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Mac OS



MacUser



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• Ideal for cartridge/tape
• EasyScript assistant
• New manual



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USER'S GUIDE

Dantz Development Corporation, 4 Orinda Way, Building C, Orinda, California 94563

Retrospect User's Guide, version 3 third edition

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INTRODUCTION

Introducing Retrospect

Safeguarding and managing the vast quantity of data stored on personal computers is critical to maintaining a productive working environment. Retrospect and Retrospect Remote are the ultimate tools for individual and network backups, respectively.

Retrospect does incremental backups so that it is not copying the same files over and over. New backups copy everything from a source and subsequent backups only copy new files or those which have changed. This saves time and backup media.

Retrospect uses an archival method of backup that ensures backed up files are not deleted or written over until you specify that to happen, so they stay on the disk or tape indefinitely. This is helpful, for example, if you have been working on an important document every day for the past month and you discover you have been making terrible mistakes for the past week. If you have been backing up every day Retrospect lets you retrieve a good version of the file from a week ago (or any point in time it was backed up). This is an important benefit of Retrospect not found in “disk mirroring” backup software.

An important capability of Retrospect is its ability to perform automatic, unattended backups. You can schedule scripts to execute automatically and you do not have to attend to the computer during the backups.

Package Contents

Your Retrospect package includes the following:

- this manual, *Retrospect User's Guide*
- two floppy disks
- registration card

If you purchased Retrospect Remote, your package includes the above-listed material *and*:

- *Retrospect Remote Administrator's Guide*
- Remote Workstation floppy disk
- list of activator codes

Other Dantz Products

Dantz Development Corporation is the premier supplier of backup and archive solutions for the Macintosh. Dantz products satisfy all your backup requirements—performance, unattended operation, network compatibility, reliability, security, low administration costs, storage, and future growth—across a range of solutions from individual floppy disk backup to network-wide backup on a large scale.

Remote Packs for Macintosh

Remote Packs for Macintosh allow Retrospect to back up other Macintosh computers over the network. Adding a Remote Pack to Retrospect forms the network backup solution known as Retrospect Remote, which provides a centralized backup solution and allows you to use a single Macintosh with a storage device to back up Remote computers connected by a network. With Retrospect Remote, you can schedule your network backups to run unattended during convenient times such as nights or weekends.

Remote Packs are available for five, ten, or fifty Macintosh computers.

Remote Packs for Windows 95 and NT

Remote Packs for Windows 95 and NT allow Retrospect to back up Windows computers over the network. Adding a Remote Pack to Retrospect forms the network backup solution known as Retrospect Remote, with the benefits described above.

Windows computers equipped with Remote Packs use the TCP/IP protocol for fast backups. They can be used in the same scripts as Macintosh Remote computers and their files can share the same backup media.

Remote Packs are available for five, ten, or fifty Windows 95 or NT computers.

DiskFit Direct

DiskFit Direct provides the basic backup essential to every Macintosh user. Simply launch DiskFit Direct, click Backup and insert disks as requested. The end result is an exact copy of your hard disk on an organized SmartSet™ of floppy disks or other removable media such as Zip, Jaz, SyQuest, Floptical, or optical disks. Subsequent incremental backups copy only the files that are new or changed since the last backup, replacing old or obsolete files. This keeps backups fast and efficient, and best of all, you don't have to add more disks each time you back up. Backup files are stored in Mac OS format, keeping files easily accessible and making retrieval simple. DiskFit Direct protects data against file corruption, viruses, accidental deletion, and hard disk crashes.

DiskFit Pro

DiskFit Pro is a full-featured backup application oriented toward backup to floppy disks, file servers, or removable media such as Zip, Jaz, SyQuest, Floptical, or optical disks. Like DiskFit Direct, DiskFit Pro copies files from a hard disk to a SmartSet of disks maintaining a complete Mac OS format backup on a fixed number of disks. DiskFit Pro adds other powerful features not found in DiskFit Direct, including support for backups over the network to and from AppleShare compatible servers and scheduled backups. DiskFit Pro can even remind users when they need to back up.

About this Manual

If you just want to get started quickly with Retrospect, go to Section I, Getting Started, which starts on page 1.

This manual is divided into ten sections, each containing chapters devoted to a particular area of Retrospect. The Glossary defines the terms used throughout this manual and Retrospect itself. Three appendices provide additional reference information.

The following conventions are used throughout this manual.

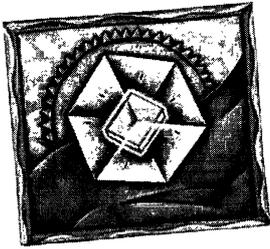
- A note, indicated by a ■ symbol, contains noteworthy information.
- A tip, indicated by a ♦ symbol, contains a useful alternative or suggestion which applies to the task at hand.

- A warning, indicated by a ▲ symbol, lets you know about something which may be destructive to your configuration, data, media, or hardware.
- *Italics* are used to emphasize important ideas and terms.

This manual assumes basic knowledge of the Macintosh and the Finder, including clicking and dragging, making selections, choosing menu items, and performing fundamental commands and operations. Familiarity with System 7 features such as file sharing is also useful. Refer to your Macintosh documentation if you are unfamiliar with these operations.

This manual often mentions network operations with Remotes, but the information may not directly apply to you if you do not have Retrospect Remote or Remote Packs.

SECTION I



Getting Started

- REQUIREMENTS
- INSTALLATION
- USING RETROSPECT
- QUICK START

This section defines the hardware and system requirements necessary to use Retrospect, then explains how to install or upgrade the Retrospect software on your Macintosh. It also shows how to start and leave Retrospect.

The Quick Start chapter puts you into the thick of things right away by having you do two backups followed by a simple restore.

CHAPTER 1 • REQUIREMENTS

In order to run and use Retrospect, certain minimum requirements of hardware, software, and memory must be met. These requirements are listed below.

Hardware

Retrospect requires the following hardware:

- Apple Macintosh Plus or later model Macintosh computer, or MacOS compatible equivalent. (Apple Macintosh 128K, 512K, 512KE, and XL/Lisa models may not be used.)
- Hard disk drive with a minimum of 4MB free space.
- A suitable backup device, with removable media if needed. This can be a hard disk drive, floppy disk drive, tape drive, or removable cartridge drive. See the Release Notes for a list of supported tape drives.

For simplicity's sake, this manual uses "Macintosh" to refer to any MacOS compatible computer.

Software

Retrospect requires System 7.0 or later Apple System software, or A/UX 3.0.1 or later.

Do not use Retrospect on a Macintosh which is running Meeting Maker, or any electronic mail server software, because these programs do not allow Retrospect to operate.

Memory

In order to run and use Retrospect, your Macintosh must have at least 4MB of RAM memory.

CHAPTER 2 • INSTALLATION

The Retrospect package includes high density 1.4MB floppy disks. If you have an older Macintosh which cannot use high density diskettes, contact Dantz Customer Service for a set of 800K diskettes.

Installing

Bring your Macintosh to the Finder. Insert the diskette labeled “Retrospect Install 1” in your floppy disk drive. In the window that opens, double-click the icon named Install Retrospect.



Install Retrospect

Follow the installer program’s instructions.

Updating Scripts and Schedules

Update from 2.0 or 2.1

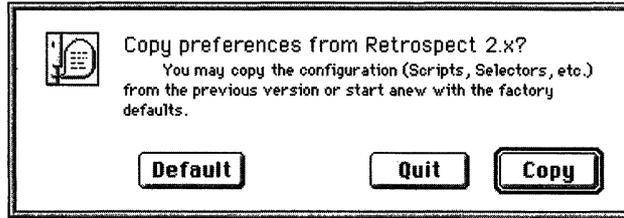
If you were using Retrospect version 2.0 or 2.1 before you obtained this new version, the first time you start the new version it asks you about updating the old scripts and schedules.

Double-click the Retrospect application icon to start Retrospect.



Retrospect

The script update dialog appears.



Click the Copy button or press Return to copy the old scripts, schedules, and selectors and convert them to the new format for use with the new version of Retrospect. This does not change the old scripts.

Update from 1.3

If you were using Retrospect version 1.2 or 1.3 before you obtained this new version and you want to keep your existing scripts, schedules, log, and configuration, use the 1.3 updater. It takes your old configuration information and converts it for use with your new version of Retrospect. Some features have changed so you may notice some adjustments to your configuration when you use Retrospect.

First locate the 1.3 updater file in the Retrospect folder.



Update from 1.3

Drag this icon on top of the new Retrospect icon to start the updater, then click OK in the first dialog it presents. The updater asks you to pick your Retro.Prepare file. Use the dialog to locate the file (which is probably in your System Folder) and then click OK. Retrospect updates the old information and converts it to a new configuration while it shows its progress in the Update Log window. When it is done, a dialog says the update was completed successfully; click OK to continue.

After updating 1.3 information, use Retrospect to check all of the newly converted information to make sure nothing got lost in the translation, so to speak.

Removing Old Files After Upgrading

Once you have Retrospect up and running and you are confident with it, you can remove the old Retrospect application from your Macintosh.

Memory Considerations

During operations such as backing up and restoring, Retrospect uses available memory (that is, memory not used by the System or other applications) to increase its efficiency. This temporary memory usage is above and beyond that which is allocated to the Retrospect application.

In most situations, it is not necessary to increase the Retrospect application's default memory allocation.

CHAPTER 3 • USING RETROSPECT

Starting Retrospect

To start Retrospect, double-click the Retrospect application icon.



Retrospect

The first time you start it, Retrospect may ask about updating old scripts and schedules. If you wish to keep your existing scripts and schedules intact for use with this new version, follow the instructions on page 4 for updating scripts and schedules.

Leaving Retrospect

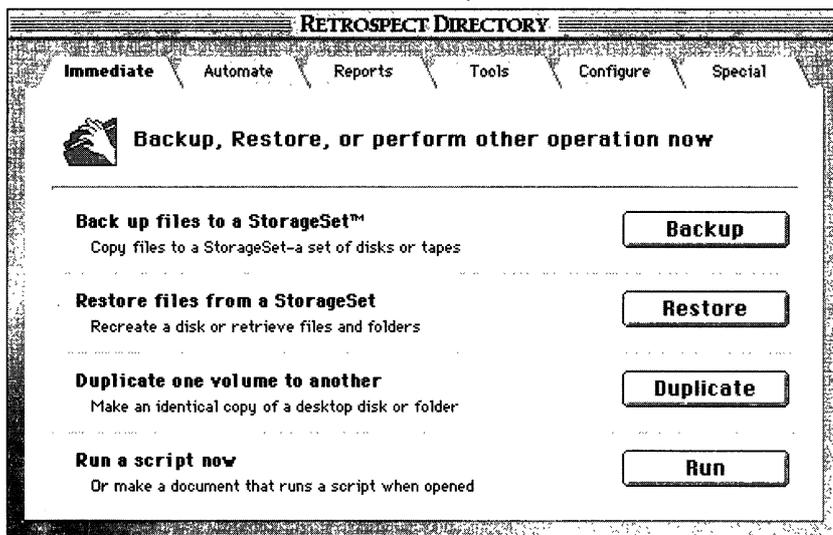
Once the Retrospect application is started, you can leave it temporarily by clicking on a program window in the background, or by choosing another program from the Apple menu or applications menu. This puts Retrospect in the background, and though it is not the active program, it will continue to perform its current operation, if any, and perform any scheduled operations which come up later.

- **Note:** Retrospect works slower when it is running in the background and faster when it is the active application running in the foreground.

To exit Retrospect entirely, choose Quit from its File menu. Before exiting, Retrospect informs you of the next scheduled operation, if any.

The Retrospect Directory

When you start Retrospect, the program displays its main window, the Directory.



You can access all areas of Retrospect through its Directory.

The Directory is like a box of your favorite recipes on index cards with tabs. By default, the Immediate tab is shown and its name is in boldface to indicate Immediate is the front-most tab. Click a tab to switch to a different tab in the Directory. Go ahead now and click the various tabs and notice the area contents change as you click the tabs.

Each tab displays a brief summary of its contents at its top, with buttons along the right. To the left of each button is a description of its action. Each button performs a function; most of these functions require several steps and involve more windows, dialogs, and buttons. This manual explains these functions.

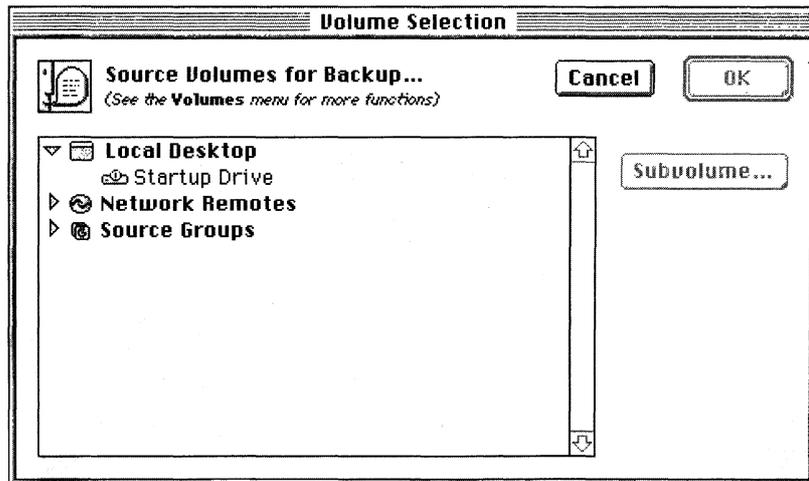
CHAPTER 4 • QUICK START

This chapter introduces you to Retrospect's basic backup and restore operations and walks you through a tutorial in which you perform your own simple backups and a restore. Have your Macintosh (with connected backup device) and media ready.

You have yet to learn some of the terminology used in this chapter, but fear not—it is not yet necessary to know it. Just follow along.

Quick Backup

Start Retrospect. Click the Backup button. The following window appears.



The volume selection window.

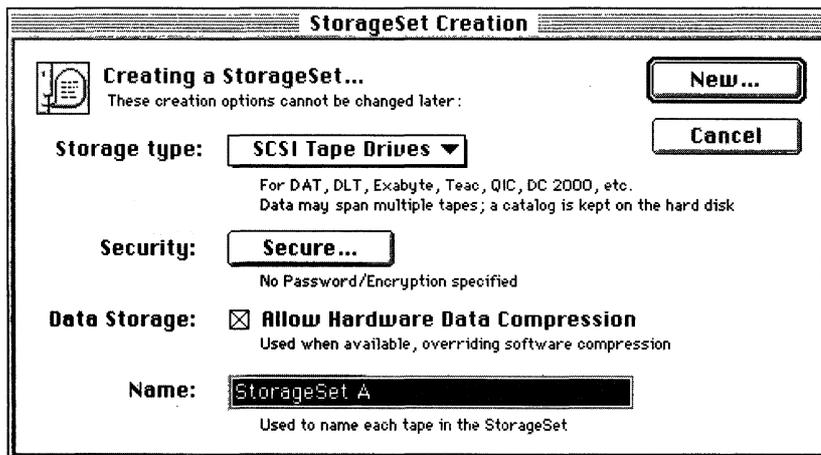
The window's scrolling area lists all available volumes, in a hierarchical format. At this time we are concerned only with the volumes on your Macintosh's Local Desktop. Click on the name of your hard disk to select it.

▼  **Local Desktop**
Startup Drive

The selected volume is highlighted in the list.

Click the OK button to accept the selected volume and proceed.

Retrospect needs to know the StorageSet we are going to back up to. Since none exist and there are none to choose from, Retrospect brings up another window to let you create a new StorageSet. If you watch closely, you can see Retrospect quickly scan your SCSI bus, looking for suitable backup devices. The StorageSet creation window appears.

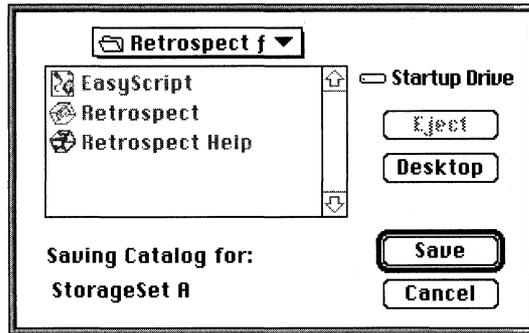


The StorageSet creation window.

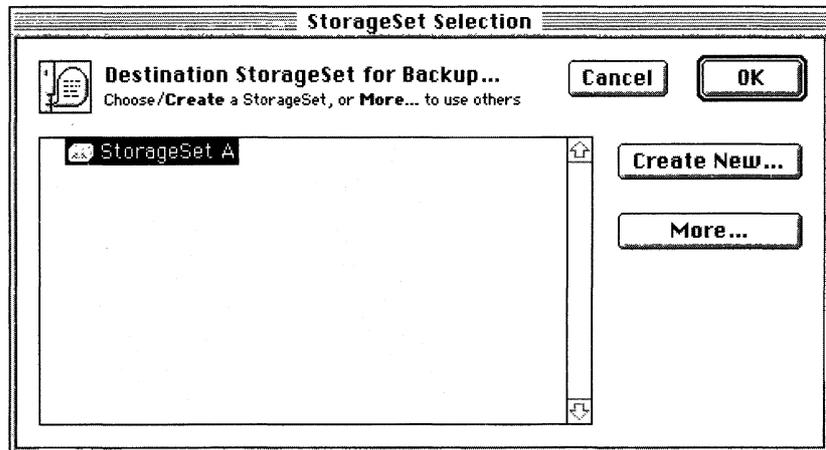
The first and most important thing we will do with this window is set the StorageSet type. The pop-up menu is set to the StorageSet type Retrospect considers most appropriate for the available backup devices. (The pop-up is set to SCSI Tape Drives in the picture above.) Choose a type which matches your backup media, either tapes or disks. Do not choose the File StorageSet type for this tutorial.

Next, enter a name for the StorageSet in the Name field, or just leave it as is with the default name.

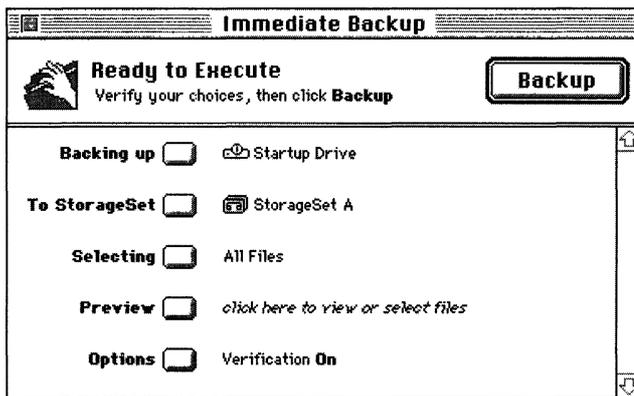
For this tutorial, ignore the security and data compression options entirely, then click the New button or press Return. The next window lets you choose where to save the StorageSet catalog file. Placing it in the same folder as the Retrospect application is a good idea.



Set the location then click the Save button or press Return to save the file in the specified place. Retrospect returns to the StorageSet selection window, which lists available StorageSets. Our new StorageSet is automatically highlighted, so we do not have to select it.

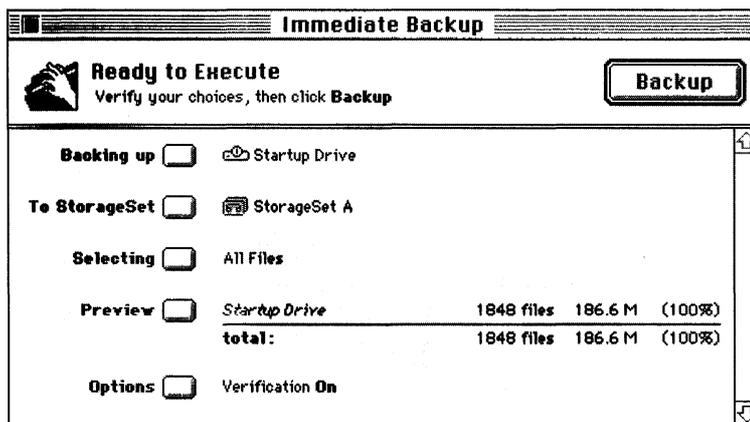


Click the OK button or press Return. The next window appears.



The immediate backup window.

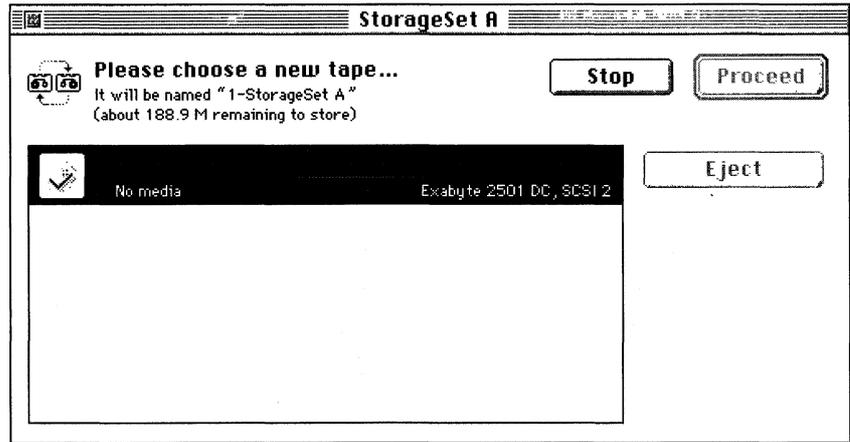
Take a moment to look at the various parts of this window, including the source volume we chose and the destination StorageSet we created. Click Preview to scan the volume and display the files chosen, then close the window which appears. The summary window lists the number and total size of the files to be backed up, which should be all of the files on the source volume.



The top of the window should say Ready to Execute. If not, Retrospect tells you why and you need to click a button and provide the necessary information.

Click the Backup button. A dialog asks whether you really want to execute the backup operation. Click OK. The next window appears.

This window differs only slightly among tapes and disks StorageSets.

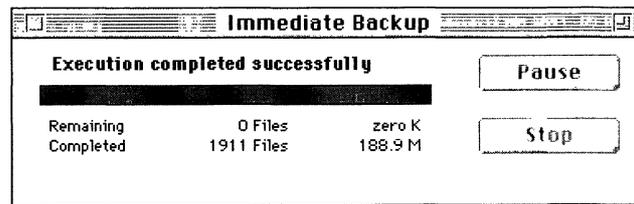


The media request window for a tapes StorageSet.

This window is asking you to choose a new piece of media for the backup.

Use only a blank disk or tape or one with unwanted data, because any files on it will be permanently removed.

If you do not have a new or erased disk or tape in the backup drive, put one in. Select the new media in the window and click Proceed. Retrospect shows you a progress window while it backs up your files. When it is done, you see the following.



Congratulations on completing your first backup.

Quick Incremental Backup

Quit Retrospect. Make some duplicates of some files with the Finder. (Make sure the names are different from the originals.) You can also make new documents with an application like a word processor. Do not make them complicated or make a lot of them; we need just a few simple, changed files. For simplicity, do not save these files in a folder; place them on the top level of the same hard disk you just backed up.

Start Retrospect and click the Backup button. Retrospect goes directly to the immediate backup summary window since it already has the necessary information, which it is using from our first backup.

Click Preview, then close the window which appears and take a look at the files chosen information.

Preview <input type="checkbox"/>	<i>Startup Drive</i>	1850 files	187.4 M	(100%)
	total:	1850 files	187.4 M	(100%)
	need to copy:	15 files	3561 K	

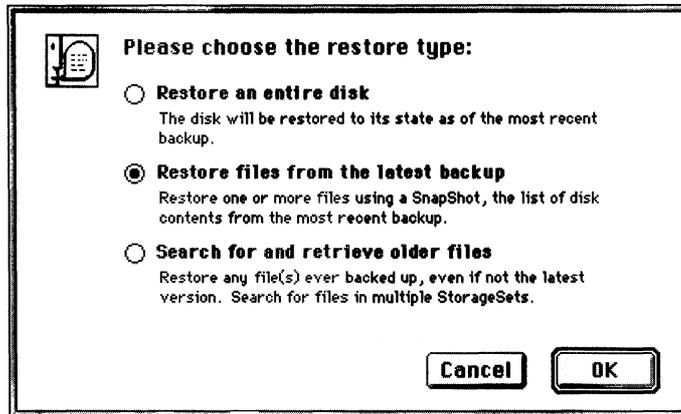
Retrospect compares all the files for this backup to all the files which exist in this StorageSet. If a file already exists and has not changed, Retrospect does not need to copy it. Since we made some new files, they are listed to the right of “need to copy.” (This is known as an incremental backup.)

Click Backup, then OK. Close the execution window when the backup is complete. Congratulations on your first incremental backup.

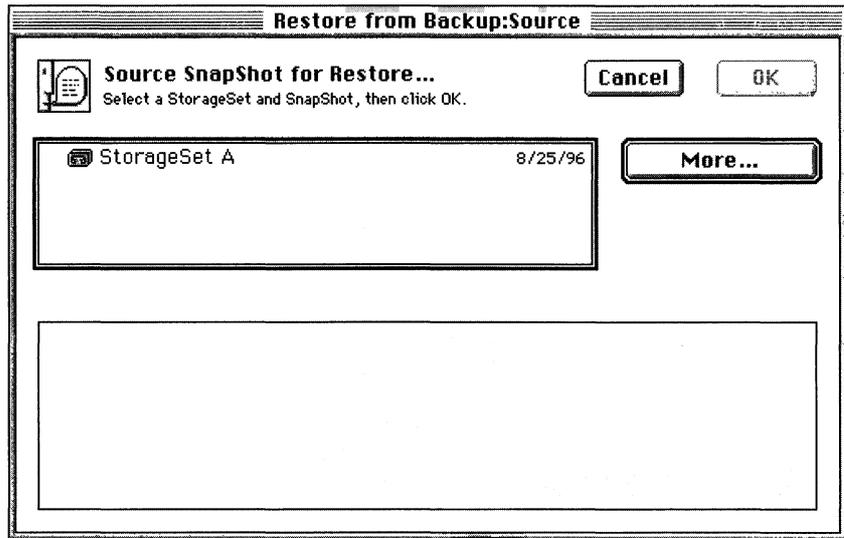
Quick Restore

So we just backed up some files; now what? Let’s assume we have lost some or all of those files and you need to recover them.

Open Retrospect and click Restore. Retrospect asks you to choose the type of restore you want to do.

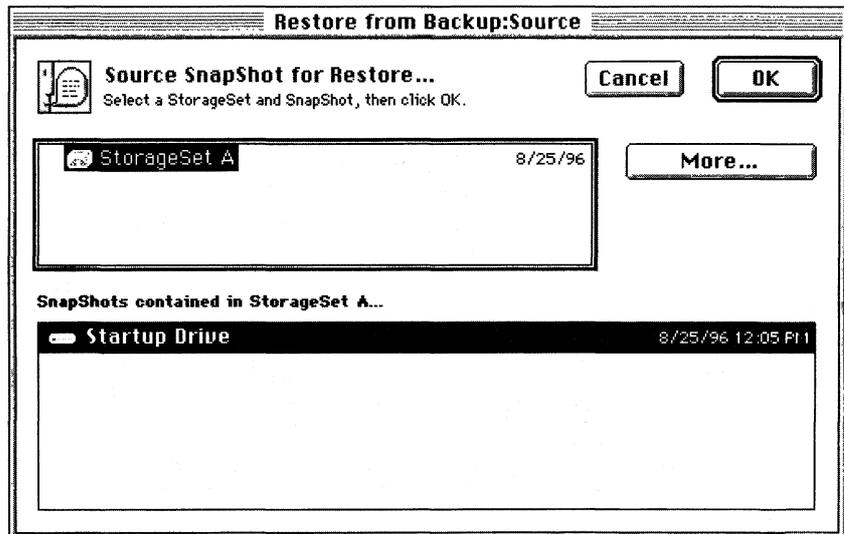


We want to restore files from the latest backup, so set that radio button and click OK to move on to the next window.

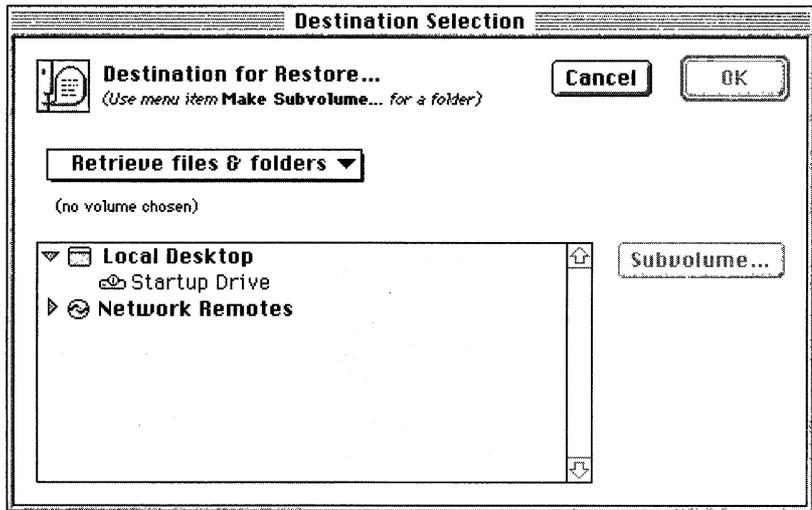


The restore SnapShot selection window.

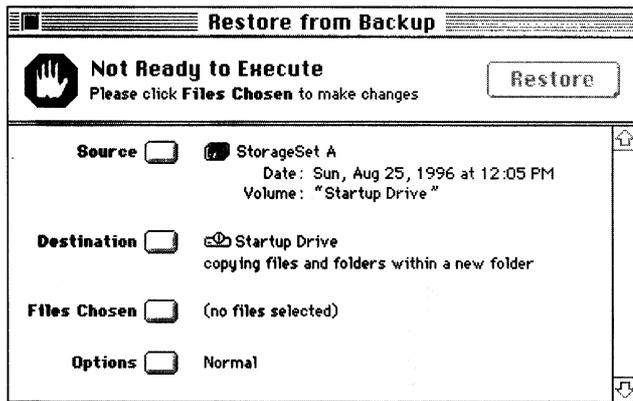
In the top part of the window click the StorageSet. Retrospect then automatically selects its one and only SnapShot in the bottom portion of the window.



Click OK to move on, which brings us to the next window, in which we are asked to pick the location to which the backed up files will be restored.

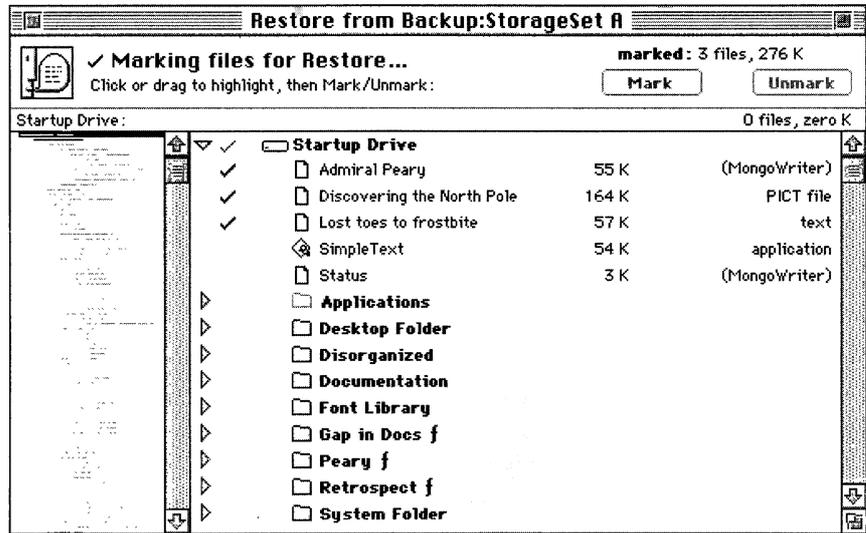


Click on the name of your hard disk to select it as the volume to which you will restore. *Make sure the pop-up menu is set to Retrieve files & folders*, then click OK. Retrospect briefly matches your SnapShot to the files in your StorageSet, then displays the summary window.



Check over the various parts of this window. Make sure the destination volume is correct and you are copying files and folders within a new folder. Note the part about the files chosen; none are selected, which is why the summary says the operation is not ready to execute. Click Files Chosen and a window opens, showing you the SnapShot of the files on the volume at the time of the backup.

Let's take care of marking the files to restore. Locate the new files you made or copied after you did the first backup. The files should be on the top level of the hard disk, but you may have to scroll to see more files. For each file, click its icon, then click the Mark button. (Or, as a shortcut, just double-click a file to mark it.) Marked files have check marks next to them.

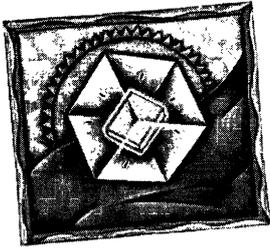


Go ahead and mark other files if you want. The upper right corner of the window has summary of the number and size of the files you have marked.

When you have marked your files, close the window. The Files Chosen information in the restore summary window reflects your new set of marked files. Click Restore. After the restore operation is complete, close the execution window and go to the Finder.

On your hard disk Retrospect made a new folder named the same as your StorageSet. Inside your folder you will find the files you marked. Congratulations on your first restore.

SECTION II



Fundamentals

- HOW RETROSPECT WORKS

This section presents Retrospect's fundamental concepts. This manual and the program itself repeatedly refer to these basic ideas. Understanding these fundamentals is important and useful but not entirely necessary. Dantz designed Retrospect to be powerful and feature-packed, yet very easy to use for basic operations. Feel free to use Retrospect without reading this section, but your grasp of these concepts is an important milestone in learning to use Retrospect to its full potential.

Also described in this section are Retrospect's different backup types, SnapShots, and network backups with Remotes.

CHAPTER 5 • HOW RETROSPECT WORKS

Retrospect copies files from a source and stores them in a backup set. The source can be a hard disk, file server, compact disc, any Finder-mountable volume, or even a combination of multiple sources.

The destination set can consist of tapes, floppy disks, removable cartridges, opticals, Flopticals, or even a single file on a disk.

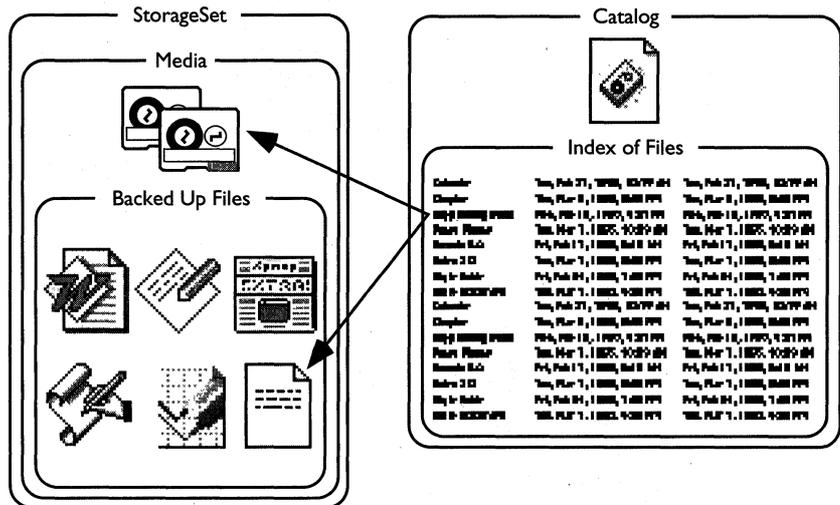
Rather than replacing old files in the backup set, Retrospect adds new or changed files to the set during incremental backups. It uses a separate catalog (usually stored on your hard disk) to keep track of the different generations of modified files in a backup set.

StorageSets and Their Components

The basic building block of Retrospect is the *StorageSet*, which is a set of one or more disks or tapes, or a file.

Individual pieces of media (for example, tapes, disks, or cartridges) are *members* of a StorageSet.

The *catalog*, a file saved on your hard disk, is an index or table of contents of the files on the backup media of a StorageSet. The catalog lets you view the contents of a StorageSet without any of its media on hand. A catalog is required for all operations which copy files to and from a StorageSet. If a catalog is lost or damaged, Retrospect can rebuild a catalog from the media. Catalogs typically use 170K of disk space for every one thousand files.



A StorageSet and its catalog. The catalog has pointers which locate the files on the media.

You may back up as many source volumes as you like to a single StorageSet. For example, you could have a single StorageSet as the backup destination for your Macintosh's internal hard disk, your external hard disk, a file server, and a co-worker's hard disk on a Macintosh with an installed Remote control panel.

StorageSet Types

Tapes

A *tapes StorageSet* uses tapes from a SCSI tape device such as a 4mm DAT drive or 8mm Exabyte drive. Files are backed up to the tapes and the catalog is usually saved on the hard disk of the Macintosh doing the backup. Section III, Hardware, and the Retrospect Release Notes provide more detailed information on SCSI and tape drives.

Disks

A *disks StorageSet* uses any ejectable media which appears on the Macintosh Desktop (for example, floppy disks and removable cartridges such as Zip, Jaz, SyQuest, Floptical, or optical disks). Files are backed up to the cartridges and the catalog is usually saved on the hard disk of the Macintosh doing the backup. Section III, Hardware, and the Retrospect Release Notes provide more detailed information on removable media drives.

File

A *file StorageSet* differs from tapes StorageSets and disks StorageSets because it does not use removable media. Rather, it combines the catalog and backed-up files into a single file stored on a volume. (This volume can be any Macintosh volume that mounts on the Desktop, such as a hard disk, file server or shared disk, floppy disk, or removable cartridge.) Unlike the other types of StorageSets, which require media dedicated only to backups, you can store a file StorageSet right alongside other files on a volume used for other purposes.

A file StorageSet can be no larger than the volume on which it is stored. You can decrease the amount of space used by a file StorageSet by using Retrospect's software compression option.

Backup Actions

The main purpose of performing a backup is to copy files into a StorageSet. You can instruct Retrospect to perform three different types of backup actions. Each backup action has its own special way of controlling which files are backed up and the StorageSet media on which they are stored.

Retrospect's default backup action does incremental backups for efficient backups without any extra effort on your part.

Normal

A *normal* backup, as its name suggests, is the action to use in most situations. It is a typical incremental backup, which saves media space by avoiding redundant files in a StorageSet. A normal backup copies only files which are new or newly-modified.

During a normal backup, Retrospect compares the list of files selected to be backed up against the list of files in the StorageSet's catalog, then copies only those files which are not already present on the media. When a normal backup is done to a new StorageSet, there are no files in the StorageSet, so everything selected from the source is backed up.

Normal Backup Example

A backup administrator creates a new StorageSet and does a normal backup to it with a new or erased medium in the backup device. Since no files exist in the new, empty StorageSet, Retrospect copies all the selected files to it.

The next day the administrator does another normal backup to the StorageSet, with the same media member in the backup device. Retrospect compares the selected source files to the catalog, then copies only several new files and a few files which have changed since the previous day's backup.

Full

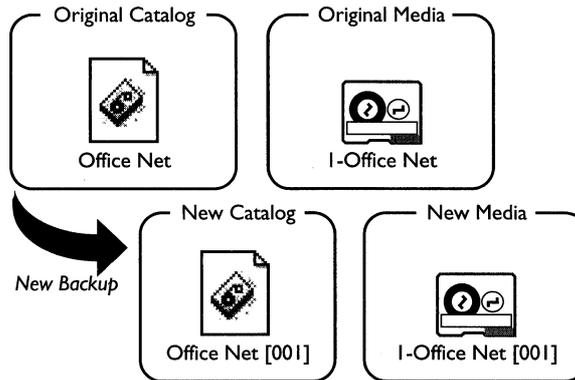
When Retrospect performs a *full* backup, it clears the catalog contents (if any) of the StorageSet so it appears no files are backed up. Then it looks for the first media member of the StorageSet and erases it if it is available. If the first member is not available, Retrospect uses any available new or erased disk or tape. Everything selected from the source is backed up to the StorageSet.

Full Backup Example

The backup administrator decides the catalog is getting too large after a week of normal backups to the StorageSet. She starts a full backup with the first media member in the backup device and Retrospect resets the catalog, erases the files on the media, and copies all the selected files.

New

When Retrospect performs a *new* backup, it makes a new StorageSet (named similar to the old one) using a new or erased disk or tape. This allows the original StorageSet and its catalog to remain intact for long-term storage in a safe place. The new StorageSet catalog and the new media member are each named with a number in sequence, such as "Office Net [001]" and "1-Office Net [001]", as the following illustration shows.



How a new StorageSet is named during a new backup.

Retrospect updates references to the old StorageSet in scripts and schedules so they reflect the new StorageSet.

New Backup Example

The backup administrator decides her network has outgrown the single StorageSet, so she starts a new backup with a new or erased medium in the backup device. Retrospect creates a new StorageSet with a new catalog, and copies all the selected files to the media. The previous StorageSet remains intact and the administrator takes its media to a secure location off site.

Additional Backup Action Examples

Chapter 28 • Backup Strategies, which starts on page 199, offers several backup strategies which use normal, full, and new backup actions. Study these strategies to see how it is possible to maximize backup safety and effectiveness by alternating among StorageSets and rotating media off site.

Adding Members to a StorageSet

When a tape or disk fills with data Retrospect asks for a new one. It uses any available (that is, in the drive) new or erased media. If the media has the name Retrospect is looking for, Retrospect will erase and re-use it. To reduce the danger of unintentionally destroying data, Retrospect will never automatically use a tape with the wrong name if the tape has data on it. Retrospect uses the catalog to keep track of files and media, so you never have to think about which files are on which disks or tapes of a StorageSet.

SnapShots

Because Retrospect does incremental backups, it may have several versions of a file scattered among several backup sessions within a StorageSet. For example, you may update your “Weekly Status Report” document every week, and since each update modifies the file, Retrospect backs up each one to your StorageSet. A flat list of all versions of all the files in the StorageSet would be very confusing. For this reason, among others, every time you back up Retrospect places a SnapShot of the source volume in the StorageSet’s catalog.

A SnapShot is a list—you can think of it as a picture—of all files and folders on a volume when it is backed up. Only one SnapShot is stored for each volume and each SnapShot is replaced during each backup, archive, or Fast Add operation.

When you want to restore from a backup, you can tell Retrospect to use the SnapShot to restore the entire contents of a disk. Or, you can use the SnapShot as a guide to see the volume as it was when it was most recently backed up, and for picking and choosing individual files to be restored. SnapShots allow you to perfectly restore each volume to its exact state at the time of its last backup.

SnapShots help Retrospect keep track of the volumes to which a file belongs. When Retrospect first backs up a volume to a new StorageSet, it copies the selected files and saves a SnapShot. When it subsequently backs up other volumes, it does not copy files which exactly match files already in the StorageSet. However, they are still noted in each volume’s SnapShot. This efficient storage saves backup media by not redundantly copying exactly matching files.

Because a SnapShot represents a volume at a specific point in time, you cannot use a SnapShot to find multiple versions of a file throughout different backup sessions on different dates. However, Retrospect does provide an easy way of doing this, which is explained in Chapter 11 • Immediate Restore, which starts on page 58.

Retrospect and Remotes

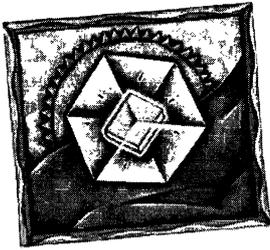
The Retrospect application can back up any volume that mounts on the Macintosh Desktop, whether it is a volume shared over a network or a drive connected directly to your Macintosh. Special software can extend the backup and restore capabilities of Retrospect to all Macintosh computers on your network. A computer equipped with this software from Dantz is known as a Remote Macintosh, or simply a Remote. Retrospect can back up any Remote Macintosh on the network without the need for installing file servers, starting file sharing, or mounting volumes.

Dantz offers Remote software in packages which include five, ten, or fifty Remotes. A special package called Retrospect Remote includes Retrospect and three or ten Remotes. At any time, you can add one or more Remotes to your network backup by purchasing one or more Remote Packs. At any time, you can get Retrospect Remote capabilities from Retrospect simply by purchasing one or more Remote Packs.

Backup Server

Retrospect's Backup Server technology accommodates changing network and disk configurations. Because it is driven by the availability of volumes and their need for backup, a Backup Server is ideal for environments in which computers and hard disks, such as PowerBooks and removable cartridges, irregularly appear on the network. Volumes are backed up to the best available StorageSet media, so Backup Server scripts give you greater freedom to use the media of your choice. Remote users can even initiate backups of their volumes, an otherwise unavailable feature. A Backup Server is often best used in concert with regular backup scripts to produce a comprehensive backup strategy.

SECTION III



Hardware

- SCSI EXPLAINED
- SCSI ENHANCEMENTS
- TAPE DRIVES
- REMOVABLE CARTRIDGE DEVICES

This section explains Macintosh SCSI technology used by Retrospect and gives summaries of the various tape drives, removable disks, and other hardware devices Retrospect can use for backups. If you are already familiar with SCSI you may skip Chapter 6 • SCSI Explained and read the chapters which apply to your particular hardware setup and backup device.

Retrospect uses hardware intensively. Its purpose is to transfer large amounts of data between a source volume such as a hard disk and a backup device such as a tape drive as efficiently as possible. If these hardware systems or their ancillary hardware (for example, cables) do not work correctly, Retrospect cannot do its job and cannot back up your data. For this reason you should understand how your hardware functions and how it relates to Retrospect.

CHAPTER 6 • SCSI EXPLAINED

Pronounced “scuzzy,” SCSI (short for Small Computer System Interface) is an important part of the Macintosh architecture. It is a specification of mechanical, electrical, and functional standards which lets the Macintosh connect and communicate with peripheral devices such as hard drives, tape drives, and scanners.

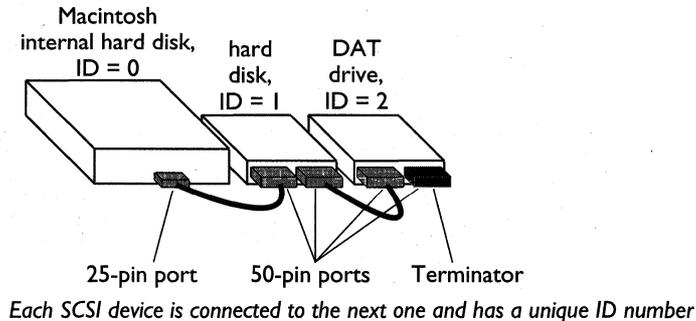
SCSI connects a Macintosh with peripherals by linking up to seven devices with SCSI cables plugged into SCSI ports. The devices are connected serially—one after the other—in a simple layout known as a daisy chain. Each device must have its own unique identifying SCSI address, or ID, numbered from zero to six. (You set a device’s ID number on the device itself.)

Both ends of a SCSI chain must be “terminated” to maintain the integrity of communication signals on the chain. This is done with a terminator, a device which plugs into an open SCSI port and acts as a kind of dead end of the chain. Almost all Macintosh models have internal SCSI hard drives with built-in termination, so you need only worry about terminating the other end of your SCSI chain. If you have an internally terminated or self-terminating SCSI device, it should be the last device of the SCSI chain (that is, at the end and the furthest device from the Macintosh). Some specific Macintosh models require special termination. (For example, Macintosh PowerBooks use in-line terminators and the Macintosh IIfx uses a special black terminator.) An in-line terminator plugs into a SCSI port, but the terminator itself also has a port that can have a cable plugged into it. To find out the termination requirements for your specific hardware setup, refer to your Macintosh User’s Guide and the documentation that came with your peripheral device.

Setting up a SCSI chain on your Macintosh is easy. All you have to do is use the cables to connect the devices in the daisy chain fashion, give each device a unique SCSI ID number, and terminate the last device. You cannot have duplicate SCSI addresses on your SCSI chain. Most Macintosh models have

an internal hard drive set to SCSI ID 0. Some Macintosh models have a built-in CD-ROM drive set to SCSI ID 3. The Macintosh always reserves ID 7 for its control of SCSI operations, so no other device may use ID 7.

The illustration below shows an example SCSI chain of two external devices connected to a Macintosh.



The IDs on your chain do not have to be sequential or in a particular order; the SCSI chain is not affected by the order as long as no devices share the same number. Some Macintosh models have IDE devices, but these are not part of the SCSI chain and have no effect on SCSI devices and operations.

- **Note:** To ensure proper operation of your SCSI devices, always turn on each SCSI device on your chain before you turn on your Macintosh, and do not turn them off until after you shut down your Macintosh.

Once your SCSI chain is set up, you can check it with Retrospect. Start the application and from the Retrospect Directory, click the Configure icon then click the Devices button. Retrospect scans the SCSI chain and brings up a window listing available tape devices, if any. Choose SCSI Status from the Devices menu to bring up a list of SCSI addresses and their respective connected devices, if any.

SCSI Status				
Currently visible SCSI devices...				
ID	vendor	product	version	driver
0	QUANTUM	LPS270S	590A	.ASYC00
1	QUANTUM	LP240S GM240S01X	6.4	.PTAD1011.5.1
2	EXABYTE	EXB-2501	7100	Exabyte 2501 DC (2.90)
3	SONY	CD-ROM CDU-8003A	1.8F	.AppleCD
4				
5				
6				

Most Macintosh models have a single SCSI bus which allows up to seven devices, but some Macintosh models, and those with special hardware additions, have more than one SCSI bus to allow additional devices. In this case, additional ID numbers are listed in the SCSI Status window.

If you set up a device properly but it is not listed, something is wrong with your SCSI chain. Ensure that each device is turned on, the cables are securely connected, each device has a unique ID, and the SCSI chain is properly terminated. Do not rearrange devices on a SCSI chain unless each device and the Macintosh itself are all turned off.

If your SCSI chain is not properly connected and terminated, or if there is an ID conflict, many different problems can result. The most harmless problem would be a device that does not appear in the SCSI Status list, which is immediately obvious. A more serious—yet subtle—problem could be a communication failure between the Macintosh and the backup device, leading to data loss. The most serious problem would be damage to your Macintosh or SCSI devices on the chain.

If everything is properly set on the SCSI chain, there is still the unpredictability of “SCSI voodoo,” the cause of problems which theoretically should not occur because the “rules” of SCSI are being followed. SCSI voodoo may require you to rearrange the devices on the chain, change the termination, assign new IDs, or replace SCSI cables. (Short cables cause less problems than long ones.) In theory SCSI has well-defined rules and expected results, but in practice SCSI is an inexact science.

Besides an incorrect SCSI setup and the vagaries of SCSI voodoo, there is another possible cause of problems with SCSI devices: incompatibility among the various software components. Retrospect is not the only

software which uses SCSI; each SCSI device, even the Macintosh itself, has its own software built into the hardware, called firmware. Additional SCSI managing software is in the Macintosh system software, in the form of drivers for various hardware devices. There are different versions of each piece of software and firmware, possibly with bugs which may adversely affect your SCSI operations. All of these software, firmware, and hardware components must be compatible for fault-free backup and restore operations with Retrospect.

Fortunately, you are not likely to encounter SCSI incompatibility problems, but we want you to be aware they exist. Most SCSI devices allow for problem-free, plug-and-play use.

Dantz maintains an extensive laboratory devoted to testing Retrospect with different Macintosh models and SCSI devices. Nothing taxes SCSI devices more than backups so if there is a problem, DantzLab's intensive testing will most likely find it. Device manufacturers supply Dantz with pre-release versions of their devices so Dantz can identify problems before the devices are made available to the public. Refer to the Release Notes included in your Retrospect or Retrospect Remote package for the latest compatibility information and more specific details on SCSI devices.

If you have problems with Retrospect and your SCSI devices after you have confirmed you have a legitimate SCSI chain with proper IDs and termination, refer to Section X, Problems and Solutions, which starts on page 267. You may also contact Dantz for help. The Dantz Technical Support staff is up-to-date on the latest compatibility issues and can help identify the cause of your problem and suggest a solution.

CHAPTER 7 • SCSI ENHANCEMENTS

Various software and hardware exist to add or improve the SCSI capability of Macintosh computers.

Software

Apple's SCSI Manager 4.3 (built into Power Macintosh, Centris AV, and Quadra AV models and part of System 7.5 for other 68040-based models) speeds tape operations. On Macintosh models with less capable SCSI hardware, the Retrospect installer application installs the Retro.SCSI extension, which provides functionality similar to that of SCSI Manager 4.3. Some Macintosh models, such as the Mac Plus and Duo family, cannot use either enhancement. (See "Retro.SCSI Questions" on page 289 for more information.) Retrospect works regardless of whether either SCSI software enhancement is installed.

Hardware

Some Macintosh models come equipped with two SCSI buses, which doubles SCSI's standard seven device limit. Third party vendors produce NuBus and PCI expansion cards which add an accelerated SCSI bus to your Macintosh. Use these cards to attach more devices to your Macintosh or to potentially improve performance.

Third party SCSI add-ons must be SCSI Manager 4.3-compliant to be compatible with Retrospect.

CHAPTER 8 • TAPE DRIVES

Retrospect is all the software required to support most tape drives available for the Macintosh.

Tape drives operate differently from most other drives and devices you are probably familiar with. Unlike random access devices such as hard drives, floppy disk drives, and CD-ROM drives, tape drives are sequential access devices. Since the data reading mechanism cannot immediately go to the correct data position on the media, a tape drive accesses data more slowly than a disk drive (or similar random access device). It is just like fast-forwarding a music cassette to find your favorite song, whereas random access devices are like moving a phonograph's tone arm to a specific track on a record.

Sequential access media is inexpensive, has large capacity, and has a good sustained data transfer rate. Thus, tapes—being cheap, big, and fast—are particularly well suited for backups.

When you use Retrospect to back up a volume to a tape, the data is written sequentially from the beginning of the tape to the end. When you add backups to the tape, the data is appended where the previous data ends, until the tape runs out (after approximately 1.2 billion bytes of data on a typical digital audio tape).

Neither the Macintosh nor Retrospect will mount a tape when you put it in the drive, so do not expect the tape to appear on your Macintosh Desktop. You cannot see it in the Finder to drag files to and from the tape like a disk volume. This is not bad because a sequential access device is not optimal for the type of file management you are likely to do with a mounted volume in the Finder. Though the technology exists to let you mount a tape as a volume and use it like a disk, you probably would not want to do this for regular backups because of the performance issues discussed previously. Retrospect's system for backing up and restoring files to and from tapes is far more powerful, efficient, and reliable.

Tape Capacity

The actual amount of data that will fit on a given tape will vary due to many factors. A tape's capacity can be greatly influenced by the relative speeds of the Backup Macintosh and the tape drive.

If you back up a slow source (for example, a slow Macintosh, a slow hard drive, or a shared volume on a network) to a fast tape drive, the tape capacity is reduced by the source's inability to supply a steady flow of data to the tape drive. (This is like dictating to an audio cassette recorder; you can record more words if you speak quickly without pauses, but when you take a breath you are wasting tape because the recorder is still going, recording silence.) When the tape drive runs out of data while backing up, it must stop writing data, reposition the tape, and resume writing at the correct section of the tape. Each reposition reduces the capacity of the tape, and excessive repositioning can lead to accelerated device wear.

Do not be surprised if your tapes end up with less than their advertised capacities. Some tape drives are represented as being capable of higher capacities than the drives normally achieve in day to day use. The representations refer to the amount of data *before* it gets compressed by a tape drive with hardware compression capability—and they often assume generous compression rates. Hardware compression is explained below.

Compression

Compression, which can be done by Retrospect or a capable tape drive, conserves space on media by reducing the size of the data being backed up. Compression does not actually increase the media capacity—a given disk or tape can only hold a certain amount of data. Compression squeezes the original data to a more compact size before the data is put on the medium, allowing you to fit more of your files on a given disk or tape.

Data compression hardware is common on tape drives. (The letters “DC” are often used in the name or model number of tape drives to indicate data compression capability.) Retrospect uses a drive's hardware compression whenever possible, automatically turning off Retrospect's software compression if necessary. It is faster to let the hardware compress the data than to have Retrospect compress it. The amount of compression achieved varies depending on the type of data being backed up. Text files, for

example, compress well while applications and system files do not. Compression typically reduces data to half its original size.

Retrospect disables hardware compression when you use encryption because encrypted data compresses poorly. If you need to use encryption and compression together, use Retrospect's software compression option. Retrospect then compresses the data before encrypting it, which is not possible when hardware compression is used.

Tape Drive Mechanisms

Though you may buy your tape drive from one of many companies, the drive is actually built around a mechanism from one of several manufacturers. Typically, companies purchase bare mechanisms from manufacturers and put them in their own cases and packaging, and support the products with their own staff.

The popular types of SCSI tape mechanisms available for the Macintosh are Digital Audio Tape (DAT), Exabyte 8mm, TEAC, DC6000, DC2000, Digital Linear Tape (DLT), and autoloaders for several types of drives. Each is briefly explained below. The Release Notes included with your Retrospect package contain detailed information on various, specific drive mechanisms for each type of tape.

Autoloaders

An autoloader is a hardware unit which mechanically moves tapes in and out of its drive mechanism from a magazine holding several tape cartridges. Tapes can be loaded in any order and Retrospect will determine which tape it needs to perform an unattended backup. Autoloaders are useful for large-scale network backups because they automatically change tapes when tapes fill up. Several autoloaders are available with a number of different drive mechanisms. For more information, refer to the loader's manual and the Retrospect Release Notes, which include a list of the autoloaders supported by Retrospect.

DAT

Four millimeter Digital Audio Tapes have become the most popular Macintosh backup media because of their high capacity, quick speed, and relatively low media cost. Tapes written to by a given DAT drive can usually be read by DAT drives from another manufacturer, provided they use the

same format and compression features. All DAT drives support sixty meter tapes with an approximate uncompressed data capacity of 1.2 GB each, while many drives support ninety meter tapes capable of about 1.9 GB. No formatting is required. It takes no more than just a few minutes for a DAT drive to locate and restore any individual file.

Many DAT drives use the Digital Data Storage (DDS) format. Other drives use the DDS-2 format with 120m tapes for an uncompressed data capacity of about 4 GB. These DDS-2 drives revert to the lower density DDS format when using 60m and 90m tapes. Drives from Gigatrend and JVC use the DataDAT format, which is not compatible with the DDS format.

DAT drives are made with and without hardware compression capabilities. If you wish to exchange DAT tapes with people who do not have compression drives, turn off Retrospect's hardware compression option when creating StorageSets.

Exabyte 8mm

Eight millimeter tape drives using Exabyte mechanisms can store 2 or 5 GB of uncompressed data on a tape cartridge. No formatting is required. It takes no more than just a few minutes for an 8mm drive to locate and restore an individual file.

TEAC

A TEAC drive uses a streaming tape cassette which looks like an audio cassette with a notch on top. Tape capacities are 50, 60, 150, and 600 MB. A given tape may be read by a drive capable of the same or higher capacity, but may only be written to by a drive of matching capacity.

A separate formatting step is not required, though the first time Retrospect uses a TEAC tape, it performs a "long erase," which retensions the tape, erases all previous data, and determines the tape's format and capacity.

DC6000

These tape drives have capacities of 120, 150, 250, 320, 525, 1000, and up to 5000 MB. Tapes written by one drive can typically be read by another of equal or greater capacity.

A separate formatting step is not required, though the first time Retrospect uses a DC6000 tape, it performs a "long erase," which retensions the tape, erases all previous data, and determines the tape's format and capacity.

DC2000

These drives come in two flavors: “streaming” and “block-addressable.”

Streaming, or sequential mode, DC2000 drives are similar to DC6000 drives in that they are not block-addressable, and some of these do not require time-consuming formatting.

Older, block-addressable DC2000 drives require formatted tapes. Although you can format tapes with Retrospect, we recommend purchasing pre-formatted tapes to save time. There are two types of block-addressable DC2000 drives, QIC-100 and Irwin, explained below.

QIC-100 is a standard followed by a number of manufacturers, allowing tapes to be compatible among QIC-100 drives as long as the same interleave is used. Some drives support a higher performance tape interleave, 1:1 Overlap, in addition to the more standard 2:1 Interchange.

Irwin drives require specially formatted tapes which are not compatible with other DC2000 drives. Retro.SCSI and SCSI Manager 4.3 provide no performance benefit for these drives.

DLT

Digital Linear Tape (DLT) drives are among the fastest tape drives available. Their Quantum mechanisms offer exceptional performance and capacity when used under optimal conditions.

In order to use DLT drives, Retrospect requires the Advanced Driver Kit, available separately from Dantz. The Backup Macintosh must also have SCSI Manager 4.3.

To achieve its high speed and large capacity, a DLT drive requires a high performance environment. Retrospect, its Advanced Driver Kit, and SCSI Manager 4.3 take care of the high performance as far as software is concerned. For hardware, best speed and capacity results are achieved with a fast Macintosh platform, such as a Quadra or Power Macintosh model. The most important performance factor is the speed of the source volume. If the source is too slow, the DLT drive must frequently stop to reposition the tape while waiting for additional data. If the drive repositions too often, copy performance will decrease dramatically.

DLT drive models are available in five capacities: 2.6GB, 6.0GB, 10.0GB, 15GB, and 20.0GB. See the Read Me file on the Advanced Driver Kit floppy disk for the latest information regarding supported models.

Cleaning

Tape drives require occasional cleaning in order to ensure proper performance. If a drive mechanism gets dirty, media failures may occur and data loss can result. Cleaners for most types of tape drives are available from various manufacturers. Please follow your tape drive manufacturer's recommendations for cleaning the drive at regular intervals.

CHAPTER 9 • REMOVABLE CARTRIDGE DEVICES

Though Retrospect is often used with tapes, it is just as effective when used with floppy disks, removable cartridges such as Zip, Jaz, SyQuest, Floptical, or optical disks, and other devices which can be mounted and ejected with the Finder.

StorageSets

When you create a StorageSet to be used for backup to a disk or disks, you can choose a file StorageSet or a disks StorageSet. A disks StorageSet can grow continuously by spanning multiple cartridges, just as a tapes StorageSet can span multiple tapes. A file StorageSet cannot grow beyond the available space of its single disk or cartridge, because the entire backup is stored in a single file.

The previous contents, if any, of a disk used as a member of a disks StorageSet will be erased. Backing up to a file StorageSet does not affect the other files on the drive you are backing up to.

Formatting

Before you use an unformatted removable cartridge or similar disk with Retrospect, you must first format the disk with a formatting utility. It is a good idea to format all of your cartridges with the same formatting utility. Floppy disks do not need to be pre-formatted. If you use floppy disks, keep Retrospect's Auto Format preference turned on to skip the confirming dialog during operations and automatically format each blank disk.

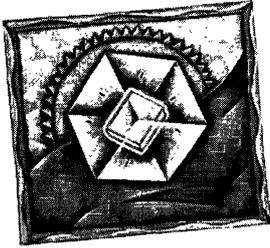
Mounting

Disks must be mounted as volumes on the Macintosh Desktop for Retrospect to recognize them. When a volume is mounted its icon appears on the Macintosh Desktop.

Some drives are mounted at startup while others require you to use software to manually mount volumes. Most removable cartridge drives include software to automatically mount volumes when you are swapping disks or cartridges.

Before using Retrospect to back up to an ejectable drive you should be familiar with the procedures to insert, mount, format, erase, and eject cartridges. In other words, you must know how to do with a removable disk everything you can do with a floppy disk.

SECTION IV



Immediate Operations

- IMMEDIATE BACKUP
- IMMEDIATE RESTORE
- IMMEDIATE DUPLICATE

Whereas previous sections of this manual mostly touched on ideas and fundamentals, this section begins to explain the actual features and use of Retrospect.

This section covers the steps you take to perform backup, restore, or duplicate operations immediately upon your command, as opposed to scripted operations which automate these tasks.

If you are a casual user and you need only occasional backups, you can do fine with these immediate operations. However, network administrators who frequently back up multiple volumes are better off automating their tasks with scripts. Regardless of whether you plan to do immediate or scripted operations, this section is a good introduction to Retrospect.

You can also initiate operations by opening run documents and by choosing items from the Run menu. These features are derived from scripts, described in Section VI, Automated Operations, which starts on page 79.

CHAPTER 10 • IMMEDIATE BACKUP

This chapter tells how to perform an immediate backup with Retrospect. At various points in the procedures, the text will direct you to other chapters where you will find additional information on performing more sophisticated backup operations.

The backup procedure described below (starting with “Preparing the Backup Media”) is all you need to know to effectively back up all your files. You can repeat the steps as needed to ensure the safe duplication of your valuable data. There are three basic stages in backing up:

- Choosing the source volumes to back up
- Choosing the StorageSet in which to store the files (or creating a new StorageSet if none exists)
- Executing the backup

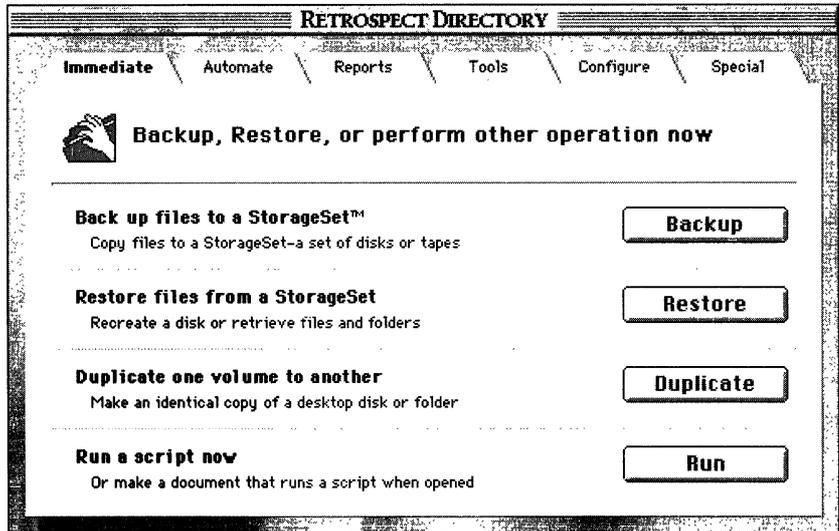
The first time you back up the contents of your hard disk, Retrospect backs up all specified files from the source volume to a StorageSet. In subsequent backups (unless you indicate otherwise), Retrospect backs up only those files that are new or that have changed since the last backup to that particular StorageSet. (This is also known as an incremental backup.) This means that if you back up frequently, fewer files will be copied in each backup session and backups will require less time. After a few backups, using Retrospect will become part of your work routine and will be only slightly more taxing than turning your computer on and off.

Preparing the Backup Media

Before you attempt to back up files with Retrospect, check that your backup device is properly connected to the Macintosh and that your backup medium (tape, disk, or removable cartridge) does not contain valuable data that should not be overwritten.

Starting the Immediate Backup

When you start Retrospect the Directory shows the Immediate tab. If you are already using Retrospect, go to the Directory and click the Immediate tab.



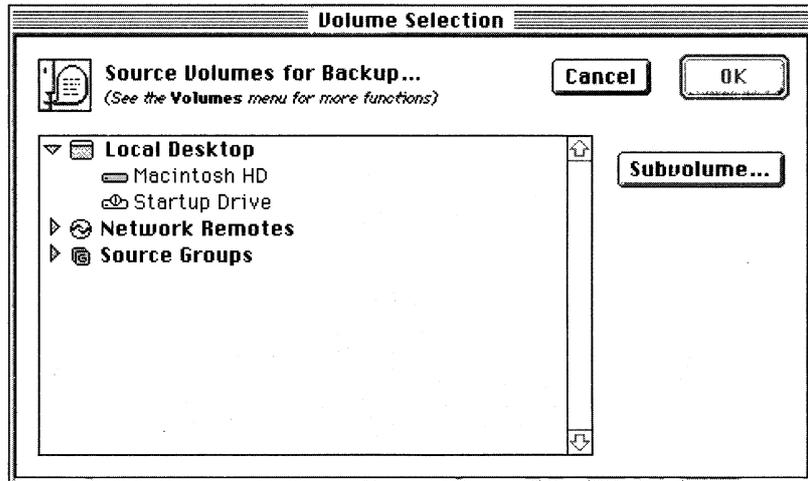
The Retrospect Directory.

Click the Backup button. If you previously set up an immediate backup, as in Chapter 4 • Quick Start, Retrospect goes directly to the summary window. This is so you can easily initiate backups with only a few clicks. If you have not set up an immediate backup before, Retrospect automatically displays the volume selection window and will automatically take you to the other windows along the way, so ignore the instructions to click source, destination, and so on.

Choosing Source Volumes

In the immediate backup summary window, click the Backing up button to display the volume selection window. It lists all volumes currently available to be backed up, including your internal hard disk, internal floppy disk, any connected cartridge drives or hard disks, any mounted shared volumes, and any logged-in Remote volumes on the network. Because these volumes contain the files to be backed up, they are known as source volumes.

Volumes used as sources for the most recent immediate backup are selected when the window opens.



The volume selection window.

Navigating Volumes

The volume list works much like a volume or folder window in the Finder with files viewed by name. It is organized hierarchically by Local Desktop, Network Remotes, and Source Groups. Click on the ▶ icon to expose the contents indented under an item and click on the ▼ icon to hide the contents. All aspects of the volume selection window, including navigating, organizing, and selecting, are fully explained in Chapter 21 • Working with Volumes, which starts on page 131.

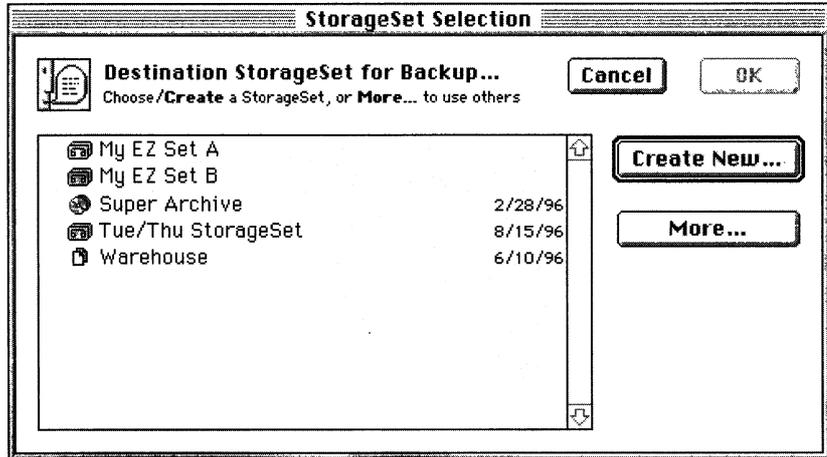
To Choose a Source Volume

In the volume list, click a volume to select it. To back up more than one volume, Shift-click or Command-click other volumes to make a multiple selection. Use items from the Volumes menu to eject removable disks or put away mounted volumes.

When you have made your volume selection, click OK to continue setting up the immediate backup. The volume selection window closes and Retrospect returns to the summary window.

Choosing the StorageSet

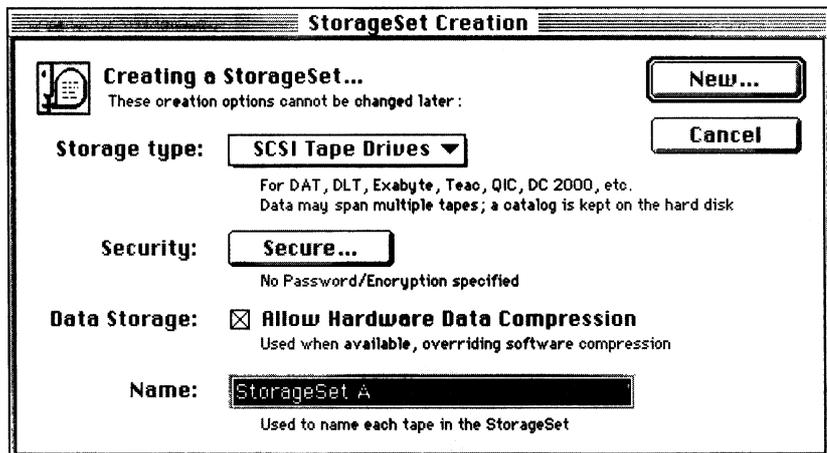
In the immediate backup summary window, click the To StorageSet button to display the StorageSet selection window, which lists available StorageSets and has commands for working with them.



The StorageSet selection window.

Creating a New StorageSet

If no StorageSets are listed in the StorageSet selection window, or if you do not wish to use any of those listed, click the Create New button to make a new StorageSet in the StorageSet creation window.



The StorageSet creation window.

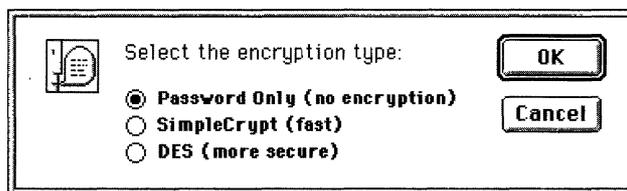
You use this window to set the attributes which make up the StorageSet. *You cannot change the attributes of a StorageSet after it is created.*

Storage Type

The most important item in the window is the storage type, which specifies the type of media the StorageSet uses for this and future backups. Use the pop-up menu to choose a StorageSet type which corresponds to your backup device—tapes, disks, or an individual file.

Security

Security lets you specify a password for accessing the StorageSet, with optional data encryption. Click the Secure button to bring up a dialog in which you determine the security options for the StorageSet.



The StorageSet security options dialog.

- **Password Only** prevents access to your StorageSet without a password. Stored data is not encrypted.
 - **SimpleCrypt** provides password protection and encrypts StorageSet data using Dantz's proprietary encryption format.
 - **DES** provides password protection and encrypts StorageSet data using the United States government Data Encryption Standard. This option is not available in international versions of Retrospect, nor in versions bundled with backup devices.
- **Note:** Using encryption increases backup time. DES encryption is slower than SimpleCrypt, which provides adequate security for most needs.
- ▲ **Warning:** If you forget your password you cannot access your data. There is no “magic key” or “back door” to circumvent the encryption. Not even Dantz Technical Support can help you.

If you leave Security alone the StorageSet will not have a password and will not use encryption.

Data Storage

The StorageSet's Data Storage attribute lets you control whether to enable or disable hardware data compression in the backup device. It is usable only when the pop-up menu is set to SCSI Tapes for a StorageSet to be used with a tape drive. When the Allow Hardware Data Compression checkbox is checked, Retrospect uses hardware data compression when you back up to this StorageSet on a drive which supports this feature. When the checkbox is not checked Retrospect does not use hardware data compression during backups to this StorageSet. Since you cannot simultaneously use encryption and hardware compression, this option will be disabled and appear grayed out if encryption is used by this StorageSet.

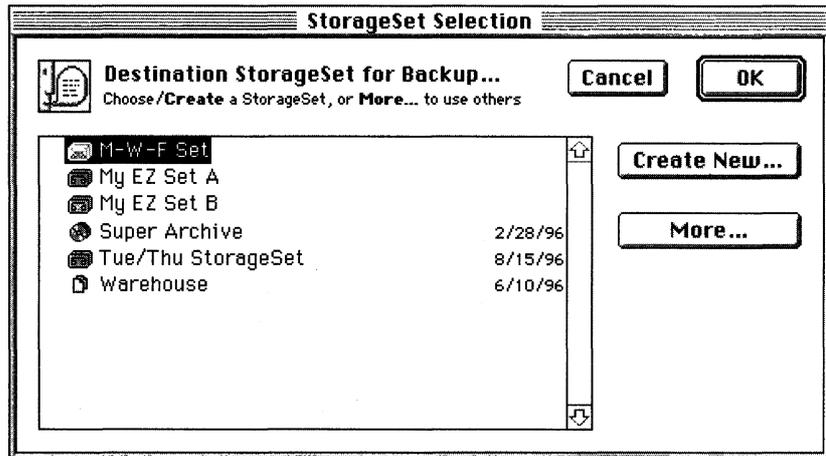
- **Note:** If you need to use both encryption and compression, specify an encryption option in the security dialog, and use Retrospect's software compression option (page 173) when copying files to the StorageSet.

Name

In the Name field, enter a unique and descriptive name for the StorageSet. For example, "Monday Complete Backup," "Accounting Backup," or "Friday Remotes Backup." Retrospect uses this name to identify both the catalog file and the StorageSet media. Name StorageSets carefully because tapes StorageSets and disks StorageSets cannot be renamed. File StorageSets, however, can be renamed in the Finder.

When the StorageSet description is complete, click New to create the StorageSet. A dialog appears, prompting you for a location to save the catalog file that keeps track of the contents of the tapes or disks StorageSet. If you are backing up to a file StorageSet, the dialog prompts you for a location to save the StorageSet. Specify a location for the catalog and click Save.

Retrospect returns to the StorageSet selection window, where the new StorageSet is now listed as available for backup.



Listing an Unlisted StorageSet

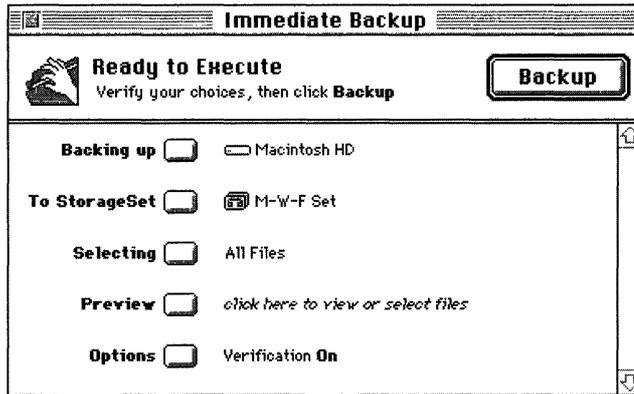
If the StorageSet you want to back up to is not listed in the StorageSet selection window, click the Open Other button and use the file selection dialog to pick a StorageSet and place it in the list.

Selecting the Desired StorageSet

When the StorageSet you want to use is listed in the StorageSet selection window, select it and click OK to continue setting up the backup.

The Final Step

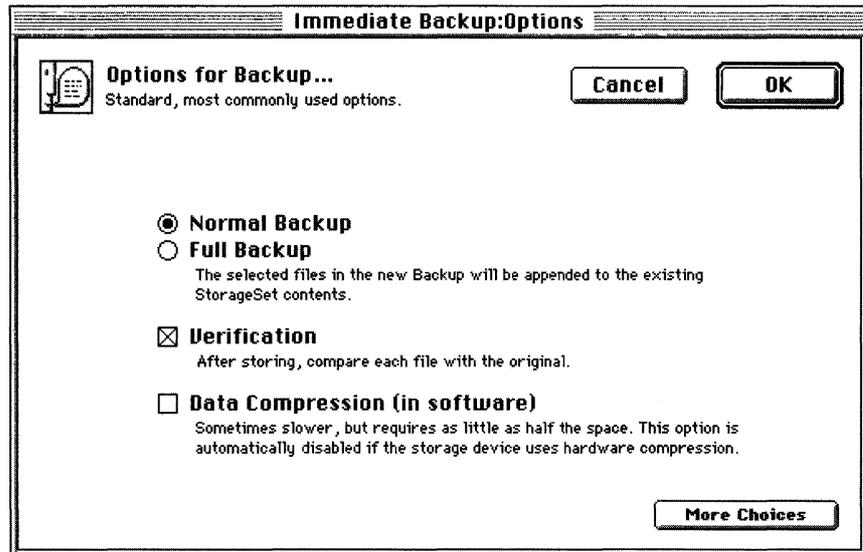
After you have specified the source volume to back up and the destination StorageSet to which it will be copied, the immediate backup summary window appears.



The immediate backup summary window.

Verify your choices for the various items. To change information, click the appropriate button.

- **Backing up** lets you add or remove source volumes.
- **To StorageSet** lets you choose a different StorageSet.
- **Selecting** lets you choose a Selector, a kind of filter for selecting files and folders to be backed up. (Selectors are explained in detail starting on page 151.) We suggest you use the default Selector, All Files, which marks all files on the source for backup.
- **Preview** scans the source volume (or volumes) and determines which files need to be backed up by comparing the source files against the files in the StorageSet catalog. When the scan is complete, Retrospect opens a Browser window to display a list of the files on the source volume marked for backup. You can use it to mark and unmark individual files and folders to be backed up. (Browsers are explained in detail in Chapter 22 • Browsing, on page 140.) When you close the Browser, the summary window shows figures for the selected files.
- **Options** displays the options window in which you can specify the backup action (normal or full), and turn on or off verification and software data compression. Backup actions are explained under “Backup Actions” on page 23, and options are explained in detail under “Backup Options” on page 172.

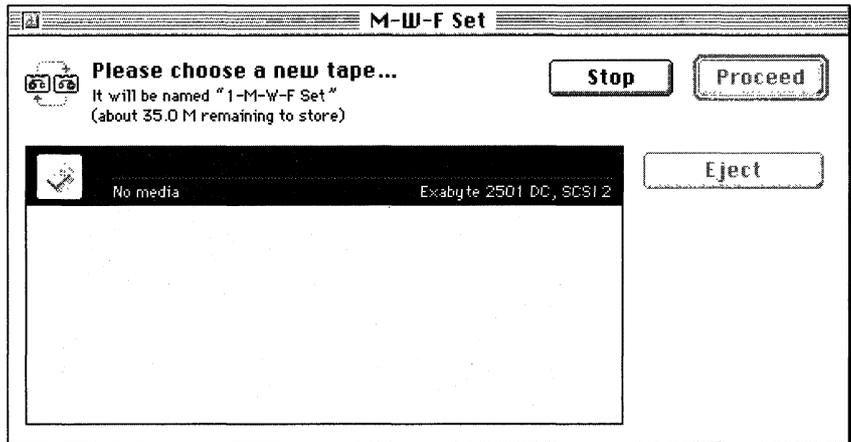


The immediate backup options window.

Executing the Backup

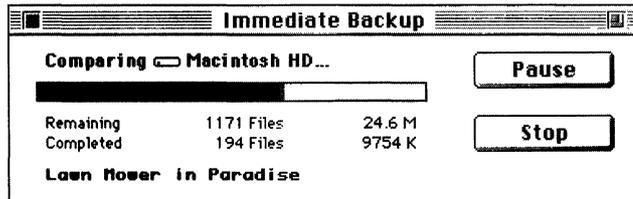
If Retrospect has the information it needs, it says “Ready to Execute” at the top of the immediate backup summary window. If the information is incomplete, it says “Not Ready to Execute” and you must change one or more parts of the information, as described at the top of the window. When it is ready click Backup and a dialog asks you to confirm the operation; click OK.

If this is the first time you are backing up to a tape or other removable media, or if there is no media in the backup device, Retrospect next displays a window with options for choosing the disk or tape for storing the files to be backed up.



The media request window.

Put in a blank tape or disk and click Proceed. Retrospect performs the backup, displaying the progress of the operation and the names of files as they are copied to the StorageSet. The execution status window also has Pause and Stop buttons for suspending or cancelling the backup.



The execution status window for an immediate backup.

When the execution is complete, Retrospect informs you in the status window. Close it to return to the Retrospect Directory. If any errors occurred you can find the offending files in the Browser which appears, or see error details in the operations log. (This log is accessible from the Windows menu and is described under “Viewing the Operations Log” on page 211.)

Scripting a Backup

When a backup summary window is active, you can choose Schedule from the Script menu to save the immediate backup information and settings as a script. You can then use the script to accomplish automatic, unattended

backup operations. See Section VI, Automated Operations, which starts on page 79.

Planning Subsequent Backups

For subsequent backups, you can repeat the basic backup procedure as often as you want and even switch among multiple StorageSets to maintain extra backups.

By default, Retrospect only backs up those files that have changed since the previous backup to a particular StorageSet.

If you want to automate your backups so they can be performed while your Macintosh is unattended, you can use Retrospect's scripting feature to set up and schedule backups. Creating a backup script involves most of the steps in an immediate backup, but it can be saved for later use and can be scheduled to automatically execute at your convenience. See Automated Operations, which starts on page 79.

CHAPTER 11 • IMMEDIATE RESTORE

Retrospect allows you to restore an entire volume or restore selected files and folders from the most recent backup or any previous backup session within a StorageSet. You can either restore by using a StorageSet's SnapShot to get the most recently backed up versions of files, or restore previous versions of files by searching through one or more StorageSets. You can restore individual files, multiple files, or entire volumes.

SnapShots

Retrospect's SnapShots make it easy to restore a volume to its exact state as of its most recent backup. A SnapShot is like a picture of the contents of a volume. It contains a list of all of the files and folders of a volume and the sessions during which they were backed up. Each time you back up a volume, its SnapShot is updated in the StorageSet.

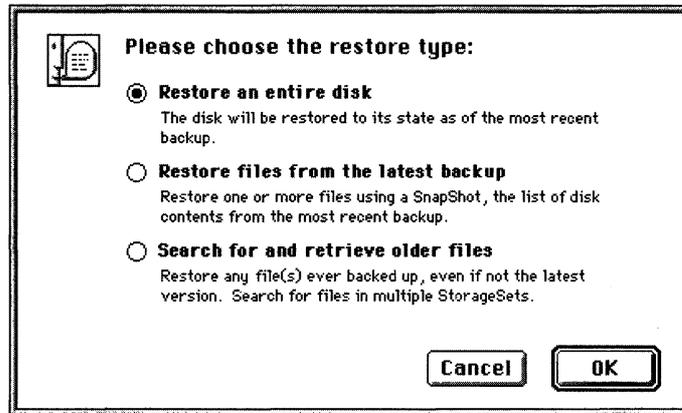
To restore an entire volume or Subvolume, simply choose the SnapShot you want to restore—you do not have to manually locate and retrieve files from the different sessions. A SnapShot allows Retrospect to get the files from a StorageSet in a single pass through the media, rather than inefficiently going back and forth on the media, even if the StorageSet contains multiple incremental backup sessions.

You can also restore individual files from a SnapShot. This is the easiest way to retrieve files that you know were on a volume the last time it was backed up. If no SnapShot is available, you must define search criteria to choose which files to restore.

Immediate Restore by SnapShot

The process of setting up Retrospect for an immediate restore operation is done in much the same manner as setting up an immediate backup.

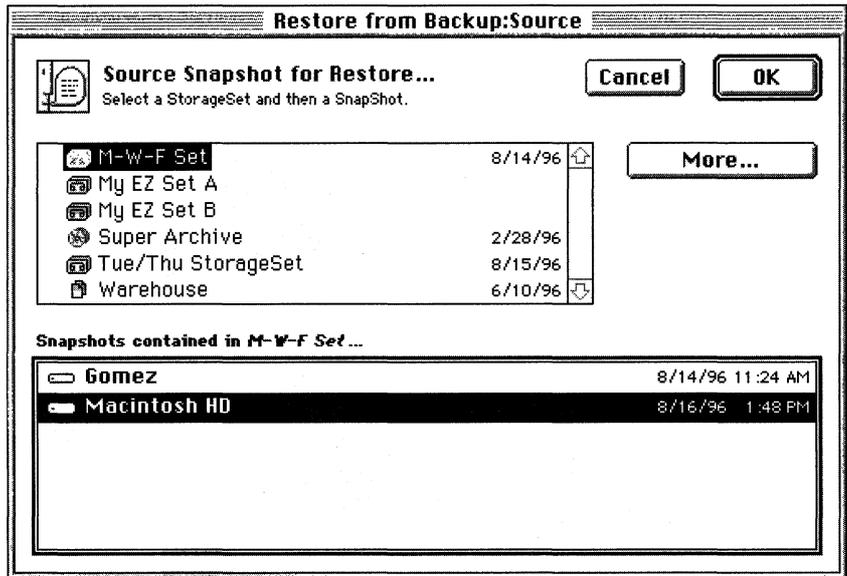
From the Retrospect Directory, click the Immediate tab, then click Restore. A dialog asks you to choose the restore type.



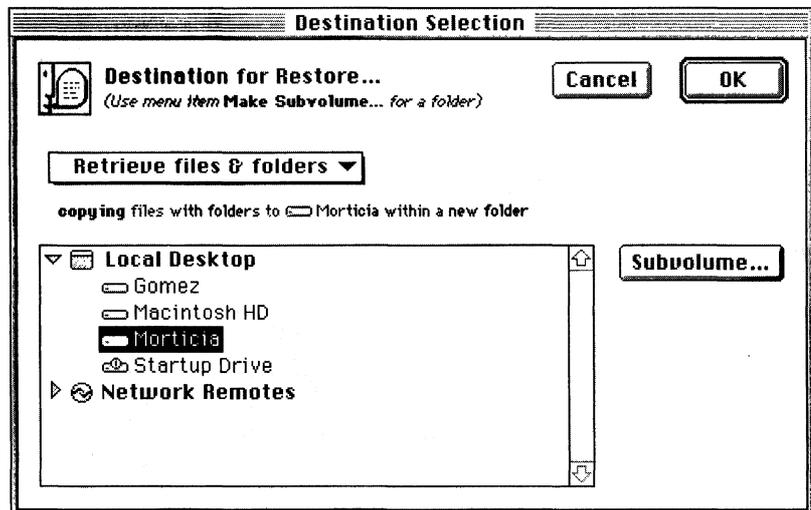
Select the type of restore which suits your needs.

- **Restore an entire disk** does so as per the latest backup SnapShot, restoring all files from the most recent backup, replacing the contents of the disk and effectively recreating the disk in its backed up state.
 - **Restore files from the latest backup** does so from a SnapShot, restoring to the disk one or more chosen files from the most recent backup.
 - **Search for and retrieve older files** restores to the disk one or more files—regardless of age—by searching one or more entire StorageSets.
- **Note:** This tutorial explains only the first two choices in the dialog, which restore the latest files by using a SnapShot. If you need to find a version of a file backed up at a particular point in time, see “Immediate Restore by Search” on page 64 for an explanation of that method. If you want to restore an entire volume (for example, to replace a crashed disk) you may want to take additional steps as detailed in Chapter 36 • Restoring After a Disaster, which starts on page 253.

After selecting a restore method, click OK.



In this window's top list, select the StorageSet from which to restore. (Use the More button if your desired set is not listed, or select a set you do not want to see here and press the Delete key to get rid of it.) In the window's bottom list, select a volume SnapShot. The date and time when the volume was last backed up are listed to the right of the volume's name. Click OK to continue.

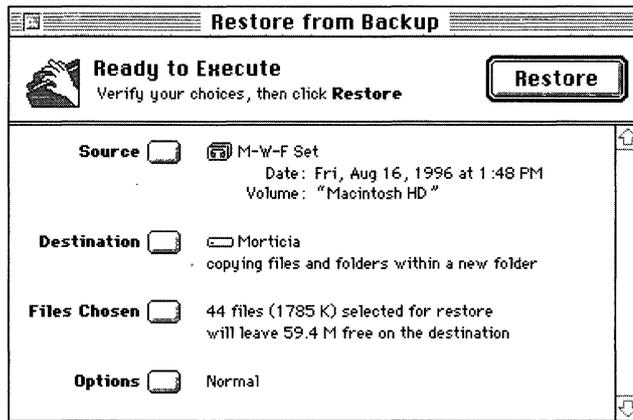


Select a volume on which you want Retrospect to place the restored files. This volume does not have to be the original volume from which the files were backed up; it can be a Subvolume or any volume mounted on your local Desktop or belonging to a Remote on the network. (Navigate through the Local Desktop and Network Remotes outlines as detailed under “Containers” on page 133.)

Set the pop-up menu to determine how Retrospect restores the files to the destination.

- **Restore entire disk** makes the destination disk like its SnapShot. It *deletes all files and folders* on the destination which do not match those marked for restore in the SnapShot, leaving files untouched if they are identical to files marked for restore. It then copies remaining files and folders from the StorageSet, preserving the folder hierarchy. The destination volume is reorganized like the SnapShot volume, less files and folders not marked.
 - **Replace corresponding files** copies the marked files to the destination volume into the same folders. Corresponding files are overwritten, *even if they are newer*. Retrospect leaves files untouched if they are identical to files marked for restore or if the file names do not match those marked for restore.
 - **Retrieve files & folders** creates a new folder on the destination volume (giving the folder the name of the StorageSet), then copies files into this folder, preserving the folder hierarchy. Nothing is replaced or overwritten.
 - **Retrieve just files** creates a new folder on the destination volume (giving the folder the name of the StorageSet), then copies only the files into this folder. The folder hierarchy is not preserved. Nothing is replaced or overwritten. (Do not use this option to retrieve a large number of files or a whole volume.)
- ▲ **Warning:** The Restore entire disk and Replace corresponding files methods may destroy data on the destination. If you choose one of these, be sure it is acceptable to replace the destination files with the source files.

After setting the destination restore method with the pop-up menu, click OK to continue. Retrospect scans the catalog and puts up the immediate restore summary window.



The immediate restore summary window.

Verify your choices for the Source, Destination, Files Chosen, and Options. To change information, click the appropriate button.

- **Source** is the StorageSet and volume SnapShot you want to restore files from. Click this button to use the StorageSet selection window to change the source.
- **Destination** is the volume you want to restore files to. Click this button to use the volume selection window to change the volume.
- **Files Chosen** are the files you want to restore from the StorageSet. Click this button to use a Browser if you want to mark and unmark individual files and folders to be restored. Browsers are explained in detail in Chapter 22 • Browsing, on page 140.
- **Options** let you reposition icons and update the modification dates of restored files. Click this button, then click More choices to change these options.

Executing the Restore

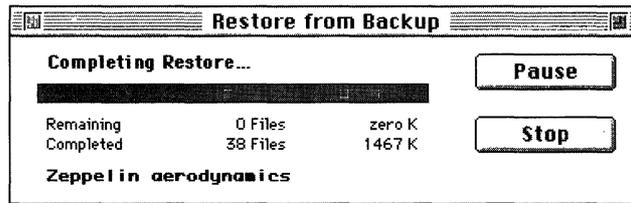
If Retrospect has the information it needs to do the restore, it says “Ready to Execute” at the top of the immediate restore summary window. If the information is incomplete, it says “Not Ready to Execute” and you must change one or more parts of the information you gave it. When it is ready, click Restore and a dialog asks you to confirm the operation.

- ▲ **Warning:** Restoring may destroy data on the destination. Be sure it is acceptable to replace the destination files with the source files.

Click OK to confirm.

Make sure the correct StorageSet media is in the backup device. If Retrospect does not see the media, it asks you for it in a window.

Retrospect performs the restore, displaying the progress of the operation and listing the names of files as they are copied from the StorageSet media to the destination. The Execution Status window also has Pause and Stop buttons for suspending the restore.



The execution status window for a restore.

When the execution is complete, Retrospect informs you in the status window. Close it to return to the Retrospect Directory. If any errors occurred you can find the offending files in the Browser which appears, or see error details in the operations log. (This log is accessible from the Windows menu and is described under “Viewing the Operations Log” on page 211.)

When you leave Retrospect and go to the Finder, you can see the destination volume is changed to reflect the restored files. The level of change can be anywhere from a new folder on the volume or a completely restructured volume from an entire disk restore, depending on the destination restore method and options.

- **Note:** The Desktop usually needs to be updated after a large restore, such as an entire disk. Restart the Macintosh while holding down the Command and Option keys to rebuild the Desktop.

Scripting a Restore

When a restore summary window is active, you can choose Schedule from the Script menu to save the immediate restore information and settings as a script. You can then use the script to accomplish restore operations. See Section VI, Automated Operations, which starts on page 79.

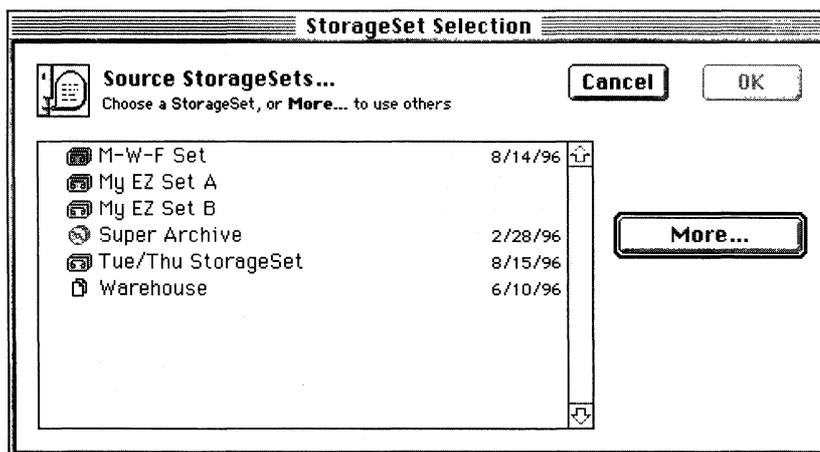
Immediate Restore by Search

Whereas restoring by SnapShot lets you get files from the most recent backup, Retrospect has another method of restoring which lets you retrieve one or more files regardless of when they were backed up. This is useful, for example, to get a document named “Financial Report” backed up on November 16, 1996, which is when you know the report file was saved with incorrect data and backed up after that date.

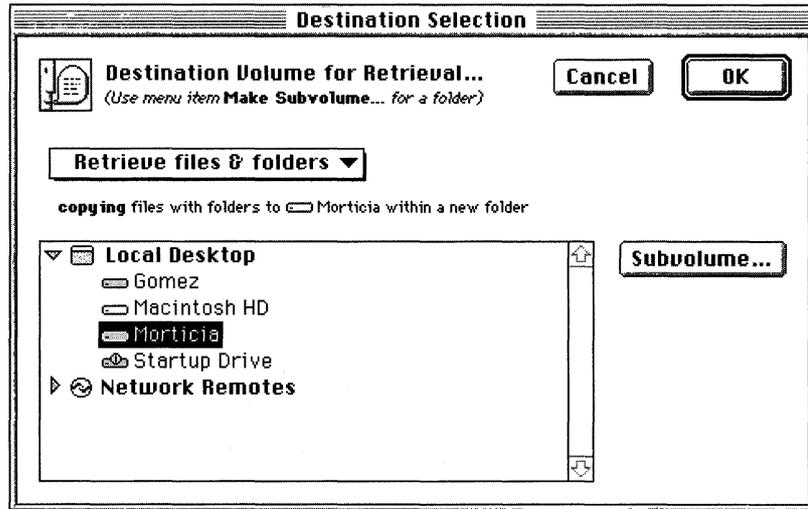
The process of setting up Retrospect for an immediate restore by search is done in much the same manner as restoring by SnapShot. If you are content to restore the most recently backed up version of a file, then this Search method is not ideal; use the restore by SnapShot method instead.

From the Retrospect Directory, click the Immediate tab, then click Restore. A dialog asks you to choose the restore type. Click the bottom radio button and click OK.

The next window asks you to select the StorageSets from which to restore.



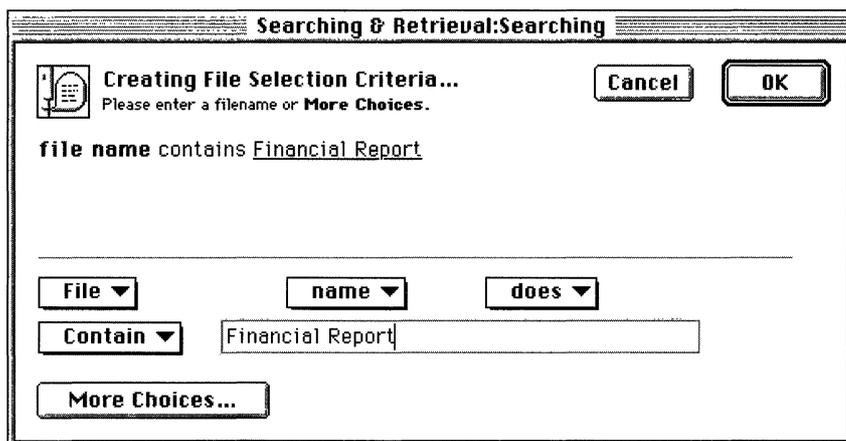
Select one or more StorageSets. (Use the More button if your desired set is not listed.) Click OK to continue, which then brings up the following window.



Select the volume on which you want Retrospect to place the restored files, and choose a pop-up menu item for the method by which they are to be retrieved.

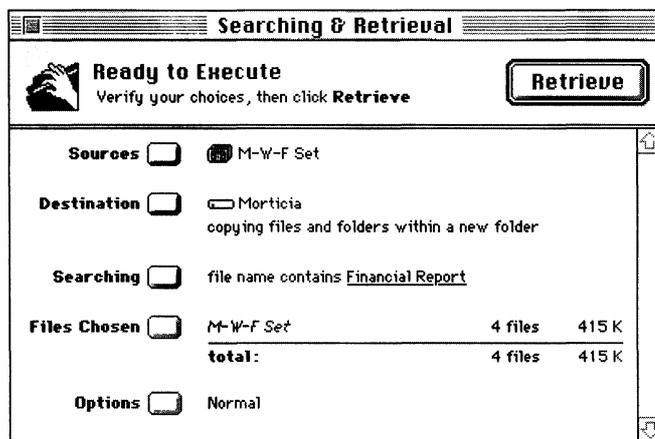
- **Note:** When restoring by searching, the methods “restore entire disk” and “replace corresponding files” work differently than when restoring from a SnapShot. Retrospect does not scan the destination volume to compare and match files found from the searched source—it just copies files to the destination, replacing existing files with the same names.

After setting the destination restore method with the pop-up menu (see page 61), click OK to continue. Retrospect puts up the window for defining file selection criteria.



If you want to select all files from the sources, leave this blank and click OK.

Use the pop-up menus and enter text to define the search criteria on file or folder names, or click More Choices to make a custom Selector with other search criteria. This window is described in detail under “Finding Files” on page 146, and Selectors are described in Chapter 23 • Using Selectors, which starts on page 151. When you have defined the search criteria, click OK, and Retrospect searches each StorageSet catalog before bringing up the summary window.



The searching and retrieval summary window.

Your file selection criteria are summarized next to Searching. Next to Files Chosen is a brief quantity and size inventory of the files found by Retrospect in their respective StorageSets.

Browsing Chosen Files

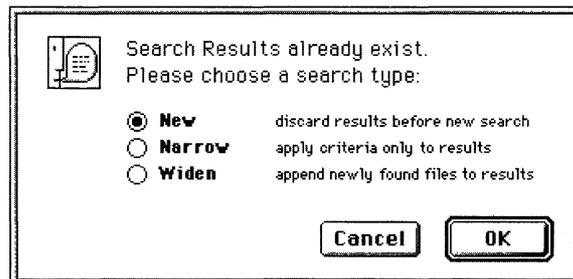
Click Files Chosen to open a Browser which lists the found files you can manually unmark and mark files for retrieval. (For details on using Browsers, see Chapter 22 • Browsing, which starts on page 140.) Files with check marks will be retrieved when the operation is executed.

Depending on your search criteria, your Browser may list more than one version of a particular file. For example, a given file may have been modified daily and backed up every day over a certain period of time and appear as follows.

✓	 Fiscal Fitness		
✓	<input type="checkbox"/> Financial Report	107 K	8/14/96
✓	<input type="checkbox"/> Financial Report	107 K	8/15/96
✓	<input type="checkbox"/> Financial Report	145 K	8/16/96
✓	<input type="checkbox"/> Financial Report	204 K	8/17/96

Additional Searching

If the Browser does not display the files you want, you can close it and return to the summary window to redefine the search criteria. If you change the search criteria, Retrospect displays the following dialog when you close the Selector window.



- **New** replaces the results of the previous search with the results of the new search.
- **Narrow** uses the new criteria to further restrict the selection.
- **Widen** uses the new criteria to add files to the current selection.

Select a search type, then click OK to return to the summary window and repeat the process until you are satisfied with the chosen files.

Executing the Restore

If Retrospect has the information it needs, it says “Ready to Execute” at the top of the searching and retrieval summary window. If the information is incomplete, it says “Not Ready to Execute” and you must change one or more parts of the information you gave it. When it is ready, click Restore and a dialog asks you to confirm the operation.

- ▲ **Warning:** Restoring may destroy data on the destination. Be sure it is acceptable to replace the destination files with the source files.

Click OK to confirm.

Make sure the correct StorageSet media is in the backup device. If Retrospect does not see the media it asks you for it in a window.

Retrospect performs the restore, displaying the progress of the operation in the execution status window.

When the execution is complete, Retrospect informs you in the status window. Close it to return to the Retrospect Directory. If any errors occurred you can find the offending files in the Browser which appears, or see error details in the operations log. (This log is accessible from the Windows menu and is described under “Viewing the Operations Log” on page 211.)

When you leave Retrospect and go to the Finder, you can see the destination volume is changed to reflect the restored files.

- **Note:** The Desktop usually needs to be updated after a large restore, such as an entire disk. Restart the Macintosh while holding down the Command and Option keys to rebuild the Desktop.

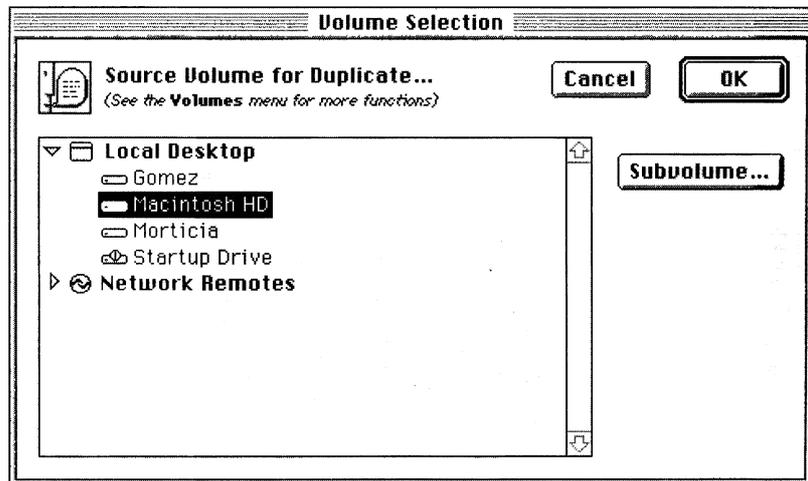
CHAPTER 12 • IMMEDIATE DUPLICATE

Retrospect allows you to duplicate files on a volume or among volumes. Files and folders are copied as in the Finder without encryption or compression, which is useful when transporting data to other computers. However, Retrospect optimizes the duplication process by copying only your selected files and by copying only those files which do not already exist on the destination.

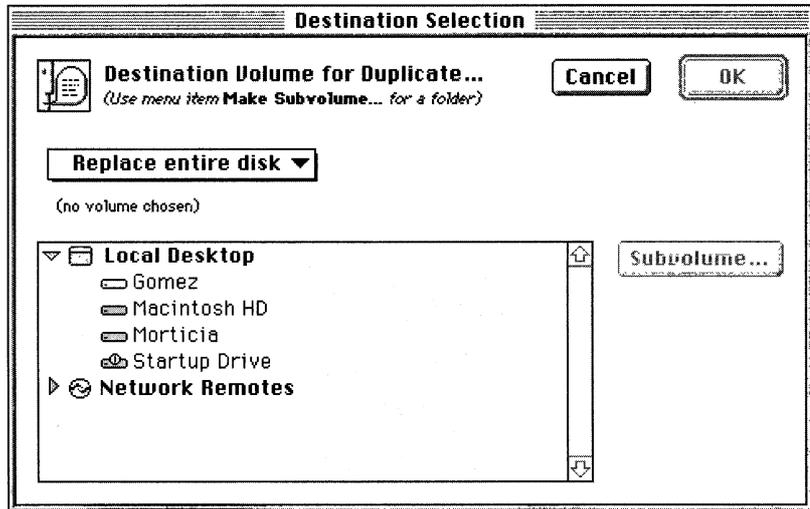
The duplicate feature is useful, for example, for a network administrator to do a Finder-format backup of a server or database to a hard disk.

- ◆ **Tip:** Subvolumes are useful tools for duplicates. For example, a network administrator can define an application folder on a server as a Subvolume and duplicate it for quick installation on a user's workstation.

Click the Immediate tab on the Retrospect Directory, then click the Duplicate button. The first window, Retrospect's familiar volume selection window, asks you to determine the source volume from which files will be copied.



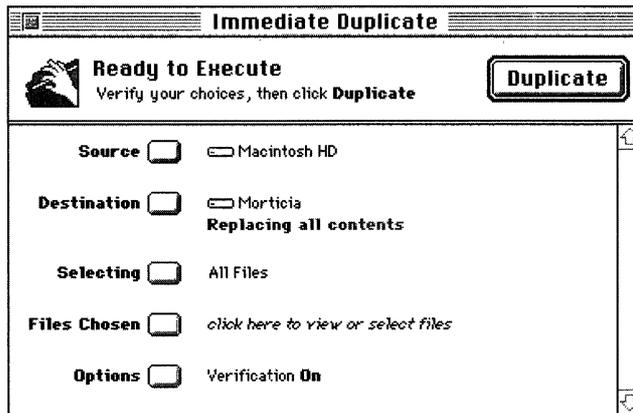
Select the source volume and click OK. (For details on using the volume selection window, see Chapter 21 • Working with Volumes, on page 131.) Retrospect next asks you for a destination volume and a method of placing the files on the destination volume.



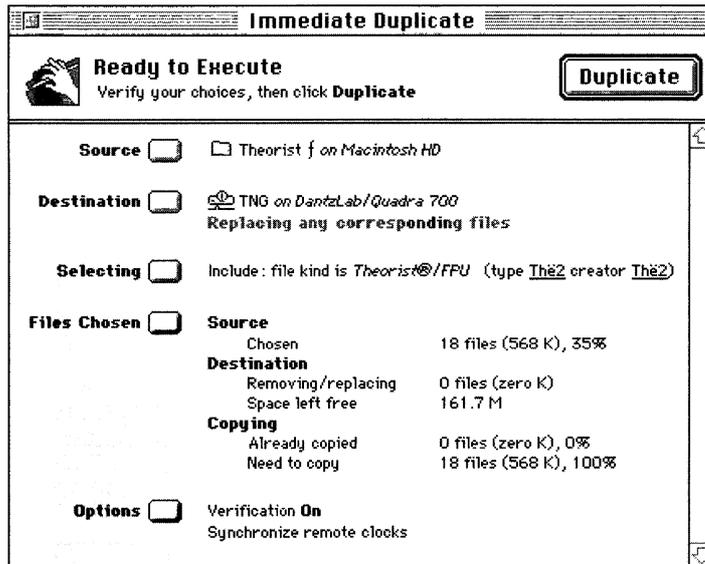
Select a destination volume and choose a method from the pop-up menu.

- **Replace entire disk** *replaces the entire contents* of the destination volume. Identical files already present on the destination are not duplicated.
- **Replace corresponding files** *overwrites any matching files* existing on the destination volume which correspond to the selected files of the source, *even if the destination files are newer*. Retrospect leaves files untouched if their names do not correspond to those files marked for duplication.

When you have selected the volume and set the pop-up menu click OK. Retrospect scans both volumes and brings up the immediate duplicate summary window.



This window lists the source, destination, selection criteria, files chosen preview, and options associated with the duplicate operation. Each item has a button you can click to change the information as with backup and restore operations. You can use the various features for a highly specific duplicate operation, such as the following example summary.

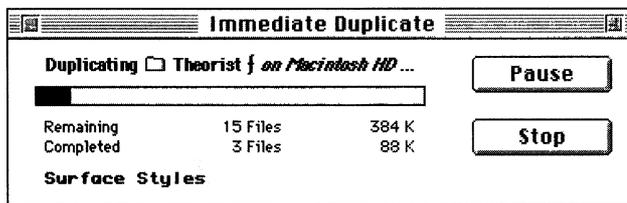


Executing the Duplicate

If Retrospect has the information it needs, it says “Ready to Execute” at the top of the immediate duplicate summary window. If the information is incomplete, it says “Not Ready to Execute” and you must change one or more parts of the information you gave it. When it is ready, click Duplicate and a dialog asks you to confirm the operation.

- ▲ **Warning:** Duplicating may destroy data on the destination. Be sure it is acceptable to replace the destination files with the source files.

Click OK to confirm. An execution window shows the progress of the duplicate operation and gives you buttons to pause or stop its execution.

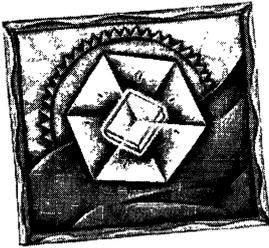


When the execution is complete, Retrospect informs you in the status window. Close it to return to the Retrospect Directory. If any errors occurred, you can find the offending files in the Browser which appears, or see error details in the operations log. (This log is accessible from the Windows menu and is described under “Viewing the Operations Log” on page 211.)

Scripting a Duplicate

When a duplicate summary window is active, you can choose Schedule from the Script menu to save the immediate duplicate information and settings as a script. You can then use the script to accomplish duplicate operations. See Section VI, Automated Operations, which starts on page 79.

SECTION V



EasyScript

- USING EASYSCRIPT

EasyScript is a Retrospect module which interviews you and uses your responses to set up a backup strategy and procedure for you and your network. EasyScript helps people who may be hesitant to create their own backup strategies and scripts. It simplifies creating StorageSets, editing scripts, and scheduling. This section describes how to use EasyScript, though details are kept to a minimum because EasyScript is self-descriptive and easy to use.

Before you use EasyScript, you should be familiar with Retrospect's immediate backup (page 47) to better understand the EasyScript steps. Just doing the quick backup (page 9) is a good start.

Backup scripts are the only type of scripts created by EasyScript. If you need another type of script, such as restore scripts or Backup Server scripts, you must make it yourself because EasyScript cannot. See Section VI, Automated Operations for complete instructions on creating scripts.

The EasyScript module, which is installed by the Installer program, resides in the same folder as the Retrospect application. Do not move it from its location.

CHAPTER 13 • USING EASYSCRIPT

To start EasyScript when Retrospect is open, choose EasyScript from the Windows menu. Or, regardless of whether Retrospect is open, double-click the EasyScript icon from the Finder.



EasyScript

To exit EasyScript and return to the Retrospect Directory, click Cancel.

Navigating EasyScript

At any time while using EasyScript, you may click the Previous button to go back to the information and options shown previously. Clicking Next accepts the options, if any, and takes you to the next set of information and options. Clicking Cancel exits EasyScript, rejecting any options or choices you may have made. Clicking Tell Me More presents additional information about the subject at hand.

Using EasyScript

When EasyScript begins, it puts up a window which tells you some general information. Click Next to begin, and EasyScript lists four terms and their definitions. For complete details and explanations, look up the terms in the index of this manual. Click Next to continue.

Using Remote Sources

EasyScript now wants to know whether you want to back up your whole network or just the Macintosh on which you are using it. If you want to back up only your Macintosh, click No. If you want to back up your Macintosh and other networked computers using the Remote control panel,

click Yes. Click Next to accept your selected choice and continue. If you selected No, EasyScript explains what volumes it will use as sources.

List of Remotes

If you selected Yes, EasyScript asks you to confirm the Remote Macintosh computers to use as sources. All Remotes logged in to Retrospect at the time of the backup are selected for backup. Make sure Remotes you want to back up are shown in the scrolling list. If necessary, manage Remotes using the Network and Configure buttons as described in the *Retrospect Remote Administrator's Guide*. Click Next to accept your selection and continue.

Backup Media

EasyScript now wants to know about the media your backup device uses. Click Tapes for any SCSI tape drive, or click Removable Cartridges for a drive which uses removable disk cartridges. Click Next to continue with your media selection. EasyScript then offers some information about selecting files. Click Next to proceed.

Backup Frequency

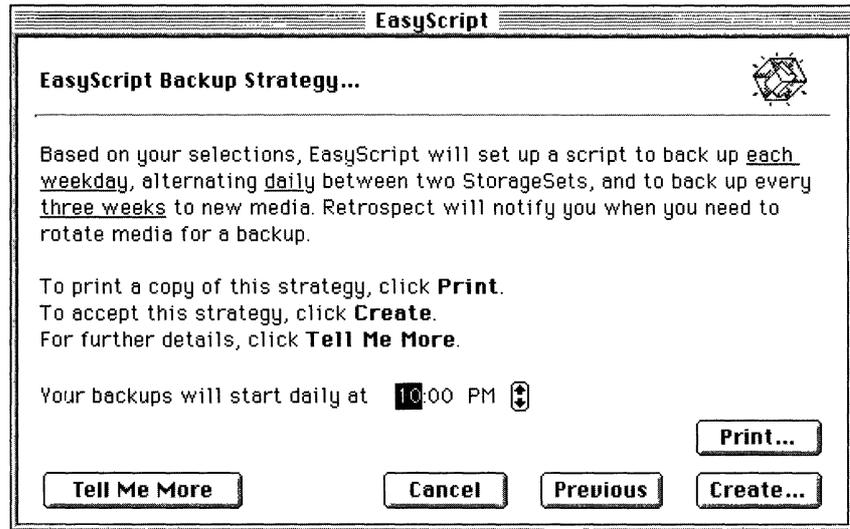
EasyScript asks how often you wish to back up. Click Every Day or Once a Week, then click Next to accept your choice and continue.

Rotating Media

EasyScript asks how often you wish to rotate tapes or disks. Rotating media lets you move media off-site for safekeeping and gives you other chances of recovery should one piece of media fail. Click Daily, Weekly, or No Rotation, then click Next to accept your choice and continue.

Strategy Summary

EasyScript presents a summary of the backup strategy it came up with based upon your answers to its questions.



Read the strategy overview and if it is unacceptable click Previous to go back and make changes or click Cancel to start over. If necessary, adjust the time of the day the backups occur. Click Print to make a hard copy of the backup strategy. Study the strategy summary, and if you find it acceptable, click Create to accept the strategy.

StorageSet Creation

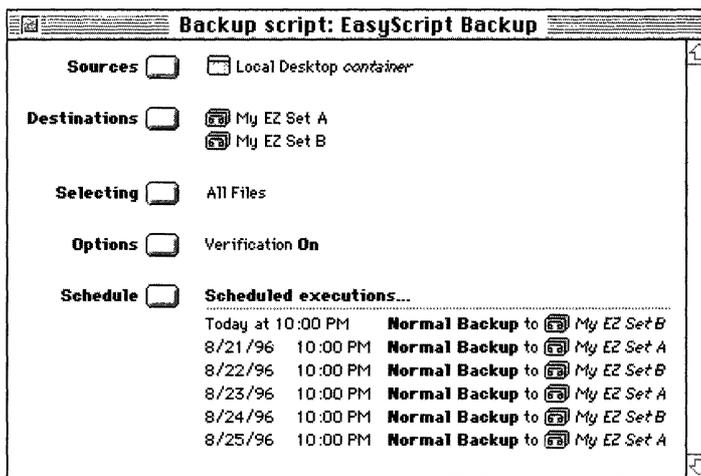
EasyScript must create catalogs for each StorageSet, so it asks you to name your StorageSets. The StorageSet name is used for the catalogs and the tapes or cartridges. When you have entered the StorageSet names, click New to have EasyScript save the script for you.

Final Overview

EasyScript presents a final overview with a reminder about media. You may click Done to return to the Retrospect Directory or click Open Script to view the script summary of the new script.

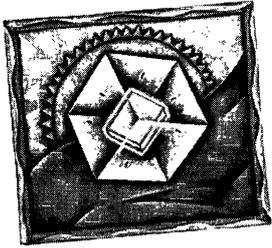
Script Summary

From the summary window, you may click on buttons to change the source volumes, destination StorageSets, file selection criteria, execution options, and scheduled executions.



For detailed explanations of all these items and the summary window, see Section VI, Automated Operations, which starts on page 79.

SECTION VI



Automated Operations

- SCRIPTED BACKUP
- SCHEDULING SCRIPTS
- EXECUTING SCRIPTS
- SCRIPTED ARCHIVE
- SCRIPTED DUPLICATE
- SCRIPTED RESTORE
- BACKUP SERVER SCRIPTS

You learned how to set up and execute Retrospect's immediate backup, restore, and duplicate operations in Section IV of this manual. This section shows you how to automate the process by using scripts.

Retrospect scripts are unlike programming scripts you may be familiar with. A Retrospect script contains predetermined information for the various elements of an operation, such as the source, destination, and files chosen. This is the same information used in an immediate operation, but you can save it in a script for repeated use and unattended, automatic operation. When a script is run, or executed, Retrospect performs the operation using the predetermined information. You can run a script at your command or schedule times when Retrospect is to automatically execute a script. You should create a script for any procedure you perform on a regular basis.

Since Retrospect allows you to schedule your scripts to run automatically and unattended, you can choose backup times that are most convenient for you and for other users. Scheduling scripted backups ensures data is backed up consistently—all you have to do is make certain the Backup Macintosh is turned on and the proper media is in the backup device. Scripts are an important part of developing a backup strategy. (For more information on developing an effective backup strategy, see Chapter 28 • Backup Strategies, on page 199.)

Another advantage of a scripted backup is that it requires less memory than an immediate backup, allowing you to back up more volumes in a single operation. For a scripted backup, Retrospect scans and backs up the sources one volume at a time, meaning the scripted backup requires only enough memory to store the scanned list of the largest source volume. For an immediate backup, however, Retrospect scans all sources before it begins copying files, meaning that it requires enough memory to store the scanned list of all source volumes.

This section's first chapter, Scripted Backup, covers the basics of creating scripts. All other script types (such as archive, duplicate, and restore) use the same basic ingredients. Be sure to read the Scripted Backup chapter carefully because the other script chapters build upon the foundation of that chapter, just as the other script types are based on backup scripts.

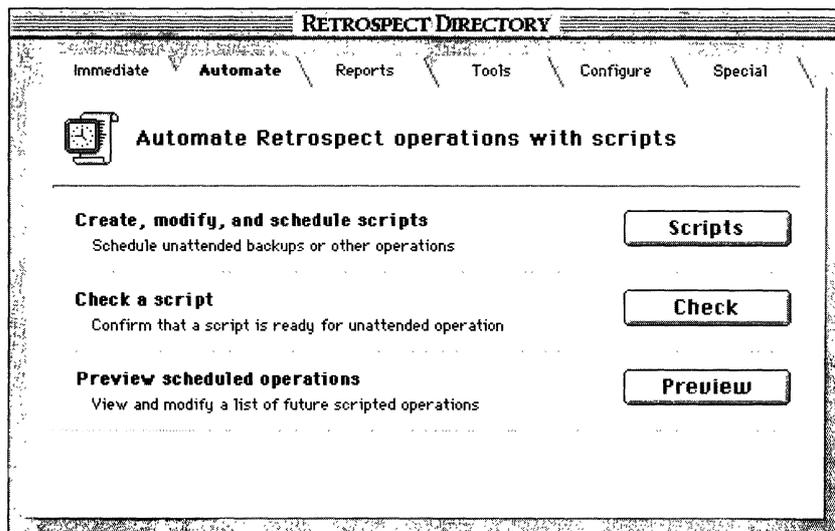
For information on managing and maintaining scripts, see Chapter 27 • Maintaining Scripts, on page 193.

CHAPTER 14 • SCRIPTED BACKUP

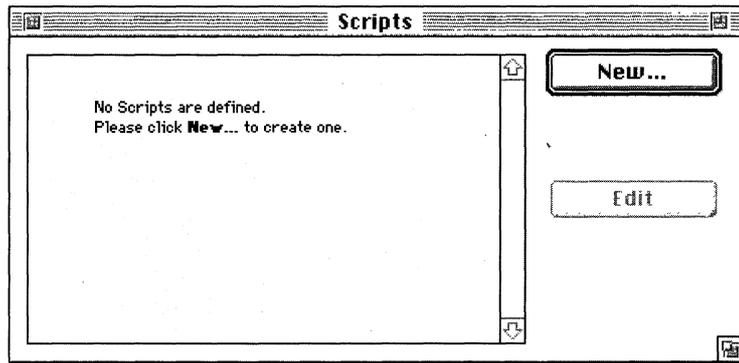
This chapter takes you through the steps of creating a backup script. These steps are similar or identical to the steps of creating other scripts for archiving, duplicating, restoring, and so on. If you have never created a backup script before, you should first read Chapter 10 • Immediate Backup, on page 47. Follow its instructions so you are familiar with the various steps of setting up a backup.

Creating the Script

From the Retrospect Directory, click the Automate tab.

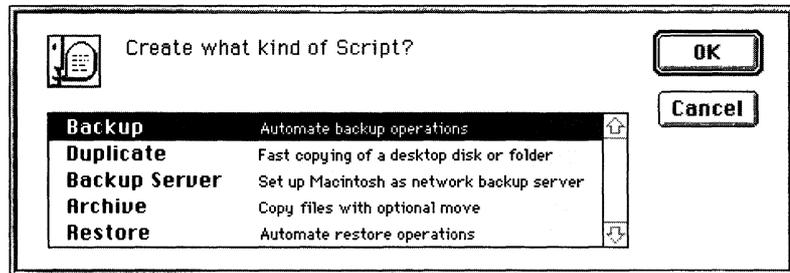


Click Scripts, which brings up the script editing window.

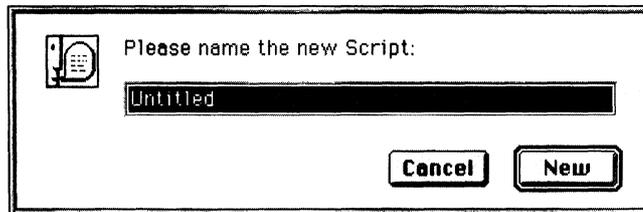


The script editing window.

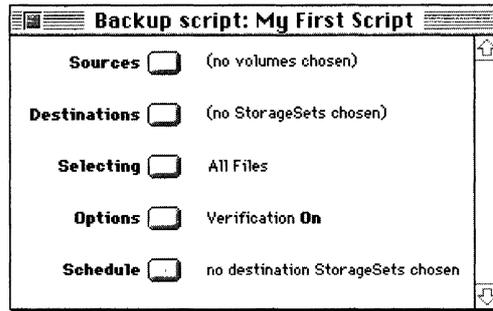
Click the New button to create a new script. A dialog asks which type of script you want to make.



Select Backup from the list and click OK. Another dialog asks you to name the script.



Enter a name and click New. The script appears in its own window.

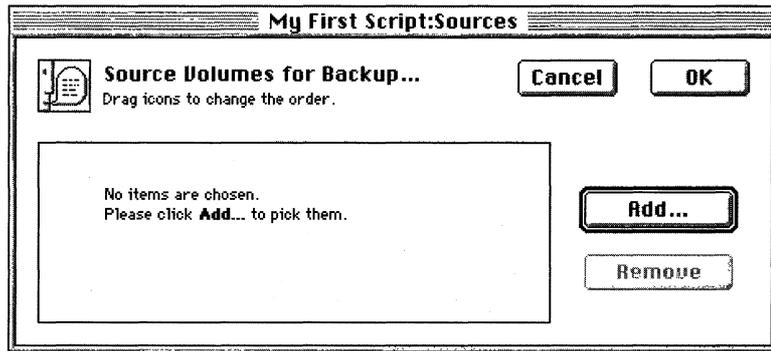


You will recognize that this script window is very similar to the immediate backup summary window, with information for the source volumes, destination StorageSets, file selection criteria, and options. Schedule is a new addition not found in immediate operations. To change information, click the appropriate button.

- **Sources** lets you add or remove source volumes.
- **Destination** lets you choose a StorageSet.
- **Selecting** lets you choose a Selector, a kind of filter for selecting files and folders to be backed up. Selectors are explained in detail in Chapter 23 • Using Selectors, which starts on page 151.
- **Options** displays the options window in which you can toggle verification and data compression. Options are explained in detail in Chapter 24 • Execution Options, which starts on page 168.
- **Schedule** lets you set the script to run at certain times or at regular intervals.

Setting the Source

Because this is a new script, Retrospect says “no volumes chosen” in the script’s window. Click the Sources button to get a window which lists sources, but is empty at this time since none are chosen yet.

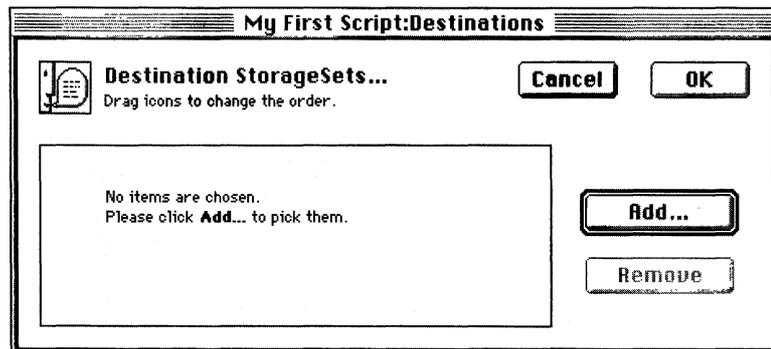


- **Note:** When no items are chosen, as is the case in a new script, Retrospect clicks the Add button for you to take you to the volume selection window.

Click Add to get the Volume Selection window and select a volume. (This is explained in detail in Chapter 21 • Working with Volumes, which starts on page 131.) Click OK to add the volumes to the sources window. If you add more than one volume to the source list, you can drag them to rearrange them in the list and rearrange the order in which they will be backed up. When the volume or volumes to be backed up are listed in the sources window click OK.

Setting the Destination

Retrospect needs to know the StorageSet to which you are going to back up. Because this is a new script, Retrospect says “no StorageSets chosen” in the script’s window. Click the Destinations button to get a window which lists destinations.



- **Note:** When no items are chosen, as is the case in a new script, Retrospect clicks the Add button for you to take you to the StorageSet selection window.

If No StorageSets are Listed

If no StorageSets are listed, click Add. Retrospect brings up the StorageSet selection window to let you add a StorageSet. If none are known to Retrospect, it automatically clicks the window's Create New button. If you watch closely, you can see Retrospect quickly scan your SCSI bus, looking for suitable backup devices before it displays the StorageSet creation window. Use this window to make a new StorageSet, as described on page 10 and page 50. You can make Retrospect recognize other StorageSets by opening them with the More button.

When StorageSets are Listed

Select one or more StorageSets. You can have multiple destination StorageSets so you can rotate among the sets for more safe and effective backups. When at least one StorageSet is listed in the destinations window, click OK.

Setting the Criteria

Retrospect uses all files as the default criteria for selecting files to be backed up. To change this, click the Selecting button and choose a different Selector. Selectors are explained in detail in Chapter 23 • Using Selectors, which starts on page 151. We suggest you use the default Selector, All Files.

- **Note:** Retrospect's All Files Selector does not necessarily cause all the source files to be copied to the destination. It merely selects the files and, during a later stage of the incremental backup, Retrospect decides whether to copy them based on whether the selected files already exist within the StorageSet. Selected files not in the StorageSet are then copied to the destination.

Unlike an immediate backup, a script has no "preview" information with which you can manually mark and unmark files. This is because the script executes later and the volume contents can change between now and then.

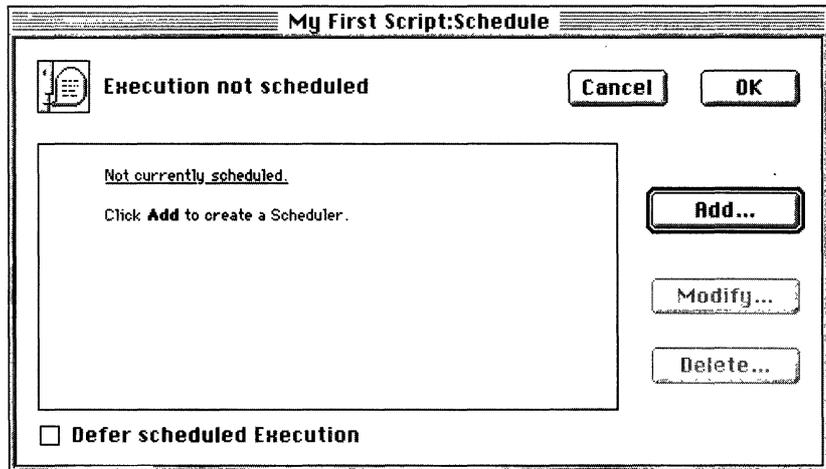
Setting the Options

Click the Options button to display the options window in which you can toggle verification, data compression, and other options which are

explained in detail in Chapter 24 • Execution Options, which starts on page 168. Leave all options at their default settings for now.

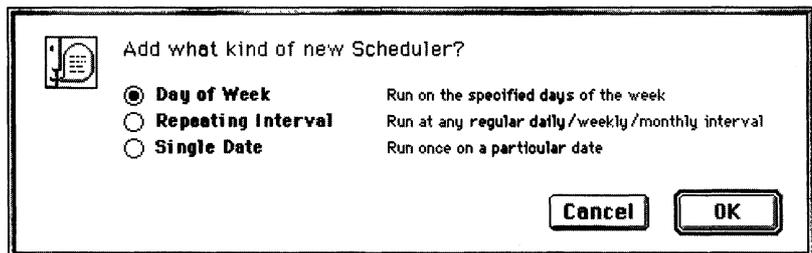
Setting the Schedule

If you want to execute this script only upon your command and in your presence, you do not need to schedule it for unattended execution. (Instead, make a run document or run it from the menu. For details see Chapter 16 • Executing Scripts, which starts on page 99.) To set a time for the script to execute, click the Schedule button to get a window with a list of scheduled operations. (But because this is a new script, nothing is scheduled and the list is empty.)



- **Note:** This chapter explains adding schedules to scripts. For details on creating the schedules themselves, see Chapter 15 • Scheduling Scripts, which starts on page 91.

Click Add to get a dialog asking which kind of Scheduler you want to make.



Select Day of Week, Repeating Interval, or Single Date, then click OK. A schedule setup window appears.

My First Script: Day of Week

No Weekdays chosen.
Please select them below.

Cancel OK

Start: 8/14/1996 Wed 10:00 PM

Run on: Monday Saturday
 Tuesday Sunday
 Wednesday
 Thursday
 Friday

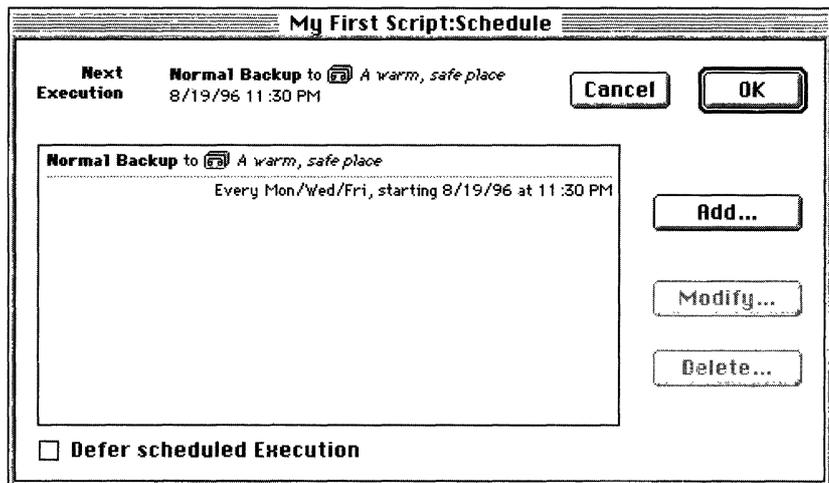
Weeks: 1

Action: Normal Backup To: A warm, safe place

The exact controls in the window depend on the type of schedule, but they are all basically similar and easy to understand. Use the controls to set the schedule. Use the Action pop-up menu to set the backup action to either Normal Backup, Full Backup, or New Backup, which are explained under “Backup Actions” on page 23. If your script has more than one destination, use the To pop-up menu to set the destination StorageSet for the operation. When you have set the various aspects of the schedule, Retrospect shows a description of the schedule at the top of the window.

Do **Normal Backup** to A warm, safe place Every Mon/Wed/
Fri, starting 8/19/96 at 11:30 PM

Click OK to return to the window listing the scheduled executions.

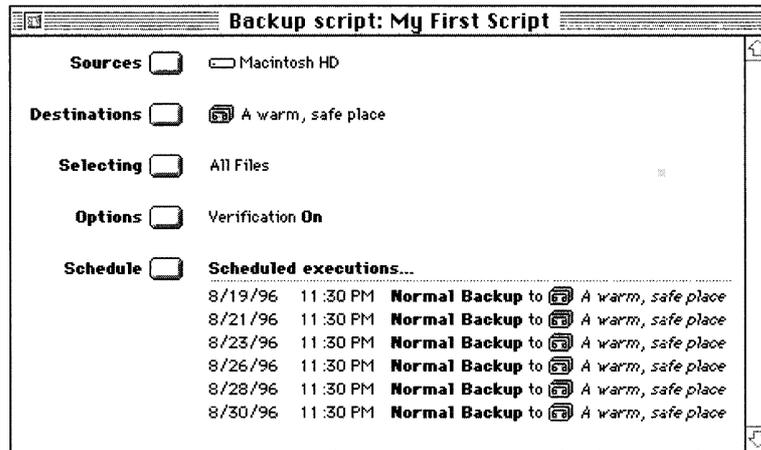


Your newly-created schedule is listed and, since it is the only one, is shown as the next to execute. This window also allows you to delete or modify existing schedules, or add more schedules.

- **Note:** Do not feel obliged to schedule an execution; there are other ways to run scripts, as detailed in Chapter 16 • Executing Scripts, which starts on page 99. If you want to delete the schedule you just made, go ahead and remove it so it does not intrude at a later time.

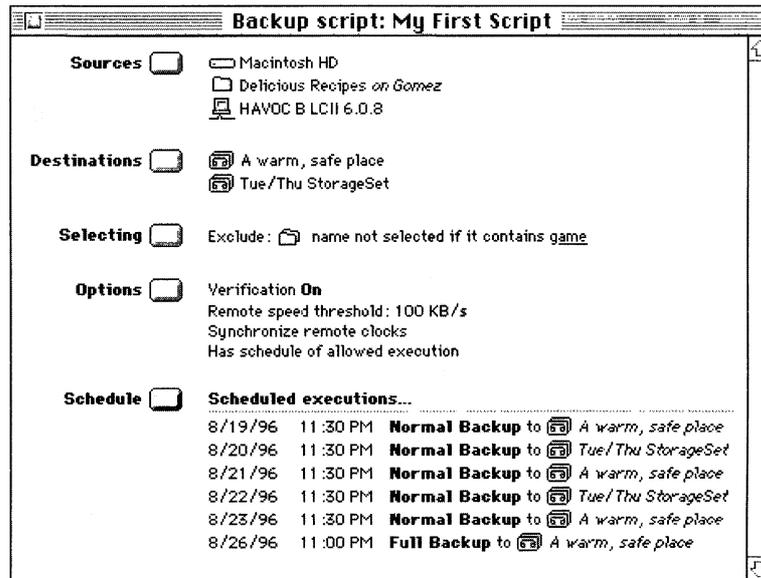
This part of the manual only touches on Retrospect's scheduling capabilities. Scheduling is explained in detail in Chapter 15 • Scheduling Scripts, which starts on page 91.

Click OK to return to the script summary window.



A script summary window.

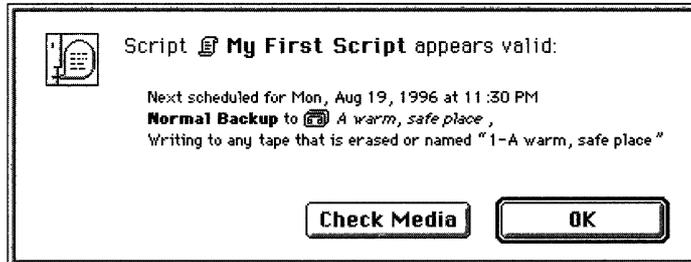
If you used multiple sources, destinations, and Schedulers, a custom Selector, and changed some options, the summary window could have more elaborate information, such as the following example.



The script is complete. Choose Save from the Script menu to save it. Once saved, the script is ready for execution upon your command or for scheduled automatic execution.

Checking Validity

Choose Check from the Script menu and Retrospect informs you whether the script is valid, and shows the next action it will take with this script.



If the script is invalid, Retrospect shows why so you can edit the script to correct the problem.

In the dialog which says the script appears valid, click Check Media to have Retrospect examine the backup device, looking for the specified media member or click OK to return to the script summary window.

Click the summary window's close box to close the script when you are finished with it.

CHAPTER 15 • SCHEDULING SCRIPTS

Retrospect allows you to schedule a script to run automatically on specified days or on a repeating schedule, such as every two weeks. You can define multiple schedules for the same script and specify the kind of backup you want for each scheduled execution.

At the time you schedule the script, you must specify the StorageSet (if the script has more than one destination) and the type of backup action: normal, full, or new.

- *Normal* backup is a typical incremental backup, which saves media space by avoiding redundant files in a StorageSet. Only files which are new or newly-modified are marked for backup.
- *Full* backup clears the catalog contents (if any) of a StorageSet so it appears no files are backed up. Then it looks for the first media member of the StorageSet and erases it if it is available. If the first member is not available, Retrospect uses any available new or erased disk or tape. Since the catalog is empty, everything selected from the source is backed up to the StorageSet.
- *New* backup makes a new StorageSet (named similar to the old one) using a new or erased disk or tape. The original StorageSet and its catalog remain intact for long-term storage in a safe place. The new StorageSet catalog and the new media member are each named with a number in sequence.

For further information, see “Backup Actions” on page 23.

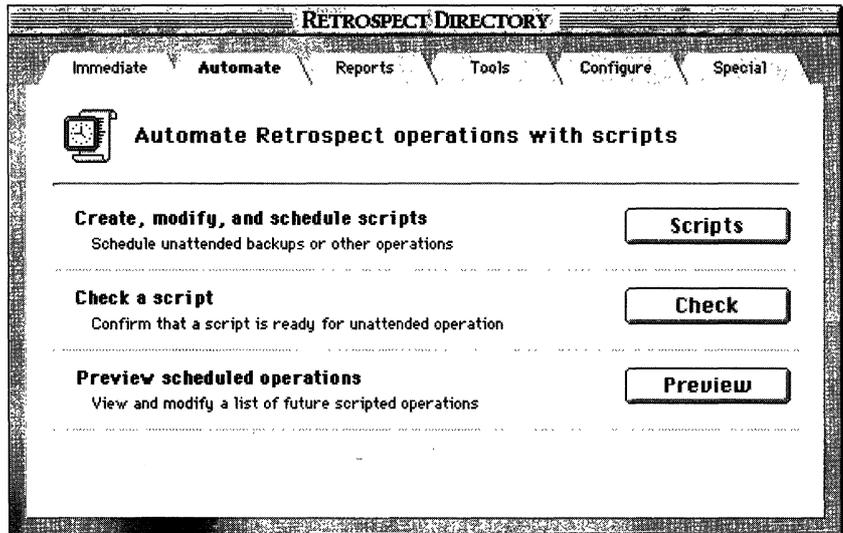
Retrospect’s Schedule preference (page 245) defines the time period during which scripts are allowed to execute. Scripts scheduled to execute outside this period will not run.

Schedulers

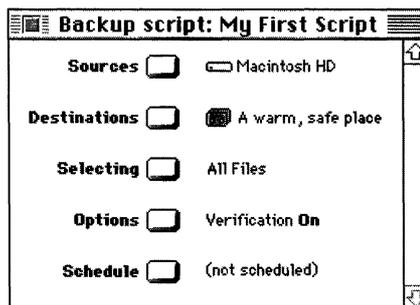
Retrospect provides three types of Schedulers: Day of the Week, Repeating Interval, and Single Date. A script can contain any combination of one or more of these Schedulers.

Creating a Script Schedule

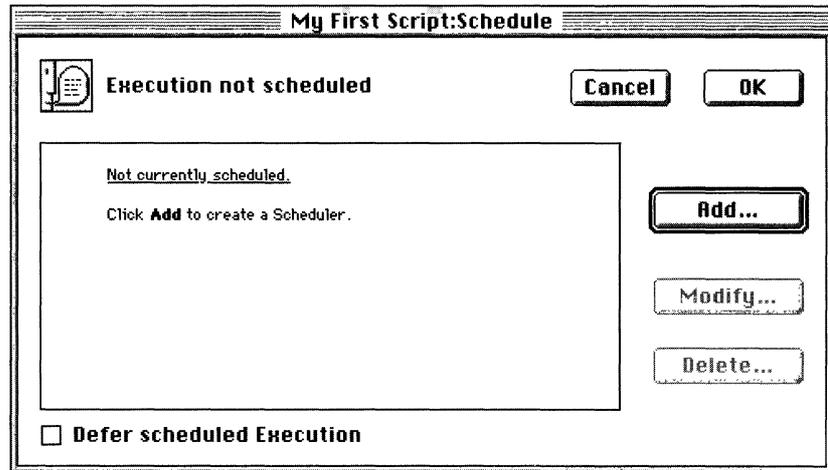
Click the Automate tab in the Retrospect Directory.



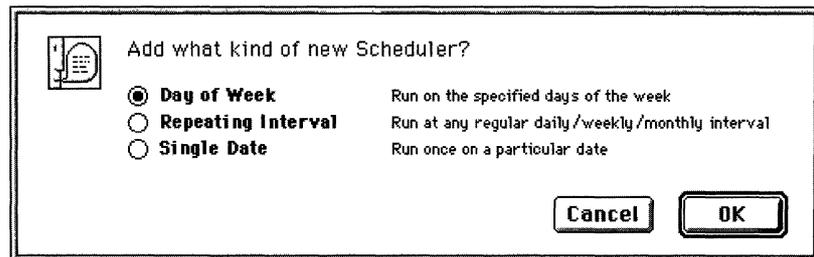
Click Scripts to display a window listing available scripts. Select the script you want to schedule then click the Edit button, which displays the script window.



Click Schedule and the script's schedule window appears with a list of its currently scheduled dates and times.



The list appears empty if the script is not scheduled. To add a new schedule, click Add, which brings up a dialog asking which kind of Scheduler you want to make.



Click a radio button to select the kind of schedule you want to create, then click OK.

- Day of Week Scheduler lets you define a schedule for one or more days of the week and specify a weekly repeating interval. For example, every Monday and Wednesday, every other week.
- Repeating Interval Scheduler lets you define a schedule that is repeated after a specified interval. For example, the last Friday of every month.
- Single Date Scheduler lets you define a schedule for a single date and time. For example, October 17, 1996 at 5:04 P.M.

Common Scheduler Elements

All Scheduler types have a few common controls and settings. These are the start date and time and the backup action and destination. Each is described below.

Start Date and Time

This determines the earliest time at which the first backup is to occur. To change the start date and time, click on any individual part of the date or time. When the item is selected, type the new information or click the arrows to change the information. (You can also press the up and down arrows on your keyboard. Press the Tab key to move the selection among the different elements.)

1/2/1997 Thu 

Backup Action Type and Destination

If the schedule is for a backup script, these additional settings are available in the Scheduler.

From the Action pop-up menu, choose Normal Backup, Full Backup, or New Backup.

- **Note:** Archiving Scripts do not provide a choice of options—they always use Normal Backup.

If the script has multiple StorageSet destinations, use the To pop-up menu to choose the StorageSet to be used for the scheduled execution.

- **Note:** The StorageSet pop-up menu is not displayed if only one StorageSet is specified in the script.

Retrospect allows you to have more than one StorageSet for a script so you can rotate media as part of your backup strategy. You specify the StorageSet for each schedule or execution.

Using the Day of Week Scheduler

My First Script:Day of Week

No Weekdays chosen.
Please select them below. **Cancel** **OK**

Start: 8/14/1996 Wed 10:00 PM

Run on: Monday Saturday
 Tuesday Sunday
 Wednesday
 Thursday
 Friday

Weeks: 1

Action: Normal Backup **To:** A warm, safe place

The day of week Scheduler window.

Set the start date and time, backup action, and destination as described previously under “Common Scheduler Elements” on page 94.

Click the checkboxes of the days of the week you want the script to execute.

Enter a number to use as the repeating interval for the weeks. For example, if you enter two and check Monday, the Scheduler repeats every other Monday, beginning on the start date.

When all of the settings are correct in the Scheduler window, click OK.

Using the Repeating Interval Scheduler

End of Month Backup: Repeating Interval

Do **Full Backup** to **Month End StorageSet** Every month on the 30th (or last day), starting 8/30/96 at 6:30 PM

Start: 8/30/1996 last Fri 6:30 PM

Repeat: **Every 1 Months on the 30th** ▼

Months:

Action: **Full Backup** ▼ **To:** **Month End StorageSet** ▼

Cancel **OK**

The repeating interval Scheduler window.

Set the start date and time, backup action, and destination as described previously under “Common Scheduler Elements” on page 94.

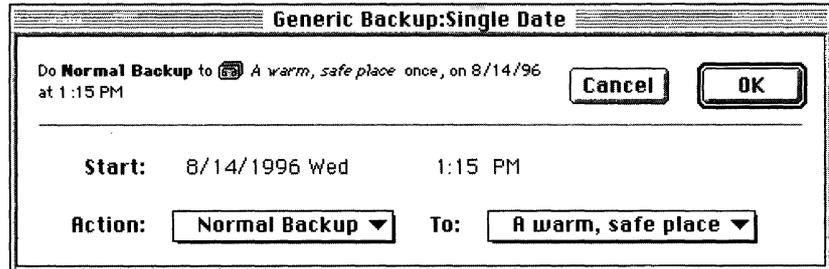
For weekly backups, the start date’s day of the week determines when future backups will occur. For example, if the Start date falls on a Monday, subsequent weekly backups will occur on Mondays. You can see the pop-up menu change when you change the start day.

For monthly backups, the start date’s day of the month determines when future backups will occur. For example, if the Start date is the fifteenth of the month, subsequent monthly backups will occur on the fifteenth. If you specify a monthly backup on a date at end of the month (such as the thirty-first), the backup will be run on the last date of the month for those months that do not extend to the requested date. For example, February usually has only twenty-eight days.

From the Repeat pop-up menu, select the time unit (Days, Weeks, or Months) for the repeating interval. Type a repeat interval in the Weeks, Months, or Days field. The Repeat pop-up menu changes to reflect the Repeat Interval you enter.

When all of the settings are correct in the Scheduler window, click OK.

Using the Single Date Scheduler



The single date Scheduler window.

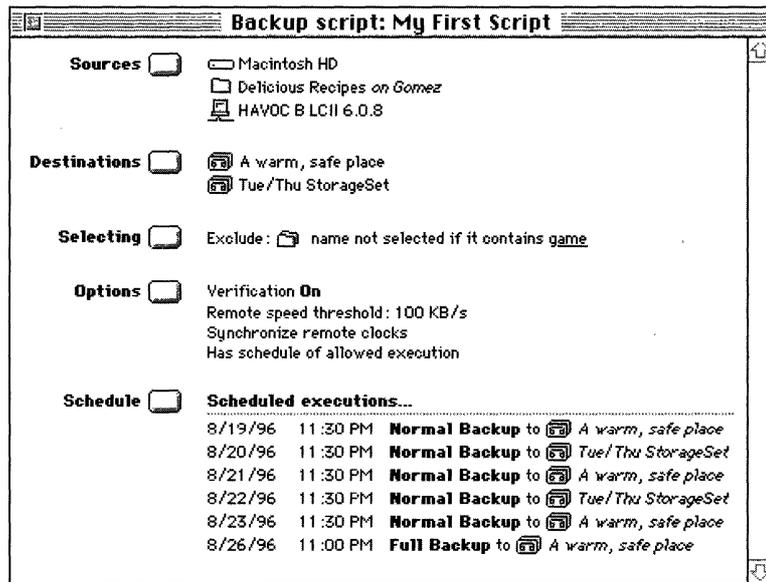
Set the start date and time, backup action, and destination as described previously under “Common Scheduler Elements” on page 94.

Since this is a single date Scheduler, the script will run once at the specified date and time, and no more.

When all of the settings are correct in the Scheduler window, click OK.

Completing a Scheduler

Click OK in the script schedule window. The script summary window reappears and lists the next six scheduled events for the script.



Choose Save from the Script menu to save it, then close the script window.

Scheduled Executions

Retrospect keeps track of all of your scheduled scripts and automatically executes them at the time you specified.

The Retro.Startup extension (first put in the System Folder by the Retrospect installer and thereafter automatically created when necessary) is responsible for checking the clock built into the Macintosh and comparing it to the next time a script is scheduled to run. If you move or remove Retro.Startup, your scheduled scripts will not automatically execute.

Retrospect is ever-vigilant about scheduled script executions. If a script is scheduled for automatic execution within the look-ahead time (normally twelve hours), Retrospect will not automatically quit (or shut down or restart, depending on a preference setting described on page 248). It instead remains open and waits to execute the script.

See Chapter 25 • Controlling Executions, which starts on page 182, for related information.

CHAPTER 16 • EXECUTING SCRIPTS

Once you have created and saved a script you need to execute it to perform its intended operation. Retrospect gives you several ways of executing scripts and of pausing or halting their execution. Other methods of controlling operations in progress are discussed in Chapter 25 • Controlling Executions, which starts on page 182.

Scheduled Execution

As you learned in the previous chapter, you can schedule times for Retrospect to automatically execute a script. Retrospect keeps track of all your scheduled scripts and automatically executes them at the time you specified. The script preview window shows upcoming scheduled events.

Immediate Execution

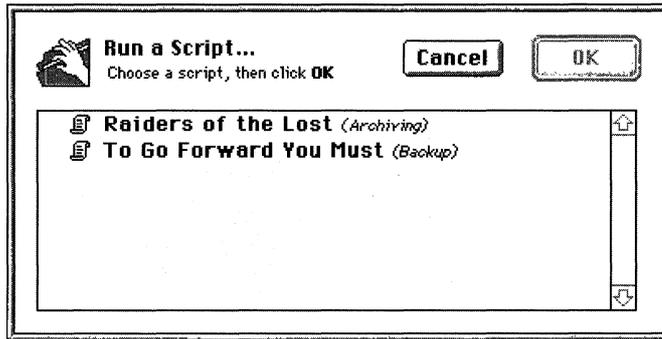
There are several ways to execute a script immediately.

Run Menu

When you choose a script from the Run menu and confirm, Retrospect begins its execution.

Run Button

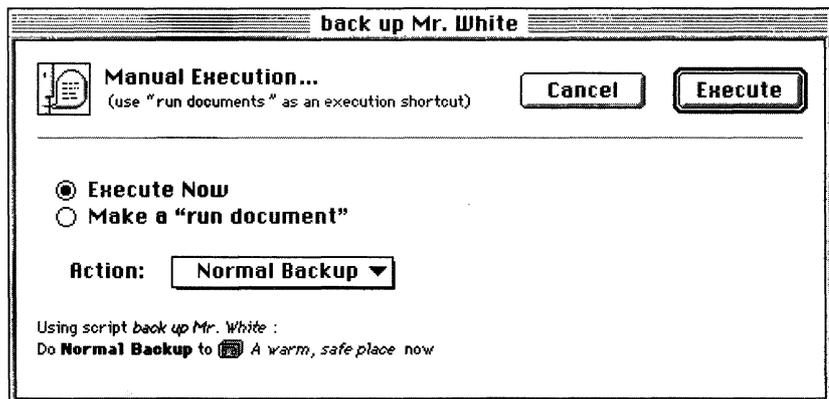
When you click the Run button from the Retrospect Directory's Immediate tab, Retrospect asks you to choose a script from a dialog.



Select a script from the list and click OK then confirm, then Retrospect begins its execution.

Execution

When you start a script using the Run menu or the Run button, Retrospect first presents an execution window.



If the script being run is a backup script, use the Action pop-up menu to set the backup type to either Normal Backup, Full Backup, or New Backup, which are explained in Section II under “Backup Actions” on page 23. If you are not sure about which to use, just use Normal. If the backup script has multiple destinations, use the other pop-up menu to specify the StorageSet to which the files are to be copied.

Leave the Execute Now radio button selected, then click Execute. Prompting you for media if necessary, Retrospect performs the scripted operation,

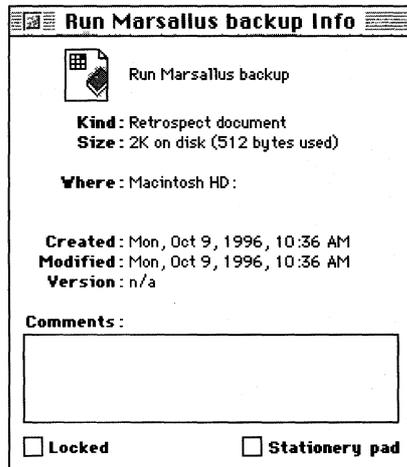
displaying its progress in the execution status window. The window also provides Pause and Stop buttons for suspending or cancelling the operation.

When the execution is complete, Retrospect informs you in the execution status window. Retrospect's Unattended preference (page 248) determines what it does when the script is completed. By default, it quits when done. If any errors occurred you can find the offending files in the Browser which appears, or see error details in the operations log. (This log is accessible from the Windows menu and is described under "Viewing the Operations Log" on page 211.)

Run Documents

You have just learned how to immediately execute a script from the execution window, but you may have noticed the radio button named Make a "run document". When this button is selected and you click Save in the dialog, then specify a location to save the file, Retrospect creates a special run document.

If you leave Retrospect and go to the Finder, you can see the file is a small Retrospect document. A Finder Info window for an example run document is shown below.



When you double-click (or otherwise open) the run document in the Finder, Retrospect executes the script.

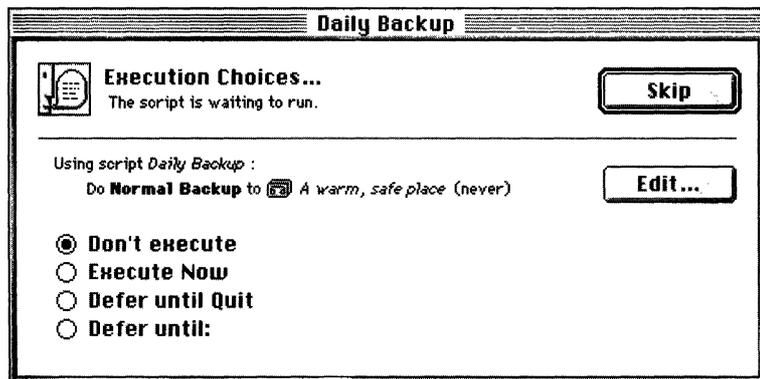
To run several scripts sequentially, select the run documents in the Finder and choose Open from the File menu. When you open several run documents at once, the scripts associated with them will run in alphabetical order by script name, regardless of the run documents' file names.

- ◆ **Tip:** You can create more than one run document for the same script, each specifying a different backup action and destination StorageSet.

You can get creative with run documents. For example, you can put them in the System Folder's Startup Items folder for automatic execution when you start your Macintosh, or execute them using AppleScript.

Halting Execution

To intercept the execution of a scheduled script before it actually begins operating, click the Stop button in its countdown window. The execution choices window appears.



The execution choices window. Note the button shown here named Skip may also appear as Execute or Defer depending on the selected execution choice.

- To cancel this execution of the script, select “Don’t execute” then click Skip.
- To execute the script, select “Execute Now” then click Execute.
- To delay execution of the script (and all other scripts) until after you quit Retrospect, select “Defer until Quit” then click the Defer button. You should defer a script when you do not want it to run while you are using Retrospect but you do want it to run after you quit.
- To delay execution of the script until a future date, select “Defer until” then set the date and time then click Defer. You should defer a script

when you do not want it to run now but you do want it to run after a certain time.

- To edit the script, click the Edit button.

You can temporarily pause a running script. See “Deferring Script Execution” on page 197.

Media Requests

When necessary, Retrospect prompts you to insert media by displaying the media request window. In most cases, Retrospect continues with the operation when you insert correctly named or erased media and click Proceed.

However, chances are you want a script to run unattended while you are away and unable to satisfy any media request from Retrospect. You can avoid this prompt if you insert the proper media member before you execute the backup. Retrospect is very particular about media names for full and new backups—if the inserted medium is not erased, its name must be the one requested in order for Retrospect to proceed without prompting you. When performing new or full backups, erase the media in advance to be sure Retrospect will proceed automatically.

When performing a normal backup, Retrospect requires the StorageSet’s most recently used medium, though it will use a blank medium if the other medium was skipped. (See “Media Control” on page 216 and “Media Request Preferences” on page 242.)

CHAPTER 17 • SCRIPTED ARCHIVE

The process of creating and using an archive script is almost identical to that of a backup script. Read Chapter 14 • Scripted Backup, which starts on page 81, to learn how to create a backup or archive script. This chapter only explains the differences between the two script types.

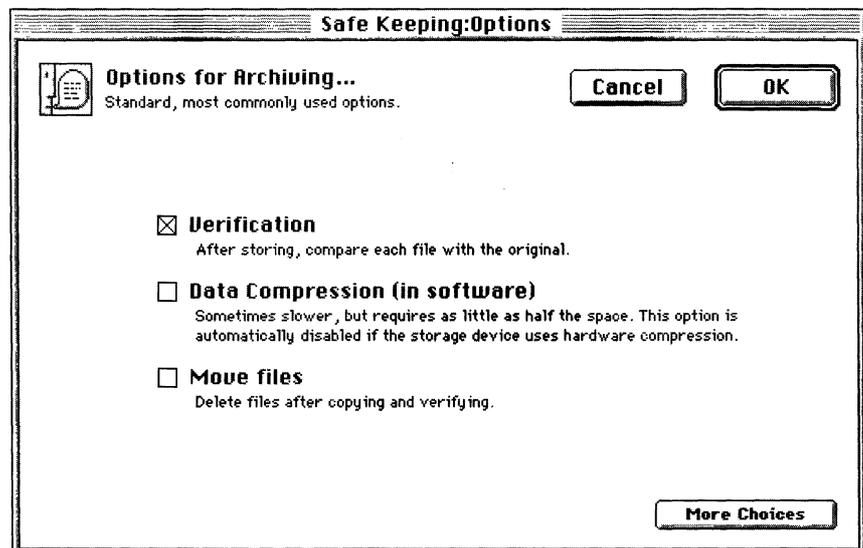
An archive script is just like a backup script, but it has the added option of moving—rather than copying—files from the source to the archive media.

Archiving allows you to remove seldom-used files from a hard disk without permanently getting rid of them.

Be sure to read “Archiving Tips” on page 220 for important information.

Move Files Option

To set this option, click the Options button in the script summary window to get the archive options window.



If the Move files checkbox is not checked, which is the default, the archive script works exactly like a backup script. It is the same thing with a different name, as a bucket is to a pail.

If the Move files checkbox is checked, Retrospect will copy the files to the StorageSet as usual and verify them, then *delete the files* from the original source volume or volumes. If Verification is turned on and the files do not match exactly, the originals will not be deleted. See page 173 for details on archive options.

CHAPTER 18 • SCRIPTED DUPLICATE

Duplicating means copying files among volumes, much like using the Finder to drag files or folders from one disk to another. Retrospect's duplicate function is intelligent, which makes it faster than the less sophisticated duplicate function of the Finder.

You can use duplicate scripts for doing Finder format backups to hard disks, folders, or file server volumes. A duplicate script would be useful, for example, for copying a folder from a hard disk to a folder on a file server at the end of every week.

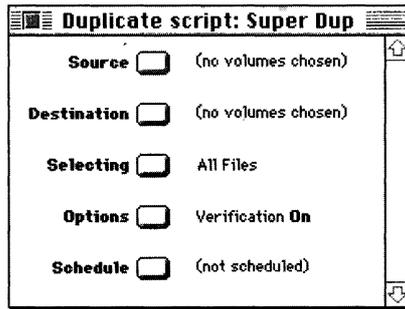
- ◆ **Tip:** Subvolumes are useful as sources or destinations for duplicating.

Making a duplicate script is much like doing an immediate duplicate operation. The main ingredients you specify are the volume from which to copy and the volume to which the files are to be copied.

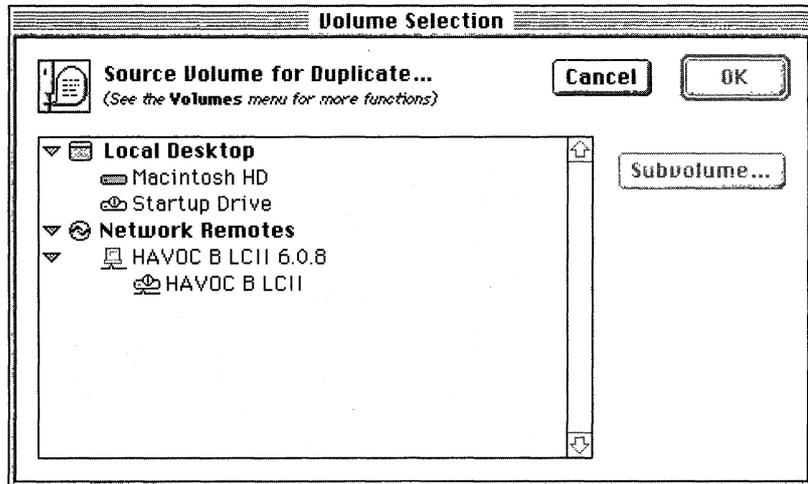
Creating the Script

From the Retrospect Directory, click the Automate tab, then click Scripts, which brings up the script editing window.

Click the New button to create a new script. A dialog asks which type of script you want to make; select Duplicate from the list and click OK. Another dialog asks you to name the script; enter a name and click New. The script appears in its own window.



Because this is a new script, Retrospect says “no volumes chosen” for the source. Click the Source button, then Retrospect’s familiar volume selection window asks you to determine the source volume from which files are to be copied.



Select the source volume and click OK. (For details on using the volume selection window, see Chapter 21 • Working with Volumes, which starts on page 131.)

There are also no volumes chosen for the destination, so click the Destination button. In the window, select the volume to which to copy the files. Also choose an item from the pop-up menu, which controls what happens to the existing contents of the destination drive.

- **Replace entire disk** *deletes all files and folders* on the destination which do not match those marked for duplication, leaving files untouched if

they are identical to files marked. It then duplicates remaining files and folders from the source, preserving the folder hierarchy.

- **Replace corresponding files** copies the marked files to the destination volume into the same folders. Corresponding files are overwritten, *even if they are newer*. Retrospect leaves files untouched if they are identical to files marked for duplication or if the file names do not match those marked.

▲ **Warning:** Duplicate operations can destroy your files. Destination items are replaced by those duplicated from the source, or deleted entirely.

Click OK to accept your destination choices. At this point, you have given the minimum information required for the script to run, but you may want to change some other script settings.

You can leave the default file selection criteria for copying all files from the source or click the Selecting button to apply a Selector. (For details on Selectors, see Chapter 23 • Using Selectors, which starts on page 151.)

If you want to change one or more of the duplicate options, click the Options button. One such option is moving—rather than just copying—files from the source to the destination. (For details on duplicate options, see “Duplicate Options” on page 174.)

To schedule the script, click the Schedule button and see Chapter 15 • Scheduling Scripts, which starts on page 91.

Click the script window’s close box and save your changes.

You can now execute the script in any manner you wish. For details, see Chapter 16 • Executing Scripts, which starts on page 99.

CHAPTER 19 • SCRIPTED RESTORE

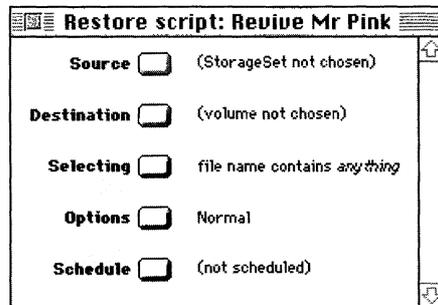
Making a restore script is much like setting up an immediate restore operation. The main elements you specify are the StorageSet and SnapShot to copy from and the volume to which the files and folders are to be restored.

A restore script would be useful, for example, in a student computer lab environment in which the hard disks are restored from a common source every night.

Creating the Script

From the Retrospect Directory, click the Automate tab then click Scripts, which brings up the script editing window.

Click the New button to create a new script. A dialog asks which type of script you want to make; select Restore from the list and click OK. Another dialog asks you to name the script; enter a name and click New. The script appears in its own window.



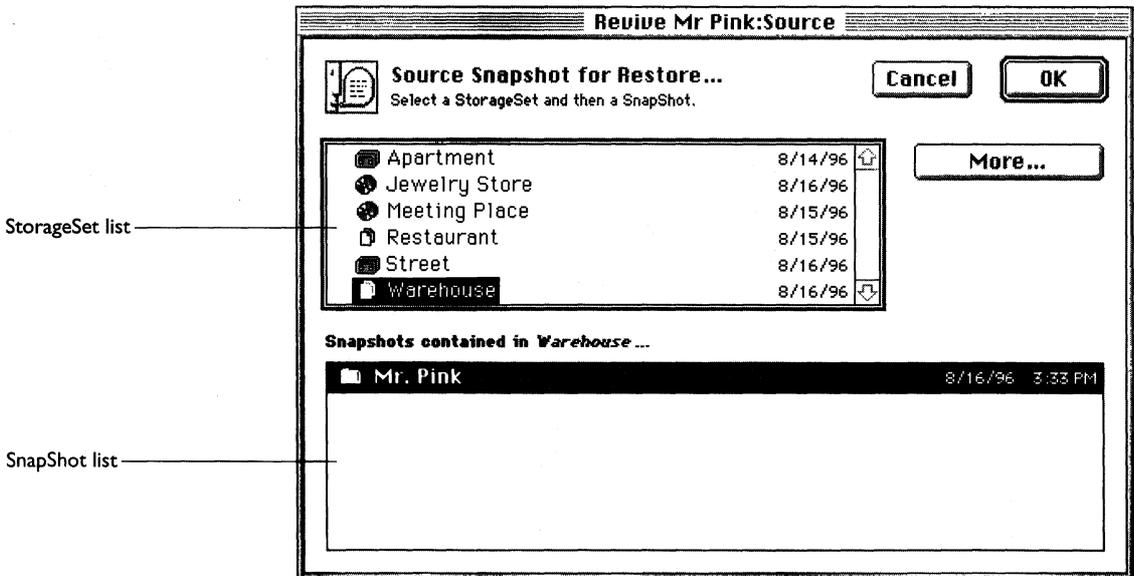
You will recognize this script window as similar to the immediate restore window, with information for the Source StorageSet, Destination volume, Selecting files, Options, and Schedule. To change information, click the appropriate button.

- **Source** lets you choose a StorageSet and SnapShot from which to copy.

- **Destination** lets you specify the volume to which to copy.
- **Selecting** lets you choose a Selector, a kind of filter for selecting files and folders to be restored. See Chapter 23 • Using Selectors, which starts on page 151.
- **Options** displays the options window in which you can specify whether to recompute icon positions or update modify dates of files. The default options suit most people but for more information see Chapter 24 • Execution Options, which starts on page 168.
- **Schedule** lets you set the script to run at specific times or at regular intervals. See Chapter 15 • Scheduling Scripts, which starts on page 91.

Setting the Source

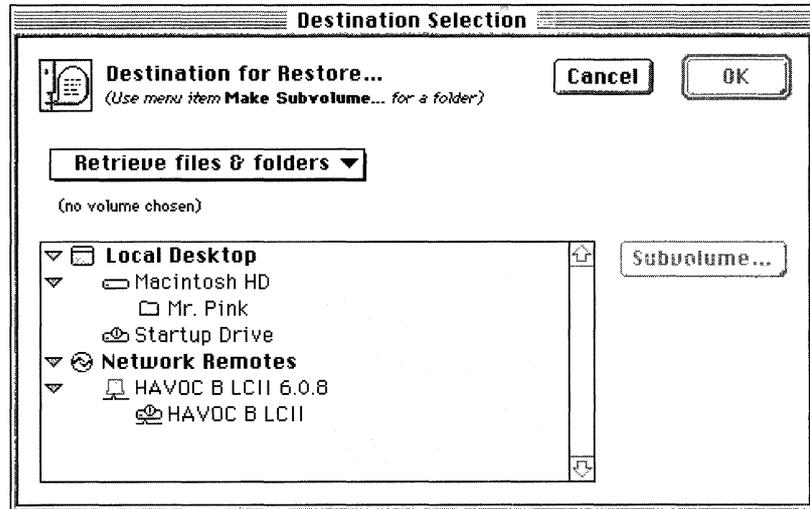
Because this is a new script, Retrospect says “StorageSet not chosen” in the script summary window. Click the Source button to get a window with a list of StorageSets and SnapShots.



From the top list, click on a StorageSet name to select it, then click on a volume name to select a SnapShot from the bottom list. (If the StorageSet you want is not listed, click More then Open to locate it.) Click OK when the StorageSet and Snapshot are selected. The StorageSet and Snapshot date, time, and volume name are listed in the script window.

Setting the Destination

Because this is a new script, Retrospect says “volume not chosen” in the script window. Click the Destination button to get the volume selection window with its familiar volumes list.



As with an immediate restore (which you learned about in Chapter 11), select a volume on which you want Retrospect to place the restored files and set the pop-up menu to determine how Retrospect restores those files to the destination. (See page 61.) Click OK to continue and return to the script summary window.

At this point, you have given the minimum information required for the script to run. You may also change the file selection criteria, change the options, or schedule the script. Click the script window’s close box and save your changes.

You can now execute the script in any manner you wish. For details see Chapter 16 • Executing Scripts, which starts on page 99.

CHAPTER 20 • BACKUP SERVER SCRIPTS

Backup scripts, explained in Chapter 14, are powerful and versatile, but in backup environments which change regularly, another kind of operation—Backup Server—may be better suited to your needs. A regular backup script copies specific volumes in a certain order to a designated StorageSet. If the backup environment changes and volumes or media become unavailable, the backup will not happen until its next scheduled time, if ever. This is why Retrospect includes Backup Server technology.

Backup Server Benefits

Retrospect's Backup Server technology accommodates changing network and disk configurations. Whereas a regular backup script follows a rigid schedule for its clearly defined source volumes and destination StorageSets, a Backup Server script is driven by the availability of those resources and their need for backup. Source volumes are backed up in order according to need—that which was backed up least recently is first to be backed up. The volumes are copied to the best available StorageSet media, so Backup Server scripts give you greater freedom to use the media of your choice.

Backup Server scripts are ideal for environments in which computers and volumes irregularly appear on the network. For example, in an office that has PowerBooks and ejectable disks which appear on the network at unpredictable times, the Backup Server recognizes the new volumes when they become available and backs them up. Remote users can even initiate backups of their volumes, an otherwise unavailable feature.

Though Backup Server scripts can be used independently, it is often best to use them in concert with regular backup scripts to produce a comprehensive backup strategy.

When to Use Backup Server

The table below compares a regular backup script to a Backup Server script.

Feature	Backup Script	Backup Server Script
Destination StorageSets	Copies to a single StorageSet as specified in the schedule or at execution. Fails if media is unavailable. Media rotation is scripted.	Copies to the most ideal available StorageSet in the destinations list. Automatic media rotation among multiple available StorageSets.
Source Volumes	Backs up volumes in the order of the source list. If a backup fails, the next backup does not occur until the next time the script runs.	Backs up volumes in the priority order of their most recent backup dates. After each backup, the queue is re-evaluated, including previously unavailable volumes.
Schedule	Starts backup at a specific time and stops when the last source is completed. Optionally ends at a specific time.	Runs between start and stop times. Backups of available volumes occur as necessary.
Execution	One script runs at a time. Conflicting scripts run one after the other.	All Backup Server scripts run concurrently. Other scripts run as scheduled, but not while Backup Server backs up a volume.
User Requested Backups	No.	Yes.

See “Network Backup Strategies” on page 201 for descriptions of situations which are suited to a Backup Server and for instructions on implementing a strategy based on a Backup Server.

How the Backup Server Works

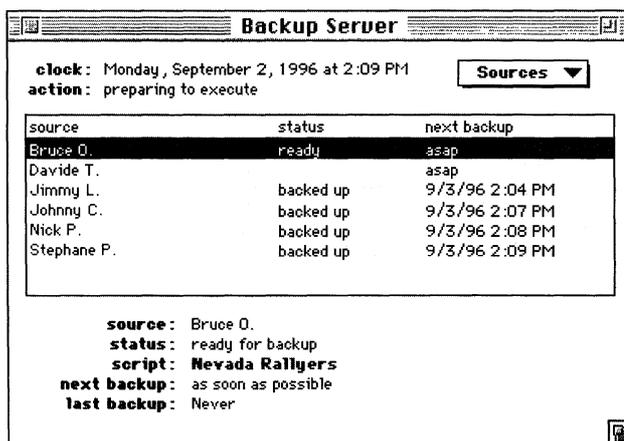
You start with a Backup Server script, which is similar to other Retrospect scripts. You may want to dedicate a Macintosh to Backup Server operations during periods of activity and avoid running other programs while the Backup Server is active. The Backup Macintosh running the script becomes a Backup Server during its scheduled time of operation and is idle during its scheduled period of inactivity, when you may use it for other purposes.

The Backup Server determines which backup media is available and makes a queue based on the most recent backups of the source volumes. The least

recently backed up volume is moved to the head of the queue and other volumes are arranged in descending order according to the priority of need. Then the Backup Server examines the Local Desktop and polls the network, looking for the volumes.

- **Note:** Polling the network does not adversely affect network performance because Retrospect uses a point-to-point protocol, not a broadcast protocol.

The Backup Server starts at the top of the volumes queue, determining the availability of each source volume and, if there is a choice, backing up each to its most suitable StorageSet. Retrospect moves the most recently backed up volumes to the bottom of the queue as it goes along. When it is satisfied that all available source volumes are backed up for the current backup interval, the Backup Server periodically polls Remotes on the network. Polling involves checking for volumes which have recently appeared, and checking whether any Remote users have requested backups of their volumes. This whole process ensures a volume in need of backing up gets it.



The Backup Server status window.

If allowed by the backup administrator and the Backup Server, a Remote user can, at any time, request to be backed up as soon as possible. This moves the user's Remote volume up in the queue.

When the Backup Server script's wrap-up time is reached, Retrospect continues the current volume backup but will not start any new backups. When the script's stop time is reached, Retrospect halts the backup in

progress, if any, and will not start any new backups until the script's next scheduled start time.

- **Note:** The Backup Server uses only the normal backup action because full and new backups are inappropriate for use with a Backup Server script.

Managing Resources

With abundant resources (large storage capacity, fast network, and powerful Backup Macintosh with plenty of time to operate) and relatively few source volumes, the Backup Server can completely back up all volumes during its window of opportunity. However, with limited resources (small storage capacity, slow network, slow Backup Macintosh with little time to operate) and relatively many source volumes, the Backup Server is not likely to completely back up each volume during its given time period. Fortunately, Retrospect's Backup Server effectively manages limited backup resources so that it eventually completes all of its backups.

Trust Backup Server to Do Its Job

Whether your setup is resource-lacking or resource-abundant, the Backup Server always backs up the volumes in order starting with those which need it most. For example, if you need to back up 100 Remote computers but you can do backups only during an eight hour period each night, chances are Retrospect will be unable to back up all 100 Remotes the first night before the script's eight hours are up. Leftover volumes will be backed up the next night, and so on, until all 100 volumes are backed up. After the initial backups, the Backup Server will move more quickly through the queue as it performs subsequent incremental backups.

As the backup administrator, you do not have to separate the Remotes into different groups for different days based on your estimation of backup times. The Backup Server distributes the load over the scheduled time period.

The main thing to remember about the Backup Server is that all of the source volumes eventually are backed up with no additional effort on your part. In the worst case, the period of time between backups of a given volume will be too long for comfort and you must allot more resources.

If you want your volumes to be backed up more often than they are, you must allocate more resources to the Backup Server script. Increase the script's operating time, use Selectors to limit the files to back up, use a faster Backup Macintosh, or speed up your network. Setting up a second Backup Macintosh with the Backup Server handling half of your Remotes effectively divides the load in half for each Backup Macintosh.

Monitoring Progress

Periodically view the Backup Report (see page 208) to see which volumes were backed up by the Backup Server and their intervals between backups. Of particular interest is the "Days" column which shows how many days have passed since each volume's previous backup.

- **Note:** The interval between backups will tend to be smaller when the Backup Server is performing incremental backups after the first backup of each volume. Incremental backups require far less time for most volumes and thus can occur more often.

Deleting a backup event from the Backup Report causes the Backup Server to not consider that backup occurrence when it evaluates the priority of volumes to be queued for backup. Consequently, that volume is given a backup priority higher than its previous priority.

Interaction with Other Scripts

You can use multiple Backup Server scripts operating simultaneously to manage limited backup resources. You can use separate scripts with different schedules to give some volumes a higher backup priority.

For example, one script could run eighteen hours in a day, backing up volumes from the sales department. Another script could run six hours in a day, backing up volumes from the accounting department. The sales department would be more likely to get completely backed up, whereas the accounting department script may not complete all its volumes in a single six hour period. Still, these volumes would eventually get backed up because volumes in greatest need of backup are backed up before volumes which have more recent backups.

As another example, consider portable volumes such as PowerBooks and removable cartridges. Another script could back them up twenty-four hours

a day, because they are available at random times during the day. For further discussion of Backup Server strategies, see Chapter 28 • Backup Strategies, which starts on page 199.

Other, non-Backup Server scripts scheduled for execution during the active operating time of Backup Server scripts can run without conflict. When a regular script wants to run while the Backup Server is backing up a volume, the Backup Server completes the backup in progress, then allows the other script to execute. When the regular script finishes, the Backup Server resumes where it left off. When a regular script is scheduled to run while the Backup Server is idle, it executes immediately.

Backup Server Tips and Techniques

Choose the Right Backup Server Macintosh

The Macintosh you use for the Backup Server is important. Backup Server scripts work best on a dedicated Backup Macintosh that is not running other file serving or sharing software. The Backup Server can run effectively on mid-range Macintosh models, but, of course, a high-end PowerPC model helps get things done more quickly.

The Backup Server does not quit or shut down the Backup Macintosh when it is finished; rather, it waits idle until the next scheduled start time.

Rotate Among StorageSets

Create multiple StorageSets and rotate through the sets by inserting different media in the backup device each day. The Backup Server uses whatever media you inserted.

Introduce New Media

As with any backup strategy, rotate among different StorageSets. The Backup Server makes this easy, as it allows you to insert different media at your leisure. Periodically do new backups to introduce new media. Store old media off-site after each new backup. Between new backups, periodically do full backups to avoid catalogs eventually becoming cumbersome and to ensure fast restore operations should they be necessary.

When you want to rotate or introduce new media, do full or new backups by executing regular backup scripts using the same StorageSets used by your

Backup Server scripts. You can schedule these, execute them from Retrospect's Run menu, or save them as run documents and execute them.

To manually set a StorageSet for a full or new backup, configure the StorageSet and use media control. (See "Media Control" on page 216.)

Monitor Media Availability

Because the Backup Server does not put up media request windows, you may not know when it does not have a legitimate medium available to it. When it needs media it shows "media" in the status column of the status window when the pop-up menu is set to either Sources or StorageSets. Choose StorageSets from the status window's pop-up menu so the window shows which destination StorageSets have media available and which do not. Insert media as needed.

If a StorageSet needs a new or erased medium and you have to erase one, stop the Backup Server, use Retrospect to erase the medium, then start the Backup Server again.

Use Other Scripts to Complement the Backup Server

Retrospect can have multiple Backup Server scripts running concurrently, and it will manage the sources and destinations.

Other, non-Backup Server scripts can execute while the Backup Server is running. You can schedule them or run them at will. Other scripts can complement Backup Server scripts by starting full and new backups, and by forcibly backing up volumes which do not get backed up by the Backup Server.

Autoloaders

A tape autoloading device with the Backup Server is a powerful combination. All tapes in the loader's magazine are available for backup as StorageSet destinations. The Backup Server rotates between sets with no additional effort from you. Blank or erased tapes are used when a backup spans over two tapes, or when you set up a new backup with Retrospect's media control.

Manage User Deferments

When a Remote user repeatedly defers his or her backups, you should make future backups occur at a time which is more convenient for the user, such

as when he or she is not using the computer. Or, create a script with the countdown time option at zero to prevent the user from deferring execution.

Avoid Creeping Backup Intervals

Each source's incremental backup interval (specified by the option `Back up every: n hours/days`) is based on the start time of its first, full backup. However, due to overhead, intervals often grow by a minute or two. For example, a volume is first backed up on Thursday at 9:30, then is next backed up on Friday at 9:33. This "creeping" is continual, so that, using the same example, subsequent backups may occur at 9:35, 9:38, 9:40, and so on. This is of no concern if the Backup Server script is scheduled to run twenty-four hours, but a more limited schedule has the possibility of a backup eventually creeping past the stop time and not backing up the source during that one period. Having not been backed up, the source is obviously given high backup priority when the scheduled Backup Server script next starts.

Creeping is not an issue when the Backup Server operates twenty-four hours per day, or when backup resources are limited to the point that the Backup Server cannot complete all backups at the minimum intervals. That being said, if your Backup Server does not run all day and all night, you can prevent creep from ever occurring by setting the backup interval to twenty-three hours.

Set Priority by Volumes

If certain critical volumes are not getting backed up as often as you would like, consider using multiple scripts with different schedules to give some volumes higher backup priority than others. Schedule the higher-priority volumes script to run for a longer duration than the lower-priority volumes script. With more time allotted to the higher-priority volumes, they are more likely to get completely backed up.

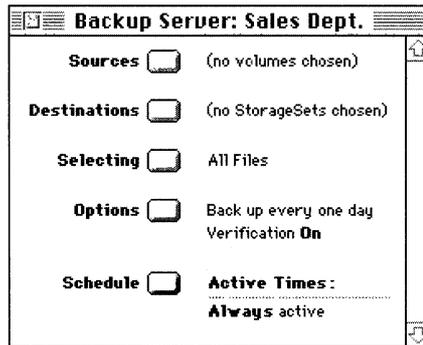
Set Priority by Files

If you find the Backup Server is not completely backing up all its sources, another way to set the backup priority is by files rather than volumes, though you can also do both. Use multiple scripts with different Selectors to give some files or folders higher backup priority than others. For example, a higher-priority Selector would include documents modified in the last seven days, and a lower-priority Selector would include all files. Schedule

the higher-priority script to run for a longer duration than the lower-priority script.

Creating a Backup Server Script

From the Retrospect Directory's Automate tab, click Scripts, then click New in the window which appears. The next dialog asks which type of script you want to make; select Backup Server and click OK. Enter its name and click New. The script summary window appears.



As with regular backup scripts, click Sources to add source volumes with the volume selection window and click Destinations to add destination StorageSets with the StorageSet selection window. Click Selecting to apply a predefined or custom Selector to the source volumes.

So far, these elements are just like those in regular backup scripts, but you will see Backup Server scripts are radically different in terms of options and scheduling.

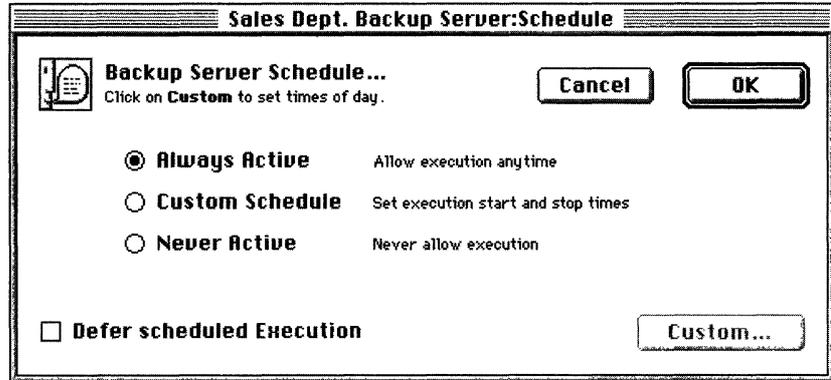
Script Options

From the Backup Server script summary window, click Options to display the basic Backup Server options.

Click More Choices to see all of the available options categories and notice that many categories parallel those of regular backup scripts. Categories specific to Backup Server scripts are Backup Server, Remote Countdown, and Polling. These are detailed in Chapter 24 • Execution Options, which starts on page 168.

Setting the Schedule

A Backup Server script's schedule is one of the major differences between it and a regular backup script. From the script summary window, click the Schedule button. The following window appears.



Select a schedule:

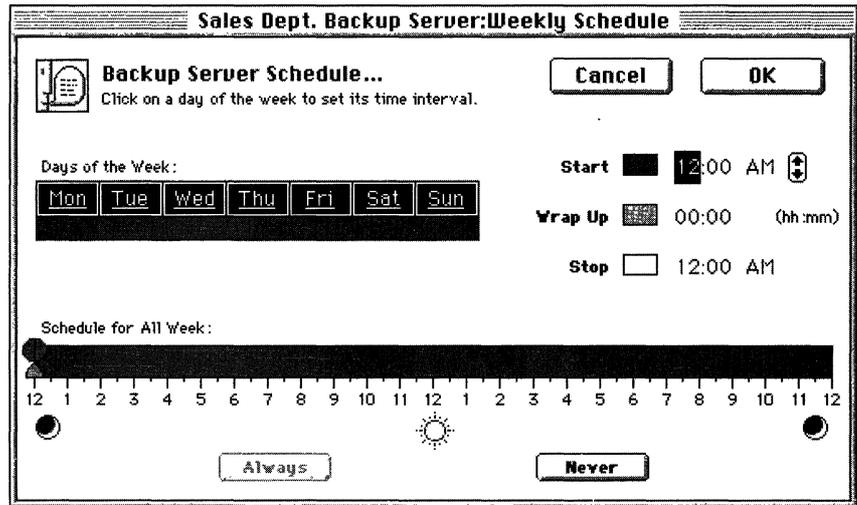
- **Always Active** makes Retrospect run the script twenty-four hours a day, seven days a week.
- **Custom Schedule** brings up another window in which you can customize the script schedule. This is described below.
- **Never Active** prevents Retrospect from running the script.

The Defer Scheduled Execution checkbox prevents the Backup Server from running until the time you specify.

Click OK when you have selected or deferred a schedule.

Customizing the Schedule

When you select Custom Schedule and click Custom, you get the custom schedule window. Though similar to the Schedule Preferences window, it is specific to this Backup Server script rather than global to all Retrospect executions.



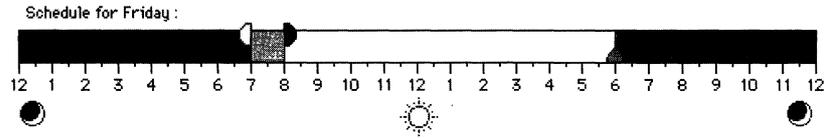
If the schedule was previously Always Active, all twenty-four hours of each of the seven days of the week are selected, as above.

To select a day of the week, click on it. Click and drag to select contiguous days of the week. Use the Shift or Command key and click or drag to select days without de-selecting the previous selection.

To change a time, click on it and type or use the control.

- **Start** is the time at which the script begins.
 - **Wrap Up** is the period of time (in hours and minutes) before the stop time, during which Retrospect should complete the current backup but not begin new backups.
 - **Stop** is the time at which Retrospect absolutely must halt this script's backups (until the next start time).
- ◆ **Tip:** You can also set times by dragging the icons on the hourly schedule bar, but you should first experiment by typing the times to see how these controls work.

When a time is changed, the hourly schedule bar changes accordingly to graphically represent the start, wrap-up, and stop times of the script.



Each selected day has a scaled-down hourly schedule bar, though it does not have controls.



You can revert a customized schedule with the Always and Never buttons.

Using the Backup Server

Automatic Starting

When you save a Backup Server script, the Backup Server is enabled after the Backup Macintosh is idle (that is, no mouse movement, clicks, or keystrokes) for ten minutes. Retrospect starts the Backup Server when a script's scheduled start time arrives. If Retrospect is not open at the start time, it will open automatically.

Run Menu

After you have saved at least one Backup Server script, Retrospect's Run menu includes two new items: Start Backup Server and Disable Backup Server. Choose Start Backup Server to manually enable the Backup Server, which will then run Backup Server scripts at their scheduled times of execution.

Choose Disable Backup Server from the Run menu to prevent any scheduled Backup Server scripts from executing until you later choose Start Backup Server or Enable Backup Server to re-enable the Backup Server.

Control Menu

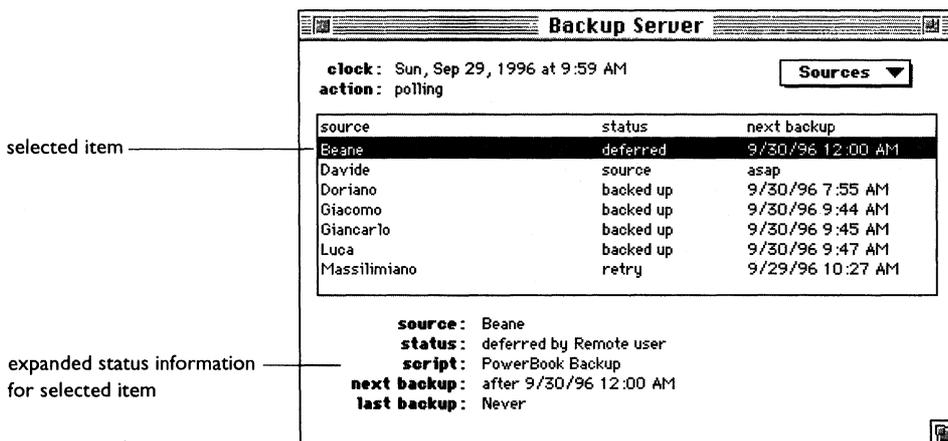
When the Backup Server is running, Retrospect has a Control menu on its menu bar. Following is a list of its items and descriptions of their functions:

- **Show Log** displays the operations log.
- **Stop on Errors** makes the Backup Server halt when it encounters any error, rather than just logging the error and continuing.
- **Just Log Errors** ensures the Backup Server continues operating when it encounters an error, rather than halting execution. You can find any errors which occur by viewing the operations log.

The Backup Server Control menu items parallel their counterparts of the Control menu available when regular scripts are running.

Status Window

When the Backup Server is running, the status window shows you what it is doing. Click its zoom box to expand it for more information.



Use the pop-up menu to choose a status category:

- **Sources** shows the source volumes from all running scripts.
- **StorageSets** shows the StorageSets from all running scripts.
- **Scripts** shows all running scripts.

Retrospect lists the status of each item under the status heading.

- *Blank* means the Backup Server has yet to connect with the item.

- **Active** means the script is functioning.
- **Asap** means the source will be backed up as soon as possible, possibly because the Remote user initiated the backup.
- **Backed up** means the source volume has been backed up within the specified interval.
- **Deferred** means the Remote user has intercepted and postponed the backup.
- **Inactive** means the script was deactivated.
- **Media** means the Backup Server cannot find the proper media for the item's StorageSet.
- **Ready** means a source is currently being backed up or is about to be. It also means a StorageSet is ready as a backup destination.
- **Retry** means the Backup Server failed to back up the source and will try again.
- **Scheduled** means the source has never been backed up, but the administrator has scheduled a pending backup.
- **Source** means the Backup Server cannot find the source volume.
- **Wrap up** means a Backup Server script is in its wrap up period.

Click on an item to see more status information in the lower part of the expanded status window.

Closing the Status Window

Click the Backup Server status window's close box to stop all scripts in progress. When one or more scripts are scheduled, Retrospect waits a period of time, then the Backup Server starts and executes scheduled Backup Server scripts. The wait period is ten minutes if you are still using Retrospect, or one hour if you quit Retrospect.

Deactivating a Script

Retrospect allows you to deactivate a Backup Server script so its sources are not included in the Backup Server's routine operations. However, the sources may be in other scripts which are not affected by deactivation of a particular script.

To prevent a Backup Server script from executing, first choose Scripts from the Backup Server status window's pop-up menu. Then select the script from the list and choose Deactivate Script from the Server menu.

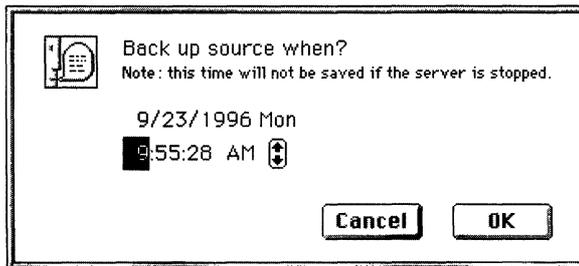
Reactivating a Script

To allow a deactivated Backup Server script to execute and include its sources in the Backup Server's routine operations, follow the same steps but choose Activate Script from the Server menu.

Scheduling a Backup of a Source

Retrospect allows you to schedule a backup of a source from a running Backup Server script. This lets you set a definite time for the Backup Server to back up the source, rather than wait for the Backup Server to back it up at its convenience. This is useful, for example, when the backup administrator knows a salesperson will be leaving the office with her PowerBook. The administrator can schedule that Remote for backup immediately.

To schedule a backup of a source, first choose Sources from the Backup Server status window's pop-up menu. Then select the source from the list and choose Schedule Backup from the Server menu (or double-click on the source), which brings up the following dialog.



Use the controls to set the date and time to back up the source, then click OK. Retrospect changes the priority of the source in the Backup Server queue according to your scheduled time.

A backup scheduled this way is not remembered by Retrospect when the Backup Server is stopped.

Resuming the Paused Backup Server

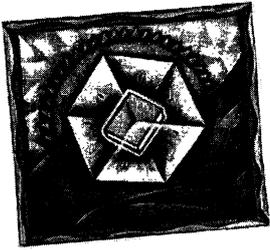
When you use the Backup Server Macintosh's mouse or keyboard while Retrospect is the active application, Retrospect pauses the Backup Server in anticipation of you issuing commands. The Backup Server automatically resumes after two minutes of mouse or keyboard inactivity.

To resume the paused Backup Server before the two minutes have passed, choose Resume Server from the Server menu.

Backup Server Runs Continuously

Unlike other scripts, when Backup Server scripts finish they do not take the action specified by the Unattended preference. For example, a Backup Server script will not quit when done. If you quit Retrospect, the Backup Server will automatically launch Retrospect when the next script is scheduled to start.

SECTION VII



Power Features

- WORKING WITH VOLUMES
- BROWSING
- USING SELECTORS
- EXECUTION OPTIONS
- CONTROLLING EXECUTIONS
- APPLESCRIPT SUPPORT

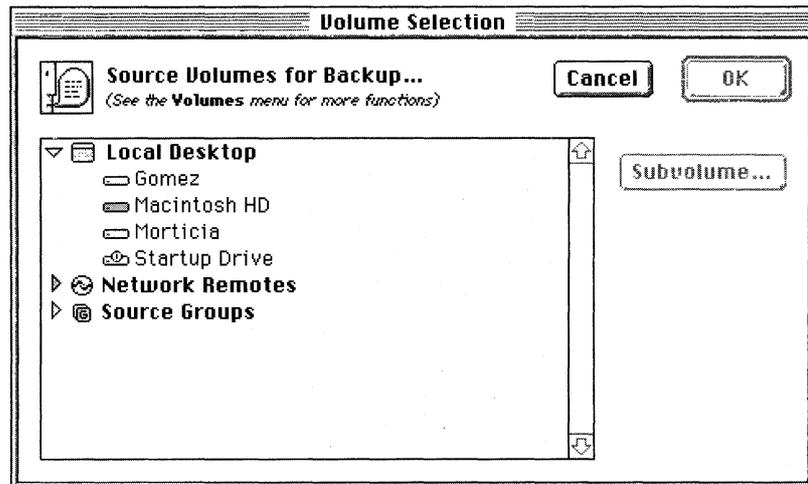
Retrospect has a number of features which go above and beyond the basics required for backup and restore operations. Your knowledge of these features is not essential to use Retrospect, but knowing them allows you to work with the program faster and more efficiently.

CHAPTER 21 • WORKING WITH VOLUMES

A volume is the Macintosh representation of a random-access storage device, such as a hard disk drive or partition, removable cartridge, floppy disk drive, or CD-ROM disc drive. It can also be a file server mounted on the Desktop. A volume is the basic storage unit containing files and folders. Retrospect uses volumes as sources for backups and other operations and helps keep track of files with volume SnapShots.

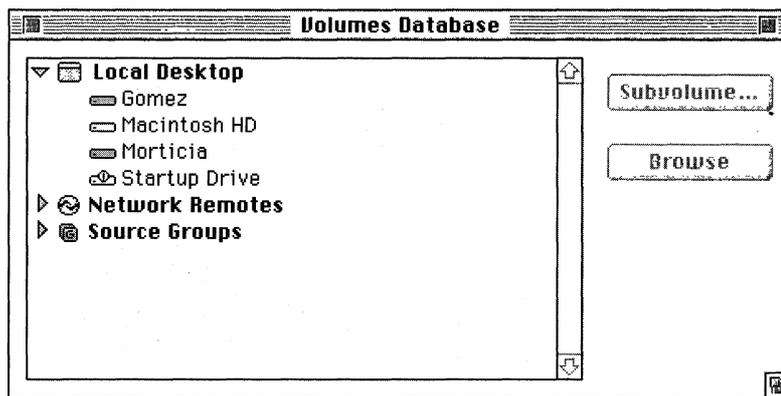
Volume List Windows

Many Retrospect operations use the volume selection window for you to select one or more volumes for the operation at hand.



The volume selection window for an immediate backup.

Though some features may not be available for some operations, this window is very similar to the volumes database window.



The volumes database window.

Using either window is fairly straightforward; you click on the volumes you want, then click a button or choose a menu item to proceed or act on the selected volume. However, the window's list is organized for and includes controls for more involved navigation and selection of the listed volumes.

To practice the techniques described here, open the Retrospect Directory's Configure tab, then clicking the Volumes button.

The volumes listed in the scroll box are organized in an outline format similar to that of the Finder's "view by name" list view.

Outline Controls

In a volume list window, the triangle icons on the left work just like those in the Finder. Click on a ▶ icon to show the contents of its container or folder. Click on a ▼ icon to hide the contents of its container or folder.

Selecting

In a volume list window, you click on a volume to select it. This de-selects any other selected volumes.

Original Selection	After Clicking on Macintosh HD
<input type="checkbox"/> Gomez <input type="checkbox"/> Macintosh HD <input type="checkbox"/> Morticia <input checked="" type="checkbox"/> Startup Drive	<input type="checkbox"/> Gomez <input checked="" type="checkbox"/> Macintosh HD <input type="checkbox"/> Morticia <input checked="" type="checkbox"/> Startup Drive

Press and hold the Command key and click a volume to select it without deselecting any currently selected volumes. You can make a multiple non-contiguous or contiguous selection this way.

Original Selection	After Command-Clicking on Macintosh HD
<input type="checkbox"/> Gomez <input type="checkbox"/> Macintosh HD <input type="checkbox"/> Morticia <input checked="" type="checkbox"/> Startup Drive	<input type="checkbox"/> Gomez <input checked="" type="checkbox"/> Macintosh HD <input checked="" type="checkbox"/> Morticia <input checked="" type="checkbox"/> Startup Drive

Press and hold the Shift key and click a volume to select all volumes listed from the current selection to the Shift-clicked volume. This is called a contiguous multiple selection.

Original Selection	After Shift-Clicking on Macintosh HD
<input type="checkbox"/> Gomez <input type="checkbox"/> Macintosh HD <input type="checkbox"/> Morticia <input checked="" type="checkbox"/> Startup Drive	<input type="checkbox"/> Gomez <input checked="" type="checkbox"/> Macintosh HD <input checked="" type="checkbox"/> Morticia <input checked="" type="checkbox"/> Startup Drive

These methods of making individual and multiple selections work throughout Retrospect, not just in the volume list.

Containers

Retrospect has three containers for organizing volumes, Remotes, and groups thereof. In a volume list, items are grouped under the three containers Local Desktop, Network Remotes, and Source Groups.

- ▶  **Local Desktop**
- ▶  **Network Remotes**
- ▶  **Source Groups**

Local Desktop

The Local Desktop container holds volumes mounted on the Backup Macintosh Desktop. This may include the internal hard disk, an inserted floppy disk, external drives, and file servers.

When you select the Local Desktop container itself, you are instructing Retrospect to select all such volumes on the Backup Macintosh, except for floppy disks, shared volumes (such as file servers), read-only volumes (such as CD-ROMs), and empty volumes.

The following table shows some examples of Local Desktop container selections and the volumes to which they resolve. (For example, if the selection were used in a backup operation, the resolved volumes would be backed up.)

Using this selection...	...resolves to these volumes.
<ul style="list-style-type: none">  Local Desktop  Gomez  Macintosh HD  Morticia  Startup Drive 	<ul style="list-style-type: none"> Gomez Macintosh HD Morticia Startup Drive
<ul style="list-style-type: none">  Local Desktop  Marcom  MongoWriter Install 1  Startup Drive 	<ul style="list-style-type: none"> Startup Drive
<ul style="list-style-type: none">  Local Desktop  Marcom  MongoWriter Install 1  Startup Drive 	<ul style="list-style-type: none"> MongoWriter Install 1 Startup Drive

Network Remotes

The Network Remotes container holds Remote Macintosh computers which are logged in to Retrospect. Remotes themselves contain one or more volumes, which are made available according to how they are configured with the General tab of the Remote configuration window. For details, see the *Retrospect Remote Administrator's Guide*.

Source Groups

The Source Groups container holds volumes grouped together for better organization. Groups, which you define, do not contain the actual volumes themselves, but aliases like the Finder which “point” to actual volumes (which are in Local Desktop or Network Remotes). For example, you could make an Accounting group containing the volumes from the accounting department. Later when you are creating a backup script, instead of tediously selecting each individual accounting volume, you can just select the Accounting group and Retrospect knows you mean all of the volumes within that group. Source Groups are not available in volume lists in duplicate and restore operations.

Creating Groups

To create a new group, choose Make Group from the Volumes menu. After you enter its name in the dialog, the new group appears under the Source Groups container. Any items that were highlighted when the group was created will belong to the new group.

Adding Volumes to Groups

You can drag any volume from the Local Desktop and the Network Remotes containers into a group.

Arranging Group Items

You can drag any volume out of one group and into another group. You can drag a volume to a different location within its group to rearrange the order of the group.

Removing Groups

You can remove an unwanted group or item by selecting it and choosing Forget from the Volumes menu or pressing the Delete key.

Folders

You can make folders to help organize the information which appears in the volume list window. For example, while setting up a backup you can select a folder as a backup source and Retrospect will use the volumes in the folder. These folders are specific to Retrospect and do not appear outside the program.

When you make a folder in the volume list it does not make an actual folder on an actual volume. When this manual mentions folders, it generally means those actual Macintosh folders, except within the context of containers and the volume list, as described here.

Creating Folders

To create a folder, choose New Folder from the Volumes menu. Retrospect asks whether you want the folder in the Local Volumes container or the Network Remotes container. After you make your choice, the new folder appears in the list.

- ▼  **Local Desktop**
 - ▢ Gomez
 - ▢ Macintosh HD
 - ▢ Morticia
- ▼  My local folder
 - 📁 Startup Drive
- ▼  **Network Remotes**
- ▼  **Source Groups**

Arranging Folders

You can drag any volume into or out of a folder to better organize the list of volumes. Just like folders on a hard disk, folders are useful for hiding numerous items to avoid cluttering your work space. For example, if you are administering a large number of Remotes, you can arrange them in a logical order by placing the individual volumes into their respective department folders, such as Accounting, Engineering, and Manufacturing.

Removing Folders

You can remove an unused folder by selecting it and choosing Forget from the Volumes menu or pressing the Delete key. However, you must move its contents out of the folder before you Forget it.

Subvolumes

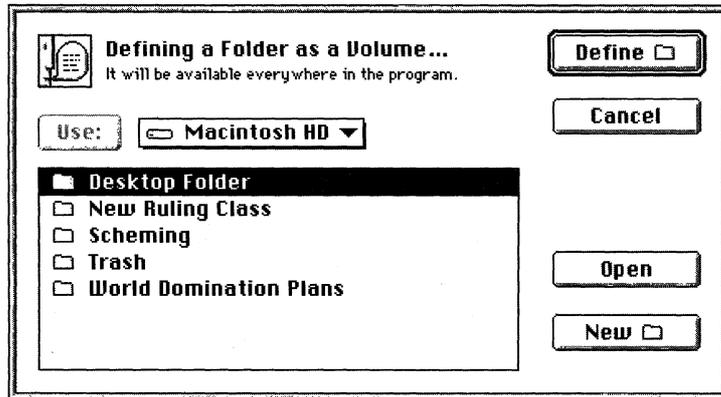
A Subvolume is a folder on a volume you define to work like a volume for use within Retrospect. After a folder is designated as a Subvolume it can be specified as a Source or Destination for Retrospect operations. Subvolumes have no function outside Retrospect and their mere existence does not affect your volume's files and folders in any way.

If you only want to back up files in a single folder, specifying a Subvolume (instead of specifying a volume and using a custom Selector) reduces the file scanning time, minimizes the number of files displayed in a Browser, and reduces the amount of memory required to scan and display in a Browser.

Retrospect treats a Subvolume as another volume on your system. Once it has been defined as a Subvolume, you may rename the folder in the Finder and Retrospect will continue to recognize it—with its new name—as a Subvolume. However, if you remove the folder, Retrospect will not be able to locate the Subvolume, even if you put a new or different folder with the same name in its place.

Specifying Subvolumes

In a volume list, select a volume, then choose Make Subvolume from the Volumes menu or click the Subvolume button in the window. A dialog appears, listing folders at the top level of the selected volume.



The Subvolume definition dialog.

You can specify any folder in the selected volume as a Subvolume, including folders nested deep within the folder hierarchy. Select the folder you want to specify as a Subvolume and click Define. (To define the folder name currently displayed in the pop-up menu as a Subvolume, click Use.) The Subvolume folder, identified by the  icon, then appears with the volumes in the volume list.

- ▼  **Local Desktop**
 - ↳ Gomez
- ▼  **Macintosh HD**
 - ↳ **World Domination Plans**
 - ↳ Morticia
 - ↳ Startup Drive
- ▼  **Network Remotes**
- ▼  **Source Groups**

Redundancy

If you specify both a Subvolume and its parent volume as Sources, they will be treated as separate objects. However, operations involving the parent volume will include the contents of the folder designated as a Subvolume.

Discarding Defined Subvolumes

To discard a Subvolume definition, select the Subvolume and choose Forget from the Volumes menu or press the Delete key. Forgetting a Subvolume does not affect the contents of the original folder or any file you may have already backed up from it.

Volume Utilities

The Volumes menu has commands for renaming, ejecting, putting away, and erasing listed volumes.

Rename

To change the name of a volume, select it and choose Rename from the Volumes menu. Enter a new name in the dialog which follows then click the Rename button.

Eject

To eject removable media from a drive, select its volume name and click the eject button or choose Eject from the Volumes menu.

Put Away

To unmount a mounted volume (such as a server), select its volume name and choose Put Away from the Volumes menu.

Erase

To erase the contents of a volume, select it and choose Erase from the Volumes menu. Be careful; this command removes all files from the volume.

Forget

To remove a volume from the list, select it and choose Forget from the Volumes menu. You may Forget any volume Retrospect has previously accessed, but not currently mounted volumes, including floppy disks, and shared volumes.

Configuring Shared Volumes and Remotes

Configure Password

You can make Retrospect use a password to automatically mount a shared volume when it is needed—typically, while executing a backup script—and unmount it when Retrospect is done with it. To configure the password of a shared volume, such as from a file server, select the volume and choose Configure from the Volumes menu. The password configuration dialog appears, listing the server, volume, and user names. Enter the password in the space provided, then click OK.

Configure Remote

To configure a Remote, select the Remote or one of its volumes from the list and choose Configure from the Volumes menu. The Remote configuration window appears. For details on how to use this window, see the *Retrospect Remote Administrator's Guide*.

Browsing

The volumes database window has a Browse button which is not found in the similar Volumes Selection window. To view and work with the contents of a volume, select the volume and click the Browse button to open a Browser. Browsing a volume is explained in detail in the following chapter.

CHAPTER 22 • BROWSING

Browsers are Retrospect's powerful tools for viewing, selecting, and manipulating files and folders on your source and destination volumes. From within Retrospect, Browser windows provide file management facilities similar to those in the Finder, and include other features not available in the Finder.

Browsers “unfold” the contents of a volume so you can work with all of its contents all at once. This is better than the folder-oriented structure of the Finder, which does not let you select multiple files within different folders, or a flat-file structure, which loses the hierarchy organization.

Browsers allow you to see the files chosen for backup, restore, duplicate, and copy operations. You can also use Browsers in a “stand-alone” manner to view and manage the contents of volumes. In backup, restore, duplicate, and copy operations, Browsers show you which files have been chosen by the Selectors you have designated.

With Browsers, you can save your file and folder selections as a “saved highlights” Selector that can be used in other backup, restore, duplicate, and copy operations. For example, you could use a Browser to select folders of current client data and save the highlighted folders as a Selector that you can use in a backup script.

You can open any number of Browser windows, including different Browsers for the same volume. You can also leave Browser windows open while performing other Retrospect operations and switch back and forth between Browser windows and other Retrospect windows.

When a Browser window is active, Retrospect adds a Browser menu to the menu bar. It has commands for selecting and managing folders and files in the Browser listing. These commands are described later in this chapter.

Viewing a Stand-alone Browser

To view a stand-alone Browser of a volume, go to the Retrospect Directory's Configure tab and click Volumes. The volumes database window appears, listing the names of available volumes. Select a volume, then click Browse. Retrospect scans the selected volume, then displays a Browser window listing all the folders and files contained in the selected volume.

To view a stand-alone Browser of a StorageSet, see “Viewing StorageSet Contents” on page 213.

Viewing a Browser from an Operation

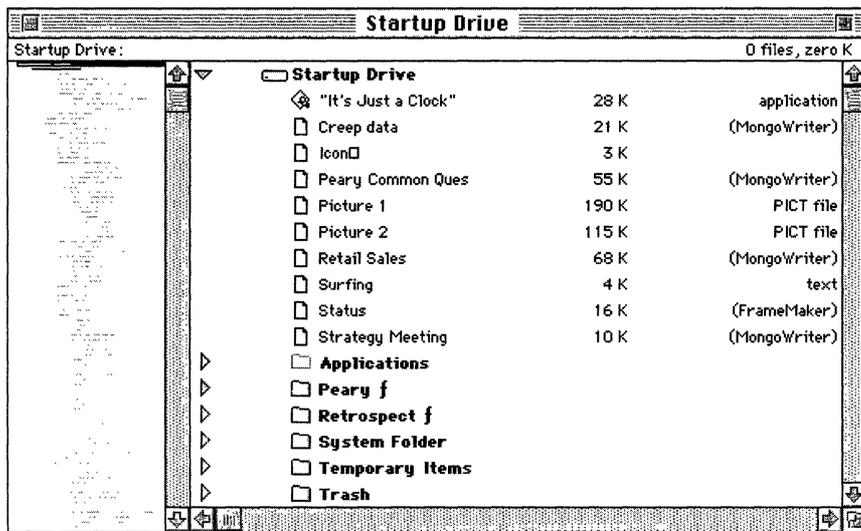
To view a Browser within an immediate backup, restore, duplicate, or copy operation, click the summary window button named either Files Chosen or Preview. Retrospect displays a Browser window for each source.

Browsers and Scripts

You cannot use a Browser within a script because scripts are meant for unattended execution at a later time. Using a Browser would not be useful because a volume's contents are likely to change between the time you edit the script and the time the script is executed.

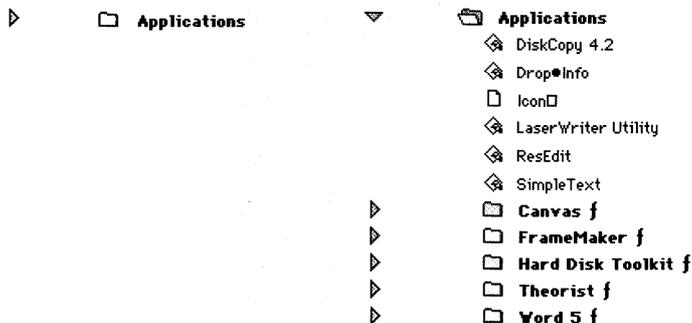
About Browsers

A Browser window displays a hierarchical file list of folders and files in the selected volume.



A Browser window.

At the top of the list (and at the highest level of the hierarchy) is the name of the volume. Folders have triangle icons to their left; click a triangle to show the contents of the folder. Click the triangle icon again to hide the contents of the folder. Open folders have different icons, , than closed folders, , and their triangles point downward rather than to the right.



Folder with contents hidden.

Folder with contents showing.

The scrolling folder index on the left of the window provides a thumbnail view of the folders on the volume. Click on the folder index to display the associated file list on the right side of the window. The pathname of the current selection is shown above the index. Tick marks in the folder index indicate the location of selected items in the file list. Index lines appear grey for unopened folders or black for open folders.

A highlight count in the upper right corner of the window indicates how many files are highlighted and shows their total size.

Selecting Files and Folders

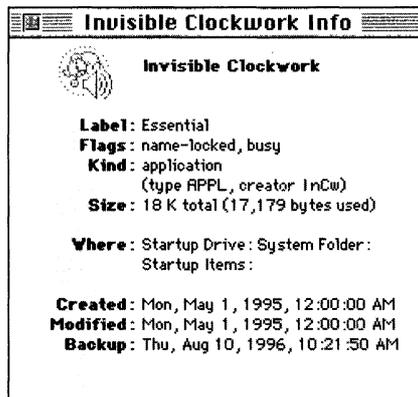
In a Browser window, you select files and folders on which to perform operations. Select files by clicking on entries in the file list. Drag through the list or Shift-click to select a range of files or folders. Command-click to select or deselect non-contiguous items. Select all items by choosing Select All from the Edit menu. Double-clicking a file both selects (highlights) and marks it. Marking is described below, under “Marking Files and Folders.”

Getting Additional Information

Retrospect provides a Get Info command you can use to view information about the selected files and folders. In addition to location, size, and dates of creation and modification, the Retrospect Get Info window provides information about a file’s label, its file type and creator, and compression achieved if you backed it up using Retrospect’s software data compression.

To View Information About Files or Folders

From a Browser, select the files or folders for which you want more information, then choose Get Info from the File menu. An Info window appears for each selected file or folder, displaying additional information about them.



The Info window.

Marking Files and Folders

A marked file or folder is one that is designated to be used in some way (for example, backed up, archived, duplicated, or restored). When performing operations, Retrospect marks files according to the rules of the Selectors in the search criteria, but you have no way of knowing which files are marked unless you use Browsers. In addition to simply viewing a list, you can manually mark and unmark files and folders within a Browser.

- **Note:** Since marking is only useful when performing operations, the stand-alone Browser from Configure>Volumes does not have Mark and Unmark buttons.

You mark files and folders in a Browser by selecting them and clicking the Mark button. A check mark appears to the left of a file or folder when it is marked. Click Unmark to remove marks. You can also mark and unmark files and folders by double-clicking them.

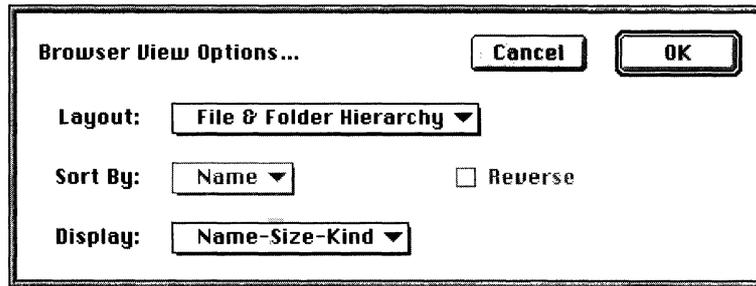
By marking or unmarking a folder you perform the same operations on all the files (and folders) contained within that folder. For example, to specify a single folder for backup, you would double-click on the volume name at the top of the file list to unmark all of the files, then scroll to the folder you want to back up and double-click the folder icon to mark it and its contents.

The Browser menu provides additional commands for highlighting and marking in the window.

- **Skip Next** scrolls the list forward to display the next highlighted file.
- **Highlight Marks** highlights marked files.
- **Cross Reference** allows you to locate files in the same hard disk or session which are related to a specified file. Specifically, Cross Reference finds duplicate files, older versions of the same file, and even files which have been renamed but were originally from the same file.

Selecting View Formats

The Browser menu has a View Options item that you can use to specify how you want to view the contents of a volume. This menu item brings you to the Browser view options dialog.



The Browser view options dialog.

The Layout pop-up menu provides two different layouts for displaying the contents of a volume:

- **File and Folder Hierarchy** displays files and folders in the same hierarchical structure in which they are stored on the volume. This is the default layout that Retrospect uses when you first open a Browser window.
- **Sorted Files—No Folders** displays all files stored in the selected volume as a single “flat file” list, discarding any folder designations.

For both types of Browser layouts, the Display pop-up menu allows you to specify the type of file information displayed in the Browser window. You can choose from:

- Name-Size-Kind
- Name-Size-Label
- Name-Size-Modify Date
- Name-Size-Backup Date

When the Sorted Files layout is specified, the Sort By pop-up menu becomes available, allowing you to choose one of six sorting options for displaying files in the flat file format:

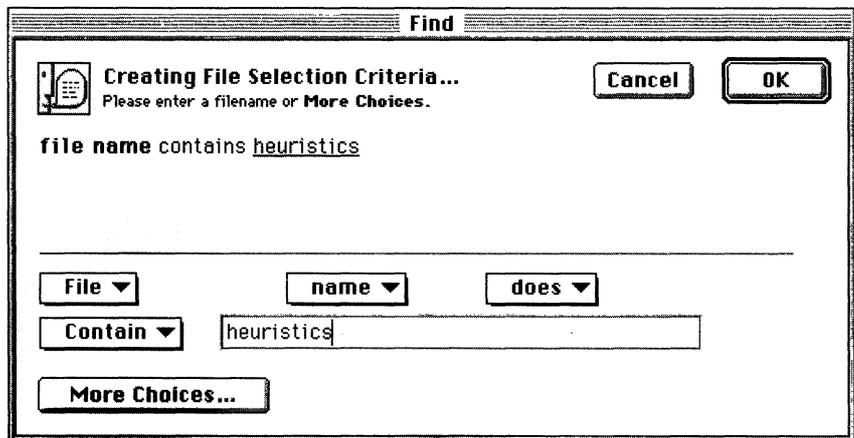
- Name
- Size
- Kind
- Label
- Modify Date
- Backup Date

When you choose a sorting option, Retrospect normally sorts the files in ascending order. For example, if sorting by size is specified, the Browser lists the smallest files at the top of the list and largest files at the bottom. You can specify a descending order for the current sorting option by clicking Reverse.

When you specify layout and display options for the current Browser window and click OK, Retrospect re-displays the files using the specified options.

Finding Files

The Browser menu has a Find item that you can use to locate specific files or folders on the volume.



The Find window (showing Fewer Choices).

In the text entry field, type the text for which you are searching.

- **Note:** This feature is not case-sensitive. It makes no difference whether you use lower or upper case letters.

The window also provides pop-up menus for specifying the type of search you want to perform:

- **File** lets you specify which items you want to find, using one of three search variations: File matches the name of the file, Folder matches the name of the folder and selects the files immediately inside the folder, and Enclosing Folder matches the name of the folder and selects all files within the folder, including files nested in other folders.

- **Name** specifies whether you are looking for the search text in the name of a file or folder, or in a pathname. Pathnames always begin with the volume name and list the hierarchy of folders, separating folder names with colons. For example, “Macintosh HD:Documents:Letter to Frank”.
- **Does** specifies inclusive or exclusive searches. For example, if you choose “does not,” and perform a search on file names, Retrospect selects all the files and folders whose names do not contain the search text.
- **Contain** specifies where the search text is positioned within the name. You can specify that the search text be located at the beginning (Start With) or end (End With) of the name, or contained somewhere within a name (Contain). Or you can specify that the name exactly match the search text and no additional text (Match).
- **More choices** lets you build a custom Selector to use in searches for a file or folder. The window that appears is identical to the Selector details window you use to build Retrospect Selectors. For more information on using the Find window to build search conditions, see Chapter 23 • Using Selectors, which starts on page 151.

To perform a search, choose Find from the Browser menu. Edit the search criteria in the Find window and click OK. Retrospect highlights all files and folders that meet the search criteria. You can mark the highlighted files by clicking the Mark button in the Browser window.

Copying and Pasting Selections

You can copy selections between Browser windows or into the Scrapbook for temporary storage. When you copy a selection, only the file and pathname information is copied, not the files themselves. This feature is useful for copying selections from a stand-alone Browser window into a Browser window opened during a Retrospect operation such as restore.

- **Note:** You can only paste a copied selection into a Browser window or the Scrapbook. You cannot paste a copied selection into any other applications or documents.

To Copy Selections Between Browser Windows

Make your file and folder selection then choose Copy from the Edit menu. Open (or bring to the front) the appropriate Browser window for the same volume, then choose Paste from the Edit menu. Retrospect pastes the

selection into the new Browser window, highlighting only the same files and folders (in the same folder hierarchy) which were selected and copied in the other Browser window.

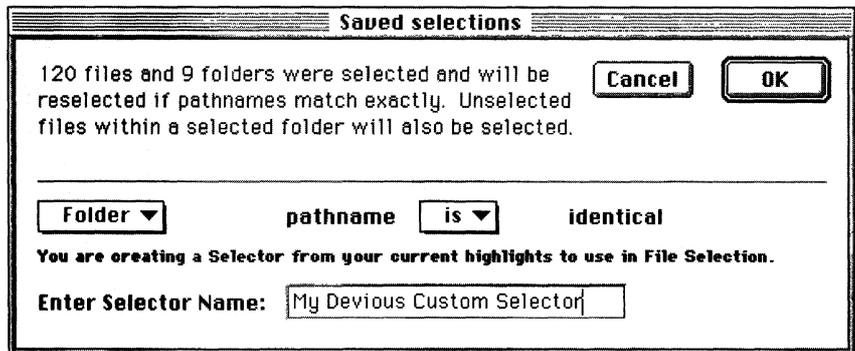
Saving Selections as a Selector

You can also save file and folder selections as a Selector that you can use to reselect files for future Retrospect operations on the same volume, including backups and restores.

- **Note:** Before you save a selection as a Selector, consider creating a custom Selector as described in Chapter 23 • Using Selectors, which starts on page 151. You can easily review and modify custom Selectors at any time. A Selector created with a Browser's Save Highlights command cannot be reviewed or modified once it has been defined.

To Save Selections as a Selector

Select the files/folders you want to apply to a Selector then choose Save Highlights from the Browser menu. The Saved selections window appears, displaying a field for entering a Selector name for the selected files and folders. For example:



The Saved selections window.

The window also provides pop-up menus for specifying the type of search you want to perform:

- **Folder** lets you specify which files and folders you would like to save in this Selector. The Folder pop-up menu has three options: File saves the names and pathnames of all currently selected files, Folder saves the names and pathnames of all currently selected files as well as files

in the top level of any selected folders, and Enclosing Folder saves the names and pathnames of all currently selected files and folders, including all files and folders that are within selected folders.

- **Is** specifies inclusive or exclusive searches. For example, if you choose “is not,” Retrospect selects all files except the selected files.

Type a Selector name and choose any options for applying the selection then click OK. Retrospect creates the new Selector, which is now available for other Retrospect operations.

Printing a File List

Any time a Browser window is active, you can print the contents of the file list by choosing Print from the File menu. If you use Page Setup to reduce the printing size, Retrospect will print a Browser in more than one column to save pages.

Rescanning a Volume

You can update the contents of the Browser window by choosing Rescan from the Browser menu. This is useful, for example, if you make changes to the volume (for example, in the Finder or another Browser window) while the volume’s Browser window is open.

The Rescan item appears in the Browser menu only when Retrospect is working with a volume directly. For example, you can not Rescan a volume when you are Browsing a StorageSet.

Deleting Files

Retrospect Browsers have a Delete command to remove files from a volume, which is like placing a file in the Finder’s Trash can and emptying the trash.

- **Note:** Retrospect does not allow you to delete files from a StorageSet.

To Delete Files

Select the file or files you want to delete in the file list then choose Delete from the Browser menu. A dialog appears, asking you to specify whether you want to remove the selected files only or remove the selected files and any empty folders that may result from the file deletions. Make your choice,

then click OK. Retrospect permanently deletes the selected files from the volume.

- ▲ **Warning:** A delete command may not be undone with the Undo command, nor may a file be pulled from the Trash can. When a file is deleted, it is gone.

The Delete item appears in the Browser menu only when Retrospect is working with a volume directly. For example, you can not delete a file when you are Browsing a StorageSet.

CHAPTER 23 • USING SELECTORS

Selectors let you choose files based on almost any criteria, including name, date, type, or size. For example, you can create a Selector that will choose all SimpleText document files modified after October 17, 1996.

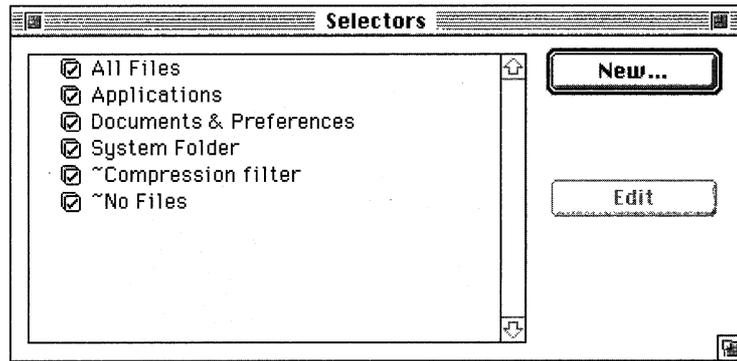
Retrospect allows you to create and save any number of Selectors, which you will typically use with scripts to fully automate and customize your backup operations. You can also use Retrospect's built-in Selectors. For more information on using Selectors in scripts, see Section VI, Automated Operations, which starts on page 79.

- **Note:** You do not need to use a Selector for backing up incrementally. When you do a normal backup, Retrospect automatically performs an incremental backup—copying only files or folders that have been created or modified since the last backup to each StorageSet.

The Selectors Window

You create and modify Selectors through Retrospect's Selectors window.

To display the Selectors window, first click the Special tab in the Retrospect Directory, then click Selectors. The Selectors window lists all of the predefined and user-defined Selectors.



The Selectors window showing Retrospect's built-in Selectors.

The Selectors window has two buttons for working with the Selectors:

- **New** creates a new Selector.
- **Edit** allows you to add new conditions or modify existing conditions for a Selector.

When the Selectors window is open, Retrospect adds a Selectors menu to the menu bar. Its items are as follows:

- **New Folder** makes a folder container for organizing Selectors.
- **Duplicate** makes a copy of the currently highlighted Selector.
- **Rename** lets you change the name of the currently highlighted Selector.
- **Forget** removes the currently highlighted Selector.

Built-in Selectors

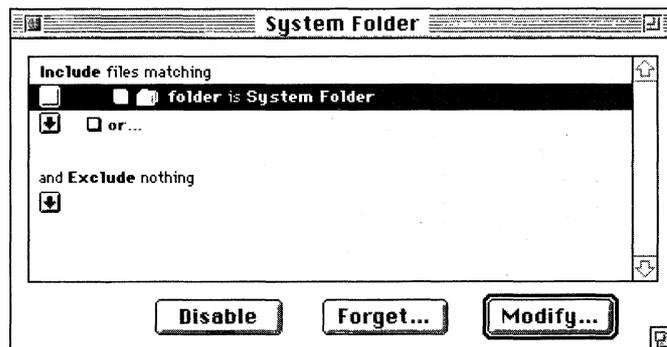
Retrospect includes six built-in Selectors, with predefined conditions for selecting files. The Selectors window lists all the Selectors, including these built-in Selectors:

- **All Files** marks all files on the Source, including the System Folder. This is the default Selector used for Immediate operations and scripts.
- **Applications** marks only applications (unless they reside in the System Folder).
- **Documents & Preferences** marks everything except applications and the contents of the System Folder.
- **System Folder** marks only the contents of the System Folder.

- **Compression filter** is used by Retrospect to determine which files to compress when using its software compression option. It is not for use in script criteria. (See “Data Compression (in software)” on page 173.) This Selector tells Retrospect which files have already been compressed by commercial applications like StuffIt, DiskDoubler, and Now QuickFiler so they are not compressed again. You do not need to modify this Selector unless you use a compression program that Retrospect does not know about. (Also see “Compression Options” on page 178.)
 - **No Files** does not back up any files. Use the No Files Selector when you are creating a Script for the purpose of shutting down Remote computers on nights when they will not be backed up. For more information, refer to the appendix of common questions and answers.
- **Note:** All copying operations (such as backups) using Selectors perform incrementally. (Actually, it is Retrospect’s matching feature which does this.) For each Selector, there is the implied meaning of “select this file, but do not copy it if it already exists in the destination.”

You can easily incorporate these Selectors into your own scripts. You can view these Selectors to better understand them, and you can even modify them to suit your needs. Do not modify the built-in Selectors until you have some experience creating your own. In fact, it is better to duplicate a predefined Selector then modify the copy instead of the original.

To view a built-in Selector, click on it to select it in the Selectors window and click Edit (or just double-click the Selector), which brings up a window with the Selector’s condition details. For example, select System Folder and click Edit to display the following window.



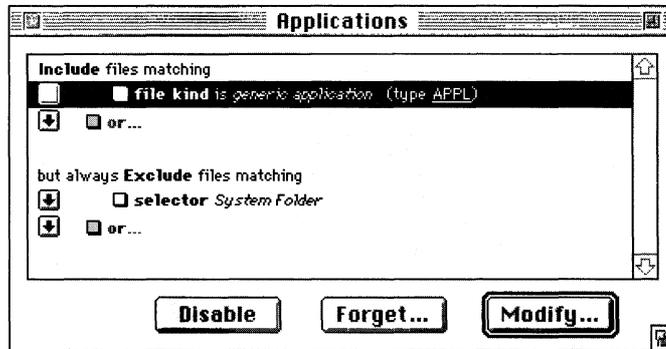
The Selector details window for the System Folder Selector.

In addition to viewing the Selector, this window also lets you modify it to make your own custom Selector, explained below.

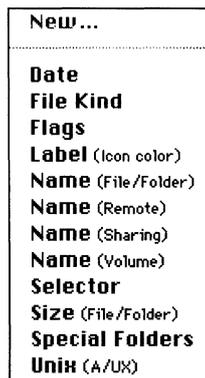
Selector Conditions

You build a Selector by adding conditions for including or excluding files or folders which meet the selection criteria. As you build the Selector you can add and relate multiple conditions, and even use logical operators to create sophisticated criteria for file selection.

To view Selector conditions, in the selectors window click on a Selector then click Edit. The Selector details window appears, displaying two distinct areas for adding conditions; one for conditions which include files or folders for an operation, and one for conditions which exclude files or folders.



The arrow buttons underneath the Include and Exclude headings are pop-up menus of condition types.



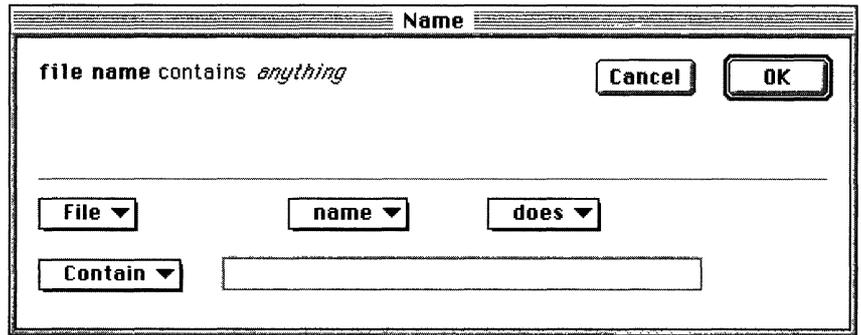
The conditions pop-up menu in the Selector details window.

You can build your own Selectors from these conditions as follows:

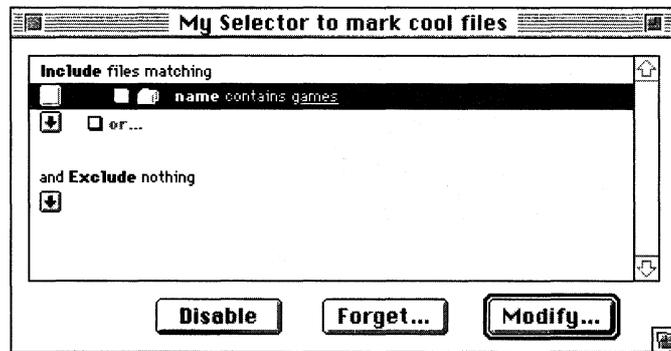
- **Date** uses creation, modification, or backup dates as conditions.
- **File Kind** uses file creator and type as conditions.
- **Flags** uses file attributes, such as file marked, matched, busy, locked, invisible, alias, name locked, stationery, or custom icon as the conditions.
- **Label (Icon Color)** uses a file or folder's label as a condition. The Label menu in the Finder contains seven labels (and colors, if your monitor displays color or shades of gray) and the "None" option. Each checkbox in this window corresponds to a specific item position in the Label menu and not to the actual color or label name.
- **Name (File or Folder)** uses the name of the file or folder as the condition. The File pop-up menu has three options: "File" matches the name of the file, "Folder" matches the name of the folder and selects the files immediately inside the folder, and "Enclosing Folder" matches the name of the folder and selects all files within the folder, including files nested in other folders.
- **Name (Remote)** uses the name from Retrospect's Network Database as the condition.
- **Name (Sharing)** uses file sharing owner, group or login names as the condition.
- **Name (Volume)** uses the name of the volume as the condition.
- **Selector** uses another selector as the condition.
- **Size (File or Folder)** lets you specify file or folder size as the conditions.
- **Special folders** uses certain system-defined folders, such as the Volume Root, Desktop Folder, and Control Panels Folder, as the conditions to be used with local and Remote volumes.
- **Unix** uses the UNIX file type, permissions, and other special settings for files and folders under A/UX as the condition. This is useful only when using Retrospect under Apple Computer's A/UX operating system. For information on using Retrospect under A/UX, see the Read Me file on Retrospect's Install 1 disk.

Condition Details

Each condition type has its own window in which you enter and specify details for the condition. For example, the Name (File/Folder) condition window is as follows.



When you add or change a condition it appears in the Selector Detail window.



You can add multiple conditions to a Selector by choosing other conditions from a pop-up menu. The location of the pop-up determines the relationship between the conditions; a pop-up can add a condition with an And operator or may add a condition with an Or operator. Each pop-up menu has its operator type as its first item (though it is grayed out because you may not choose it) so you know whether you are And-ing or Or-ing a new condition.

The And operator allows you to combine conditions so that a file or folder must meet the combined conditions before it is selected. Any condition before the last under each Include and Exclude area always uses an And operator.

The Or operator allows you to build conditions where a file or folder must meet at least one condition—but not necessarily all conditions—before it is selected. The last condition under each Include and Exclude area always uses an Or operator.



To gain a better understanding of how this works, follow along with “Creating a Custom Selector” on page 158 and experiment with conditions on your own. Retrospect has extensive balloon help for each selector condition.

Condition Examples

The table below shows an example of a custom Selector and its effect when applied to some files.

Using this Selector	On these Files	Marks these Files
Include files matching <input checked="" type="checkbox"/> file name contains <u>Games</u> <input type="checkbox"/> or matching <input checked="" type="checkbox"/> file name contains <u>Bren</u>	Big Game Hunting Bren's Games Erik's Games Games People Play The Gamester from Brentwood	Bren's Games Erik's Games Games People Play The Gamester from Brentwood
Include files matching <input checked="" type="checkbox"/> file name contains <u>Games</u> <input checked="" type="checkbox"/> and file name contains <u>Bren</u>	Bren's Games Erik's Games Games People Play The Gamester from Brentwood	Bren's Games The Gamester from Brentwood

Precedence

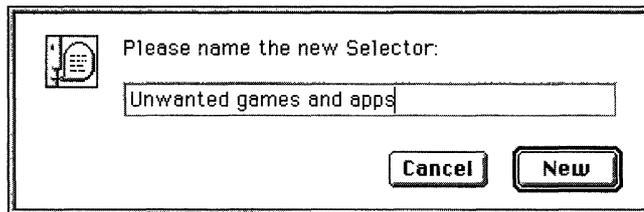
Exclude statements always take precedence over Include statements when Retrospect applies the Selector. For example, if a Selector has a statement which includes the Preferences folder and a statement which excludes the System folder, the files in the Preferences folder will not be marked.

Creating a Custom Selector

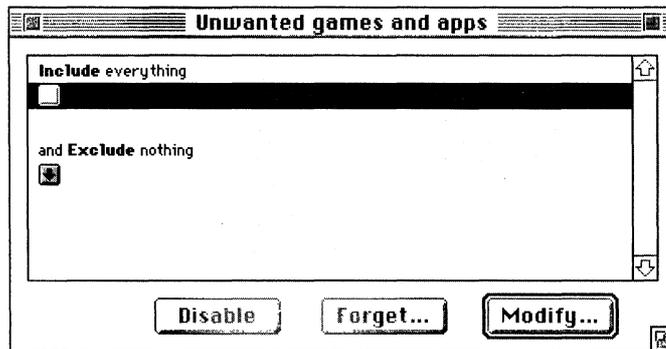
Retrospect allows you to quickly build Selectors that can perform the most sophisticated file and folder selection. In this example, we create a custom Selector which will exclude certain applications and a folder called “Games” from backup.

Creating a New Selector

From the Directory’s Special tab, click the Selectors button, then click New. Retrospect prompts you to name the new Selector. This example uses “Unwanted games and apps” but you can enter a name of your own.



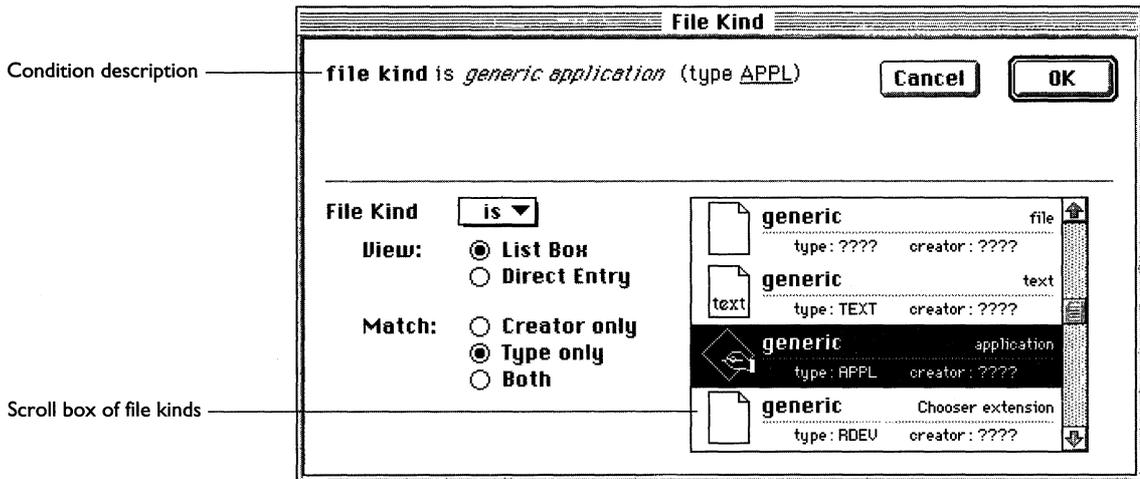
After typing the name, click New. Retrospect displays a Selector details window for the new Selector. Notice the window name is the Selector name.



The contents of the scroll box in this window specify the conditions the new Selector uses to mark files or folders.

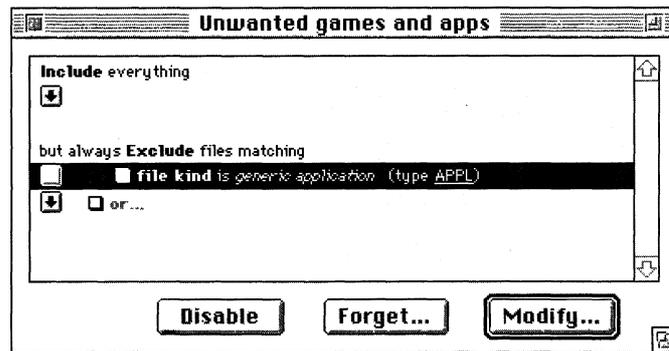
Excluding Files

Use the arrow pop-up menu beneath the Exclude heading to choose the File Kind condition. Retrospect displays the following window.



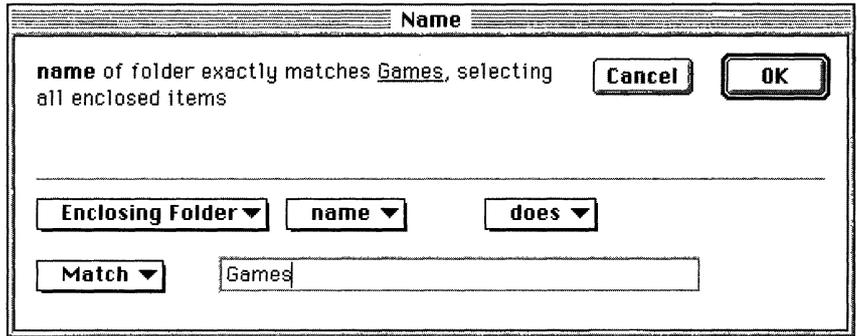
The File Kind Selector condition window.

This window lets you specify a file type and/or creator as a condition. The default file kind is a generic application with the type “APPL.” Since this is the condition we would like to use in this example, click OK. The Selector details window now reflects our new condition.



At this point, the Selector excludes all applications. We are ready to add a second condition.

Use the lowest arrow pop-up beneath the Exclude heading again and choose the Name (File/Folder) condition type. The Name (File/Folder) window appears. Choose Enclosing Folder from the File pop-up menu and choose Match from the Contain pop-up menu, then enter “Games” in the box.



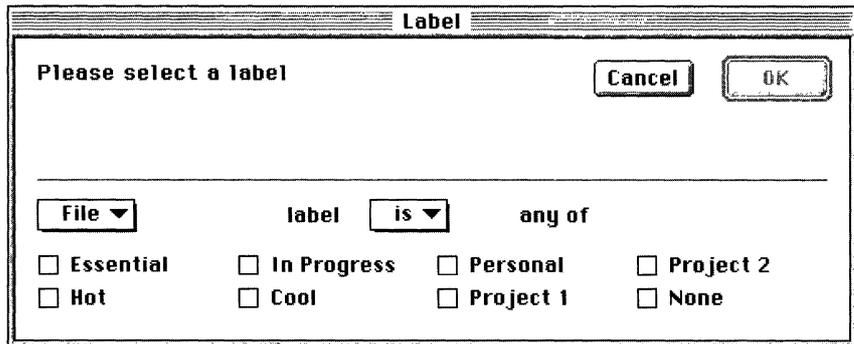
Click OK to return to the Selector details window. At this point, the Selector excludes all applications or any folder called “Games”. Since we chose this condition from the lowest arrow pop-up, Retrospect added the condition to the Selector with the Or operator. (Or and And operators are explained on page 156.)

We are ready to add a third condition. Use the arrow pop-up alongside the file kind condition to choose the Label condition.

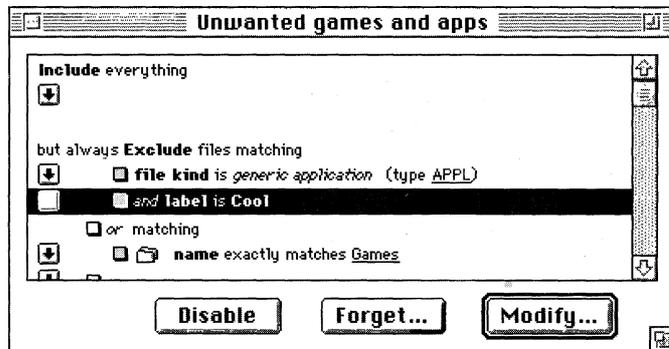
Click and hold this arrow button to create the And operator



(By using this particular pop-up, Retrospect adds the new condition with the And operator.) The Label condition details window appears.



Select Cool (or whatever corresponds to Cool if you changed your label names with the Finder) and click OK. The Selector details window appears with the now-finished Selector.



The Selector excludes only those applications which are labeled “Cool” and everything in the “Games” folder. You may now use it in scripts or immediate operations, including browsing.

Selector Menu

When a Selector details window is active, Retrospect adds a Selector menu to the menu bar.

Saving

Choose Save or Save As from the Selector menu to save the Selector.

Reverting

Choose Revert from the Selector menu to discard your current changes to a Selector and revert it back to its original state.

Renaming

Choose Rename from the Selector menu to change the name of the Selector. Enter the new name in the dialog which follows, then click Rename.

Testing

After you have made your own custom Selector (see “Creating a Custom Selector” on page 158), test it by opening it and choosing Check Selector from the Selector menu. Retrospect asks you to select a volume for browsing with your Selector. Do so and it opens a Browser window with the files that match the Selector criteria marked with checks.

If the correct files are marked, the Selector is working correctly and you can begin using it for immediate operations or in scripts.

If the files that are marked are not the correct ones, you need to modify your Selector and check it again. You may need to add conditions, delete conditions, or modify the conditions. Pay close attention to the And and Or operators which may affect the results of your Selector. When you have finished modifying your Selector, save it then check it again to see if the correct files are now marked. Repeat this process as needed until your Selector is working correctly.

Using a Selector in a Script

Once you have created a custom Selector, you may use it in any script or operation. Here is how to use one in a backup script:

1. Follow the normal steps to create your script.

See Section VI, Automated Operations, which starts on page 79, if you do not know how to make a script.

2. In the Script summary window, click **Selecting**.
3. Choose your Selector from the pop-up menu.
4. Click **OK** to return to the Script summary window.
5. Close and save your script.

The Selector will be applied the next time the script is executed.

Printing a Selector

You can print the contents of Selector details windows to keep for reference or to share with other Retrospect users. To print a Selector window, edit the Selector and choose Print from the File menu.

Modifying a Selector

Any condition that appears in a Selector details window can be modified. After you modify a condition, Retrospect returns to the Selector window, where you can add new conditions or modify existing conditions.

To open a Selector from the Selectors window, click on the Selector you want to modify then click Edit (or just double-click the Selector). Retrospect opens the details window for the Selector.

To edit a Selector's existing condition, open a condition for editing by selecting it and clicking Modify, or by double-clicking the condition line. When a condition is reopened, you can modify its options. Click OK to save the changes to the condition.

To add a new condition, choose the type of condition you want to add from an arrow pop-up menu. A condition window appears, providing options for specifying the type of condition you chose. Make the appropriate choices and settings in the window then click OK to add it to the Selector. The condition window closes and the Selector window now displays the new condition.

Disabling Conditions

At any time, you can disable a condition within a Selector. When a condition is disabled, it has no effect on file selection and will remain inactive until it is enabled. This feature is useful when a Selector becomes very complex and you want to trace its construction.

To disable a condition open a Selector and select the condition you want to disable. Click Disable and Retrospect disables the selected condition, displaying it in grayed out text to identify it as inactive.

You can restore a disabled condition by selecting the condition and clicking Enable.

Moving Conditions

Within a Selector details window, you can move a condition by dragging the square button that accompanies the condition description and dropping it at a new location within the window's scroll box.

You can drag any condition to a new location, either in the same group or another group or heading. For example, if you added "file kind" as a condition for inclusion under the Include heading, you can change the same condition to an exclusionary condition by dragging it beneath the Exclude heading.

When you move a condition, its outline follows the hand cursor, indicating the new location for the condition. Release the mouse button when a new outline appears in your desired destination. After you drop it, Retrospect moves the condition to the new location, inserting it before the outlined destination condition.

To copy the condition, press and hold the Option key while dragging. Dragging an "or matching" heading moves the entire group. Option-dragging an "or matching" heading copies the group.

- **Note:** Be careful to pay attention to the operator type (And or Or) of what you are dragging; moving it may change the operator.

Removing Conditions

At any time, you can remove a condition from within a Selector.

To delete a condition open a Selector and select the condition you want to remove. Click Forget and Retrospect removes the selected condition from the window.

Deleting a Selector

If you no longer need a Selector you can delete it through the Selectors window.

To delete a Selector, click on the Selector to be removed from the list to select it, then choose Forget from the Selector menu or press the Delete key. A

dialog appears, asking you to confirm the deletion; click OK. Retrospect deletes the Selector.

Duplicating a Selector

Sometimes, you will want to duplicate a Selector so that you can make slight modifications to fit your needs. For example, you may want to modify a copy of one of Retrospect's built-in Selectors but leave the original untouched. You can make a duplicate through the Selectors window.

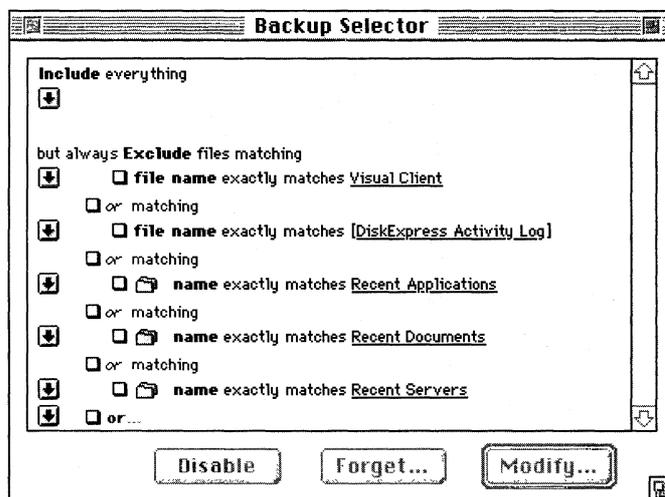
To duplicate a Selector, click on the Selector to be duplicated from the list to select it, then choose Duplicate from the Selector menu. A dialog appears, providing a field for entering a new Selector name. Type a new name and click New. Retrospect creates an exact copy of the Selector, using the name you provided in the dialog.

Selector Examples

Following are examples of Selectors and explanations of each.

Backup Selector

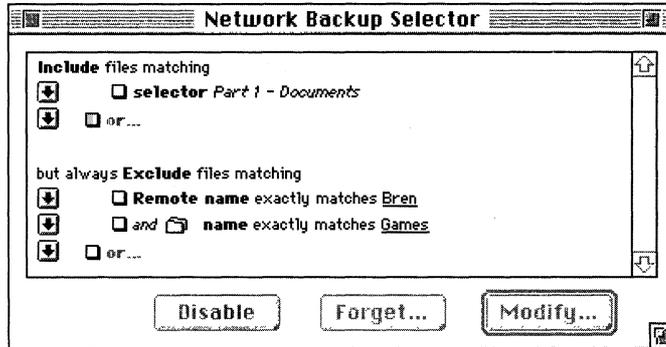
This Selector excludes some unessential files which sometimes cause Retrospect to report errors when the files change during a backup.



A Backup Selector that excludes several specific files.

Network Backup Selector

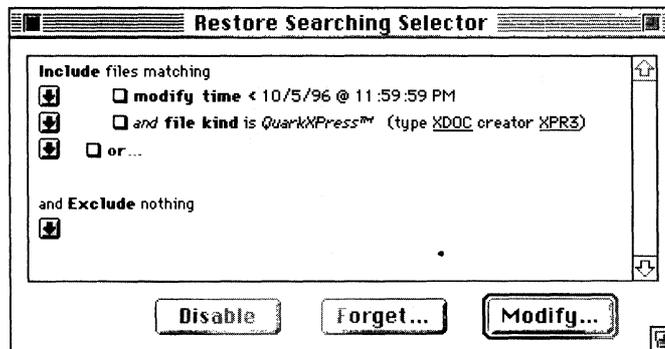
This Selector marks all documents to be backed up, except for files in a folder named “Games” on Bren’s Remote Macintosh. In this example, the backup administrator knows that Bren has a large folder with games that do not need to be backed up.



A network backup Selector that excludes a specific folder on a specific Remote Macintosh.

Restore Searching Selector

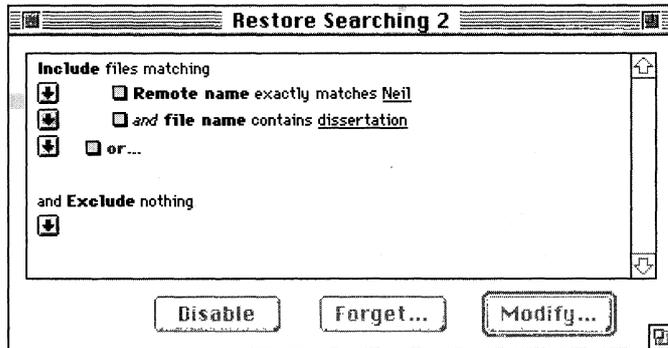
This Selector searches for a Quark XPress document file that was modified before October 5, 1996 at 11:59:59 P.M. This Selector is a good example of how, during an immediate restore operation, you could have Retrospect find a file when you forgot its name. Even though you do not know the exact file name, you know the file was last saved before a certain date and time.



Restore Searching Selector

This Selector searches for a named file that was created on a particular Remote user’s Macintosh. In this case, the name of the file is “Dissertation”

and Remote's name is "Neil." This Selector could be used during an immediate restore operation.



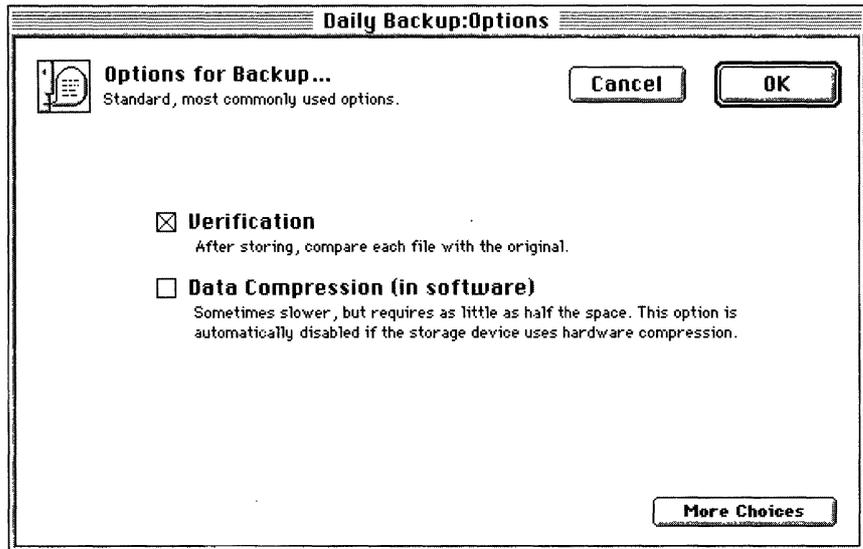
CHAPTER 24 • EXECUTION OPTIONS

Retrospect has many options you can set to determine how your backup, duplicate, copy, and restore operations are executed. For example, you could set a backup script to turn on software data compression and synchronize Remote Macintosh clocks. You can set options while setting up an immediate operation or while editing a script. Execution options are local rather than global, so they apply only to the current operation or script, not to all operations and scripts.

Retrospect also has global program preferences, described in Chapter 34 • Preferences, which starts on page 240.

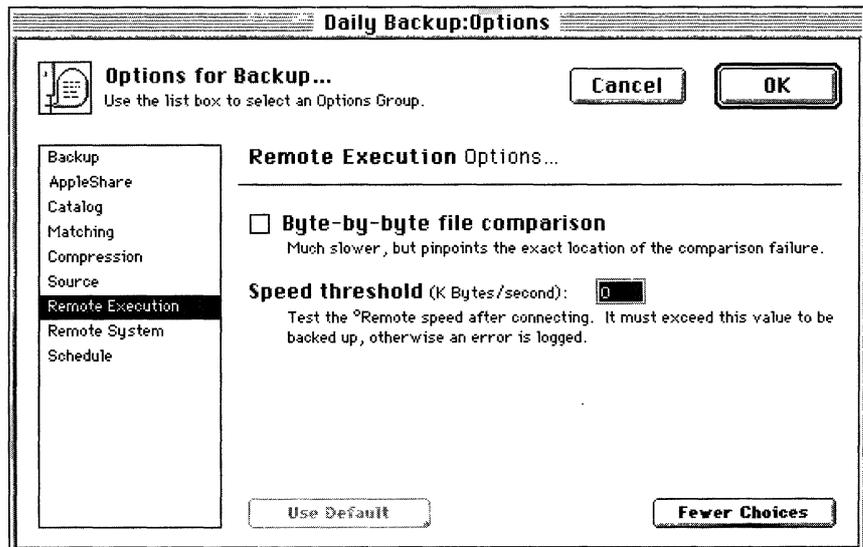
Setting Options for an Immediate Operation or a Script

Begin the immediate operation, or edit the script. Once you reach the summary window click the Options button. A window appears listing the basic options for the operation you are performing. The following example shows the basic options initially available for a backup script.



The basic options window of a backup script, showing options for the Backup category.

If you click More Choices, the window changes to show a scrolling list of option categories, as shown below.



The extended options window of a backup script, showing the Remote Execution category.

You can display the options for each category by clicking the category name in the list.

To turn an option on or off, click its checkbox or radio button. Some options use time and date controls, and others let you enter numbers or text. If any options in a category have been changed from their default settings, the category name is shown in boldface. Clicking Use Default reverts all visible options to their default states. Clicking Fewer Choices returns you to the basic Options window.

When you have finished setting options, click OK.

The options for each category are described in detail below.

Backup Server Options

This options category is available only with Backup Server scripts, which are explained in Chapter 20 • Backup Server Scripts, which starts on page 112.

Back up every: 1 days

Each source will be backed up when possible, but not more often than this backup interval (except for an Early Backup.)

Allow Early Backup

Check this option to allow Remote users to schedule another backup before the previous backup interval elapses.

Back up every: *n* days/hours

This time interval, which is one day by default, specifies the minimum time between backups. Each source is backed up when possible, according to the priority of need, but not more often than this interval unless the Allow Early Backup option is on and a Remote user initiates a backup.

Allow Early Backup

When this option is on, which is the default, Remote users may initiate backups from their Remote control panels, overriding the backup interval. A request for an early backup does not necessarily move the user's volume to the top of the priority list, depending on the priority of other volumes listed as sources in the script. Retrospect begins a user-requested early backup only after the Backup Server has current backups of its other source volumes.

Remote Countdown Options

This options category is available only with Backup Server scripts.

Countdown time: 20 seconds

The Remote countdown dialog notifies the user that a Backup is about to begin, allowing them to defer execution if desired.

Enter a
countdown
message

From the Retrospect Backup Server:
«script» is about to begin.
Click "Defer" to run it later.

Countdown time: *n* minutes/seconds

Retrospect gives Remote users advance notice of when a backup is about to begin, counting down the time specified here. Enter a number here and set the time units to seconds or minutes. (When the countdown time is zero Retrospect does not notify Remote users before backing them up.) When it is going to back up a source from a Remote computer, Retrospect puts up a dialog on the Remote. This dialog displays the countdown message (see below) and offers buttons to defer the backup to a later time or bypass the countdown and immediately begin backing up. (If the Remote user does not take any action Retrospect backs up when the countdown reaches zero.)

Countdown message

The text in this box is shown to a Remote user when a backup is about to begin, according to the countdown time option. Retrospect will replace the text “«script»” with the name of the script it is executing.

Polling Options

This options category is available only with Backup Server scripts.

Retry failure after: 30 minutes

Delays at least this interval after a source's backup fails or is canceled.

Check source every: 90 seconds

Waits at least this interval between attempts to access each source.

Remote connect every: 5 minutes

Determines how often a Remote is checked to see if the user has changed their backup schedule.

Retry failure after: *n* minutes/hours

Retrospect waits this time interval, which is thirty minutes by default, before retrying to back up a source after a backup has failed or was canceled. Retrospect waits at least this amount of time before attempting the backup again.

Check source every: *n* seconds

Retrospect uses this time interval, which is ninety seconds by default, to access a source just to check whether it is available for backup. Retrospect does not check sources while a backup is in progress.

Remote connect every: *n* minutes/seconds

Retrospect uses this time interval, which is five minutes by default, to access a Remote to check whether the user has changed the backup schedule for the Remote. Retrospect does not connect to Remotes while a backup is in progress.

Backup Options

This options category is available with backup operations and Backup Server scripts.

Normal Backup

Full Backup

Normal Backup: The selected files in this Backup will be appended to the StorageSet.

Verification

After copying, compare each file with the original.

Data Compression (in software)

Sometimes slower, but requires as little as half the space. This option is automatically disabled if the storage device uses hardware compression.

Normal Backup

Only available with immediate backups, this option makes Retrospect perform a normal incremental backup, as described under “Normal” on page 23.

Full Backup

Only available with immediate backups, this option makes Retrospect perform a full backup, as described under “Full” on page 24.

Verification

Verification ensures files are copied correctly by comparing files in the StorageSet with the original source files after the backup is performed. If the StorageSet spans multiple tapes or cartridges in the session done with verification, you must re-insert all members to which data has been written. Although verification increases the time it takes for a backup to complete, it

ensures that information is correctly written to the StorageSet. This option is on by default.

Data Compression (in software)

Data Compression saves space in the StorageSet by compressing files to about half their original size while copying them into the StorageSet. Files are automatically decompressed back to their original state when restored. Compression savings achieved during an operation are reported in the expanded Status window and the operations log. The amount of compression savings you can expect depends on the types of files you are compressing. Text files compress substantially; application and System files do not. Backups using Data Compression are slower than those without, and restores of compressed backups are also slower.

When copying to a tape device that has built-in compression, Retrospect automatically turns off software compression in favor of the faster hardware compression. Retrospect uses its built-in Compression filter Selector to identify files that are already compressed (such as those compressed with a utility such as StuffIt) so it will not attempt to re-compress them with software data compression. See “Compression Options” on page 178 for more information. The Data Compression option is off by default.

Archiving Options

This options category is available only with archiving operations.

Verification

After copying, compare each file with the original.

Data Compression (in software)

Sometimes slower, but requires as little as half the space. This option is automatically disabled if the storage device uses hardware compression.

Move files

Delete files after copying and verifying.

The archiving options include Verification and Data Compression, as with backups (page 172) and Move Files, as with duplicate operations (page 174). An archive is just like a backup unless you move files, which deletes files from the Source volume after they have been copied.

Duplicate Options

This options category is available only with duplicate operations.

- Update Backup Report**
Consider this execution a backup, and add to the report.
- Verification**
After storing, compare each file with the original.
- Move files**
Delete files after copying and verifying.

Update Backup Report

When this option is checked, Retrospect treats the duplicate operation like a backup and amends the backup report.

Verification

Same as with backups (page 172).

Move files

This option, which is only available for archive and duplicate operations, deletes files from the Source volume after they have been copied. If Verification is turned on and the files do not match exactly, the originals will not be deleted. Do not turn on the Move Files option without also turning on the Verification option. You should perform at least one additional verified archive or backup before deleting files from the Source. Retrospect cannot move files from a Remote Macintosh if its Remote control panel has been set to Read Only. By default, this option is off.

File Copying Options

This options category is only available with duplicate and restore operations.

- Recompute Icon Positions**
Always reposition newly created icons so they do not overlap.
- Update Modify Dates**
Set the modify date of each copied file to the current date and time.

Recompute Icon Positions

Repositions icons of restored files and folders to prevent overlapping. By default, this option is off.

Update Modify Dates

Changes the modification information of the restored files to the date and time of the restore operation. This option is only available with restore operations and is off by default.

Fast Add Options

Options categories for a Fast Add are the same as those for backups (page 172).

StorageSet Transfer Options

These options are available only with StorageSet transfer operations initiated with the Copy command from the Tools tab.

Copy SnapShots

Before transferring files, copy all SnapShots from the source StorageSet catalogs to the destination. This will not overwrite any existing SnapShots.

Only most recent versions

When searching, only the most recent version of each file is found; older versions are ignored.

Merge Sessions

Check this option to merge the chosen files from multiple sessions on a source StorageSet into a single session in the destination StorageSet.

Copy SnapShots

This option transfers a StorageSet's SnapShots in addition to its files. SnapShots which exist in the destination StorageSet will not be replaced. This option is on by default.

Only most recent versions

This option ignores older files, selecting the most recent versions of similar files. By default, this option is off.

Merge sessions

This option merges the files from multiple sessions of the source StorageSet to a single session in the destination StorageSet, as if they were all backed up at once. With the option off, which is the default, files transferred from several different sources are listed separately by session in the destination StorageSet.

Retrieval Options

This options category is only available during an immediate restore by searching for current or older files.

Only most recent versions

When searching, only the most recent version of each file is found; older versions are ignored.

Minimal folder structure

Restore files using as few folders as necessary.

Only most recent versions

Ignores older files, selecting the most recent versions of similar files. By default, this option is off.

Minimal Folder Structure

Restores files to their original folders, in the minimum required hierarchy. Empty folders are not restored. This option is off by default.

AppleShare Options

This options category is available with all types of operations except restore.

Lock out volumes during backup

For AppleShare servers, version 3.0 and later. As each volume is backed up, disconnect its users and disable access until done.

Warning time in minutes:

Enter a disconnect message

Preparing to back up server volume "«volume»". Please close any documents you're using on that volume and drag the volume icon to the Trash.

By default, this option is off, but it is enabled here to show the default warning time and message.

Lock out Volumes During Backup

This option, which only applies to AppleShare 3.0 or later, disconnects users and prevents them from using a shared volume during backup. When you check this option, you can enter a warning message that is displayed to users before they are disconnected. You can also specify how many minutes advanced warning users will be given. This option will lock out users only if you are running Retrospect on the server itself. By default, this option is off.

Catalog Options

This options category is available with all types of operations except duplicate and restore.

Save Source SnapShots for Restore

SnapShots permit disks to be automatically restored to their exact state as of the backup.

Save Source SnapShot for Restore

This option directs Retrospect to save a SnapShot to the catalog and replace it every time a volume is backed up. SnapShots make it easy to restore a volume to the exact state it was in when it was last backed up, or retrieve files that you know were on a volume the last time you backed up. Empty folders are only backed up in SnapShots. If you deselect this option, no SnapShot is saved to the catalog. Should you need to restore files, you will have to use a Selector (and/or Browser) to choose which files to restore—a time-consuming process. By default, this item is on.

Matching Options

This options category is available with all types of operations except duplicate and restore.

Match source volumes to catalog

Determine which files are already in the StorageSet.

Don't add duplicates to StorageSet

When a matched file is found, automatically prevent the duplicate file from being copied to the StorageSet again.

Match only same location

Consider file location when matching. Identical files in different folders or volumes won't match.

Match Source Volumes to catalog

This option directs Retrospect to identify previously backed up files during normal backups. Retrospect compares the files on the source volume to file information in the catalog for the selected destination StorageSet. It compares files by name, size, type, creator, creation date and modify date and considers a file already backed up if all of these criteria match. When you view the Preview Browser while setting up an immediate backup, files that have already been backed up are preceded by a diamond symbol (◆).

By default, this option is on and you should keep it that way unless you have a specific need to change it.

Don't Add Duplicates to StorageSet

This option works with the “Match source volumes to Catalog” option to prevent previously backed up files from being added to the StorageSet again. Select both of these options when you want to perform a standard incremental backup; that is, you only want new or modified files copied to the StorageSet. If this option is deselected, Retrospect adds all files, including previously backed up files, to the StorageSet every time a Normal Backup is performed. By default, this option is on and you should keep it that way unless you have a specific need to change it.

Match Only Same Location

This option, which is only available if “Match source volumes to Catalog” is selected, affects how strict Retrospect is about matching so-called “identical” files from a source to a destination. (Normally, files are considered identical files when they have the same name, size, type, creator, creation date, and modification date.) By default, this option is off and you should keep it that way unless you have a specific need to change it.

When this option is selected, Retrospect uses the unique (and hidden) Macintosh file identification number as an additional part of the matching criteria. This causes separate copies of otherwise-identical files to not match. (And unmatched files get backed up, so your backups are larger and slower, but possibly safer due to the redundancy.)

When this option is not selected, Retrospect is less strict about what it considers identical files for the purpose of matching. If the name, size, type, creator, creation date, and modification date match, the files are considered identical and matched. (And matched files do not get backed up, which leads to smaller, faster backups.) By default, this option is off.

Compression Options

This options category is available with all types of operations except duplicate and restore.

Selector:

Not available because software compression is not enabled.

Selector

This option, which is available only when the Data Compression option is on, lets you determine the Selector used to filter files when compressing. Retrospect normally uses the built-in Compression filter Selector to identify and avoid compressing files that are already compressed. You are not likely to need to change this option. If you want to use a different Selector to tell Retrospect which files to compress, you can modify the Compression filter Selector or create your own. (See Chapter 23 • Using Selectors, which starts on page 151.) By default, this option is set to use the Compression filter Selector when Data Compression is on. See “Data Compression (in software)” on page 173 for further information.

Source Options

This options category is available with all types of operations except restore.

- Set source volume's backup time**
- Set source folders' backup time**
- Set source files' backup time**
The backup time stamp of each item is set on the source (unless it is write-protected.)
- On Move, don't delete empty folders**
Not available because **Move** is not chosen.

Set Source (Volume's/Folders'/Files') Backup Time

These options, not available with duplicate operations, record a backup time for each source volume, folder, or file. (The Mac OS keeps track of the creation date, modification date, and backup date for each file, folder, and volume.) Using these options allows you to create Selectors based on the “backup time,” which is the moment execution begins. Retrospect cannot set the source backup time on a Remote Macintosh if its Remote control panel has been set to Read Only. By default, the volume option is on and files and folders options are off.

- **Note:** When matching files for incremental backups, Retrospect does not use the backup time stamp. It uses more sophisticated and flexible criteria.

On Move, Don't Delete Empty Folders

This option is only available for archive and duplicate scripts and operations. It keeps folders that become empty as a result of the move instead of automatically deleting them. By default, this option is off.

Remote Execution Options

This options category is available with all types of operations except restore, and these options apply only when backing up Remote Macintosh computers.

Byte-by-byte file comparison

Much slower, but pinpoints the exact location of the comparison failure.

Speed threshold (K Bytes/second):

Test the Remote speed after connecting. It must exceed this value to be backed up, otherwise an error is logged.

Byte-by-Byte File Comparison

This option overrides Retrospect's fast Remote compare, verifying files the same way Retrospect does for local backups. When this option is turned off, Retrospect uses a faster technique to verify copied files. Both methods compare backed-up data to the original files. By default, this option is off and you should keep it off.

Speed Threshold

This option, which is available only with scripts, is useful for preventing backups which would be too slow. The number you enter here determines the minimum acceptable rate at which the Remote Macintosh is accessed. If Retrospect finds the network or Remote is not working fast enough it will terminate the operation and log an error.

This option is useful, for example, for preventing the Backup Server from trying to back up a PowerBook volume when its user connects with Apple Remote Access, and for preventing a slow Remote from holding up a series of backups.

Remote System Options

This options category is available with all types of operations except restore, and these options apply only to Remote Macintosh computers.

Synchronize clock

Synchronize the remote computer's clock to match the clock of this computer. Ignored if the Remote is set to Read Access Only.

Never shut down

Shut down when done

Shut down when done completes deferred shutdown for Remotes not scheduled for further access within 12 hours.

Synchronize Clock

This option sets the date and time on each Remote Macintosh to match the clock on the Backup Macintosh. This is useful to get times and dates to agree and is especially useful when changing to and from daylight savings time. Retrospect cannot synchronize a Remote Macintosh's clock if its Remote control panel has been set to Read Only. By default, the synchronize option is off.

Never Shut Down/Shut Down when Done

This option specifies how Retrospect handles the Finder's Shut Down process on a Remote Macintosh after Retrospect is done with its operation. The desired behavior only happens when the Remote Macintosh is waiting for a deferred shutdown after the Remote control panel intercepts its user's Shut Down command. Never Shut Down prevents shut down entirely. Shut Down when Done completes shut down if the Remote is not scheduled for an operation by a automatic script execution within the look-ahead time period (see "Schedule Preferences" on page 245). By default, this option is set to Shut Down when Done.

Schedule Option

Schedule...

Retrospect will execute this script only during the specified times. This defaults to the settings in Special>Preferences>Schedule. Click this button to change the schedule.

Click Schedule to define a time period during which this script may execute. The default schedule reflects the global schedule preference, described under "Schedule Preferences" on page 245.

CHAPTER 25 • CONTROLLING EXECUTIONS

Retrospect gives you many options to control operations in progress. For example, you can pause or stop an operation, view additional volume and performance details, and switch between interactive and unattended modes. These options are available once execution of an operation begins.

You can use any one of following methods to begin an operation:

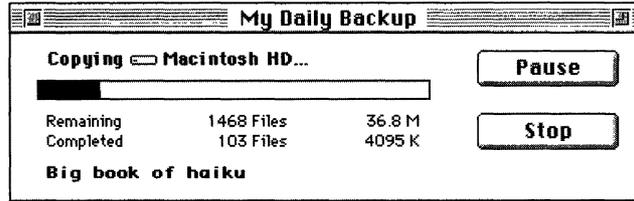
- Initiate a backup, restore, or duplicate from the Immediate tab.
- Initiate an archive, Fast Add, or StorageSet transfer from the Tools tab.
- Run a script immediately using the Run menu or the Immediate tab.
- Open a run document in the Finder.
- Wait until a scheduled script begins automatic execution.

When an operation is in progress, Retrospect displays the execution status window and the Control menu. When necessary, Retrospect displays the media request window.

Controlling Backup Server Executions

Though many of the features described in this chapter apply to both regular scripts and Backup Server scripts, this chapter is intended for use with regular scripts. Backup Server scripts have their own, unique features for controlling executions, which are described under “Using the Backup Server” on page 123.

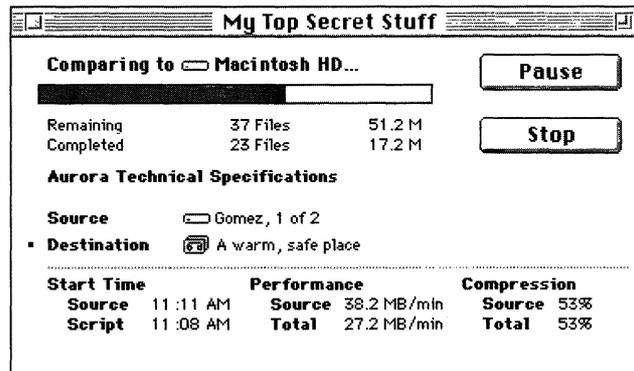
Execution Status Window



The execution status window.

The execution status window is available during all file transfer operations and contains the following features:

- The Pause button temporarily suspends the current operation. Click Continue to resume the operation.
- The Stop button halts the current operation, bringing it to a premature end.
- The zoom box expands the window to display more detail about the execution in progress. This includes the source and destination names, source and script start times, source and overall execution speed, and source and overall compression.



The execution status window (zoomed to its expanded state).

Control Menu

The Control menu is available during all file transfer operations and contains the following command items:

- **Show Log** displays the operations log. See “Viewing the Operations Log” on page 211.

- **Run Interactively** switches the execution to interactive mode. In this mode, the “When Done” options in the Control menu are dimmed and Retrospect always remains open after execution. The interactive mode cursor is a pair of rotating gears. All Immediate and Tools operations default to interactive mode.
- **Run Unattended** switches the execution to unattended mode. During executions in this mode, the “When Done” options in the Control menu are available and determine what Retrospect does after execution. The unattended mode cursor is an animated grid. All automatic executions, run documents, and scripts launched from the Run menu default to unattended mode.
- **Stop on Errors** tells Retrospect to report errors by pausing execution and displaying a dialog. Retrospect will resume execution if possible after the OK button is clicked.
- **Just Log Errors** tells Retrospect to report errors to the operations log, but continue execution if possible. The Run Control general preference determines the default for this menu option.
- **When Done** determines what Retrospect will do when completing the current operation in unattended mode: Wait, Quit, Restart, or Shut Down. These commands are not available in interactive mode. The Unattended general preference determines the default for this menu option.

Retrospect will not quit, restart, or shut down (depending on the preference setting described on page 248) if another script is scheduled for automatic execution within the look-ahead time (as determined in the Schedule preferences). Retrospect remains open and waits for the script to execute.

Media Requests

When necessary, Retrospect prompts you to insert media by displaying the media request window. In most cases, Retrospect continues with the operation when you insert correctly named or erased media and click Proceed.

You can avoid this prompt if you insert the correct media before you execute the backup. So it does not overwrite valuable data, Retrospect is very particular about media—they must be blank or erased, or their names must exactly match the requested names in order for Retrospect to proceed without prompting you. When performing new or full backups, consider

erasing the media beforehand to be sure Retrospect will proceed automatically without your attention.

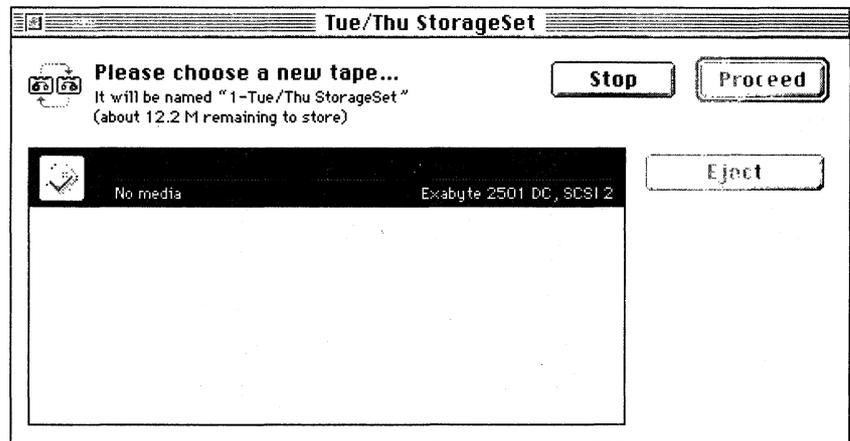
The media request window has a Stop button which halts execution of the currently running operation, bringing it to a premature end. It also has an Eject button which unloads the selected medium from the backup device. (Some devices require you to manually eject their cartridges.) If you have a tape autoloader, the Eject button changes to a Loader pop-up menu used to control the loader device.

Whenever the media request window is active, Retrospect adds the Devices menu to the menu bar. The items on this menu are as follows:

- **SCSI Status** scans the SCSI bus and lists the IDs and their corresponding devices.
- **Eject** unloads the selected tape or disk from its drive. (Some devices require you to manually eject their cartridges.)
- **Retension** runs the selected tape forward and backward to even out the tension and alignment (applies only to DC2000, DC6000, and TEAC drives).
- **Erase** erases the contents of the selected tape or disk and, in the case of TEAC, DC6000, and some DC2000 drives, conditions media for reuse.

New Medium Request

When Retrospect says, “Please choose a new” medium, it wants a blank medium or one it can erase.



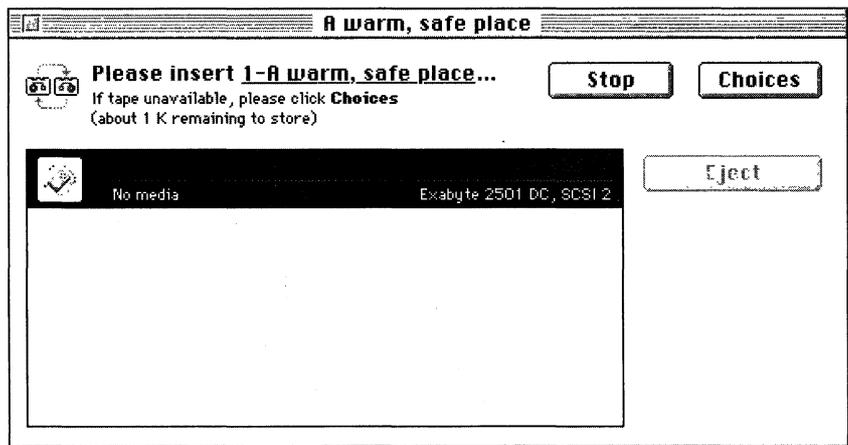
The media request window asking for a new tape.

When there is a medium in the drive and you click the Proceed button, Retrospect erases and names the media then continues with the operation using that medium.

- **Note:** Retrospect may ask you to confirm before erasing a medium which appears to belong to another StorageSet. It will not allow you to erase a member of the StorageSet currently in use.

Specific Member Request

When Retrospect says, “Please insert” a specific medium, it wants that member of the StorageSet currently in use.



The media request window asking for a specific member of a StorageSet.

You should insert the requested medium, but if it is unavailable you can click the Choices button to handle the situation. The media choices dialog asks the action to take.

- **Missing** tells Retrospect to designate the requested member as permanently unavailable from the StorageSet. Retrospect will ask for a new member and re-copy the missing data to it during the next backup.
- **Note:** Select Missing only when you have permanently lost or damaged the requested member. It is not appropriate for other situations.
- **Skip** tells Retrospect to skip the requested member and ask for a new member. Data on the requested member remains intact. Effectively, you are saying, “Stop copying to this member and start copying to a new medium.” This is useful when a member is nearly full and you

think it may not make it through a complete unattended backup before Retrospect asks for a new medium.

- ▲ **Warning:** Do not select Skip when you have lost or damaged the requested disk or tape, or you may lose your data.

For more information on media requests, see “Retrospect refuses to use the inserted tape or disk.” on page 273.

CHAPTER 26 • APPLESCRIPT SUPPORT

This chapter assumes your knowledge of using scripting utilities to script Apple events. It is intended only for advanced users who wish to further automate Retrospect with AppleScript.

Due to the complex nature of AppleScript, Dantz Development can only offer minimal technical support for these features.

Further Automating Retrospect with Apple Events

In addition to its built-in scripting and scheduling features, you can also use Retrospect with scripts created with the AppleScript Script Editor, UserLand Frontier, and other Apple event scripting utilities. There are three ways to use Apple events to script Retrospect:

- Retrospect is scriptable, so you can send events to Retrospect to initiate various operations. For example, you can use an AppleScript script to back up a volume, start a prepared Restore script, or poll Retrospect to see if it is busy.
- Retrospect is attachable, meaning Retrospect can “trigger” scripts to run. For instance, Retrospect can run a script that quits your database application before a backup and starts it again when the backup completes. Or it can run a script that sends a message to your text pager warning you that the wrong media is in the backup device.
- Retrospect’s Remote control panel is also scriptable. For more information, refer to the *Retrospect Remote Administrator’s Guide*.

Installing Apple Event Support for Retrospect

When you install Retrospect, a folder named “AppleScript Utilities” is put in the same folder as the Retrospect application. This folder contains the Retrospect Event Handler script application and example AppleScript scripts you can use or examine to help you start scripting Retrospect on your own.

To activate script triggering, you must copy the Retrospect Event Handler script application to Retrospect's preferences folder ("System Folder:Preferences:Retrospect:"). If you only want to control Retrospect with Apple events, you do not need to activate script triggering.

Sending Apple Events to Retrospect

You can use Apple events to perform a variety of operations, including starting Retrospect scripts, finding out what script is running, and spontaneously running backups. Following is an example AppleScript script to back up your hard disk to a StorageSet:

```
tell application "Retrospect"  
    back up "Local Desktop:Macintosh HD" to "StorageSet A"  
end tell
```

Nearly everything you need to know to control Retrospect with Apple events is in Retrospect's dictionary and in the example scripts. (To view the dictionary, choose Open Dictionary from the Apple Script Editor's File menu and open Retrospect.) Refer to the Read Me file on the Retrospect Install 1 floppy disk for more information about scripting Retrospect and about the example scripts.

- **Note:** When you use AppleScript to send a script name to Retrospect, the capitalization of the name must match that of the name as it appears in Retrospect.
- **Note:** When you refer to a volume or Subvolume in Retrospect, you must use the hierarchy that appears in the volume configuration window. For example, to refer to a Subvolume named "Reports" on the local hard disk "Macintosh HD" you would use "Local Desktop:Macintosh HD:Reports".

Using Retrospect to Trigger Scripts

Some events cause Retrospect to send messages to the Retrospect Event Handler script application, "triggering" it to run one of its handlers. The default handlers are surrounded by comment marks so Retrospect's messages are ignored. If you remove the comment marks, the handlers will display a dialog as each event occurs, naming the event and in some cases

listing information about the event. These handlers are included only as examples to help you with your own scripts.

To make Retrospect trigger your own scripts, first copy the handler representing the event that triggers your script. Paste it at the top of the script, outside the comment marks. (Leave the original handler in place, in case you need it later while debugging your own scripts.) Then place your own AppleScript code between the handler's "on" and "end" statements.

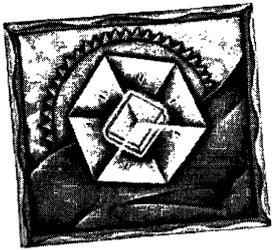
- **Note:** If you save a copy of the Retrospect Event Handler script application by choosing Save As from Apple Script Editor's File menu, select both the Stay Open and Never Show Startup Screen checkboxes.

The following example AppleScript script quits FileMaker Pro Server when Retrospect starts a script that backs up the database, and then opens the server again when the backup is completed.

```
on scriptStart given scriptName: theScript, startDate: theDate
    if theScript is "Back Up Database" then
        tell application "FileMaker Pro Server"
            force quit
        end tell
    end if
end scriptStart
```

```
on scriptEnd given scriptName: theScript, ¬
    scriptErrorMessage: theError, errorCount: theErrorCount
    if theScript is "Back Up Database" then
        tell application "Finder"
            open file "FileMaker Pro Server" of startup disk
        end tell
    end if
end scriptEnd
```

SECTION VIII



Management

- MAINTAINING SCRIPTS
- BACKUP STRATEGIES
- REPORTS
- MANAGING STORAGESETS
- COPY OPERATIONS
- CONFIGURING DEVICES
- MAINTENANCE AND REPAIR
- PREFERENCES
- MOVING RETROSPECT

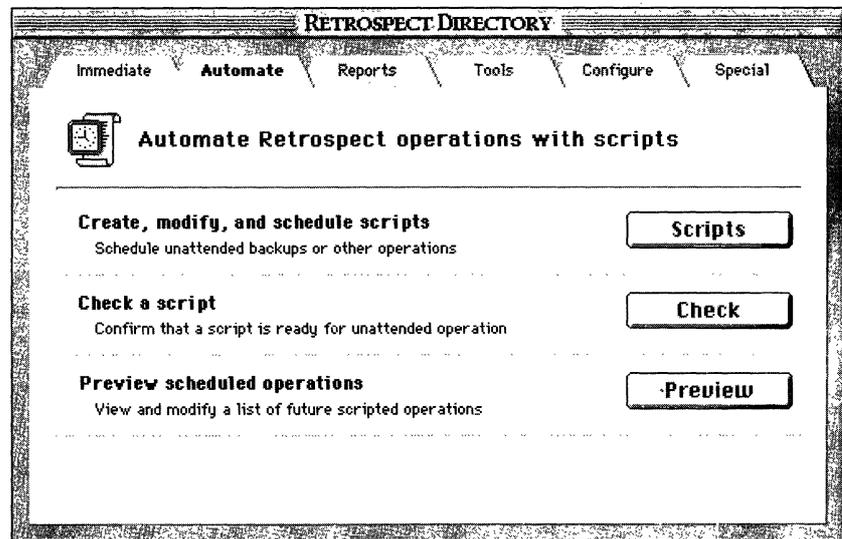
This section describes how to perform various tasks to manage StorageSets and scripts, including viewing reports, maintaining scripts, and transferring files among StorageSets. It also offers several strategies for doing backups.

CHAPTER 27 • MAINTAINING SCRIPTS

This chapter provides instructions for various tasks you may need to perform in maintaining the scripts you have created. Maintenance tasks include:

- Checking script settings to confirm a script is ready for unattended operation;
- Modifying script settings, such as sources, destinations, or the schedule;
- Duplicating a script to create a similar one;
- Renaming a script;
- Deleting a script;
- Previewing and modifying the script execution schedule;
- Deferring script execution until a later date.

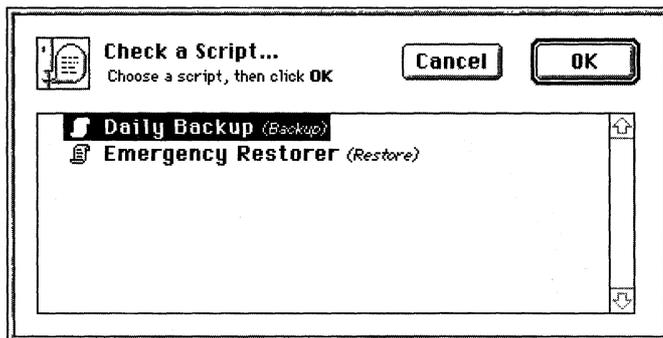
To perform any of these tasks, first click the Automate tab in the Directory.



Checking Scripts

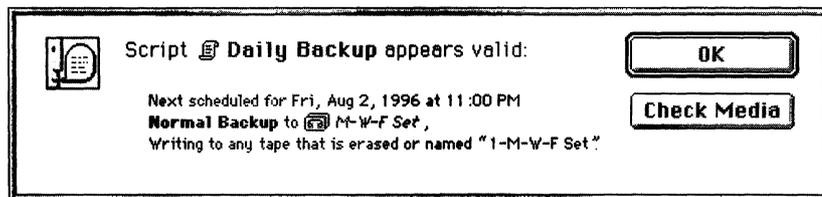
Before leaving Retrospect to run a script unattended, it is a good idea to confirm the script is ready for unattended operation. When appropriate, a script check also tells you what media Retrospect will request when the script runs.

To check a script, click Check from the Directory's Automate tab and a dialog appears, listing the available scripts.



The script checking dialog.

Click the script you want to test and click OK. Retrospect checks the script definition to make sure that a Source and Destination have been properly defined. A message informs you if the script is missing necessary information. If the script is complete, a message appears telling you that the Script is ready.

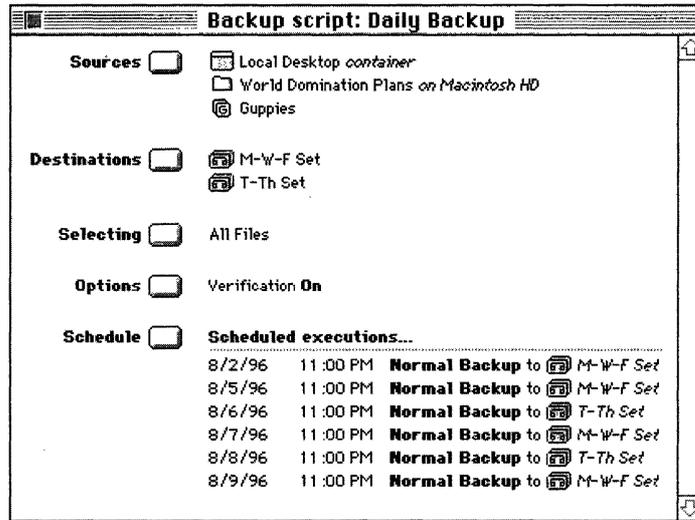


- **Note:** The information presented in this dialog varies with the StorageSet and active media member.

Click OK to return to the Retrospect Directory or click Check Media to have Retrospect check whether the correct StorageSet member is available.

Modifying Script Settings

You can change any of the choices you made in creating a script—you can choose different source volumes or destination StorageSets, change the file selection criteria, the options, or the schedule. You can modify a script from the script summary window by clicking the buttons and choosing different settings.



The script summary window shows the script's current settings.

Modifying script settings is done just like creating them. For further explanation, read Section VI, Automated Operations, which starts on page 79. For details on using Selectors to set the criteria, see Chapter 23 • Using Selectors, which starts on page 151. For details on Options, see Chapter 24 • Execution Options, which starts on page 168. For details on using Schedulers, see Chapter 15 • Scheduling Scripts, which starts on page 91.

Duplicating, Renaming, or Deleting a Script

You can base a new script on an existing one by duplicating a script and then modifying the settings of the duplicate. Existing scripts can also be renamed or permanently deleted.

To duplicate, rename, or delete a script, first click the Automate tab in the Retrospect Directory. Then click Scripts to display the list of scripts. Next, click the desired script to select it before issuing a command.

Duplicate

Choose Duplicate from the Scripts menu. Retrospect asks you to name the new script; type a name and click New. The new script is added to the list.

Rename

Choose Rename from the Scripts menu. Retrospect asks you to give the script's new name; enter a name and click Rename. The script is renamed in the list. You can also rename a script when its script summary window is active.

Delete

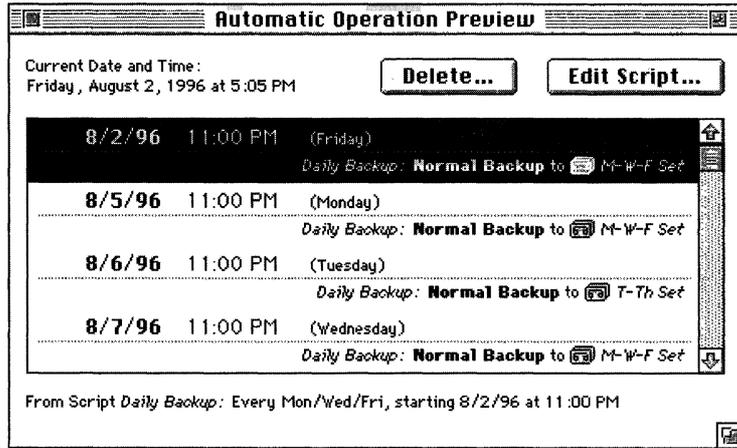
Choose Forget from the Scripts menu. Retrospect asks for confirmation; click OK to confirm. The script is removed from the list.

If you do not want to receive a confirmation message when you delete or duplicate scripts, press and hold the Option key as you issue these commands.

Future Execution Schedule

You can view the script execution schedule to see when each script is scheduled to run. You can also modify the execution schedule by deleting scheduled events or by editing a script and changing its schedule.

Click Preview from the Automate tab to view the execution schedule for all scheduled scripts. (The following example shows a typical schedule.)



The scripts execution schedule window.

Deleting

To delete a scheduled event and all prior events for this Scheduler, click the event to select it then click Delete. The event and all prior events for this Scheduler are removed.

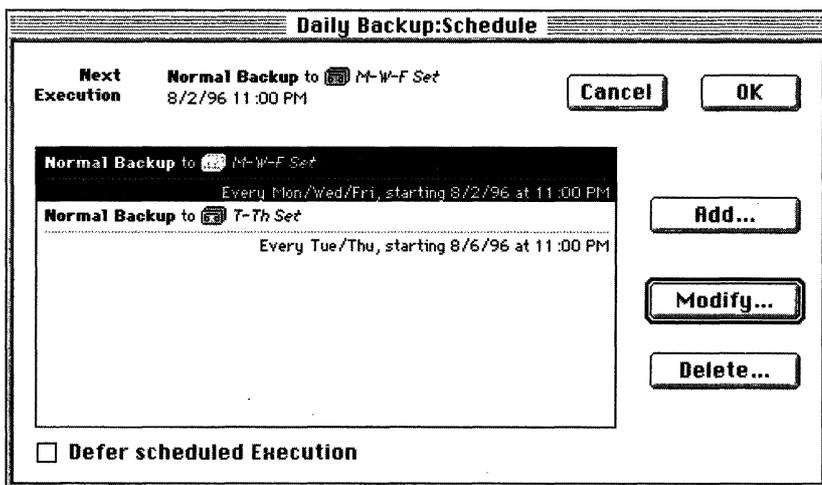
Editing

To edit the script associated with an event listed in this window, click the event to select it then click Edit Script. The script summary window appears, and you can click the Schedule button to modify the schedule. For details on modifying schedules, see Chapter 15 • Scheduling Scripts, which starts on page 91.

Deferring Script Execution

If you do not want a script to run for a period of time, you can turn the script schedule off and specify when it is to be turned on again. This is useful, for example, if your office closes a week for holidays and nobody will be there to change media in the backup device.

To defer script execution, click Scripts from the Automate tab to display the list of scripts. Select the desired script then click Edit. The script summary window appears. Click Schedule. Retrospect lists the currently scheduled dates and times for this script.



Click the Defer scheduled Execution checkbox at the bottom of the window. A date and time field appears at the bottom of the window.

Defer until: 8/13/1996 Fri 4:00 PM

Set the date and time at which the script is to be turned on again, then click OK. Retrospect ignores execution events prior to the deferred date.

CHAPTER 28 • BACKUP STRATEGIES

Introduction

This chapter suggests several strategies for backing up your Macintosh or your entire network. Review each strategy and decide which will work best for your situation. Perhaps you will need to slightly modify a strategy to better fit your needs. Perhaps you will devise your own strategy which bears no relation to these suggestions. Realize these are but a few suggested strategies, and Retrospect's features allow an unlimited number of different strategies. Just remember the basic backup rules when you go about creating a backup strategy of your own.

Different backup actions are often integral parts of effective strategies. Know and understand them, which are described under "Backup Actions" on page 23.

Basic Backup Rules

While Retrospect is a powerful tool for safeguarding your data, there are some basic backup rules you should follow to help avoid data loss:

- Back up regularly. You cannot restore what you have not backed up. Retrospect is most effective when you back up everything and back up often, which is best accomplished by automating backups.
- Keep multiple backups of your data. Rotate among different StorageSets when you make subsequent backups. The more you have, the less likely you are to lose data.
- Do not repeatedly back up to the same disk or tape StorageSet for months. Regularly retire old media and introduce new media using full or new backups.
- Always store at least one backup set off-site to guard against fire, theft, and natural disasters.
- Take care of your backup media. Magnetic media can be damaged by dirt, liquids, smoke, magnetism, excessive humidity, or high heat.

Media can also wear out after as few as several hundred uses.

- Periodically verify your backups are working. Retrospect provides tools that allow you to compare data and verify media to ensure valid backups. It also creates logs and reports that detail backup successes and failures.
- If you make a mistake or see a problem, do not panic. Instead, take a break and read Section X, Problems and Solutions, which starts on page 267. If you cannot find a solution, contact technical support.

Individual Backup Strategies

The three following strategies are useful for backing up a single computer. If you need to back up more than one computer, see “Network Backup Strategies” on page 201.

Strategy 1—Run Documents

Create a backup script and make one full backup run document and one normal backup run document. (See “Run Documents” on page 101.) Execute the normal backup run document at your leisure, such as daily, and every few weeks execute the full backup run document to keep your StorageSets from becoming large and cumbersome.

To introduce new media for rotation with other sets or off-site storage, periodically configure the StorageSet to use new media, as described under “Media Control” on page 216.

Strategy 2—Scheduled Script

Instead of using the run documents tied to the script of the strategy described above, schedule the script to run automatically. Add one Scheduler operating repeatedly Monday through Thursday, doing a normal backup. Add another Scheduler operating repeatedly on Friday, doing a full backup. The two Schedulers look like this:

Day of week Schedulers —————

Normal Backup to  StorageSet A
Every Mon/Tue/Wed/Thu, starting 9/2/96 at 10:00 PM
Full Backup to  StorageSet A
Every Friday, starting 9/6/96 at 10:00 PM

To introduce new media for rotation with other sets or off-site storage, periodically configure the StorageSet to use new media, as described under “Media Control” on page 216.

Following is a partial calendar showing the backup action and destination StorageSets of this strategy.

Monday	Tuesday	Wednesday	Thursday	Friday
2	3	4	5	6
Normal Backup StorageSet A	Normal Backup StorageSet A	Normal Backup StorageSet A	Normal Backup StorageSet A	Full Backup StorageSet A

Strategy 3—EasyScript

Use Retrospect's EasyScript module, letting the program set up a strategy based on its interview with you. See Section V, EasyScript, which starts on page 73.

Network Backup Strategies

When you need to back up a network of Remote Macintosh computers, you must decide which kind of backup scripts to use. The following table lists situations which are suited to Backup Server scripts or regular backup scripts.

Situations Suiting Backup Server	Situations Suiting Backup Scripts
You have a Backup Macintosh dedicated solely to that purpose.	Your Backup Macintosh has other duties at other times.
You have too many Remotes with too much data to be entirely backed up in a single night.	Your scheduled backups are completed before the Remote computers are used in the mornings.
You find yourself trying to catch up with your backups, making special scripts and immediate backups for certain Remotes which are not completely backed up by your regular backup script.	Your scheduled backups are completed before the Remote computers are used in the mornings and unsuccessful backups are rare.
You have PowerBook Remotes and portable drive volumes which appear on the network at random times.	Your network includes only desktop computers and drives which are not removed.
You want Retrospect to back up to whatever media is in the backup device.	You always insert the correct media beforehand for unattended backups.

If you choose to use a strategy which includes the Backup Server, skip ahead to network backup strategy number five on page 206.

Strategy 1—EasyScript

Use Retrospect's EasyScript module, letting the program set up a strategy based on your needs. See Section V, EasyScript, which starts on page 73. Tell EasyScript you want to back up other computers on the network.

Strategy 2—Scheduled Script

Create a backup script. Change the script destination to use three StorageSets. Add a day of week Scheduler to run the script daily to a particular StorageSet, every three weeks. Add a similar Scheduler to run the script daily to the second StorageSet, every three weeks starting one week after the first Scheduler. Add a similar Scheduler to run the script daily to the third StorageSet, every three weeks starting one week after the second Scheduler. The three Schedulers look like this:

Day of week Schedulers —

Normal Backup to  StorageSet A
Every 3 weeks on .MTWTF. , starting 9/2/96 at 10:00 PM
Normal Backup to  StorageSet B
Every 3 weeks on .MTWTF. , starting 9/9/96 at 10:00 PM
Normal Backup to  StorageSet C
Every 3 weeks on .MTWTF. , starting 9/16/96 at 10:00 PM

Below is a partial calendar showing the backup action and destination StorageSets of this strategy.

Monday	Tuesday	Wednesday	Thursday	Friday
2 Normal Backup StorageSet A	3 Normal Backup StorageSet A	4 Normal Backup StorageSet A	5 Normal Backup StorageSet A	6 Normal Backup StorageSet A
9 Normal Backup StorageSet B	10 Normal Backup StorageSet B	11 Normal Backup StorageSet B	12 Normal Backup StorageSet B	13 Normal Backup StorageSet B
16 Normal Backup StorageSet C	17 Normal Backup StorageSet C	18 Normal Backup StorageSet C	19 Normal Backup StorageSet C	20 Normal Backup StorageSet C
23 Normal Backup StorageSet A	24 Normal Backup StorageSet A	25 Normal Backup StorageSet A	26 Normal Backup StorageSet A	27 Normal Backup StorageSet A

This strategy does not include scheduled full and new backup actions, so you should manually configure the StorageSets for full and new backups at appropriate times. See “Media Control” on page 216.

Strategy 3—Scheduled Script with Full and New Rotation

Create a backup script. Change the script destination to use three StorageSets. Add a day of week Scheduler to run a normal backup Monday through Thursday to the first StorageSet, every three weeks. Add a day of week Scheduler to do a full backup on Friday, every three weeks. Add similar Schedulers for the second and third StorageSets, but *offset their starting times* one and two weeks later, respectively. Add a repeating interval Scheduler to do a new backup to one of the StorageSets every six weeks. (After a new backup take the old StorageSet media off site for safe keeping.) The Schedulers look like this:

- Day of week Scheduler — Normal Backup to  **StorageSet A**
 Every 3 weeks on Mon/Tue/Wed/Thu, starting 9/2/96 at 10:00 PM
- Day of week (or repeating interval) Scheduler — Full Backup to  **StorageSet B**
 Every 3 weeks on Friday, starting 9/6/96 at 10:00 PM
- Normal Backup to  **StorageSet B**
 Every 3 weeks on Mon/Tue/Wed/Thu, starting 9/9/96 at 10:00 PM
- Full Backup to  **StorageSet C**
 Every 3 weeks on Friday, starting 9/13/96 at 10:00 PM
- Normal Backup to  **StorageSet C**
 Every 3 weeks on Mon/Tue/Wed/Thu, starting 9/16/96 at 10:00 PM
- Full Backup to  **StorageSet A**
 Every 3 weeks on Friday, starting 9/20/96 at 10:00 PM
- Repeating interval (or day of week) Scheduler — New Backup to  **StorageSet A**
 Every 6 weeks on Friday, starting 10/11/96 at 10:00 PM

Below is a partial calendar showing the backup action and destination StorageSets of this strategy.

Monday	Tuesday	Wednesday	Thursday	Friday
2 Normal Backup  StorageSet A	3 Normal Backup  StorageSet A	4 Normal Backup  StorageSet A	5 Normal Backup  StorageSet A	6 Full Backup  StorageSet B
9 Normal Backup  StorageSet B	10 Normal Backup  StorageSet B	11 Normal Backup  StorageSet B	12 Normal Backup  StorageSet B	13 Full Backup  StorageSet C
16 Normal Backup  StorageSet C	17 Normal Backup  StorageSet C	18 Normal Backup  StorageSet C	19 Normal Backup  StorageSet C	20 Full Backup  StorageSet A
23 Normal Backup  StorageSet A	24 Normal Backup  StorageSet A	25 Normal Backup  StorageSet A	26 Normal Backup  StorageSet A	27 Full Backup  StorageSet B
30 Normal Backup  StorageSet B	1 Normal Backup  StorageSet B	2 Normal Backup  StorageSet B	3 Normal Backup  StorageSet B	4 Full Backup  StorageSet C
7 Normal Backup  StorageSet C	8 Normal Backup  StorageSet C	9 Normal Backup  StorageSet C	10 Normal Backup  StorageSet C	11 New Backup  StorageSet A

Strategy 4—Scheduled Script with Rotating Daily StorageSets

Make a script with five StorageSet destinations, named Monday through Friday. Add five day of week Schedulers to back up to each respective StorageSet. Add five repeating interval Schedulers to stagger full backups every four weeks to each respective StorageSet, starting with Monday the first week, Tuesday the second week, and so on. But for Friday, make the repeating interval the last Friday of the month, doing a new backup to the Friday StorageSet. (Take the old StorageSet media off site for safe keeping.) The Schedulers look like this:

Day of week Scheduler	Normal Backup to  Monday Set Every Monday, starting 9/2/96 at 10:00 PM	
Repeating interval Scheduler	Full Backup to  Monday Set Every 4 weeks on Monday, starting 9/2/96 at 10:00 PM	
	Normal Backup to  Tuesday Set Every Tuesday, starting 9/3/96 at 10:00 PM	
	Normal Backup to  Wednesday Set Every Wednesday, starting 9/4/96 at 10:00 PM	
	Normal Backup to  Thursday Set Every Thursday, starting 9/5/96 at 10:00 PM	
	Normal Backup to  Friday Set Every Friday, starting 9/6/96 at 10:00 PM	
	Full Backup to  Tuesday Set Every 4 weeks on Tuesday, starting 9/10/96 at 10:00 PM	
	Full Backup to  Wednesday Set Every 4 weeks on Wednesday, starting 9/18/96 at 10:00 PM	
	Full Backup to  Thursday Set Every 4 weeks on Thursday, starting 9/26/96 at 10:00 PM	
	Repeating interval Scheduler	New Backup to  Friday Set Every month on the last Friday, starting 9/27/96 at 10:00 PM

- **Note:** When you schedule the new backup, make sure it occurs at the same time as the scheduled Friday normal backups. When Retrospect encounters the new backup scheduled for the same execution time as the normal backup, it executes only the new backup. If you were to schedule them at different times, both backups would execute, which is undesired.

Following is a partial calendar showing the backup action and destination StorageSets of this strategy.

Monday	Tuesday	Wednesday	Thursday	Friday
2 Full Backup ☑ Monday Set	3 Normal Backup ☑ Tuesday Set	4 Normal Backup ☑ Wednesday Set	5 Normal Backup ☑ Thursday Set	6 Normal Backup ☑ Friday Set
9 Normal Backup ☑ Monday Set	10 Full Backup ☑ Tuesday Set	11 Normal Backup ☑ Wednesday Set	12 Normal Backup ☑ Thursday Set	13 Normal Backup ☑ Friday Set
16 Normal Backup ☑ Monday Set	17 Normal Backup ☑ Tuesday Set	18 Full Backup ☑ Wednesday Set	19 Normal Backup ☑ Thursday Set	20 Normal Backup ☑ Friday Set
23 Normal Backup ☑ Monday Set	24 Normal Backup ☑ Tuesday Set	25 Normal Backup ☑ Wednesday Set	26 Full Backup ☑ Thursday Set	27 New Backup ☑ Friday Set

Strategy 5—Basic Backup Server

Create a Backup Server script backing up all Remote sources. Schedule it to work from 7:00 P.M. to 7:00 A.M. during the work week, so as not to interfere with the users during their workdays. Set the backup interval so Retrospect backs up every twelve hours.

Strategy 6—Basic Backup Server Including PowerBooks

Duplicate the basic Backup Server script described above. Make PowerBook Remotes its only sources. Remove these volumes from the original script. Schedule the new script to run twenty-four hours per day, with a backup interval of eighteen hours. Run the basic Backup Server script as usual, so these two scripts complement each other.

- ◆ **Tip:** Should you decide to implement a strategy which includes the Backup Server, read “Backup Server Tips and Techniques” on page 117. It includes information to help you devise a more effective strategy.

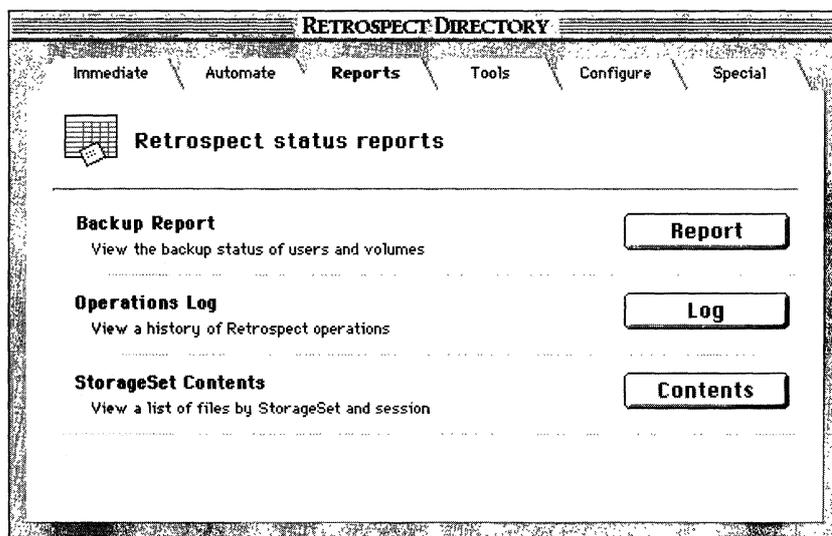
CHAPTER 29 • REPORTS

Using Logs and Reports

Retrospect's Reports tab lets you monitor backup execution history and error messages by viewing these logs and reports:

- The Backup Report shows a detailed account of backup operations for each local and remote volume.
- The operations log shows a record of each Retrospect operation, transaction, and event, and any errors that occurred.
- The Contents Report shows the files that were actually backed up in a specific backup session.

To view any of these reports, first click the Reports tab in the Retrospect Directory.



Viewing the Backup Report

Click the Report button from the Reports tab to view the Backup Report.

The screenshot shows a window titled "Backup Report" with the following content:

3 out of 3 successful events shown
1 out of 1 unsuccessful events shown

Buttons: Edit Script, Find in Log

User/Volume	Elapsed Days	Errs	Date	StorageSet (Script)
Local Desktop				
⌵ Clockwork	0	3	8/30/96 6:00 PM	Weekly Rotation A (Daily Backup)
⌵ Projects	1	0	8/29/96 6:06 PM	Weekly Rotation A (Daily Backup)
Network Remotes				
⌵ Chris Selmoh/PowerBook Duo 280c				
⌵ ChrisGo				
⌵ Derrick's IIsi				
⌵ Thendara				
⌵ The Server	1	0	8/29/96 6:07 PM	Weekly Rotation A (Daily Backup)
⌵ 8/29/96 error -1028 (*Remote: not visible on network)				Weekly Rotation A (Daily Backup)
⌵ File Server				

Annotations on the left side of the screenshot:

- "Errors occurred, but the backup was completed" points to the "Clockwork" row.
- "No errors means the backup was a complete success" points to the "Projects" row.
- "Lack of report events indicates the volume has never been backed up" points to the "ChrisGo" and "Derrick's IIsi" rows.
- "'X' indicates the volume was not successfully backed up" points to the "8/29/96 error -1028" row.

Example of the Backup Report in the standard view format.

Unlike the operations log, to which Retrospect repeatedly appends new information, the Backup Report is completely updated each time a backup is performed. It allows you, as the backup administrator, to see, on a volume-by-volume basis, any problems with recent backups.

The standard Backup Report contains the following information:

- **User/Volume** is the source volume name. Remote Macintosh names, if logged in, are also listed.
- **Elapsed Days** is the number of days since the backup.
- **Errs** indicates any errors that occurred for each backup. (Use the Find in Log command to isolate an error in the operations log.)
- **Date** is the date of the backup.
- **StorageSet (Script)** are the names of the StorageSet and the script of the most recent successful backup.

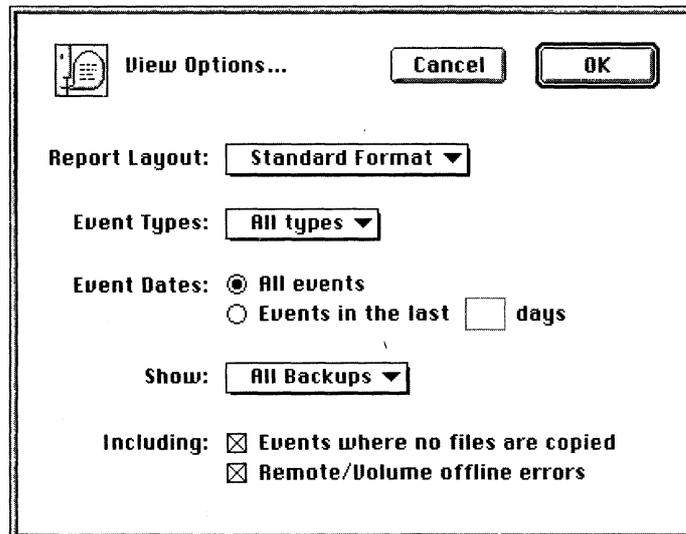
When the Backup Report is viewed in the performance data format (see “Changing the View” below), it contains the following additional information:

- **Duration** shows the time duration of the backup, in hours and minutes. Large numbers may indicate sources with heavy backup needs.
- **MB** is the amount of data, in megabytes, backed up from the volume.
- **MB/Min** is the speed, measured in megabytes per minute, of the source’s backup. Abnormally slow performance may indicate problems with the network, backup device, or other hardware.

You can select a line in the report and open the script it refers to by using the Edit Script button. You can select any line listed in the report and clear it by choosing Clear from the Edit menu or by pressing the Delete key. If you clear a script or forget a StorageSet, that information is removed from the report. This may cause a volume to appear as if it were never backed up.

Changing the View

You can change various aspects of the Backup Report view and format. Choose View Options from the Report menu to bring up a dialog in which you can make changes.



The view options are self-explanatory.

How the Backup Report Works

The backup report is a kind of database of backup events. Each time it completes a backup Retrospect puts a new backup event in its database. For each combination of source, destination and script it saves all unsuccessful backup attempts and the latest successful backup.

Forgetting Events

To remove events from the Backup Report, choose Forget Events from the Report menu. This brings up a dialog with which you can remove the following execution events from the report:

- All but the most recent successful backup
- All successful backups
- All unsuccessful attempts
- Events older than one week
- All execution events
- All Backup Server events

Deleting a backup event from the Backup Report causes the Backup Server (page 112) to not consider that backup event and gives the volume a backup priority higher than its previous priority. When you Forget a script, source, or StorageSet, Retrospect removes that item's backup events from the Backup Report database.

Finding in the Operations Log

Select a line from the Backup Report and click Find in Log to open the operations log with the corresponding action selected.

Editing a Script

Select a line from the Backup Report and click Edit Script to open the script window for the script which executed and created the event.

Printing the Backup Report

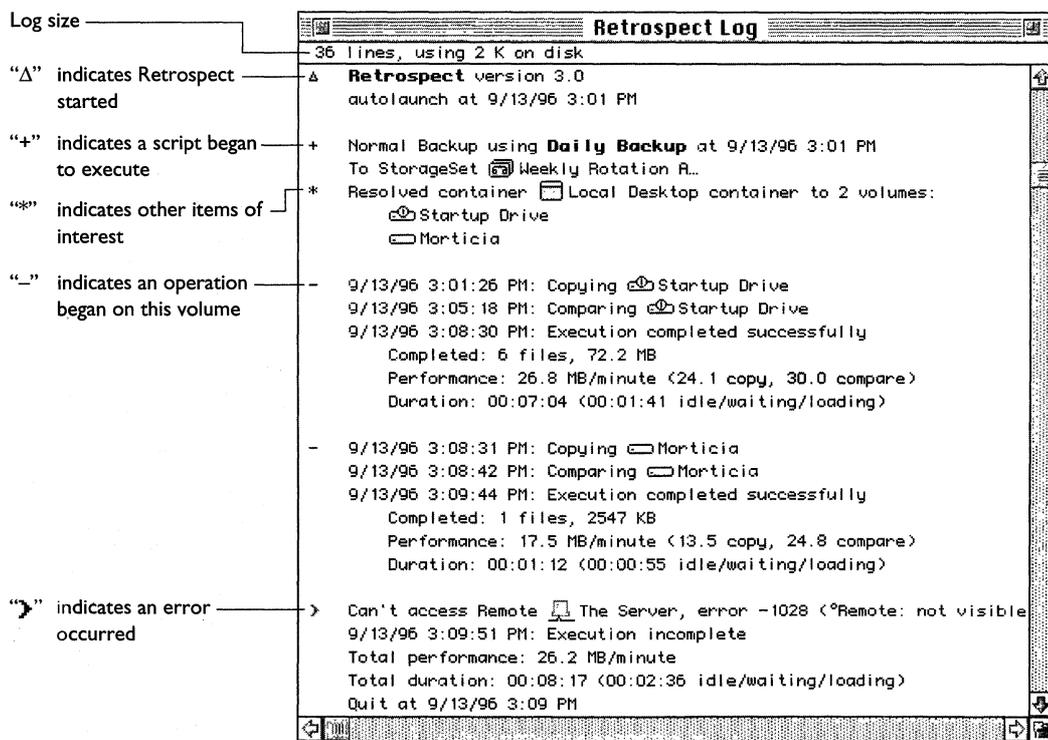
To print the Backup Report, view it then choose Print from the File menu. If you have only a portion of the report selected, only that portion will print. If you have nothing selected, the entire report will print.

Viewing the Operations Log

The operations log stores any messages that are generated during an operation such as a backup or restore. You may need to review the log to find out why an operation was unsuccessful in order to diagnose problems or provide information to Dantz Technical Support.

To view the operations log click the Log button or choose Log from the Windows menu.

The following example shows how information appears in the operations log.



An example operations log.

The log shows the following information for each successful operation:

- **Completed** indicates the number and size of the files that were copied. If you used Retrospect's data compression feature, the log also shows compression achieved for this session.

- **Performance** indicates the number of megabytes of information copied per minute. If the Verification option is turned on, additional performance figures are listed for comparing.
- **Duration** shows the total time required to complete the operation. If you clicked Pause during the operation or there were delays while you inserted media, the waiting time is shown separately. The waiting figure includes time spent during tape drive locate functions and other required functions.

Finding Items in the Log

Retrospect has commands for finding items in the operations log. When the operations log window is active, Retrospect adds a Log menu to the menu bar.

Find

Choose Find from the Log menu, which brings up a dialog. Enter the text you want to search for, then click OK. Retrospect searches for the text, top down from the current selection. When the specified text is not found, Retrospect beeps. When the text is found, Retrospect selects the entire line in which the text appears.

Find Backwards

This command works like the Find command, except it searches bottom-up instead of top-down.

Find Again

After you have used the Find or Find Backwards command, this command continues the search from the current selection forward, or down. Upon reaching the end of the log, it continues searching from the beginning.

Find Again Backwards

After you have used the Find or Find Backwards command, this command continues the search from the current selection backward, or up. Upon reaching the log's beginning, it continues searching backward from the end.

Clearing the Log

To delete the contents of the operations log, view it then choose Clear from the Edit menu. You do not have to clear the log, because Retrospect removes old log entries as the log fills to its capacity, determined by the log size limit preference (page 241).

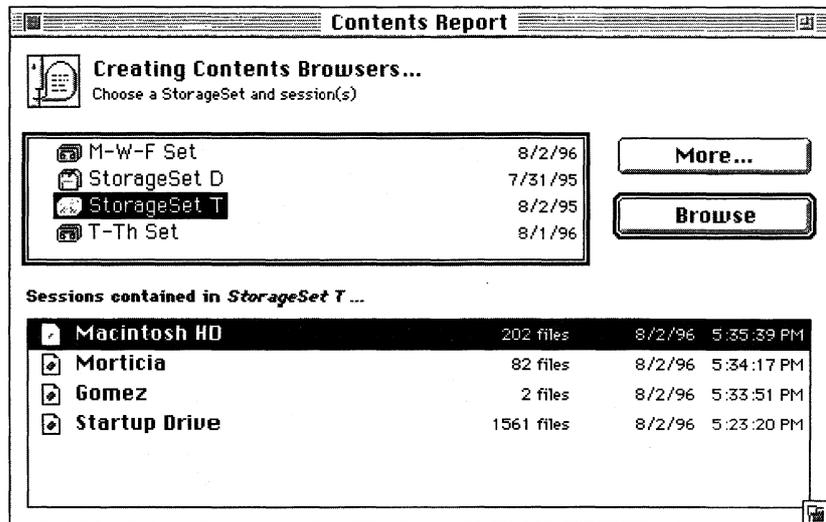
Printing the Log

To print the operations log, view it then choose Print from the File menu. If you have only a portion of the log selected, only that portion will print. If nothing is selected, the entire log will print.

Viewing StorageSet Contents

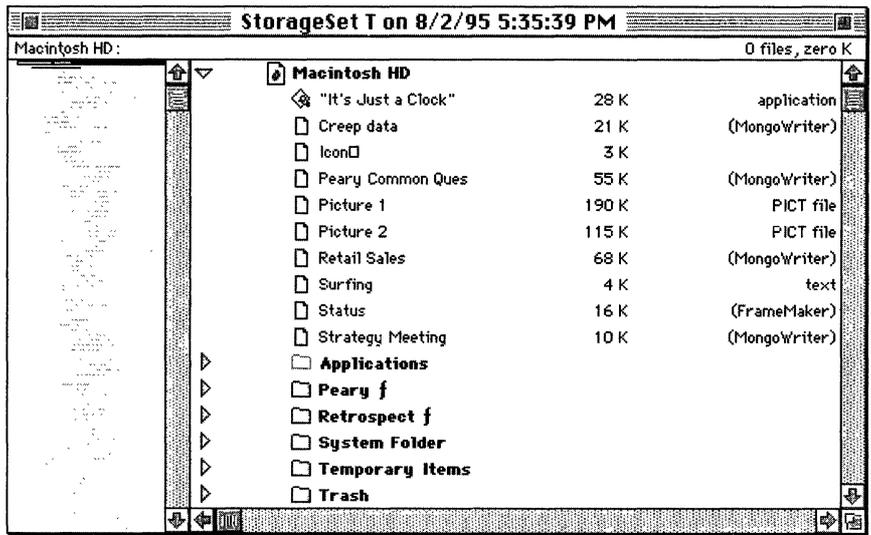
Retrospect can report files backed up to a StorageSet during a specific backup session.

To view the contents of a StorageSet, click Contents. The following window appears.



The StorageSet contents report window.

In the upper list box, select the StorageSet you want information about. (Click More to open another catalog to add to the listed StorageSets.) After you select a StorageSet the lower list box displays the backup sessions contained within the selected StorageSet. In the lower list box, select the backup session or sessions you want to review, then click Browse. A Browser window appears listing the files and folders that were backed up during the session or sessions you selected.

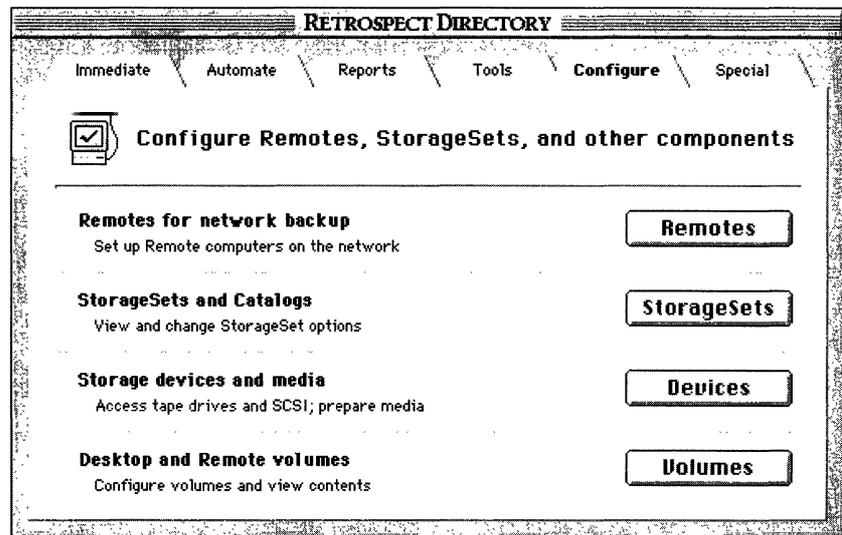


A Browser reporting backed up files.

You can print the file list, search for specific files, get information about a specific file, or change the view format in the Browser window. You can view Browser windows for multiple backup sessions at the same time by performing the same steps and selecting multiple sessions. For information about using the Browser window and menus, see Chapter 22 • Browsing, on page 140.

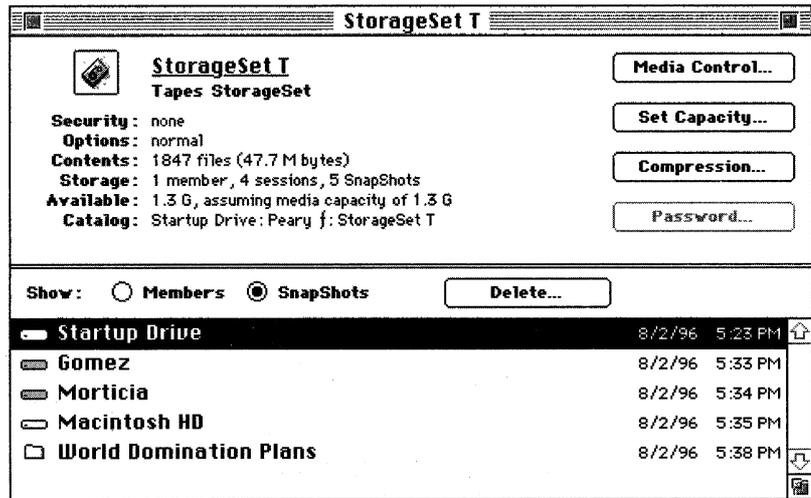
CHAPTER 30 • MANAGING STORAGESETS

Retrospect allows you to pre-configure catalogs and StorageSets for later use or perform maintenance operations on StorageSets which already exist. To configure catalogs and StorageSets first click the Configure tab from the Retrospect Directory.



Configuring StorageSets

Click StorageSets and Retrospect displays a list of all known StorageSets. (If your StorageSet does not appear, click More then Open to locate its catalog file.) Select the StorageSet to configure and click OK. The StorageSet configuration window appears.



The StorageSet configuration window.

The top half of the window displays information about the StorageSet, which are self-explanatory for the most part. “Storage” shows how many media members, sessions, and SnapShots are in the StorageSet. “Available” shows how much space remains on the current member, assuming a media capacity specified by you. (See “Set Capacity” below.) “Catalog” shows the path to the location at which the StorageSets’s catalog is stored.

The top half of the window also includes buttons for changing various aspects of the StorageSet and its catalog. (When a particular function is not available for a given type of StorageSet, its button is dimmed.) The buttons are as follows.

Media Control

This allows you to set how the media will be handled the next time you perform a backup to this StorageSet. Full erases and reuses the media. New requests new media and creates a new StorageSet. For more information on backup actions, see page 23. Skip requests a new member to add to the current StorageSet. Skip is useful when the current member (tape or cartridge) is almost full and you wish to get a complete, unattended execution without changing media.

Set Capacity

This allows you to change Retrospect’s estimate of your tape capacity. The capacity estimates are used for display purposes only and do not affect how

much data Retrospect will copy to a tape because it uses all the space it can. Leave the default (automatic) in this window to let Retrospect estimate the capacity.

Compression

This allows you to compress the catalog file stored on your hard disk, saving thirty to forty percent of its uncompressed disk space. Retrospect compresses catalogs when doing various operations with StorageSets. Catalog compression is only available for catalogs created with Retrospect 2.0 or later.

Password

When a StorageSet uses password protection or encryption, Retrospect requires you to enter the password the first time the StorageSet is used during a session with Retrospect. (That is, during the time between launching and quitting.)

This configuration option allows you to configure how Retrospect manages this particular StorageSet's password requirements. You can choose from three options:

- **Require manual password entry each time** makes Retrospect ask for the password the first time it performs an operation with the StorageSet. This precludes the use of unattended, scripted operations, for which you should use one of the other password options. This is the most strict level of password requirement.
- **Save the password for scripted access only** makes Retrospect require the password only for non-scripted operations. This option allows you to use encrypted StorageSets for unattended operations while still requiring password entry for interactive operations. If you use this option, we recommend you also use the Security preference (page 245) to protect access to the Retrospect program itself.
- **Save the password for any access** makes Retrospect store the password for all backup and restore operations. This is the least strict level of password requirement. If you use this option, we recommend you also use the Security preference (page 245) to protect access to the Retrospect program itself.

Members and SnapShots

The bottom half of the StorageSet configuration window lists either members or SnapShots, depending on which radio button is selected.

When the Members radio button is selected, Retrospect shows the members of the StorageSet. If a StorageSet member is no longer available (for example, it is lost or damaged), you can designate it as permanently unavailable by clicking Set Missing. This causes Retrospect to copy the missing files during this StorageSet's next backup.

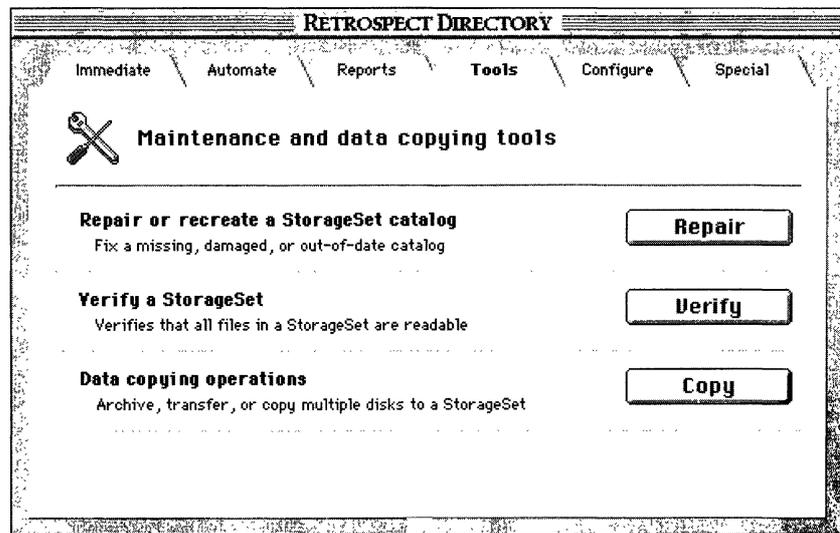
When the SnapShot radio button is selected, Retrospect shows the SnapShots in the StorageSet. SnapShots can be removed by clicking the Delete button. A deleted SnapShot will be replaced when its volume is next backed up.

- ▲ **Warning:** You will not be able to restore an entire disk if a volume's SnapShot has been deleted.

CHAPTER 31 • COPY OPERATIONS

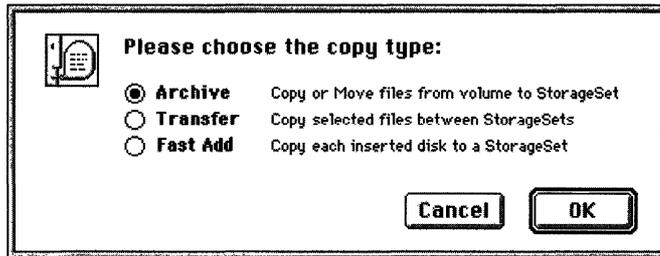
Retrospect has three different specialized operations to copy or move files among StorageSets and disks. Archive lets you move files from a volume to a StorageSet for off-line storage. Transfer lets you copy files from one StorageSet to another. Fast Add copies a series of floppy disks or removable cartridges to a StorageSet.

To set up a copy operation, first click the Tools tab from the Retrospect Directory.



Archive

Click Copy from the Tools tab. A dialog asks you to choose the type of copy operation you wish to perform.



Leave the Archive radio button selected, then click OK. From this point on, the archive operation is set up just like a backup, as described in Chapter 10

- **Immediate Backup**, which starts on page 47. The only difference is the additional option of whether to move files, which deletes the original files from the source after copying them to the destination.

Scripting an Archive

When an archive summary window is active, you can choose Schedule from the Script menu to save the archive information and settings as a script. You can then use the script to accomplish archive operations. See Section VI, Automated Operations, which starts on page 79.

Archiving Tips

Media

Plan for the long term. Archive to two or more StorageSets and maintain an off-site copy of your archived data. Always store media according to manufacturer's guidelines. Periodically transfer your data to new media to ensure storage integrity. Do not use device-specific options such as hardware compression, because your next backup device may not support features of an older model.

Planning

Define an archiving system and follow it every time. Only archive files in specific folders, having defined labels, or modified within a specific date range. Force users to make a decision on what is to be archived by moving data to a specific location. Never archive data without telling users what was removed.

Before you use the Move files (delete after copy) option, first archive to a different StorageSet by copying without moving. This provides an extra measure of safety should one StorageSet become unusable. If you have only

a single archive tape and it is lost or damaged, you will have lost all of your data. Be sure not to recycle, lose, or damage your archive media.

Verification

Always use verification. If you do not use verification and hardware problems occur when archiving, your data may not be correctly copied to the media.

On-line Archiving

To archive documents in place, compress them in a file StorageSet that you store on your hard disk. This way they take up less room, but are still on-line.

Transferring Files Between StorageSets

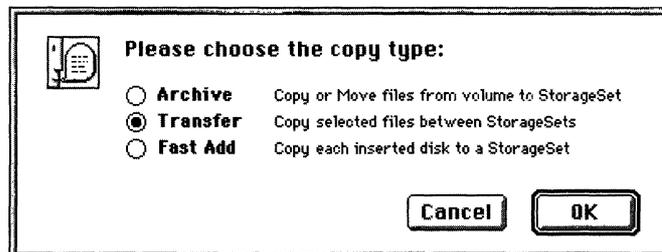
Retrospect can copy files between StorageSets if you want to change the media on which your files are stored, back up an existing StorageSet, or copy selected files from one StorageSet to another.

Transferring does not use any kind of matching files among the source and destination.

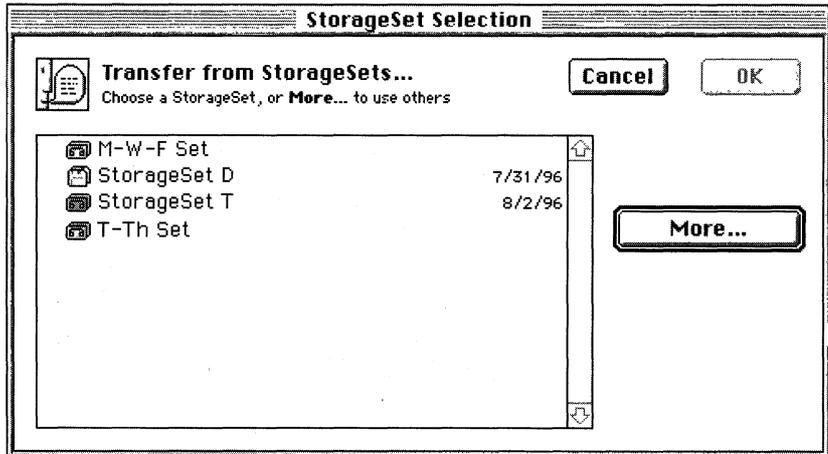
To copy files between StorageSets, you must have a separate backup device for each StorageSet, even if both StorageSets are on the same type of media. In the case of file StorageSets the need for separate backup devices does not apply.

If you do not have separate drives for each StorageSet, you can first copy files temporarily to a file StorageSet on a hard disk and then copy them from the file StorageSet to the destination StorageSet.

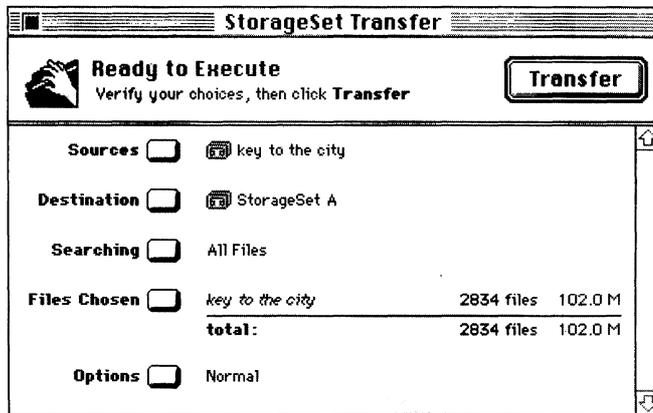
To copy files between StorageSets, click Copy from the Tools tab. The following dialog appears.



Click Transfer and click OK. The StorageSet Selection window appears, asking you to choose one or more StorageSet sources from which to transfer.



Select one or more source StorageSets, and click OK. Another StorageSet Selection window appears, this one asking you for the one to which to transfer. Select a destination StorageSet, and click OK. Another window asks you to choose file selection criteria for selecting the files to transfer. Specify search criteria and click OK. (For details on using Selectors, see Chapter 23 • Using Selectors, which starts on page 151.) The StorageSet transfer summary window appears.



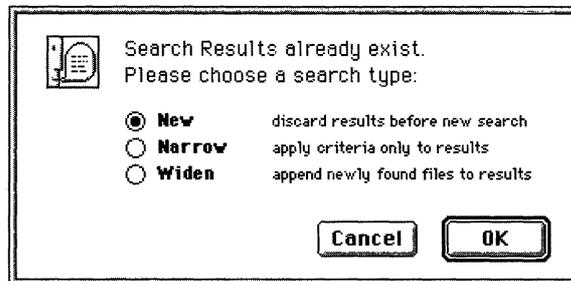
The StorageSet transfer summary window.

- **Note:** Retrospect can copy only 32,000 files at a time. If your chosen files selection exceeds this limit, click Searching to use date Selectors and copy only certain sessions at a time.

If you want to view the files found in the search or mark or unmark some of the files, click Files Chosen to display a Browser. (For details on using Browsers, see Chapter 22 • Browsing, which starts on page 140.)

Additional Searching

If the chosen files Browser does not display the files you want, you can close the Browser and return to the summary window to redefine the search criteria by clicking Searching. If you change the search criteria, Retrospect displays the following dialog when you close the Selector window.



- **New** replaces the results of the previous search with the results of the new search.
- **Narrow** uses the new criteria to further restrict the selection.
- **Widen** uses the new criteria to add files to the current selection.

Select a search type, then click OK to return to the summary window.

Transfer Options

If you want to change the default transfer settings, click the Options button in the summary window. The options are described under “StorageSet Transfer Options” on page 175.

Transfer Summary

After you have changed the options, click OK. When you have finished setting options, the StorageSet transfer summary window reappears. Check that the summarized information is correct.

Transfer Execution

When you are ready to proceed and Retrospect says “Ready to Execute” at the top of the window, click Transfer and a dialog asks you to confirm the operation; click OK. Retrospect performs the transfer operation, displaying its progress in the execution status window. Retrospect may ask you to insert media.

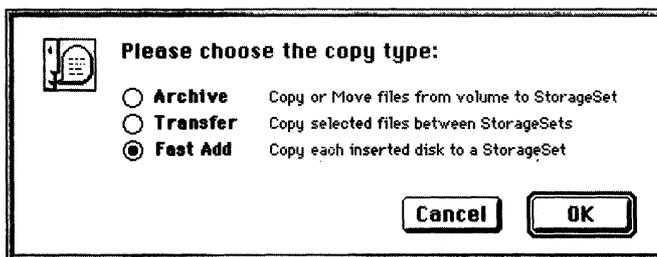
When the execution is complete, Retrospect informs you in the status window. Close it to return to the Retrospect Directory. If any errors occurred, you can see their details in the operations log (which is accessible from the Windows menu and is described under “Viewing the Operations Log” on page 211).

Fast Add

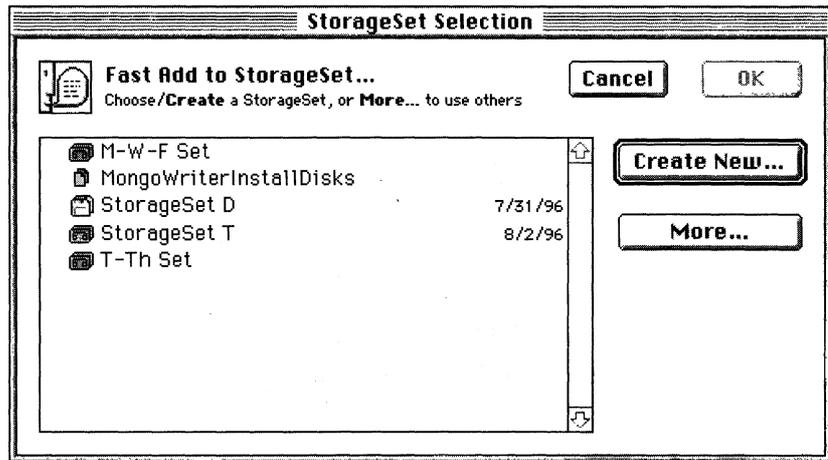
Retrospect’s Fast Add feature provides the most convenient way to copy files from several floppy disks and removable cartridges to a StorageSet.

Using Fast Add

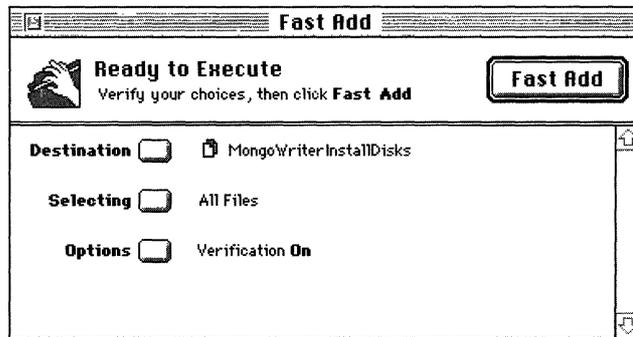
Click Copy from the Tools tab. When the dialog asks you to choose the type of copy, select Fast Add.



Click OK. The StorageSet Selection window appears, asking you to choose a StorageSet destination.



After you specify a destination StorageSet, Retrospect's Fast Add summary window appears.

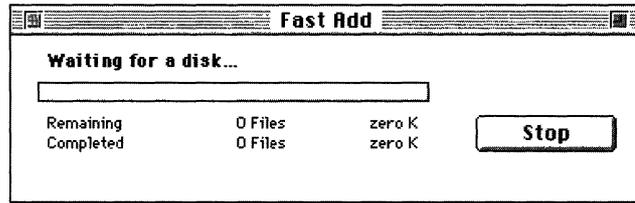


- **Note:** If you are wondering about a source, Retrospect does not ask you for one because the source is a series of removable disks.

If you do not want all files on the disks to be copied to the StorageSet, click the Selecting button and use a Selector. (For details on Selectors, see Chapter 23 • Using Selectors, which starts on page 151.) There is no Files Chosen information because Retrospect does not yet know the contents of the source disks.

When you have set and verified the information and options, Retrospect says “Ready to Execute” at the top of the window. Click the Fast Add button to begin the operation and a dialog asks you to confirm the operation; click OK. An execution window shows the progress of the

operation and gives you a button to stop its execution. Retrospect says “Waiting for a disk...” until you insert a disk to back up.



When Retrospect is done with a disk, it ejects it and waits for you to insert another. Click Stop when you have no more disks to add.

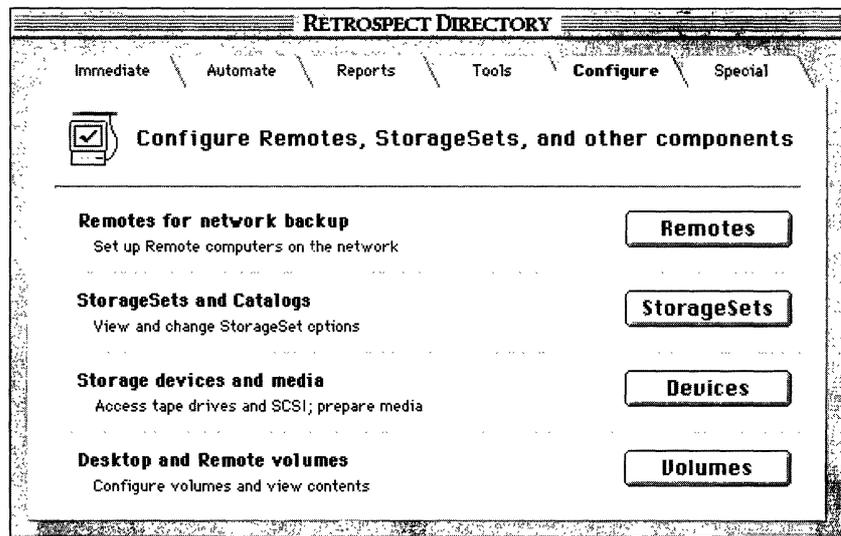
Close the status window to return to the Retrospect Directory. If any errors occurred, you can see their details in the operations log (described under “Viewing the Operations Log” on page 211).

Fast Add disk copy operations cannot be done with scripts.

CHAPTER 32 • CONFIGURING DEVICES

Retrospect has several features for working with backup devices. These let you scan the SCSI bus to check devices, eject media from devices, reension tapes, erase media, and format media.

To perform any of these tasks, first click the Configure tab from the Retrospect Directory.



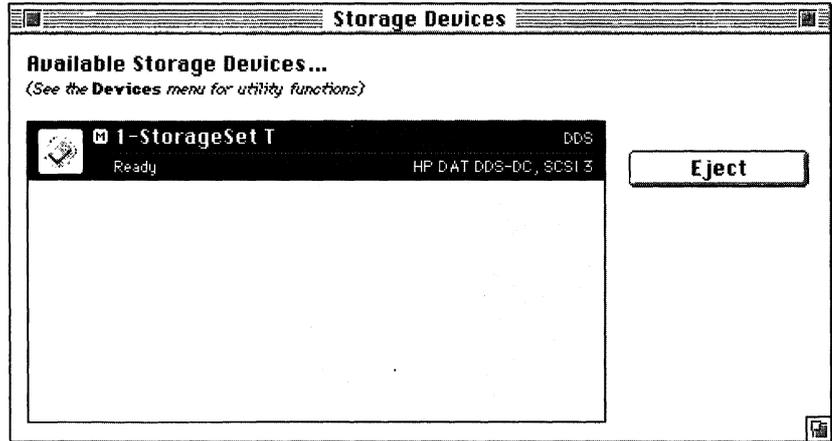
Then click the Devices button.

Preparing Tapes for Use

When Retrospect is executing a script unattended and requires a new piece of media, it will automatically use any appropriate media that is erased or has the correct name. It is a good idea to prepare media for use ahead of time by erasing or reformatting media or reensioning tapes. Use the following functions to erase, reension, or format tapes.

- **Note:** These instructions do not apply to removable cartridges such as Zip, Jaz, SyQuest, Floptical, or optical disks, which do not appear in Retrospect's storage devices window. Prepare this media with the formatting software which came with your drive, or with the Finder's Erase command.

To prepare tape media, insert a tape and notice its name and description in the Storage Devices window. If the device you want does not appear in the window, see page 230 for information on checking SCSI addresses.



The Storage devices window.

Once a tape is loaded, its status appears below its name:

- **Ready** indicates the tape contains Retrospect data.
- **Content Unrecognized** means the tape is not empty, but does not contain valid Retrospect data. Often, this happens when a compressed tape is inserted in a drive without hardware compression abilities.
- **Erased** indicates an empty tape.
- **Write Protected** means the tape is locked.
- **Hardware Error** indicates a device error has occurred.
- **No Media** indicates there is no tape in the drive.
- **Unloaded** means a tape is in the drive but is rewound and must be ejected and re-inserted to be used.
- **Running** and **Busy** indicate the tape drive is busy.

Eject Button

The storage devices window has an Eject button to unload the selected tape from its drive. Alternately, you can choose Eject from the Devices menu. The button is dimmed if it cannot be used with the selected media.

Loader Pop-up Menu

When a tape from an autoloader device is selected, the Eject button changes to a Loader pop-up menu used to control the loader device. The Loader menu items are explained under “Configuring Autoloader Tapes” on page 230.

Devices Menu

Whenever the storage devices window is active the Devices menu appears on the end of the menu bar. It has items to eject, retension, erase, and format media, as well as an item to check the status of the devices on the SCSI bus.

- **SCSI Status** brings up a window listing SCSI bus ID numbers and their respective devices, if any. This window is explained in detail under “Checking SCSI Addresses” on page 230.
- **Eject** unloads the selected tape from its drive.
- **Retension** winds the selected tape forward to the end and back to even out the tension and alignment of DC2000, DC6000, and TEAC drives. (DAT and Exabyte tapes are retensioned automatically during execution, and cannot be retensioned manually.) You should retension tapes if they have not been used in a long time or if the temperature or humidity of their storage environment has changed significantly.
- **Erase** erases the contents of the selected tape, and—in the case of TEAC, DC6000, and some other drives—conditions media to be reused.
- **Format** completely reformats the selected tape and is more time-consuming than Erase. Unformatted DC2000 tapes are the only type of tapes that require formatting; the item is dimmed for other drives.

How Retrospect Works with Autoloaders

Just after its power is turned on, or when its magazine is changed, an autoloader goes through a process to determine which slots contain tapes. The autoloader does not know the names of the tapes, only that they are present in the magazine.

When Retrospect needs information about each tape it polls the loader to get tape names and types. The autoloader inserts each tape in turn, and Retrospect keeps track of the tape names and locations. Each time Retrospect is opened or the magazine is changed, Retrospect must poll again.

Manual Execution

During immediate operation, Retrospect waits at the media request window. Use the Loader pop-up menu to choose the requested tape.

Automatic Execution

During a scripted operation, Retrospect scans the autoloader and searches for the appropriate media and loads whichever tape is required. If a new or erased tape is required, Retrospect will load and use the first one available.

Configuring Autoloader Tapes

Click Devices from the Configure tab to bring up the storage devices window. Select a loader drive from the list and notice the Loader pop-up menu on the right (where the Eject button would usually be). The Loader menu has items to control the tapes in the loader.

- **Scan Media** cycles through all the tape slots in the autoloader, moving each tape from slot to drive to learn the name of the tape.
- **Erase All** erases each tape in each slot of the autoloader.
- **Unload** ejects all media from the autoloader. Use this command to reload a magazine with new media.
- A numbered item loads that particular slot's tape into the drive to learn its name and make it ready for use.

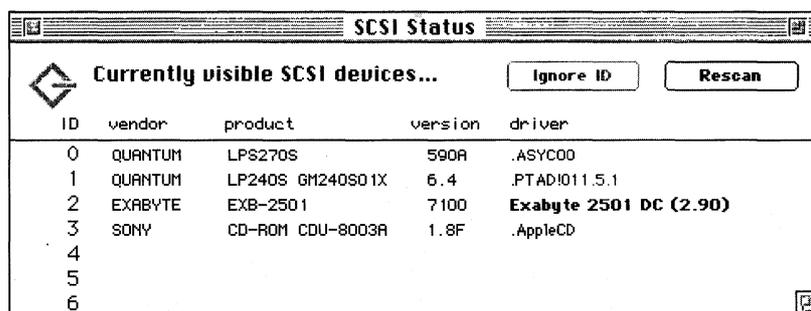
Checking SCSI Addresses

You can determine which SCSI tape devices on your SCSI chain Retrospect recognizes. This capability is useful when a tape drive does not appear in the storage devices window.

To make sure Retrospect supports your tape drive, refer to the Release Notes included with your Retrospect package, as well as the Read Me file installed by the Retrospect installer program. The fact that Retrospect *recognizes* a tape drive does not always mean the tape drive is supported or

qualified for use with Retrospect, although usually it is. If you are in doubt, contact Dantz Technical Support for confirmation.

To check SCSI addresses with Retrospect, click Devices from the Configure tab, then choose SCSI Status from the Devices menu. Retrospect scans the Macintosh SCSI bus, and displays a window showing all SCSI ID numbers and their connected devices, if any.



ID	vendor	product	version	driver
0	QUANTUM	LPS270S	590A	.ASYC00
1	QUANTUM	LP240S GM240S01X	6.4	.PTAD1011.5.1
2	EXABYTE	EXB-2501	7100	Exabyte 2501 DC (2.90)
3	SONY	CD-ROM CDU-8003A	1.8F	.AppleCD
4				
5				
6				

The SCSI status window.

If a device has a driver installed, Retrospect lists the driver to the right of the device listing. If Retrospect recognizes a tape drive, the name of its device driver appears in bold. If Retrospect does not recognize a tape drive, the words “(no driver)” appear. If your drive does not appear at all, or a different driver is installed for it, refer to the troubleshooting information of Section X, Problems and Solutions, which starts on page 267.

In the above example, the Exabyte model 2501 is shown as a recognized tape drive with data compression. The “(2.90)” indicates Retrospect’s internal driver version for this tape drive.

Ignore ID

If you select an ID and click Ignore ID, Retrospect will not scan that ID when Retrospect is next opened after you quit. (This is not a feature you will need to use unless directed to do so by Dantz Technical Support.)

Rescan

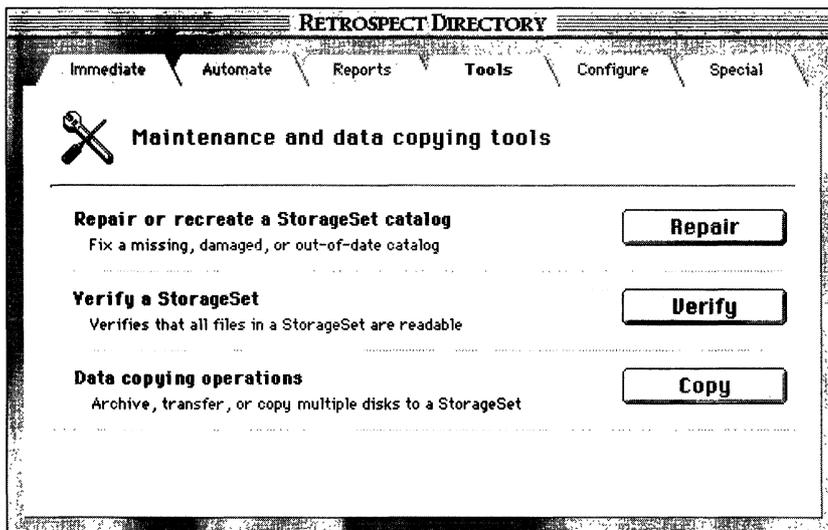
Clicking this button makes Retrospect scan the SCSI bus and display any changes to the SCSI bus since the window was initially opened.

CHAPTER 33 • MAINTENANCE AND REPAIR

This chapter provides instructions for maintaining and repairing catalogs and media by performing the following tasks:

- Update catalogs that are out-of-date or “out of sync”.
- Recreate catalogs that are missing or damaged. (If it produces “chunk checksum” errors, it is damaged.)
- Repair damaged file StorageSets.
- Verify StorageSet media integrity to confirm that all files are readable.

To perform these tasks, first click the Tools tab from the Retrospect Directory.



Updating a Catalog

When to Update a Catalog

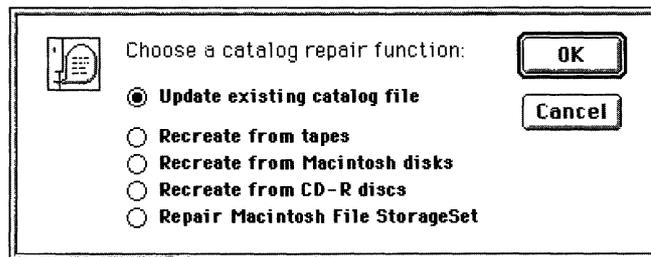
Update a StorageSet's catalog when Retrospect reports a “catalog out of sync” error while operating with the StorageSet. You must update the catalog to synchronize it with the media or you will be unable to use the StorageSet.

A “catalog out of sync” error indicates Retrospect was unable to update the catalog the last time it copied data to this StorageSet—possibly because of equipment failure or power failure. This error may also be caused by a full disk (error -34) or by an out of memory (error -108).

- **Note:** If, after updating a catalog, you continue to get “out of sync” errors when using the StorageSet, do not attempt to repair the catalog again. You must skip to new media, reset with a full or new backup, or create a new StorageSet. See page 292 for more information on the error message.

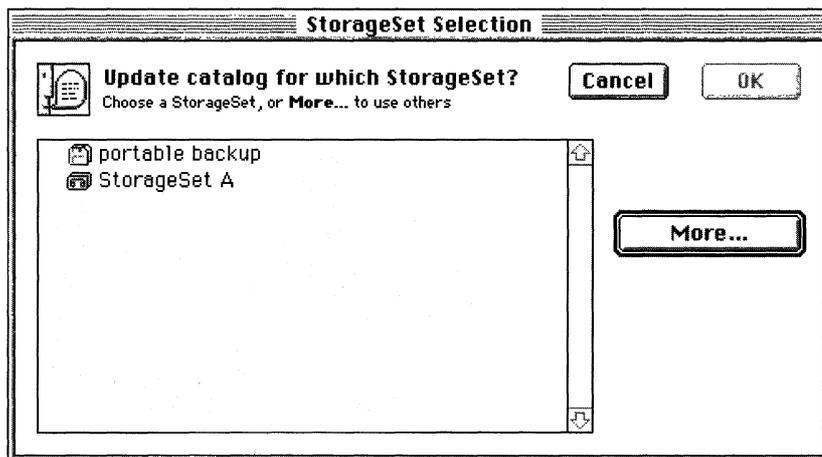
Updating from a Tapes or Disks StorageSet

To update a catalog, click Repair from the Tools tab. The following dialog appears.



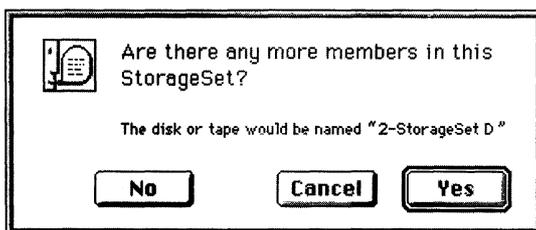
The catalog repair dialog.

Select Update existing catalog file then click OK. The following window appears.



Select the StorageSet to update then click OK. Insert the StorageSet member requested by Retrospect.

Retrospect recatalogs the StorageSet, informing you of its progress with the execution status window. When Retrospect finishes recataloging a particular member of a StorageSet it asks whether there are any more members to recatalog.



If there are no more members because you have already given Retrospect the final disk or tape in the StorageSet, click No to complete the recataloging. If there are more members in the StorageSet, click Yes. Retrospect continues to ask you for additional StorageSet members until you click No or Done.

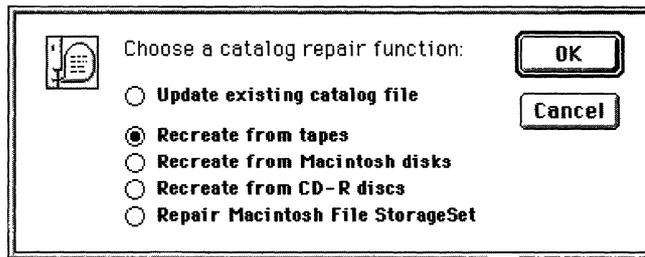
The execution status window informs you whether the update was successful. If the operation was not successful, refer to the operations log for additional information.

Recreating a Catalog

When to Recreate a Catalog

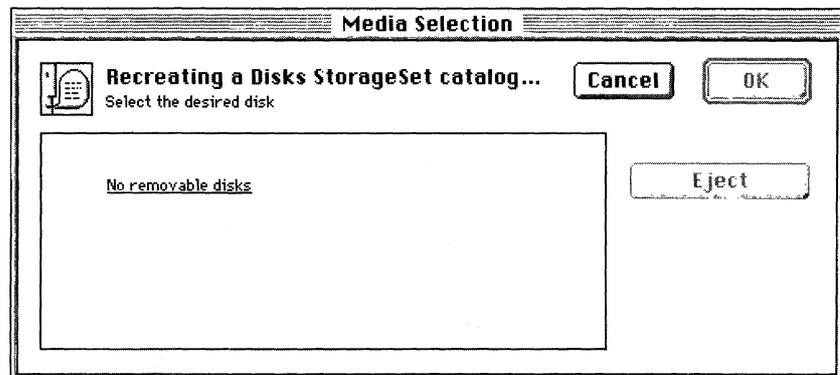
Because you cannot use a StorageSet unless it has a catalog file, you should recreate the catalog whenever the original catalog file is lost or damaged. If the catalog file is unavailable, you can have Retrospect recreate it by reading each piece of media in the StorageSet. Recreating may take a long time, depending on the amount of data in the StorageSet.

To recreate a catalog, click Repair from the Directory's Tools tab. The following dialog appears.



The catalog repair dialog.

Select one of the three Recreate functions then click OK. The following window appears.



The media selection window.

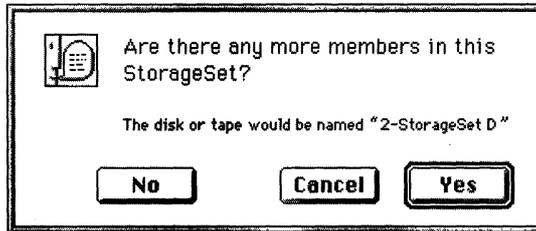
In the media selection window, Retrospect requests the first media member of the StorageSet. If you do not have the first member, insert any other member of the StorageSet to be recataloged. Click OK when you have inserted the medium.

If you are recreating a catalog for a StorageSet that is still known by Retrospect, it asks whether you want it to recognize the recreated StorageSet instead of the known StorageSet.

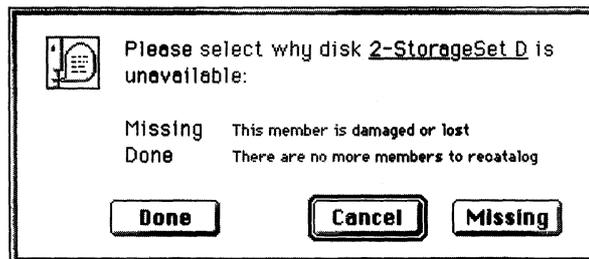
Next, if the StorageSet is encrypted, Retrospect asks for its key. Enter the key or password and click OK.

Specify a location to save the recreated catalog file in the dialog which follows.

Retrospect recatalogs the StorageSet, informing you of its progress with the execution status window. When Retrospect has finished recataloging a particular member of a StorageSet it asks whether there are any more members to recatalog.



If there are no more members because you have already given Retrospect the final disk or tape in the StorageSet, click No to complete the recataloging. If there are more members in the StorageSet, *even if one or more members are lost or damaged*, click Yes. Insert the requested member of the StorageSet, or if you do not have it, click Choices and a dialog asks you what happened to the member.



The choices dialog.

If you have already given Retrospect the final disk or tape in the StorageSet, click Done. If you do not have the requested StorageSet member, or if it is damaged, click Missing.

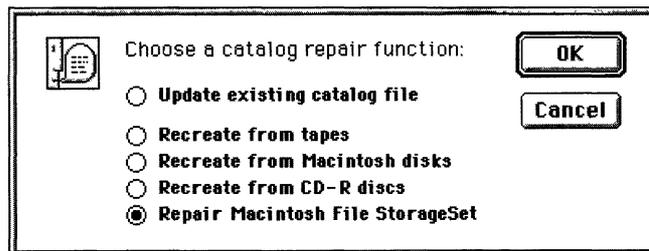
Retrospect continues to ask you for additional StorageSet members until you click No or Done.

The execution status window informs you whether the recreation was successful. If the operation was not successful, refer to the operations log for additional information.

- **Note:** After Retrospect informs you the recataloging was successful, you should edit the scripts which used the StorageSet and add the newly-recognized, recreated StorageSet as the destination within each script.

Repairing File StorageSets

To repair a damaged file StorageSet, click Repair from the Tools tab. The following dialog appears.



The catalog repair dialog.

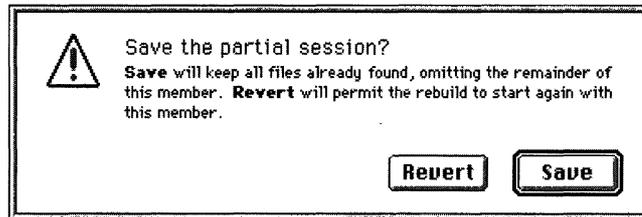
Select Repair Macintosh File StorageSet and click OK. Retrospect displays the StorageSet selection window.

Locate the file StorageSet that needs repair and click Open. A message asks you to confirm the StorageSet repair. Click Yes to repair the StorageSet.

A status box shows how the repair is proceeding. When it is complete, you are returned to the Retrospect Directory. If the repair was not successful, the execution status window reports errors occurred and you can find them in the operations log.

Incomplete Catalog Repair

Any time you stop a cataloging operation, the following dialog appears.



- **Revert** saves all complete sessions cataloged so far, but discards the current, incomplete session. Use this when you want to terminate recataloging for now, but wish to continue updating the catalog from the current tape or disk later. (To continue later, use the Update existing catalog function.)
- **Save** should be used when you do not wish to try to catalog any more data from the current disk or tape. All data cataloged so far should be retrievable. (To continue later, use the Update existing catalog function.) Recataloging will resume with the next disk or tape, if there is one. If you back up more data to the StorageSet after using this option, Retrospect will ask for a new disk or tape, treating this one as full.

Verifying Media Integrity

Retrospect can check all files on your StorageSet media to make sure that they are readable, and reports if there are damaged or lost files due to media failure. For example, if Retrospect informs you that the file you just retrieved is damaged, you may want to verify the StorageSet media to ensure that other files are intact.

Verifying media does not mean Retrospect compares the files on the media with the original files. It only verifies that the files on the StorageSet media are readable.

To verify media integrity, click Verify from the Tools tab. Retrospect displays the StorageSet selection window. Select the StorageSet to be verified, and click OK. If the StorageSet is a disks or tapes StorageSet, Retrospect asks you to insert each StorageSet member as it is needed.

If you do not have the requested StorageSet member, but have more members of the StorageSet to verify, click Choices then Missing, then insert the next requested piece of media.

After verifying the last available member of the StorageSet, Retrospect displays a final status window, which tracks the number of files verified. If there are errors, a Browser displays the files that could not be verified.

- **Note:** Consider backing up unverified files to a new StorageSet.

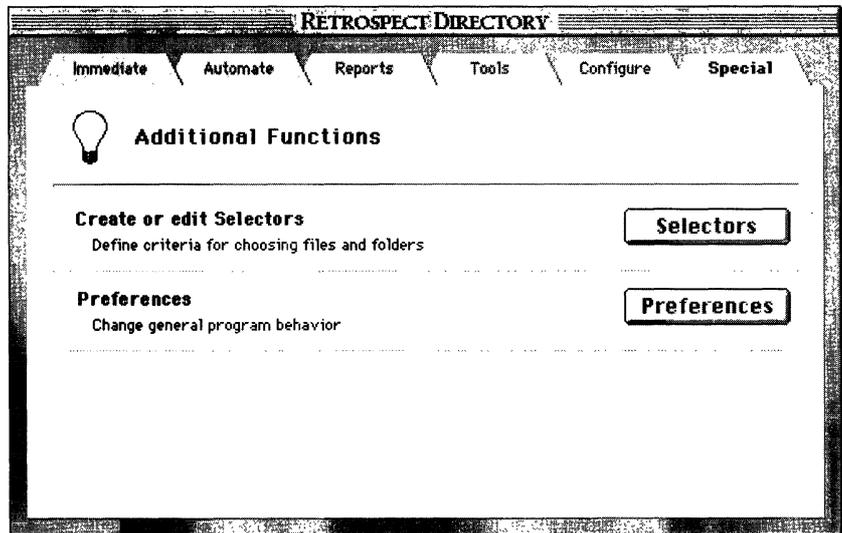
A message informs you if the operation is successful, and the Retrospect Directory is redisplayed. If the verification is not successful, you are referred to the operations log for additional information.

CHAPTER 34 • PREFERENCES

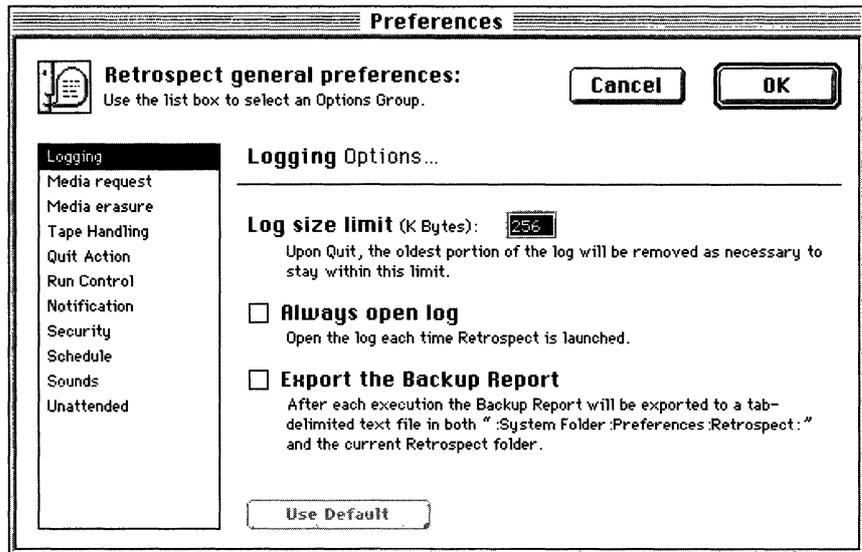
Use the following steps to set general program behavior for Retrospect. This section provides steps for setting these preferences and a detailed description of each option.

Setting Preferences

Click the Special tab in the Retrospect Directory



Then click the Preferences button and the preferences window appears.



The preferences window.

The scrolling list on the left contains the category options. The options for the selected category appear on the right. Click to select your desired preferences category in the scrolling list. Select or deselect options by clicking their checkbox or radio button controls, or enter text or numbers where necessary.

- **Note:** If you change the default setting for an option, the category name will appear in bold in the scrolling list.

When you have finished setting options, click OK.

Logging Preferences

- Log size limit (K Bytes):**
 Upon Quit, the oldest portion of the log will be removed as necessary to stay within this limit.
- Always open log**
 Open the log each time Retrospect is launched.
- Export the Backup Report**
 After each execution the Backup Report will be exported to a tab-delimited text file in both " :System Folder :Preferences:Retrospect:" and the current Retrospect folder.

- **Log size limit (K Bytes)** maintains the operations log size within the limit you set in the field provided. You can set the limit anywhere

between 32K and 9999K. When the log reaches the limit, the oldest portion of the log is deleted to keep its size within the limit. The bigger the log is, the longer it will take to open. The default size is 256K.

- **Always open log** automatically opens the operations log each time you start Retrospect. By default, this preference is turned off.
- **Export the Backup Report** produces or updates two identical files (one in the folder with the Retrospect application and one at the path “:System Folder:Preferences:Retrospect:”) after each execution of an operation. The tab-delimited text files contain all the information from the Backup Report, which is described under “Viewing the Backup Report” on page 208.

Media Request Preferences

- Media request timeout**
(never)

Check this option to limit the time Retrospect will wait for media during execution.

- Automatic Skip to blank media**

Enable this to use a blank tape/disk/disc when the last member of the StorageSet is not available, even though it's not yet full.

- **Media request timeout** specifies a period of time for Retrospect to wait for media during execution. When Retrospect times out, the execution stops and Retrospect proceeds according to the next scheduled event. This preference is off by default, so it never times out.
- **Automatic Skip to blank media** makes Retrospect use an erased tape or disk for subsequent Normal backups even if the current member of the StorageSet is not yet full. For example, select this option and leave an erased tape in the drive when the current tape of the StorageSet is almost full. Then you need not wait for the old tape to fill and be prompted to change tapes. When this option is not selected, Retrospect always prompts for the most recent member of the StorageSet until it becomes full. By default, this preference is turned off.

Media Erasure Preferences

- Auto Format Disks**

Automatically format floppy disks that appear blank.

Warning: HD disks always look blank in an older 800K-only drive.

- Minimal Erase Confirmation**

Choosing a destination disk already containing data is normally confirmed before erasure. Enable this to omit the confirmation.

- **Auto Format Disks** automatically formats unformatted floppy disks when you perform a backup. By default, this preference is turned on.
- ▲ **Warning:** High density (HD) disks always appear blank if inserted into an older 800K-only drive.
- **Minimal Erase Confirmation** skips the confirmation message that normally appears when you proceed with a backup operation and Retrospect needs to erase the media. By default, this preference is turned off.

Media Handling Preferences

Retension Tapes

Automatically retension media to compensate for slow network backups to DC 2000, DC 6000, and Teac tape drives.

Rewind Tapes

At Quit, rewind any accessed tapes, speeding future access.

Eject Media

At Quit, eject any accessed tapes and CD-Rs.

- **Retension Tapes** winds a tape forward to the end and back to even out the tension and alignment. (This applies only to DC2000, DC6000, and TEAC drives.) By default, this preference is turned off.
- **Rewind Tapes** does so when you quit Retrospect. Rewinding helps to speed future access. By default, this preference is turned on.
- **Eject Media** does so with tapes and CD-R discs when you quit Retrospect. By default, this preference is turned off.

Quit Action Preference

Check Validity of Next Script

At Quit, verify and display information on the next script to execute.

- **Check Validity of Next Script** does so when you quit Retrospect. It automatically verifies and displays information about the next script scheduled to execute. By default, this preference is turned on.

Run Control Preferences

Pause in Background

Automatically pause whenever Retrospect is moved to the background.

Stop on Errors

Stop with an alert for execution errors. Errors are always recorded in the operations log.

- **Pause in Background** automatically pauses any operation Retrospect is performing when the Retrospect application is moved to the background. By default, this preference is turned off.
- **Stop on Errors** automatically pauses a Retrospect operation and displays an alert message if any error occurs. By default, this preference is turned off.

Notification Preferences

Show Apple Menu Icon

Show  in the  menu when a script is waiting to run.

Autolaunch Retrospect

Automatically launch Retrospect when a script is waiting to run.

Launch Option at Shutdown

Warn at Shutdown if a script would run within 12 hours.

- **Show Apple Menu Icon** displays the Retrospect application icon in the Apple menu when a script is ready to execute. By default, this preference is turned on.
- **Autolaunch Retrospect** automatically starts Retrospect when a scheduled script is waiting to execute. By default, this preference is turned on.
- **Launch Option at Shutdown** displays a message at shutdown if a script is scheduled to run within the look ahead time. (See “Schedule Preferences” on page 245.) The message asks whether you want to start Retrospect or continue to shut down. By default, this preference is turned on.

The Retro.Startup extension is responsible for launching Retrospect and executing scheduled scripts. This extension is automatically installed by the Retrospect installer program. The Retrospect application installs Retro.Startup when you first start and quit, or when any of the notification preferences are turned on when Retro.Startup is not installed. To remove the

Retro.Startup extension, uncheck all three Notification preferences and the Unattended preferences noted on page 248.

Security Preference

Protect...

The program password will be required to access Retrospect manually. Setting a password does not interfere with automatic execution.

- **Protect** allows you to specify a password that must be entered to start Retrospect manually, though it does not interfere with automatic script execution. If a user enters three incorrect passwords an error is recorded in the operations log. By default, there is no password protection.

When protection is added Retrospect enables the Lock Application item in the Run menu. Choose this item to force Retrospect into locked, unattended mode to prevent someone from interrupting executions. Click the mouse or press a key to enter the password and unlock the application.

- **Unprotect**, which appears only when protection is added, lets you enter the password and remove the protection from the Retrospect application.

Schedule Preferences

Look ahead time: 12 hours

The number of hours to look ahead for future script execution. This affects shut down of Remotes, shut down warnings, and the **Unattended** action.

Schedule...

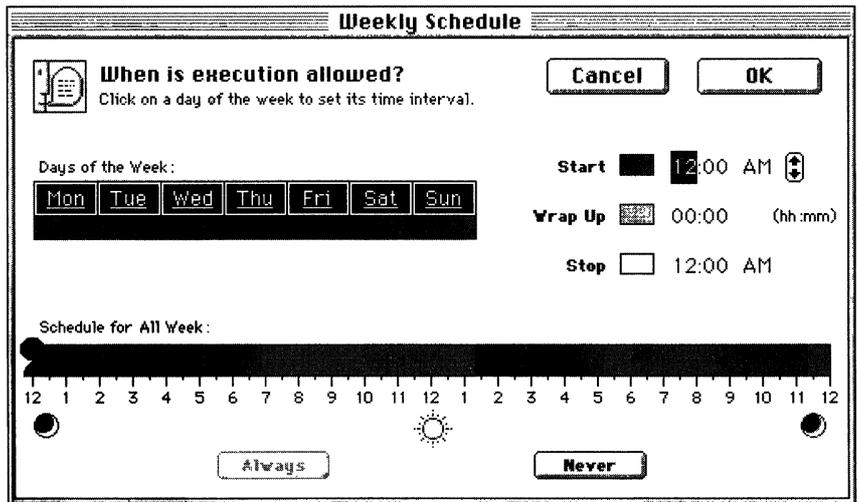
Retrospect will execute scripts only during the specified times each day. This sets the default for all scheduled scripts. Click this button to change the schedule.

- **Look ahead time:** *n* hours defines the number of hours Retrospect looks ahead for scheduled script executions. This affects what happens when you begin to shut down the Backup Macintosh or a Remote, and what Retrospect does when it completes an unattended operation. (For details see “Notification Preferences” on page 244, “Remote System Options” on page 180, and “Unattended Preferences” on page 248, respectively.) The default preference is twelve hours.

- **Schedule** lets you define a default time period during which scheduled non-Backup Server scripts are allowed to execute. You can change the allowed schedule of an individual script with its Schedule option (page 181). The default schedule is twenty-four hours a day, seven days a week.

Customizing the Schedule

When you click Schedule you get the weekly schedule window. Though similar to the Backup Server custom schedule window, it applies *only* to other scripts.



By default, all twenty-four hours of each of the seven days of the week are selected, as above.

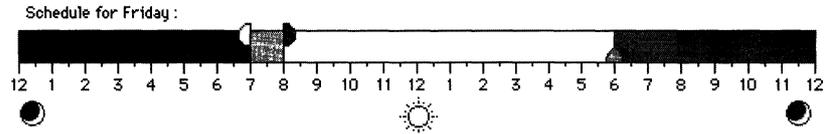
To select a day of the week, click on it. Click and drag to select contiguous days of the week. Use the Shift or Command key and click or drag to select days without de-selecting the previous selection.

To change a time, click on it and type or use the control.

- **Start** is the time at which the script begins.
- **Wrap Up** is the period of time (in hours and minutes) before the stop time, during which Retrospect should complete the current operation but not begin new operations.
- **Stop** is the time at which Retrospect absolutely must halt this script's operations (until the next start time).

- ◆ **Tip:** You can also set times by dragging the icons on the hourly schedule bar, but you should first experiment by typing the times to see how these controls work.

When a time is changed, the hourly schedule bar changes accordingly to graphically represent the start, wrap-up, and stop times of the script.



Each selected day has a scaled-down hourly schedule bar, though it does not have controls.



You can revert a customized schedule with the Always and Never buttons.

Sounds Preferences

Attention sound

Simple Beep ▼

Plays when user interaction is needed, e.g., media request.

Completion sound

Simple Beep ▼

Plays when an automated activity completes normally.

- **Attention Sound** lets you choose one of the sounds in the System file to use when Retrospect requires user interaction, such as during a request for media. The default sound is Simple Beep.
- **Completion Sound** lets you choose one of the sounds in the System file to use when Retrospect completes an automated operation. The default sound is Simple Beep.

Unattended Preferences

- Stay in Retrospect**
- Quit**
- Restart**
- Shut Down**

When unattended execution is complete and no other scripts are scheduled to run for 12 hours then the action selected above is taken.

Notify for Failures and Media

Shows notification alerts after automatic execution for serious failures or when tapes or disks will be needed in the future.

- **Stay in Retrospect, Quit, Restart, and Shut Down** determine what Retrospect does when a script is completed and no additional scripts are scheduled in the specified look ahead time. (See “Schedule Preferences” on page 245.) By default, this preference is set to Quit.
- **Notify for Failures and Media** displays an alert message if errors occur during the automatic execution of a script. It also displays an alert message when tapes or disks will be needed in the future. This option is only available if you have selected the Quit, Restart, or Shut Down preferences described above. By default, this preference is turned on.

The Restart, Shut Down, and Notify on Failure preferences require the Retro.Startup extension. Retrospect installs this extension automatically whenever any of these preferences are checked.

CHAPTER 35 • MOVING RETROSPECT

If you would like Retrospect on a different Backup Macintosh, you must do a little more than just install Retrospect and the backup device on the new machine. You must move other files to keep the preferences, Remotes, catalogs, scripts, and schedules intact.

Install Retrospect

The first thing you must do is install Retrospect on the new Macintosh. Be sure to use the installer program; do not just copy it to the new machine because Retrospect may need files and folders installed by the installer program.

Move Catalogs

Copy the catalog files from the old Backup Macintosh to the new Macintosh. For best results, place the catalogs in the same folder as the Retrospect application.

Move Preferences

The old Backup Macintosh has a Retrospect folder in the Preferences folder in its System Folder. Copy this entire Retrospect folder into the same location on the new Macintosh, replacing any existing Retrospect folder there.

Initialize Catalogs

If your catalog files are not stored in the same folder as the Retrospect application, you must force Retrospect to take notice of them. The easiest way to do this is to select all of the catalogs in the Finder, and double-click one to open all of them. Retrospect opens a StorageSet configuration window for each catalog, causing it to recognize the catalogs.

Mediating Remote and Local Volume Changes

Moving a Retrospect Remote Backup Macintosh

If you have moved Retrospect and its components to a new Backup Macintosh and you want to back up either or both the old Macintosh and the new Backup Macintosh, you must perform a few extra steps.

Previously Remote Volume is Now Local

You used to be able to back up the volumes from the new Macintosh using Remote software, but now that is no longer necessary since its volumes are now local. Forget the Remote to free its activator code for use by another machine. (See the *Retrospect Remote Administrator's Guide*.) Remove the "Remote" file from the Control Panels folder of the System Folder. Edit the sources in any Retrospect scripts which used Remote volumes from the new Macintosh and add the volumes which are now local.

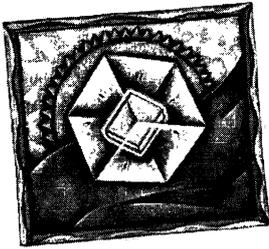
Previously Local Volume is Now Remote

You used to be able to directly back up the local volumes of the old Macintosh, but now you must install a Remote control panel on that machine to access its volumes with Retrospect from the new Backup Macintosh. (See the *Retrospect Remote Administrator's Guide*.) After installing and configuring the Remote, add its volumes to the scripts. Use the Volumes Database's Forget command (page 139) to get rid of the remnants of the previously local volumes. Forgetting volumes removes them from the Volumes Database and any scripts which use them.

If You Moved to Another Network Zone

Make sure all Remote computers are turned on, then start Retrospect on the new Backup Macintosh. Click the Configure icon, then click Remotes. In the Remotes database window, click Network. Select the zone for the previous Backup Macintosh, then select the zone for the new Backup Macintosh. This allows Retrospect to update the Remotes database.

SECTION IX



Tips and Techniques

- RESTORING AFTER A DISASTER
- CATALOG BACKUPS
- WORKING WITH FILE SERVERS
- WORKING WITH OTHER SOFTWARE

This section offers advice on using Retrospect and shows some techniques for more effective backups, including tips on using Retrospect with other software. It also explains what to do after a disaster so you can restore your lost files.

CHAPTER 36 • RESTORING AFTER A DISASTER

Everything you do with Retrospect is aimed at the ultimate goal of restoring files which have been lost or damaged. Previous sections of this manual described how to use Retrospect's immediate restore and scripted restore features, but this chapter goes into detail about other aspects involved in recovering from a crashed disk or similar disaster.

This chapter assumes your Macintosh encounters a highly destructive disaster. It provides instructions on getting the computer back in working order. If you want to restore some files and folders rather than a complete hard disk, you do not need these instructions; you can follow the instructions in Chapter 11 • Immediate Restore, which starts on page 58.

Hope for the Best; Prepare for the Worst

Let's assume you have read Chapter 28 • Backup Strategies, which starts on page 199, and you have implemented the ideal strategy for your situation and you have been following the plan, doing regular backups.

Disaster Scenario

Disaster strikes. You turn on your Macintosh and it fails to start up; instead it displays a blinking question mark on a disk icon



or a sad Mac icon indicating major trouble.



You troubleshoot the problem and determine the hard disk has crashed or is severely damaged.

Restart and Try to Mount the Hard Disk for Backup

Find the Disk Tools disk from your Apple Macintosh system software floppy disk set or CD-ROM disc, restart your Macintosh, and put in the disk. Your Macintosh starts from this disk. If your Macintosh starts up and mounts the problem disk, before taking further action try to make two backups (with the verification option on) to separate StorageSets.

Repair the Disk

Start the Disk First Aid application from the Disk Tools disk and use it to examine your hard disk for problems. (You should also try other disk repair utilities if you have them.)

Reformat the Irreparable Disk

If the disk repair utility can not fix the disk, you may have to erase or reformat the disk in order to prepare it for restoration.

- ▲ **Warning:** Erasing or formatting a hard disk destroys all data stored on the disk. If you are not sure whether you should erase or format your hard disk, contact its vendor for assistance.

If the disk is beyond repair, use the Finder to select the damaged volume and choose Erase Disk from the Special menu. If erasing is unsuccessful, you need to reformat the disk. To do this, start the drive setup application from the Disk Tools disk, or the formatting software that came with the hard disk, and use it to format your hard disk.

Re-install Software

Install new Apple Macintosh system software on your newly-formatted hard disk. Rename the System Folder to “temp.”

Install Retrospect according to the instructions in Chapter 2 • Installation, on page 4. If you copied your catalog files to floppy or removable disks, copy them back to your hard disk. Start the Retrospect application. If you did not make copies or backups of your catalog files, recreate the catalog or catalogs of your backup media, using Tools▶Recreate.

Restore from Backup

Now that your hard disk is working again and Retrospect is installed along with catalogs of your backups, you can use Immediate Restore (page 58) or Scripted Restore (page 109). Because your whole hard disk was wiped out, the best way to restore is by SnapShot, restoring the entire disk.

After restoring, which places your original System Folder on the disk, restart the Macintosh, pressing and holding the Command and Option keys while it starts. (This rebuilds the Desktop.) When the Macintosh has started up, place the “temp” System Folder in the Trash and empty the Trash.

CHAPTER 37 • CATALOG BACKUPS

Catalog files are important adjuncts to StorageSets, but face the same risks as your files since they often share the same hard disk. If you lose your catalog files, Retrospect cannot restore any files until the catalogs are recreated, which can be a lengthy process. For this reason back up your catalog files as well as your regular files. You can use the Finder or Retrospect to back up catalogs; each method is explained below.

Copying in Finder Format

Catalogs copied with the Finder or with Retrospect's duplicate operation can be easily copied back to a new or resurrected hard disk after a hard disk crash or similar disaster

If you have a few small catalogs, simply copy the catalog files from your hard disk to floppy disks. If you have more than a few moderately-sized catalogs, copy catalogs to a removable cartridge, shared volume, or another hard disk.

- ◆ **Tip:** Create and schedule a script to automatically duplicate your catalog files to another volume, such as a file server.

Backing Up to Independent StorageSets

Another method for backing up catalogs is to create a new StorageSet dedicated to backing up your catalogs files. Define as a Subvolume the folder in which your catalogs are stored—usually the Retrospect folder—and create a script that backs up just this Subvolume. Run the script periodically or schedule it for weekly backups. Alternatively, create an archive script which copies and moves catalogs which have not been modified in over a month. Should a disaster damage this StorageSet's original catalog, Retrospect takes very little time to rebuild it.

CHAPTER 38 • WORKING WITH FILE SERVERS

This chapter describes how to use Retrospect to back up and restore volumes shared by AppleShare or System 7. These operations require special procedures to ensure that access privileges are intact after the volume is restored.

Overview

Shared volumes maintain access privileges that determine which users and groups of users can see and change files and folders. These privileges are active only when the server is running and the volume is shared.

To retain access privileges for a server, file sharing must be on during the backup. During a subsequent restore operation, Retrospect reassigns privileges to the same users and groups that were active during the backup. Otherwise, any privileges for the restored and retrieved folders revert to the volume owner or server administrator.

There are three ways to back up and restore AppleShare 3.0 (or later) and System 7 file sharing servers. The methods are local, remote, and mounted volume, each explained below.

Server Backup Methods

Local backup of a server involves running Retrospect on the server Macintosh with a backup device connected and file sharing activated. This is the fastest way to back up a server. You may want to use Retrospect's AppleShare Lockout option to disconnect users before backing up the server.

Remote backup of a server uses the Remote control panel on the server Macintosh. Retrospect runs on another Macintosh and backs up the server without using file sharing.

The mounted volume method is done by logging into the server as a workstation user. Retrospect can automatically log on to the server and mount a volume, then unmount it when its backup is complete. With this backup method, you must manually copy the Users & Groups data file to a floppy disk any time you make changes to the users and groups, and keep the disk with your backup media in a safe place.

AppleShare and System 7 file sharing do not permit the copying of files which are in use, so you may not be able to back up busy files if you use the mounted volume method. Remote and local backups do not present this problem.

Backing Up a Server to Move its Contents

If you are going to back up a server to move its contents (for example, you have a more powerful Macintosh to be the new server) you should make two separate verified backups. Verification, usually on in Retrospect, ensures the integrity of the data; having two backups will not leave you stranded if one fails for some reason.

AppleShare 2.0 Pitfalls

You cannot back up a running AppleShare 2.0 server locally because AppleShare 2.0 does not allow you to run other applications while the server is running. You cannot back up an AppleShare 2.0 server by way of a Remote because the two are not fully compatible. The mounted volume method is the only way to back up an AppleShare 2.0 server.

Partial Restore to an Undamaged Server

Access privileges are restored for a server only if file sharing was active when the backup was made *and* if file sharing is active during the restore operation.

If your server is undamaged and you need to restore only some of the files and folders from a backup (for instance, because somebody accidentally

deleted some folders from the server), just follow this manual's previous instructions on how to restore to the server volume.

Restoring an Entire Crashed or Damaged Server

Access privileges are restored for a server only if sharing was active when the backup was made *and* if sharing is active during the restore operation.

The steps to take to restore a server depend on how the server was backed up. There is a restore method for servers which were backed up locally or remotely, and another method for servers which were backed up as mounted volumes.

If the server was backed up locally or remotely, Dantz recommends you restore the server locally. (That is, with the backup device connected to the server and Retrospect running on the server.) The time and trouble of restoring a large volume over a network may outweigh the inconvenience of temporarily moving the backup device to the server Macintosh. If the server was backed up as a mounted volume, you must restore it as a mounted volume.

Restoring a Server Backed up Locally or Remotely

Follow these instructions to restore an AppleShare file server which was backed up locally or as a Remote. If you backed up the server as a mounted volume, skip ahead to the heading "Restoring a Server Backed Up as a Mounted Volume" on page 260.

To Prepare the Hard Disk for Restore

If your file server disk crashed or suffered damage such as a corrupted directory, it needs to be repaired, erased, or formatted. Refer to Chapter 36 • Restoring After a Disaster, on page 253 to learn how to prepare the hard disk.

Starting with your empty prepared hard disk, install a temporary System Folder on the volume and rename it "temp." Restart the machine so it boots from the temporary System. Install Retrospect on the hard disk. Copy the StorageSet catalog to the hard disk. (If you do not have the StorageSet catalog you must rebuild it. See "Recreating a Catalog" on page 235.)

First Restore for Files

Refer to Chapter 11 • Immediate Restore, on page 58 or Chapter 19 • Scripted Restore, on page 109 to learn how to restore from a backup.

Use the destination option “Restore entire disk” to restore the server volume from its SnapShot. When the restore is complete, Retrospect reports copying errors on a few of its files. Ignore these errors and quit Retrospect.

Restart the Macintosh. When the Macintosh finishes starting up, discard the “temp” System Folder by placing it in the Finder’s Trash can and emptying the Trash.

Second Restore for Privileges

If you are using AppleShare, start the AppleShare File Server and AppleShare Admin application. If you are using System 7 file sharing, start sharing with the Sharing Setup control panel.

Choose which volumes or folders you wish to share, then select the appropriate Owner and Group for root access privileges and set your desired options.

With sharing on, perform another restore operation with the same StorageSet, again using the Restore entire disk option. Retrospect automatically performs an incremental restore, copying only a few files, and then sets the access privileges.

When the restore operation is complete, Retrospect reports copying errors on a few of its own files. Ignore these errors and quit Retrospect.

Restart the server, and rebuild the Desktop by holding down the Command and Option keys until a confirming dialog appears.

Your server should now be up and running with all privileges intact.

Restoring a Server Backed Up as a Mounted Volume

Follow these instructions to restore an AppleShare file server which you backed up as a mounted volume.

To Prepare the Hard Disk for Restore

If your file server disk crashed or suffered damage such as a corrupted directory, it needs to be repaired, erased, or formatted. Refer to Chapter 36

- Restoring After a Disaster, on page 253 to learn how to prepare the hard disk.

Set Up Sharing

Install Apple System software and AppleShare on the Macintosh. Copy your previously saved Users & Groups Data File from the floppy disk to the restored System Folder's Preferences folder. Start the server and share the volumes you need to restore. From the Backup Macintosh, mount the shared volume and restore from a backup, using the destination option "Restore entire disk," as described in Chapter 11 • Immediate Restore, on page 58 and Chapter 19 • Scripted Restore, on page 109.

- **Note:** The Desktop usually needs to be updated after a large restore, such as an entire disk. Restart the file server while holding down the Command and Option keys to rebuild the Desktop.

Your server should now be up and running with all privileges intact.

CHAPTER 39 • WORKING WITH OTHER SOFTWARE

No program is an island. Among the thousands of other software programs available for the Macintosh, there are but a few which can cause problems with Retrospect or which require special attention. These programs are described below.

Read the contents of the Read Me file installed by the Retrospect installer program. It may contain late-breaking information on software which requires special attention for use with Retrospect.

Electronic Mail Servers

Do not run Retrospect on a Macintosh which is used as an electronic mail server or a Meeting Maker server. These servers do not allow Retrospect to operate. You can back up an electronic mail server remotely, or locally if you temporarily deactivate the serving software.

File Servers

Retrospect is compatible with AppleShare, AppleShare Print Server, and PowerShare servers.

Security Programs

Security programs such as AME, DiskGuard, Empower, FileGuard, FolderBolt Pro, NightWatch II, Norton DiskLock, ultraSECURE, and ultraSHIELD are designed to prevent access to your files on your disk. Because Retrospect tries to access your files, there is an obvious conflict of interest and problems may arise. If your security program locks files and folders and prevents Retrospect from backing them up, turn it off before backing up.

Some security programs lock the screen and may prevent Retrospect from launching automatically for unattended backup. You can avoid this problem by starting Retrospect manually and leaving it running at the Retrospect Directory window. Scripts should then run automatically as scheduled.

Some security programs balk when Retrospect attempts to back up their configuration files. You can avoid this by excluding these files with a custom Selector. See Chapter 23 • Using Selectors, which starts on page 151.

If you have questions about compatibility, contact your security product's publisher to determine which features are compatible with Retrospect and which features undermine backups.

Invisible Files

In general, Retrospect backs up all files you ask it to back up, whether or not they are invisible. The exceptions to this are the Desktop file (on System 6 Remote volumes) and the Desktop DB, Desktop DF, VM Storage, Shutdown Check, and AppleShare PDS files (on System 7 volumes). Retrospect excludes these files because they are of no use to restore. In fact, unlike other invisible files, these do not even appear in volume Browsers.

Soft Partitions

Soft partition files, which typically are invisible, are backed up as large files. However, we strongly recommend you back up soft partitions as mounted volumes and exclude the large partition files with a custom Selector.

DOS Partitions

DOS partition files, which are created by SoftPC from Insignia Solutions, the DOS Compatibility Card from Apple Computer, or similar products, are backed up as large files. Each time you use the PC emulator, the partition file is modified (and, accordingly, needs to be backed up).

To avoid huge incremental backups of partition files, it is better to individually store the DOS files on a Macintosh volume. Retrospect can back up these individual files and restore them as needed.

Auto-Compression Programs

The following are issues and considerations you need to be aware of when using Retrospect with a file-level compression utility, such as AutoDoubler or SpaceSaver. Refer to the Read Me files on your Retrospect Install 1 floppy disk for specific information on each compression application.

If a Macintosh is using an auto-compression utility, files that have been compressed may be decompressed before they are backed up. When you restore a volume, any decompressed files are not re-compressed unless your compression utility is installed and running during the restore.

Some auto-compression utilities change the type of a file when compressing. For example, the application MacWrite may become a compressed document even though it appears to be an application. In these cases, Retrospect's Selectors Documents & Preferences and Applications appear to behave improperly. The Applications Selector does not select compressed applications because they are now documents of the compression utility. Likewise, the Documents & Preferences Selector selects compressed applications.

To find out if your auto-compression utility changes an application's file type when compressing, refer to the documentation that came with the utility or contact the developer.

Programs Which Do Not Update File Dates

Some programs may save some files without updating the file modification dates and times, which is a transgression of normal file handling procedures. Below is a list of known software which misbehaves in this way.

- ChiroMac
- DentalMac
- Great Plains
- MediMac

This poses a problem with Retrospect since it optimizes backups by backing up only one file when it finds multiple files with the same name, size, type, creator, creation date, and modification date. When you use software which changes a file without updating its modification date, the file does not

appear changed to Retrospect so it does not get backed up (unless you do the following).

To back up files used by the above-listed software, you should take the following steps to ensure complete backups, allowing complete restores.

- Try to keep all of the files and folders related to a particular program within a single folder, and declare each such folder a Subvolume (page 136).
- Make a script, separate from your regular backup script but with the same destination StorageSet. Use these new Subvolumes as sources and disable matching (page 177). This script always copies all the files in the Subvolumes to the StorageSet.

4D Server

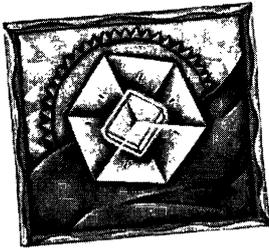
4D Server databases cache data in memory, periodically writing to disk. Even if all users are logged off you cannot be sure all of the most recent modifications have been saved to disk. Because of this, we recommend that you use one of the following two options for backing up a 4D Server:

- Quit 4D Server before starting your Retrospect backup. This guarantees a backup of all the data. You can use AppleScript and/or a macro program like QuicKeys to quit and start your database as needed.
- Use 4D Server's built-in backup module in combination with Retrospect. 4D Backup forces users to log out for the duration of the backup, is fully scriptable, and copies your database to another hard disk. Use Retrospect to back up this non-active data file.

FileMaker Pro and FileMaker Pro Server

Before backing up FileMaker Pro databases, we recommend that you close them, regardless of whether you are running locally or with the FileMaker Pro Server. You can use Retrospect's AppleScript triggering mechanism to do this.

SECTION X



Problems and Solutions

- TROUBLESHOOTING
- COMMON QUESTIONS
- ERROR MESSAGES
- TECHNICAL SUPPORT

This section offers solutions to problems you may encounter with Retrospect. In the next few chapters, we present general troubleshooting help, answer frequently asked questions, and introduce you to the same troubleshooting techniques Dantz Technical Support uses to solve problems.

It is not necessary to read these chapters start to finish, since the information herein is more for reference than for tutoring. Feel free to go directly to the area that best applies to your situation.

Chapter 40 • Troubleshooting includes common problems encountered during installation and backup and restore operations and offers explanations and solutions.

Chapter 41 • Common Questions presents frequently asked questions. These questions do not involve error messages and are more general than the troubleshooting problems.

Chapter 42 • Error Messages provides a numerically ordered list of error numbers and their meanings. If Retrospect reports a specific error number in an alert or in the operations log, look here for a detailed explanation.

Chapter 43 • Technical Support offers troubleshooting techniques and procedures for getting help.

CHAPTER 40 • TROUBLESHOOTING

Most problems encountered while using Retrospect fall into a few general categories. Dantz Technical Support follows some basic troubleshooting procedures for each of these categories. With a little effort, you can learn how to troubleshoot many problems on your own. This chapter outlines those procedures and shows you the most common problems and their treatments.

We recommend that you keep notes of your troubleshooting efforts. Even if you are unable to resolve a problem right away, your notes can establish a pattern of behavior to help understand the problem. If, after reading this chapter, you find you are still unable to solve a problem, contact Dantz Technical Support. Your troubleshooting notes will allow us to get to the heart of the problem more quickly.

Troubleshooting Road Map

The first step in troubleshooting a problem is to isolate the problem by identifying exactly when and where it occurs. Knowing when an error occurs gives you a fixed point of reference to help you solve a problem. Retrospect has different phases of operation. For example, a backup typically includes scanning, matching, copying, and verification phases in that order. If you can determine the problem happens while matching, you are on your way toward solving it. The situations described over the next several pages are listed in the likely order in which they would occur.

Installation Issues

Before installing Retrospect, we recommend you restart your Macintosh while holding down the Shift key to disable extensions and turn off Virtual Memory. Installing Retrospect consists of inserting the first installation disk, opening the installer, choosing your installation options, and inserting the appropriate disks.

The installer does not eject a disk.

If you have more than one floppy drive, leave the Retrospect Install 1 disk in one drive and use the other drive for the other disk. The first disk is not ejected when you install on a Macintosh with more than one drive because the first disk is needed later to complete the installation.

If you have only one floppy drive, try holding down the Command and Shift keys and press the number 1 key on your keyboard to eject the disk in the internal floppy drive. If this does not help, restart with the Shift key held down to disable extensions and try again.

The Macintosh offers to re-initialize one of Retrospect's disks.

If you insert a disk and get a "disk is unreadable" message, click Eject, then try again. If the error repeats, try the disk on a different Macintosh. Make sure your Macintosh has an FDHD drive, which supports 1.4MB disks. (Macintosh Plus, Macintosh II, and some SE models can use only 800K disks.) You may need to contact Dantz customer service for a replacement disk if you have a bad disk or if your Macintosh requires 800K disks.

The Macintosh crashes during installation.

Restart with the Shift key down to disable extensions and try again.

Backup Issues

Immediate backups and scripted backups differ in the way they are started and what they do when they are done. Otherwise, both follow the same procedure after starting: scanning, matching, requesting media, copying, comparing, and then closing.

Retrospect fails to automatically launch to execute a scheduled script.

There are reasons this can happen: the script is incorrectly scheduled, the Retro.Startup extension is not working, there is not enough memory, or the Notification preference "Autolaunch Retrospect" is not checked.

1. Incorrectly Scheduled Script

Check the list of future scripted operations to confirm that Retrospect has the same schedule you expect your scripts to run. To do this, click Preview from the Retrospect Directory's Automate tab. Check that you have not set a limited schedule of possible execution times with the Schedule preference (page 246).

2. Lack of Memory

Make sure Retrospect has enough memory to start. In the Finder, choose About This Macintosh from the Apple menu to determine the size of the largest unused block of available memory. Compare this with Retrospect's memory size. Make more memory available by quitting other applications or reduce Retrospect's minimum memory size. (That is, if it was increased before.) See page 295 for information on how to see and change its memory allocation.

3. Autolaunch Preference Not On

Check that the Notification preference Autolaunch Retrospect (page 244) is turned on.

4. Retro.Startup Trouble

As a last resort, try throwing away the Retro.Startup file. Then restart the Macintosh and start Retrospect. Click Preferences from the Retrospect Directory's Special tab. Make sure the Schedule (in the Schedule options category) allows execution during the scheduled time and verify the Notification preferences Autolaunch Retrospect and Show Apple Menu Icon are turned on. Then schedule a script to run a few minutes in the future, quit Retrospect, and restart the Macintosh again. At the script's scheduled time, the Macintosh should display a flashing Retrospect icon over the Apple menu icon. Within a few minutes, Retrospect should start and run the script. If you do not see the Retrospect icon in the menu bar after you restart or if Retrospect does not start automatically, contact Dantz Technical Support for further assistance.

Retrospect crashes while it is being launched.

The Retro.Config (3) file may be damaged. Move the Retrospect folder out of the System Folder's Preferences folder. Try launching again. If this solves the problem, place that suspect Retrospect folder in the Trash. (Retrospect creates a new folder in your Preferences folder and uses the default settings.) If you have a recent backup of this drive and do not want to recreate your scripts and settings, try restoring an earlier version of the Retro.Config (3) file from a backup.

Retrospect reports an error during scanning or matching.

There may be a problem with the volume being scanned. In this case, Retrospect reports a specific error in the operations log. Look up the error number in Chapter 42 • Error Messages, which starts on page 292.

Retrospect does not see the backup device.

First, ensure that the drive is turned on and properly connected and terminated. If other devices on the SCSI bus are off, turn them on and restart. Use Retrospect's SCSI Status (from Configure>Devices) to review your SCSI address settings and verify the drive has a unique SCSI ID number.

A tape drive does not appear in the storage devices window.

Check SCSI Status (from Configure>Devices). If a non-Retrospect "driver" appears installed for your tape drive, some other software loaded itself inappropriately. Try restarting with extensions off. If this solves the problem, an extension is loading a device driver for your backup device, keeping Retrospect from using it. See "System Software Issues" on page 280 for methods to isolate the troublesome extension.

If you have a new type of tape drive, it may not be supported by the version of Retrospect you are using. To find out if a newer version of Retrospect is required for this tape drive, first refer to the Release Notes included with Retrospect, then contact Dantz Technical Support and be ready to describe what information for this drive appears in the SCSI Status window.

The storage devices window does not show volumes from a removable cartridge drive (such as Zip, Jaz, SyQuest, Floptical, or optical).

The storage devices window shows only specialized drives supported by Retrospect. Use SCSI Status (from Configure>Devices) to look at other devices.

Retrospect reports a removable cartridge (such as Zip, Jaz, SyQuest, Floptical, or optical) is busy and refuses to add it to a StorageSet.

There are three possible causes:

- You have file sharing turned on. Turn it off or upgrade to System 7.5.1 or later.
- You have saved the catalog for a disks StorageSet on a media member. Move the catalog to your hard disk.
- Some other software may be creating or using files (which may be invisible) on your backup cartridge. Try running with fewer extensions to determine which extension is preventing Retrospect from using your cartridge.

Retrospect refuses to use the inserted tape or disk.

Retrospect has a system for recognizing tapes and disks and for adding them to StorageSets. If Retrospect is not automatically using the tape or disk you think it should, one of the following typically applies. Carefully read the text that appears in the media request window; it explains what media Retrospect needs.

1. You are not inserting the tape or disk that Retrospect requires.

Check that the name of the media you are inserting matches the name Retrospect is requesting. If the name is the same and Retrospect does not proceed with the backup when you insert the media, you probably have two pieces of media with the same name and are inserting the wrong one. This can happen if you switch tapes or disks when you perform a full backup to a particular StorageSet.

2. Retrospect requires new media.

Insert the media you want Retrospect to use, wait for the media to appear in the window, and then click Proceed. Retrospect will not use media that is part of a known StorageSet. It will automatically use any media that is erased or correctly named.

3. Retrospect asks for a new disk or tape, but then complains ‘You can’t use “I-StorageSet”, it already belongs to a StorageSet!’

This is a feature designed to prevent accidental erasure. If you are sure you want to erase this disk or tape and use it for the current backup, choose Erase from the Devices menu, then click Proceed if necessary. Erasing the tape removes the entry for this tape from the StorageSet it previously belonged to.

4. Retrospect asks for a particular disk or tape, but then reports “‘I-StorageSet’ is not a member of this StorageSet. Although it is named correctly, it has a different creation date.”

This means you have more than one disk or tape with the same name. This can happen if you run a full backup to new media and later try to do a normal backup with older tapes or disks. If possible, locate the proper disk or tape for the restore.

Try other disks or tapes to see if any match the catalog you are using.

If you are sure this disk or tape has the files you want, rebuild its catalog. Go to the Tools tab, click Repair, and select the appropriate repair function to recreate the catalog (page 235).

Retrospect asks for a particular disk or tape, but you do not have it.

1. You know where it is, but it's not available right now and you must back up.

Click Choices, then click Skip. Retrospect treats the requested member as if it were full and backs up incrementally to a new piece of media. Files previously backed up to the requested member are not backed up again. Future backups will require the new member and you will need to use both members later if you need to restore.

2. You know it is lost, damaged, or erased.

If this is the first member of the StorageSet, it is easiest to start a new StorageSet or run a full backup to this StorageSet. Either way, Retrospect asks for a new disk or tape, which becomes the new first StorageSet member.

If this is not the first member and you wish to continue backing up incrementally to the members you do have, click the Choices button, then click Missing. Retrospect will start backing up to a new disk or tape. Files that were backed up to the missing member will be backed up again, if possible, during your next incremental backup.

Retrospect reports a catalog out of sync error at start of backup.

Update your catalog from the media. (See “Updating a Catalog” on page 233.)

Your Macintosh hangs or crashes while copying during a backup.

Serious problems during copying can be caused by software or hardware. To solve this problem, start by minimizing your extensions or restarting with the Shift key down to disable all extensions, and try the backup again. If the backup succeeds, you probably have a problem with your system software or extensions. If the backup fails again, it's more likely to be a SCSI or hardware problem. See “System Software Issues” on page 280, and “SCSI Issues” on page 278 for methods to isolate the problem.

Retrospect reports a chunk checksum error.

If the error occurs only with a particular StorageSet, repair its catalog and try again. (See “Updating a Catalog” on page 233.)

Retrospect reports compare errors.

If Retrospect reports “different modify date/time...” for a particular file, the most likely explanation is that the file was modified during the backup. In this case, no action is required. When you next back up, Retrospect will re-copy the file.

Errors such as “File ... didn't compare at data offset...” or “File ... didn't compare at resource offset...” usually indicate a SCSI communication problem. Back up again to re-copy the file.

Note, however, that these “offset” error messages usually point to serious data corruption problems you should not ignore. If the error occurs with many or all Remotes or with a source connected to the Backup Macintosh itself, troubleshoot its SCSI bus. If the error occurs only on a particular source being backed up over the network, troubleshoot the SCSI bus of that Macintosh and possibly the network connection to that computer. See “SCSI Issues” on page 278 and the *Retrospect Remote Administrator's Guide* for information on network troubleshooting.

When it has finished executing an operation, Retrospect does not quit, restart, or shut down according to the Unattended preference.

Retrospect quits, restarts, or shuts down when it finishes only if it is executing an operation in unattended mode and no additional operations are scheduled within the look-ahead period (page 245). Retrospect automatically enters interactive mode when you start an immediate operation and unattended mode when you start a script. While Retrospect is copying, use the Control menu to switch between modes.

Remotes do not shut down after the backup is complete.

Remotes shut down only if all of the following conditions are met:

- The Shut Down when Done option (from the Remote System category) is turned on in the script which is doing the backup. (See “Remote Execution Options” on page 180.)
- The Remote Macintosh is displaying the “waiting for backup” window.
- The Remote is not scheduled for another backup within the Look ahead time. (See “Schedule Preferences” on page 245.)

Backup Server Issues

Backup Server says there is no media, but there is a tape in the drive.

Backup Server is reporting it needs a specific media member to back up a source. To determine which StorageSet needs more media, choose StorageSets from the pop-up menu in the Backup Server status window and look for any with a status showing “media.”

If you have never backed up to the StorageSet that needs media, Retrospect accepts any new or erased tape. Stop the Backup Server, use **Configure**➤**Devices** to erase the tape you want to use, then start the Backup Server again.

If you still can't determine why Backup Server isn't accepting your tape, back up the source to that StorageSet using **Immediate**➤**Backup**. Retrospect will display a window naming the media being requested.

Retrospect does not quit when Backup Server completes its backups.

Backup Server is optimized to run continuously. If you have other kinds of scripts, they will start at their scheduled times even though Backup Server is still running.

If you schedule the Backup Server to run only part of the time (for example, from 7:00 A.M. until 7:00 P.M. each day), you can quit Retrospect after the Stop time without affecting the Backup Server. Retrospect will automatically launch when the next script is scheduled to start.

Restore Issues

When you start a restore, you first select the StorageSet from which you are restoring. You then go through the following stages: selecting a volume (specifying where the files are going), matching or selecting files, requesting media, copying, and setting privileges if necessary.

You have problems selecting a StorageSet.

If your StorageSet is not in the list, click the **More** button. Click **Open** if the catalog for your StorageSet is available, or click **Recreate** to rebuild it from the media.

If Retrospect reports a chunk checksum error after selecting a StorageSet, throw away the catalog and rebuild it from the media.

You have a disk or tape that you want to restore from, but you do not see it in the StorageSet selection window.

Use the **Finder** to look for the StorageSet catalog file on your hard drive. It will have the same name as the disk or tape in Retrospect's storage devices window. For example, if the disk or tape is named "1-StorageSet A" look

for a catalog file named “StorageSet A”. Double-click the catalog file to show Retrospect where it is.

If you cannot find the catalog file on your hard drive, go to the Tools tab, click Repair, and select the appropriate function to recreate it (page 235).

You cannot find the files you want to restore.

If you are using “Restore files from the latest backup,” be sure the SnapShot you select is for the right volume. By default, the chosen files preview Browser shows your files and folders in alphabetical order, organized as they were on your hard disk. Once you find the file you want, double-click it to mark it for retrieval. If you cannot find your file, select Find from the Browser menu to search by name or other attributes.

If you are restoring older versions of files, use “Search for and retrieve older files.” Click Searching to tell Retrospect to look for a particular file or folder name, and if necessary click More Choices to use Retrospect’s Selector interface for finding files. (See Chapter 11 • Immediate Restore, which starts on page 58 and Chapter 23 • Using Selectors, which starts on page 151.)

Retrospect refuses to use the inserted tape or disk, reporting it is named correctly but has a different creation date.

This means that you have more than one disk or tape with the same name. This can happen if you run a full backup to new media and then try to restore with older tapes or disks. If possible, locate the proper disk or tape for the restore.

Try other disks or tapes to see if any match the catalog you are using.

If you are sure that this disk or tape has the files you want, rebuild its catalog. Go to the Tools tab, click Repair, and select the appropriate repair function to recreate the catalog. (See “Recreating a Catalog” on page 235.)

Your Macintosh hangs or crashes while copying during restore.

This is the same as hanging or crashing while copying during backup. Repeat the operation with system extensions turned off or minimized to determine if the problem is a software or SCSI hardware problem, then refer to “System Software Issues” on page 280 and “SCSI Issues” on page 278.

Retrospect reports error -34 (disk full) while copying.

This error means the volume you are restoring to does not have enough space for the files you are restoring. You will need to manage your disk space by moving or deleting files, or avoid the problem by marking fewer files to restore. If you are restoring a volume that was using a compression utility, you may need to restore your files in batches and use your compression utility between restores to make room for the next batch of files.

After restoring, file sharing privileges are not set.

Retrospect will only set the privileges for file sharing and AppleShare while sharing is active. (Note that sharing also had to be on during backup.) Turn on sharing and restore again. (See “Restoring an Entire Crashed or Damaged Server” on page 259.)

After restoring, documents have generic icons in the Finder.

The Desktop usually needs to be updated after a large restore. Restart your Macintosh while holding down the Command and Option keys to rebuild the Desktop.

After restoring a backup to a new hard disk, the volume icon on the Finder Desktop is no longer custom. It is now generic.

Restart the computer.

SCSI Issues

If the SCSI chain is not set up properly, communication errors may cause data corruption or system failures during copy operations. The following information is designed to give you guidance when you encounter SCSI problems. See also Chapter 6 • SCSI Explained, which starts on page 31, your Macintosh user’s guide, and the manual that came with your hardware device.

These sample errors can indicate communication errors on a SCSI bus:

- File “Home” didn’t compare at resource offset 10,750
- File “Tech Note” didn’t compare at data offset 3,253
- Trouble reading: “1-Office Backup 2” (0), error 102 (trouble communicating)

- Trouble writing: “1-The StorageSet” (0), error 205 (lost access to storage medium)

These errors can usually be traced to a failure in the SCSI configuration, whether it is termination, a particular device, cabling, or device order. The most common cause of communication problems is improper termination or bad SCSI cables.

Termination

The general rule for termination is to use only two terminators on the SCSI bus, one at the beginning and one at the end. If you have only a single device on the SCSI bus, then only one terminator is needed. Most Macintosh computers purchased with internal hard drives are internally terminated. Some SCSI peripherals come with internal termination built in, and must be placed at the end of a SCSI chain.

Unlike hard drives in other Macintosh computers, PowerBook internal hard drives are not internally terminated. Even if you have only a single device on the SCSI bus, you need two terminators: a normal terminator at the end of the SCSI chain and an in-line, or pass-through, terminator between the PowerBook and the first device.

SCSI Cables

Communication problems can be caused by bad or loose-fitting SCSI cables. Check all cables to ensure they are properly seated in each connector. The entire length of your SCSI bus should not exceed 20 feet. Whenever possible, try to use short (12 to 36 inches) cables and avoid cables over six feet in length.

Some devices, such as scanners, SCSI Ethernet connectors, and removable cartridge drives, can cause communication failures on the SCSI bus, especially if they are turned off. If you are experiencing SCSI communication problems, make sure all of your SCSI devices are turned on when you use your Macintosh. Even if you are not experiencing SCSI problems, we highly recommend you turn on all SCSI peripherals while using your Macintosh.

Device Order and Device Conflicts

To avoid problems caused by device order or device conflicts, make sure that each device has a unique SCSI address. To see the SCSI address of every device, go to the Configure tab and click Devices. Then choose SCSI Status

from the Devices menu to view all of your SCSI devices. You may print this window for future reference or to have handy when calling Dantz Technical Support. If problems occur (for example, a device does not appear that you know is turned on and connected), try changing the order of SCSI devices or temporarily removing unneeded devices. Recheck that each device has a unique SCSI ID.

System Software Issues

If you restarted your Macintosh with extensions off and the problem went away, there could be a conflict between the extensions themselves, or between some of your extensions and Retrospect. You need to find and eliminate possible conflicts. A common technique to test extensions is to drag half of the items in your Extensions folder to the Desktop and restart, then try to recreate the problem. If you still experience the problem, remove half of the remaining extensions, restart and try again. Repeat this process as necessary.

Remember, control panels are system extensions too! They should be part of the testing process.

If the problem persists even though all extensions are off, then the system software may be corrupt and need to be re-installed. If you are installing System 7.5 or later, then at the installer window, press Command-Shift-K. Choose Install New System Folder and the Installer will create a new System Folder and rename your old System Folder to "Previous System Folder." Skip ahead to step four below.

If you are not using System 7.5, you need to make sure that your new system software does not inherit traits from the previous system software. Follow these steps to ensure a clean system installation:

1. Change the name of your System Folder to Old System Folder.
2. Remove the System file from Old System Folder and put it in a new folder. Close Old System Folder.
3. Use your set of Apple System disks or your Apple System CD-ROM to re-install the operating system, creating a new System Folder. Restart with the new system.
4. Move the Retrospect folder from the Preferences folder of Old System Folder to the Preferences folder of the new System Folder.

5. Try to reproduce your problem. If the problem re-occurs, call Dantz Technical Support. If you cannot reproduce the problem, proceed to the next step.
6. Move any third-party software, fonts, preferences files, etc. from “Old System Folder” to the new System Folder. Be careful not to replace any of the new system files with old ones.
7. Throw away the old System file and “Old System Folder.”

Sometimes changing the loading order of system extensions helps avoid conflicts. Within a particular folder (that is, Extensions folder or Control Panels folder) extensions load in alphabetical order.

System software troubleshooting can be automated by System 7.5's Extensions Manager or by commercial utility software such as Conflict Catcher by Casady & Greene and Now Startup Manager, part of Now Utilities.

CHAPTER 41 • COMMON QUESTIONS

Backup Questions

How do I see what was backed up last night? How can I tell if everyone has been backed up by the Backup Server?

To view files backed up during the most recent backup, choose Reports in the Retrospect Directory and click Contents. Select the appropriate StorageSet from the top list in the contents report window, select one or more sessions from the bottom list, and click Browse. A Browser appears, listing the files in the order they were backed up. See page 213.

The operations log shows by date which volumes were backed up, how much data was copied, and whether the backup completed successfully. To view the log, click Log from the Retrospect Directory's Reports tab. The log also lists any errors which occurred. See page 211.

The Backup Report shows a summary of the backup operations for each volume. To view the report, click Report from the Retrospect Directory's Reports tab. See page 208.

To see all files on a particular volume at the time of its most recent backup, set up an immediate restore. Select the desired StorageSet and volume SnapShot. From the summary window, click Files Chosen to get a Browser showing the volume. See page 58.

How do I back up only files that have changed?

Retrospect does this automatically. The first time you back up, Retrospect copies all selected files. On subsequent normal backups, it copies only the selected files that are new or changed.

How do I specify full or incremental backups?

Specify the backup action (page 23): full, normal (incremental), or new (full to new StorageSet). Do this when executing an immediate backup, by changing the backup options (page 172). Do this when running a script by

selecting an item from the manual execution dialog's pop-up menu (page 100). Do this beforehand when scheduling a script (page 91). Finally, you can do this by configuring the StorageSet and using Retrospect's media control feature (page 216).

How do I back up multiple volumes to the same tape?

Use the same destination StorageSet. To back them up at the same time, select each volume you want to back up in the volume selection window. You can make a non-contiguous selection using the Command key or select a range of volumes using the Shift key (page 133). When you execute the backup, Retrospect backs up each of the selected volumes, one after another.

You can later do backups of other volumes to the same StorageSet and Retrospect will add them to the tape.

What is the best way to back up many removable disks at once?

Using Retrospect's Fast Add feature (page 224), you can easily copy files from several removable disks (such as SyQuest, Bernoulli, Zip, Jaz, optical, and Floptical cartridges, or floppy disks) one after another to a StorageSet. By default Retrospect copies all files, but you may use Selectors to choose specific files.

How do I run an operation from the Finder?

To run an operation from the Finder, you must first create a script in Retrospect. Then create and use a run document (page 101) to start that script directly from the Finder.

How do I include or exclude files with particular attributes?

You can specify which files Retrospect backs up by using Selectors. These allow you to include or exclude files by their size, kind, dates, and many other attributes. See Chapter 23 • Using Selectors, which starts on page 151.

Restore Questions

How do I restore just one file when I am not sure of its name?

If you know part of the file's name, Retrospect can help you find it. Retrospect also lets you search for files by size, kind, date, and many other attributes, so even if you haven't a clue about the file's name Retrospect can still help you find it.

Set up a searching restore according to “Immediate Restore by Search” on page 64. If you specify just part of the file’s name in the searching window, Retrospect will probably find the file you are looking for, but may also find others. If you do not know the file’s name, click the More Choices button and create a Selector to choose files by date, kind, label, size, parent folder, and several other criteria you know the desired file possesses.

After Retrospect searches, click the Files Chosen button in the summary window. In the Browser window that appears, use the Browser menu to sort the list of files and find files in the list. You can also find related files using the Browser’s cross reference feature: select a file in the list and choose Cross Reference from the Browser menu to find, for example, other versions of that file.

Make sure only the files to be retrieved are marked, then close the Browser window. Click Retrieve in the summary window to start restoring.

How do I restore files backed up on a given date?

To restore files that were backed up on a specific date, set up a searching restore according to “Immediate Restore by Search” on page 64. In the searching window, click More Choices and create a Date selector. Set the pop-up menus in the Date selector to File, Backup date, is, exactly, Fixed date, no offset. Set the fixed date to the day the file was backed up.

After Retrospect searches, click the Files Chosen button in the summary window to review the files selected for restore. Make sure only the files to be retrieved are marked, then close the Browser window. Click Retrieve in the summary window to start restoring.

How do I restore an earlier version of a file?

To restore any version of the file in the StorageSet, set up a searching restore according to “Immediate Restore by Search” on page 64. In the searching window, type the name of the file you want.

After Retrospect searches, click the Files Chosen button in the summary window to display a Browser of the files found, then click Unmark. To view the files by modification date, choose View Options from the Browser menu and choose Name–Size–Modify Date from the Display pop-up menu. Mark the file to be restored, close the Browser, and click Retrieve.

Does Retrospect restore empty folders?

Yes. Empty folders are restored when you restore from a SnapShot using Restore an entire disk or Restore files from the latest backup.

StorageSet and Catalog Questions

What if I forget my catalog?

If you forget a StorageSet catalog from within Retrospect, its file remains on your hard disk until you drag it to the Trash. If you have mistakenly told Retrospect to forget a catalog, you can open the catalog file from within Retrospect or from the Finder. After forgetting a catalog, you must add the StorageSet to your scripts again because Retrospect removes them when you forget the catalog.

What if I lose my catalog?

If you lose your StorageSet catalog (perhaps because it was deleted, corrupted, or lost), you can have Retrospect recreate the catalog by scanning all of the tapes or disks in the StorageSet. See “Recreating a Catalog” on page 235.

It may take several hours to recreate a catalog if there is a large amount of data in the StorageSet.

Can I delete files from a StorageSet?

You cannot delete files from a StorageSet because most types of storage devices do not allow it. If you want to keep only selected files from a StorageSet, you can copy these files to a different StorageSet using Retrospect’s StorageSet transfer operation. See Chapter 31 • Copy Operations, which starts on page 219.

Can I rename a StorageSet?

You cannot rename disks or tapes StorageSets. You can rename a file StorageSet in the Finder. Open the StorageSet after you rename it to make Retrospect recognize the change.

Can I put more than one StorageSet on a tape?

You cannot have more than one StorageSet on a tape. When you add a tape to a StorageSet, Retrospect reserves the entire tape for that StorageSet.

You can, however, back up as many volumes as you want to a single StorageSet (page 283).

What is the best way to manage catalog files?

Catalogs typically contain about 170K for each thousand files that you back up. Keep your often-used catalogs on your hard disk. If you do not have enough room on your hard disk, here are a few alternatives:

- Store infrequently used catalogs on a file server.
- Archive old catalogs to their own StorageSet.
- Compress the catalogs. See “Configuring StorageSets” on page 215.

I back up by moving a tape drive from computer to computer. What is the best way to do this?

It is not necessary to create a separate StorageSet for each computer unless you plan to use a different tape for each workstation. If you use a single StorageSet for the computers, do not do a full backup of each workstation; use normal backup only, and new backup when you need to rotate media.

After each backup, copy your StorageSet catalog to a floppy disk and then, once you move to the next computer, copy the catalog to its hard disk. You may want to use Retrospect’s catalog compression option (page 217) to keep the catalog as small as possible.

Alternatively, keep the catalog on a server accessible from each computer. This, though, assumes all of your computers are connected by a network, in which case you will save yourself a great deal of trouble by purchasing a Remote Pack. For less than twenty dollars per Macintosh, Retrospect Remote software allows Retrospect to back up all of your Macintosh computers over a network without moving the backup device.

Devices and Media Questions

Why are my DAT tapes filling up sooner than I expected?

A sixty meter DAT tape has a nominal capacity of 1300 megabytes. For everyday use this means you will typically achieve capacities anywhere from 700 to 1250 MB. Using a ninety meter tape you can expect to get fifty percent more data on a tape (1.9 gigabytes instead of 1.3 GB). Drives using

the DDS-2 format support 120 meter tapes for an uncompressed data capacity of about four gigabytes.

If you use a drive with hardware compression, you can roughly double the capacity of your tapes. Your tape's actual capacity will depend largely upon how well the data you are copying compresses. Text compresses well, for example, but applications do not.

If you back up many small files or back up files over a network, your tape's actual capacity will also decrease.

Retrospect only requests a new tape for one of three reasons:

- The tape drive reports the current tape is full.
- An error occurred while writing to the tape. Open the log to see if an error occurred.
- You selected Skip or Missing while configuring a StorageSet, or you are performing a new backup.

How much space is left on my tape?

Retrospect estimates your tape's capacity to help you manage your backup. To view this estimate, click StorageSets from the Retrospect Directory's Configure tab. In the StorageSet selection window, select your StorageSet and click Configure. The window that appears lists the estimated available space on that StorageSet's current member.

This estimate is only to help you gauge when Retrospect will request new media. Regardless of the estimated available space, Retrospect uses a member until the tape drive reports the tape is full.

Because DAT drives do not report a tape's capacity dynamically, Retrospect's estimate may be inaccurate. To change the estimate to match your tape's actual capacity (based on your own experience), click Set Capacity in the StorageSet configuration window.

What do I do when I know my tape or disk is going to fill up during tonight's backup?

If you think there is not enough space for the next backup on the current tape or disk of your StorageSet, you can tell Retrospect to ask for a new one.

To skip to a new member, click StorageSets from the Retrospect Directory's Configure tab. In the StorageSet selection window, select your nearly-full

StorageSet and click Configure. In the window that appears, click Media Control and select Skip. The next time Retrospect adds files to that StorageSet it will ask for new media, in effect skipping over the blank space at the end of the current member.

If this situation arises frequently, consider using Retrospect's Automatic Skip to blank media preference. When this preference is on, Retrospect automatically uses any erased media if the current member is not available.

You might also consider purchasing a tape autoloader, a backup device which holds a magazine of many tapes. When one tape fills, Retrospect uses an empty tape from the magazine.

When I try to erase a tape or disk Retrospect asks for the catalog file, but I no longer have it. How can I erase the tape?

When you erase a disk or tape, Retrospect tries to remove the member's contents from the catalog for that StorageSet. If it is missing, Retrospect asks you for it. You need to tell Retrospect to forget the catalog because it is gone, which will then allow you to erase the tape. Configure>StorageSets and Forget the StorageSet then Configure>Devices and Erase your tape.

If I have two tape drives, will Retrospect use them both when performing unattended backups?

Yes it will if the devices are similar, such as two DAT drives or two Exabyte 8mm drives. When it fills up a tape, Retrospect looks in any available drive for any tape that is new or erased, or has the correct name.

How do I start over at the beginning of the tape?

To start over on a tape, you must reset the entire StorageSet. First, click StorageSets from the Retrospect Directory's Configure tab. In the StorageSet selection window, select the StorageSet and click Configure. In the window that appears, click Media Control and select Full, then click OK. Retrospect warns that the StorageSet's data will be lost; click Reset.

How do I recycle tapes from old StorageSets?

To re-use a tape from a StorageSet that you no longer need, insert the tape, choose Configure in the Retrospect Directory, and click Devices. The Tape Devices window that appears shows you the name of the tape. Select the tape and choose Erase from the Devices menu. The next time Retrospect

requests a new member for a StorageSet, it will automatically use this or any other erased tape in the backup device.

You should also remove the old StorageSet's catalog. Click StorageSets from the Retrospect Directory's Configure tab. In the StorageSet selection window that appears, select the old StorageSet and choose Forget from the StorageSets window. In the Finder, drag the old StorageSet catalog file to the Trash.

How do I determine the name of a certain tape?

To view the name of a tape, click Devices from the Retrospect Directory's Configure tab. Retrospect scans for available tape devices. The tape devices window appears, listing each tape drive, its type and status, and the name of the inserted tape. Insert the tape if you have not done so.

Once you know the name of a tape, use a soft-tip pen and the manufacturer's adhesive labels for the tape cartridge.

Can I use my audio DAT deck for backup?

No. Audio DAT decks are not SCSI devices and Retrospect only recognizes DAT mechanisms on your Macintosh's SCSI bus.

Can I use audio DAT tapes in a DAT drive?

No. While audio-grade DAT tapes can be used in some computer DAT drives, we recommend data-grade media. Data-grade tapes must pass more stringent testing than audio-grade tapes. More recent computer DAT drives recognize only Media Recognition System (MRS) data-grade tapes, which are tested even more rigorously.

Retro.SCSI Questions

What does Retro.SCSI do, and do I need to have it installed?

The Retro.SCSI extension patches the Macintosh SCSI Manager, enabling Retrospect to use SCSI disconnect and reselect commands. This allows more efficient transfer of data between the backup Macintosh and a tape drive.

You do not need to install Retro.SCSI to use a tape drive. It is available only to enhance performance on some models. If your Macintosh can use Retro.SCSI, it was automatically included when you installed Retrospect.

Which Macintosh models need or use Retro.SCSI?

Retro.SCSI works on all Macintosh models based on Motorola's 68000, 68020, and 68030 processors, and does not work on any Macintosh based on 68040 or PowerPC processors. Apple's SCSI Manager 4.3, available with System 7.5 and built into AV and Power Macintosh models, provides the benefits of Retro.SCSI on 68040- and PowerPC-based Macintosh models. The following are exceptions to this:

- A Macintosh Plus running System 7 does not use Retro.SCSI.
- PowerBook Duo models do not use Retro.SCSI or SCSI Manager 4.3 because of their special docking technology.
- PowerBook 500 models use Retro.SCSI but not SCSI Manager 4.3.

Why isn't Retro.SCSI recommended for a Macintosh with an accelerator card?

Third party accelerators for any Macintosh can affect SCSI timing issues critical to Retro.SCSI's successful performance.

Retro.SCSI may work with your accelerated Macintosh. Try some test backups with Retrospect's Verification option turned on. If your Macintosh hangs or you encounter unexpected SCSI communication errors, Retro.SCSI is incompatible with your accelerator. Remove Retro.SCSI and restart your Macintosh.

Miscellaneous Questions

How do I get rid of a StorageSet I don't need anymore?

Click StorageSets from the Retrospect Directory's Configure tab. In the StorageSet selection window, select the StorageSet to be removed and choose Forget from the StorageSets menu. This removes the StorageSet from the destination lists of all your scripts. To remove a StorageSet completely, you must also drag the StorageSet's catalog file to the Trash with the Finder. The catalog file is usually kept in the same folder as your Retrospect application. Erase tapes with Retrospect (page 227) and erase disks with the Finder.

How do I get rid of a volume that no longer exists?

Click Volumes from the Retrospect Directory's Configure tab. In the volume selection window, select the volume to be removed and choose Forget from

the Volumes menu. This removes the volume from the source lists of all your scripts.

How do I keep Retro.Startup from being created?

The Retro.Startup extension is created by Retrospect and allows the application to automatically start for scheduled backups. To prevent Retro.Startup from installing, click Preferences from the Retrospect Directory's Special tab. Select the Notification preferences category and uncheck all three checkboxes shown there. Then select the Unattended preferences category, select Quit or Stay in Retrospect, and turn off Notify for Failures and Media. Quit Retrospect, drag the Retro.Startup extension from your Extensions folder (in the System Folder) to the Trash with the Finder, and restart your Macintosh.

Without Retro.Startup, scheduled backups automatically run only while Retrospect is running and Retrospect will not restart or shut down the Backup Macintosh after an unattended operation.

When I quit Retrospect, how can I prevent the message that tells me the next time Retrospect will execute?

Click Preferences from the Retrospect Directory's Special tab. Select the Quit Action preferences category and turn off Check Validity of Next Script.

Where are my scripts stored?

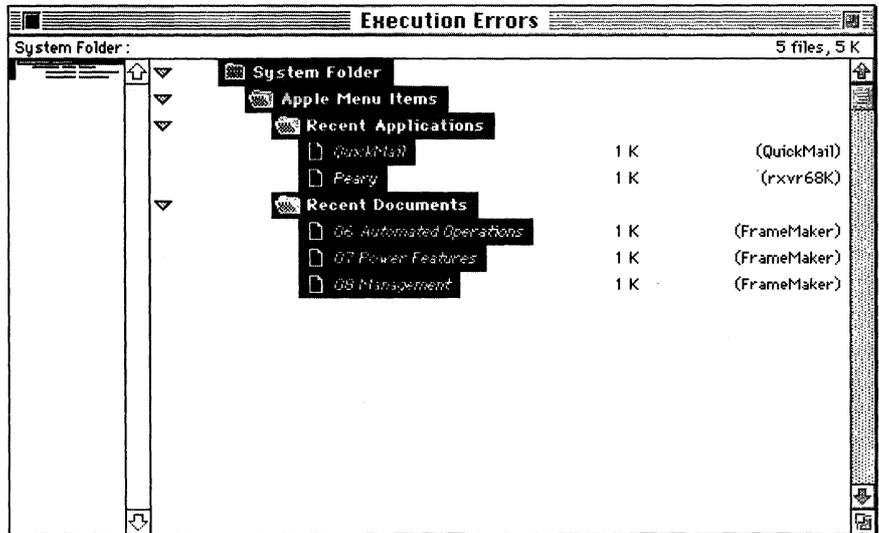
Your Retrospect scripts are stored in the Retro.Config (3) file in the Retrospect folder of your System Folder's Preferences folder. Many other customizations you make to Retrospect are stored there as well.

CHAPTER 42 • ERROR MESSAGES

Retrospect Errors

Execution Errors Browser

When Retrospect detects compare errors while backing up, write errors while retrieving, or read errors while retrieving or verifying, it opens a Browser displaying the files involved. The execution errors Browser may be printed for reference, or copied and pasted into another Browser for easy re-selection. An example errors Browser appears below.



The execution errors Browser window.

Look in the operations log for the error message associated with each file and act appropriately.

Catalog out of sync

Retrospect was unable to update the catalog the last time it copied data to this StorageSet.

This may have been due to equipment failure or power failure, or was caused by a full disk (error -34) or by an out of memory (error -108).

Repair the catalog. See “Updating a Catalog” on page 233.

If updating the catalog does not eliminate the “catalog out of sync” error Retrospect cannot add files to that tape. You have three options:

- Perform a full backup, which resets the catalog and erases the tape, removing its existing backup files.
- Skip to a new medium with media control (page 216), forcing Retrospect to use a new piece of media for the next backup.
- Create a new StorageSet and do a backup to new media.

Bad StorageSet header

Retrospect encountered a file header, which contains information such as the file’s name and size, that is missing or damaged.

If the error appears immediately while you are recreating a catalog file, it means you forgot to tell Retrospect that the StorageSet was encrypted. If the error appears during backup or retrieving, it can indicate SCSI communication problems. See Chapter 6 • SCSI Explained, on page 31, and “SCSI Issues” on page 278 of Chapter 40 • Troubleshooting.

Content Unrecognized

Retrospect can see data on your media, but the data is not recognized as Retrospect-formatted data.

For tapes this usually means that the tape was damaged, used by an incompatible backup program, or used with an incompatible drive. This often results with tapes used with hardware compression drives then used with drives which do not support the same hardware compression.

Content Damaged

Somebody changed the name of a disks StorageSet member.

If you want to preserve this data, rename the disk to the original name it was given by Retrospect. The original disk uses the format *1-StorageSet*. If you do not want to save the data and want to use the disk for a new backup or other purposes, erase the disk using the Erase Disk command from the Special menu in the Finder.

Compare Errors

The following messages indicate a compare error:

- File “Home”: different modify date/time
- File “My File”: didn’t compare at data offset 263,078
- File “My File”: didn’t compare at resource offset 731,429

A compare error appears if a StorageSet’s copied file does not match the file from which it was copied. Retrospect will try to copy the file again during the next backup session or similar operation.

If you know the file was in use at the time the copying was done, a compare error is usually nothing to worry about. It simply means the file changed between backup and verification. Compare errors which mention data or resource offsets usually indicate SCSI communication problems. See “SCSI Issues” on page 278.

Error Numbers

-34 (volume full)

A volume has run out of free storage space.

There are three causes of this error:

- You are restoring more files than will fit on the destination volume.
- Retrospect is updating a StorageSet catalog during a backup and the volume where the catalog is located runs out of room.
- You are backing up to a file StorageSet and the destination volume runs out of free space.

Find the hard disk which is full and make more space on it. Try restoring fewer files, or restore to a larger volume. Use catalog compression (page 217) to make your catalogs use less space.

-35 (volume doesn’t exist)

Retrospect cannot find a volume.

Make sure the volume is actually connected to the Macintosh and it is mounted on the Desktop.

-36 (I/O errors)

A media problem occurred on a source volume.

Try verifying the media on your source disk using a disk utility or the formatting program that came with your hard drive. If you are using an Apple hard drive, try using the Test command in its included drive setup utility. The Disk First Aid utility is not helpful in this case because it only checks for directory problems and does not check your media.

-43 (file not found)

Retrospect cannot find a file.

This usually means someone moved or deleted one or more files and folders while a backup or compare operation was in progress. The Apple Menu Options of System 7.5 can move files during backups, resulting in harmless errors with folders such as Recent Items and Recent Servers.

Try backing up again. If this error continues to occur, run Apple's Disk First Aid, or a third party disk checking utility to check for possible directory corruption. Ignore the harmless errors generated by Apple Menu Options.

-53 (volume off-line)

Effectively the same as error -35.

-54 (file busy/locked)

The file cannot be accessed because it is in use.

There are two causes of this error:

- You are trying to back up System files using System 7 file sharing or AppleShare.
- Another application, such as FileMaker or 4th Dimension, had the files open, preventing Retrospect from accessing them.

Back up the busy files from the local Macintosh, quit the application that owns the busy file, or use Retrospect Remote to back up your server instead of mounting it on the Desktop.

-108 (out of application memory)

There is not enough memory available to Retrospect for it to continue the operation. This error occurs most often when scanning volumes.

When Retrospect needs more memory to start an operation, it temporarily takes memory not in use by other running applications. Because of this, you usually do not have to change the default memory settings of the Retrospect application.

Retrospect may report error -108 if other applications and extensions are using most of the memory or your Macintosh does not have enough RAM installed.

Try quitting your other applications or restarting with fewer extensions to make more memory available to Retrospect. Repeat the operation which brought about the error.

If Retrospect still reports this error, try setting Retrospect's memory settings as shown in the table below.

Number of Files/Folders	Memory Allocation
4,000	2,500K
10,000	4,000K
20,000	6,000K
32,000	8,000K

- **Note:** These requirements increase by approximately 900K on a Power Macintosh (or Mac OS compatible, PowerPC-equipped computer) without virtual memory turned on.

Increasing the Memory Allocation

To increase the memory allocation of the Retrospect application, follow these steps. Quit Retrospect if it is open, go the Finder, and select the Retrospect application icon. Choose Get Info from the File menu. The Info window appears, listing Retrospect's memory allocation. Enter a new preferred memory allocation number in the space provided in the lower right corner of the window.

-24004 (media request timeout)

Retrospect could not find a requested disk or tape before the Media Request Timeout period elapsed.

Turn off the Media Request Timeout preference so Retrospect waits indefinitely for the requested media.

102 (trouble communicating)

The Backup Macintosh lost contact with the backup device.

The most common cause is improper SCSI termination. See “SCSI Issues” on page 278.

106 (data overwrite attempt)

For TEAC drives, errors 106 and 212 indicate a media failure.

If you see this error on a TEAC drive, run the Verify operation from the Tools tab to check the extent of the failure on the tape. If this error occurs on any drive other than a TEAC, contact Dantz Technical Support for more assistance.

114 (can't use because file sharing is on)

Retrospect cannot add a new member to a Disks StorageSet while System 7 file sharing is on.

Turn off file sharing before the backup starts or upgrade your system software to version 7.5.1 or later.

203 (hardware failure)

The tape drive is having problems because of a bad tape, a SCSI problem, or a mechanical error.

If the error only occurs when you use a particular tape, that tape is probably damaged. Try using a new tape. If the error occurs when you use any tape, you may have a problem with your SCSI chain or device. Try turning off the tape drive and computer for two minutes and then turning them back on again. See “SCSI Issues” on page 278 or call Dantz Technical Support for more information.

204 (device busy)

Effectively the same as error 114.

205 (lost access to storage media)

Usually indicates the SCSI bus was reset during a backup, causing Retrospect to lose contact with the tape.

This error usually indicates a SCSI problem and may be accompanied by an error 102 (trouble communicating). If error 102 accompanies error 205, see “SCSI Issues” on page 278. If error 102 does not accompany error 205 and SCSI communication problems have been ruled out, the next step is to check for media failure on the source volume. Some hard drives reset the SCSI bus when they sense they are experiencing a media failure. Try testing the hard drive with the software that was originally used to format it.

206 (media failure)

There is trouble reading from or writing to the StorageSet media. This error is always generated by the backup device, and is usually due to one of four causes:

- The media is physically defective and needs to be replaced. Try using a different tape or cartridge.
- The heads on the tape drive are dirty and need to be cleaned. Consult the manual that came with your tape drive or contact the drive manufacturer for cleaning recommendations.
- Another device is causing interference. If you have a DAT drive immediately next to an older Seagate hard drive, try moving the DAT drive further away on the SCSI bus. Try removing one or more devices temporarily to see if there is some other device conflict. Try using your backup device on another computer to see if interference is caused by your monitor or other nearby electronic devices.
- The tape device is failing. Contact the vendor.

212 (media erased)

Indicates a possible problem with a TEAC drive. See error 106.

503 (Remote turned off), 505 (Remote Reserved), 506 (duplicate Activator Code), 508 (access terminated), 515 (piton protocol violation), 519 (network communications failed), 525 (name/login conflict), 527 (Remote was renamed), -1028 (not visible on network), -1277 (can't open connection)

Please refer to the *Retrospect Remote Administrator's Guide* for all 500-series error numbers, as well as errors -1028 and -1277.

-24201 (chunk checksum failed)

A catalog or other Retrospect format file is corrupt.

If the error occurs when you are trying to back up to a particular StorageSet, you need to rebuild the catalog for that StorageSet. After the re-catalog, reselect this StorageSet in your scripts. If the error occurs when you launch Retrospect, see “Retrospect crashes while it is being launched.” on page 271 of Chapter 40 • Troubleshooting.

-24062 (limited to 32000 files/folders)

Retrospect cannot completely scan a volume that contains more than 32,000 files and folders, nor can it completely perform a search request which finds more than this number of items.

Define each of the top level folders of the volume as Subvolumes and back them up separately. Or, divide your hard disk into two or more partitions, keeping less than 32,000 items in each partition.

Internal consistency check error

Retrospect experienced a major problem not due to normal errors or circumstances. When this happens, Retrospect creates an error log in the Retrospect preferences folder named “Retrospect.error.log.*n*” where *n* is a long number.

If you experience one of these errors restart your Macintosh and try to do what you were doing when the error occurred. If the error occurs again contact Dantz Technical Support as detailed in the following chapter.

-25040 (Catalog invalid or damaged)

Effectively the same as error -24201.

CHAPTER 43 • TECHNICAL SUPPORT

If the common questions, troubleshooting techniques, and error messages discussed in this section have not helped you solve your problem, the Dantz Technical Support team is available to answer your questions, provide help, resolve conflicts, and troubleshoot problems. We will try to answer your questions as thoroughly as possible. If we do not have an immediate answer we will get back to you within a reasonable period of time.

Before contacting Dantz, try to recreate the problem and be able to describe the steps which cause the problems. Make a note of what has changed on your Macintosh since the last time Retrospect worked successfully. These details could provide essential clues for Dantz Technical Support.

- ▲ **Warning:** If your problem involves tapes or disks being unreadable or you suspect malfunctioning backup hardware, do not try to reproduce your problem with other, undamaged backup sets. Contact Dantz Technical Support first.

As technical representatives we assume two roles—we are Retrospect troubleshooters and teachers. If you are a seasoned professional, we will try to answer your questions with as much technical proficiency as we can. If you are new to the Macintosh, do not be afraid to ask us questions that seem trivial. If we use a term you do not understand, please ask us for a clearer explanation. In any case, we will try to make your time spent with us a learning experience. We are here to help solve your problem, so do not be afraid to ask us for help.

When you call Technical Support, please have the following information available for us. It helps us answer your questions and ensures you receive efficient technical support.

- Be at your computer; this makes it easier to walk through any problem.
- Have your original disks close at hand. Note the current version number you are using and the registration number on the Retrospect

Install 1 floppy disk. (If you upgraded from an older version of Retrospect your registration number is on your original disks.)

- Be prepared to describe your hardware and software setup as thoroughly as possible.
- If you are having problems with your backup device, print the SCSI status window and have the printout when you call.
- Does the problem only occur when you are using specific type of backup media? Try backing up to a different medium. (That is, try a short backup to floppy disks or a file StorageSet if you have been using tapes or removable cartridges.)
- Does the problem still occur if you start up without extensions?
- At what point in the backup or restore procedure does the problem occur?
- Were there any error messages? When did they occur in the procedure? Check the operations log and Backup Report and print or write down any error messages before contacting us.

Additional Technical Information

Retrospect technical notes, covering specific areas in great detail, are available from Dantz Technical Support and from the Dantz Web site.

The Dantz World Wide Web site has technical notes, new product and upgrade information, and helpful tips. Send electronic mail to info@dantz.com to receive an automated response with more information on the Dantz Web site and its address.

Contacting Technical Support

You can contact Dantz Technical Support by telephone, fax, postal mail, or electronic mail.

Phone: (510) 253-3050 (8:00 A.M. to 5:00 P.M. Pacific time)

Fax: (510) 253-9099

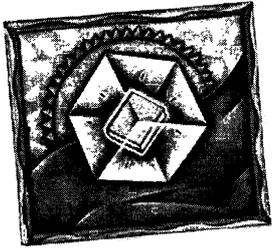
Electronic Mail: tech_support@dantz.com (*technical questions*),
customer_service@dantz.com (*upgrade or change of address information*)

Mail: Dantz Development Corporation, 4 Orinda Way, Building C, Orinda, CA 94563

Log of Your Calls to Technical Support

Use the following form to keep track of calls to Dantz Technical Support.

Date	Technical Representative	Problem/Solution



Appendices

- A: SHORTCUTS
- B: SYMBOLS
- C: FILES

APPENDIX A • KEYBOARD SHORTCUTS

Interface Element	Keyboard Shortcut	Example
Directory	Type a combination of two letters in rapid succession: the first letter of a Directory tab name then the first letter of a button.	Type "IB" for immediate backup.
Dialog or window with buttons	Type the first letter of a button.	In the Tools>Copy dialog, type "A" to select Archive, "T" to select Transfer, or "F" to select Fast Add.
Summary windows	Type the first letter of a button label or type a number from 1 to 5.	In a script summary window, type "D" to select the Destination or "O" to select the Options. Or, type "2" to select the Destination or "4" to select the Options.
Dialog or window with checkboxes	Type the first letter of an option to toggle it on or off. If two options begin with the same letter, type the letter once to select the first option or twice to select the second option. Retrospect highlights the currently selected option; press Return to toggle it on and off.	In the backup options window, type "D" to toggle the Data Compression option on and off.
Options and Preferences windows	Use the arrow keys to select a category, then type the first letter of an option to toggle it on or off.	In the immediate backup options window use the arrow keys to select Remote, then type "S" to toggle the Synchronize Clock option on or off.
Immediate action that requires confirmation	Press and hold the Option key before you click the button to skip its normal confirmation.	In the immediate backup summary window, press and hold the Option key while clicking Backup to execute the backup without confirmation.
Forget or Delete command requiring confirmation	Press and hold the Option key while choosing the menu item or pressing the Delete key to bypass the normal confirmation.	In the scripts window, select a script and press and hold the Option key while clicking Delete to remove the script without confirmation.
Browser window	Use the arrow keys to scroll to the previous or next folder in the volume. Double click to mark or unmark.	

Interface Element	Keyboard Shortcut	Example
Any list with drop arrows	Press Option while clicking on a drop arrow to show all contents of the folder or container. Press Command-left arrow to collapse the contents of the selected item or Command-right arrow to expand it. Press Command-Option-left arrow to completely collapse or Command-Option-right arrow to completely expand.	
Windows	Press and hold the Option key while clicking a window's close box (or while pressing Command-W) to close all open windows.	This does not close the operations log window or the Directory.
Info windows	Press and hold the Shift key while clicking an Info window's close box (or while pressing Command-W) to close open Info windows related to that volume.	

APPENDIX B • SYMBOLS

General Symbols

	Button to change the information for a script or operation.
	Drop arrow indicating a closed item. Click to open and show its contents.
	Drop arrow indicating an open item. Click to close and hide its contents.
	Local Desktop container.
	Network Remotes container.
	Folder proprietary to Retrospect; not a Macintosh folder.
	Groups container or an individual group.
	Startup volume of the Backup Macintosh.
	Disk volume (other than the startup volume).
	Folder (may also be a Subvolume).
	Shared volume, such as a file server.
	Remote Macintosh with which Retrospect has recently communicated.
	Remote Macintosh with which Retrospect has not recently communicated.
	Startup volume of a Remote Macintosh.
	Volume—other than the startup volume—from a Remote Macintosh.
	Subvolume on a Remote Macintosh.
	Tapes StorageSet.
	File StorageSet.
	Disks StorageSet.



Recordable compact discs StorageSet.



Script.



The item is locked, allowing only read access.

Media Symbols



The medium is a member of a known StorageSet.



The medium is not a member of a known StorageSet, but its name matches that of a known StorageSet.



Missing StorageSet member.

Cursor Symbols



Cursor when Retrospect is running in unattended mode.



Cursor when Retrospect is busy, such as when it is scanning, matching, copying, or communicating with a Remote Macintosh.



Cursor when the user has complete control of Retrospect.

Selector Symbols



Selector.



Pop-up menu for choosing Selector conditions.



Condition handle used to move or copy the conditions.



Condition set to select folders *and any files in the top level of those folders* that match the given criteria.



Condition set to select folders *and all items enclosed in those folders* that match the given criteria.

Browser Symbols



Completely marked item. If the item contains other items, it means all the items within it are marked.

- ✓ Partially marked item. One or more items—but not all—within the item are marked.
- ◆ Matched file that exists in or on the destination and will not be copied in an operation.
- ✱ Missing item that exists in a missing StorageSet member.
- 📁 Folder (closed).
- 📁 Folder (open).
- 📄 StorageSet catalog.
- 📄 Document.
- 📄 Application.

Report Symbols

- △ Retrospect opened.
- + Start of script, operation, event, or module.
- Start of operation with a volume.
- * User-initiated action.
- > Error.

APPENDIX C • FILES

Files Created by the Installer or Retrospect



Retrospect

The Retrospect application.



Retrospect Help

The help file contains information displayed when you choose Help from the Windows menu or use Retrospect's Balloon Help. The Retrospect Help file is stored in the Retrospect preferences folder or in the same folder as the Retrospect application.



EasyScript

A Retrospect module which aids in setting up a backup strategy based upon your backup needs. You can start EasyScript by opening this file from the Finder or by choosing EasyScript from Retrospect's windows menu.



Update from 1.3

Used to update information from versions 1.2 and 1.3 of Retrospect. It updates all preferences, Selectors, volumes, Remote login names, StorageSets, and backup and archive scripts to a Retrospect 3.0 compatible format. This file should only be used once and should be deleted from the hard disk after the update to 3.0 is complete.



Retro.SCSI

Retro.SCSI is installed in the Extensions folder located within the System Folder. It is used with tape drives; however, it is not required. See "Retro.SCSI Questions" on page 289.



Retrospect preferences folder

This folder is created the first time you start Retrospect. It is stored in the Preferences folder in the System Folder. It contains many of the files listed in this appendix.



Retro.Config (3)

Created automatically by Retrospect and placed in the Retrospect preferences folder. It contains most of your customization settings, including scripts, Security Codes (passwords), unattended backup preferences, Selectors, AppleShare and Remote login names.



Retro.Icons (3)

Created automatically by Retrospect and placed in the Retrospect preferences folder. It stores information on all of the file types and icons encountered by Retrospect.



Operations Log

This text file is created automatically by Retrospect and placed in the Retrospect preferences folder. It keeps a record of each Retrospect activity and can be opened and edited by any text editing application or viewed from within Retrospect. Formatting codes that start with “\$[” are visible when the Retrospect Log is opened in a text editing application. These codes are used by Retrospect to display symbols, as well as bold and underline font styles.



Retrospect Update Log

This text file is created automatically by the Update from 1.3 application and is placed in the Retrospect preferences folder. It logs the results of using the Update application. The log can be opened by Retrospect or any text editing application. You can place this file in the Trash after updating.



Retro.Startup

This file, which is stored in the Extensions folder, checks the System clock against the next time a script is scheduled to run. It is automatically installed when you first start and quit Retrospect.



Retrospect Plug-in Extension

This file is used for future updates to the main application. Its main use is for backup device updates and usually involves new tape drives. It is not a file that is included with or created by Retrospect. Its function is to allow Dantz to update your copy of Retrospect when a newly available backup device requires a new driver for Retrospect.

Files Created by the User



Run Document

These files are created when you create a run document. You can save a run document file on any disk, and double-click the file whenever you want to run the script without having to first start Retrospect manually. When you save a run document, you can give it any name you want.



Catalog for Disks StorageSet

This is a catalog file for a disks StorageSet. It is created when you first make a new StorageSet and it bears the name of that StorageSet. To do any kind of operation with the corresponding StorageSet, such as back up or restore, you must have this catalog file. If you lose or damage the catalog, you can have Retrospect rebuild it from the StorageSet disks.



Catalog for Tapes StorageSet

This is a catalog file for a tapes StorageSet. It is created when you first make a new StorageSet and it bears the name of that StorageSet. To do any kind of operation with the corresponding StorageSet, such as back up or restore, you must have this catalog file. If you lose or damage the catalog, you can have Retrospect rebuild it from the StorageSet tapes.



Catalog for CD-R Discs StorageSet

This is a catalog file for a recordable compact discs StorageSet. It is created when you first make a new StorageSet and it bears the name of that StorageSet. To do any kind of operation with the corresponding StorageSet, such as back up or restore, you must have this catalog file. If you lose or damage the catalog, you can have Retrospect rebuild it from the StorageSet discs.



File StorageSet

A file StorageSet combines both the catalog (the index for the StorageSet) and the data being backed up into a single file stored on a single volume. In earlier versions of Retrospect this type of StorageSet was called Combined File.

GLOSSARY

access privileges – The privileges given to (or withheld from) users to see folders, see files, and make changes to shared volumes.

ADSP – AppleTalk Data Stream Protocol facilitates the transfer of large amounts of data over a network.

archive (verb) – To move files from your hard disk to a StorageSet, freeing up space on your hard disk. Also see **back up**.

archive (noun) – The previous name of a StorageSet in old versions of Retrospect. See **StorageSets**.

back up (verb) – To copy files from your disk to a StorageSet, such as tape, another hard disk, floppy disks, and so on. You should back up your files regularly in case something happens to your disk or any files.

backup (noun) – 1. An operation in which files are backed up. For example, “I just did today’s backup.” 2. An entity of backup materials. For example, “Fortunately, we can get the backup from the safe and restore the files.” Also see **back up**.

backup date – The most recent time and date a file, folder, or volume was copied to a StorageSet. Retrospect sets this date for volumes, folders, and/or files *only* when you check the appropriate boxes under Options in the Execution window. Also see **creation date** and **modification date**.

Backup Macintosh – The computer on which you are using Retrospect with a backup device. Often a networked Macintosh that backs up all Remote Macintosh computers.

Backup Report – Displays the information in the detail log in terms of individual volumes. In the Backup Report, all known volumes are displayed with information about when they were last backed up.

Backup Server – 1. Retrospect’s technology allowing flexible, resource-

driven or user-initiated backups. 2. A Backup Macintosh running a Backup Server script.

Browser – Retrospect’s tool that allows you to view the folder and file structure of a volume. You can also use a Browser to see the files and folders in a StorageSet. The Browser allows you to manipulate files and mark them to be worked within an operation such as a backup.

catalog – Retrospect’s index of the files and folders contained in a StorageSet. The catalog file allows you to mark files for restore or retrieval without having to load or insert your StorageSet media.

CD-R discs StorageSet – For use with packet-recordable compact disc drives.

container – An item for organizing other items such as volumes or Remotes.

condition – In Retrospect’s file Selectors, a distinguishing criterion relating to file or folder characteristics. You can choose multiple conditions to make your own custom Selectors. Also see **Selector**.

compression – Reduces the size of the data being copied to the media. Retrospect can do it with software compression, or a capable tape drive can do it with hardware compression.

Contents Report – A Retrospect report that shows a single StorageSet in terms of the sessions it contains. A list of all sessions is displayed for each StorageSet. Double clicking a session creates a Browser of all files in that session.

creation date – The time and date a file, folder or volume was created. A file’s creation date is set when the file is first saved or made. A folder’s creation date is set when you select New Folder. A volume’s creation date is set any time the volume is formatted or erased. Also see **backup date** and **modification date**.

creator code – The four-letter code that represents the creator of a file. For example, documents created by SimpleText have a creator code of ttxt. Retrospect lets you select files according to creator code.

day of week Scheduler – A type of Scheduler that lets you schedule a script to run every week on specified days of the week (for example, every Monday, Wednesday, and Friday).

destination – The storage medium to which files are being moved, copied, or otherwise transferred. When backing up, the destination is a StorageSet. When restoring or retrieving, the destination is a volume.

device – Any piece of equipment connected to your Macintosh, such as a hard disk, removable cartridge, or tape drive. In this manual, the term “backup device” refers to any device that accepts StorageSet media, such as a tape drive or another hard disk.

disk – Any volume which can appear on your Desktop and to which you can copy files. Usually this is a hard disk, but it can also be an optical drive or other large capacity volume, or even a floppy disk.

disks StorageSet – For use with removable cartridges such as Zip, Jaz, SyQuest, Floptical, or optical disks.

encryption – A way of encoding data so that it cannot be used by others without the password.

file header information – A file’s name, size, type, creator, and dates (creation date, modification date, and backup date). This information is part of every file, and is also indexed in a StorageSet’s catalog.

file server – A computer running file server software, allowing users to share information over a network.

file StorageSet – This type of StorageSet combines the catalog and the data in a single Macintosh file. The StorageSet media must be a single volume that appears on the Macintosh Desktop, such as a file server or hard disk.

folder – 1. A Macintosh directory on a volume. 2. A Retrospect container for organizing items such as scripts, volumes, or Remotes.

Forget – The Forget menu item allows you to remove an item from certain windows. Use Forget to clear listings for volumes, Subvolumes, Remotes, or StorageSets you no longer wish to use. Note that “forgetting” a backup source volume does not affect any of the StorageSets it has been backed up to; its files may be restored at any time as long as the StorageSet media is intact.

full backup – A full backup is useful periodically to reset a StorageSet so that it does not grow forever. A full backup completely erases the StorageSet and catalog before copying all selected files to the StorageSet. All previous data

in the StorageSet is lost.

group – A Retrospect container for organizing items such as volumes and Remotes.

incremental backup – A backup that intelligently copies only files that are new or have changed since the previous backup. Retrospect usually backs up incrementally with its normal backup action. See also **matching**.

interactive mode – Retrospect’s mode of operation when you perform an immediate operation. Interactive mode assumes you are at the Macintosh and available to respond to prompts. See also **unattended mode**.

Local Desktop – A container which holds volumes mounted on the Backup Macintosh Desktop.

Macintosh File StorageSet – See File StorageSet.

marking – Selecting files in the Browser to be backed up or retrieved. Files can be marked (or unmarked) manually, or they can be marked according to various criteria using file Selectors. In the Browser, a check mark appears next to any marked file. Files that are highlighted in the Browser are not necessarily marked.

matching – The scheme for comparing file attributes to determine whether files are identical, which then allows intelligent copying to avoid redundancy. Also see **incremental backup**.

media – Any tape, hard drive, floppy disk, Floptical disk, or cartridge to which Macintosh files can be copied. In this manual, media usually refers to the StorageSet media.

member – An individual piece of media used in a StorageSet (such as a disk, tape, or cartridge).

modification date – The time and date a file was last changed. This date is automatically attached to the file by the Macintosh. A file’s modification date is reset any time you make changes and save the file (see “backup date” and “creation date”). A folder’s modification date is updated any time a folder or file is added, changed or removed from it.

Network Remotes – The Network Remotes container holds Remote Macintosh computers which are logged in to Retrospect.

new backup – Allows you to periodically introduce new media into your backups, keeping the original StorageSet media and catalog intact for archival purposes. A new backup copies all selected files to a new StorageSet of the same name as the old, with the addition of a generation number, such as “StorageSet [001].”

normal backup – Retrospect’s usual backup action, performing an incremental backup to copy new or changed files.

operations log – A Retrospect report that tracks all actions by Retrospect. The operations log documents all start-ups, executions, errors, and completions, as well as information on the number of files copied, duration of backup, and backup performance.

Remote Macintosh – When using Retrospect Remote, any network Macintosh whose volumes are available for backup to the Backup Macintosh. This can be any Macintosh with the Remote files installed. Also see **Backup Macintosh**.

repeating interval Scheduler – A type of Scheduler that lets you schedule a script to repeat automatically at a specified interval of time, such as once every three weeks.

restore – An operation which copies files from a StorageSet to a volume.

Retro.Config (3) file – The file containing your custom settings, including scripts, security codes, preferences, custom Selectors, and Remote login names. This file is created automatically the first time you start Retrospect, and is used while Retrospect is open. If you delete this file, all of your customized information will be lost and the default configurations will be restored.

Retro.Icons (3) file – The file containing the type and creator database, and the creator and type codes for all scanned volumes. This file is created and updated automatically during operations. If you delete the Retrospect folder or its files, your customized information will be lost and the default configurations will be restored the next time you start Retrospect.

Retro.SCSI extension – An extension which, when placed in the System Folder of certain Macintosh models, increases Retrospect performance. Also see **SCSI Manager 4.3**.

Retrospect folder – A folder automatically created within your System Folder's Preferences folder that contains three files—Retro.Config (3), Operations Log, and Retro.Icons (3).

root – The highest level of folders in a data structure. When you double-click a Macintosh Desktop volume icon in the Finder, you see the root folders and files.

run document – A file that automatically starts a Retrospect script when opened. A run document allows you to run predefined Retrospect scripts by double-clicking on the run document file.

script – A saved backup procedure that you can schedule to run at some future date and time or on a repeating schedule, such as daily. You can create as many scripts as you want.

SCSI (Small Computer System Interface) – A specification of mechanical, electrical, and functional standards for connecting peripheral devices (hard drives, tape drives, printers) to the Macintosh. SCSI is a built-in part of every Macintosh and allows you to easily attach additional devices to your computer.

SCSI chain – The means of connecting multiple SCSI devices to a single Macintosh computer. SCSI devices are attached to each other and to the Macintosh by SCSI peripheral cables. Macintosh allows up to seven SCSI devices on a single chain. Each device must have its own unique SCSI ID number.

SCSI Manager 4.3 – Apple's extension which speeds tape operations. May be required for use with some devices, such as DLT drives. Also see **Retro.SCSI**.

SCSI terminator – A device used on a SCSI chain to maintain the integrity of signals on the chain.

Selector – A feature that lets you search for files that match certain conditions. You can use Retrospect's standard Selectors, or create your own custom Selectors. Also see **Browser**.

session – A group of files from a single operation stored within a StorageSet.

single date Scheduler – A type of Scheduler that lets you schedule a script to run automatically at a specific date and time.

SnapShot – A Retrospect SnapShot is created during a backup operation to depict a volume's most recent state. When you restore a volume, the SnapShot automatically scans all sessions in the StorageSet and restores only the most recent version of each file, so your hard disk is returned to the exact state it was in after the last backup.

source – In a backup, the volume from which files are copied. In a restore, the StorageSet from which files are copied.

StorageSet – Previously called Archive (n). Retrospect stores all files in StorageSets. There are different types of StorageSets for different media and devices: *disks StorageSets* (for multiple ejectable volumes), *file StorageSets* (for a single volume), *tapes StorageSets* (for tape), and *CD-R StorageSets* (for recordable compact disc drives).

Subvolume – A folder you designate as a volume for use within Retrospect.

tapes StorageSet – For use with SCSI tape drives.

unattended mode – Retrospect's mode of operation when you run a script. Unattended mode assumes no one is currently at the Macintosh, and therefore Retrospect must make assumptions about media use. See also **interactive mode**.

volume – A hard or floppy disk, partition of a hard disk, Subvolume, file server, or any data storage medium that can be mounted on the Macintosh Desktop.

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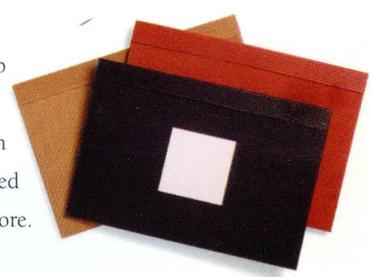
You spend hours at your Mac. Your work is important. So, you occasionally copy files to floppies or cartridges. Then it happens. It could be a disk crash, fire, theft, flood, or even a slip of the finger; it doesn't matter because it's gone.

Is all of your work in that pile of floppies?
Where is that file? Will you recover everything?
Probably not.



With Retrospect, you'll recover from data loss disaster in minutes. Retrospect is the most trusted and recommended backup software in the industry.

Retrospect backs up everything—documents, fonts, programs, and preferences. With backup like that, you're covered when it's time to restore.



Retrospect knows what's changed since the last backup, so it only backs up what's new or different. Saves space. Saves you time.



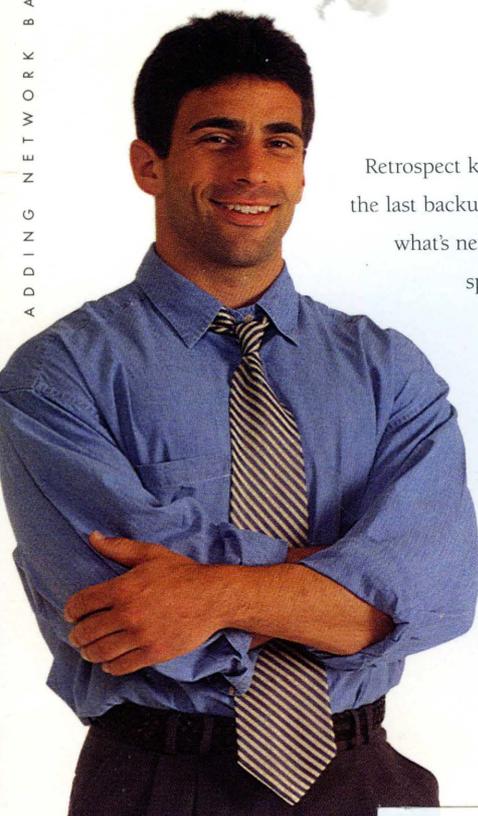
You have better things to do than watch a backup. Automate your backups with Retrospect. Answer a few questions and Retrospect's EasyScript™ will make it all happen when you're not around.



Of course, Retrospect wouldn't be the #1 backup software without a lot of other features like compression, encryption, and support for almost every SCSI tape drive ever made.



Spend your time doing something cool. Use Retrospect.



MU45430A/3374



SERIAL NUMBER (S)



Retrospect®