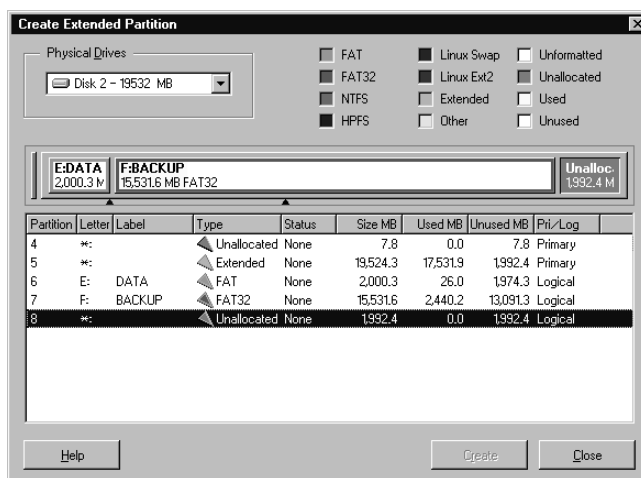
Creating Extended Partitions

If you create an image of a primary partition and want to restore it as a logical partition, you must first have an extended partition on your hard drive. For example, if you have two hard disks that each include a primary partition (a bootable C: and a data partition D:) and you are copying both partitions to a new hard disk that will be your master disk, you would want the D: partition copied to a logical partition to avoid having two primary partitions on the new hard disk. Primary partitions on the primary master drive should be reserved for operating systems only.

It is not necessary to manually create an extended partition when you restore an image of a logical partition. Drive Image automatically creates an extended partition if one does not already exist.

- 1 At the Drive Image main screen, click **Tools ► Create Extended Partition**.

The **Create Extended Partition** window appears.



- 2 Select an unallocated space from the partition list.

If there is no unallocated space on your computer, you must delete an existing partition to create unallocated space.

- 3 Click **Create**.

Drive Image creates an extended partition in the selected free space.

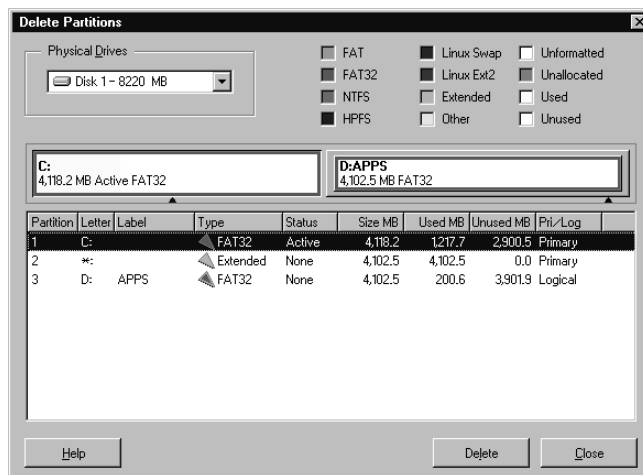
- 4 Click **Close** to return to the Drive Image main screen.

Deleting Partitions

This feature deletes existing partitions to create unallocated space on your hard drive. Be aware that deleting existing partitions destroys any data they contain.

- 1 At the Drive Image main screen, click **Tools ► Delete Disk Partitions**.

The **Delete Partitions** window appears.



- 2 From the **Physical Drives** drop-down list, choose the disk where the partition you want to delete is located.

- 3 Click the partition you wish to delete.

You may need to scroll to view all the partitions on your machine.

- 4 Click **Delete**.

The **Delete Partition** dialog appears, displaying the selected partition and its volume label.

- 5 Type **OK**, then click **OK**.

Drive Image deletes the partition and displays the message: “Volume <volume name> was deleted successfully.”

- 6 Click **Close** to return to the Drive Image main screen.

Hiding Partitions

The **Hide/Unhide** feature allows you to protect partitions from unwanted user access. Hidden partitions are not accessible because they are not assigned drive letters when you boot your computer. If you unhide a partition, it is assigned a drive letter the next time you boot your computer and becomes accessible again.

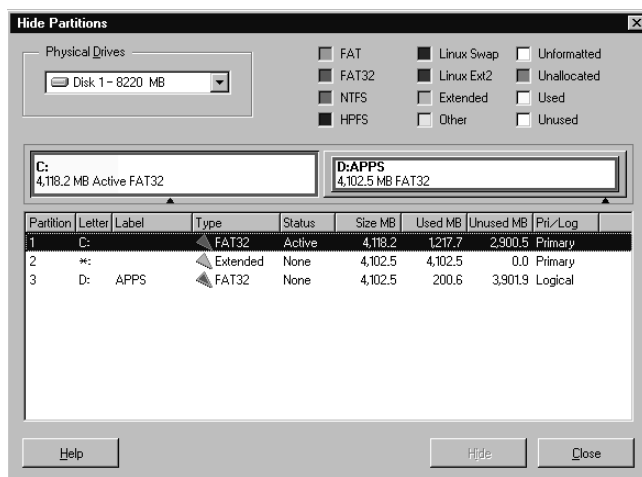
Before hiding and unhiding partitions, be aware of the following restrictions.

- Hiding or unhiding a partition can cause the drive letters of subsequent partitions to change. This may make the computer fail to boot or cause applications to fail. For information on why drive letters change and how to fix them, run Setup from the Drive Image CD, then click **Documentation ► Understanding Hard Drives**.
- If your hard drive contains more than one primary partition, only one is visible by default. When you use the **Set Active Partition** feature, Drive Image unhides the selected primary partition and automatically hides all other primary partitions. See “Setting the Active Partition” on page 64.
- Because a hidden partition is not bootable or accessible, if you hide the partition where Drive Image is installed, you must re-install Drive Image on your new active (bootable) partition to run it again.

To hide/unhide a partition,

- 1 At the Drive Image main screen, click **Tools ► Hide/Unhide Partitions**.

The **Hide Partitions** window appears.



- 2 Click the partition you want to hide.

Normally when you select a partition, the **Hide** button becomes available. If the button is not available, the partition can't be hidden.

- 3 Click **Hide** to hide the selected partition.

The partition status changes to "Hidden."

- 4 Click a hidden partition.

Normally when you select a partition, the **Unhide** button becomes available. If the button is not available, the partition can't be unhidden.

- 5 Click **Unhide** to unhide the selected partition.

The partition status changes to "None."

- 6 Click **Close** to return to the Drive Image main screen.

- 7 Click **Exit** to exit Drive Image.

- 8 Reboot your computer.

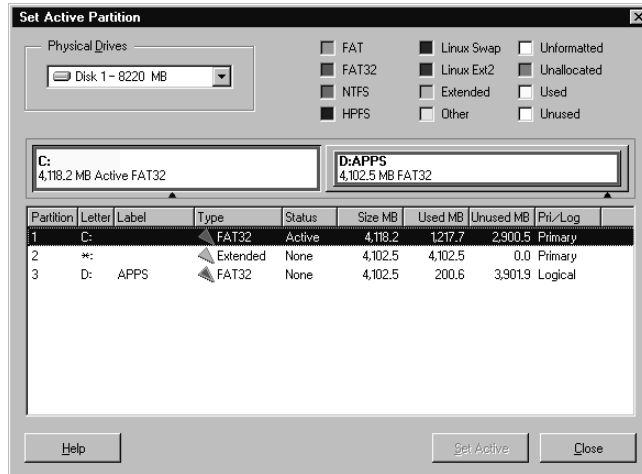
Setting the Active Partition

The Set Active Partition feature allows you to make a primary partition the active (bootable) partition. Only one primary partition can be active at a time. To be bootable under most operating systems, a primary partition must be located on the first (master) drive, and it must contain an operating system. When your computer boots, it scans the partition table of the first drive to find the active partition, then boots from that partition.

WARNING! Before you set an active partition, be sure it is bootable. If it is not bootable or if you are not sure, locate the boot disk you created when you installed Drive Image. If you restart your computer and it does not boot normally, you must boot from the floppy disk, run Drive Image from the program disk you created during Drive Image install, and set a different partition active. Refer to "Drive Information Displayed on the Screen (Partition Map)" on page 60 for explanations of the Drive Image screen that may also help you determine if your partition is bootable.

- 1 At the Drive Image main screen, click **Tools ► Set Active Partition**.

The **Set Active Partition** window appears.



2 Select a primary partition that is not currently active.

3 Click **Set Active**.

The status of the selected partition changes to “Active.”

4 Click **Close**.

5 Click **Exit** to exit Drive Image.

6 Reboot your computer.

Drive Image File Editor

This chapter includes the following information:

- Overview
- Drive Image File Editor—Main Screen
- Modifying Images
- Restoring Files or Partitions
- Verifying Image Contents
- Deleting Image Files
- Displaying Information About Images
- Displaying Information About Partitions
- Drive Image File Editor Options
- Online Help
- Exiting Drive Image File Editor

Overview

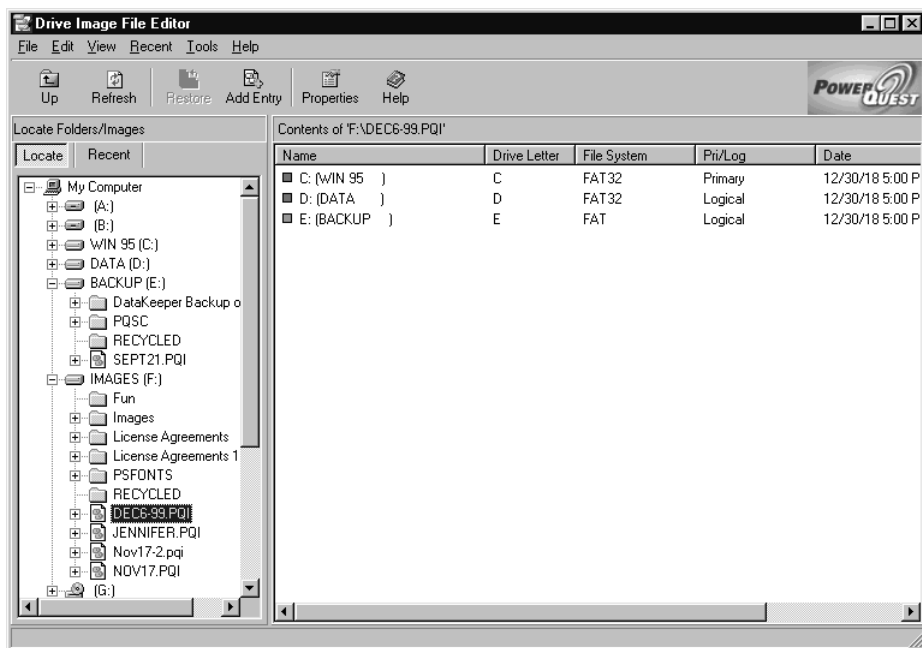
PowerQuest's Drive Image File Editor simplifies management of your image files. Working within a single screen, Drive Image File Editor gives you total control of the image files you can access. You can view image file contents, copy image files, copy partitions within files, restore individual program and data files from the image, or add password protection to image files.

Drive Image File Editor also provides description capabilities, so you can easily identify individual image files and partitions.

Drive Image File Editor runs under Windows 95, Windows 98, Windows NT Workstation, and Windows 2000 Professional.

Drive Image File Editor—Main Screen

The Drive Image File Editor main screen is divided into three panes: Locate, Recent, and Contents.



Screen area:	Description:
Locate pane	Displays a tree view of all the drives on your machine (local hard disks and network drives).
Recent pane	Displays a tree view of image files you have browsed to or opened recently. You can clear the list of recent images by clicking Recent ► Clear Recent Images List .
Contents	Displays the contents of the selected drive, folder, image file, or partition.
Toolbar	Provides quick access to common tasks. You can display or hide the toolbar using the View menu. You can also use the View menu to determine whether to display text labels on the toolbar buttons.
Status bar	Displays a brief description of the toolbar button where the pointer is located. You can display or hide the status bar using the View menu.

Modifying Images

You can use the Copy to Image feature in Drive Image File Editor to copy single or multiple partitions to new or existing image files. When you copy a file, partition, or image, you also have an option to set the compression level for the resulting image, add a password to the image, or split the image into multiple files.

Copying Partitions to an Image File

You can drag and drop partitions from one image file to another, or you can copy partitions using the **Edit** menu. Copied partitions will not overwrite any partition already in an image file. Therefore, you can have several partitions with the same name or drive letter within one image file.

There are several methods to copy partitions or image files:

- Drag and drop the partition or image from the Recent or Locate pane onto a drive or folder in the Locate pane.
- Drag and drop a partition within an image file onto another image file or onto a folder in the Locate pane.
- Select a partition, click **File ► Copy to Image**.

- Right-click a partition, click **File ► Copy to Image**.
- Select a partition, click **Edit ► Copy**, move the insertion point to the new location, then click **Edit ► Paste**.

What you copy:

Result:

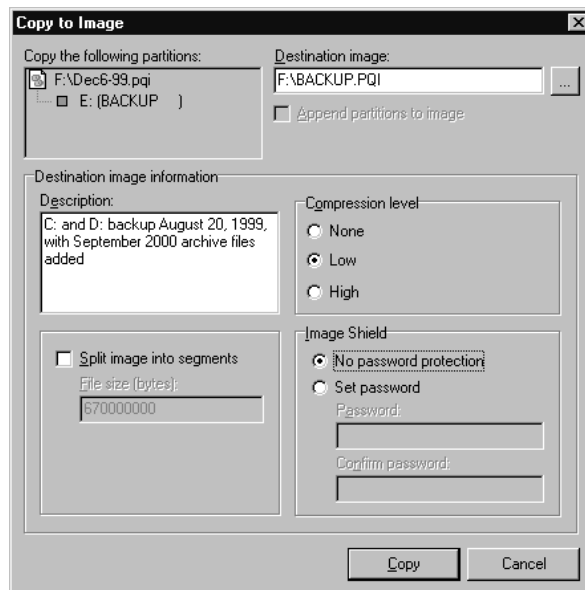
Entire .PQI image file

The Copy to Image dialog appears with the Destination image text box filled in according to the currently selected drive or folder in the Locate pane.

Partition within an image file

If the partition is copied to another image file, the **Copy to Image** dialog appears and the partition is added to the image file and inherits the characteristics of the target image file including compression ratio, password, and so forth. If the partition is copied to a folder, the **Copy to Image** dialog is displayed and the partition is added to a newly created .PQI image file.

The **Copy to Image** dialog box displays the filename for the image file you are modifying (or allows you to type a filename for a new image file). It also allows you to split an image file, combine files that make up a spanned image, add a password to an image, and choose the compression level for an image.



Splitting an Image into Multiple Files

Use Split to save an existing image file across a series of removable media disks (for example, floppy disks, Jaz, or Zip disks). You can use Drive Image File Editor to split image files after they have been created. You can save split image files to a network drive and later transfer the files to removable media, such as a CD-ROM.

You split an image by copying the whole image or selected partitions to a new image file and then splitting the new image file.

- 1** Copy the image file you want to split from the Locate or Recent pane into the Locate pane.

The **Copy to Image** dialog appears.

- 2** Under **Destination image**, type a path and filename for the new image file.

- 3** Select **Split image into segments**.

- 4** Type a maximum size for each segment of the image file.

For example, if you want to create an image file that will later be saved on CDs, type 670000000.

- 5** Specify any other options for the new image file (such as a description, a password, or a compression level).

- 6** Click **Copy**.

When you split an image file, you are automatically prompted for new media when the image file reaches the size you specified or when media in a removable device is full.

Combining Files that Make up an Image

If you select a file that is part of a split image (an image that is split across several files) and copy the file to a new image file, Drive Image File Editor automatically combines all the pieces of the image in the new Destination image.

You must ensure that the **Split image into segments** check box is not selected, or the new image file will be split at the specified size instead of combined into one file.

This feature is useful if you have an image file stored on removable media, but you want to save it on a network directory or your hard disk.

Adding a Password to an Image

- 1 Copy the image file you want to add a password protection for from the Locate or Recent pane into the Locate pane.

The **Copy to Image** dialog appears.

- 2 Under **Image Shield**, click **Set Password**.

- 3 Type the password in the **Password** and **Confirm password** fields.

Passwords are case-sensitive. Store the password in a safe place, since you cannot copy, modify, or restore a password-protected image file without typing the password. You also cannot change a password for an image file without knowing the current password assigned to that image. PowerQuest does not have a workaround to access password-protected image files if you lose the password.

- 4 Specify any other options for the new image file (such as a description, a compression level, or a split size).

- 5 Click **Copy**.

Compressing Image Files

- 1 Copy the image file you want to compress from the Locate or Recent pane into the Locate pane.

The **Copy to Image** dialog appears.

- 2 Under **Compression Level**, click the level of compression you want.

None	No compression is usually the fastest method for saving the image file and is useful if storage space is not an issue. However, if you are saving your image file to a busy network drive or to a relatively slow removable media device, it may be faster to compress the image since there is less data to write to the file.
-------------	---

Low	Low compression offers a 40% average compression ratio.
------------	---

High	High compression offers a 50% average compression ratio.
-------------	--

- 3 Specify any other options for the new image file (such as a description, a password, or a split size).

- 4 Click **Copy**.

Adding or Changing an Image File Description

- 1** Copy the image file you want to add a password protection for from the Locate or Recent pane into the Locate pane.

The **Copy to Image** dialog appears.

- 2** Under **Description**, type comments about the image file.

Comments cannot exceed 232 characters.

- 3** Specify any other options for the new image file (such as a password, a compression level, or a split size).
- 4** Click **Copy**.

Restoring Files or Partitions

You can use Drive Image File Editor to restore individual files or partitions from within an image file. You can restore individual files or folders from spanned or compressed images without restoring the entire image file.

- 1** From the Locate or Recent pane, double-click the image file that contains the partition with the files you want to restore.
- 2** *(If applicable)* Type the image file password, then click **OK**.
- 3** Double-click the desired partition.
- 4** Select the folder or files you want to restore.
- 5** Click **File ► Restore**.

You can also drag a file into the desired location to restore it or right-click a file and choose **Restore** from the quick menu.

If you selected an image file that was created with an older version of Drive Image or Drive Image File Editor, a progress bar displays while the Drive Image File Editor expands the image index. To speed up the process with older image files, refer to “Working with Images from Previous Versions of Drive Image” on page 74.

- 6** Click **To this destination**, then specify the location where you want to save the restored files. Click the browse button to navigate to the location you want.

You can also click **Restore to original path** if you want to restore the folders or files to their original location. If the original location does not include a drive letter (because the partition was hidden when you imaged it), you must enter a drive letter for the partition before you can restore it.

- 7** Click **Restore** to restore the files.
- 8** When file restoration is complete, click **OK**.
- 9** Click **Close** to return to the Drive Image File Editor main window.

Working with Images from Previous Versions of Drive Image

If you restore files from an image that was created with an earlier version of Drive Image File Editor (before Drive Image 4.0), you can do one of the following to speed up the process. Note that these procedures are optional.

- Ensure that the index file (*.PQX) for the image is saved in the same directory where the image is saved. If Drive Image File Editor finds the index file in the same directory, it will use that index file instead of creating the index during the restore.
- If you do not have an index file for the image, you can use Drive Image File Editor to copy the image into a new 4.0 image file.

Verifying Image Contents

Use Verify Image to determine whether an image file is valid or corrupt. Drive Image File Editor will check to see that all of the files in the image are available for you to open, the internal data structures in the image file match the data that is available, and the image file can be uncompressed and create the expected amount of data.

This feature is useful if you have added partitions to an image and want to verify the integrity of the image.

- 1** From the Locate or Recent pane, select the image file you want to check.
- 2** Click **File ► Verify Image**.
- 3** When the check is complete, click **OK**.

You can also right-click an image file, then click **Verify Image** from the quick menu.

Deleting Image Files

Use Delete to remove an entire image file, including all partitions, folders, and files. If you delete an image file that resides on your local hard disk, it is sent to the Windows Recycle Bin.

- 1 From the Locate or Recent pane, select the image file you want to delete.
You cannot delete individual partitions or selected files or folders within an image file.
- 2 Click **File ► Delete Image**.
- 3 Click **Yes** to continue or **No** to cancel.

You can also right-click on an image file, then click Delete Image from the quick menu or delete the image using Windows Explorer.

Displaying Information About Images

- 1 From the Locate or Recent pane, select the desired image file.
- 2 Click **File ► Properties**, or right-click the image file and click **Properties**.

The following list describes each option in the Image Properties dialog.

Description	A user-assigned comment associated with the partition.
MS-DOS name	A user-assigned name for the image.
Image size	The total size of the image.
Image date/time	The date and time that the image file was created.
Spanned	Whether the image file is spanned over several disks or split into multiple files on the same disk.
Compression	Whether the selected partition is compressed or uncompressed. The level of compression (Low or High) is also specified. Low level compression yields an approximate 40% compression rate. High level compression yields approximately 50%.
Password Protected	Whether the image is password protected.

- 3 Click **OK** to exit the dialog.

Displaying Information About Partitions

- 1 From the Locate or Recent pane, double-click the image file that contains the desired partition.
- 2 Select the partition you want.
- 3 Click **File ► Properties**, or right-click partition and click **Properties**.

Display name	A user-assigned name for the partition.
Description	A user-assigned comment associated with the partition.
Drive letter	The partition drive letter.
Type	The file system type (for example, FAT, NTFS, and HPFS) used within the partition.
Primary/Logical	The selected partition's drive status as either primary or logical.
Partition size	The total size of the partition. This total includes both used and unused space.
Used space in partition	The amount of used space within the partition.
Unused space in partition	The amount unused space within the partition.
Physical size in image	The actual size of the partition within the image file. This physical size may differ from the partition size depending upon the amount of used and free space within the partition and the compression level.

- 4 Click **OK** to exit the dialog.

Drive Image File Editor Options

You can specify a default restore path or a default size for image files. The default size is that size at which images will be split during a copy. This size will display in the **Copy to Image** dialog.

1 Click **Tools ► Options ► General**.

2 *(Optional)* Specify the full path to the default restore location.

This path is used if you do not initiate a file restore using drag and drop or copy and paste.

3 *(Optional)* Specify the default byte size for splitting an image file.

For example, if you want to save the file to the hard disk and later copy it to a CD, you could specify a file size of 670,000,000 bytes (670 MB) or less.

4 Click **OK**.

You can also specify filename extensions that will display in Drive Image File Editor as image files.

1 Click **Tools ► Options ► Image Extensions**.

2 Type the image file extension in the **Extension** text box.

File extensions can be up to three characters long and can contain alphanumeric characters. You do not need to type the period. It will be added automatically.

3 Click **Add**.

4 Repeat steps 2 and 3 to add more file extensions, or click **OK**.

All image files that match the extensions you have added to the list are displayed in the Locate and Recent panes.

To remove an extension, select it from the list box, then click **Remove**. To erase all extensions you have added, click **Clear**. Note that *.PQI cannot be removed from the list.

Online Help

1 Click **Help ► Contents**.

- 2 Select the help topic you want to display, or click **Index** or **Search** to search for the topic you want.

Exiting Drive Image File Editor

- 1 Click **File ► Exit**.

When you run Drive Image File Editor again, your previous view settings will be used.

PowerQuest DataKeeper

This chapter includes the following information:

- Getting Started
- Monitoring Your System
- Creating Custom Backups
- Mobile Support
- Restoring Backups
- Starting DataKeeper from a Windows Shortcut
- Getting Help
- Exiting DataKeeper

Getting Started

PowerQuest DataKeeper provides an easy way for you to perform secure, automated backups of all your important data. You can back up to your local hard disk, a second partition that has an assigned file system (such as FAT32) and drive letter, a network drive, or removable media such as LS-120, Jaz, or Zip drives. You can use DataKeeper to:

- Back up combinations of files and folders on your computer with options such as password protection and file compression.
- Restore a single file (even from a compressed backup), a most recent version of a file, or an older version of a file.

DataKeeper System Requirements

Before you install DataKeeper, you should ensure your computer meets the minimum system requirements.

Operating system	<ul style="list-style-type: none">• Windows 95b (or later)• Windows 98• Windows Me• Windows NT 4.0 Workstation (through Service Pack 6)• Windows 2000 Professional
Hard-disk space	4 MB
File Systems	FAT, FAT32, or NTFS
Monitor	VGA or higher resolution

Installing and Configuring DataKeeper

The installation of DataKeeper involves two processes:

- **Install DataKeeper.** If you are running Windows NT or Windows 2000, you must have administrator privileges to install DataKeeper.
- **Configure the backup locations.** Following installation, when you run DataKeeper for the first time, you will need to specify the primary and substitute backup locations. If there are multiple users sharing a single computer (usually under Windows NT or 2000), each user must run DataKeeper and setup their own primary and backup locations.

It is recommended that you use the program's defaults to simplify the installation and to make file restoration easy and quick.

- 1 Insert the DataKeeper CD into the CD-ROM drive.
- 2 Click **Install** in the DataKeeper setup window, then follow the on-screen instructions to install the program.
- 3 When the setup is complete, deselect **Yes, I want to launch DataKeeper**, then click **Finish**.

If the DataKeeper setup window does not appear automatically on screen, you can install the program manually:

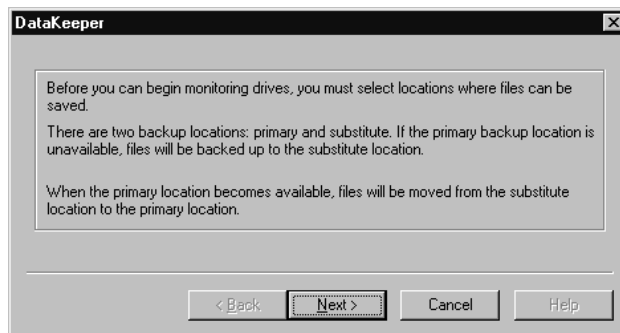
- 1 From the Windows taskbar, click **Start > Run**.
- 2 Type D : \SETUP in the **Open** text box.
- 3 If your CD-ROM drive uses a letter other than D, substitute that letter for D.
- 4 Click **OK**, then follow the on-screen instructions to install the program.
- 5 When the setup is complete, deselect **Yes, I want to launch DataKeeper**, then click **Finish**.

If you are a system administrator, you are finished installing the program; each user must now configure the primary and backup locations for their monitored files.

Configuring the Backup Location

The first time you start DataKeeper, you will be prompted to specify a primary and substitute backup location for your monitored files. If you click Cancel anytime before you complete the backup configuration, you will exit DataKeeper.

- 1 Start DataKeeper from the Windows taskbar.



- 2** Click **Next**.
- 3** Type the full path to the primary backup location in the text box, then click **Next**. The primary location can be a fixed local hard disk, a network disk, or removable media such as LS120, JAZ, or Zip drives.
- 4** If the primary backup location you typed in step 3 is a fixed local hard disk, skip to step 5 below; you do not need to specify a substitute backup location.
- 5** Otherwise, type the path to the substitute backup location in the text box, then click **Next**. The substitute location must be a fixed local hard disk on your machine. If the primary backup location is unavailable, your files will be stored in this substitute backup location.
- 6** Click **Finish**.
- 7** It is recommended that you create an initial back up of your files. To do so, click **Back up now**.
- 8** You can now select to back up all files that meet the specified backup criteria (the default choice), or you can limit the backup to files that have been created or modified since the last backup or a specific date and time.
- 9** Click **OK** to begin the backup.

Monitoring Your System

DataKeeper is set up, by default, to monitor changes to all fixed drives on your system and to automatically create a backup of any file that you save to your hard disk. The program file directories, the directories specified by the environment variables Temp and Tmp, and your primary backup location, are excluded from the automatic backup to minimize backup time and system impact. If you want to back up these and other types of files, you can add them as described in “Creating Custom Backups” on page 83.

Monitoring, or automatic backup, remains in effect on your system as long as DataKeeper is running, or until you click **Stop Monitoring** from the Backup tab.

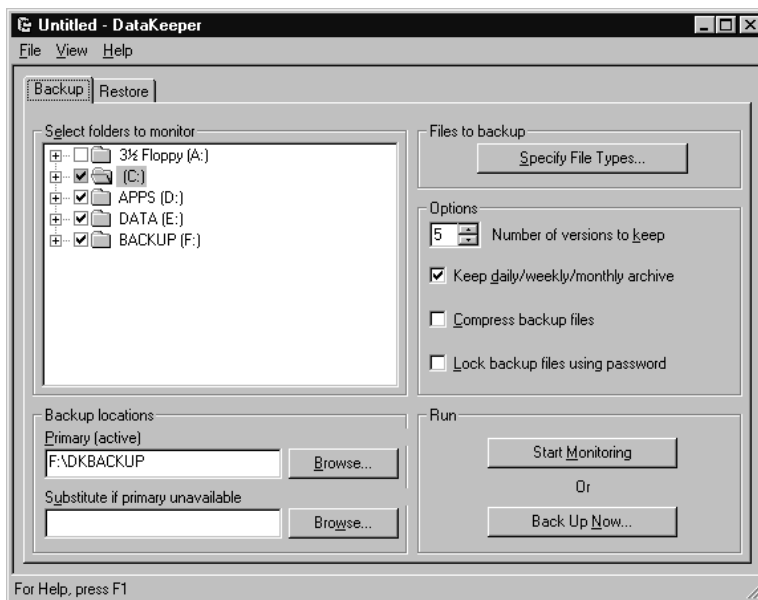
To restore a backed up file, see “Restoring Backups” on page 86.

Creating Custom Backups

DataKeeper has many options, beyond the default settings, that let you customize how your data is backed up. You can even save all the options you select to a backup specification file (.DKS) for later use.

- 1 From DataKeeper, click the **Backup** tab.

If necessary, click **Stop Monitoring** to access the backup options on the Backup tab.



- 2 Choose the following backup options:

Option:	Description:
Select folders to monitor	In the Select folders to monitor group box, select the folders you want to monitor and back up.
Specify file types	In the Files to back up group box, click Specify File Types . Verify the file types you want to include in the backup (if they are found in the monitored folders), and the files types you want the backup to ignore.

Option:	Description:
Specify file types (<i>continued</i>)	<p>To move file types between the Backup Files Matching and Ignore Files Matching list boxes, select the files you want, then click the appropriate arrow (<< or >>) to move the files.</p> <p>To add more file types to a list box, type *.<file extension> in the Add file type text box, then click << or >>.</p> <p>To delete file types, select the extensions you want, then click Delete.</p>
Backup location— Primary	In the Backup locations group box, verify the specified primary backup location. Or, click Browse to select a new location for the backup. The primary backup location can be a fixed local hard disk, a network disk, or removable media such as LS120, JAZ, or Zip disks. The word “(active)” will appear at the end of the option name “Primary” to indicate that the backup location is in effect. If the primary backup location becomes unavailable, the “active” status is applied to the substitute backup location.
Backup location— Substitute if primary unavailable	In the Backup locations group box, verify the specified substitute backup location if the primary location is unavailable, or click Browse to select a new substitute backup location on your hard disk. The word “(active)” will appear at the end of the option name if the primary backup location becomes inactive (unavailable). This helps you identify that the substitute backup location is in effect.
Number of versions to keep	In the Options group box, specify the number of backup versions (1-99) you want to keep. File versioning lets you go back to a previous backup if you have made an unwanted change to a file, or the current backup becomes corrupted. You should check the date and time of the backups to determine which version you want to restore.

Option:	Description:
Keep daily/weekly/monthly archive	<p>In the Options group box, select Keep daily/weekly/monthly archive.</p> <p>This option maintains archive copies, even if the number of copies has been exceeded. For example, if you specify that DataKeeper keep the last five versions of a backup, then you select Keep daily/weekly/monthly archive, DataKeeper does the following:</p> <ul style="list-style-type: none"> • Saves the most recent five versions of the specified files. • Overwrites the five files in rotation, replacing the oldest file each time. • Saves up to seven daily, five weekly, and 12 monthly archive copies in addition to the five most recent files. • Does not create a daily, weekly, or monthly version of files that have not changed since the last backup.
Compress backup files	<p>In the Options group box, select Compress backup files.</p> <p>Compressing files during backup will use less hard disk space.</p>
Lock backup files using password	<p>In the Options group box, select Lock backup files using password, type the password you want in the Password and Confirm password text boxes, then click OK.</p> <p>Passwords are case-sensitive. When you restore a password-protected backup, DataKeeper will prompt you for the password. If you do not enter the correct password, or you forget the password, you will not be able to open the backup file.</p>

- 3 (Optional) Save all the backup options you have chosen to a backup specification file (.DKS) for later use. Click **File ► Save**, type the filename for the backup specification file, then click **Save**.

This step is helpful if you often select different options based on the type of data you are backing up. You can later retrieve the .DKS file for use with other backups you create. To retrieve the .DKS file, just click **File ► Open**, select the backup specification file you want, then click **Open**; all your backup options will be set.

- 4 It is recommended that you do an initial back up of your newly-customized backup set. To do so, click **Back Up Now**.

You can now select to back up all files that meet the backup criteria you specified (the default choice). Or, you can limit the backup to those files that have been modified since the last backup, or created or modified since a specific date and time.

- 5 Click **OK** to begin the backup.
- 6 After you have created an initial backup, click **Start Monitoring** to have DataKeeper run in the background and automatically back up files that are changed.

The custom backup options you have selected remain in effect until you change them again.

Mobile Support

If you are using a laptop computer remotely and the primary backup location (a network disk) is unavailable when a backup is made, the files are automatically saved to the substitute backup destination. You can change the substitute location by clicking **Browse** to the right of the **Substitute if primary unavailable** text box in the Backup tab.

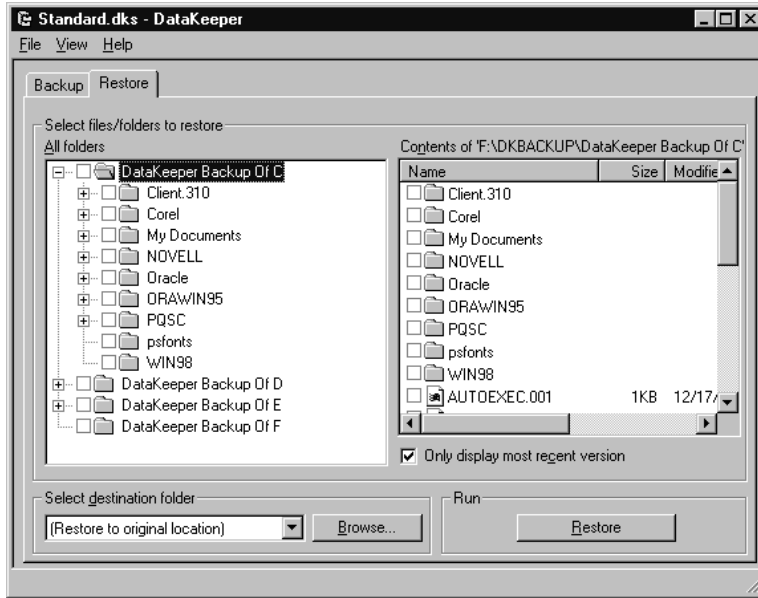
If the current backup location is the substitute destination, then at startup when monitoring is enabled and the primary location (a network disk) is detected, you are prompted to change your substitute backup location to the primary location. When you change to the primary location, any backup files are copied to the specified primary location and deleted from the substitute location.

If you choose not to change your substitute backup location to the specified primary location, you will be prompted with the same message when monitoring is restarted and the primary location is detected.

Restoring Backups

You can restore backed up individual or multiple files or folders in one simple operation.

- 1 From DataKeeper, click the **Restore** tab.



- 2 Select the backup location, then click **OK**.

If you only have files at one backup location, skip this step and go to step 3.

- 3 Select the files, folders, and drives you want to restore.

- 4 Select **Only display most recent version** to list only the most recent backed up version of each file. Deselect the option to see all file versions. You can only restore those items that you have backed up using DataKeeper.

- 5 Select the destination folder or drive from the drop-down list, or click **Browse** to select the destination folder you want.

If you do not specify a destination folder, the items will be restored to their original locations.

- 6 Click **Restore** to begin file restoration.

Viewing Versions of Backups

- 1 From DataKeeper, click the **Restore** tab, then go to the backup location.

2 Check the Tag and Version columns of the Contents pane. You may need to scroll to the right to see the columns. The Version column displays the following information:

- D - Daily backup
- W - Weekly backup
- M - Monthly backup

The **Version** column is blank for files that are not archived files.

The tag values in the **Tag** column (for example, aa, ab, or ac) are unique identifiers and are unrelated to the sequence or age of the backup.

Starting DataKeeper from a Windows Shortcut

When you start DataKeeper from a Windows shortcut on the desktop, DataKeeper will automatically run the backup specification file that you name. You may find it helpful to create a shortcut for each backup specification file that you have saved.

- 1** Follow the Windows online Help instructions for creating a shortcut on your desktop.
- 2** In the **Command line** field of the **Create Shortcut** dialog, enter the full path to the DataKeeper program (DATAKEEPER.EXE).
- 3** *(Optional)* At the end of the full path (to the right of the double quote mark) in the **Command line** field, add one or more of the following commands described below.

The order that you add each command line option is not important.

Command Line Options

Be sure you replace [*.DKS] with the name of your actual backup specification file.

Command

Line option:	Description:
[*.DKS]	Starts DataKeeper and loads the backup specification file you named. Example: "C:\Program Files\DataKeeper\DataKeeper.exe" C:\My Backup Specs\Manuals.dks
-c [*.DKS]	Starts DataKeeper, loads the backup specification file you named, and starts monitoring. Example: "C:\Program Files\DataKeeper\DataKeeper.exe" -c C:\My Backup Specs\Manuals.dks

Command

Line option: Description:

-r [*.DKS]	Starts DataKeeper, loads the backup specification file you named, performs a backup, then exits DataKeeper. Example: "C:\Program Files\DataKeeper\DataKeeper.exe" -r C:\My Backup Specs\Manuals.dks
-a	Use with the -r option. Starts DataKeeper, loads the backup specification file you named, performs a backup of all selected files, then exits DataKeeper. Example: "C:\Program Files\DataKeeper\DataKeeper.exe" -r -a C:\My Backup Specs\Manuals.dks
-m	Use with the -r option. Starts DataKeeper, loads the backup specification file you named, performs a backup of those files that were modified since the last backup was performed, then exits DataKeeper. Example: "C:\Program Files\DataKeeper\DataKeeper.exe"-r -m C:\My Backup Specs\Manuals.dks
-s="date"	Use with the -r option. Starts DataKeeper, loads the backup specification file you named, performs a back up of only those files that were modified after the date you specify, then exits DataKeeper. The date must be in quotes and formatted as follows:-s="yyyy/mm/dd hh:mm:ss." Example: "C:\Program Files\DataKeeper\DataKeeper.exe"-r C:\My Backup Specs\Manuals.dks -s="2000/07/25 9:15:00"

Getting Help

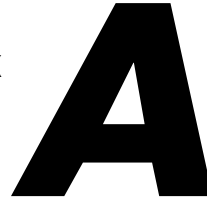
When you need information beyond what this Quick Start Guide provides, online Help is your best solution. Click **Help** in any dialog in DataKeeper, or click **Help ► Help Topics** on the menu bar.

Exiting DataKeeper

- 1 From DataKeeper, click **File ► Exit**.

This will close DataKeeper, and no files will be backed up.

Clicking the “–” near the upper-right corner of the DataKeeper window will minimize the program to the Windows system tray.



Additional Tasks

This appendix includes the following information:

- Using Drive Image with SCSI Hard Disks
- Using Drive Image with Drive Overlay Software
- Using Drive Image on a Notebook Computer
- Using Drive Image with a Castlewood ORB Drive
- Assigning a CD-ROM Drive Letter
- Converting Ghost Image Files to Drive Image
- Using International Keyboards
- Finding Jumper Settings

Using Drive Image with SCSI Hard Disks

To use Drive Image on a SCSI hard drive, you must have a SCSI controller card that supports software Interrupt 13. Most SCSI controller cards let the user enable software Interrupt 13 support in the BIOS through the card. If your SCSI controller card does not allow you to set it to use software Interrupt 13, Drive Image will not work on drives attached to your SCSI adapter. Contact the manufacturer of the SCSI adapter to determine if your adapter can support software Interrupt 13. As a general rule, if FDISK can be used to partition the drive, you can use Drive Image.

Using Drive Image with Drive Overlay Software

Drive overlay software is needed, such as Disk Manager or EZ-Drive, if the system has an older BIOS and the disk copy is being made from IDE to IDE or IDE to SCSI.

IMPORTANT! If copying SCSI to SCSI, the older BIOS does not come into play because SCSI has its own translation mechanism.

This section provides information on both IDE and SCSI hard drive installations. The following are scenarios which outline, step-by-step, the installation procedures for a variety of system configurations.

Scenario 1

- The system has a BIOS that does not support drives over 504 MB in size.
- The source drive is an IDE drive that is smaller than 504 MB. It does not have a drive overlay program.
- The destination drive is an IDE drive that is larger than 504 MB and needs to have a drive overlay program to be recognized by the older BIOS.

Steps

- 1** Install the destination drive as the master and the source drive as the slave and run the auto-detect in the BIOS.
- 2** Restart the computer with the drive overlay boot disk.
- 3** Install the drive overlay program to the destination drive that is now set as the master (check with manufacturer).
- 4** Restart the computer again, allowing the drive overlay program to load.

- 5** Put your Drive Image bootable diskette in your diskette drive (A:).
- 6** In the drive overlay boot menu, select the option to boot from a floppy disk.
- 7** Make sure that Drive Image is showing the correct size for each drive and the correct order for the copy sequence.
- 8** Finish the copy process.

Scenario 2

- The system has a BIOS that does not support drives over 504 MB in size.
- The source drive is an IDE drive larger than 504 MB and a drive overlay program is loaded.
- The destination is a SCSI drive and will not need a drive overlay program.

Steps

- 1** Leave the source drive set as the master.
- 2** Install the SCSI drive with the lowest SCSI ID in the SCSI chain.
- 3** Run the BIOS auto-detect and make sure it recognizes the IDE drive.
- 4** Run the SCSI BIOS to make sure the SCSI drive is recognized correctly.
- 5** Restart the computer and allow the drive overlay program to load.
- 6** Put your Drive Image bootable diskette in your diskette drive (A:).
- 7** In the drive overlay boot menu, select the option to boot from a floppy disk.
- 8** Make sure that Drive Image is showing the correct size for each drive and the correct order for the copy sequence.
- 9** Finish the copy process.

Scenario 3

- The system has a BIOS that does not support drives over 504 MB in size.
- The source drive is an IDE drive larger than 504 MB and a drive overlay program is installed.
- The BIOS is upgraded to a BIOS that supports larger drives.
- The destination drive is a SCSI drive that is larger than 504 MB.

Steps

- 1** Leave the source drive set as the master.
- 2** Install the destination drive and set it as **drive 0**.
- 3** Run the BIOS and auto-detect the drives.
- 4** Make sure that LBA is off for the source drive.
- 5** Run the SCSI BIOS to make sure the SCSI drive is recognized correctly.
- 6** Restart the computer and allow the drive overlay program to load.
- 7** Put your Drive Image bootable diskette in your diskette drive (A:).
- 8** In the drive overlay boot menu, select the option to boot from a floppy disk.
- 9** Make sure that Drive Image is showing the correct size for each drive and the correct order for the copy sequence.
- 10** Finish the copy process.

Scenario 4

- The system has a BIOS that does not support drives over 504 MB in size.
- The source drive is an IDE drive larger than 504 MB and a drive overlay program is installed.
- The BIOS is upgraded to a BIOS that supports larger drives.
- The destination is an IDE drive that is larger than 504 MB.

Steps

- 1** Set the source drive as the master.
- 2** Set the destination drive as the slave.
- 3** Run the new BIOS and auto-detect the drives.
- 4** Make sure that LBA is turned on for the destination drive and off for the source drive.
- 5** Restart the computer and allow the drive overlay program to load.
- 6** Put your Drive Image bootable diskette in your diskette drive (A:).

- 7** In the drive overlay boot menu, select the option to boot from a floppy disk.
- 8** Make sure that Drive Image is showing the correct size for each drive and the correct order for the copy sequence.
- 9** Finish the copy process.

Using Drive Image on a Notebook Computer

To make PCMCIA slots on a notebook computer active for use with Drive Image, you must load the correct drivers in DOS.

- 1** Determine the correct card services DOS driver for your hardware.

The driver is supplied by the hardware manufacturer. It may be called card services, card-bus services, CardWare, or another name chosen by the manufacturer. Consult the hardware documentation or contact the manufacturer if you do not know which driver is required.

- 2** Add a statement to your CONFIG.SYS file to load the card services driver.

For example, `DEVICE=PCMCIA80CL.SYS`.

There may be additional switches to configure the device. The hardware manufacturer can provide detailed information.

- 3** Add a statement to your CONFIG.SYS file to load the NIC or SCSI driver you need.

For example, `DEVICE=C:\3COM\EL589ND4.SYS`.

Using Drive Image with a Castlewood ORB Drive

To use a Castlewood ORB drive with Drive Image, the drive must be correctly configured in the computer BIOS so that DOS can assign it a drive letter and read and copy large files to and from the drive. Drive Image recognizes the ORB drive as removable media only if the computer BIOS can be configured to recognize the drive as removable media.

Refer to your ORB drive owner's manual, or contact Castlewood Systems, Inc. (www.castlewood.com or help@castlewood.com) for more information about configuring the ORB drive for use under DOS.

Refer to www.powerquest.com/support/orb for more information about using Drive Image with an ORB drive.

Assigning a CD-ROM Drive Letter

If your computer has a CD-ROM drive or any form of removable media, you should be aware of potential problems with the way drive letters are assigned to these devices.

Drive Image does not make drive letter assignments; this is a function of the operating system. The operating system assigns drive letters in the following order: The first recognized primary partition on each hard disk will receive a letter, followed by all logical partitions on each hard disk. Next, the CD-ROM drive and any other form of removable media will be assigned a letter.

Because the CD-ROM is one of the last drives to receive a letter, any partitions that you create or delete on any of your hard disks will affect the drive letter assignment of your CD-ROM drive. This change in drive letter assignments is usually performed by the operating system automatically. Occasionally, however, the operating system will fail to assign a new drive letter to the CD-ROM drive. If this should occur, please follow the steps:

If you are using DOS/Windows 3.11 or are loading your CD-ROM drivers under DOS with Windows 95, perform the following:

- 1 At a DOS prompt, type `EDIT C:\CONFIG.SYS`.

This starts the DOS editor program and opens your CONFIG.SYS file.

- 2 Change `LASTDRIVE=drive` (in which *drive* is any letter of the alphabet) to Z.

This allows the OS to assign all drive letters through Z.

- 3 Click **File** ► **Exit**.

- 4 Click **Yes** to save the file.

- 5 You should now be back to a C:\ prompt. Type `EDIT C:\AUTOEXEC.BAT`.

The DOS editor program starts and opens your AUTOEXEC.BAT file.

- 6 Look for a line that includes the word MSCDEX. The `/L:drive` parameter (in which *drive* is the drive letter that was assigned to your CD-ROM before you made changes with Drive Image) may appear at the end of this line. Change this letter to Z.

Because the OS assigns all other available drive letters before assigning Z, this ensures that partition changes you make in the future will not invalidate your CD-ROM drive letter.

For more information, type `HELP MSCDEX` at a DOS prompt.

If your computer is on a network, when you log in to the network the letter Z and other letters at the end of the alphabet may be assigned to network search drives. In this case, assign your CD-ROM a letter just before the first letter used by the network search drives.

- 7** Select **File ► Exit**. When you are asked whether you want to save the file, click **Yes**.
- 8** When you see the DOS prompt (C:\), reboot your machine.

If you are using Windows 95 and Windows 95 drivers for the CD-ROM:

- 1** Click **Start ► Settings ► Control Panel ► System**.
- 2** From the **System Properties** screen, select **Device Manager**.
This brings up a list of the devices in your computer.
- 3** Double-click **CDROM**.
- 4** Click the **Settings** tab.
- 5** At the bottom of the **Settings** page is the heading, **Reserved Drive Letters**. Under this heading are two listings, **Start Drive Letter** and **End Drive Letter**. Change the values for these listings to Z.

Because the OS assigns all other available drive letters before assigning Z, this ensures that partition changes you make in the future will not invalidate your CD-ROM drive letter.
- 6** Click **OK** to close the **Settings** page.
- 7** Click **OK** to close the **System Properties** page.
- 8** Click **Yes** to restart your computer.

Converting Ghost Image Files to Drive Image

Three sample batch files are included on the Drive Image CD in the \SETUP\OS2DOS directory to help you convert existing Ghost Image files to Drive Image files. This process requires a computer with Ghost installed and a connection to a scratch hard disk that is large enough to contain the largest restored Ghost image.

The batch files restore the Ghost image to the scratch hard disk, then create a Drive Image file from that hard disk using Drive Image. Any existing data on the scratch hard disk is overwritten when the Ghost image is restored to it. To preserve a computer's primary hard disk, the scratch drive can be a second drive.

The batch files are PQCVT.BAT, PQCVT2.BAT, and PQCVT3.BAT.

You must modify the sample batch files to match your computer and network environment by specifying the directory paths and executable file locations.

Using PQCVT.BAT

Use PQCVT.BAT when you want to specify program paths, image filenames, and working disk information on the command line.

To run the batch file, provide the following arguments:

```
PQCVT <Ghost exe path> <Ghost image file path> <Drive Image exe
path> <Drive Image image file path> <disk drive number>
```

Arguments	Description
<Ghost EXE path>	Full path to Ghost EXE program
<Ghost image file path>	Full path to existing Ghost image file to be converted
<Drive Image EXE path>	Full path to Drive Image EXE program
<Drive Image image file path>	Full path to the new Drive Image file
<disk drive number>	Working disk drive number, 1=first, 2=second, etc.

For example:

```
PGCVT S:\BIN\GHO210 T:\OLD\I12345.GHO S:\BIN\DM T:\NEW\I12345.PQI 2
```

This example runs the Ghost program found at s:\bin\gho210, then restores the image file t:\old\i12345.gho to disk drive 2. It then runs the Drive Image program found at s:\bin\dm and builds a new image file at t:\new\i12345.pqi from drive 2.

A log file can be created by executing the batch file from the command shell and redirecting the output. For example: `COMMAND/C PQCVT IMAGE.GHO >CVT.LOG`

Modifying PQCVT2.BAT

Use the PQCVT2.BAT file when you want to “hard wire” program paths and working disk information. When you enter this information in the batch file itself, you only need to enter one argument in the batch command line: the image file name. For example,

```
PQCVT2 I12345
```

After the paths are edited in the PQCVT2.BAT file, it will run the Ghost Image program, restore the image file I12345.GHO to the second hard disk, then run the Drive Image program and create the new image file.

To modify the batch file,

- 1** Retrieve the PQCVT2.BAT file into a DOS text editor such as Notepad or DOS Editor.
- 2** Edit the file and replace all occurrences of ggg1, ggg2, ddd1, ddd2, and 9999, with the path information for the Ghost executable, new image files, and drive number respectively.
- 3** Remove the first GOTO line following the REM statements, then save the file.

Converting Multiple Files

To convert several existing Ghost Image files, use the PQCVT3.BAT file as follows:

```
PQCVT3 <file path and pattern>
```

This batch command scans the directory looking for Ghost image files and calls the PQCVT2 batch command for each file that matches the file pattern specified. Rather than specify an exact file, use MS-DOS conventions where “*” equals any number of characters and “?” equals any single character.

Using International Keyboards

When you use the Drive Image rescue disks, you may lose the ability to use your keyboard the way you are accustomed to or to view extended characters properly. The Drive Image rescue disks include the files you need to resolve these problems.

If you use an international keyboard or character set, you must edit the AUTOEXE2.BAT and CONFIG.SYS files on the rescue disks.

- 1 The following lines are remarked in the AUTOEXE2.BAT file. Delete the REM from the beginning of the line, and replace the variables *xx* and *yyy* with the keyboard code and character set code page for your language.

```
MODE CON CP PREP= ( yyy) EGA .CPI )  
MODE CON CP SEL=yyy  
KEYB xx, yyy
```

xx = two-letter keyboard code (for example, US or FR)

yyy = character set code page (for example, 437)

- 2 Save the AUTOEXE2.BAT file.
- 3 The following line is remarked in the CONFIG.SYS file. Delete the REM from the beginning of the line, and replace the variable *yyy* with the character set code page for your language.

```
DEVICE=DISPLAY .SYS CON= (EGA, yyy, )
```

- 4 Save the CONFIG.SYS file.
- 5 Reboot from the first rescue disk.

Finding Jumper Settings

To find the jumper settings for hard disks, consult your hard disk installation guide or contact your hard disk manufacturer directly. In most cases, the hard disk manufacturer's web site will contain the information you need to install the hard disk correctly.

Another valuable resource is www.thetechpage.com. In addition to listing the most common hard disk manufacturers, this site provides the jumper settings for every hard disk ever made. Additional jumper information is available from OnTrack at www.ontrack.com. Please note that PowerQuest is not responsible for the content on these web sites and cannot guarantee that the web site addresses will not change.

Setting Up Removable Storage Devices

This appendix describes removable media device drivers included with Drive Image and how to manually install them on a hard drive or diskette.

Both the Drive Image install program (for Windows) and the MAKEDISK.BAT file (for OS/2 and DOS) install and configure the drivers for removable storage devices. This information is provided for those who want to manually configure these drivers or alter the standard configuration. For more information about MAKEDISK.BAT, see “Installing on an OS/2 or DOS-Only Computer” on page 5.

Using Removable Media with Network Clients

If you are using a Jaz, or Zip parallel port device with a network client, be aware that loading a parallel port device driver with a network client installed will cause the system to hang. To successfully install the device driver for the parallel drive, reboot the system without loading the network client.

Iomega Drivers

Iomega provides a driver loader program that allows you to load drivers from the AUTOEXEC.BAT file. Each time the Iomega driver program loads, it must also load an ASPI manager to communicate with the Zip or Jaz drive. The Drive Image install program copies a large set of ASPI managers to the DRIVERS directory for SCSI, IDE, and parallel port interfaces.

The Iomega driver program tries to load each ASPI manager until it finds one that matches. If it does not have to use this trial-and-error process to find the correct ASPI manager, it can load more quickly.

Iomega has not provided a DOS driver for their Zip drives that attach to a USB (Universal Serial Bus) port. Consequently, you cannot create or restore image files to a Zip drive that is attached to a USB port.

You can access a document, "Using Drive Image with Iomega Removable Drivers," at the PowerQuest support web site. Go to support.powerquest.com, and query "Iomega." This document is available in English only. For additional information about Iomega drives, refer to the install diskettes that came with your Iomega product or the Iomega web site www.iomega.com.

Editing Your GUEST.INI File

If you use only one or two specific host adapters, you may want to edit the GUEST.INI file and remark (using the REM command) the ASPI managers you do not need. This way only the ASPI managers you normally use will be loaded and tested.

- 1 From the DRIVERS directory where you installed Drive Image, locate the GUEST.INI file and open it using Notepad in Windows, DOS EDIT, or any other ASCII text editor.
- 2 Find the ASPI manager line for the Iomega driver that supports your drive. For example, if you routinely use an Iomega PC1616 adapter, use the line that reads ASPI=ASPI1616.SYS.

The following table lists the supported Iomega Adapters and their corresponding ASPI managers.

Iomega Adapter	ASPI Manager
Jaz jet PCI (PC/Mac model)	ADVASPI.SYS
Jaz jet (PC-only model)	ASPI8DOS.SYS
Jaz jet ISA	ASPIPC16.SYS
Jaz Traveller	ASPIPPM1.SYS
Parallel Port Zip drive	ASPIPPM1.SYS
Zip zoom SCSI Accelerator	ASPIPC16.SYS
Zip Card PCMCIA SCSI adapter	ASPIPC16.SYS
Zip IDE drive	ASPIIDE.SYS

Iomega Adapter	ASPI Manager
PC1616 adapter	ASPI1616.SYS
PC1600 adapter	ASPIPC16.SYS

If you are using a non-Iomega SCSI adapter with the SCSI Zip drive, the SCSI adapter must be ASPI-compatible and an ASPI manager must be obtained from the SCSI adapter manufacturer.

- 3** Add a REM at the beginning of each ASPI manager line you do not want to load.

For example, in a case where the Zip or Jaz drive is connected to an Iomega PC1616 adapter, you would remark all ASPI manager lines except ASPI1616.SYS:

```
REM ASPI=ASPIPPM1.SYS /INFO FILE=NIBBLE.ILM SPEED= 1
REM ASPI=ASPIIDE.SYS /INFO
REM ASPI=ASPI8DOS.SYS /D
REM ASPI=ADVASPI.SYS
REM ASPI=ASPIPC16.SYS INFO
ASPI=ASPI1616.SYS /SCAN /INFO
```

- 4** Save the changes to the GUEST.INI file and exit the text editor. If you are using a word processor, be sure to save the file as ASCII or DOS text.

If you later need to use an ASPI manager which has been remarked, edit the GUEST.INI file again and remove the REM command at the beginning of the ASPI manager line.

ASPI Manager Reference

Detailed reference information on the ASPI managers used by the Iomega driver program is located in the electronic "Installation Manual" (MANUAL.EXE) on the Iomega installation diskette.

- 1** For either Windows or DOS, go to a DOS prompt, type A : , then press <Enter>.
- 2** Type MANUAL, then press <Enter>.

Assigning Specific Drive Letters for Iomega Drives

To specify the first drive letter you want the Iomega drive to use, add the LETTER= *option* to the command line. For example, if you type GUEST . EXE LETTER=G, then G will be assigned to the first supported drive it finds.

If you have more than one Iomega drive, each additional drive will receive a drive letter following G in alphabetical order. (When supporting more than one drive, drive letters are assigned in order of SCSI ID number, from lowest to highest.)

Magneto-Optical Disk Drives

The 3.5-inch Magneto-Optical (MO) drive is available with either a SCSI or ATAPI interface. Separate DOS device drivers are supplied for each interface type. The device driver supports the FAT (File Allocation Table) file system, read/write, and disk change status.

The SCSI device driver requires a SCSI host adapter card and its matching ASPI manager software. For more information, see the “List of ASPI Managers and Supported Adapters” on page 106 and your SCSI host adapter documentation.

The 3.5-inch Magneto-Optical disks are available in several capacities.

The volume format may be **Super floppy**, **AT Hard disk**, or **NSR** format. The driver automatically detects the volume format and assigns logical drive letters (such as D:). If no valid formats or partitions are detected, the device driver identifies the disk as unformatted. See the driver documentation supplied with the product for additional information about formatting MO disks.

Installation of Magneto-Optical Drivers

The ATAPI MO device driver is loaded in the CONFIG.SYS file using the following command:

```
DEVICE [HIGH] = (path) \MODISKAP.SYS [/P] [/Ii] [/Rr]
```

The SCSI MO device driver is loaded in the CONFIG.SYS file using the following:

```
DEVICE [HIGH] = (path) \ASPIXXX.SYS  
DEVICE [HIGH] = (path) \MODISK2.SYS [/P] [/Ii] [/Rr]
```

ASPIXXX.SYS represents the ASPI manager that matches your SCSI host adapter.

Optional Switches

/P

Pauses screen messages after the driver has been loaded and initialized. Press any key to continue the operation. Use this option to check the messages displayed by the driver.

/li ATAPI driver

Only the device connected to port IDE *i* is mounted. Otherwise, all ports are scanned MO devices.

i is defined as:

- 1 = Primary Master
- 2 = Primary Slave
- 3 = Secondary Master
- 4 = Secondary Slave

/li SCSI driver

Only the SCSI device with ID *i* is mounted. Otherwise all SCSI IDs are scanned. To also specify the host adapter number, enter /lh:*i* (*h* is the host adapter number and *i* is the SCSI-ID). To specify multiple devices, use the “+” character as a delimiter. For example: /l0:1+1:2

/Rr

Reserves the specified number of logical drive letters (*r*=1 to 10) for a single drive. Otherwise, a single drive letter is reserved. The number of reserved drive letters is independent of the number of disk partitions. The driver can access only as many partitions as the number of reserved drive letters.

If the inserted disk contains more partitions than specified by the /*r* option, as many drive letters are assigned to the disk drive as there are defined partitions. If the disk has fewer partitions than the number of drive letters reserved, an error occurs only when the driver attempts to access the additional drive letters.

LASTDRIVE

The CONFIG.SYS last drive command does not affect the drive letter assignment in the MO disk drive. If the driver assigns a drive letter higher than the one specified by the LASTDRIVE command (default is E:), the CD-ROM drive cannot be accessed. To enable access to the CD-ROM drive, specify a larger value in the LASTDRIVE command.

If the following conditions exist, the device driver will not be loaded into memory and the message “Driver not loaded” will display.

- No ASPI manager loaded
- Cannot find MO drive (with or without a disk inserted)
- Driver already loaded

IMPORTANT! The SMARTDRV cache is turned off by default for MO disk drives. If you attempt to write data to a write-protected disk while the SMARTDRV write cache is on, you will need to reset the computer.

You can read more about Magneto-Optical disk drivers from the install diskettes that came with the product and from the Fujitsu web site *www.fujitsu.com*.

List of ASPI Managers and Supported Adapters

The following is a list of several popular ASPI managers and the cards they support. Drive Image will use the ASPI manager you install to support your SCSI card.

ASPI8DOS.SYS

PCI Bus

- Adaptec AHA-2910A/2910B
- Adaptec AHA-2930A/2930B
- Adaptec AHA-2940/2940AU/2940W/2940U/2940UW
- Adaptec AHA-2944W/2944UW
- Adaptec AHA-3940/3940U/3940W/3940UW
- Adaptec AVA-2904, AVA-2902E/I
- Adaptec AIC-7850/7855/7860/7870/7880 based SCSI host adapters
- Jaz jet (PC-only model)

ASPI7DOS.SYS

EISA Bus

- Adaptec AHA-1740/1742/1744
- Adaptec AHA-1740A/1742A
- Adaptec AHA-2740/2742/2740T/2742T
- Adaptec AHA-2740A/2742A/2740AT/2742AT
- Adaptec AHA-2740W/2742W
- Adaptec AIC-7770 based SCSI host adapters

VL BUS

- Adaptec AVA-2825
- Adaptec AHA-2840VL/2842VL
- Adaptec AHA-2840A/2842A

ASPI4DOS.SYS

ISA Bus

Adaptec AHA-1540B/1542B
Adaptec AHA-1540C/1542C
Adaptec AHA-1540CF/1542CF
Adaptec AHA-1540CP/1542CP
Microchannel Adaptec AHA-1640

ASPI2DOS.SYS

ISA Bus

Adaptec AVA-1502P/AP
Adaptec AVA-1505
Adaptec AVA-1515
Adaptec AHA-1510/1520/1522
Adaptec AHA-1510A/1520A/1522A
Adaptec AHA-1510B/1520B/1522B
Adaptec AHA-1530P/1532P
Adaptec AVA-1502AE/AI, AVA-1505AE/AI, AVA-1505AES
Adaptec AIC-6260/6360/6370 based SCSI host adapters
Adaptec AVA-1502AE/AI, AVA-1505AE/AI, AVA-1505AES

MCAM18XX.SYS

PCI Bus

Adaptec AHA-2920/2920A

MA160.SYS

If needed, add this adapter to the ASPI manager lines in your GUEST.INI or LDSQSCSI.BAT files.

ISA Bus

Trantor T160
Microchannel Trantor T260

MA348.SYS

If needed, add this adapter to the ASPI manager lines in your GUEST.INI or LDSQSCSI.BAT files.

Parallel Port Trantor MiniSCSI Plus (T348)
Adaptec MiniSCSI Plus (APA-348)

MA358.SYS

If needed, add this adapter to the ASPI manager lines in your GUEST.INI or LDSQSCSI.BAT files.

Parallel Port Trantor MiniSCSI EPP (T358)
Adaptec MiniSCSI EPP (APA-358)
Adaptec MiniSCSI EPP (APA-358A)

ASPIIDE.SYS

IDE

SCSI to IDE ASPI Manager
Zip IDE drive

ASPIATAP.SYS

SCSI to ATAPI ASPI Manager

ASPIPPM1.SYS and ASPIPPM2.SYS

SCSI to Parallel Port Zip Drivers
Jaz Traveller

ASPIEDOS.SYS

Adaptec AHA-1740/1742/1744 (in Enhanced Mode only)

ASPIPC16.SYS

PC1600 adapter Zip Zoom SCSI Accelerator
Adaptec APA-1460 and other AIC-6260/5360 based adapters
Jaz jet ISA adapter
Zip zoom SCSI Accelerator
Zip Card PCMCIA SCSI adapter

ASPI1616.SYS

PC1616 adapter and other NCR-53C406A based adapters

ASPI2930.SYS

AHA-2930 adapter



Troubleshooting

This appendix gives solutions to problems that you may encounter while using Drive Image. Included are the following:

- Accessing Your CD-ROM Drive
- Freeing Conventional Memory to Run Drive Image
- Resolving Check Errors
- Resolving Partition Table Errors
- Partition Tables and Viruses
- Generating Diagnostic Reports with PARTINFO
- Error Messages and Solutions

Accessing Your CD-ROM Drive

If you need to access your CD-ROM drive from Drive Image, you will need to add the command in the CONFIG.SYS file to load your CD-ROM driver. You will also need to add the command in the AUTOEXEC.BAT file to load the CD-ROM extensions.

- 1 At the DOS prompt, change to the directory of the CONFIG.SYS you want to edit. For example, if you are editing the CONFIG.SYS on a boot diskette, type *drive:* (where *drive* is the drive letter of the boot diskette), then press <Enter>.
- 2 Type `EDIT CONFIG.SYS` and press <Enter> to start the DOS Editor and retrieve the CONFIG.SYS file.

- 3 Add either the `DEVICE` or `DEVICEHIGH` command. For example, type

```
DEVICE=[drive:][path]filename [dd-parameters]
```

or

```
DEVICEHIGH=[drive:][path]filename [dd-parameters]
```

where *[drive:][path]filename* specifies the location and name of the CD-ROM device driver and *[dd-parameters]* specifies any command-line information the device driver requires.

You may want to use `DEVICEHIGH` if you need to conserve conventional memory. See “Freeing Conventional Memory to Run Drive Image” on page 111.

For more information on your device driver, consult the documentation that came with your CD-ROM.

- 4 Click **File ► Save** to save the file.
- 5 Click **File ► Open** and retrieve the AUTOEXEC.BAT file.
- 6 Add the command line `MSCDEX.EXE`.
- 7 Click **File ► Save** to save the file.
- 8 Click **File ► Exit** to exit the editor.

Freeing Conventional Memory to Run Drive Image

The Drive Image executable running under DOS requires a minimum of 400KB of memory in the first 640KB of the computer's address space (conventional memory). If you try to run Drive Image from DOS and find you do not have enough free conventional memory, you can free enough additional memory in a number of ways.

Running MEMMAKER

MEMMAKER is a program that automatically configures your computer to save conventional memory (while still loading all of the device drivers and other programs you usually load when booting DOS). MEMMAKER frees conventional memory by moving as many programs as possible out of conventional memory into high memory. Run MEMMAKER by typing MEMMAKER at a DOS prompt. Follow the on-screen instructions.

MEMMAKER is only available with DOS versions prior to DOS 6.0. MEMMAKER is not available with Windows 95.

Using the F8 Key to Keep Programs From Loading

If running MEMMAKER does not free enough conventional memory, you can free more by pressing <F8> right after booting your computer (while DOS is booting). If you press <F8>, when DOS reads the commands from the CONFIG.SYS and AUTOEXEC.BAT files on your hard drive, DOS will ask you if you want it to execute each command. When you see commands that load device drivers or TSR programs that you will not need to run Drive Image, answer N (no) to tell DOS not to execute that command (not load that software into memory). This will conserve conventional memory.

Creating an Operating System Boot Diskette

If running MEMMAKER and using <F8> does not free enough conventional memory, you can create a boot diskette that allows you to boot using a very minimal amount of conventional memory.

You can create a boot diskette for any version of DOS by performing the following:

- 1** Place in your diskette drive (A:) any diskette that does not contain information you want to keep.
- 2** Go to a DOS prompt, type `FORMAT drive: /S` (where *drive* is the drive letter of the diskette drive).
- 3** Press <Enter>.

After the diskette is formatted and the operating system files are transferred, you will be able to boot the computer from the diskette. If you restart your computer with the diskette in the diskette drive, your computer boots using a minimal amount of conventional memory. After you boot from the diskette, you can run Drive Image from either the diskette or your hard drive.

If you want to create and restore images across a network, you will need to create a network boot diskette.

Creating a CONFIG.SYS File on the Boot Diskette

If making an ordinary boot diskette doesn't free enough conventional memory, you can create a customized boot diskette that will free even more conventional memory. (With the customized diskette, you will free more conventional memory by loading some of the DOS operating system into high memory.) To customize the diskette, you must create a CONFIG.SYS file in the root directory (A:\). To create a CONFIG.SYS in the root directory, perform the following:

- 1** At the DOS prompt, type `drive:` (where *drive* is the drive letter of the diskette drive), then press <Enter>.

Verify that you have changed to the diskette drive (you see the `drive:\>` prompt).

- 2** Type `EDIT CONFIG.SYS` and press <Enter>.

This starts the DOS editor. (You will see a blank screen if no CONFIG.SYS currently exists.)

- 3** In the editor, type the following:

```
DEVICE=C:\DOS\HIMEM.SYS
```

```
DEVICE=EMM386.EXE
```

```
DOS=HIGH,UMB
```

IMPORTANT! All lines must be entered in the order shown. Windows users: substitute `DEVICE=C:\WINDOWS\HIMEM.SYS`.

- 4** Click **File** ► **Save** to save the file.
- 5** Click **File** ► **Exit** to exit the editor.

You can now reboot your computer from the customized boot diskette. When DOS loads, much of it is loaded into high memory, saving a maximum amount of conventional memory.

Deleting Operating System Compression Files

If you use DOS 6.22 and your system doesn't have any compressed drives (for example, DriveSpace, DoubleSpace, or Stacker), you can free conventional memory by deleting the operating system compression files DRVSPACE.BIN or DBLSPACE.BIN from any boot diskette you create. To delete these hidden system files, perform the following:

- 1 From the DOS prompt, type `drive :` (where *drive* is the drive letter of the diskette drive).
- 2 Type `ATTRIB -R -H -S *.BIN`.
- 3 Type `DEL *.BIN`.

Resolving Check Errors

Drive Image checks the integrity of a partition very thoroughly prior to creating an image file or copying a partition. These checks are substantially the same as those made by the operating system's CHKDSK, SCANDISK, or AUTOCHK utility.

If you receive a Check error message for any partition, after backing up your hard drive, run your operating system's CHKDSK program on that partition. CHKDSK usually shows the same problems as Drive Image. (If you are using Windows NT CHKDSK, DO NOT use the /F switch on the initial run.)

Run SCANDISK if you have MS-DOS 6.x or Windows 95.

The DOS CHKDSK program does not detect problems in Extended Attributes.

If CHKDSK (or SCANDISK) does not show the same errors that Drive Image shows, contact PowerQuest at the numbers listed in *Appendix D*. If the CHKDSK (or SCANDISK) program and Drive Image detect the same errors (which is usually the case), run CHKDSK with the /F switch to fix the problem.

After running CHKDSK /F, run CHKDSK without the /F switch to make sure the partition is free of errors. Under OS/2, you should perform this procedure twice before proceeding. If Drive Image still reports a problem, reformat the partition and restore your files from the backup copy to correct the error.

Drive Image also checks a partition after restoring it. If this check fails, report the problem to PowerQuest Technical Support. The problem is usually a minor file system error that CHKDSK /F can correct without data loss. For more extensive errors, you may need to restore your files from a backup copy.

Resolving Partition Table Errors

In some cases, PowerQuest technical support can help you fix partition table errors without data loss. Check with them first before proceeding to the following steps.

To resolve some partition table errors, you must create new, error-free partition tables.

- 1** Make sure you have no viruses.

See “Partition Tables and Viruses” on page 114.

- 2** Back up the data on the affected partitions.

- 3** Delete the partitions.

You may need to use the FDISK program from a recent DOS version because earlier versions of DOS may refuse to delete HPFS or hidden partitions.

If using OS/2, the OS/2 FDISK program may recognize the partition's corruption and refuse to modify it. In this case, use the FDISK program from a recent DOS version.

- 4** Recreate the partitions.

- 5** Restore the contents of the partitions.

Partition Tables and Viruses

If partition changes made under one operating system are not reflected under the other, and vice versa, it is possible that a master boot record (MBR) virus is present.

Use a virus check utility that can detect the latest viruses. If a virus is found, data loss is likely. If a virus is found, perform the following:

- 1** Before removing the virus, run ScanDisk or CHKDSK under each of the operating systems to evaluate the integrity of the partition.
- 2** Back up the files from any partition that passes the Check operation.
- 3** After backing up the files from all operating systems, remove the virus.
- 4** Run ScanDisk or CHKDSK under each of the operating systems again.
- 5** Delete and recreate any partitions which fail the check.
- 6** Reinstall the operating systems.

- 7 Restore the backup files as necessary.

Generating Diagnostic Reports with PARTINFO

PARTINFO, a PowerQuest utility program included on the Drive Image CD, generates a report showing the contents of your hard disk partition table. This information is helpful in resolving various partitioning problems.

- 1 Boot the computer to DOS.
- 2 Change to the directory that includes PARTINFO.EXE.
- 3 You have several options for running PARTINFO.

To do this:	Do this:
To display partition information on your screen	Type PARTINFO, then press <Enter>.
To send a report directly to your printer	Type PARTINFO >LPT1 or PARTINFO >PRN, then press <Enter>.
To save the report as a text file on a floppy disk	Type PARTINFO >A:\PARTINFO.TXT, then press <Enter>.

PowerQuest support technicians may request a report from PARTINFO to help you resolve any problems that you experience with Drive Image.

Error Messages and Solutions

For a list of error messages and solutions in English, run Setup, then click **Documentation** ► **Error Documentation** on the Drive Image CD, or go to the PowerQuest Knowledge Base at www.powerquest.com/support/er/er0000.html.

PowerQuest Technical Support

Before Contacting Technical Support

PowerQuest is committed to providing you with comprehensive technical support. However, before contacting our technical support department, please try to resolve your problem by using this guide, the online help for the application you are using, the README file, and PowerQuest's corporate web site.

Tips

- Your problem may be resolved by applying the most recent patch or upgrade of the software. You can go to www.powerquest.com/updates to see if there are updates to the software.
- PowerQuest technical support engineers may request information from the PARTINFO utility program to help you resolve problems with Drive Image Pro. See “Generating Diagnostic Reports with PARTINFO” on page 115.
- Your product serial number is required to obtain technical support.

Term of Technical Support

Technical support is available to all registered users throughout the life of the product, which began when PowerQuest released the product to manufacturing and ends six months after the release of the next version or when PowerQuest discontinues development of the product.

Upon registration, PowerQuest provides 90 days of complimentary technical support from the day of your first call. In addition, registered users are eligible for special upgrade pricing when PowerQuest releases a new version of Drive Image. Contact PowerQuest Customer Service for additional information about upgrade pricing.

Contact Information

Corporate Web Site

The PowerQuest web site *support.powerquest.com* includes technical support information, including answers to frequently asked questions (available in English only), an overview of support options, and explanations for error messages.

E-mail

Language	E-mail (for specific technical problems)
Dutch	eurots@powerquest.com
English	help@powerquest.com eurots@powerquest.com
French	france@powerquest.com
German	germany@powerquest.com
Italian	italian@powerquest.com
Portuguese	latina@powerquest.com
Spanish	spanish@powerquest.com

To obtain e-mail technical support for specific technical questions, you can fill out the form at *support.powerquest.com/emsupport.html* (available in English only).

E-mail on Demand

PowerQuest maintains an e-mail on demand system to resolve common problems. You can view a list of available documents at *support.powerquest.com*. To request one of the documents, send an e-mail message to **support@powerquest.com** with the index number of the document in the subject of the message. You can only request one document per e-mail message. E-mail on demand documents are available only in English.

Fax

Location	Number
USA	(801) 437-4218
Europe	+31 (0)20 581 9270

Fax a description of your problem to the technical support fax number. This service is available in the U.S., Canada, and Europe 24 hours a day, 7 days a week. PowerQuest technicians try to respond to all fax requests within 24 hours.

Telephone

Language	Location	Number
Dutch	Netherlands	+31 (0)20 581 3906
English	Netherlands	+31 (0)20 581 3907
English	UK	+44 (0)17 1341 5517
English	USA	(801) 226-6834
French	France	+33 (0)1 69 32 49 30
German	Germany	+49 (0)69 66 568 516
Italian	Italy	+39 (0)2 45 28 1312
Portuguese	USA	(801) 226-6834
Spanish	Spain	+34 (0)91 662 51 46
Spanish	USA	(801) 226-6834

The U.S.A. call center is open Monday through Friday from 7 a.m. to 6 p.m., MST/MDT. Our European call centers are open Monday through Friday from 9:00 to 18:00, CET.

Postal Service Mail

USA	Europe
PowerQuest Corporation P.O. Box 1911 Orem, Utah 84059-1911 U.S.A.	PowerQuest Customer Service P.O. box 58287 1040 HG Amsterdam, Netherlands

Include a detailed description of your problem and a return address, a daytime phone number, or other relevant contact information.

Glossary

ATA

A standard used by hard drives to communicate with the controller ports or cards that allow the hard drive to interface with the computer. Before ATA, there were numerous incompatible methods for interfacing hard drives to computers. ATA simplifies this process, thus reducing the cost of developing and purchasing related hardware. ATA is the proper term for Integrated Drive Electronics (IDE).

ATA-2

ATA-2 is the common name for a new, enhanced IDE standard. This standard is still evolving and has not yet been submitted for approval as an official standard.

BIOS (Basic Input/Output System)

The BIOS is the program code stored in a PC-compatible ROM to boot the computer and provide basic services such as low-level hard drive access.

Cloning

Copying a hard drive to an image file or destination disk to create an exact duplicate.

Destination

The destination hard drive is the drive that is copied to during a copy or restore operation.

Disk

A hardware device to store data. A disk contains a Master Boot Record and partitions.

EIDE (Enhanced Integrated Drive Electronics)

A marketing program that promotes certain features of ATA-2.

Extended Partition

One of the four primary partitions on a hard drive can be an extended partition. Extended partitions do not directly hold data; rather, you can create an unlimited number of logical partitions within the extended partition to store data. An extended partition cannot be the active partition.

FAT File Allocation Table

File system used by DOS, Windows 95/98, NT and sometimes OS/2 to store and retrieve files and directories.

FAT32

FAT32 is the file system used by updated versions of Windows 95 (version 4.00.950B or above and Windows 98). FAT32 is an enhancement of the FAT file system and is based on 32-bit file allocation table entries, rather than on the 16-bit entries the FAT file system uses. As a result, FAT32 supports much larger volumes (up to 2 terabytes).

GB (Gigabyte)

1,073,741,824 bytes.

IDE

See ATA.

Image

An image is a snapshot of a drive's partitions that can be used to back up a system, install a new hard drive, or configure a new system.

Jumper

Metal prongs and a circuit completion cap on the outside of a hard drive. You can remove, reposition, and then replace the cap to create various jumper settings such as master and slave.

HPFS

High Performance File System, an alternative to a FAT file system which is used by OS/2.

LBA (Logical Block Addressing)

1) In EIDE, a means of specifying sector addresses by replacing CHS values with a single linear 28-bit number. 2) Generically, a one-dimensional address of a hard-disk sector; contrast with CHS.

Linux

Linux Ext2 file system was developed for the Linux operating system (a free-ware version of the UNIX operating system). Linux Ext2 file system supports a maximum volume size of 4 terabytes.

Logical Drive

A contiguous area inside an extended partition that can be used by the operating system to store and retrieve files.

Master

The first hard drive on an IDE hard drive controller.

MB (Megabyte)

1,048,576 bytes.

NetBIOS

A high level Network programming interface which is supported by lower level network protocols such as IP/SP and TCP/IP.

NetWare

The Novell NetWare network operating system uses the NetWare File System, which was developed specifically for use by NetWare servers.

NTFS (New Technology File System)

An alternative to FAT and HPFS file systems used by Windows NT.

Partition

An uninterrupted area on a disk, defined in the Master Boot Record. Every partition contains a specific file system such as FAT, FAT32, HPFS, or NTFS.

Primary Partition

A partition referenced in the Master Boot Record partition table. Four primary partitions can exist on a hard drive. One of these may be an extended partition. Only one primary partition on a drive may be active at time. Data and applications are often placed on a logical partition inside an extended partition. This enables the data to be accessed by all primary partitions.

Restore

Downloading an image file to a destination drive.

Slave

The second hard drive on an IDE hard drive controller.

Source

The Source hard drive is the drive from which the image is made.

Spanned Image

An image file that has been created in two or more segments so that it can be placed on media that is smaller than the image itself.

Unallocated Space

Space on a hard disk that is not assigned to any partition.

Volume

This User Guide uses the term volume interchangeably with partition.

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