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SUM II™

Symantec Utilities for Macintosh

Crashed Disk and File Recovery, Backup, Optimization, and Security

Apple® Macintosh® System 7 Compatible

- Preinstall SUM Shield for fast and easy data recovery
- Recover crashed disks and deleted files with SUM Recover even if SUM wasn't installed
- Backup and restore applications and files with SUM Backup
- Improve disk speed and performance with SUM TuneUp
- Organize and secure disks with SUM Partition
- Encrypt documents and folders with SUM Encrypt
- Copy and initialize floppies fast with SUM QuickCopy
- Edit files, disks, and memory with SUM Tools
- Diagnose and repair disk problems quickly with SUM Disk Clinic

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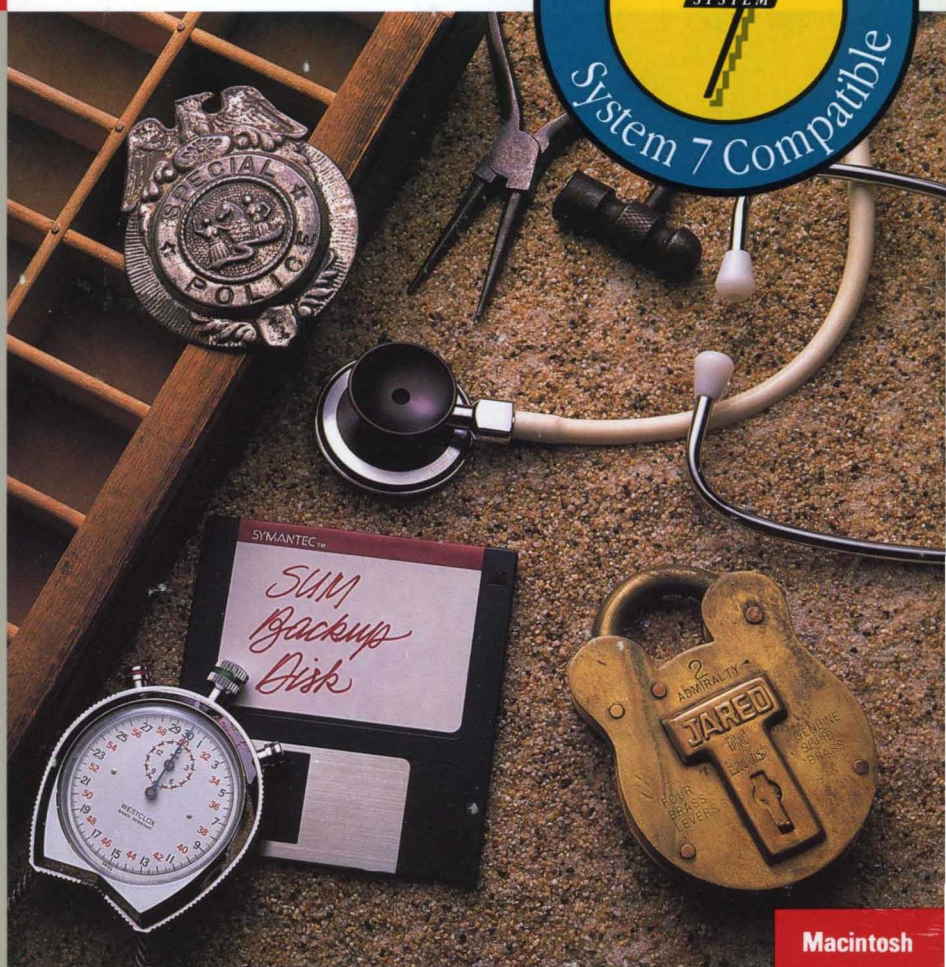

Macintosh

Dear Symantec Customer:

Congratulations on your choice of Symantec Software, the "Perfect Balance Of Performance And Quality."

This software product has been tested and assured to be compatible with Apple's new System 7 operating system with the exception of the SUM Tools module. SUM Tools does not operate under System 7. To use SUM Tools, create a System 6.0.x start-up disk and copy SUM Tools on to it. Then start your Macintosh from this disk whenever SUM Tools is required. All the other functionality of SUM II remains unchanged and fully compatible with System 7.

Our quality assurance team has noted that several popular System Enhancements (INITs) are not compatible with System 7. The SUM Installer is vulnerable to incompatible System Enhancements. To install SUM II under System 7, hold down the shift key while System 7 starts-up. This will temporarily disable all System Enhancements until the next time you start-up.

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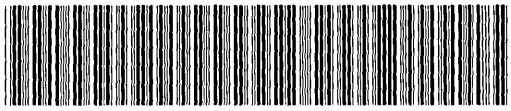
Sincerely,

Alison Unden

Alison Unden

06-70-00044



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SUM II™ Domestic

Symantec Utilities for Macintosh

The Best-Selling, Award-Winning Data Recovery and Disk Management Program

User Manual

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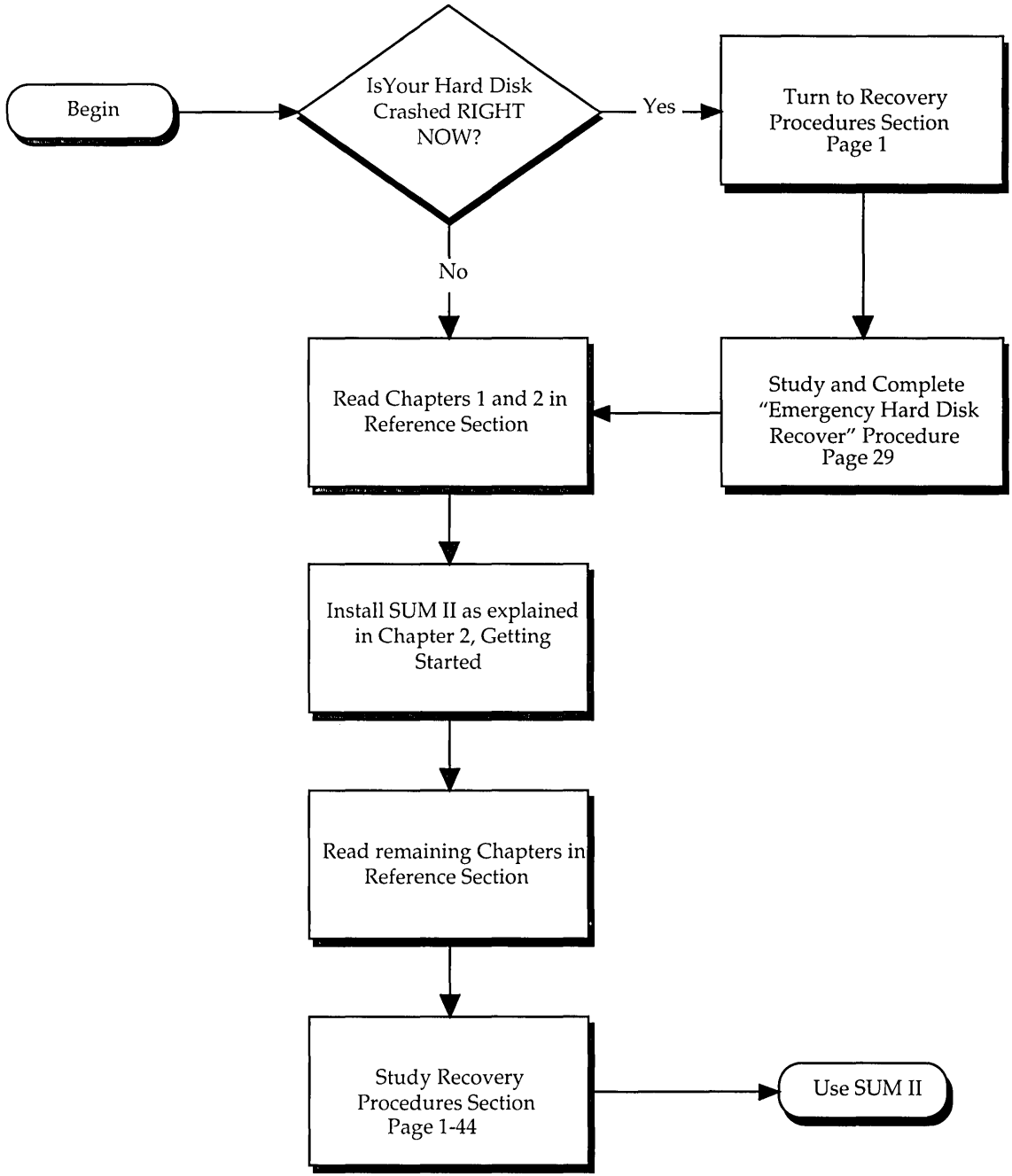
How to Use This User Guide



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Product Management	Ted Schlein
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Symantec™ Utilities for Macintosh™ User Guide

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8 • SUM Partition

9 • SUM QuickCopy

Important: This User Guide includes two versions of Chapter 10, the encryption chapter – a version for the U.S. and Canada and an international version for users outside the U.S. and Canada. If you purchased SUM II in the U.S. or Canada, refer to the chapter titled *SUM Encrypt*. If you purchased SUM II **outside** the U.S. or Canada, refer to the chapter titled *SUM UniCrypt*.

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RECOVERY PROCEDURES

SUM Disk Clinic Recovery Procedures

This section contains graphic, step-by-step instructions to help you use SUM Disk Clinic's various procedures. These procedures will help you:

- Repair a damaged volume.
- Recover files from a crashed volume.
- Recover deleted files from a volume.

This section is divided by recovery procedure, such as how to recover a damaged volume or check a volume for errors. With any recovery procedure, you begin by launching SUM Disk Clinic, but the volume from which you launch SUM Disk Clinic depends on the recovery procedure you are attempting.

For example, if you have a crashed hard disk, you shouldn't install and launch SUM Disk Clinic from that hard disk. Instead, make working copies of SUM Program Disks #1 and #2, and launch SUM Disk Clinic from your working copy of SUM Program Disk #1 on your floppy drive. Remember, don't copy or install SUM II or any other files on the volume you are trying to recover.

If you have a hard disk that is **now** crashed, read *Before You Start* on the next page, then turn directly to *Emergency Hard Disk Recover* (page 29) and use those instructions to repair your hard disk.

If you are having trouble deciding where to begin your recovery process, take some time to review the handy *Task Index* on page 3. It tells you which page to turn to for each recovery procedure.

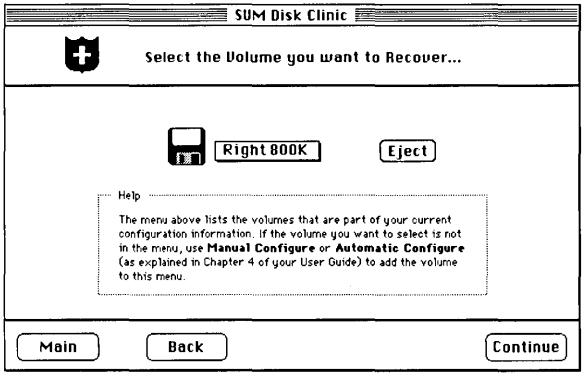
Before You Start

Before you start the Recovery Procedures, you should be familiar with such basic Macintosh operations as using the mouse, manipulating windows, choosing menu commands, and displaying pop-up menus.

In this section, the term "volume" refers to different storage mediums, such as hard disks, hard and soft partitions, and floppy disks. "Disk" is used when referring specifically to a floppy disk or hard disk.

If you aren't familiar with displaying and using pop-up menus to select a volume, take a minute to read the following information.

A pop-up menu is a menu that appears somewhere besides the menu bar. For example, notice in the dialog below the pop-up menu identified by the label **Right 800K**. You can identify a pop-up menu by looking for a box with a shadowed outline. In SUM Disk Clinic, these menus show the name of the currently selected volume, such as **Hard Disk 40**, **HD 40**, **My Floppy**, or **Right 800K**.



Or pop-up menus in SUM Disk Clinic look like this:

To display the menu, place the mouse pointer directly on top of the menu. Then, press and hold the mouse button. The menu and its available volume selections are displayed. For example:

Drag through the menu until the volume you want is highlighted. When you release the mouse button, a check mark, like the one above, is placed to the left of the selected volume.

Next to every volume pop-up menu is the **Eject** button, which may or may not be grayed out. If you select a removeable volume, such as a floppy disk, the **Eject** button is enabled and is no longer grayed out.

If you want more information on pop-up menus, see *Volume Selection* in Chapter 1.

As you learned earlier, the *Emergency Recovery Procedures* has step-by-step instructions. Next to the steps on either the left or right is a screen shot, for example, a dialog box or a window from SUM Disk Clinic. Refer to these illustrations as you perform the recovery procedures to ensure accurate results.

Task Index

If the problem you have is a...	To recover files to... Floppy Disks — Page #	Hard Disk — Page #	Volume Partition — Page #
 Damaged Floppy Disk	5 & 11	5 & 11	5 & 11
 Damaged Hard Disk	5 & 11	5 & 11	5 & 11
 Damaged Volume Partition	5 & 11	5 & 11	5 & 11
 Hard Disk Initialized by Mistake	11	11	11
If you want to recover files deleted from a...			
 Floppy Disk	21	21	21
 Hard Disk	21	21	21
 Volume Partition	21	21	21

* See the Glossary for definitions of the terms in the Task Index.

Notes

Quick Fix

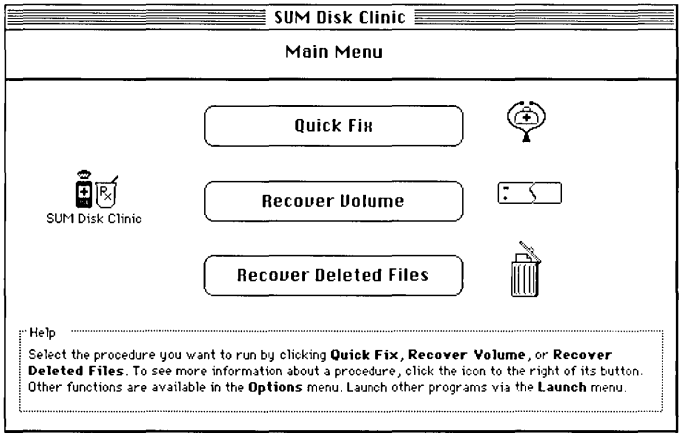
This procedure diagnoses your volume for certain types of volume errors. If Quick Fix finds errors, it can often make repairs, and thereby, save you the trouble and time of recovering all files from the volume and reinitializing or reformatting the volume.

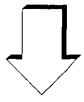
To use Quick Fix, read the following warning message first and move directly to step 1 below.

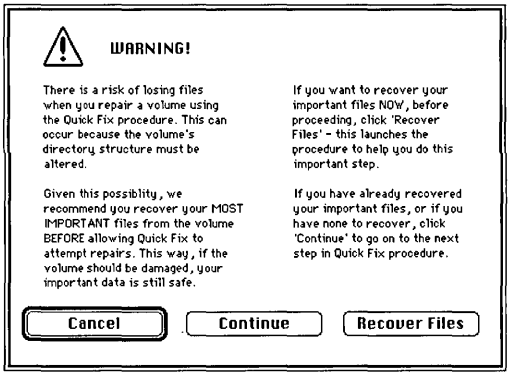
Do not copy or install SUM Disk Clinic onto the volume you are trying to fix.

To use Quick Fix, proceed as follows:

1. Launch SUM Disk Clinic.
2. When the Main Menu appears, click **Quick Fix.**





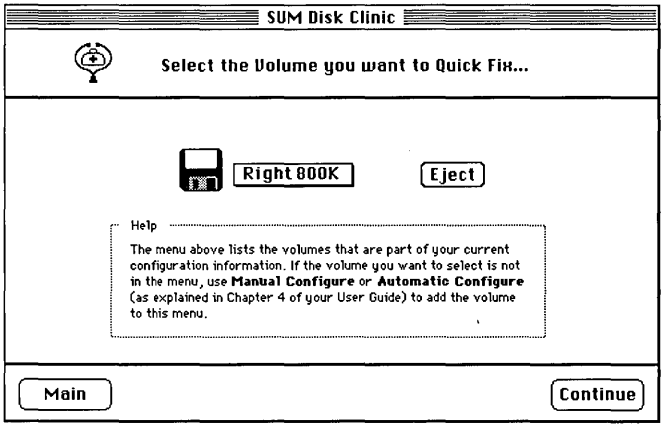


The WARNING dialog, shown to the left, gives you various options for how to proceed at this point. When Quick Fix repairs a volume, there is always the risk that some data might be lost. Therefore, you should always recover your most important files from the volume **before** repairing it with Quick Fix.

3. If you have important files you want to recover before continuing with Quick Fix, click **Recover Files** and continue with step 1 on page 15.

   If you want to abort Quick Fix and return to the SUM Disk Clinic Main Menu, click **Cancel**.

   If you have already recovered your important files and are ready to proceed with Quick Fix, click **Continue** and proceed to step 4.



4. Display the pop-up menu to determine the volumes that are mounted. Select the volume you want to repair from the menu.

If the volume you want isn't in the menu, see the descriptions of **Automatic Configure** and **Manual Configure** in Chapter 4, *SUM Disk Clinic*.

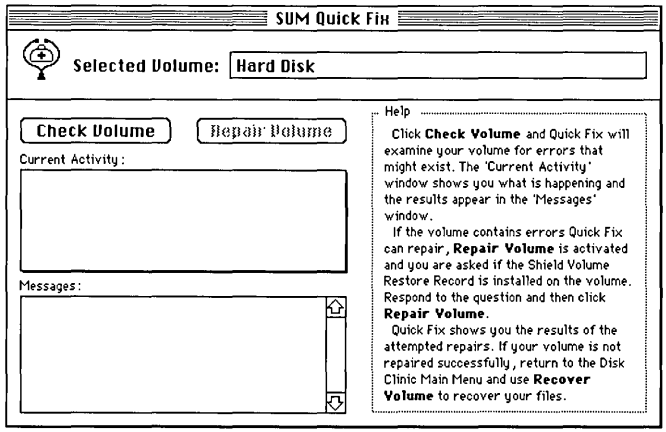
5. After selecting a volume, click **Continue**.

SUM Disk Clinic launches SUM Recover automatically, and you see the SUM Quick Fix window.

6. Click **Check Volume.**

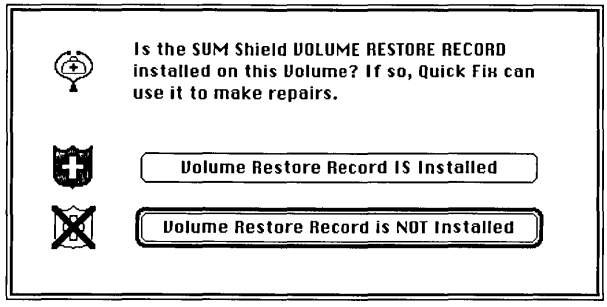
(If you are examining a floppy disk, insert your disk when prompted.) SUM Recover begins examining the volume for errors. As QuickFix checks the volume, you see a description of the process in the *Current Activity* window, and the results of the examination appear in the *Messages* window.

If Quick Fix does **not** detect any errors, the **Repair Volume** button remains disabled. In this case, no other action is necessary, and you can leave SUM Recover. You can use the volume just examined without worrying about problems. Choose **Quit** or **SUM Disk Clinic** from the **File** menu to leave SUM Recover.

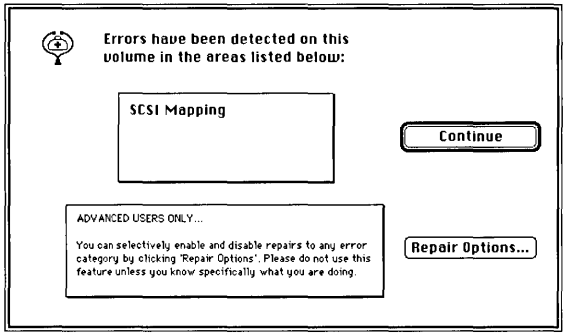


If Quick Fix **does** detect errors, you see this dialog.

If the SUM Shield Volume Restore Record IS installed on the volume you are attempting to repair, Quick Fix uses it to make repairs. (This record can be installed by running SUM Install as described in Chapter 2, *Getting Started*). If the record has not already been installed, you cannot install it at this time, but Quick Fix may still be able to repair your volume. Otherwise, the message "Sorry, unable to repair" is displayed.



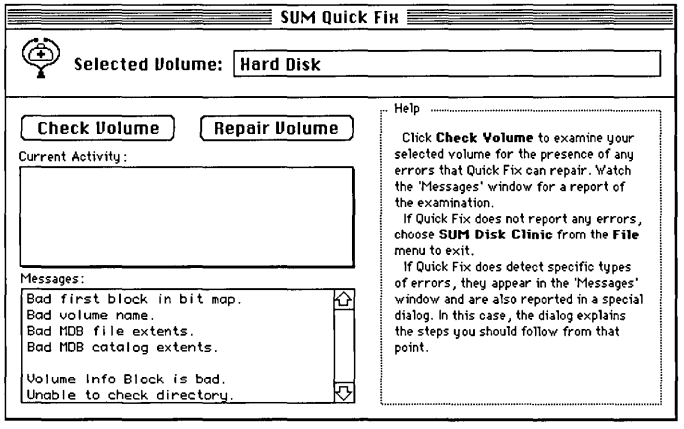
7. If the Volume Restore Record was *previously* installed on the volume, click **Volume Restore Record IS Installed**; otherwise, click **Volume Restore Record is NOT Installed.**



This dialog lists the errors that Quick Fix found on your volume.

8. Unless you consider yourself an *advanced* Macintosh user, click **Continue** and proceed to step 9.

The **Repair Options** button can be used to enable and disable specific types of repairs that Quick Fix attempts to make. You should not use this option unless you fully understand the benefits and ramifications of doing so. If you want more information on the Repair Options, see *SUM Quick Fix Window* in Chapter 5, *SUM Recover*.



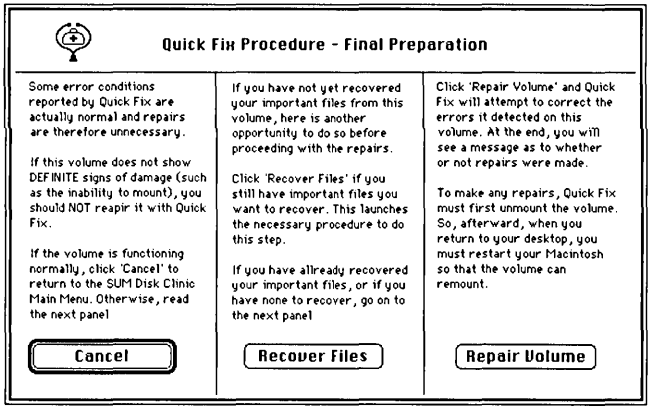
9. When the SUM Quick Fix window appears, click **Repair Volume**.

This is your final checkpoint before proceeding with actual repairs to your volume. You have three options:

10. Click **Cancel** to abort Quick Fix at this point and return to the SUM Disk Clinic Main Menu.

    If you have not yet recovered your important files, click **Recover Files** and go to step 1 on page 15.

    If you're ready to have Quick Fix make repairs to your volume, click **Repair Volume**.



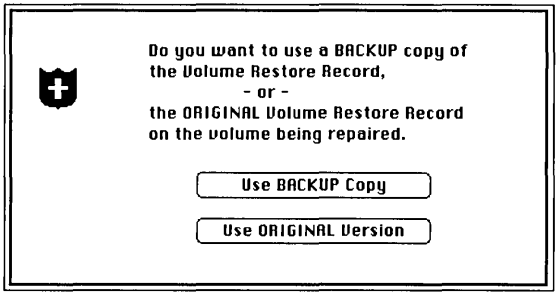
This dialog appears *only* if you clicked **Volume Restore Record IS Installed** in step 7.

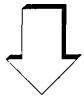
This dialog gives you the option of using a backup copy of the Volume Restore Record to repair the volume or using the record from the damaged volume itself. See *Volume Restore Record* in Chapter 3, *SUM Shield*, if you need help making a selection here.

11. Click either **Use BACKUP Copy** or **Use ORIGINAL Version**.

If you click **Use BACKUP Copy**, a file selector appears, so you can select the backup copy you want to use.

If you click **Use ORIGINAL Version**, SUM Recover scans the volume to locate the Volume Restore Record.





Quick Fix begins making the necessary repairs to your volume, and at the conclusion, shows you the results and explains how to proceed.

Normally, if you have come this far with Quick Fix , the chances of successfully repairing your volume are quite good. However, in some cases, repairs might not be possible. Your only alternative is to return to the SUM Disk Clinic Main Menu and use the **Recover Volume** function to recover your files.

A Final Word

Your chances of recovering a damaged volume are always greatly improved if the SUM Shield Volume Restore Record is installed on the volume. Once you have restored your damaged volume to a "healthy" state with Quick Fix, we strongly recommend you install this record on the volume. Instructions for installing this record are found in Chapter 2, *Getting Started*.

End of Procedure

Recover Volume

This procedure can be used to recover files from a floppy disk, hard disk, or volume partition that is damaged (commonly referred to as a "crashed disk"). It can also be used to recover files from a hard disk that was initialized by mistake. (**You cannot recover files from a floppy disk that was accidentally initialized.**)

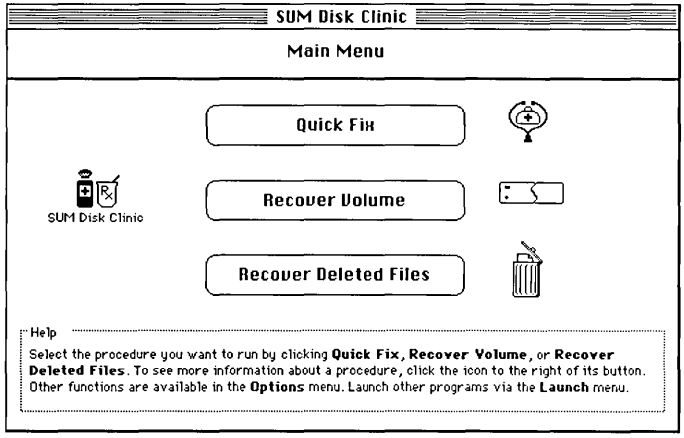
With this procedure you can recover one file, many files, or all files from a crashed disk – depending on your needs. For example, you can use this procedure before running Quick Fix to recover your important files, or you can use it to recover all of your files from a crashed disk before reinitializing or reformatting it.

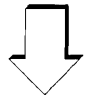
Do not copy or install SUM II or any other files onto the volume you are recovering.

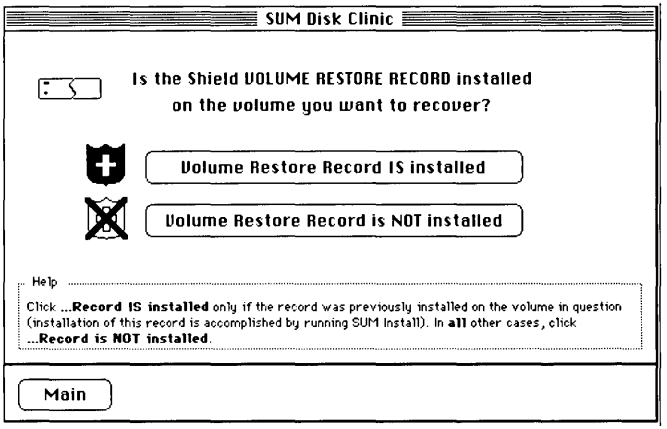
To use the Recover Volume procedure, do the following:

1. Launch SUM Disk Clinic.
2. When the Main Menu appears, click **Recover Volume**.

If you are using this procedure to restore a volume on which a Volume Restore Record IS installed, please read *Synchronizing Your Volume* (Chapter 3) and *Synchronized Recovery* (Chapter 4) before proceeding.



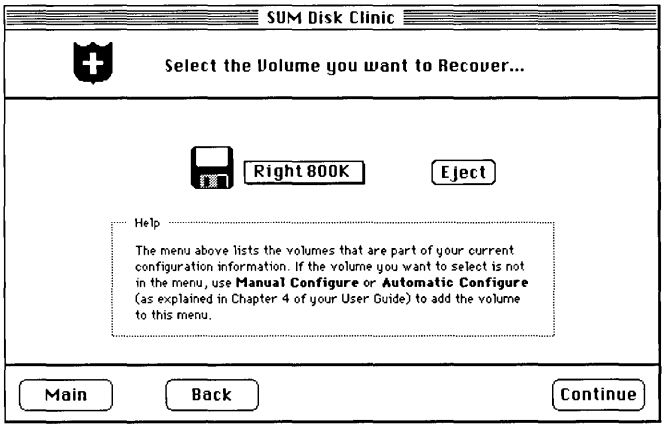




From here the path you take to recover files from your damaged volume depends on whether or not the SUM Shield Volume Restore Record was *previously* installed on the volume. (You cannot install the record at this point.) This window asks you for this information.

3. If the Volume Restore Record was **not** previously installed, click **Volume Restore Record is NOT Installed** and proceed to page 15.

If the Volume Restore Record was **previously** installed via SUM Install, click **Volume Restore Record IS Installed**.



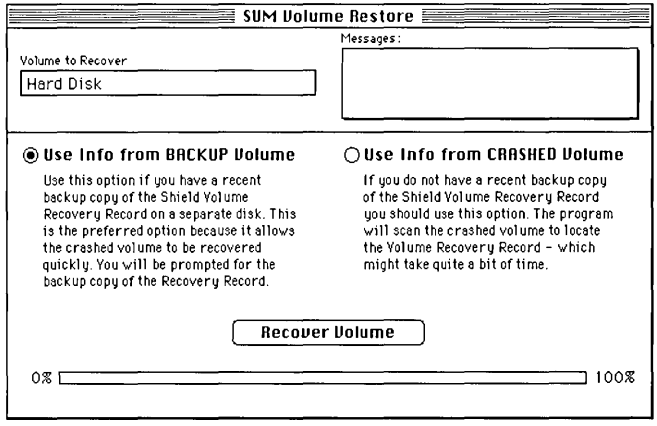
4. Display the pop-up menu and select the volume you want to recover.

This pop-up menu lists the devices available in your current configuration information. If the volume you want is not listed, refer to the descriptions of the **Manual Configure** and **Automatic Configure** commands in Chapter 4 for further instructions.

5. After selecting a volume, click **Continue**.

SUM Disk Clinic launches SUM Recover automatically, and you see the SUM Volume Restore window.

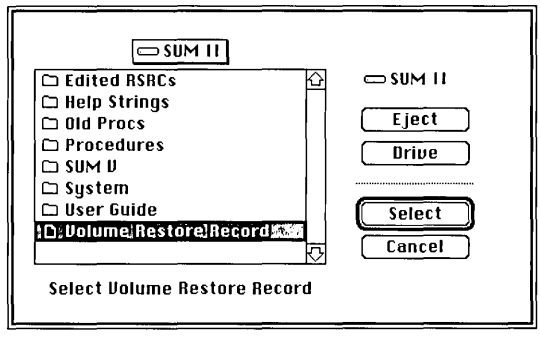
6. Click a radio button to indicate whether you intend to use a backup copy of the Volume Restore Record or use the one on the crashed volume.
7. Click **Recover Volume**.

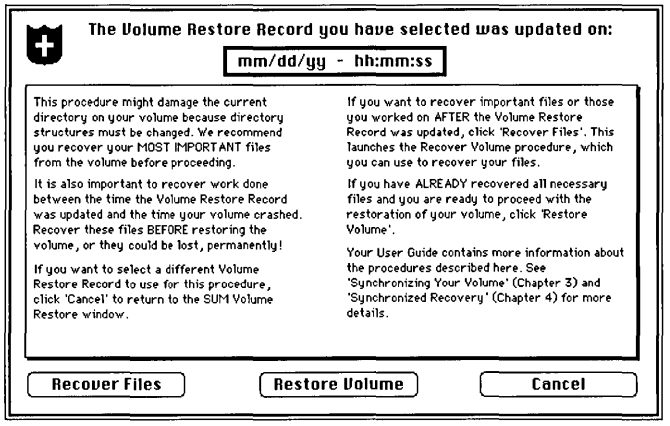


This file selector appears only if you selected **Use Info from BACKUP Volume** in step 6. Use this dialog to locate and select the backup copy of the Volume Restore Record you want to use for this procedure.

(If you selected **Use Info from CRASHED Volume** in step 6, the program begins searching your volume for the Volume Restore Record. Once the record is located, you see the dialog shown in step 9.)

8. Locate the backup copy you want to use and click **Select**.





Once a Volume Restore Record has been selected or located, you see this dialog indicating when the record was last updated. *This is a critical point*, and you have three options for how to proceed:

9. If you want to select a different Volume Restore Record to use, click **Cancel**, and you return to the SUM Volume Restore window.

   If this Volume Restore Record is not *synchronized* to the point at which your volume crashed, click **Recover Files** and proceed to step 1 on page 15.

   If everything is in order and you are ready to proceed with the restoration of your volume, click **Restore Volume**.

After your volume has been restored, a dialog instructs you to restart your Macintosh after you quit SUM Recover and return to your desktop. This step remounts your restored volume because the program unmounts your volume during the restoration process.

After restarting your Macintosh and mounting your restored volume, the volume should be available for normal use.

If you recovered any other files before restoring the volume, check that they are present on the restored volume. If not, copy them to the restored volume at this time.

As a final check, you might want to open a random sample of your files with their parent applications (the ones with which they were created) just to ensure that your data is intact.

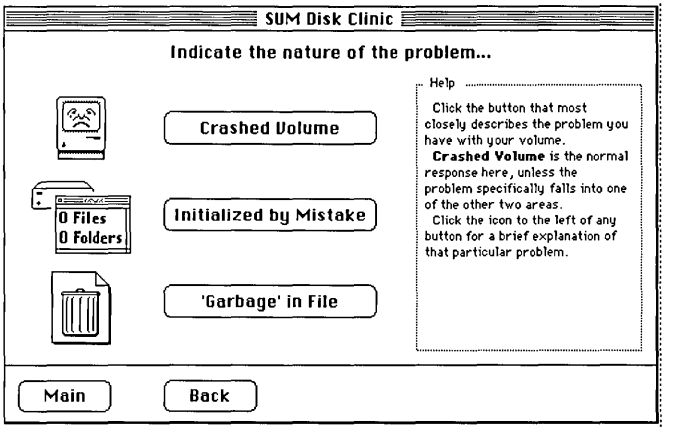
End of Procedure

Recover Volume (continued)

This section continues the Recover Volume procedure. It explains how to recover files from a volume where the SUM Shield Volume Restore Record is NOT installed.

In some cases, you'll use this procedure on a volume where the Volume Restore Record IS installed. For example, you use this procedure to recover important files prior to repairing a volume with the Quick Fix procedure. You might also use this procedure to recover files before restoring a volume if the Volume Restore Record is not properly synchronized to the point at which a volume crashed. (See *Synchronizing Your Volume* in Chapter 3 and *Synchronized Recovery* in Chapter 4 for more on this subject.)

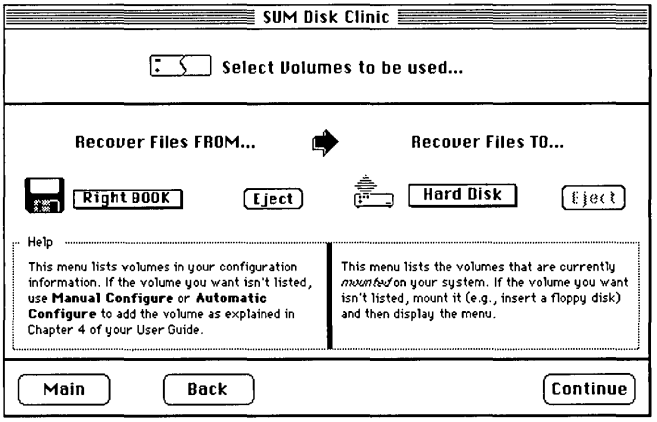
1. Click one of the buttons in this window to indicate what type of problem you have with your volume.



Crashed Volume is the normal response – it covers most problems not specifically addressed by the other two options.

Choose **Initialized by Mistake** *only* if you know your volume is a hard disk that was mistakenly initialized. **You cannot recover a floppy disk that was initialized by mistake.**

If one or more files on your volume contains unrecognizable data, click **'Garbage' in File**. Although SUM Disk Clinic cannot directly repair your files, it can offer some suggestions on how you might be able to recover your data.



The pop-up menu on the left lists the devices that are part of your current configuration information.

2. Display the left pop-up menu and select the volume **FROM** which you want to recover files.

If the volume you want to select does not appear in this menu, your configuration information needs to be updated. See the description of the **Manual Configure** command in Chapter 4 for further instructions.

The pop-up menu on the right lists the volumes that are currently mounted on your system.

3. Display the right pop-up menu and select the volume **TO** which you want to recover files.

If the volume you want to select is not listed, you need to mount it before continuing. If you are recovering files to floppy disks (or any other type of removable media, such as a disk cartridge), insert the disk to mount it, and it will then appear in the menu. If you need to mount a non-removable volume (such as a hard disk), you must quit this procedure and return to your desktop to do so. Once the volume is mounted, restart this procedure.

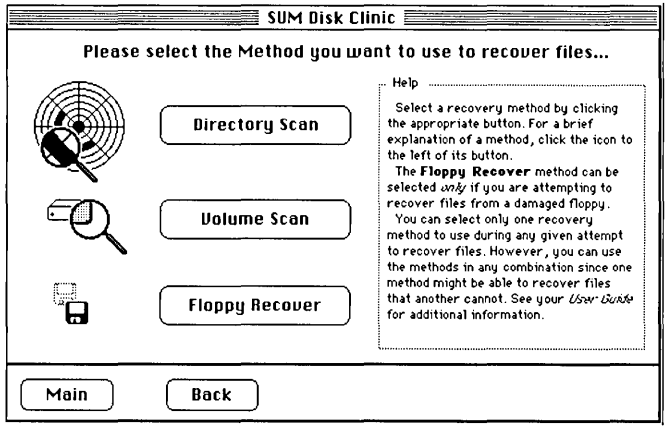
4. After selecting both volumes, click **Continue**.

This window does not appear if you are recovering files from a hard disk that was initialized by mistake because in that case, Volume Scan is the only recovery method.

5. Choose one of the three Recovery Methods here by clicking its button.

Always choose **Directory Scan** first as a recovery method because it is faster than either of the other two methods. **Volume Scan** should be used after you have used Directory Scan, and it did not successfully recover all your files.

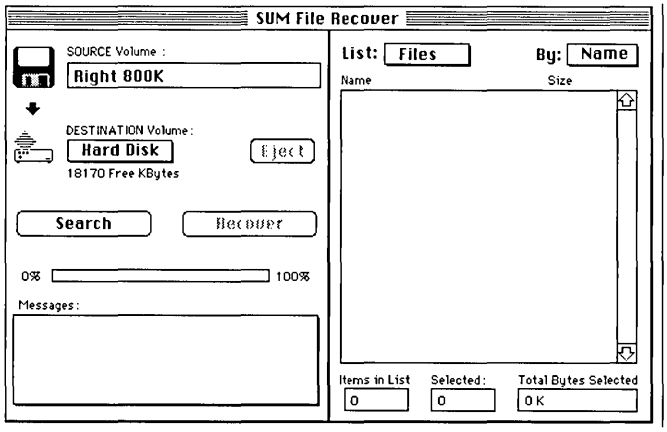
If you are recovering files from a floppy disk, select **Floppy Recovery**, but *only* after using Directory Scan and Volume Scan first, and both methods did not successfully recover all the files on your floppy disk.

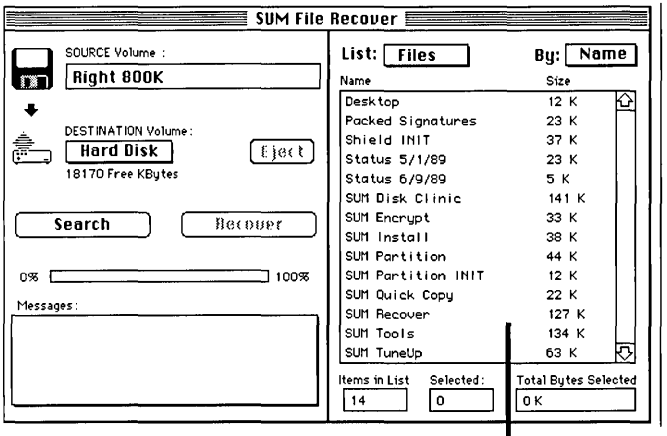


Once you choose a Recovery Method, SUM Disk Clinic launches SUM Recover, and you see the SUM File Recover window.

6. When you're ready to begin searching the SOURCE Volume for files you can recover, click **Search**.

During the search, the **Search** button changes to **Stop**. You can cancel the search by clicking this button. But if you do, **you must search the volume again from the beginning before you can recover any files.** That is, the search procedure must finish completely before you can recover any files.





File List Window

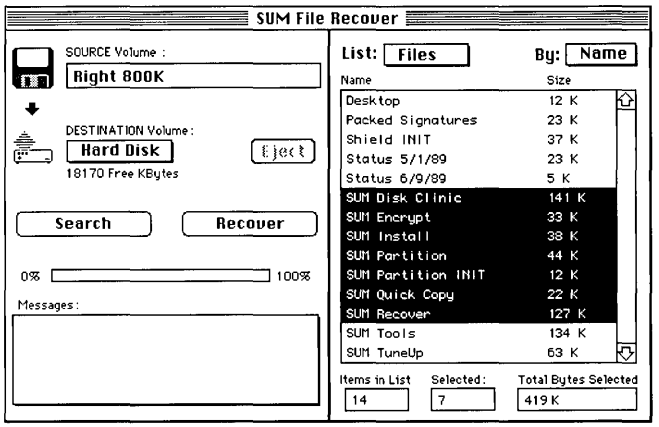
At the conclusion of the search, all files SUM Recover located appear in the File List window.

You can use the **List** pop-up menu to list either **Files** or **Folders** in the window.

The **By** pop-up menu lets you list items by **Name**, **Date**, **Size**, or **Type**.

Items in List (at the bottom of the window) tells you the number of items SUM Recover was able to locate.

Please read the descriptions of the commands available in the SUM Recover menus (Chapter 5) for several additional ways to use this window.



7. Select the item you want to recover by clicking on it in the File List window.

   To select multiple items, use the Shift-click method, or choose **Select All** or **Select Modified** from the **Edit** menu.

Note that as you select items, the *Selected* and *Total Bytes Selected* fields are dynamically updated.

8. Click **Recover** to recover the item or items you have selected.

During the recovery process, the program might need to *split* one or more files. If this occurs, see *Splitting Files for Recovery* in Chapter 5 for more information.

A.SUM Recovered Files

SUM Recover creates one or more folders on your DESTINATION Volume where it stores your recovered files. The first folder created is named **A.SUM Recovered Files**. If additional folders are needed, they are named **B.SUM Recovered Files**, **C.SUM Recovered Files**, and so on.

9. Unless you intend to use another SUM Disk Clinic procedure (such as Quick Fix) following this procedure, your next step would normally be to reinitialize or reformat your damaged volume. You would then restore your recovered files to the volume by copying them from the folder or folders described above back onto your newly initialized volume. In this case, choose **Quit** from the **File** menu to return to your desktop and complete the necessary steps.

   If you are using this procedure to recover files in preparation for using another procedure (for example, Quick Fix), choose **SUM Disk Clinic** from the **File** menu to return to the Main Menu. Then, restart the original procedure.

End of Procedure

Notes

Recover Deleted Files

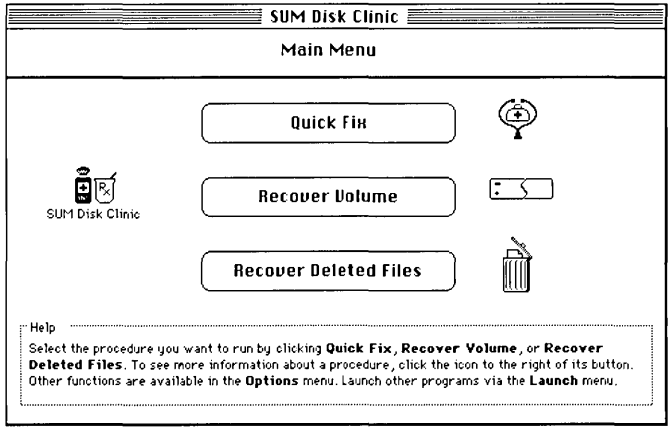
This procedure can be used to recover files without a directory entry; that is, files removed from a volume by dragging their icons to the Trash, and then subsequently emptying the Trash.

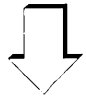
Your success at recovering a deleted file depends on many different factors, such as how long ago the file was deleted, where it was originally located on the volume, and so forth. Read the description of the *Deleted File Record* in Chapter 3, *SUM Shield*, for more information about what happens when files are deleted.

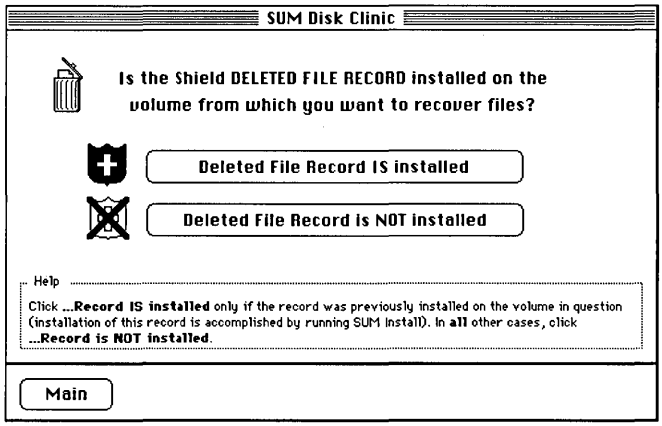
Before you launch SUM Disk Clinic, make a working copy of SUM Program Disk #1 and launch the program from that disk. Do *not* install SUM II on the volume you are recovering.

To use the Recover Deleted Files procedure, proceed as follows:

1. Launch SUM Disk Clinic.
2. When the Main Menu appears, click **Recover Deleted Files**.



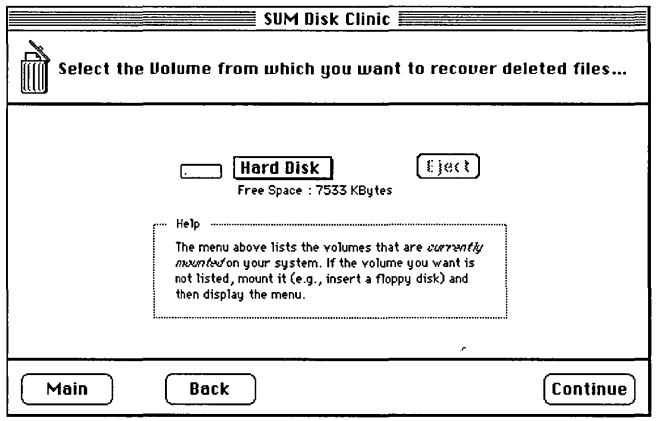




The path you follow from here to recover the deleted files depends on whether or not the SUM Shield Deleted File Record was previously installed on the volume where you are trying to recover the files. (You cannot install the record at this point.) The window asks you for this information.

3. If the Deleted File Record is NOT *installed* on the volume, click **Deleted File Record is NOT Installed** and turn to page 25.

If the Deleted File Record *IS installed* on the volume, click **Deleted File Record IS Installed** and continue with step 4 below.



4. Display the pop-up menu and select the volume from which you want to recover deleted files.

This pop-up menu lists **only those volumes that are currently mounted** on your system. If the volume you want is not in the menu, you must mount it before continuing. If you are attempting to recover files from a floppy disk (or other removable media, such as a disk cartridge), insert the disk and *then* display the menu. If you try to recover files from non-removable media (such as a hard disk) and it is not currently mounted, you must return to your desktop, mount the volume, and restart this procedure.

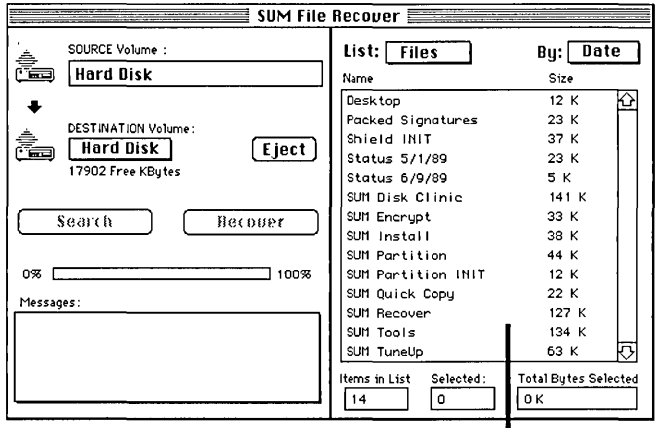
5. After selecting a volume, click **Continue**.

SUM Disk Clinic automatically launches SUM Recover, and you see the SUM File Recover window.

Note that the **Search** button is inactive, and the File List is already available in the File List window. Therefore, searching the volume is unnecessary, and the **Search** button is never activated with this procedure.

In addition, the SOURCE and DESTINATION Volume names are identical because the files are recovered by "reactivating" them on the volume that they were originally deleted from.

You can, if necessary, select a different SOURCE Volume by choosing the one you want from the DESTINATION Volume pop-up menu.

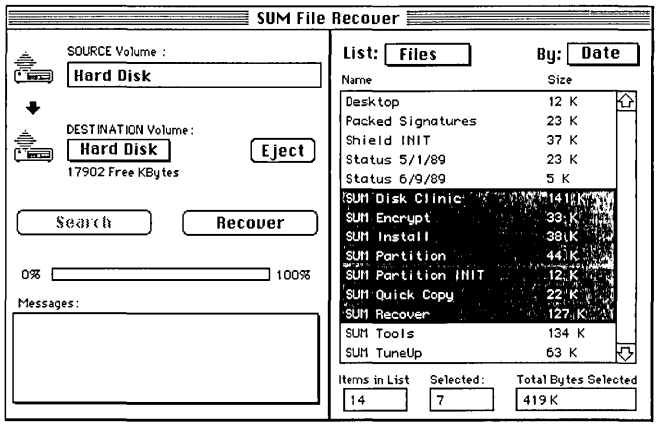


File List Window

6. Select the item you want to recover by clicking on it in the File List window.

   To select multiple items, use the Shift-click method, or choose **Select All** or **Select Modified** from the **Edit** menu.

When you select one or more items in the File List window, the **Recover** button is activated.



7. Click **Recover** to recover the item or items you have selected. The file name in the File List window changes to italics when the file is recovered.

8. After recovering all items you want, exit from the program by choosing **Quit**, **SUM Disk Clinic**, or **Transfer** from the **File** menu.

SUM Recover creates a folder named **A.SUM Recovered Files** on your DESTINATION Volume where it stores the files you have recovered. If additional folders are needed, SUM Recover names them **B.SUM Recovered Files**, **C.SUM Recovered Files**, and so on.

At this point, all the files you recovered should be immediately available on your DESTINATION Volume. Since the files are recovered on the volume from which they were originally deleted, the files should now be on that volume.

Sometimes if you try to open a document you have recovered, the alert tells you that the application is busy or missing, or the recovered application may not launch. Normally this indicates that the file's Type and Creator codes are incorrect or missing. You can insert these codes in two ways. You can use the **Get Info** command in SUM Recover's **File** menu at the time you are recovering the files. Or if you are a power user, you can use SUM Tools to insert the codes once you have left SUM Recover. (Appendix B contains a list of the common Type and Creator codes.)

Because you were able to recover a file, does not mean that it is completely intact. Check your recovered documents by opening each one with its parent application (the application with which it was created) and then make sure all of your data is present. Check any recovered applications by launching them.

End of Procedure

Recover Deleted Files (continued)

This section continues the Recover Deleted Files procedure from page 22. It explains how to recover files deleted from a volume on which the SUM Shield Deleted File Record is NOT installed.

Before continuing here, you should have already done the following:

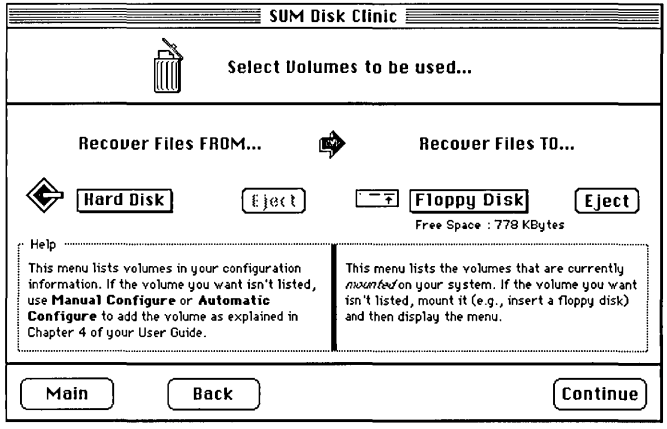
1. Launched SUM Disk Clinic.
2. Clicked **Recover Deleted Files** at the Main Menu.
3. Specified **Deleted File Record is NOT Installed** on the volume from which you are attempting to recover files.

...from page 22

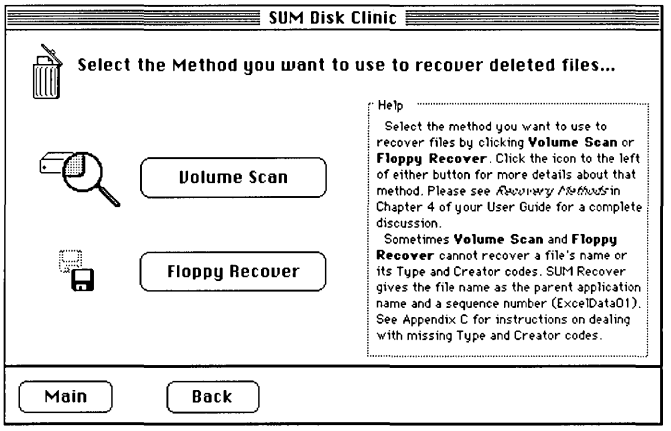
4. Select the volume **FROM** which you want to recover files in the left pop-up menu.

   Note that if the volume does not appear in the menu, see the Help information about mounting volumes.

5. Select the volume **TO** which you want to recover files in the right pop-up menu. The volume must be currently mounted to appear in this menu.
6. After selecting both volumes, click **Continue**.



If you select the same volume in both menus, SUM Recover warns you that you are at risk of losing data. If you are recovering files from a floppy disk to another floppy disk using the same drive, you can override the alert and continue. **In all other cases, you should select a different volume in each menu.**

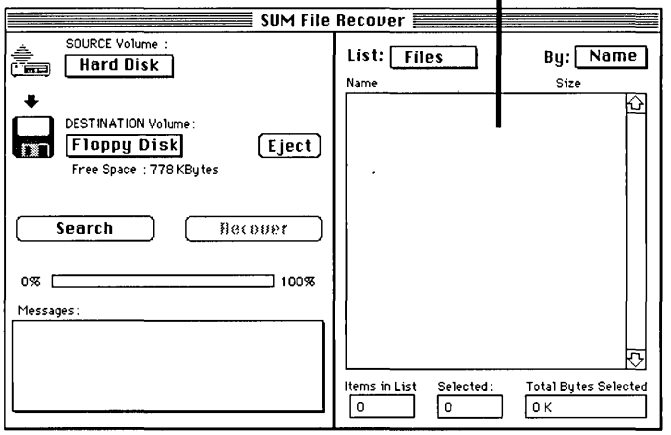


This window appears *only* if you are attempting to recover files from a floppy disk – as specified in the preceding window. If you are recovering from any other type of volume, continue with the window below.

7. Choose **Volume Scan** by clicking on that button. Even though you are trying to recover deleted files from a floppy disk, you should use Volume Scan after using Directory Scan, and then Floppy Recovery as a last resort.

For more information about these options, see *Recovery Methods* in Chapter 4, *SUM Disk Clinic*.

File List Window



SUM Disk Clinic automatically launches SUM Recover, and you see the SUM File Recover window. Note that you can select a different DESTINATION Volume here if you wish, but you cannot change the SOURCE Volume.

8. To begin searching the SOURCE Volume for the files you can recover, click **Search**.

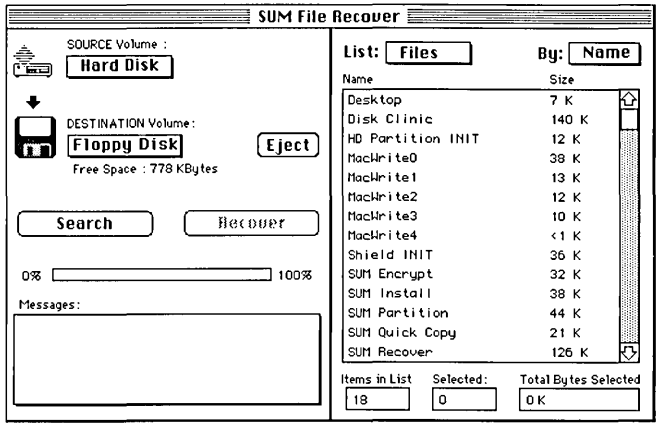
During the search, the **Search** button changes to **Stop**, and the beachball rotates on the screen. You can cancel the search at any point by clicking this button. But if you do, **you lose all entries accumulated to that point and must search the volume again**.

At the conclusion of the search, all files SUM Recover located appear in the File List window.

You can use the **List** pop-up menu to list either **Files** or **Folders** in the window. The **By** pop-up menus lists items by **Name, Date, Size**, or **Type**.

Items in List (at the bottom of the window) shows the number of items SUM Recover was able to locate.

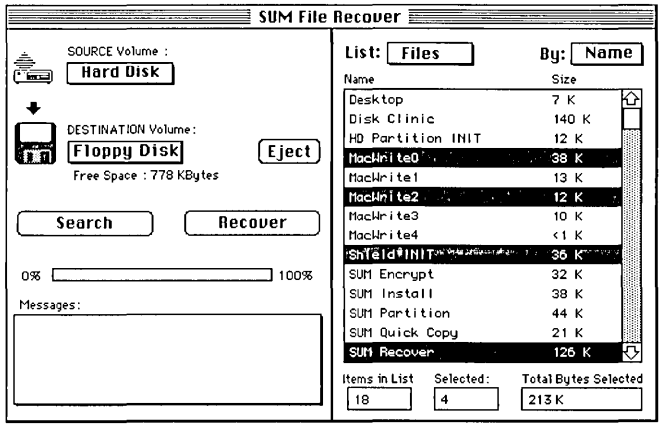
The **File**, **Edit**, and **Options** menus in SUM Recover let you manage the items in the File List window. See Chapter 5, *SUM Recover*, for descriptions of the commands.



9. Select the item you want to recover by clicking on it in the File List window.

   To select multiple items, use the Shift-click method, or choose **Select All** or **Select Modified** from the **Edit** menu. Notice that *Selected* and *Total Bytes Selected* are updated as you select items.

10. Click **Recover** to recover the item or items you have selected. During the recovery process you can change the DESTINATION Volume at any point. For example, if the DESTINATION Volume becomes full, wait until the disk full message appears, then select a new DESTINATION Volume.



SUM Recover might need to split one or more files during recovery. See *Splitting Files for Recovery* in Chapter 5 for further information.

11. After recovering the items you want, exit SUM Recover by choosing **Quit**, **SUM Disk Clinic**, or **Transfer** from the **File** menu.

SUM Recover creates a folder named **A.SUM Recovered Files** on your DESTINATION Volume where it stores the files you have recovered. If additional folders are needed, they are named **B.SUM Recovered Files**, **C.SUM Recovered Files**, and so on.

If you want to restore your recovered files back onto the same volume from which they were originally deleted, you can do so simply by copying them from the folders described above.

Sometimes if you attempt to open a document you have recovered, an alert stating that the application is busy or missing is displayed. Or you might find that a recovered application is unable to launch. This normally indicates that the file's Type and Creator codes are incorrect or missing. (SUM Recover cannot always retrieve these codes.) You can insert the correct codes at the time you recover the files using the **Get Info** command in the **File** menu (Appendix B contains a list of common Type and Creator codes.) If you are more technically inclined, you can also use SUM Tools to insert the codes if you have already quit SUM Recover. (See **Edit File Attributes** in Chapter 11.)

Remember, because you were able to recover a deleted file, does not necessarily mean it is completely intact. If the file was fragmented on your disk or some of it was overwritten by another application, only part of the file might have been recovered. Therefore, you should check all recovered files thoroughly by opening documents with their parent applications (the application with which they were created) and launching all recovered applications to determine if all data is present.

End of Procedure

Emergency Hard Disk Recover

Use the Emegency Hard Disk Recover procedure *only* in the following situation:

> Your hard disk is *currently* crashed and you have purchased Symantec Utilities for Macintosh so that you can recover your files and restore the disk.

If you purchased and installed SUM II and *then* experienced a crash, *DO NOT USE THIS PROCEDURE.* Instead, use the **Recover Volume** or the **Quick Fix** procedure described earlier in this section.

The instructions in this section don't provide much detail except when essential to making a decision. However, help is available along the way if you need it. You should read this entire section carefully before you begin.

Since you use this procedure *only* with hard disks, we will not discuss recovering a damaged floppy. Return to the Task Index (page 3) for directions on that process.

Three Recovery Phases

The Emergency Hard Disk Recover procedure has three separate phases:

Phase I: Recover Your Important Files – Recover your most important files from the crashed disk. This is essential because the repairs you will attempt in Phase II could lose data from the disk if it is damaged in certain ways.

Phase II: Use Quick Fix – Use the SUM Disk Clinic Quick Fix procedure to try and repair the disk. If successful, Phase III is unnecessary, and your disk should be back in service. If Quick Fix cannot repair the disk, move on to Phase III.

Phase III: Recover Your Remaining Files – Use the SUM Disk Clinic Recover Volume procedure to recover the remaining files from your crashed disk. Then, reinitialize or reformat the disk. Finally, copy your recovered files back to the disk. Everything should now be back to the way it was prior to the crash.

Things You Need

Unless you have a second hard disk or a *mountable* tape drive, you need a supply of floppy disks. It isn't necessary to initialize the disks beforehand because the recovery routines initialize them for you "on the fly."

There is no way to estimate the number of floppy disks you might need. But this section may be helpful in calculating that number.

Before you begin, make copies of your original SUM II Program Disks, referred to as *SUM Disk #1* and *SUM Disk #2* throughout this procedure. You can launch SUM Disk Clinic from disk #1 from a floppy drive or from a healthy hard disk if you have installed the program there.

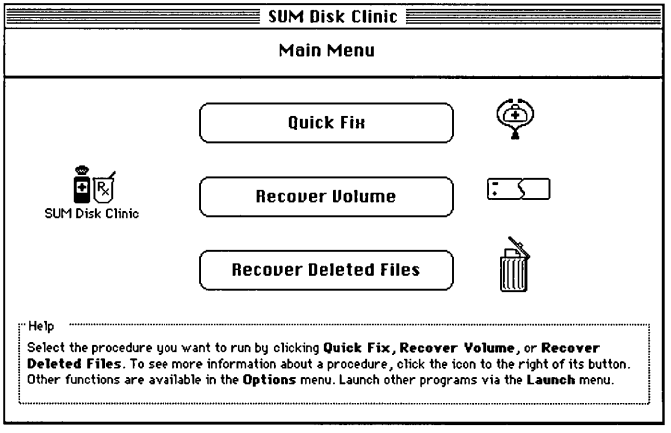
Do not use your original SUM II Program Disks in this procedure. If you damage them, you will have a new set of problems to deal with.

Finally, you will need a copy of the Volume Information File (VIF) for your hard disk. We recommend using one of the following ways to acquire a VIF:

1. Use the VIFs provided on SUM Program Disk #2.
2. Use SUM Disk Clinic to create a VIF for a hard disk with a configuration similar to your crashed disk – the same model, manfacturer, and make.
3. As a last resort, call the manufacturer of your hard disk and request a copy of the VIF you need.

See **Create Volume Info File** in Chapter 4, *SUM Disk Clinic,* for more information about creating VIFs.

Phase I: Recover Your Important Files

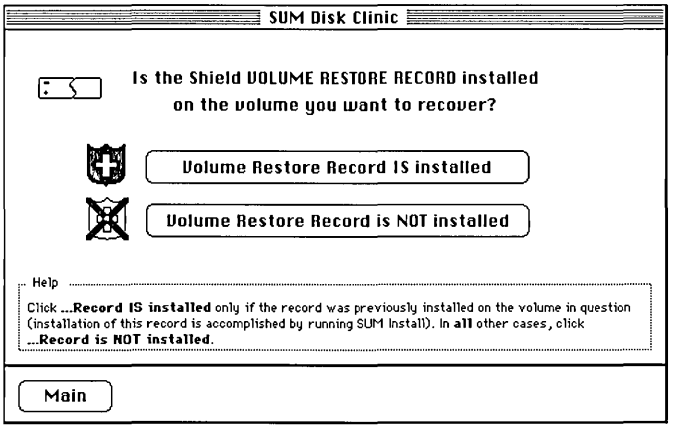


1. If your Macintosh is running, shut it down now.
2. Insert SUM Disk #1 in your internal drive and start your Macintosh. SUM Disk #1 contains the System and the Finder files, so you can start up directly from this disk.
3. Eject SUM Disk #1 and replace it with SUM Disk #2. The disk's window opens automatically onto your desktop.
4. Locate the *Read Me* file and double-click its icon to launch *TeachText*. Examine the Read Me file thoroughly (you cannot print it at this time). This file might contain important instructions that supplement those in this section.
5. Eject SUM Disk #2 and replace it with SUM Disk #1.
6. Locate the SUM Disk Clinic icon (shown below) and double-click it to launch the program.

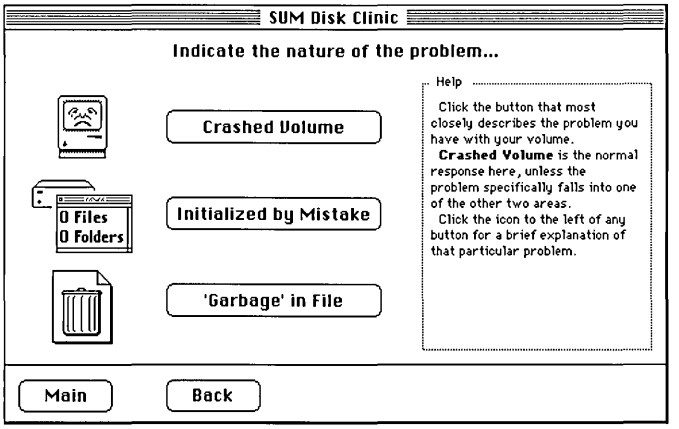
SUM Disk Clinic

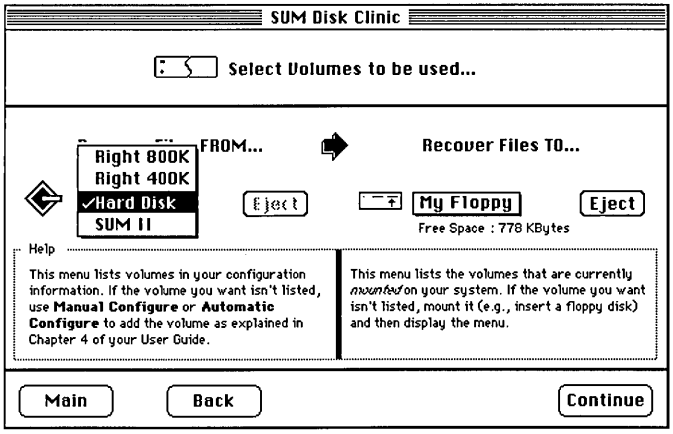
7. After SUM Disk Clinic starts, you see the Main Menu (shown here). Click **Recover Volume**.

8. Click **Volume Restore Record is NOT Installed.**



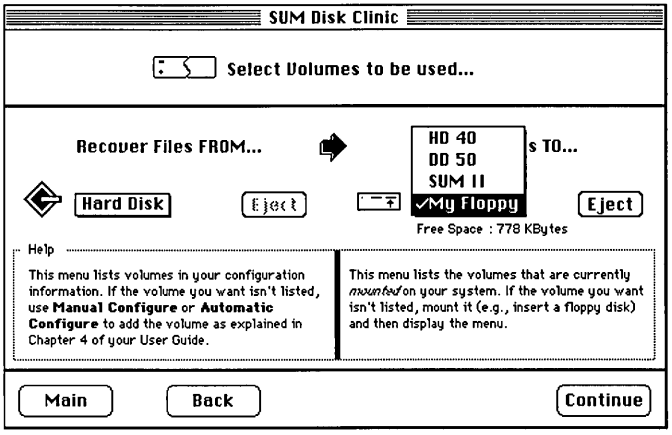
9. Click **Crashed Volume.**





10. Display the left pop-up menu and select your crashed disk from this menu. (Your menu won't look exactly like the one shown here.)

If your crashed volume does not appear in this menu, turn to Chapter 4, *SUM Disk Clinic*, and read the description of the **Manual Configure** command. Follow the instructions for adding a device to your configuration. You will probably need to load a Volume Information File (VIF) for your device during the manual configure operation. For information about creating VIFs, turn to *Create Volume Info File* in Chapter 4.



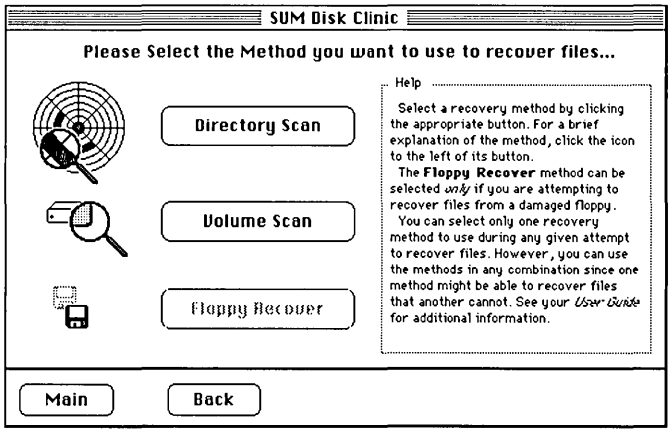
11. Display the right pop-up menu and select the volume **TO** which you want to recover files. (Again, your menu will look different.)

If you are recovering to floppy disks, you can eject the disk currently in your drive by selecting it in the menu and then clicking **Eject**. Then, insert the first floppy where you are going to recover files and select it in the menu.

Do not select your crashed hard disk in this menu, even if it does appear. Recovering files back onto the same volume can destroy your data and prevent you from ever recovering it.

12. After selecting both volumes in this window, click **Continue**.

13. Click **Directory Scan.**



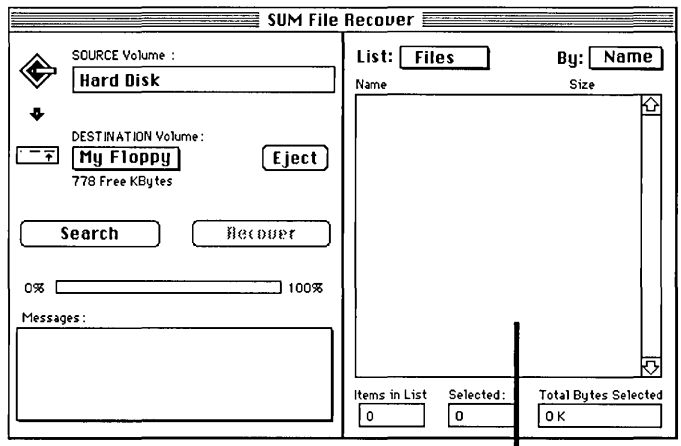
After a short delay, you see the SUM File Recover window.

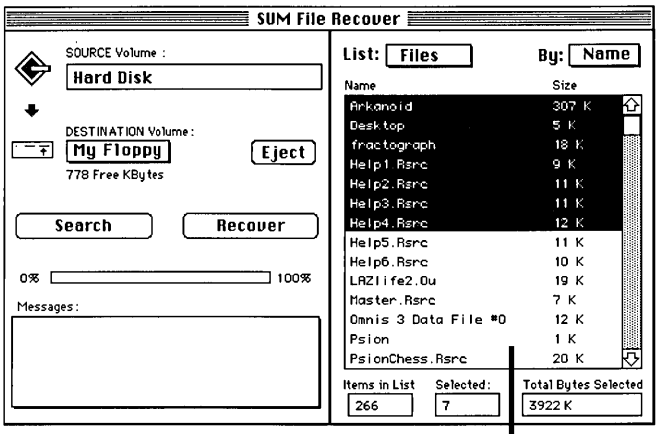
14. Click **Search.**

The program begins scanning your volume's directory for files it can recover. This process can take anywhere from 5 minutes to more than 1 hour, depending on the size of the volume.

The progress indicator bar begins filling as the program searches your disk, and the **Search** button changes to **Stop.** You can click **Stop** to cancel the search, but if you do, **you lose the entire list of files that has accumulated in the File List window**, which means you would have to search the disk again.

When the search is complete, the **Stop** button changes back to **Search.**





File List Window

Once the search is complete, your objective is to recover those files that are most important to you before going on to the next phase.

(You can, if you prefer, recover all files in the list at this point. See the sidebar on the next page for considerations.)

15. Locate and select those files in the File List window that are essential, and you feel must be recovered.

Click a file name in the list to select it. Use the Shift-click method to select multiple files or folders. Use **Find File** in the **Options** menu to locate files by name.

16. After selecting the files you want to recover, click **Recover**.

The program begins recovering your files to the DESTINATION Volume specified in the window. SUM Recover deselects the file when it is recovered. Notice that in most cases, the program works from the top of the list to the bottom.

In some cases, the program might find it necessary to *split* a file across multiple volumes and alerts you when this is necessary. If this happens and you need help, read *Splitting Files for Recovery* in Chapter 5, *SUM Recover*.

The program notifies you after all files have been recovered.

At this point, you should have one or more disks containing the important files you just finished recovering.

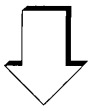
In the process of recovering your files, the program creates a new folder on each DESTINATION Volume for storing your recovered files. Each folder is named SUM Recovered Files and is prefixed with a capital letter and a period for unique identification:

If the program needs to create additional folders on the same volume, it does so by incrementing the prefix letter, for example, **B.SUM Recovered Files**, **C.SUM Recovered Files,** and so on. This information isn't relevant at the moment, but it might become important later.

If you recovered your files to floppy disks, label your disks and set them safely aside – you might need them later.

If you recovered your files to a hard disk, they are safe where they are, and you don't need to do anything further.

You have now completed Phase I of the recovery process, and you are ready to move on to Phase II. Turn the page when you're ready to begin.



The main criteria you should use in deciding whether to recover all of your files or only your important ones at this point is how long it took to complete the search of your volume.

If the search was a relatively short one, recover only your important files.

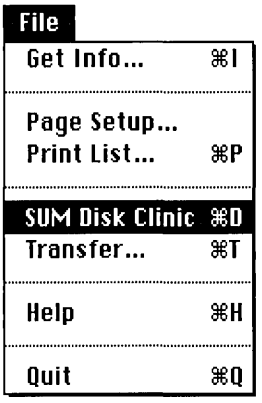
If the search was lengthy, you might want to recover all of your files now. The reason for this is that if during Phase II Quick Fix is unable to repair your volume, it will then be necessary to do the entire search again during Phase III.

On the other hand, if during Phase II Quick Fix *does* repair your volume, recovering all of your files would have been an unnecessary and time consuming process.

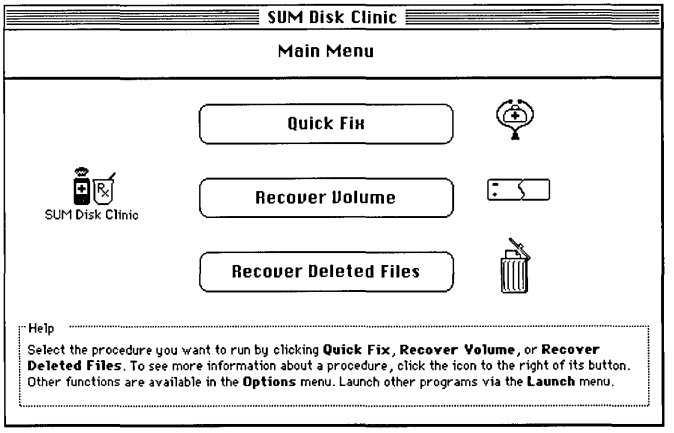
Unfortunately, there is no way to predict the outcome of the Quick Fix procedure, and thus, no way to advise you which approach might be best in your situation. The best advice is to make your decision, and go with it.

Even if you do decide to recover all of your files now, you should still complete Phase II. If Quick Fix does repair your volume, this will save you the time required to reinitialize your disk and then restore all of your files back to it.

Phase II: Use Quick Fix

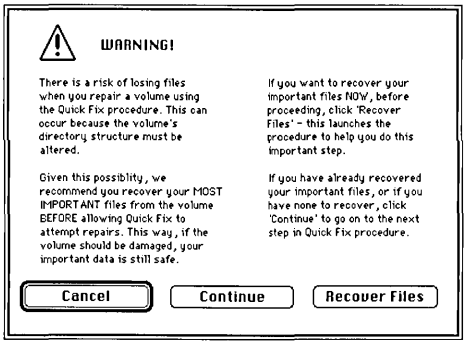


17. Choose **SUM Disk Clinic** from the **File** menu.

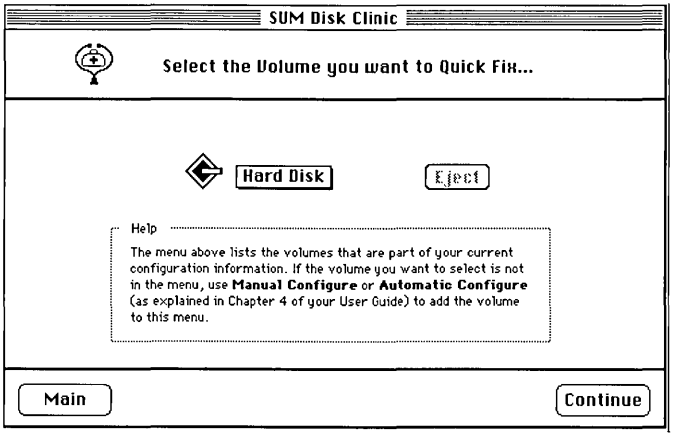


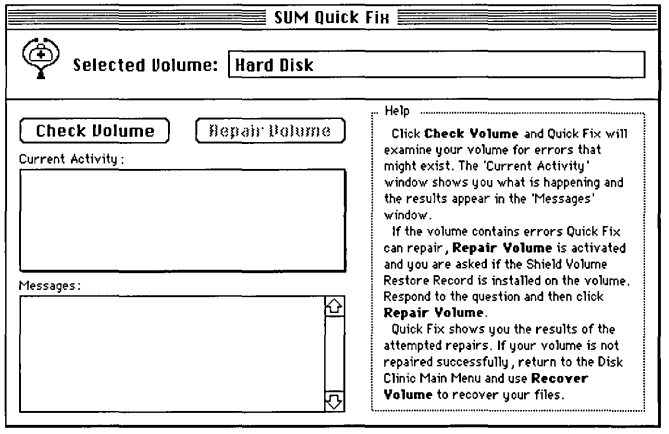
18. When the SUM Disk Clinic Main Menu appears, click **Quick Fix**.

19. Read the **WARNING** screen, and then click **Continue.**



20. Display the pop-up menu and select your crashed disk.
21. Click **Continue.**





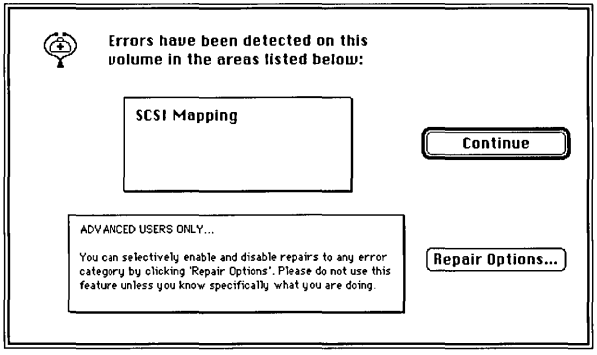
After a short delay, you see the SUM Quick Fix window.

22. Click **Check Volume**.

Quick Fix examines your disk and shows the results in the *Messages* window.

If the program does **not** detect errors in your disk that it can repair, the **Repair Volume** button remains deactivated. In this case, proceed directly to Phase III beginning on page 41.

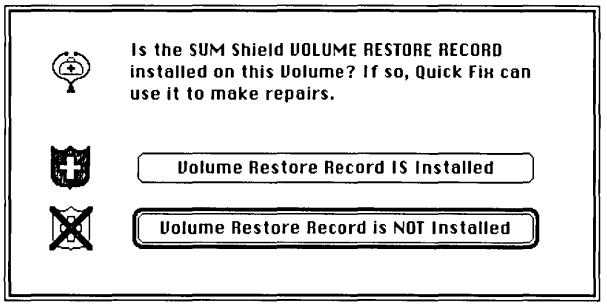
If the program **does** detect errors, you see the following dialog.



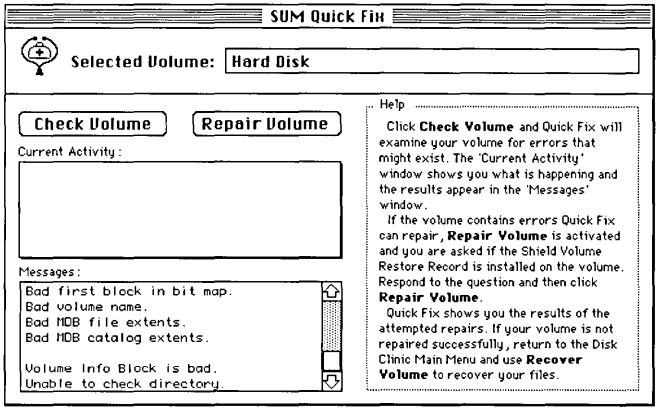
This dialog lists the errors Quick Fix found on your volume. The list you see might be different from the one shown next. If Quick Fix cannot repair your volume, the message "Sorry, unable to repair" is displayed. In that case, click **OK**, and continue with Phase III on page 41.

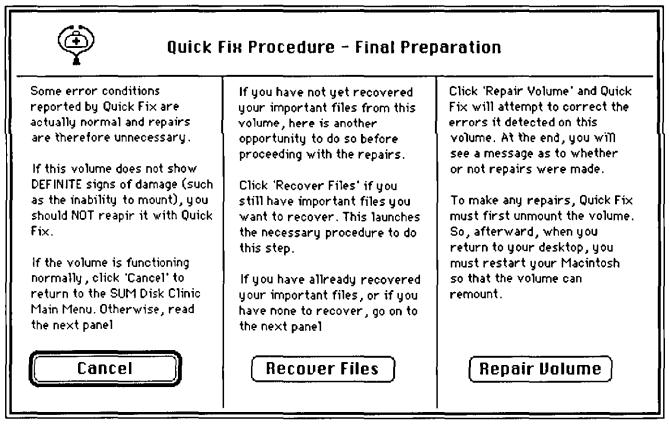
23. Click **Continue** to move to the next step in the repair process.

24. Click **Volume Restore Record is NOT Installed.**



25. Click **Repair Volume.**





26. Click **Repair Volume.**

Quick Fix attempts to make the necessary repairs to your volume and shows you the results.

If repairs are successful, Quick Fix instructs you to return to your desktop and restart your Macintosh (restarting is necessary to mount the repaired volume, which was unmounted during repair procedures). If the volume mounts, your volume should be ready for normal use, and the repairs have been successful.

If repairs are not successful, you must now move on to Phase III and recover all remaining files from your damaged volume. When you are ready, go on to the next page.

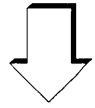
Phase III: Recover Remaining Files

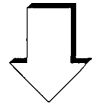
Don't let the fact that Quick Fix could not repair your disk bother you in any way. Quick Fix looks for and repairs specific types of problems. The fact that it did not work simply means your disk is not damaged in a way that Quick Fix can deal with. This should not affect your ability to recover your remaining files from your crashed disk in any way.

Phase III is actually the same as Phase I, except that you will be recovering *all* of your remaining files from the crashed disk, rather than just your important ones.

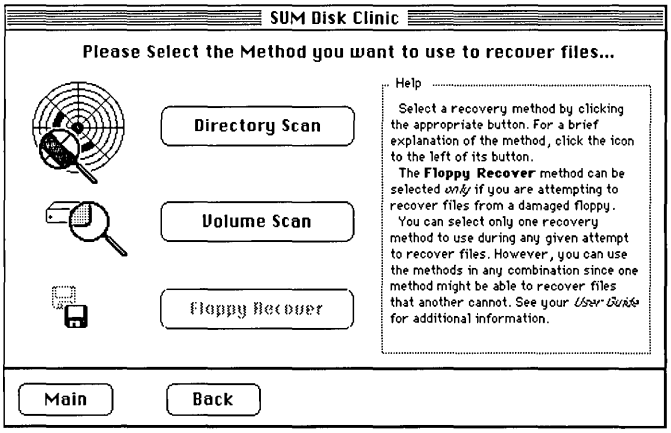
If you recovered all of your files during Phase I, choose **Quit** from the **File** menu and then proceed directly to step 32 on page 43; otherwise,

27. Choose **SUM Disk Clinic** from the **File** menu.
28. Once SUM Disk Clinic loads, you must repeat several steps you performed earlier. Turn to page 30 in this section and repeat steps 7 through 12. After completing step 12, return here and continue with step 29 on the next page.





To step 7, page 30



29. Click **Volume Scan.**

After a short delay, you see the SUM File Recover window.

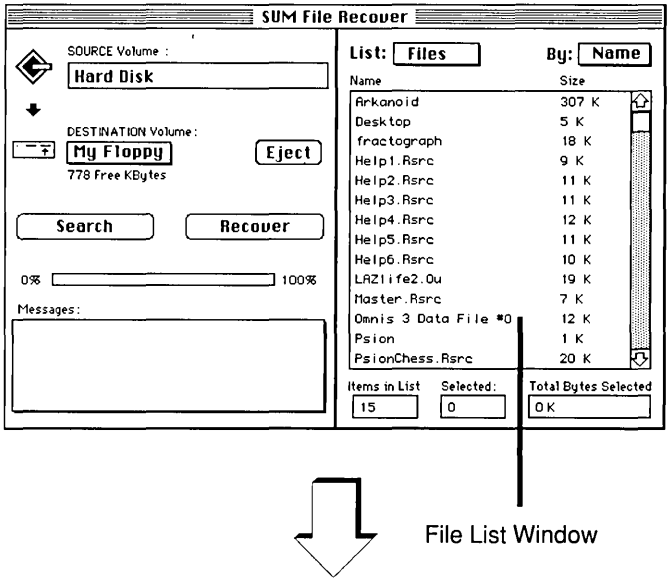
30. Click **Search.**

The program begins scanning your volume for files it can recover using the Volume Scan Recovery Method. This process can take some time, depending on the size of the volume.

The progress indicator bar begins filling as the program searches your disk, and the **Search** button changes to **Stop.** (With Volume Scan, the items are not displayed in the File List window until the process is completed.)

If you click **Stop**, the files accumulated so far are lost.

...from step 14



File List Window

When the search is complete, the items are displayed in the File List window, and the **Stop** button changes back to **Search**.

Your objective here is to recover those files you did not recover during Phase I.

31. Choose **Select All** from the **Edit** menu to select all files in the File List window.
32. Use the Shift-click method to deselect those files you *did* recover during Phase I.
33. Click **Recover**.

The program begins recovering your files to the DESTINATION Volume. If the program finds it necessary to split files during recovery, refer to *Splitting Files for Recovery* in Chapter 5, *SUM Recover*.

The program notifies you when all files have been recovered.

34. Once recovery is complete, choose **Quit** from the **File** menu to return to your desktop.

Assuming you recovered your files to floppy disks, you now have a stack of floppies you can use to restore your disk to service. But before doing so, you need to correct whatever is wrong with the crashed disk.

35. Reinitialize your crashed disk.

    Normally, you would accomplish this step by selecting the disk's icon on your desktop and choosing **Erase Disk** from the **Special** menu.

    Some hard disk manufacturers provide their own software for initializing and reformatting. If you have such a drive and the necessary software, reinitialize your drive according to the manufacturer's instructions.

36. After you have reinitialized your disk, copy all of your recovered files back onto the volume. If any of your files were split during recovery, refer to *Restore Split File* in Chapter 4, *SUM Disk Clinic*, for instructions.

37. Install SUM II according to the instructions in Chapter 2, *Getting Started*. We strongly recommend you install the Shield Volume Restore Record on the disk you just restored and on any others that contain important data.

Although your disk is restored and back in service, it's a good idea to hold on to the disks containing your recovered files until you are satisfied everything is working properly.

End of Procedure

Remember, your recovered files are located in a folder like the one shown here. If you don't find all of your files in the folder named **A.SUM Recovered Files**, look for folders named **B.SUM Recovered Files**, **C.SUM Recovered Files**, and so on.

REFERENCE

Introduction to SUM II

This is

Symantec Utilities for Macintosh

Version 2.0

Crashed Disk Recovery, Backup, Optimization, and Security

Symantec Utilities for Macintosh version 2.0 (called **SUM II** from here on) is a collection of utility programs that keeps your Macintosh disks operating at peak performance, protects you from disk problems (such as crashed disks, unintentionally initialized disks, and mistakenly deleted files), and provides maximum security for your disks and the data they contain.

Components

SUM Shield is the ultimate tool for protecting your hard disk against disk crashes and accidental initialization and for recovering deleted files from a disk. With SUM Shield, you can recover from any of these problems faster and easier than you ever thought possible.

SUM Disk Clinic is the "heart" of SUM II, and it serves two major purposes. First, its diagnostic abilities greatly simplify the steps involved in recovering crashed disks and deleted files. Second, it serves as a launching pad from which you can start and run the other SUM II programs.

SUM Recover is the program that actually recovers files and repairs damaged disks. SUM Recover is normally launched by SUM Disk Clinic in response to the way you answer the diagnostic questions.

SUM BackUp is a disk backup utility program. You should run this program regularly to protect the data on your disks *whether or not* you are using SUM Shield. Although SUM Shield protects your disks and helps you recover from most problems, it is not intended to replace good backup procedures. SUM BackUp was designed and engineered by Microseeds Publishing, Inc. and is based on the popular backup program, Redux.

SUM TuneUp keeps your hard disk operating at peak performance by reorganizing (or "defragmenting") your files and optimizing the way space is used. In addition, SUM TuneUp can analyze your disks and tell you if they need to be tuned up. This program also works with floppy disks.

SUM Partition lets you divide a hard disk into separate volumes. You can then use each volume (partition) as a separate hard disk. The program lets you protect the individual partitions by encrypting the data and assigning a password (encryption, unlike simple password protection, is extremely difficult to break). Like SUM TuneUp, SUM Partition can also be used with floppy disks. You'll learn later how useful this can be.

SUM Encrypt protects individual files and folders from unauthorized access. This program encodes data using the standard DES (Data Encryption Standard) method. Encrypted files and folders are protected with passwords. SUM Encrypt quickly decrypts files and folders when you need to access the information.

SUM QuickCopy is an extremely fast utility program for duplicating floppy disks. You can quickly and easily make one or more copies of any floppy disk and initialize floppy disks faster and easier than with the standard Macintosh desktop method. The program is ideal for mass duplication of floppies.

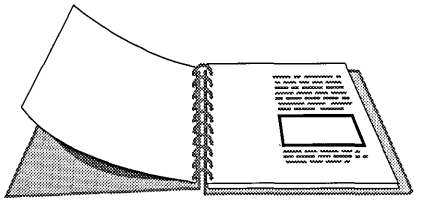
SUM Tools is a disk, file, and memory editing utility. You can use it to make changes to data files on a disk, to edit information about the disk itself, or to directly alter computer memory. Although the program is designed primarily for Macintosh *power users*, it provides some features other users might find useful.

Do not use **SUM Tools** to edit volumes, files, or memory unless you are absolutely sure about what you are doing. Even minor changes can have serious ramifications to your system.

Major Features and Benefits

- **Ease of Use**. As powerful as SUM II is and considering how many things it does for you, you'll find the programs very easy to understand and use. All the programs provide extensive help, so assistance is always available if needed.
- **Peace of Mind**. You might not spend a lot of time worrying about crashed disks and lost files, but if this ever happens, the effects can be devastating. SUM Shield protects your disks from this type of damage and ensures that even in the worst of cases, you can be back up and running with your data fully intact, with minimal effort, and in the shortest possible time. Add to this the power of SUM BackUp and you have everything you need to protect your disks and your data against almost any catastrophe.
- **Improved Disk Performance**. Keeping your disks in tip-top shape keeps your entire system running smoothly and efficiently. Periodic maintenance with SUM TuneUp keeps your disks operating like a finely-tuned automobile. Your applications open and save files more efficiently, and your disks have much larger blocks of free, contiguous space available.
- **Fast Disk Duplication**. Copying and initializing floppy disks on the Macintosh desktop is a slow and tedious process. But with SUM QuickCopy, you'll be able to speed through these tasks. And if you need to make many copies of a single disk, there is simply no quicker way than with SUM QuickCopy.
- **Disk Partitioning**. Disk partitioning gives you several options for organizing applications and data files into a logical structure. For example, you might want to create one partition for your applications, another for documents, and yet another for your sensitive data. While partitioning is especially useful on hard disks, you can also use it on floppies to protect sensitive information.
- **Data Security**. SUM II gives you several different ways to secure your data. With SUM Encrypt, you can encode information in individual files and folders. With SUM Partition, you can encrypt all data in a volume. And with SUM TuneUp, you can completely erase information from your hard disk so that even the most sophisticated programs cannot recover the information. Any time you encrypt data, you assign a password to prevent anyone from accessing the information without authorization.
- **Volume Compatibility**. All SUM II components work with hard disks, floppy disks, and mountable tape drives (except SUM QuickCopy, which only works with floppy disks). This guide generally assumes you are using a hard disk – exceptions for using the components with other media are noted when necessary.

About This Guide



Your guide is divided into two primary sections: *Recovery Procedures* and *Reference*.

> *Recovery Procedures* contains step-by-step instructions to guide you through the process of recovering crashed volumes and deleted files.
>
> The *Reference* section provides descriptions of each individual SUM II component.

Appendix A, *Error Messages*, lists and explains the error messages you might see when using any of the SUM II programs.

Appendix B, *Type and Creator Codes*, contains a comprehensive list of codes associated with various types of Macintosh files. You might find this list useful when recovering files from a crashed disk or recovering deleted files.

A *Glossary* and an *Index* are also provided at the end of this guide.

How to Use This Guide

If you purchased Symantec Utilities for Macintosh because you have a crashed hard disk that needs immediate repair, turn to *Emergency Hard Disk Recover* in the *Recovery Procedures* section (in the front of this guide) and follow the steps described there. The procedure does not go into a great deal of explanation – it is designed to walk you through the necessary steps in as short a time as possible so that you can repair your disk and get back up and running.

Skim through the chapters in the *Reference* section to get a feel for how the guide is organized and learn a little about each of the SUM II components. This will also help you decide which components you want to install on your Macintosh.

Carefully read and complete all steps described in Chapter 2, *Getting Started*, to install SUM II.

Study Chapter 3, *SUM Shield*, and configure this component to work the way you want.

Study the *Recovery Procedures* section. You'll find the procedures easier to comprehend if you read them in a relaxed atmosphere rather than under the stress of a problem situation, such as a crashed disk.

Study the remaining chapters in the *Reference* section to learn how to use different SUM II programs.

Assumptions

The instructions in this guide assume that you are familiar with basic Macintosh operations. Before starting you should know how to:

- Point, click, and drag the mouse.
- Select, copy, rename, and move icons on the desktop.
- Choose commands from various menus.
- Manipulate windows, including opening, scrolling, resizing, and moving windows.
- Work with documents, folders, and applications.
- Use Macintosh shortcuts, such as double-click, Shift-click, and so forth.
- Use the Finder, Chooser, and Control Panel.

If you aren't familiar with these terms and operations, please see your *Macintosh User's Guide* and spend time with your computer before attempting to use SUM II and this guide.

Most of the instructions in this guide assume you are using SUM II with a hard disk. You can, however, use all components equally well with floppy disks, except SUM QuickCopy.

Conventions

Certain conventions are used throughout this guide so that the information is easier to understand.

All command names and button names appear in **boldface**; for example, **Quit** and **OK**. Option names (those associated with radio buttons and check boxes) are also in boldface.

Some command names, when they appear in a menu, are followed by an ellipse (...) to indicate that a dialog appears when you select that command. The **Transfer...** command is one example. The ellipse is omitted from this guide for easier reading.

You'll find the term *volume* used extensively throughout this guide. Volume is a generic term used in reference to various storage mediums, such as hard disks, partitions on a hard disk, and floppy disks. Normally, *volume* is synonymous with *hard disk* , but it is necessary to use the generic term to include all other types of storage mediums.

Another term you'll find used in this guide is *mount*, which describes the process of making a volume available for use. For example, when you insert a floppy disk into your Macintosh drives, the volume is *mounted* when its icon appears on your desktop.

Please consult the *Glossary* if you come upon any other terms that you aren't familiar with.

Volume Selection

Selecting a volume or volumes to use in SUM II is always done using pop-up menus. Pop-up menus before they "pop-up" look like this:

To use a pop-up menu, place the pointer directly atop the menu, and then press and hold the mouse button. The menu "pops-up" to display its available selections. Drag up or down through the menu until the item you want to select is highlighted, and then release the mouse button.

When you display a pop-up menu in this fashion, a check mark always appears to the left of the current selection.

The first thing you'll notice is that every volume pop-up menu has an **Eject** button associated with it.

The **Eject** button is enabled only when you select a removeable volume, such as a floppy disk, in the menu.

In most cases, a removeable volume is a floppy disk, but it can also be a removeable disk cartridge or any other media that can be ejected.

When you select a removeable volume and then eject it, its name remains in the menu but is grayed out, as shown below. This is due to a limitation in the Macintosh file system.

When you are running SUM Disk Clinic, the volume pop-up menus work as described here, but the actual menu entries differ depending on the names of your volumes. Please see *Volume Pop-Up Menus* in Chapter 4, *SUM Disk Clinic*, to learn about these differences.

What You Need

Software Requirements

SUM II requires Macintosh System File version 4.2 and Finder version 5.3 or later. If you do not have the required versions, you can obtain them from an authorized Apple™ dealer or from many on-line services, like CompuServe®.

The SUM II programs are compatible with MultiFinder. However, you will generally have better results if you do *not* run SUM II with MultiFinder.

Hardware Requirements

SUM II works with the following Macintosh computers:

- Macintosh Plus
- Macintosh SE
- Macintosh SE/30
- Macintosh II
- Macintosh IIx
- Macintosh IIcx
- Macintosh IIci
- Macintosh Portable

SUM II works with floppy disks (single-sided, double-sided, and high-density), hard disks (SCSI and non-SCSI), volume partitions, device partitions, and tape drives.

If you are installing SUM II on a hard disk, a minimum of 2 megabytes of contiguous (adjacent) space is required. You can use SUM TuneUp to create contiguous space on your hard disk if it is not available. (See Chapter 6 to learn about SUM TuneUp.)

Package Contents

Your SUM II package contains the items listed below.

- *Symantec Utilities for Macintosh User Guide* (this book)
- Two floppy disks (SUM #1 and SUM #2)
- Customer Service Plan booklet, which includes your Registration Card, Disk Replacement Coupon, and Change of Address form

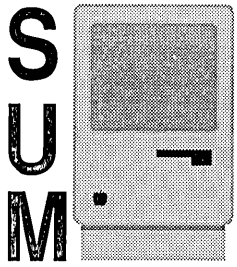
If anything is missing and you purchased SUM II from a dealer, contact your dealer for replacements; otherwise, telephone Symantec Customer Service between 8:00 a.m. and 5:00 p.m. Pacific time, Monday through Friday at 408-252-3570.

Your SUM II disks are double-sided, 800K floppy disks. If your disks are damaged in any way, please complete and mail the Disk Replacement Order Coupon (included in the Customer Service Plan) and return it with your damaged disk or disks to Symantec Corporation, ATTN: Customer Service.

End of Chapter 1

Notes

Getting Started



This chapter describes the steps you should complete in preparation for using SUM II.

Your SUM Program Disks contain **SUM Install**, a program designed to help you quickly and easily install the various SUM II components on your Macintosh hard disks or floppies.

This chapter begins with some Preliminary Steps you should complete before running SUM Install.

Please take a few moments to read this chapter once before doing the actual steps.

Preliminary Steps

Copy Program Disks

Before you continue, make working copies of both SUM II program disks. You will need two copies of SUM II Program Disk #1; that extra copy will eventually be your emergency startup disk.

We recommend you use SUM QuickCopy, a disk duplication utility, to make working copies of SUM II Program Disks #1 and #2 because it makes exact duplicates of your original disks, including all the invisible files.

Before starting, make sure you have three 800K disks for your working copies. To make your copies with SUM QuickCopy, do the following:

1. Insert your original SUM II Program Disk #2 in your floppy disk drive. If the disk window is not open, open the window now.
2. Locate the SUM QuickCopy icon:

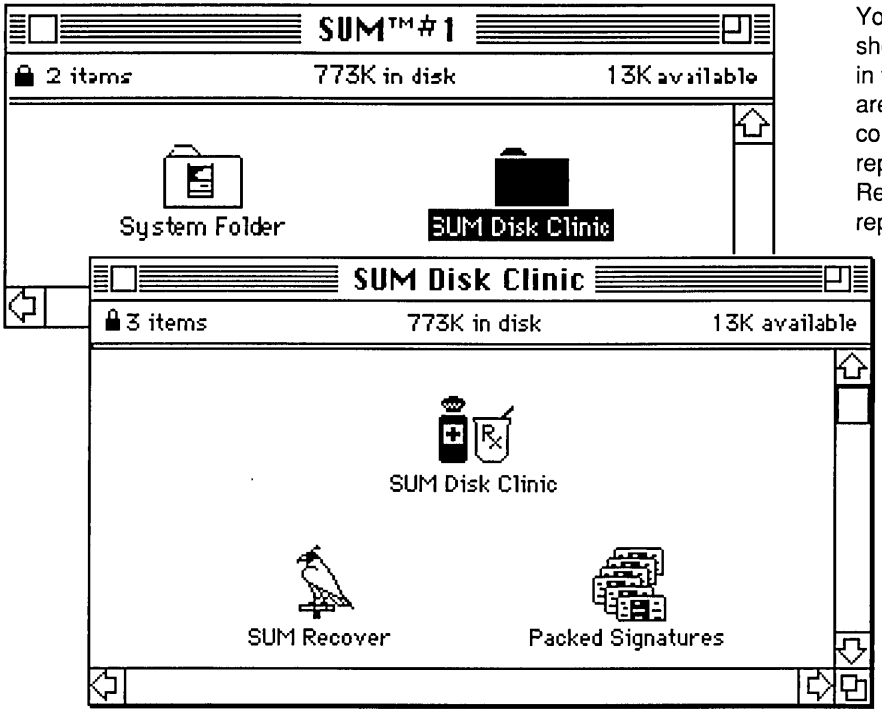
3. Launch SUM QuickCopy by clicking on the icon to select it, and then choose **Open** from the desktop's **File** menu. Or simply double-click on the icon.
4. The SUM QuickCopy window appears.
5. Click in the radio button for **Copy ALL Sectors.**
6. If your disks are new or you want to erase all the data on your Target disks (the disks you are copying TO), click in the check box for **Initialize Before Copying**.
7. Click **Start Copy**.
8. When QuickCopy prompts you, insert your Source disk (the disk you are copying FROM), SUM II Program Disk #1, in the appropriate drive.
9. Insert your Target disk into the appropriate disk drive. (If you have a 1 megabyte machine, swap the Source and Target disks when prompted.)
10. After inserting the Target disk, click **Write toTarget**. When the copying process finishes, label this disk SUM II Program Disk #1.
11. To make another copy of SUM II Program Disk #1, insert a new Target disk and click **Write to Target**. Label this disk your Emergency Startup Disk.
12. Finally, you need a copy of SUM II Program Disk #2, so repeat steps 7 through 10. Use SUM II Program Disk #2 as your Source disk. Once the copy is complete, label this SUM II Program Disk #2.
13. Click **Quit** to exit from SUM QuickCopy.

Store your original disks in a safe place and use the copies from here on. (For more information on SUM QuickCopy, see Chapter 9.)

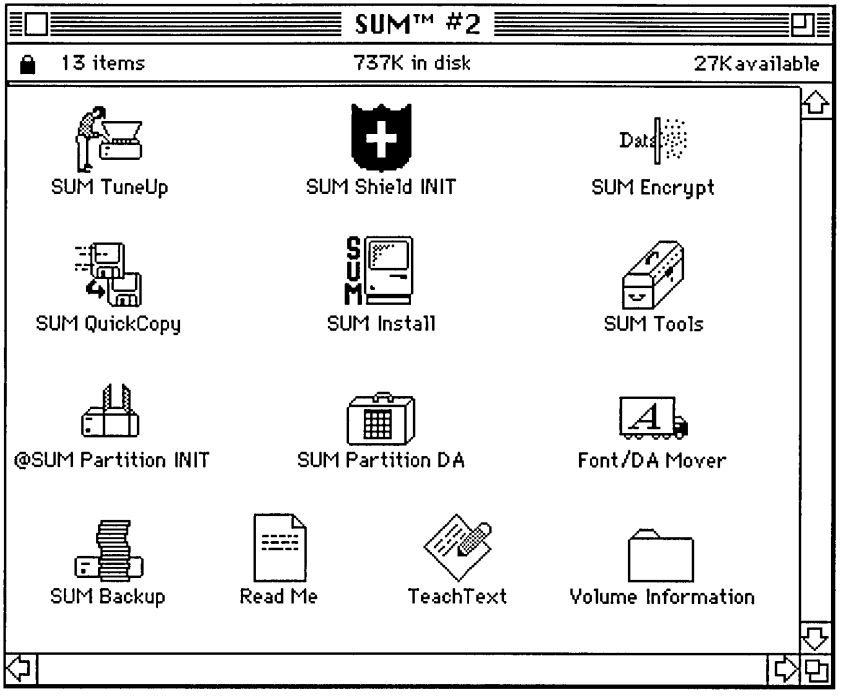
Check Disk Contents

The illustrations on the facing page show the contents of both SUM II Program Disks. Insert each disk, in turn, into your floppy drive and check that you have all of the components shown in the illustrations.

If any component is missing, contact the dealer where you purchased SUM II for replacements, or use the Disk Replacement Form in the Customer Service Plan to order replacement disks.



Your SUM II Program Disks should contain the items shown in these windows. If any items are missing from your disks, contact your dealer for replacements or use the Disk Replacement Form to order replacement disks.



Complete Registration Card

Your SUM II Registration Card is included in the Customer Service Plan booklet. Please remove the card, complete all requested information, and return the card to Symantec at your earliest opportunity.

Registering your ownership of SUM II is for your benefit. It makes it possible for us to notify you regarding enhancements and upgrades to the product.

SUM Version 1.x Users

This section explains which files and folders to remove before installing SUM II if you are using an earlier version of SUM.

Remove Files and Folders

You should remove HD Partition INIT, HD Partition DA, Shield INIT, and the Disk Clinic folder from your startup volume so they do not conflict with SUM II. To remove these components, do the following:

- Drag Shield INIT and HD Partition INIT from the system folder into the Trash.
- Use the Font/DA Mover to remove HD Partition DA from your System file.
- Remove the Disk Clinic folder by dragging it to the Trash. Press the **Option** key while trashing the components to bypass the warning alert.

Once these components are removed, restart your Macintosh.

Remove Guardian Files

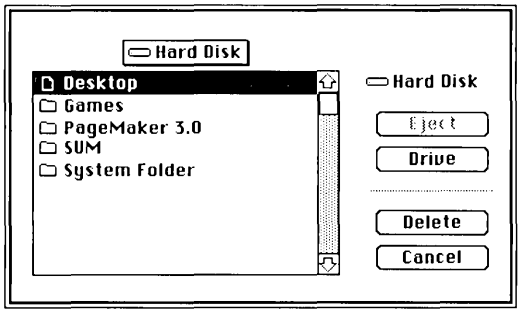
If you installed the Guardian files (GuardianDelData and GuardianSavData) on your volumes, you must use SUM Tools to remove these files. You'll need to remove these files because SUM Install doesn't delete them during the installation process.

Removing the Guardian files will give you more free space on your volume or volumes. Because the Guardian files are invisible, the only way to remove them is by using SUM Tools or a similar type of program.

To remove the Guardian files from a volume, do the following:

1. Insert your copy of SUM II Program Disk #2 in your internal floppy disk drive if it isn't there. If the disk window isn't open, open it now.
2. Locate the SUM Tools icon in the window:

3. Launch SUM Tools by clicking on the icon to select it, and then choose **Open** from the **File** menu. Or simply double-click on the SUM Tools icon.
4. From **Other File Tools** on the **File** menu select **Delete File.**
5. This opens a dialog similar to the one shown on the next page:
6. Select the volume where the Guardian files are stored, for example, your hard disk, by clicking on the **Drive** button. All the items on the volume are listed in alphabetical order.



7. Click on GuardianDelData to select it.
8. Click the **Delete** button.
9. When the dialog "Delete this file?" appears, click **OK** to remove the file.
10. Repeat steps 4 through 9 to delete the file GuardianSavData.
11. When both files are deleted, choose **Quit** from the **File** menu to leave SUM Tools.

The Guardian files are now removed from your hard disk, and you can install SUM II.

New Terms

A few terms have changed from the earlier version of SUM. The old and new terms are as follows:

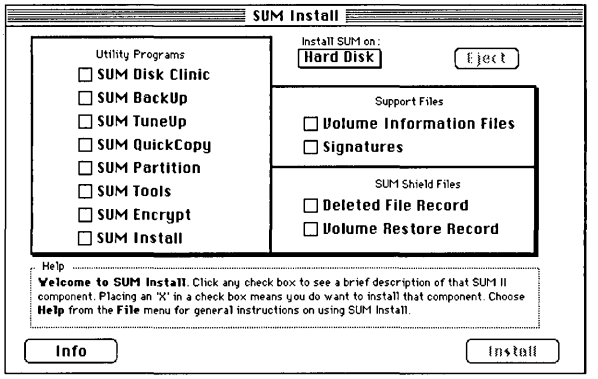
"Volume Parameters" are now called Volume Information Files or VIFs for short.

"Guardian Volume Save Record" is now called the Volume Restore Record.

"Guardian File Save Record" is now called the Deleted File Record.

Guardian protection is now referred to as Shield protection, which consists of Shield INIT, the Deleted File Record, and the Volume Restore Record.

Using SUM Install



Launching SUM Install

1. Insert your copy of SUM II Program Disk #2 in your internal, floppy disk drive. If the disk window is not open, open the window on the desktop now.
2. Locate the SUM Install icon in the window:

3. Launch SUM Install by clicking on the icon to select it, and then choosing **Open** from the desktop's **File** menu. Or simply double-click on the SUM Install icon.
4. The SUM Install window appears on your screen, like the one pictured above.

As you can see in this window, SUM II consists of many different components. Do not move any of the SUM II components on your SUM II Program Disks because SUM Install looks for those components in specific locations. If the components are misplaced, SUM Install will be unable to complete the installation.

You need to decide which components you want to install before actually running SUM Install. It is entirely up to you which component you choose to install. For example, if you aren't planning to partition your hard disk, then you would not install SUM Partition. SUM Tools is another component you may never need.

Chapter 1, *Introduction to SUM II*, provides a brief explanation of each SUM II component. For more information about a component, see the appropriate chapter in this guide or install the component after you know more about it.

When you click any check box in the window, a brief description of the component appears in the Help area. Read the **Help** information before installing any SUM II component. For complete instructions on the installation process, choose **Help** from the **File** menu.

Selecting a Volume

The pop-up menu, labeled "Install SUM on," shows the volume where the SUM II components will be installed. To install the components on a different volume, display the pop-up menu and choose the volume you want. The volume must be mounted for you to be able to select it.

You can install the components on as many different volumes as you like. Normally, you install the *Utility Programs* and the *Support Files* on only your startup volume. But you'll probably want to install the *Deleted File Record* and *Volume Restore Record* on multiple volumes. This will become clear as you read the rest of this chapter.

Selecting Utility Programs

Listed under *Utility Programs* are the different SUM II programs you can install: SUM Disk Clinic, SUM BackUp, SUM TuneUp, and so on. Click in the check boxes to place an **X** next to the utility programs you want to install on the selected volume.

When you install SUM Partition, SUM Install gives you the choice of installing it directly into your System file or simply copying it into your system folder. The latter option (copy only) is provided if you have applications like MasterJuggler™ or Suitcase™. If you are not using one of these, you should install SUM Partition in your System file – assuming you wish to use the component.

If you don't install SUM Disk Clinic with SUM Install, copy SUM Recover into the same folder as SUM Disk Clinic. These two components must be in the same folder to operate properly. Also, place all of the SUM utility programs (SUM Backup, SUM TuneUp, and so on) in the same folder as SUM Disk Clinic if you want to launch these utility programs within SUM Disk Clinic.

Volume Information Files

Volume Information Files (VIFs) are special files used by SUM Disk Clinic to tell the recovery programs what they need to know about a particular volume when that volume has crashed and needs to be restored. VIFs are necessary because each particular type of volume has its own characteristics. For example, the characteristics of an Apple 40 megabyte SCSI hard disk are significantly different from those for a MacBottom™ 20 megabyte serial hard drive.

If a crash does occur, SUM II reads the information in the VIF if it is unable to access the volume normally. Without the VIF, SUM II might still be able to access the volume, although the chances are decreased somewhat. So to give yourself the best chance of recovering a crashed volume, you should have a VIF available for every volume on your system that you want to protect.

Although an assortment of VIFs are provided on SUM II Program Disk #2, you don't need to install these VIFs if you plan to create VIFs for your volumes. *Creating a Startup Disk* at the end of this chapter shows you how to create VIFs for your volumes after you have finished installing SUM II. *Create Volume Info File* in Chapter 4, *SUM Disk Clinic*, has complete details about creating VIFs.

Signatures

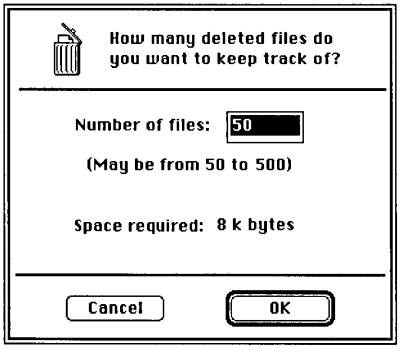
Signatures are files with special information that help SUM Recover locate and recover files from a crashed disk. Different software applications (MORE™ II, THINK Pascal, etc.) use different signatures. Your SUM II Program Disks come with the *Packed Signatures* file that contains many different signatures for the most popular software applications. By clicking the Signatures check box to place an **X** in it, these signatures will be installed on your system and will help you recover files, when necessary. (For information on viewing signatures, read *Show Signatures* in Chapter 5, *SUM Recover.*)

We strongly recommend you install the Signatures file as this greatly improves your chances of recovering files from a damaged volume.

Deleted File Record

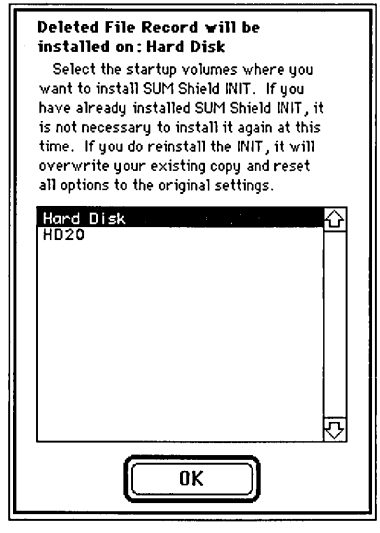
You should install this record on any volume that you might want to recover deleted files from, provided you have adequate free space on that volume.

When you click the **Deleted File Record** check box to place an **X** in it, a dialog like the following appears in which you can specify the number of deleted files you want to track on the selected volume.



You can track any number of files from 50 to 500. **Space required** shows the amount of disk space required on the volume to track the number of files you have specified.

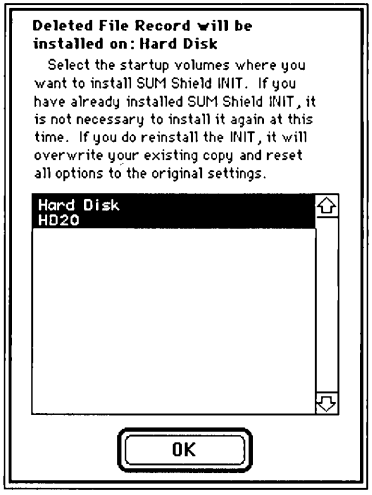
After specifying the number of files to track, you see a dialog similar to this:



Notice that the name of the startup volume where the Deleted File Record will be installed, in this case Hard Disk, is shown at the top of the window. Now take a look at the lower half of the window where a list of volumes is shown. These mounted volumes are the volumes that can be used as startup volumes. From this list, you need to select the startup volumes on which you want to install SUM Shield INIT.

To install SUM Shield INIT, you must select the volume or volumes in this window where you want Shield INIT installed.

Click on the volume name or use the Shift-click method to select multiple volumes. The selected volume is highlighted, like the one on the next page:



When you finish selecting volumes, click **OK**.

You can increase or decrease the size of the Deleted File Record *after* it is installed. To do this, rerun SUM Install and simply reinstall the record on the volume.

When you reinstall the record in this manner, the existing Deleted File Record is overwritten by the newly installed record. Thus, the names of all deleted files in the existing record are lost permanently.

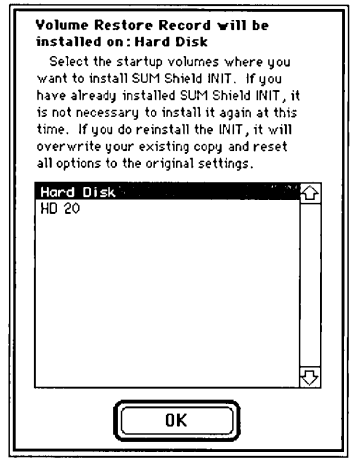
The **Options** menu in SUM Disk Clinic contains a command (**Remove Shield Files**) for removing the Deleted File Record from a volume. This command is described in Chapter 4, *SUM Disk Clinic.*

Volume Restore Record

You should install the Volume Restore Record on *any volume that contains important information.* With this record installed, recovering files from the volume in the event of a crash is painless and fast. For a complete description of this record, please refer to *Volume Restore Record* in Chapter 3, *SUM Shield.*

The size of the Volume Restore Record varies depending on the volume's capacity, the amount of space used on that volume, and several other factors. As a rough estimate, a 30 megabyte volume that is about 90% filled with data requires a Volume Restore Record of approximately 230K.

When you click the **Volume Restore Record** check box to place an **X** in it, you see a dialog similar to this:



At the top of this dialog the volume name where the Volume Restore Record will be installed is displayed. (The volume name corresponds with your selection in SUM Install.)

This window lists the currently mounted volumes that can be used as a startup device. From the list of volumes, *you must select the volume or volumes* in the list on which you want to install SUM Shield INIT because

> SUM Shield INIT and the Volume Restore Record work together. To protect your volumes, the Volume Restore Record must be updated on a periodic basis – SUM Shield INIT does this for you. Because SUM Shield INIT is a startup document, it must reside in the system folder on your

startup device so that it can update the Volume Restore Record when necessary.

If you use different startup volumes, you should install SUM Shield INIT on each volume. If you **do not** select a volume in this window, SUM Shield INIT is not installed.

Select the volume or volumes in the volume list on which you want to install SUM Shield INIT and click **OK**. Use the Shift-click method to select multiple volumes.

The **Remove Shield Files** command in the SUM Disk Clinic **Options** menu can be used to remove the Volume Restore Record from a volume.

The Invisible Files

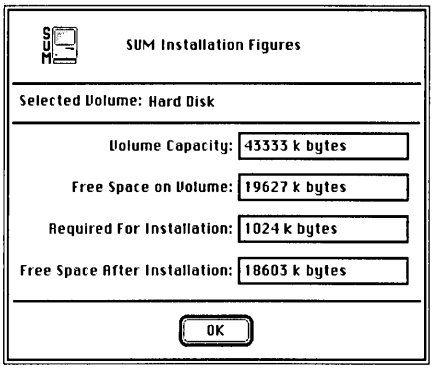
The Deleted File Record and Volume Restore Record are not files you will find on your desktop – they are invisible. This is helpful because it prevents you from accidentally deleting these files.

We recommend you create a Deleted File Record, Volume Restore Record, and Volume Information File for each disk, disk partition, floppy disk, file server, and so on that you want to protect. (Note that the Volume Information File is not invisible, and its icon appears on the desktop after you create it.)

For example, if you add a hard disk to your system and you want to install only the invisible files on that volume, press the **Option** key as you launch SUM Install. With this method, SUM Install allows you to install the Deleted File Record and the Volume Restore Record without any of SUM II's other components on the selected volume.

Installation Info

Click or choose the **Info** command from the **File** menu to see how much space is required on the selected volume to install the components you have specified. You see a dialog similar to this:

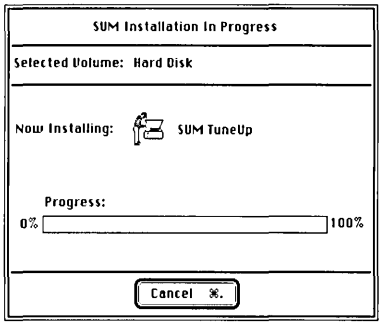


If the dialog indicates that you don't have adequate space, you have these options:

- Deselect one or more SUM II components so they aren't installed on the current volume. You can install these components on a different volume if you wish.
- Remove one or more items from the current volume to make room for the SUM II components you want to install.
- Copy SUM TuneUp on a *different* volume that has adequate contiguous space. Run SUM TuneUp on this volume to defragment and optimize the volume that didn't have enough contiguous space. If the volume is badly fragmented, this *might* free up enough space so that you can install the SUM II components the way you want. Install the components on the volume you tuned up. (See Chapter 6 for instructions on using SUM TuneUp.)

Installing SUM II

Click **Install** or choose the **Install** command from the **File** menu to begin installing the selected components on the chosen destination volume. Insert SUM II Program Disk #1 and #2 when the program prompts you. During the installation, a dialog similar to this is displayed:



This screen keeps you updated as each component is installed, and SUM II prompts you when the installation is completed.

If you click **Cancel** during the installation, SUM Install asks you to confirm the cancellation or lets you resume the installation. If you do decide to cancel the installation, SUM Install finishes installing the current component. Since this may take some time, it may be a while before you are prompted to confirm the cancellation.

Post Installation

After installing all of the SUM II components, choose **Quit** from the **File** menu to return to your desktop.

Restart your Macintosh so that the SUM Shield and SUM Partition INITs can load into memory and begin working for you. These components will not be available until you restart.

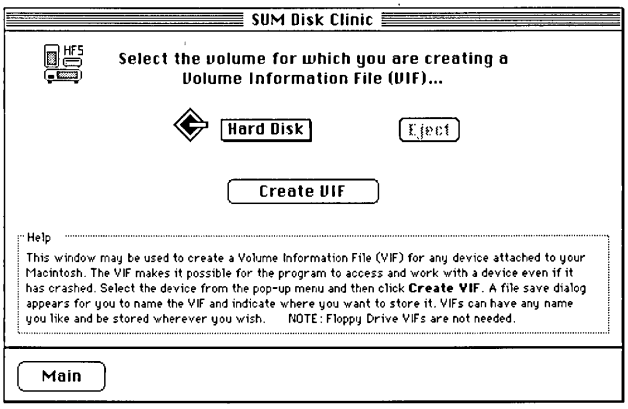
If you are using MasterJuggler or Suitcase and you *copied* SUM Partition desk accessory to your system folder rather than installing it in your System file, you must open the SUM Partition DA to have it appear in your menu.

The Emergency Startup Disk

Earlier in the chapter, you made an extra copy of SUM II Program Disk #1. That disk, called your emergency startup disk, will make it possible for you to recover your startup volume if it crashes.

By the time you finish this section, the emergency startup disk will contain the system folder, the SUM Disk Clinic folder, which contains SUM Disk Clinic, SUM Recover, and Packed Signatures, and your volumes' VIFs. The VIFs, which you'll create next, will be stored on your emergency startup disk. You'll need to create VIFs for each volume you want to protect.

Although SUM II Program Disk #2 contains a folder of existing VIFs (that work in most recovery cases), you should create your own VIFs if possible to ensure the optimal recovery of a damaged volume.



In the steps that follow, you will launch SUM Disk Clinic and create VIFs for all the volumes attached to your Macintosh (including hard disks, soft and hard partitions, and so forth). Even if you have installed the VIFs with SUM Install, this step ensures that your VIFs are absolutely accurate and provides the best chance of recovering a crashed volume.

If you didn't restart your Macintosh after the installation, do so now.

To finish the startup disk and create a VIF for each volume you have, follow these steps:

1. Retrieve the extra copy of SUM II Program Disk #1 that you made earlier. Make sure this is labeled Emergency Startup Disk.
2. Insert this copy of SUM II Program Disk #1 in your floppy disk drive. If the disk window is not open, open it now.
3. Locate the SUM Disk Clinic folder and open it if it is closed.
4. Locate the SUM Disk Clinic icon:

5. Launch SUM Disk Clinic by clicking on the icon to select it, and then choose **Open** from the desktop's **File** menu. Or simply double-click on the icon.
6. Enter your name and organization at the first screen, which only appears the first time you launch the program. (In Organization enter at least one character, such as a space, even if you don't have an entry; otherwise, you cannot continue.)

If you try to save your name and organization on a locked disk, SUM Disk Clinic returns to the Finder. If this happens, unlock the disk and launch SUM Disk Clinic again.

SUM Disk Clinic loads, and the message "Please stand by....Scanning for configuration info." appears temporarily. SUM Disk Clinic automatically collects your system's configuration information the first time it is launched. It is best

To create a VIF for each volume, follow these steps:

1. Choose **Create Volume Info File** from the **Options** menu. The **Volume Information File** window, shown above, appears.

2. Select a volume from the pop-up menu for which you want to create a VIF, for example, your hard disk or volume partition.
3. Click **Create VIF**.
4. A default file name is displayed, such as HardDisk.VIF. You can use the default or enter a new file name for the VIF. Before clicking **Save**, you can select the drive where you want to store your VIFs; in this case, they should be saved on your emergency startup disk (SUM II Program Disk #1).
5. Click **Save** to save the VIFs to the selected volume.
6. Click **OK** when the message "VIF successfully created" is displayed, and the program returns to the VIF window.
7. Repeat steps 2 through 5 for each volume you want to protect, including all hard disks and soft and hard partitions. (To create a VIF for a password-protected partition, you must remove the password first, and then create the VIF. See *Removing Passwords* in Chapter 8, *SUM Partition* for more information.)
8. Choose **Quit** from the **File** menu to leave SUM Disk Clinic when you have created *all* your VIFs.

When you return to the desktop, your VIFs are displayed in the SUM Disk Clinic folder on your emergency startup disk.

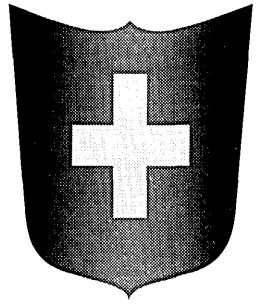
There should be enough room on the emergency startup disk for the VIFs from all your volumes. If the disk space is inadequate, use another disk to store any VIFs that don't fit on the startup disk.

When all the VIFs are saved, remove the disk and place the startup disk in a safe place. If you need to restore a crashed volume, retrieve the startup disk and see *Recover Volume* in the *Recovery Procedures* (front of this guide) for instructions on recovering your volume.

End of Chapter 2

Notes

SUM Shield



SUM Shield is one of the most important and beneficial components of SUM II. It gives you the *ability* to:

- Quickly and easily recover a volume that has either crashed or has been initialized by mistake.
- Quickly and easily recover files deleted from a volume.
- Protect the "integrity" of a volume's directory by preventing accidental or intentional changes that could make the volume inaccessible.

We stress the word "ability" here to point out that SUM Shield does not actually recover volumes and deleted files; these functions are performed by SUM Disk Clinic and SUM Recover. However, SUM Shield is the component that protects volume directories and makes volume and file recovery possible.

SUM Shield operates as a "startup document" (an INIT) rather than as a standard Macintosh application like MORE II or Microsoft™ Excel. Because it is a startup document, the only thing you have to do to use it is make sure the SUM Shield component is located inside the system folder on your startup volume. (SUM Shield must not be nested within another folder in your system folder.)

Every time you start your Macintosh, SUM Shield loads into memory and begins working to maintain your invisible files – the Volume Restore Record and the Deleted File Record. This combination, known as "shield protection," protects your volumes from disaster.

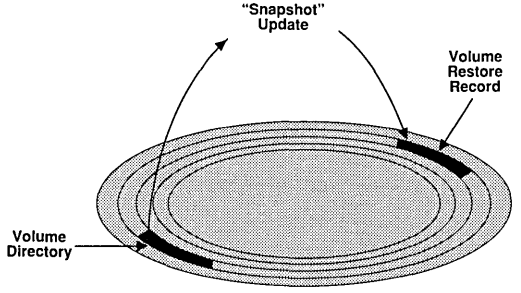
If you used SUM Install to install SUM Shield (as explained in Chapter 2), the program is correctly located and ready to use. However, before learning how to use SUM Shield, you need to understand how the program protects your volumes. Therefore, this chapter begins with discussions of the Volume Restore Record and Deleted File Record.

Volume Restore Record

When you run SUM Install, you have the option of installing the Volume Restore Record on those volumes you want to protect. It is this record that gives SUM II the ability to restore crashed or mistakenly initialized volumes. If you do *not* install the record on a volume, you can still use SUM Disk Clinic to recover from a crash, but the time and effort required increases considerably.

You can install the Volume Restore Record on as many different volumes as you like. For the purposes of this discussion, we'll assume you have installed the record on one hard disk.

While you are working with your Macintosh, SUM Shield periodically takes a "snapshot" of your volume's directory and stores it (along with some other information) in the Volume Restore Record on that volume. You can control when the snapshot is taken – you can force it to occur in response to pressing certain keys, automatically at specific time intervals, and when you shut down or restart your computer. You'll learn how to accomplish this later.



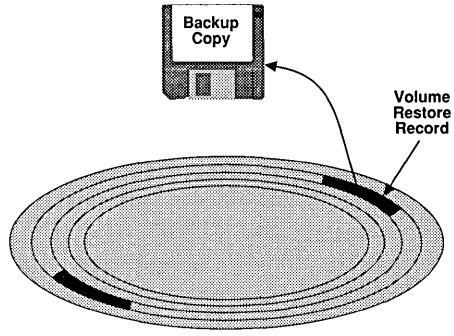
If your volume sustains a crash or is initialized by mistake, SUM Recover can use the snapshot in the Volume Restore Record to restore your volume.

Removing Shield INIT from your system folder means that the Volume Restore Record isn't regularly updated. Suppose your volume sustains a crash, and the only Volume Restore Record you have is outdated. It isn't advisable to use that record to recover your files. Your best chance of recovering all your files would be to use the Directory Scan Recovery Method.

Backing Up Volume Restore Record

Often times, crashed volumes sustain damage to the volume directory. As a result, when you use SUM Recover to restore the volume, the program must search the entire volume to locate the Volume Restore Record. This can take considerable time on a 20 megabyte hard disk and significantly longer on larger disks. SUM Shield gives you a way to avoid such lengthy searches.

The key to avoiding lengthy searches is to keep a backup copy of the Volume Restore Record on a separate volume (such as a floppy disk). If a crash does occur, you can use the backup copy to restore the volume.



As part of your periodic update procedure (when the volume snapshot is taken), you can instruct SUM Shield to create a backup copy at the same time the snapshot is taken. This ensures that your backup copy is always current.

If you don't use the automatic backup function, you can use SUM Disk Clinic to manually create backup copies of your Volume Restore Record. See the **Backup Shield Files** command in Chapter 4, *SUM Disk Clinic.*

At times the backup copy of the Volume Restore Record may not fit on a single floppy disk, for example, if you are backing up the Volume Restore Record from a large hard drive that is filled with information (80 megabytes or more). To split the backup file across multiple floppy disks, use the **Backup Volume Restore Record** command from the **Options** menu in SUM Disk Clinic. (See Chapter 4, *SUM Disk Clinic*, for details.)

Synchronizing Your Volume

If a volume crashes and you use the Volume Restore Record to restore it, it is likely that things will be *out of synchronization* following restoration. To illustrate this, assume that on Monday at 3 o'clock you update the Volume Restore Record with a new snapshot. Two hours later your volume crashes.

Even following the crash, chances are good that all of your work (including what you accomplished between 3 and 5 o'clock) is still on the volume. But if your first step is to use SUM Disk Clinic to restore the volume using its Volume Restore Record, the volume's directory would be restored to the way it was at 3 o'clock, and you will lose the work you did between 3 and 5.

You can avoid this potential loss of data and recover all of your work by following the procedure explained under *Synchronized Recovery* in Chapter 5, *SUM Recover*. **Please read this special section before going any further with the recovery process.**

The synchronization factor brings up the question of how often you should update the Volume Restore Record with a new snapshot. There is no definite answer to this question; it depends on how critical you feel your work is, how much time you're willing to spend recovering your missing files, and several other factors. (You'll see later in this chapter how SUM Shield gives you complete control over this function.) The best advice is to *update often*. The amount of time required to take the snapshot is relatively minor compared to the time and effort required to synchronize your volume following a crash.

Deleted File Record

To better understand how the Deleted File Record works, you need to understand what actually happens when you drag a file's icon to the Trash on your desktop.

When you place a file in the Trash, that file is not physically removed from the volume *at that moment*. As you know, up to a certain point you can open the Trash can and recover a file simply by dragging its icon back onto your desktop. This is possible until such time as any of the following occur:

- You choose the **Empty Trash, Shut Down,** or **Restart** command from the **Special** menu.
- You launch any application other than the Finder.
- You unmount the volume.
- You give another file the same name as one currently in the Trash.

When the Trash is emptied and a file's icon is removed, the file *still* remains on your volume. What actually occurs is that the Macintosh file system marks the file's entry in the volume directory to indicate that the space occupied by the file can now be used for other purposes. Thus, as you create or modify files on the volume, some or all of the deleted file's space might be overwritten with new data at some point. Thus, at any given point, you might be able to recover some or all of a deleted file.

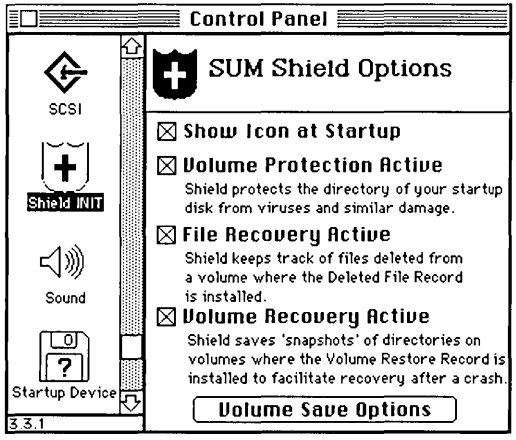
When you install the Deleted File Record on a volume (via SUM Install), you specify the number of files you want to recover. SUM Shield

keeps track of each file deleted from the volume by recording its name and location in the Deleted File Record. When you want to recover a deleted file, SUM Recover uses the information in the Deleted File Record to do so.

What you must keep in mind is that even though the Deleted File Record contains an entry for a deleted file, you might not be able to recover the file completely if some or all of the data has been overwritten by some other application. If SUM Recover suspects there might be something wrong with a file you are attempting to recover, it lets you know. You'll learn how this works in Chapter 5, *SUM Recover*.

The Deleted File Record works on a queuing basis. Once the record reaches its maximum capacity, the first entry in the record is automatically "bumped out" when the next file is deleted. For example, if you set up a record to contain a maximum of 100 entries, entry number one is moved out when entry 101 is made; entry two is bumped out by entry number 102; and so forth. Thus, your most recently deleted files are always available in the Deleted File Record.

Using SUM Shield



As explained earlier, once SUM Shield is inside your system folder, the program loads every time you start your Macintosh. Thereafter, most of the functions performed by the program are completely automatic and require no action on your part. However, you might want to change how the program is operating by changing its configuration.

To reconfigure SUM Shield, begin by choosing the **Control Panel** from the menu. When the Control Panel appears, scroll down the window on the left side until you see the SUM Shield icon:

Click the SUM Shield icon, and the Control Panel changes so that it looks similar to the one pictured above.

Show Icon at Startup

Click this option On (click to place an **X** in its check box) if you want the SUM Shield icon to appear on your startup screen; otherwise, click the option Off.

Volume Protection Active

With this option clicked On, SUM Shield protects your volume against certain types of activity that might cause damage to its directory. Damage can be inflicted by certain types of viruses, by applications that do not operate correctly, or by applications under development by software engineers.

Unless you have a specific reason for deactivating this option, we recommend you always leave it selected for maximum protection of your volumes.

At times SUM Shield INIT interferes with certain installation programs. Before running the Install program for Aldus Pagemaker® or Persausion, remove SUM Shield INIT from your system folder and restart your computer. After completing the installation, copy SUM Shield INIT into the system folder and restart your computer.

File Recovery Active

If you have installed the SUM Shield Deleted File Record on one or more of your volumes and this option is clicked On, SUM Shield keeps track of files deleted from your volume or volumes. If you click this option Off, the names and locations of files are *not* entered in the Deleted File Record when they are deleted from a volume.

Volume Recovery Active

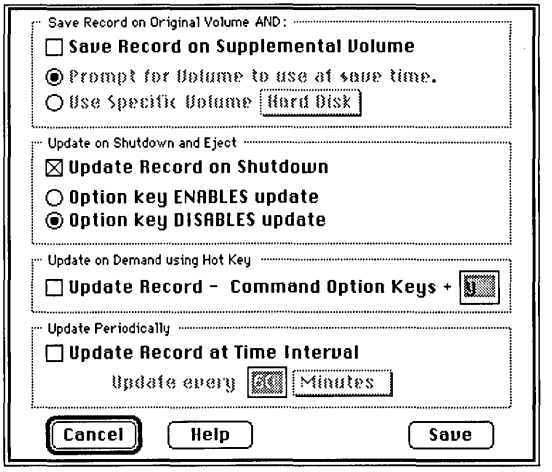
If you have installed the SUM Shield Volume Restore Record on one or more volumes and this option is clicked On, SUM Shield updates the record with a new directory snapshot when you instruct it to. When you click this option On, the **Volume Save Options** button at the bottom of the Control Panel becomes active. This button gives you access to those options that let you control if and when the directory snapshot is taken. These options will be discussed in a moment.

Whenever you instruct SUM Shield to update the Volume Restore Record with a new snapshot, the program examines every volume that is *currently mounted* to determine whether or not the Volume Restore Record is installed. If the record **is** installed, SUM Shield takes the snapshot and updates the record on that volume; otherwise, it moves on and examines the next mounted volume until all the volumes have been examined and updated as necessary.

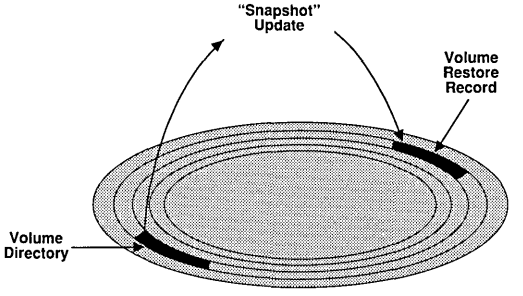
Unless you have a specific reason for deactivating the **Volume Recovery Active** option, leave this option selected for maximum protection of your volumes.

Volume Save Options

Clicking the **Volume Save Options** button displays the dialog shown here:



This dialog gives you several different options for controlling when SUM Shield updates the Volume Restore Record on your volumes.

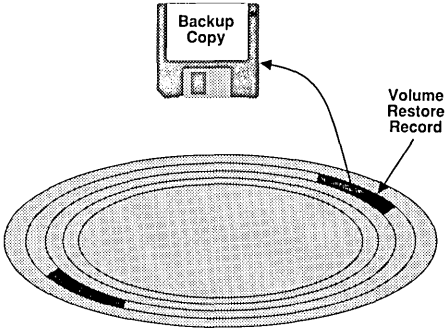


Note first of all that the dialog contains four separate check boxes that you can click On and Off in any combination. Thus, you may combine the options in any way that suits your needs. For example, you can specify that a snapshot be taken in response to a hot key during any shut down procedure *and* at a specific time interval. In some cases, combining certain options may not work, but you can easily identify when this happens.

Any time SUM Shield updates the Volume Restore Record on a volume, it automatically overwrites any existing backup file with the same name without confirming the back up.

Save Record on Supplemental Volume

This option lets you create the backup copy while updating the original Volume Restore Record. SUM Shield automatically updates the Volume Restore Record on the original volume; that is, the volume where the record is installed. Remember, it is good practice to have a *backup copy* of the Volume Restore Record on a separate volume to simplify recovery.



If you want to back up the Volume Restore Record to a volume other than the startup volume, you can set **Prompt for Volume to use at save time** to prompt you for the backup volume since the other volumes are unmounted before the startup volume.

If you click this option On and then select **Prompt for Volume to use at save time**, SUM Shield asks you to select the volume on which you want to store the backup copy of the Volume Restore Record *at the time the original is being updated*. You can, at that time, select a floppy disk, a hard disk, or any other currently mounted volume.

If you want the backup copy of the Volume Restore Record saved to floppy disk on shut down, select **Prompt for Volume to use at save time**. This lets you select the floppy disk to store the backup copy.

If you click this option On and select **Use Specific Volume**, you must select the volume you want to use from the pop-up menu. If you want to use a floppy disk for this purpose, insert the disk before displaying the pop-up menu. The volume you select from this menu must be mounted at the time the snapshot is taken. If the volume isn't mounted, the snapshot is taken, but the backup record is *not* created.

If you click **Save Record on Supplemental Volume** Off, no backup will be created. An alternate method to make a backup copy of the record using **Backup Shield Files** command in the SUM Disk Clinic **Options** menu.

Update Record on Shutdown

If you click this option On and then select **Option key ENABLES update**, the record is updated only if you hold down the Option key during the shut down or restart procedure.

If you click this option On and then select **Option key DISABLES update**, the record is *not* updated if you hold down the Option key during the shut down procedure.

If you click **Update Record on Shutdown** Off, the Volume Restore Record is *never* updated during a shut down procedure.

When using security programs (such as Night-Watch and Mac Password) that take over your Macintosh upon Shut Down, SUM Shield cannot update the Volume Restore Record.

If more than one volume is updated by SUM Shield at Shut Down and Shield Options is set to update the Shield files (Volume Restore Record and Deleted File Record) when the Option key is held down, you must hold down the Option key until the last volume is updated; otherwise, some volumes aren't updated.

Update Record – Hot Key

You might find it useful to be able to force an update of the Volume Restore Record at any given time. For example, if you have just completed a lengthy session of important or complex work, that would be a good time to update the record.

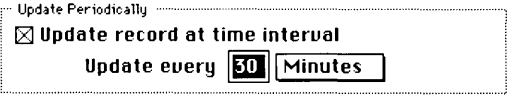
This option lets you specify that when certain key combinations are pressed (called *hot keys*), the update is performed at that moment.

The hot key combination must always include the ⌘ key, the Option key, and one other key of your choice. By default, the third key in this sequence is the letter "y" (lowercase only). To use a letter other than "y," select the text box and type the letter you want to use.

When selecting a hot key combination for SUM Shield, try to avoid conflicts with your other applications. For example, entering ⌘-Option-Y while working within Microsoft™ Word initiates an entirely different action, which prevents the Volume Restore Record from being updated.

Update Record at Time Interval

Click this option On if you want SUM Shield to update the Volume Restore Record at specific time intervals. Then, select the time period (**Minutes** or **Hours**) from the pop-up menu and enter the time measurement in the text box.



The time interval is measured relative to the time you start up your Macintosh. When the time interval has elapsed, SUM Shield sounds an audible signal, suspends all current activity, and immediately updates the Volume Restore Record. While the update is taking place, a small Shield icon appears on your screen.

If you hear the audible signal while working on your Macintosh, stop work until SUM Shield completes the update. Otherwise, any work you do during the update is not recognized.

If you are using Pyro! (Fifth Generation Software) and have activated the time interval update, the Volume Restore Record update does not occur while Pyro! is in its "sleep state." If an automatic update is due, it occurs after the screen is refreshed. (Note that SUM Shield only works with version 3.3 of Pyro!.)

Click **OK** to save the changes to the Volume Save Options before quitting.

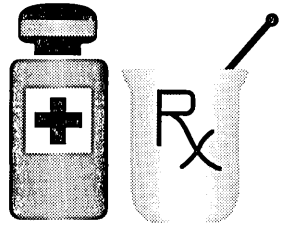
Quitting SUM Shield

To quit SUM Shield, click the Control Panel's close box.

Whatever configuration changes you make to SUM Shield take effect immediately; it isn't necessary to restart your Macintosh.

End of Chapter 3

SUM Disk Clinic



SUM Disk Clinic is best described as a "diagnostician." That is, it asks you a series of questions about the type of problem you are having, *diagnoses* the problem, and prescribes a cure.

The primary functions of SUM Disk Clinic are to help you:

- Repair a damaged volume.
- Recover files from a damaged volume.
- Recover files deleted from a volume.

These primary functions are discussed at length in *Recovery Procedures* (at the front of this guide) and are not repeated in this chapter. However, the information in this chapter supplements the *Recovery Procedures* section and is essential for using the application.

SUM Disk Clinic also has several secondary functions that help you:

- Diagnose and repair a damaged volume without using the SUM II programs.
- Make backup copies of your Volume Restore Records.
- Create Volume Information Files.
- Restore files that were split during recovery.
- Remove Deleted File Records and Volume Restore Records from volumes.
- Keep your system configuration information current.

This chapter is devoted primarily to discussing these secondary functions.

Launching SUM Disk Clinic

Please read this entire section before launching SUM Disk Clinic.

1. Locate the SUM Disk Clinic icon on your desktop:

2. Click the SUM Disk Clinic icon to select it and then choose **Open** from the **File** menu, or simply double-click the icon.

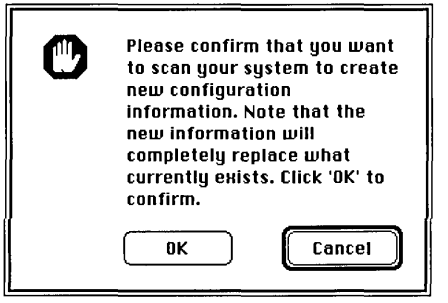
Automatic Configuration Scan

SUM Disk Clinic stores information about your system hardware configuration internal to the program. This makes it easy to select the volumes you want to use while running the program – even if a volume is crashed.

The first time you launch SUM Disk Clinic after installing it, the program automatically scans your system to collect and store the configuration information it needs.

Normally, SUM Disk Clinic assumes that the configuration information it has available is current and correct and launches using this information. However, if your configuration has changed since the last time you ran SUM Disk Clinic, you can force the program to automatically scan your system to collect new configuration information during startup.

To force an automatic configuration scan during startup, press the **Option** key immediately *after* opening the program's icon. To be more specific, double-click the SUM Disk Clinic icon, or select it and choose **Open** from the **File** menu. Then, press and hold the **Option** key until you see the dialog shown here:

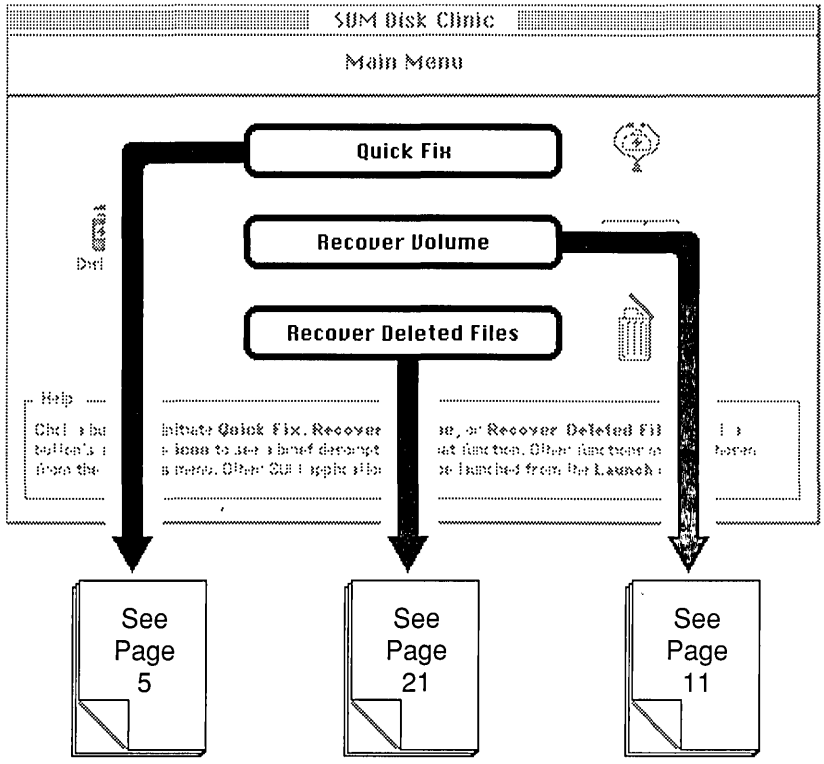


Do not press the **Option** key *before* opening the SUM Disk Clinic icon because this causes your Macintosh to switch startup volumes.

The preceding dialog simply asks you to confirm that you do, in fact, want to perform an automatic configuration scan.

Before performing an automatic configuration scan, please read the description of the **Automatic Configure** command later in this chapter. If you just want to add a single device to your configuration or remove an existing one, read the description of the **Manual Configure** command.

SUM Disk Clinic Main Menu

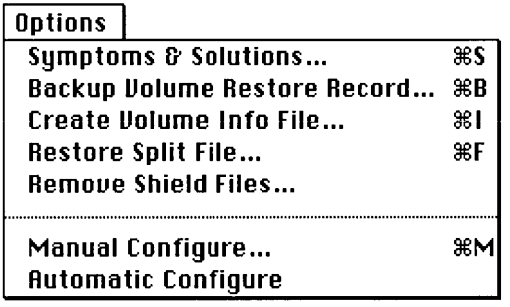


Once SUM Disk Clinic starts, the Main Menu appears. The diagram above shows you the page to turn to in the *Recovery Procedures* section (at the beginning of this guide) for more information on **Quick Fix, Recover Volume,** or **Recover Deleted Files.**

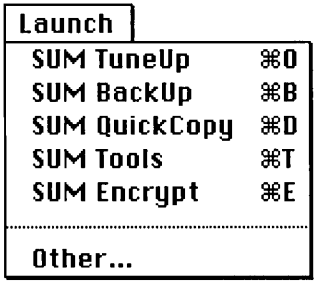
The rest of this chapter discusses SUM Disk Clinic's secondary functions, which can be accessed via the **Options** and **Launch** menus.

SUM Disk Clinic Menus

SUM Disk Clinic has four menus: **File**, **Edit**, **Options**, and **Launch**. Only the **Options** and **Launch** menus are pictured here. The **File** menu contains only the **Quit** command, which exits the program and returns you to your desktop. The commands in the **Edit** menu are available only when you are working with desk accessories.



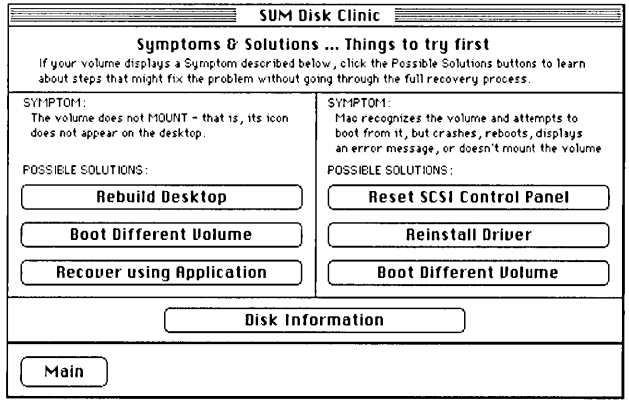
See page 4-5
See page 4-6
See page 4-7
See page 4-8
See page 4-9
See page 4-11
See page 4-14



These commands launch the SUM II utility program indicated. Note that when you quit any launched utility, you have the option of returning to SUM Disk Clinic or to the desktop.

This command lets you launch any other application available on your system. When you quit the launched application, the program automatically returns to the desktop.

Symptoms & Solutions

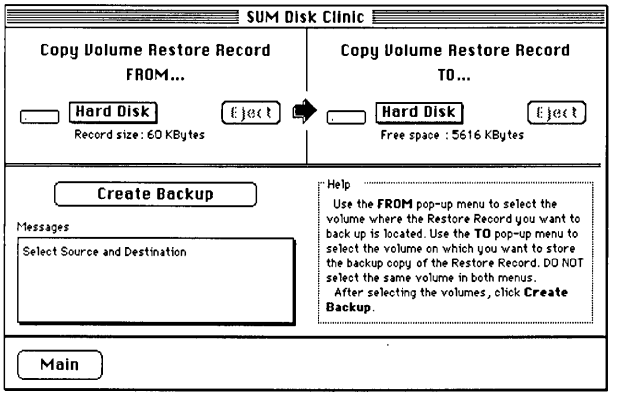


Choosing **Symptoms & Solutions** from the **Options** menu displays the first in a series of dialogs describing various symptoms that are common with crashed or damaged volumes. The first dialog you see (pictured above) is like an index. Find the **SYMPTOM** that most closely matches your problem, and then click a **SOLUTION** button to see the possible solution for solving that problem.

Symptoms & Solutions is strictly for informational purposes. The solutions offered in the various dialogs describe steps that *might* restore a damaged volume to service without using SUM Disk Clinic. Of course, there is no guarantee that the prescribed solutions will solve your problem, but you have nothing to lose but a little time by trying. In fact, you might save yourself considerable time if the prescribed solution does work.

Before making any major repairs to a damaged volume, it is good practice to back up your important data beforehand, if possible. If you attempt to use one or more of the solutions prescribed but are not successful in restoring your volume, your best alternative is to use SUM Disk Clinic and SUM Recover.

Backup Volume Restore Record



Backing up your Volume Restore Record or Records on a frequent and regular basis can save you a great deal of time if one of your volumes should crash. You can use the backup copy to quickly and easily restore the damaged volume to service. If you don't have a recent backup copy, the program can scan the damaged volume to locate the original Volume Restore Record. However, there is some element of risk involved with this because the record itself might be damaged. And scanning a volume in this manner can take considerable time.

SUM Shield gives you the option to automatically back up your Volume Restore Record or Records. (See Chapter 3, *SUM Shield*.) The **Backup Volume Restore Record** command lets you back up the Volume Restore Record or Records manually if you aren't using the automatic procedures.

To manually back up a Volume Restore Record, do the following:

1. Choose **Backup Volume Restore Record** from the **Options** menu. The window pictured above appears.
2. Use the left pop-up menu to select the volume **FROM** which you want to back up the record. (If the Volume Restore Record is *not* installed on the volume you select, the message "No Restore Record" appears just below the pop-up menu.)
3. Use the right pop-up menu to select the volume **TO** which you want to copy the record. (If you want to select a floppy disk, insert it before displaying the pop-up menu.)
4. Click **Create Backup**.

   If the volume you are copying **TO** already contains a backup record for the volume you are copying **FROM**, SUM Disk Clinic asks for confirmation before overwriting the existing record.

At times the backup copy of the Volume Restore Record may not fit on one floppy disk. **Backup Volume Restore Record** automatically asks if you wish to split the record onto another floppy disk if the space is inadequate on the Destination volume.

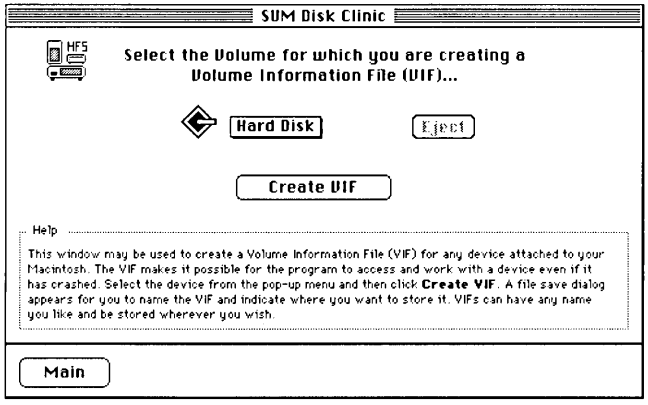
When SUM Disk Clinic determines that there is insufficient room to back up the Volume Restore Record, this message is displayed: "Insufficient room on Destination Volume. Do you want to split the file."

To remove the message and continue, click **OK**. Select a new Destination volume. Once you have done that, the program displays the space needed to back up the Volume Restore Record. The program then prompts you to insert the new Destination volume and begins backing up the Volume Restore Record.

The Volume Restore Record is usually stored on your hard disk, but you may choose to keep the record on a partition created with SUM Partition. If your Volume Restore Record is on a partition created with SUM Partition and you want to back up that record, the partition shouldn't be password protected. SUM Disk Clinic will not let you back up the Volume Restore Record from a password-protected partition.

To get around this, remove the password protection temporarily in SUM Partition. Back up the Volume Restore Record, and then reinstate the password protection.

Create Volume Info File



Volume Information Files (VIFs) are special files SUM Disk Clinic uses to determine certain characteristics about a given type of volume. Because different volumes have different characteristics, SUM Disk Clinic must know what those characteristics are to successfully communicate with the volume. VIFs provide this information.

Normally, Macintosh applications can determine a volume's characteristics by getting the information they need directly from the volume. However, when a volume is damaged, the information might not be available or reliable. For this reason, SUM Disk Clinic relies on VIFs to provide accurate and reliable information.

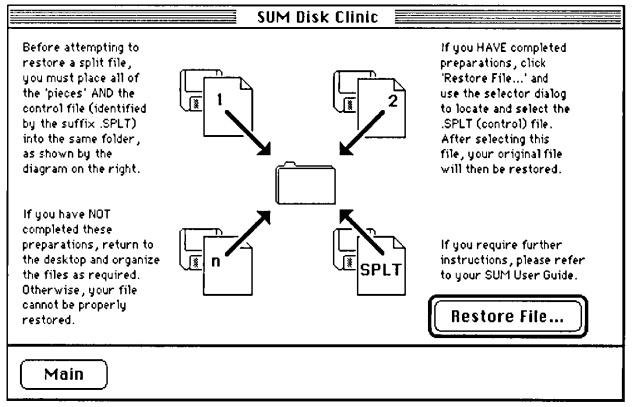
Although you installed VIFs when you ran SUM Install, **you should use this command to create a new VIF for every volume on your system immediately after the installation.** This is necessary because volume characteristics change (such as when you create SCSI partitions on a volume) and such changes can negate or reduce the effectiveness of the VIFs you installed with SUM Install. If you reformat or repartition a volume, you should always create a new VIF for it.

To create a VIF, do the following:

1. Choose **Create Volume Info File** from the **Options** menu. The window shown above appears.
2. Use the pop-up menu to select the volume for which you want to create a VIF.
3. Click **Create VIF**.
4. SUM Disk Clinic collects the information it needs about the selected volume, and then asks you to give the VIF a name and indicate where you want to store it. These steps are accomplished using the standard Macintosh file save dialog.

We recommend you store your VIFs (or at least copies of them) on a separate volume, such as a floppy disk. If a volume crashes, you still have access to the VIF you need to restore it. If the VIF is on the crashed volume, you will not be able to get to it, and you might not be able to create a new one.

Restore Split File



Sometimes it is necessary for SUM Recover to *split* a file across multiple volumes during recovery. This occurs when the volume receiving the recovered file does not have adequate space available. For example, if you are recovering files to 800K floppy disks and a file you are recovering is 2 megabytes in size, SUM Recover must split the file across multiple floppies.

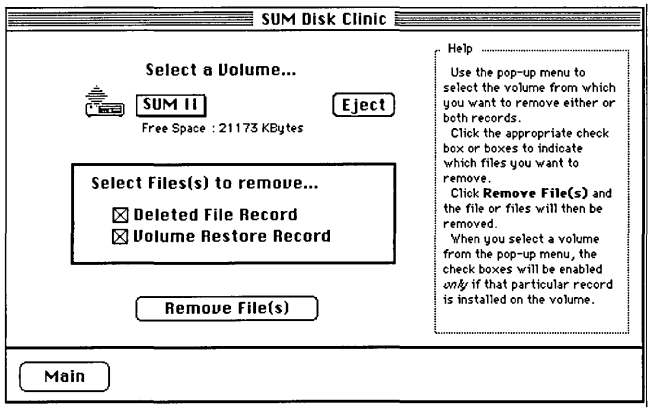
The **Restore Split File** command gives you an easy way to "reassemble" the pieces of a split file, and thus, restore it to your repaired volume.

Please read *Splitting Recovered Files* in Chapter 5, *SUM Recover*, before using this command.

The Restore Split File window (shown above) provides detailed instructions. Here are some additional points to keep in mind:

- Do not restore split files until *after* you have reinitialized or reformatted your damaged volume.
- Make certain you have every disk you need to restore the split file. If one or more of the "pieces" are missing, your file cannot be restored.
- After restoring a split document file, open it using the parent (original) application to make sure it was restored satisfactorily. Once you are sure the file is completely intact and useable, you can remove the individual pieces of the split file from your volume and recycle the disks used to split the file.
- After restoring a split application file, open it to make sure it runs normally. If it doesn't, check the file's Type and Creator codes to make sure they are correct. If they are, replace the file with a copy from your original disks.

Remove Shield Files



Removing the Deleted File Record or the Volume Restore Record from a volume is not something you will find necessary under normal circumstances.

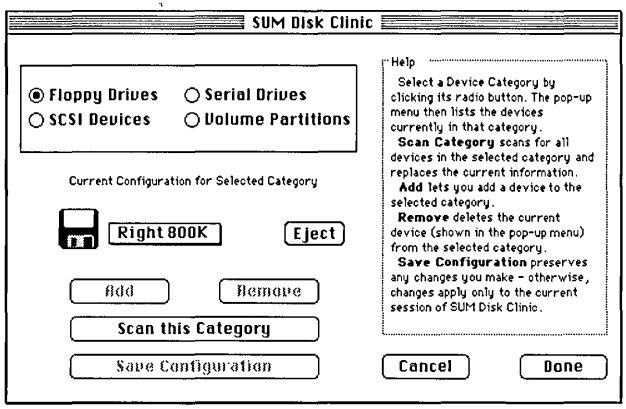
For example, you might want to remove the Deleted File Record if free space is extremely short on a volume. (However, remember that you can reduce the size of the Deleted File Record by specifying that it contain fewer entries. See Chapter 2, *Getting Started*, for further instructions.)

You might want to remove the Volume Restore Record if your volume is short of free space. However, the value of this record is so significant that you should consider removing other files instead.

To remove the Deleted File Record, the Volume Restore Record, or both from a volume, do the following:

1. Choose **Remove Shield Files** from the **Options** menu. The window pictured above appears.
2. Use the pop-up menu to select the volume from which you want to remove the record or records. The check boxes in the center of the window become available depending on which of the two records is installed on the volume you select.
3. If you want to remove the Deleted File Record, click its associated check box to mark it with an **X**.
4. If you want to remove the Volume Restore Record, click its check box to mark it with an **X**.
5. Click **Remove Files**.

Manual Configure



As you learned earlier, SUM Disk Clinic maintains information internally about your Macintosh system configuration – that is, information indicating what types of volumes are attached, where they are attached, the partitions that are available, and more. This configuration data determines what appears in some pop-up menus when you need to select a volume or partition to work with.

The first time you launch SUM Disk Clinic following installation, the program automatically scans your Macintosh to collect the configuration information. Normally, you will not need to update the information unless your configuration changes (such as adding or removing a volume), or you have to reinstall your copy of SUM Disk Clinic.

If it becomes necessary to change your configuration information, SUM Disk Clinic provides several different ways to do so. You'll learn about these methods in this section. (Also recall that you can force an automatic configuration scan when launching SUM Disk Clinic by holding down the **Option** key.)

If you display a pop-up menu while using SUM Disk Clinic and the volume you want to select is not listed, either the volume is not mounted, or the volume is not included in your configuration information. In the first case, all you have to do is mount the volume (for example, insert a floppy disk), and it appears in the menu. In the second case, you need to update your configuration information using either the **Manual Configure** or **Automatic Configure** command. (See *Volume Pop-Up Menus* later in this chapter for important information about menu contents.)

Do not choose **Automatic Configure** without first reading the command description that follows in this chapter. This is especially important if you have a crashed volume you are trying to recover.

When you choose **Manual Configure**, the window pictured above appears. You use this window to modify your configuration information as necessary, for example, to add a new volume.

Device Categories

SUM Disk Clinic separates devices into four different categories:

- Floppy Drives
- SCSI Devices
- Serial Drives
- Volume Partitions

When you click one of the *Device Category* radio buttons, the pop-up menu changes and shows the devices currently available in that category based on your configuration information. You can then use the buttons **Scan Category, Add,** and **Remove** to update the configuration information for the currently selected category.

Scanning Categories

The **Scan Category** button works similar to the **Automatic Configure** command except that it scans only for devices in the currently selected category.

This function erases *all current configuration information* for the selected category and replaces it with new information. If you do not want this to happen, consider using the **Add** or **Remove** buttons instead.

Adding Devices

To add a particular device to the currently selected category, click the **Add** button. What occurs next depends on which category you have selected.

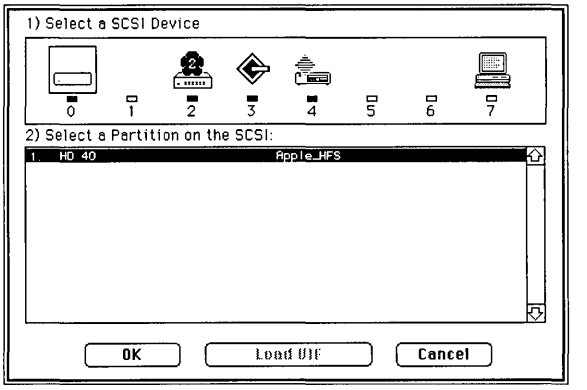
Floppy Drives

The **Add** button is not available when you select the category Floppy Drives. You can only add floppy drives by scanning your system for the information.

To add a floppy drive to your configuration, use the **Scan Category** button just described.

SCSI Devices

Clicking **Add** when SCSI Devices is the current category displays a dialog similar to this:



The top portion of this dialog shows the SCSI devices currently attached to your Macintosh and their respective drive numbers, 0 through 7. (Note that SCSI device number 7 is reserved for your Macintosh computer.) Click the icon that represents the device you want to add.

After you select a device, SUM Disk Clinic lists the *device partitions* available on that device in the lower window.

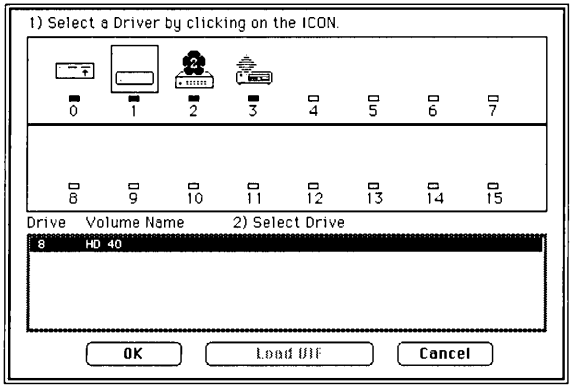
Device partitions are different from software partitions (like those created with SUM Partition). Device partitions are sometimes created by the device manufacturer, or you create them using software the manufacturer provides. Software partitions are *not* listed in this window.

If a device partition name appears in *italics*, it means the program is unable to completely identify the partition. If you select this partition, a Volume Information File is needed to access it, so the **Load VIF** button at the bottom of the window is activated. Click **Load VIF**, and select the VIF that applies to the SCSI device selected in the upper window.

After selecting a device partition (and if necessary, loading a VIF), click **OK** , and the device is added to your configuration.

Serial Drives

Clicking **Add** when Serial Drives is the current category displays a dialog similar to this:



The top window shows the "Drivers" available on your system. Click the one that pertains to the Serial Drive you want to add to your configuration. (Note that SCSI Devices are also listed here because SUM Disk Clinic has no way of making a distinction. So be sure you select a serial-type device driver.)

Once you select a driver, the drive number (which is not necessarily the same as the Driver number above) and volume name appear in the bottom window. In most cases, only one entry is listed here. However, in some cases, you might see multiple entries.

If a drive name appears in *italics*, it means the program is unable to completely identify the drive. If you select this drive, a Volume Information File is needed to access it, so the **Load VIF** button at the bottom of the window is activated. Click **Load VIF** and select the VIF that applies to the driver selected in the upper window.

After selecting a drive (and if necessary, loading a VIF), click **OK**, and the device is added to your configuration.

Volume Partitions

Clicking **Add** when Volume Partitions is the current category displays a standard Macintosh file selector dialog. Use this dialog to select the Volume Partition (such as one created with SUM Partition) you want to add to your current configuration.

Removing Devices

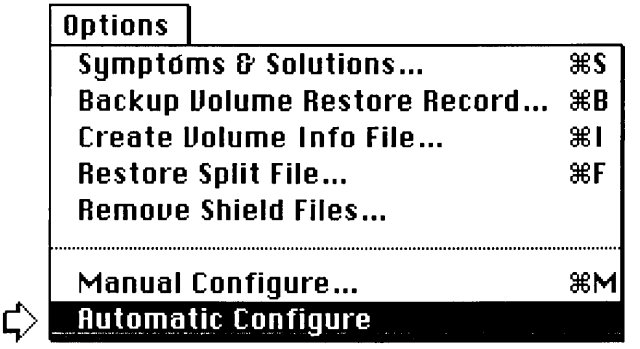
Clicking **Remove** deletes the device currently shown in the device pop-up menu.

Never remove a device if that particular device is currently crashed. By doing so, you will jeopardize your chances of recovering your data from that volume.

Saving Configuration Data

Clicking **Save Configuration** permanently records any changes you have made. If you do not save your configuration in this manner, your changes are effective only until you quit the current SUM Disk Clinic session.

Automatic Configure



Automatic Configure performs a complete scan of your system to collect and store new configuration information. Although it is a quick and convenient way to update your configuration information, there are times when you should *not* use this command. For example:

When you choose **Automatic Configure**, all of your current configuration information is replaced with new information. The new information is based on whatever volumes SUM Disk Clinic finds available on your system at the time it performs its scan.

If you have a crashed volume, SUM Disk Clinic can probably give you access to the volume to recover it because it is part of your current configuration information. If you do an **Automatic Configure** at this point, SUM Disk Clinic might not be able to recognize the volume because it is crashed. Consequently, when the new configuration information is collected, the crashed volume will not be included, and you will have no way to access it.

The rule of thumb here is to *never* use **Automatic Configure** unless all volumes on your system are in a "healthy" state. To put it another way, if one or more of your volumes is damaged, use **Manual Configure** rather than **Automatic Configure** if you need to add a device to your configuration information.

Any time you choose the **Automatic Configure** command, SUM Disk Clinic asks you to confirm that you do want to replace all current configuration information with new data. Keep the above rule in mind before you confirm this action.

Recovery Methods

You have three different recovery methods available for recovering files from a crashed volume – **Directory Scan**, **Volume Scan**, and **Floppy Recover**. Although these methods are actually part of SUM Recover (discussed in Chapter 5) and not SUM Disk Clinic, they are described here because they are usually launched from SUM Disk Clinic.

In most cases, when recovering files on a damaged volume, you launch SUM Disk Clinic. Once in SUM Disk Clinic, you pick the recovery method you want to use. After choosing the recovery method, SUM Disk Clinic launches SUM Recover for you, and you can then recover the files.

The three recovery methods each use a different technique to locate files on a volume. You can use the various recovery methods in different combinations to recover files, but you should select the method that has the best chance of recovering the greatest number of files. Consider this example:

> Your hard disk has crashed, and you have launched SUM Disk Clinic in an effort to recover your files. You choose **Directory Scan** first for the Recovery Method. SUM Recover is automatically launched for you. Using Directory Scan, the program is able to locate 90% of your files that you then recover.
>
> You launch SUM Disk Clinic again, but this time you choose **Volume Scan** to try and recover the remaining files. Because SUM Disk Clinic is using a different recovery method, the program is able to locate the remaining files, not found in your first attempt with **Directory Scan**. This time you select the files located with Volume Scan and recover them.
>
> Between these two methods, you should be able to recover every file from any crashed disk – hard or floppy. Suppose you have a crashed floppy disk and the two previous recovery methods have not been completely successful. You can run SUM Disk Clinic again and choose **Floppy Recover** to locate any remaining files on your floppy disk. Then, recover those files. Do keep in mind that Floppy Recover can only recover files from 400K and 800K floppy disks and not high density disks.

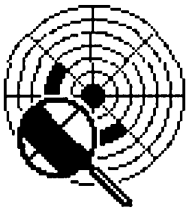
The recovery methods should be executed in a specific order. Notice that in this example, Directory Scan was used first, followed by Volume Scan when all the files were not successfully recovered with Directory Scan. If you are recovering files from a floppy disk, you would use Floppy Recover, *but* only after you have tried to recover files with Directory Scan and Volume Scan first.

Before launching a second or third recovery attempt, consider the amount of time involved. The larger the volume's capacity, the more time required to search through it. Before you set off to search an 80 megabyte hard disk for a few missing files, you might find it more efficient simply to recreate them.

Although you don't really need to know how each recovery method goes about locating files, the discussions that follow will help you decide which method to select in a given situation.

Keep in mind that you can use different recovery methods on the same volume to locate and recover the maximum number of files. (Floppy Recovery is only meant for floppy disks. You should use it after Directory Scan and Volume Scan proved unsuccessful.)

Directory Scan



Directory Scan searches the volume's existing directory to locate whatever directory entries might still be available. When SUM Recover locates what appears to be a valid directory entry, it then attempts to locate the actual file associated with that entry – wherever it resides on the crashed volume. If the directory entry for the file appears to be valid and the actual file appears to be intact, SUM Recover believes it can recover the file successfully and makes it available in the SUM Recover File List window.

Directory Scan is meant to recover files on a crashed volume and is ineffective for recovering deleted files that have no directory entry. A file's directory entry is destroyed when you trash the file; that is, when you throw a file in the Trash on the desktop and empty the Trash, it destroys the directory entry.

A Directory Scan can be completed in a relatively short amount of time (compared to a Volume Scan). Unless you are absolutely sure that a volume's directory is damaged beyond use, choose Directory Scan in your first attempt to locate and recover files.

In most cases, Directory Scan should be the first Recovery Method you choose when attempting to locate and recover deleted files.

Once the files are recovered and you return to your desktop, the recovered files are displayed on the desktop in the SUM Recovered File folders. Even though the file icons are displayed, this does not mean that the files were successfully recovered. To verify the recovery, open several of the files from their parent application. Only after you are sure that the files have been recovered should you reinitialize or reformat your hard disk and restore the files.

Volume Scan

Volume Scan uses two different methods to search for files. Both methods take place simultaneously.

- The first method searches for special markers that indicate the beginning location of a file stored on disk. If the program finds this marker, it generally assumes that the file can be recovered successfully.
- The other method uses something called *Signatures*, which are special, unique codes that SUM Recover uses to recognize different types of files. Your original SUM Program Disk #1 contains a document named **Packed Signatures** where the signatures the program uses are stored. These signatures have been specially prepared by Symantec with the cooperation of various software developers and publishers. If you cannot find the Signatures you need in this file, contact Symantec Product Support. To view the Signatures file, use the command **Show Signatures** on the **Options** menu in SUM Recover. (Symantec updates the Packed Signatures on a periodic basis.) For SUM Recover to locate a particular type of file based on the file's Signature, the Packed Signatures document must be available. Assuming you used SUM Install to install the Signatures, the document should always be available.

Volume Scan works on the same basic philosophy as Directory Scan. If Volume Scan locates a file and determines that it is logically intact, it assumes that it can recover the file and lists the file in the File List window after the search process is finished. This is in contrast to Directory Scan where the files are displayed as the search process takes place.

Floppy Recover

Floppy Recover can only be used with floppy disks. This recovery method is a last resort method for recovering files on a floppy disk; **that is, you should use Directory Scan first and then Volume Scan to recover files on your floppy disk.** If those two methods are unsuccessful in recovering all the files from your floppy disk, then launch SUM Disk Clinic and use Floppy Recover to recover the files.

You cannot use Floppy Recover to recover files on hard disks, volume partitions, or 1.4 megabyte floppy disks.

Summary

Because Directory Scan deals only with the volume directory, it can locate and list files *much* quicker than Volume Scan. However, if the volume's directory is damaged, the Directory Scan method might not be effective. In most cases to save time, you should use the Directory Scan method *before* using Volume Scan.

When you are attempting to recover a hard disk that has been initialized by mistake, you are *not* given a choice of recovery methods. Volume Scan is used by default because the volume's directory is "wiped clean" when the hard disk is initialized. Thus, the Directory Scan method cannot operate on the directory.

Many SUM users have reported that Volume Scan seems to be able to locate the greatest number of files on a damaged volume. However, the Volume Scan method is lengthy because the program must search the entire volume whereas Directory Scan searches only the directory. We recommend using Volume Scan *only* when your results with Directory Scan are not satisfactory.

Because of the way Volume Scan and Floppy Recover locate and recover files, certain information is not recovered at times. The most notable information that might be missing is the file name and its Type and Creator codes.

If SUM Recover cannot recover a file's name, it shows the file creator's name (the name of the application used to create the file) and an incremented counter. For example, ExcelData01, ExcelData02, and so forth.

If SUM Recover cannot recover a document file's Type and Creator codes, when you attempt to open the document your Macintosh alerts you that the application you are attempting to launch is busy or missing. You can insert the correct Type and Creator codes at the time you are recovering files using the SUM Recover **Get Info** command (see Chapter 5). You can also use SUM Tools for this purpose "after the fact" of recovering files and quitting SUM Recover. Appendix B contains a list of Type and Creator codes for this purpose.

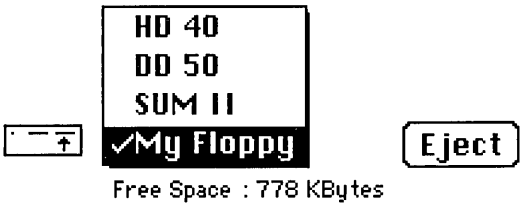
If an application file's Type and Creator codes are missing, a variety of problems can result – the most notable of which is the application's inability to launch. You can insert the correct Type and Creator codes in the application files the same way as document files, as described in the preceding paragraph.

Because of the way Volume Scan searches volumes, it cannot locate all fragments of a fragmented file. Thus, it is to your advantage to keep your files defragmented as much as possible. Using SUM TuneUp on a frequent and regular basis to defragment your files increases your chances of recovering files with Volume Scan.

Volume Pop-Up Menus

Sometimes when you are selecting volumes from SUM Disk Clinic pop-up menus, you'll notice that the list of available volumes in two separate menus is different. This happens because one menu lists the **devices available on your system,** whereas the other lists the **volumes that are currently mounted.**

For example, you might display one pop-up menu that looks similar to this:



This menu lists the devices available on your system. SUM Disk Clinic constructs this menu using your current configuration information.

You might display another pop-up menu in the same window that looks similar to this:

This menu lists your currently mounted volumes. SUM Disk Clinic constructs this menu by scanning your computer to find the currently mounted volumes.

Why Menus Are Different

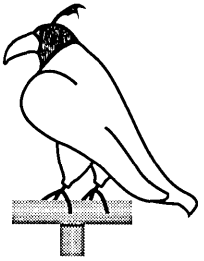
Assume you have a crashed floppy disk that will not mount. You can insert the disk in a disk drive, but your Macintosh does not recognize it. As a result, SUM Disk Clinic has no way of knowing anything about the disk and cannot work with it. Consequently, you cannot select the disk from a pop-up menu, or by any other means, unless SUM Disk Clinic gives you a way of doing so.

This is where your configuration information becomes so important. Although the Macintosh file system cannot tell SUM Disk Clinic you have inserted a floppy disk, the program does know that you have a floppy disk drive because your configuration information indicates this. Thus, you can *point* SUM Disk Clinic to the floppy disk drive where you have inserted the crashed disk, and the program will be able to access the volume. This is what makes it possible for SUM Disk Clinic to work with a crashed disk.

When you use the other pop-up menu to select the volume on which you will store recovered files, you will be using a "healthy" volume that is able to mount. So SUM Disk Clinic builds this menu using information the Macintosh file system provides about your currently mounted volumes.

Thus, the reason the pop-up menus are sometimes different is that one contains your configuration information, and the others contains a list of your currently mounted volumes.

SUM Recover



SUM Recover, a utility program, performs the actual recovery of damaged volumes and deleted files.

SUM Recover displays one of three different windows, depending on what you are attempting to do. For example, if you are attempting to recover a damaged volume using Quick Fix, SUM Recover shows you the **SUM Quick Fix** window; if you are attempting to restore a damaged volume on which the Shield Volume Restore Record is installed, SUM Recover shows you the **SUM Volume Restore** window; and if you are attempting to recover files (whether from a damaged volume or deleted files), SUM Recover shows you the **SUM File Recover** window. This chapter describes these three windows.

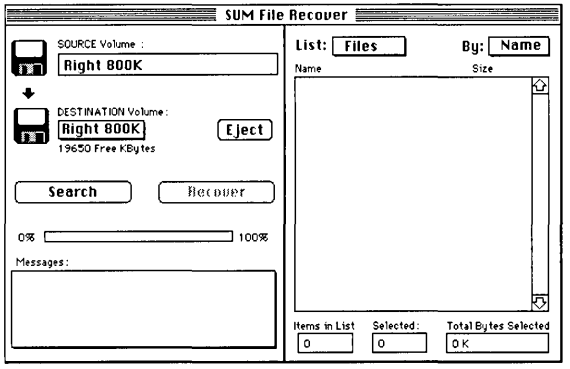
Launching SUM Recover

Normally, you do not launch SUM Recover yourself. SUM Disk Clinic launches the program for you at the appropriate time and displays the window you need to accomplish what you are attempting to do.

SUM Recover can be launched directly from the desktop. Launching it from the desktop, however, means that SUM Disk Clinic's recovery methods are unavailable.

When you launch the program in this way, this message is displayed: **Shield Deleted File Recovery is active. You must use SUM Disk Clinic to select a recovery method.** If you want to use Quick Fix, Recover Volume, or Recover Deleted Files, you must use SUM Disk Clinic.

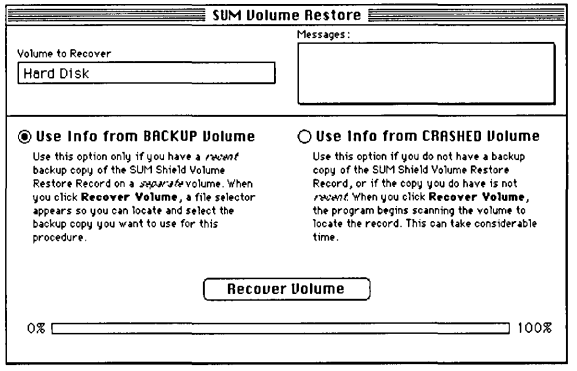
SUM Recover Windows



SUM File Recover Window

See page 5-3 (opposite).

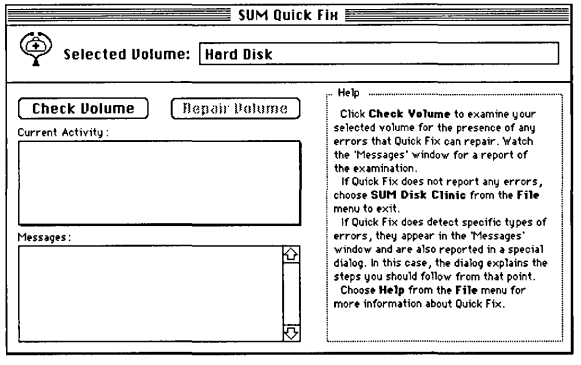
Recovering files with or without SUM Shield installed or if you select Recover Volume and SUM Shield is not installed.



SUM Volume Restore Window

See page 5-9.

Select Recover Volume and SUM Shield is installed.

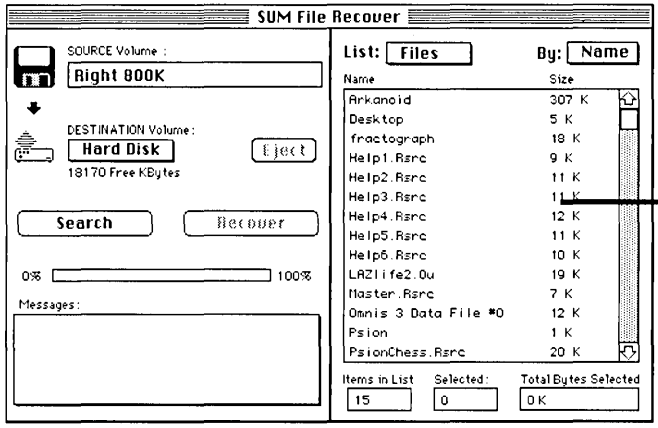


SUM Quick Fix Window

See page 5-13.

Select Quick Fix to repair a damaged volume.

SUM File Recover Window



Any time you attempt to recover files from a volume (whether the volume is damaged or you are recovering deleted files), SUM Recover displays the window like the one above.

SOURCE Volume

This field always shows the name of the volume **FROM** which you are trying to recover files.

You selected the SOURCE Volume at a previous window while running SUM Disk Clinic. Normally, you can't select a different SOURCE Volume from this window (except when you are recovering deleted files from a volume on which the Deleted File Record is installed). If you want to use a different volume, you must return to the SUM Disk Clinic Main Menu and repeat the steps.

If the SOURCE Volume is a software partition, you must unmount the partition before recovering files because sometimes the partition may be damaged during the recovery process. (See Chapter 8 for more about partitions.)

DESTINATION Volume

This pop-up menu displays the name of the volume on which recovered files are stored as they are recovered.

You selected the DESTINATION Volume from a previous window while running SUM Disk Clinic. You can select a different DESTINATION Volume now by choosing the one you want from the pop-up menu.

If you are recovering files from a volume where the Deleted File Record or the Volume Restore Record are NOT installed, you should never select the same volume for your source and destination. If you do, there is a good chance of overwriting files, and thereby making any further attempts to recover the files impossible.

Search Button

Clicking **Search** (⌘-S) initiates a search of the SOURCE Volume to locate whatever files might be recoverable.

If you are attempting to recover files from a volume on which the Deleted File Record IS installed, the **Search** button is disabled when the SUM File Recover window appears. In this case, the File List window already lists the names of recoverable files on the SOURCE Volume, and therefore, a search of the volume is unnecessary.

While the search is taking place, the progress bar fills in gradually to indicate what percentage of the SOURCE Volume has been scanned. Also, the **Search** button changes to **Stop**, and you can cancel the search at any time by clicking **Stop**.

If you cancel a search by clicking **Stop**, *all entries* in the File List window are lost. (The files themselves are not affected.) Without the File List, you cannot recover files. Therefore, even if you should see the name of the file or files you want to recover listed in the File List window, do not cancel the search at that point and assume that you will be able to recover the file or files. To put it another way, if you want to recover *any* files, you must allow the Search process to continue all the way to the end.

At the conclusion of the search, the following things occur:

- The names of those files SUM Recover was able to locate appear in the **File List window.**
- The number of files SUM Recover was able to locate is shown under **Items in List.**

Search Methods

When you click the **Search** button and SUM Recover begins its scan of the SOURCE Volume, it uses the Recovery Method you selected in a previous SUM Disk Clinic window, either **Directory Scan**, **Volume Scan**, or **Floppy Recover**.

You'll find detailed discussions of the *Recovery Methods* in Chapter 4, *SUM Disk Clinic*. It is important to point out here, once again, that each Recovery Method uses a slightly different technique for locating files on the SOURCE Volume. Thus, one Recovery Method might be able to locate and help you recover files that another could not. Fortunately, you can use the different Recovery Methods in any combination on the same SOURCE Volume (with the exception of Floppy Recover, which can be used only with floppy disks and after the other two methods were unsuccessful).

For example, assume your hard disk is crashed, and the Shield Volume Restore Record is NOT installed. You launch SUM Disk Clinic and choose the **Directory Scan** Recovery Method. Once the program scans the directory and displays the items in the File List window, you can recover your files. After this, you determine that all your files were not recovered. You'll need to run the Volume Scan to try and recover the remaining files. But before you do that, print a list of the files in the File List window. To do this, select **Print List** from the **File** menu. You'll need this list for reference after the Volume Scan.

Once the list is printed, you'll launch SUM Disk Clinic again, but this time choose **Volume Scan**. When the **File List** appears following this search, it contains the missing files, as well as many of the same ones listed following the original search.

Using the list you printed, determine which files still need to be recovered. At this point, select and recover those files that were missing from the original search and bypass those you already recovered.

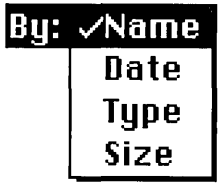
The **Directory Scan** and **Volume Scan** methods can take considerable time to complete on high-capacity volumes. However, keep in mind that Directory Scan is *much* faster than Volume Scan. You must decide whether or not any missing files are important enough to warrant the additional time.

"List" Pop-Up Menu

The **List** pop-up menu lets you control whether files or folders are listed in the **File List window**. Make your selection by displaying the pop-up menu and selecting either **Files** or **Folders**.

"By" Pop-Up Menu

The **By** pop-up menu lets you control the logical order of the items listed in the File List window.



You can list items by

- **Name** – alphabetical listing by file name.
- **Date** – the date the file was created or last modified, in ascending chronological order.
- **Type** – alphabetical listing based on each file's type code (for example, applications normally have a file type code APPL, Control Panel devices have the code CDEV, and so forth).
- **Size** – a listing based on each file's size in kilobytes.

File List Window

This window lists the files (or folders) that SUM Recover was able to locate on the SOURCE Volume during the search. **Items in List** at the bottom of the window displays the total number of items in the window. The name and size of each item is next to the item in the list .

Selecting Items

The File List window lets you select the items (files or folders) you want to recover from the Source volume.

To select a *single* item in the File List window, click on it.

To select *multiple* items, use the Shift-click method to select them. You can use this method to select noncontinuous items in the list.

To select all items in the list, choose **Select All** from the **Edit** menu.

To select files based on the date and time they were last modified, choose **Select Modified** from the **Edit** menu.

When you select items in the File List window, the total number of items **Selected** and the **Total Bytes Selected** are shown near the bottom of the window. The **Total Bytes Selected** figure can be useful by comparing it to the **Free KBytes** figure shown just below the DESTINATION Volume pop-up menu. This tells you immediately whether or not you have sufficient room on the DESTINATION Volume to store the items you have selected for recovery.

At times items in the File List window appear in italics (before attempting to recover). SUM Recover uses the italics to designate an unrecoverable file. For example, when a portion of a file is overwritten, the entire file becomes unrecoverable.

If you want additional information about any item selected in the File List window, use the **Get Info** command in the **File** menu. A complete description of **Get Info** appears later in this chapter.

Recover Button

The **Recover** button is enabled when you select one or more items in the File List window.

After selecting the item or items you want to recover, click the **Recover** button. SUM Recover recovers the item from the SOURCE Volume and places it on the DESTINATION Volume.

If you optimized your SOURCE Volume using SUM TuneUp, you cannot recover the files deleted before the optimization from that volume. Because the files are moved to different locations during the optimization, the Deleted File Record loses track of their locations.

Notice that once an item is recovered it is deselected in the File List. The item name appears in italics in the File List window if the Recover Deleted File Record IS Installed or if you selected Recover Deleted Files. To determine whether or not the recovery was successful, check the **Messages** area at the bottom of the window.

In rare cases, a file may appear recovered and actually isn't. For example, if you deleted a file with the **File** menu **Delete** command in Microsoft Word, SUM Recover can't recover the file. Although the file appears recovered in the File List window, Word will not open it.

About Recovered Files

During the process of recovering files, SUM Recover creates one or more folders on your DESTINATION Volume for storing the recovered files. Each folder is named SUM Recovered Files and is preceded by a single character and a period, such as A., B., C., and so forth (which is incremented with each new folder) . For example, the first folder created on your DESTINATION Volume is named:

A.SUM Recovered Files

If a second folder is created, it is named "B.SUM Recovered Files," and so on as necessary.

When you open a folder, you will find your recovered folders and files inside.

During the recovery process, SUM Recover may encounter files with duplicate names, such as Read Me files. When the program encounters a duplicate file name, the program stops and displays the message "Duplicate file error." If you wish to recover the duplicate file, you must reselect the DESTINATION Volume and click **Recover** to continue. SUM Recover starts a new recovery folder on a different DESTINATION Volume and continues the recovery process. If you like, you may return to the original DESTINATION Volume once the duplicate file is recovered. If you return to the original

DESTINATION Volume, a new recovery folder is started.

If you used the Volume Scan or Floppy Recover Method to recover files, you might not be able to open the files directly from the desktop at this point. For example, if you attempt to launch an application by opening its icon, an alert that the application is busy or missing may appear. This results from the fact that the file's Type and Creator codes are missing or incorrect because the codes can't normally be recovered with either method.

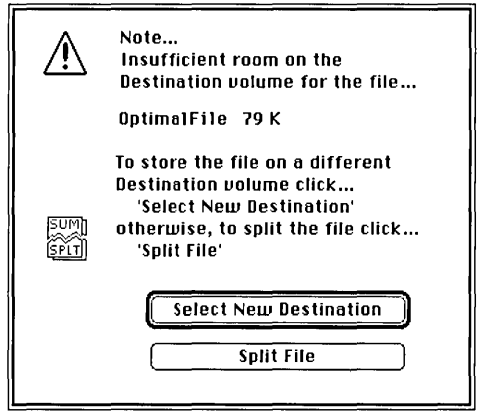
The **Get Info** command (described later) lets you reinsert the Type and Creator codes while you are working with SUM Recover. If you are working at the desktop, you can correct this problem by opening the parent application, opening the file, and then saving the file from within the application. This reassigns the correct Type and Creator codes to the file. Yet another way to insert the Type and Creator codes is to use SUM Tools. Appendix B contains a list of common Type and Creator codes to help you in these situations.

Splitting Files for Recovery

Sometimes it is necessary for SUM Recover to *split* a file into two or more *pieces* during recovery. This occurs when there is not enough space on the DESTINATION Volume to store the entire file. For example, if your DESTINATION Volume is an 800K floppy disk and you are attempting to recover a 1000K file from a hard disk, the file has to be split.

When splitting a file, SUM Recover requires a *minimum* of two DESTINATION Volumes. Each volume contains a separate *piece* of the file (for the technically minded, the file's resource and data forks are split between the two volumes). A special Control Record that is later used to restore the pieces back into a single file is also placed on one of the volumes.

When SUM Recover determines that it must split a file, it informs you of this by displaying a dialog similar to this:



This dialog gives you the option of temporarily selecting a different DESTINATION Volume to use, and thus, possibly avoid splitting the file. For example, if you have a second, healthy hard disk available on your system, you might want to recover this particular file to that volume rather than to floppy disks. To do so, click **Select Different Volume**, and the program prompts you to select the volume you want to use to recover this particular file. After recovering this file, the program automatically reverts back to your original DESTINATION Volume.

If you don't have an alternate DESTINATION Volume available or if you don't mind splitting the file, click **Split File** in the preceding dialog. SUM Recover prompts you to insert each new DESTINATION Volume when needed to split the file.

While it isn't necessary to keep the split file volumes in any particular order, it is essential that you have all of them when it comes time to restore the split file. If any of the file pieces are missing, you will not be able to restore the file. If it is necessary to split any of your files, be sure to keep these volumes separate from any others.

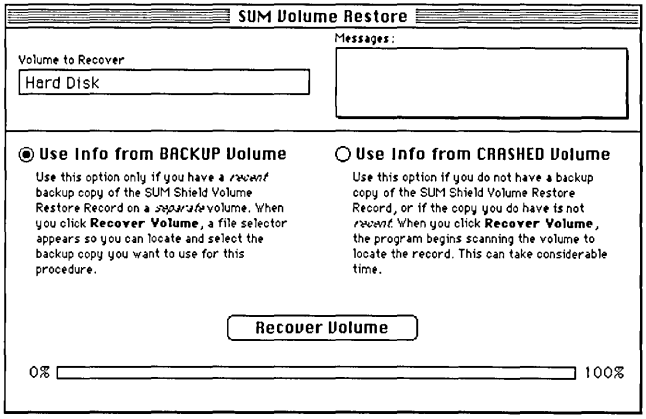
Restoring a split file is a relatively simple process. See the description of the **Restore Split File** command in Chapter 4, *SUM Disk Clinic*, for instructions.

Summary

The SUM File Recover window appears any time you need to recover files from a volume. Thus, the window appears in these situations:

- You are recovering files deleted from a volume where the Deleted File Record is NOT installed.
- You are recovering files deleted from a volume where the Deleted File Record IS installed.
- You are recovering files from a crashed volume where the Volume Restore Record is NOT installed.

SUM Volume Restore Window



The **SUM Volume Restore** window (pictured above) appears *only* when you are attempting to restore a crashed volume where the SUM Shield Volume Restore Record IS installed.

The **Volume to Recover** area shows the name of the crashed volume you selected in a previous window. You cannot select a different volume at this point. If you selected the wrong volume, you must return to the SUM Disk Clinic Main Menu and go through the procedure again.

The SUM Volume Restore window provides two options: **Use Info from BACKUP Volume** and **Use Info from CRASHED Volume**. You must select one or the other before proceeding. (Please be sure you have read the section *Volume Restore Record* in Chapter 3 before continuing; otherwise, you might find the following discussions difficult to follow.)

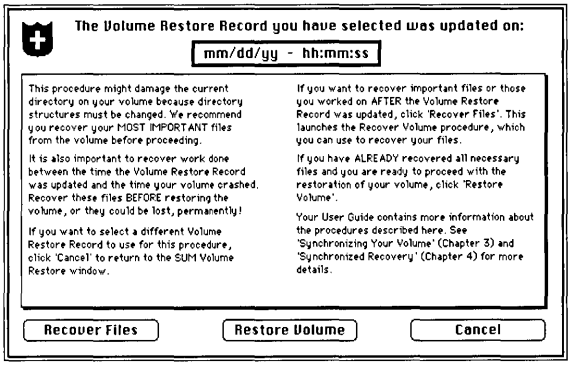
Use Info from BACKUP Volume

When practical, this is the option you should select in the SUM Volume Restore window because it makes it possible to restore the damaged volume in the shortest amount of time.

If you select this option and then click **Recover Volume**, the program asks you to specify the volume on which the backup copy of the Volume Restore Record is located. If the backup copy is on a floppy disk, you can insert the disk at the time you are prompted.

SUM Recover reads the backup copy and compares its name to the name of the volume you selected (the one you are attempting to restore). If the volume names do not match, SUM Recover gives you the option to proceed anyway, or to cancel the procedure, so you can locate the correct backup copy of the record.

Next, SUM Recover shows you the date that the backup copy was created and gives you three options for how to proceed.



If this is *not* the Volume Restore Record you want to use, click **Cancel**. This returns you to the SUM Volume Restore window, and you can repeat the steps to select a different record.

If the date and time of the Volume Restore Record are not properly synchronized to the point at which your volume crashed, click **Recover Files** and refer to *Synchronized Recovery* later in this section.

If you are ready to proceed with the restoration of your volume using this Volume Restore Record, click **Restore Volume.**

Use Info from CRASHED Volume

When you select this option, SUM Recover must scan your crashed volume to find the Volume Restore Record. It can then use the record to restore the volume.

Scanning a volume to locate the Volume Restore Record can take considerable time. And although rare, it is possible that the record was damaged during the volume crash and cannot be used. Therefore, it is preferable to keep a backup copy of the Volume Restore Record and use that to restore your volume.

If you must scan the crashed volume for the Volume Restore Record, click **Restore Volume**. SUM Recover immediately begins scanning the volume for the Volume Restore Record. Once the record is found, the preceding dialog appears, and you can proceed as explained in that section.

It is preferable to scan the crashed volume for a backup copy of the Volume Restore Record if you discover that your backup copy is outdated, and you know that the record on your crashed volume is more current.

Of course, the best way to restore your volume completely is to use the most current copy of the Volume Restore Record. If the record is outdated, you can recover the files since the last backup copy of the Volume Restore Record using the method described in the next section, *Synchronized Recovery.*

Synchronized Recovery

In Chapter 3, *SUM Shield*, you learned that you run the risk of losing some of your work if your Volume Restore Record is not properly synchronized to the point at which the crash occurred. This section explains how to avoid this potential loss of data.

The risk here is that if you restore the volume using a Volume Restore Record (or a backup copy), the volume directory is restored as it was as of the last snapshot update. The current volume directory is overwritten, and there is very little, if any, chance of recovering the work you did *after* the snapshot was taken.

The solution is to recover the files that are at risk *before* restoring the volume with the Volume Restore Record. The following steps explain in detail how to accomplish this.

1. Launch SUM Disk Clinic.
2. Choose **Recover Volume** from the Main Menu.
3. When asked whether or not the Shield Volume Restore Record is installed on the volume you want to recover, click **Volume Restore Record is NOT installed.**

   Even though the record is actually installed on the volume, be sure you make this choice.
4. Select the volume you want to recover.
5. When prompted to select a Recovery Method, click **Directory Scan.**
6. SUM Disk Clinic launches SUM Recover automatically. Use the SUM File Recover window to locate and recover those files that were created or modified *after* the last time the Volume Restore Record was updated.

SUM Recover gives you some help determining which files you should recover.

- After scanning the crashed volume, locate and select the Volume Restore Record in the File List.
- Use the **Get Info** command to see when the Volume Restore Record was last modified.

  (If the Volume Restore Record does not appear in the File List, you have to rely on your memory to recall when the Volume Restore Record was last updated.)
- Recover any and all files created or modified *after* the Volume Restore Record was modified. (You can use the **Select Modified** command in the **Edit** menu to automatically select all files created or modified after the Volume Restore Record was updated.)

Continuing with the recovery.

7. Choose **SUM Disk Clinic** from the **File** menu to return to the Main Menu.
8. Choose **Recover Volume** once again.
9. This time, click **Volume Restore Record IS installed** when questioned.
10. Again SUM Disk Clinic launches SUM Recover automatically, but this time you see the SUM Volume Restore window. Use the window to restore your volume using the instructions earlier in this section.

At this point, your damaged volume should be restored to the way it was at the time the last snapshot update was taken. You should also have a stack of floppy disks (or some other media) containing all of the work you did between the last snapshot update and the moment of the crash (those recovered in steps 1 through 6). To restore your volume to the way it was at the time of the crash, do the following:

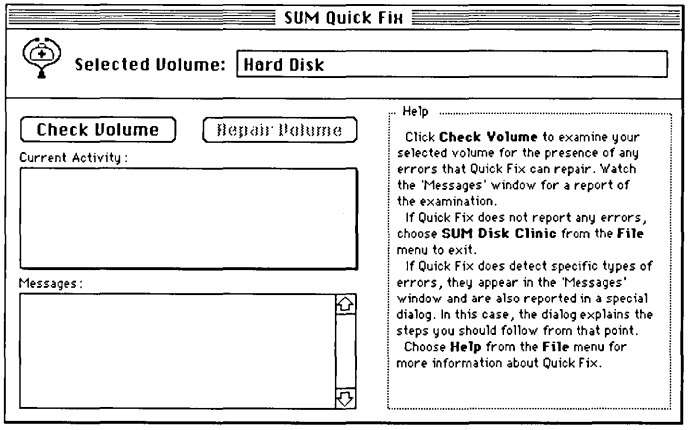
11. Choose **Quit** from the **File** menu to return to your desktop.
12. When your desktop appears, the volume you just restored is no longer mounted – that is, its icon is not present, which is normal. To remount the volume, restart your Macintosh.
13. Now copy the recovered files back to the original volume. Use the standard method of dragging each file's icon to the restored volume's icon.

    Remember, your recovered files are located in one or more folders, like the one shown below, that SUM Recover creates on your DESTINATION Volume or Volumes. (See *About Recovered Files* earlier in this chapter for more information.)

A.SUM Recovered Files

Your volume is now restored and ready to use.

SUM Quick Fix Window



The **SUM Quick Fix** window appears, similar to the one pictured above, when you use the Quick Fix procedure to repair a damaged volume.

Quick Fix looks for specific types of errors that are common with damaged volumes. If these specific types of errors are found, Quick Fix can normally repair them. The advantage of the Quick Fix procedure is that you can often repair a damaged volume and restore it to service quickly without having to recover all of your files or reinitialize the volume. The disadvantage is that Quick Fix repairs only certain types of errors, and unless your volume is damaged in one of these ways, Quick Fix cannot make the repairs.

In many cases, when Quick Fix *is* able to repair a volume, it must do so by altering the volume's existing directory structure. So to protect your important files, you should always recover them from the volume before allowing Quick Fix to make any repairs. The Quick Fix procedure is designed with this caveat in mind.

For a complete and detailed description of the Quick Fix procedure, please refer to the *Recovery Procedures* section at the beginning of this User Guide. This section does not reiterate the entire procedure.

Selected Volume

The volume you selected to Quick Fix in a previous window is shown near the top of the SUM Quick Fix window. You cannot select a different volume at this point. If you want to select a different volume, choose **SUM Disk Clinic** from the **File** menu to return to the Main Menu and then go through the procedure again.

Check Volume

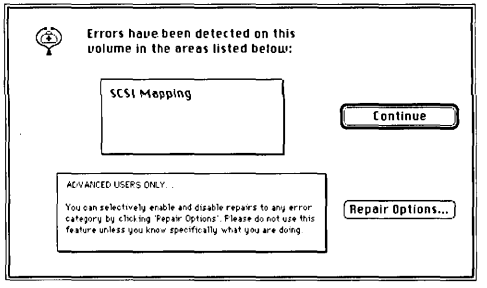
Click the **Check Volume** button. SUM Recover begins examining the volume to determine whether or not it can be repaired using the Quick Fix method unless you are examining a floppy disk.

If you are examining a floppy disk, SUM Recover asks you if the disk is in the drive. If you wish to examine the disk currently in the floppy drive, click **OK**. If the disk is not inserted, click **Cancel** and either insert the disk or manually eject the disk in the drive and insert another one. After inserting the disk, click **Check Volume** and then click **OK**.

During the check of the volume, the *Current Activity* area keeps you posted on exactly what is happening. In addition, various messages appear in the *Messages* area to let you know the results of the volume check.

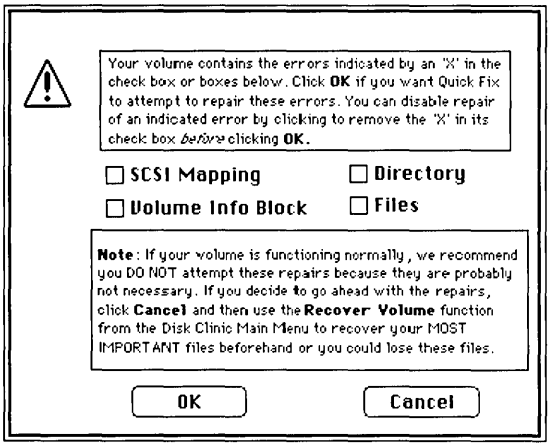
If Quick Fix does *not* detect any errors on the volume, the program displays the items it checked in the Messages area. The **Repair Volume** button remains disabled. This does not mean, however, the volume is error-free, it simply means Quick Fix did not find errors that it can repair. If the volume is, in fact, giving you problems, your best alternative at this point is to return to the SUM Disk Clinic Main Menu and use the **Recover Volume** procedure to recover your files.

IF SUM Shield is installed or Quick Fix detects errors it can fix, Quick Fix displays a dialog similar to this:



If QuickFix detects errors but does not think it can correct them, it asks if SUM Shield is installed. A yes response displays the dialog you just saw. If you click No, QuickFix may be able to repair your volume, and therefore, the **Repair Options** button is enabled.

Notice that the dialog below states that if you consider yourself an advanced user, you can selectively enable and disable repairs to the listed errors by clicking **Repair Options**. Clicking this button displays the following dialog:



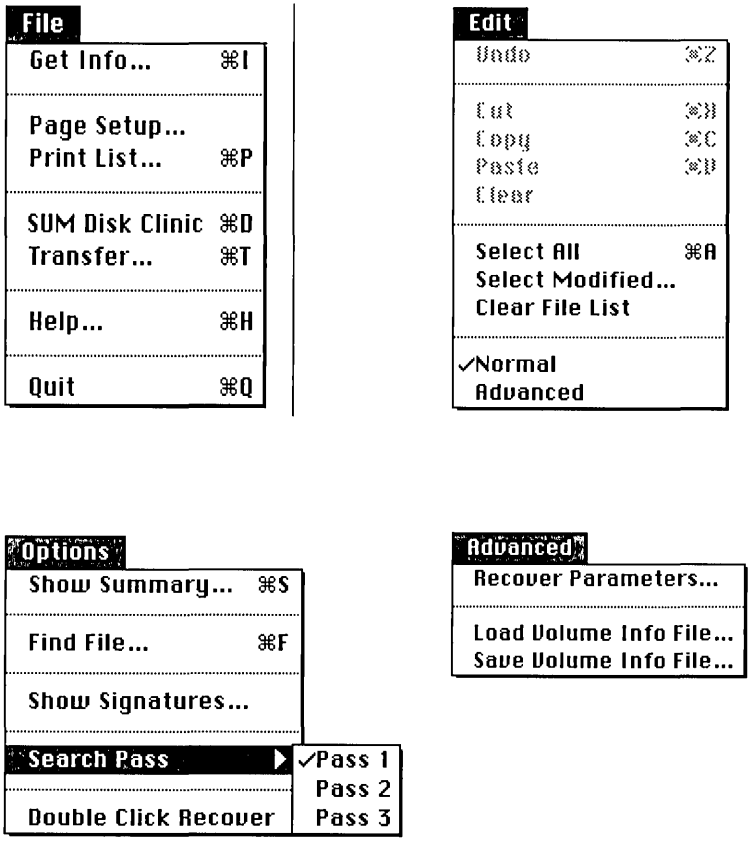
We recommend that you do not select options other than those already marked in this dialog unless you fully understand what you are doing and why.

Repair Volume

When you click **Continue** in the dialog shown in the opposite column, you return to the SUM Quick Fix window and the **Repair Volume** button is active.

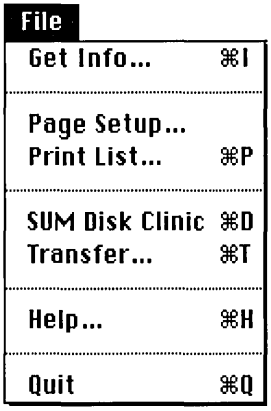
Click **Repair Volume** to initiate repairs.

SUM Recover Menus



Detailed descriptions of these menu commands are listed in this section.

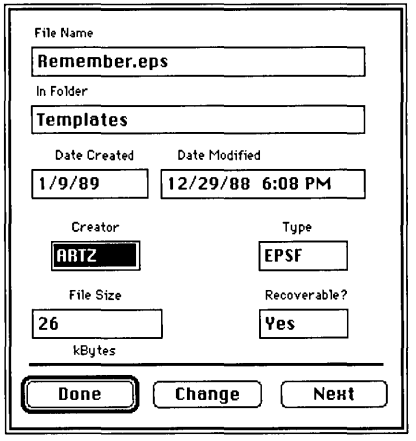
File Menu



Get Info

This command is available when one or more items (files or folders) are selected in the File List window. Get Info displays a dialog containing information about the selected item or items.

If the selected item is a file, a dialog similar to this appears (the dialog for selected folders looks similar with obvious exceptions):



If multiple items are selected in the File List, the **Next** button is available, and you can use it to cycle through all selected items. The keyboard shortcut for this button is ⌘-N.

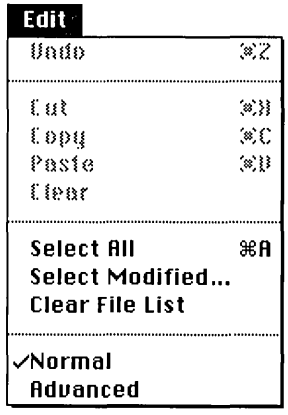
The **Change** button is available if you used the **Volume Scan** or **Floppy Recover** method to locate and recover files. (It is not present if you use **Directory Scan**). The button lets you change the Type and Creator codes for the current file because Volume Scan and Floppy Recover cannot always recover this information.

All Macintosh files have a unique *Type* and *Creator* code. These codes, among other things, tell the Macintosh which application it should launch if you open a particular file (i.e., document) and also determine which icon is used to represent the file on your desktop. If these codes are not available or are incorrect, you will not be able to launch an application by opening a document (your Macintosh tells you the application is busy or missing), and a generic icon represents the file.

Appendix B contains a list of common Type and Creator codes. Please refer to this appendix before making changes to these codes for any particular file. If you insert the wrong codes, a variety of undesirable things can happen.

If you discover that a file's Type and Creator codes are missing after you have quit SUM Recover, you can use SUM Tools to insert the codes.

Edit Menu



Page Setup

Displays the standard Macintosh page setup dialog for specifying page orientation, size, and so forth for your printer. The command is used in conjunction with **Print List** (described next).

Print List

Use this command to print the current contents of the File List Window.

SUM Disk Clinic

Terminates SUM Recover and launches SUM Disk Clinic.

Transfer

Use this command to launch any application available on your system other than SUM Disk Clinic. When you quit the application you have launched, you return to your desktop – *not* to SUM Recover.

Help

Displays the first in a series of dialogs explaining the basics of using SUM Recover.

Quit

Terminates SUM Recover and returns to your desktop.

Note that the Undo, Cut, Copy, Paste, and Clear commands are not available in this menu. They are only available when you are using desk accessories.

Select All

Selects every item in the File List Window.

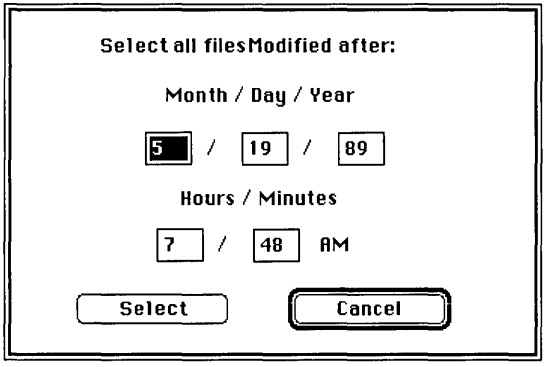
Select Modified

Selects all items in the File List window that were created or modified after a specific date and time. When you choose this command, you see a dialog similar to the one shown on the next page.

Please note that **Select Modified** is not available with all the Recovery Methods. While it is always available with the Directory Scan, it may or may not be available when using Volume Scan. For example, Select Modified is available if Volume Scan was able to locate date informa-

tion on the files you are trying to recover; otherwise, it isn't.

To select files modified after a certain date and time, enter your date and time criteria in this dialog and click **Select**.



Use the Tab key to move between text fields. To change the time designation from AM to PM (and vice versa), click it.

Select Modified is a particularly useful command when you need to do a *synchronized recovery* (as explained earlier in this chapter under the *SUM Volume Restore Window*). If you know the date and time a volume's Volume Restore Record was last updated, you can use this command to quickly isolate the files you need to recover before doing the volume restore. For example, if you know the Volume Restore Record was last updated at 12:30 PM on July 15, 1989, enter this criteria into the Select Modified dialog and click **Select**. SUM Recover selects every file in the File List that was created or modified after this date and time. All you have to do is click the **Recover** button to recover these files.

Clear File List

This command removes all entries from the current File List.

You cannot undo this operation. If you clear the File List, the only way to restore it is to search the volume again. SUM Recover asks you to confirm your choice before clearing the list.

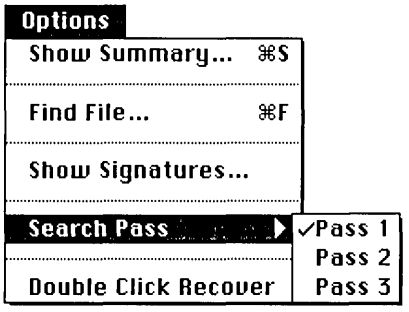
Normal/Advanced

You can use SUM Recover in either **Normal** or **Advanced** mode. The mode you are currently using is checkmarked in the menu.

Advanced mode is a "power user" feature. It gives you access to functions that require some understanding of disk and file structures. Unless you possess such an understanding, **Advanced** mode will be of little or no use to you, and you should always remain in **Normal** mode.

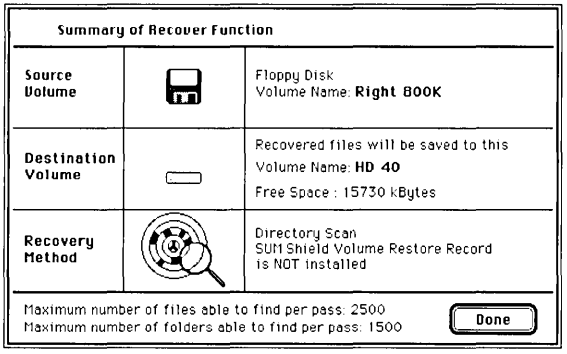
When you choose **Advanced** mode, the **Advanced** menu title appears in the menu bar. This menu and its commands are described later in this section.

Options Menu



Show Summary

This command displays a dialog summarizing the choices you made in SUM Disk Clinic:

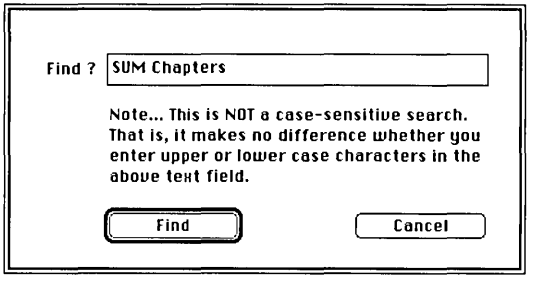


You cannot change anything in this dialog – it is strictly for information purposes.

At the bottom of the Summary dialog are two pieces of information that might come in handy under some conditions. The **Max number of files...** and the **Max number of folders...** information tells you the maximum number of items the program can locate and recover in a single pass. This information relates to the **Search Pass** command described later in this section.

Find File

Use this command to quickly locate a particular file in the File List. Choosing the command displays this dialog:

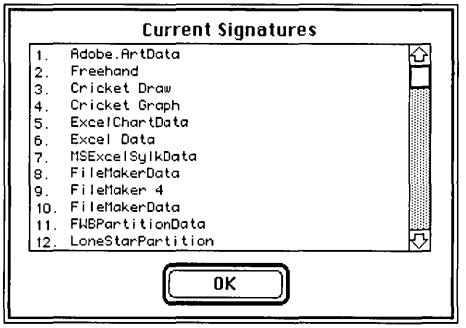


Enter the name of the file you want to find and click **Find**. SUM Recover scrolls the list to that file.

Show Signatures

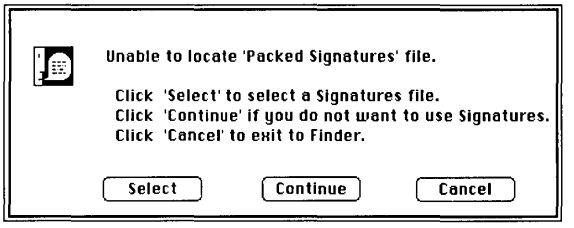
This command is available only when you use the **Volume Scan** method to locate and recover files because Signatures are not used with the **Directory Scan** and **Floppy Recover** methods.

Choosing the command displays this dialog:



The window lists the Signatures that are included in the file named *Packed Signatures* on your disk. This file is provided on your original SUM Program Disks and can be installed when running the SUM Install program. (See Chapter 2.) Symantec updates the Packed Signatures file periodically to provide additional signatures. If the signature you need is not listed, Symantec may have it. Please contact our product support department.

If you have not installed the Packed Signatures file or if its has been renamed, damaged, or removed, SUM Recover notifies you at launch time that it cannot locate the file:



Search Pass

While SUM Recover scans a volume to locate whatever files it can recover, it is building a list of those file names in your computer's memory. At the completion of the scan, it displays the list in the File List Window.

The number of files or folders that the program can place in the list depends upon the amount of memory available in your computer. The **Show Summary** dialog (described earlier) tells you the maximum number of files and folders the program can keep in the list.

If you need to recover more than the maximum number of files and folders the program can accomodate, the **Search Pass** command provides the solution. (Unless you are recovering a very large number of files with a limited amount of memory, you'll probably never have occasion to use this command. You might want to bypass reading this description until you need it.)

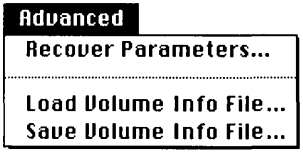
Search Pass lets you make up to three separate passes on the volume to locate and recover files. During each pass, the program knows which files it located in the previous pass or passes. For example, assume that the maximum number of files the program can locate and recover in a single pass is 3,000 (which you learn by choosing the **Show Summary** command), but your volume contains 8,000 files that you need to recover. Here is the correct procedure to use:

1. In the SUM File Recover window, click the **Search** button. The program locates the first 3,000 files and lists them in the File List window.
2. Select the files you want to recover in the File List and click **Recover**.
3. After recovering the first batch of files, display the **Search Pass** submenu and choose **Pass 2.**
4. Click **Search** again and the program locates the next 3,000 files and lists them in the File List Window.
5. Select the files you want to recover and click **Recover.**
6. Display the **Search Pass** submenu again and choose **Pass 3.**
7. Click **Search** again and the program locates and lists the remaining 2,000 files.
8. Select the files you want to recover and click **Recover.**

Double Click Recover

Activating this command (it is active when a check mark appears to its left) provides you with a shortcut method for recovering files - that is, when you double-click a file name in the File List window it is the equivalent of selecting the file and then clicking **Recover.**

Advanced Menu

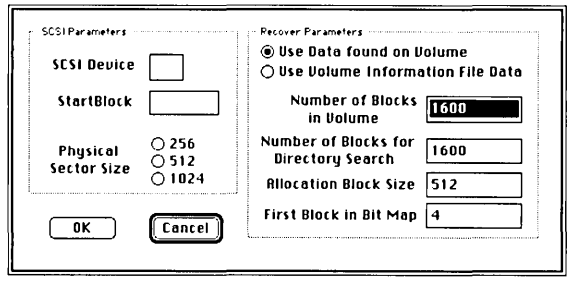


The **Advanced** menu title appears in the menu bar only when you select **Advanced** mode in the **Edit** menu.

Use of the commands in the **Advanced** menu requires some understanding of disk and file structures. We recommend that you do not attempt to use these commands unless you understand these concepts.

Recover Parameters

This command can be used to modify the parameters used by SUM Recover. Choosing the command displays this dialog:



The **SCSI Parameters** area can be used to set the current parameters for the SCSI device, including device number, starting block, and sector size. These options are available only if the startup volume was a SCSI device or another SCSI is available and selected; otherwise, SCSI Parameters is greyed out.

The **Recover Parameters** can be used to describe the volume size, allocation, and structure.

Load Volume Info File

Use this command to select a Volume Information File you want to force the program to use.

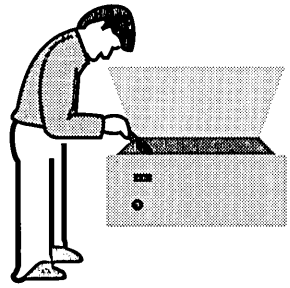
Save Volume Info File

Saves the settings in Recover Parameters in a separate Volume Information File. If you edit the Recover Parameters, use this option to save the settings. The program assigns the default file name "source volume name.VIF."

End of Chapter 5

Notes

SUM TuneUp



SUM TuneUp's primary function is to maintain your volumes at peak efficiency and speed. Several secondary functions are available for helping maintain your volumes in other important ways. SUM TuneUp performs these functions:

- Defragments disk files.
- Optimizes disk space.
- Verifies file data.
- Erases unused disk space.
- Locks out bad disk sectors.
- Lists all INITs in system folders.

Fragmentation and Optimization

What Is Fragmentation?

When you first connect a new hard disk to your system, it performs at top efficiency. But as you add new files, change existing ones, delete files, and do other routine maintenance to the disk, its performance decreases. This loss of performance is mainly due to *fragmentation.*

Fragmentation results when your Macintosh cannot find enough *contiguous* free space on the disk to store an entire file. When this happens, the file is split into two or more separate fragments (or pieces) and placed on the disk wherever space is available. The various fragments are *linked* together so that an application can easily locate the fragments in their correct sequence. Fortunately, the Macintosh handles all of this for you, so you don't have to be too concerned about it.

The problem with fragmentation is that the Macintosh must physically move the disk's read/write heads from one place on the disk to another to store and collect all of the various fragments of the file. These physical movements are mechanical, and compared to the relative speed of your computer, quite slow. If a file is highly fragmented (that is, split into many fragments widely spread throughout the disk), a great deal of head movement is required, and thus, reading or writing the file requires considerable time.

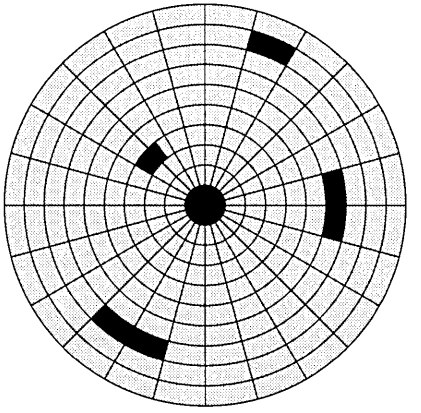
You might be asking at this point why, if fragmentation creates these types of problems, is it used? The answer is that if it were not used you would not be able to store as much information on disk because finding enough contiguous free space becomes impossible after a very short time.

Normally, the more information a disk contains and the more it is used, the more it is fragmented. This is because it becomes increasingly difficult to find adequate contiguous free space. And, fragmentation occurs so gradually that you might not even be aware it is slowing down your hard disk.

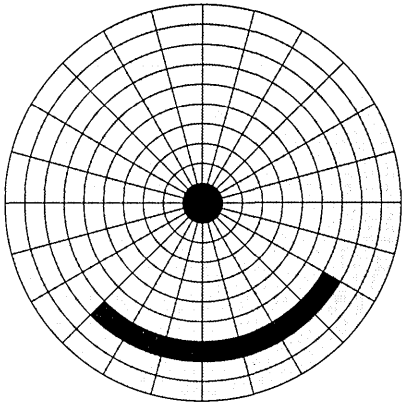
Overcoming Fragmentation

One way SUM TuneUp restores performance is by defragmenting the files on the disk. This is done by reorganizing the fragments into contiguous areas, thus minimizing head movement and maximizing performance.

The diagram below shows an example of how a single file might be fragmented on your disk (the dark areas indicate various fragments).



This diagram shows how the same file might be organized on the disk after it has been defragmented with SUM TuneUp.



Normally, SUM TuneUp cannot defragment every file on your hard disk. This is especially true if your disk contains very little free space. Other factors, which you'll read about later in this chapter, also determine whether or not a file can be defragmented.

The major factor that determines whether or not defragmentation will improve your disk's performance is how badly it is currently fragmented. To help you make the decision as to whether or not a tune up is needed, SUM TuneUp has an option that examines your disk to determine how much fragmentation exists. This option shows you the extent of fragmentation that currently exists so that you can decide whether or not you want to tune up the volume.

Optimizing Volumes

Defragmenting files on a disk normally improves performance, as you have just seen. Yet even after defragmentation, the various files are still spread out in many different locations. Although this has very little effect on drive performance, defragmenting files can significantly reduce the amount of contiguous space available on the volume.

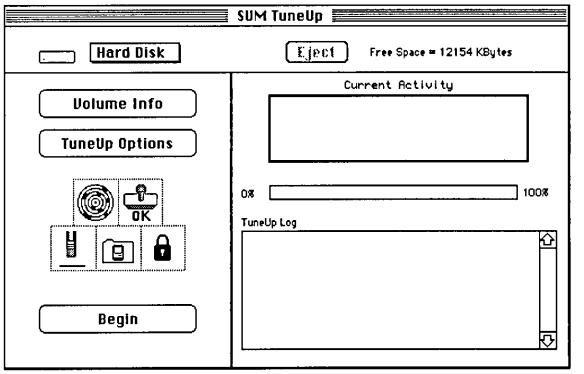
Having large blocks of contiguous free space on a volume can be useful for the following reasons:

- It reduces the probability that new files you add to the volume will be fragmented.
- It allows you to create larger partitions.

SUM TuneUp has a feature available that optimizes free space on your volumes. This is accomplished by literally moving each and every file into a contiguous area of the disk. Think of it this way, if you moved all of the furniture in your living room into one corner, you'd have a great deal more contiguous floor space available, and everything would be more readily accessible.

Defragmenting your files and then subsequently optimizing your volume organizes your data in the most compact and efficient manner possible.

Using SUM TuneUp



Launching SUM TuneUp

1. Locate the SUM TuneUp icon on your desktop:

2. Launch SUM TuneUp by clicking on the icon to select it and then choose **Open** from the **File** menu. Or simply double-click the SUM TuneUp icon. (You can also launch SUM TuneUp directly from SUM Disk Clinic.) After SUM TuneUp starts, your screen looks similar to the one above.

Selecting a Volume

The pop-up menu at the top of the window shows the volume that is currently selected. You can select a different volume by choosing it from the pop-up menu.

If you select a floppy disk (or other type of removable media), the **Eject** button is activated. Clicking this button ejects the volume.

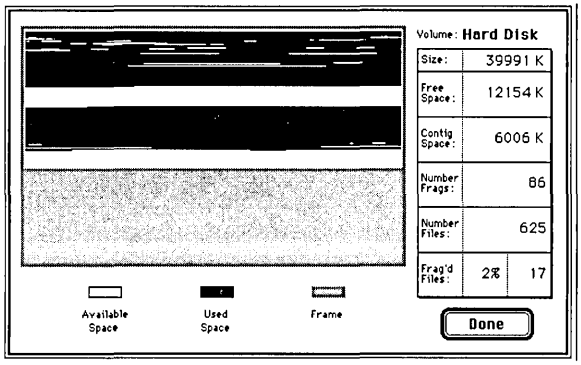
Some restrictions apply when selecting volumes:

- You cannot optimize space on your startup volume or on the volume from which you launch SUM TuneUp. You can overcome this by starting up from a different volume or launching SUM TuneUp from a different volume.
- You cannot tune up a volume partition smaller than 800K in size. Volumes must be at least 800K to be in the HFS format, and SUM TuneUp works only with HFS volumes. This applies to partitions created with SUM Partition or any similar software.
- You cannot tune up any volume on which Apple™ Desktop Manager is running.
- Before running SUM TuneUp, remove all copy-protected software (some music programs and games are copy-protected) from the volume you are tuning up.

Volume Info

Clicking **Volume Info** instructs SUM TuneUp to analyze the selected volume and show you the results. You would normally analyze the volume in this way prior to performing the actual tune up to determine how badly the volume is fragmented and also to determine how much free space is available.

After the analysis is complete, a window similar to the one shown here is displayed.



This window shows graphically how the volume is organized along with various important statistics. The window is for observation only; therefore, you cannot change anything.

The graphic display on the left side of the window gives you some indication of the state of fragmentation that exists on the volume. **Black** represents Used Space – that is, locations that contain data; **White** represents Available Space; **Gray** represents the Frame for the window – that is, this area is not available to the particular volume.

The statistics on the right side provide the following information:

Size: Indicates the volume's maximum capacity.

Free Space: Indicates the total amount of space currently available on the volume.

Contig Space: Indicates the largest block of contiguous free space available.

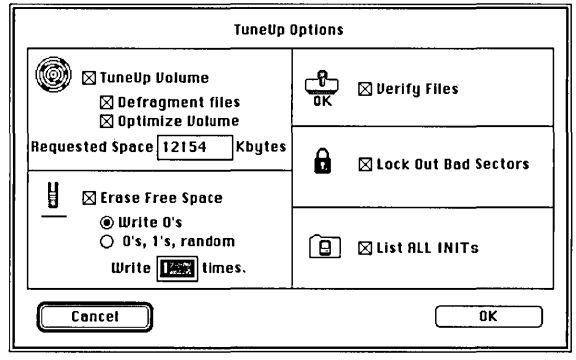
Number Frags: Indicates the number of file fragments found on the volume.

Number Files: Is the total number of files on the volume.

Frag'd Files: Shows the percentage fragmented files (in this case, 17) relative to the total number of files (625). We recommend tuning up a volume that is more than 5 to 7% fragmented.

TuneUp Options

Clicking **TuneUp Options** gives you access to the other functions you can have SUM TuneUp perform on the selected volume.



You can also activate and deactivate the TuneUp options by clicking their respective icons located just below the **TuneUp Options** button. Activating an option this way uses whatever option settings are currently selected in the TuneUp Options' dialog.

TuneUp Volume

This is the standard tune up option. Click it ON when you want SUM TuneUp to reorganize and defragment files on the selected volume. **TuneUp Volume** offers two additional options for controlling how the tune up is performed: **Defragment Files** and **Optimize Volume**.

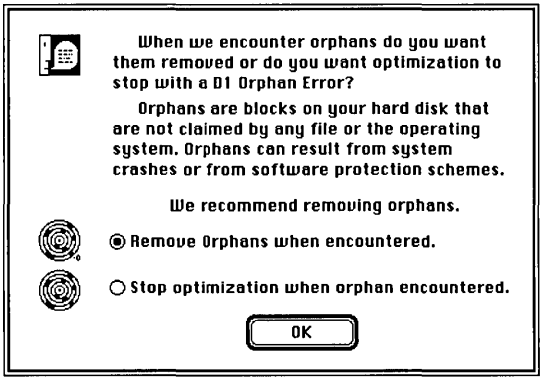
Defragment Files Option

This option instructs SUM TuneUp to tune up the volume by simple defragmentation of files. In this case, the program leaves the first fragment of each file in its current location on disk, *collects* the other fragments of the file, and then *attaches* the stray fragments to the first fragment in its original location.

Optimize Volume Option

Optimize Volume moves files around on the volume to maximize available free space.

When you select Optimize Volume, this dialog appears:



This dialog lets you decide how SUM TuneUp handles "orphans," which SUM TuneUp may encounter during a tune up operation. An *orphan* is a block on your volume without a directory entry or a file allocation or doesn't belong to any file or operating system. This usually is caused by a system crash or certain software protection schemes.

You can control how SUM TuneUp handles an orphan by selecting an option in the Optimize Volume dialog. You can choose to **Remove Orphans when encountered** or **Stop Optimization when orphan encountered**.

If you select **Remove Orphans when encountered**, SUM TuneUp eliminates the orphans from the volume when it finds them. This is done automatically and without interrupting the tune up process.

If you select **Stop Optimization when orphan encountered**, SUM TuneUp alerts you when an orphan is encountered with the message "Unexpected error, cancelled. D 1" and terminates the tune up operation. Once the optimization is terminated, leave SUM TuneUp and use Apple™ Disk First Aid to fix your volume's errors.

Of the two orphan control options, we recommend the first – **Remove Orphans when encountered**. This option lets you optimize a volume without interrupting the process and eliminates the orphans automatically.

Select an orphan control option by clicking on the button. Then, click **OK** to save the setting.

When you select **Optimize Volume**, the **Requested Space...kBytes** text field becomes active. By entering a number in this field, SUM TuneUp will attempt to reorganize the files so that you end up with at least that amount of free, contiguous space on the volume. The default value you see here is always the maximum amount of contiguous space that can be made available on the selected volume.

Verify Files Option

Clicking this option ON instructs SUM TuneUp to verify each and every file on the volume. That is, SUM TuneUp reads each file to ensure that it can be read without resulting in a disk error.

Using the **Verify Files** option gives you the security of knowing that all of your files are correct following any tune up operation, but it does lengthen the operation considerably. You must weigh whether or not the additional time is important to you.

Erase Free Space Option

When you click the **Erase Free Space** option ON, SUM TuneUp erases all unused space on your volume, including space occupied by deleted files, by replacing it with binary zeros or a random pattern of binary zeros and ones.

Remember, when you delete files or defragment a volume, the original information remains on the volume. Even though the data cannot be accessed directly by the Macintosh file system, data can be recovered using special utility programs, such as SUM Tools, SUM Recover, and others. This options ensures that the data cannot be recovered by *any* method. For example, if you erase free space, all the entries in the Deleted File Record are invalid, and you cannot recover deleted files from the volume.

You'll find the Erase Free Space option useful if your volume contains sensitive data that you want to make sure no one can access.

When you select this option, you must also select the method you want to use to erase free space. You can either **Write 0's** (zeros), or **Write 0's and 1's in random order.** (The latter option is one typically used by government agencies.)

Write 0's Option

SUM TuneUp fills the free space with binary zeroes. This option is adequate for most purposes.

Write 0's, 1's, Random

SUM TuneUp fills the free space with a random pattern of binary zeroes and ones.

When you select this option, you can also specify the number of times you want the random pattern written into the free space by entering a value into the **Write...Time(s)** text field.

This option makes three separate passes on the volume to write the bit pattern and, therefore, is time consuming. Unless you specifically require this bit pattern, use the **Write 0's** option.

Lock Out Bad Sectors

Sometimes the physical surface of a device sustains damage that can lead to problems. For example, a small area might loose some of its ability to hold the magnetic charge needed to record data (this is commonly referred to as "dropping bits"). Your Macintosh does not detect these problems (unless they are severe) and will go ahead and write data into these bad areas or "sectors." But when you attempt to read the data, you might find it is corrupted or even unreadable.

The **Lock Out Bad Sectors** option detects bad sectors and "flags" them so that data cannot be written into those sectors.

If SUM TuneUp detects a bad sector, it reports its location in the *TuneUp Log* area.

If a bad sector already contains a file, you must recover that file before locking out the sector. In this case, SUM TuneUp tells you how to do this, (or you can refer to the error message "Sector is allocated to a file..." in Appendix A).

List All INITs Option

INITs are small programs that load into memory every time you start up your system. They reside in your system folder and perform a variety of functions. For example, the SUM Partition INIT occupies a small portion of memory and handles all of the operations you want to do with volume partitions.

By clicking the **List All INITs** option ON, SUM TuneUp displays a list of the INITs and CDEVs in your system folder along with the ID numbers and other pertinent information.

Begin Button

After selecting the options you want and the volume you want to use, click **Begin** to start the tune up. A dialog appears suggesting that you back up your important files before doing the operation. This is a precautionary step, but one we recommend. See Chapter 7, *SUM BackUp*.

While the tune up is taking place, the **Begin** button changes to **STOP**. Click **STOP** to halt the operation or press ⌘ – . (period) at any point. If an operation is in progress when you click **STOP**, that operation finishes before the program halts.

If a screen blanker, such as Pyro™ or AutoBlack, is installed and activates during the tune up process, the screen is not fully refreshed. The results of the tune up are displayed when the process is complete.

Current Activity Indicator

While the tune up is being performed, the current activity is indicated in this box. The icon displayed matches those shown in the TuneUp Options' dialog.

Progress Indicator

This bar gradually fills in from 0% to 100% to indicate how much of the current activity has been completed.

Messages Area

Messages appear in the *Messages* area to keep you informed of the program's progress. You can save the information that appears in the *Messages* window using the **Save TuneUp Log** command in the **File** menu. (This command is described later in this chapter.)

You might occasionally see a message that SUM TuneUp is unable to defragment a file. In some instances, SUM TuneUp cannot defragment a file because

- SUM TuneUp cannot find enough contiguous disk space to store the file it is attempting to defragment.
- The file is locked (this is done using the **Get Info** command in the desktop's **File** menu).
- The file is in use. This always occurs with the System and Finder files on the current startup disk. It can also occur if you are running an application under MultiFinder or if you have desk accessories open.

These situations do not require action on your part. The program continues to run without your response.

If an error occurs, an error message appears in the Messages area. In rare cases, you may see this message "Unexpected Error, cancelled. D 1." This message is displayed when SUM TuneUp encounters an orphan.

SUM TuneUp provides a way to handle orphans. See *Optimize Volume Option* on page 6-6 for more information.

You can find a list of error messages with detailed descriptions and proposed solutions in Appendix A, *Error Messages*.

Once the tune up is complete, the program shows the results in the *Messages* area.

Quitting SUM TuneUp

When you are finished with SUM TuneUp, you can exit to various locations by choosing one of the following commands from the **File** menu:

- **SUM Disk Clinic** takes you to the SUM Disk Clinic Main Menu.
- **Transfer** lets you transfer directly to a different application.
- **Quit** returns you to the desktop.

Special Operations

Defragmenting Your Desktop

SUM TuneUp cannot defragment a file that is currently in use, such as the System file or the desktop on your startup volume. Because of its high level of activity, the desktop is often the most fragmented file on a volume. Tuning up the desktop normally helps your Macintosh operate faster and more efficiently.

You need a special startup disk for this operation. This startup disk should contain a system folder (with at least the System and Finder files inside) and a copy of the SUM TuneUp utility.

Here's how to tune up the desktop on your startup volume:

1. Use your special startup disk to start your Macintosh.
2. Launch SUM TuneUp.
3. Select your ***original*** startup disk (the one containing the desktop you want to defragment) as the volume to tune up.
4. Click **TuneUp Options** and select the options you want to use. You should at least select the **Defragment Files** option.
5. Click **Begin** when you are ready to start.
6. After the tune up is complete, quit SUM TuneUp and restart your Macintosh from your original startup volume.

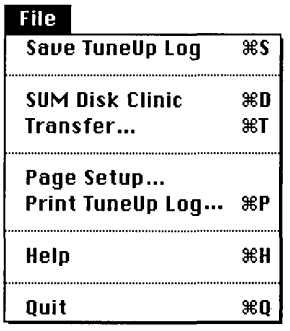
Copy-Protected Files

You should not tune up any volume that contains copy-protected files. Remove such files from your volume before doing the tune up and then replace them afterward.

SUM TuneUp on Networks

You can tune up most volumes on a network, but you cannot tune up the file server from a remote location.

File Menu



Save TuneUp Log

This command saves a copy of the information in the *Messages* window to a file on disk.

The log file is always stored at the lowest level (root) of the volume that was tuned up. The file is named with the name of the volume, the date and time, and the word SUM. For example, if you tune up the volume named "Hard Disk" at 2:15 PM on July 1st, the log file is named **Hard Disk 7/1/89 2.15 PM.SUM.**

The log file is a standard, unformatted text document; therefore, you can open it using most word processing applications.

SUM Disk Clinic

Choose this command if you want to launch or return to SUM Disk Clinic.

Transfer

Use this command if you want to launch any application other than SUM Disk Clinic. A standard file selector dialog appears so you can select the application you want.

Page Setup

Displays the standard Macintosh dialog for setting page orientation, size, and printing options. Use prior to printing the TuneUp Log with the **Print TuneUp Log** command.

Print TuneUp Log

Prints the TuneUp Log as shown in the *Messages* window.

Help

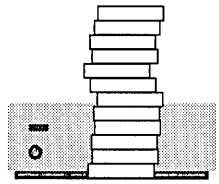
Displays a series of dialogs containing instructions for using SUM TuneUp.

Quit

Terminates SUM TuneUp and returns you to the desktop.

End of Chapter 6

SUM BackUp



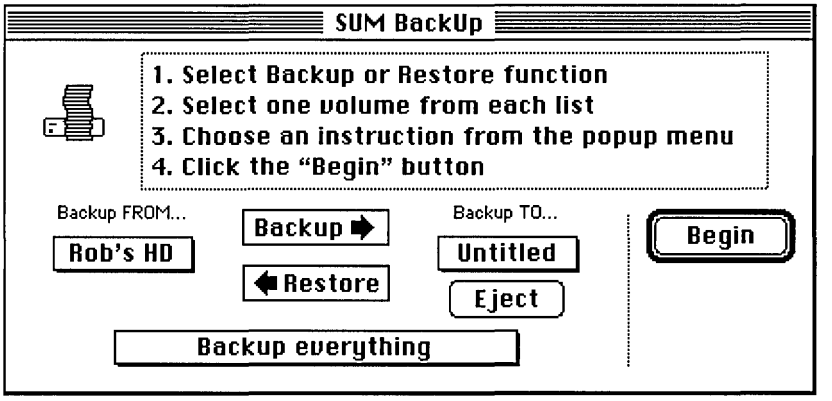
SUM BackUp provides a fast and efficient way to back up the files on your hard disk. You can back up to floppy disks, other hard disks, removable cartridges, or any other device that shows up on your desktop as an HFS volume. However, you cannot use SUM Backup to back up from one floppy disk to another; use SUM QuickCopy for that.

Because SUM BackUp automatically backs up only the files that have changed since the last backup, this makes it convenient to back up on a daily basis. You can also use the program to restore your files because SUM BackUp stores the files in a special format.

SUM BackUp automatically includes all your files in a backup, you can be selective about the files you back up or restore. You can:

- Back up or restore everything.
- Back up or restore only applications.
- Back up or restore only documents.
- Back up or restore a single file or folder.

Using SUM BackUp



Launching SUM BackUp

1. Locate the SUM BackUp icon on your desktop:

2. Launch SUM BackUp by clicking on the icon to select it and then choose **Open** from the **File** menu. Or simply double-click the icon. (You can also launch SUM BackUp directly from SUM Disk Clinic, as described in Chapter 4). After SUM BackUp starts, your screen looks similar to the one above.

Notice the steps 1 through 4 at the top of the window. These are the steps you follow during a Backup or Restore process. Take a moment to read these before continuing.

Backup or Restore

The two buttons – **Backup** and **Restore** – let you back up or restore files from and to various volumes.

Click **Backup** to store copies of your files on floppy disks or some other media; click **Restore** to copy previously backed up files back onto your hard disk.

Selecting Volumes

The two pop-up menus, **Backup FROM** and **Backup TO**, display all the currently available volumes. They allow you to choose the volume you're backing up or restoring (source) and the volume you're backing up to or restoring from (target).

To select a different volume, display the pop-up menu and select a volume.

Source Volume

The source volume is the volume you want to backup FROM or restore TO. Choose your source volume from the pop-up menu on the left.

Target Volume

The target volume is the volume you want to backup TO or restore FROM. Choose your target volume from the pop-up menu on the right.

Only the volumes marked with a diamond in the pop-up menu can be used for backups. Any other volumes shown are unavailable because the volume is a startup volume, this is the volume you launched SUM Disk Clinic from, or the volume is locked.

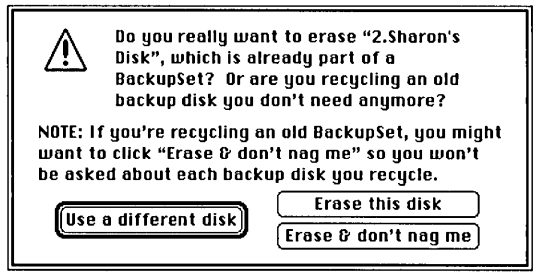
Initial Backup

To back up the files on your hard disk, you will perform an *initial backup* and create a set of backup disks, called a *backup set*. Once you have this initial set, you can use them again and again in incremental backups (described next). (If you are making backups to floppy disks, the program tells you exactly how many disks are needed.)

To create an initial backup, do the following:

1. Click **Backup**.
2. Select your ***source volume*** (the hard disk you want to backup). To do this, display the pop-up menu on the left and choose the hard disk you are copying FROM.
3. Select your ***target volume*** (the disk you want to backup TO). If you're backing up to floppy disks or other removable media, insert a disk now. Display the pop-up menu Backup TO and choose the name of your target volume.

   Any volume not currently mounted on the desktop is not shown in the pop-up menu. Because the volume is not displayed, you cannot select it as the **source** or **target volume**.
4. Click **Begin**. A dialog confirms that it's OK to erase the target disk. If you insert a floppy disk that is part of previous backup set, you'll see this dialog:



   Read the warning carefully, then click one of these buttons: **Use a different disk**, **Erase this disk**, or **Erase & don't nag me**.

   After you respond, SUM BackUp begins backing up everything from the source volume you selected. **Please note that SUM BackUp does not back up files if the file name begins with a period.**
5. Insert disks as prompted. You will be asked to insert as many disks as needed to complete the backup. SUM BackUp numbers these disks internally, but you need to label them externally! Label the disks "1.hard disk name," "2.hard disk name," and so forth.

   Except for the first disk in the backup set, you can insert unformatted disks, blank disks, or used disks. The first disk cannot be part of a previous SUM backup set, and preferably, should be blank.
6. After all files are backed up, SUM BackUp prompts you to reinsert the first disk so that the backup set directory can be updated. **It's important not to skip this step!**

Do not misplace the first disk in you backup set because that disk contains important information needed to restore your files.

Incremental Backup

After you create an initial backup set, SUM BackUp reuses the backup set, backing up only those files that have changed since the last backup. The program compares the contents of your source volume with the contents of the backup set and makes the changes to the backup set. This means new files are added to the backup set, changed files are overwritten, and files deleted from your hard disk are removed from the backup set.

To perform an incremental backup:

1. Click **Backup**.
2. Select your *source volume*.
3. Select your *target volume* (the first disk of your existing backup set). If you used floppy disks or other removable media for the backup, insert the first disk of the backup set now.
4. Click **Begin**. A dialog box appears asking you to confirm that it's OK to use this backup set. After you respond, SUM BackUp begins backing up only the files that have changed.
5. Insert the disks when prompted. You are only asked to insert the disks that contain files that have changed; if new files were added, you may need a new disk or two.
6. Reinsert the first disk in the backup set at the end of the backup to update backup set directory.

Reinserting the first disk at the end of the backup is an important step. You cannot restore your files if you don't update the backup set directory! If your backup is interrupted before this step is completed, follow the instructions on page 7-7 to correct the situation immediately.

Restore

In the event that your hard disk has been erased or reinitialized, you can smoothly reconstruct its contents by using SUM BackUp to restore your entire hard disk. (Redux files are not interchangeable with SUM BackUp, so if you back up a volume with Redux, you can't restore the files using SUM BackUp or vice versa.)

First, you'll need to create a disk from which you can start your Macintosh and launch SUM BackUp. This disk, let's call it startup, should contain a system folder (with the System and Finder files inside) and a copy of SUM BackUp.

1. Use this startup disk to start your Macintosh.
2. Launch SUM BackUp.
3. Click **Restore**.
4. Select your *source volume* (the hard disk you want to restore TO). To do this, display the pop-up menu on the left and choose your hard disk. If your hard disk is not available, you can also restore to floppy disks or any other HFS volume.
5. If you're restoring from floppy disks, you'll need to eject your startup disk so that you can insert the backup set disks. To do this, display the pop-up menu on the right and choose the name of the startup disk. Click the **Eject** button.
6. Select your *target volume* (the disk you want to restore FROM). If your backup set is on floppy disks or other removable media, insert the first disk of the backup set now. Display the pop-up menu on the right and choose the name of your target volume.

7. Click **Begin**. SUM BackUp begins restoring files to the destination you specified. The program prompts you to insert each disk of your backup set as needed. If SUM BackUp tries to restore a file that already exists on the hard disk, you must confirm the replacement.

If you are restoring a file that is larger than the destination volume, the message "Had problem writing 'file name.' Disk Full. Stop Now or Continue." is displayed. By selecting **Continue**, you can locate, select, and restore files that will fit on the destination volume.

Special Restore Operations

Running SUM BackUp on the Hard Disk

You can also restore your hard disk by running SUM BackUp from the hard disk itself. To do this, the hard disk must contain SUM BackUp, a System file, and the Finder. Then, you can simply run the program from the hard disk, following the instructions described in the last section, but eliminating the need to eject the startup disk (Step 5).

Restoring Does Not Erase Source

If you restore to a hard disk that already contains files, SUM BackUp will not erase the files currently on the hard disk. It simply writes the files to be restored in whatever space is available and continues to do so until all files have been restored or until you encounter a "Disk Full" message.

Replacing Existing Files

If SUM BackUp tries to restore a file that already exists on the hard disk, it asks you whether you want to replace that file or skip it. You'll also have the opportunity to tell SUM BackUp to "Replace all" duplicate files or "Skip all" duplicate files.

Selective Restores

If you want to restore just one file or folder, perhaps all your applications, or all your documents, you can use SUM BackUp to streamline the process. These features are described on the next page.

Selective Backups

SUM BackUp automatically backs up every file and folder on your source volume. However, you can back up a specific set of files. You can use a *Backup Instruction* to tell SUM BackUp to backup only documents, for example, a single file or folder.

To select an instruction for an initial backup:

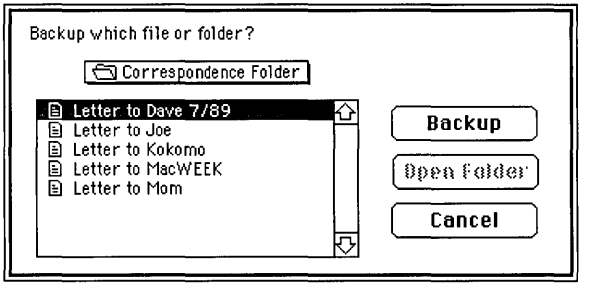
1. Launch SUM BackUp.
2. Click **Backup**.
3. Select your **source volume**.
4. Select your **target volume**.
5. Choose one of the Backup Instructions from the pop-up menu at the bottom of the SUM BackUp window:

   Backup everything backs up all files and folders on your source volume.

   Backup only applications backs up only the applications on your source volume.

   Backup only documents backs up all files *except* applications or system files.

   Backup a single file or folder allows you to choose individual items to be backed up. Choosing this menu item displays this dialog:



6. Click on a file or folder to select it; double-clicking a folder opens that folder. Select an item by clicking on it or use the Shift-click method to select multiple items. When the item or items are selected, click the **Backup** button.
7. After you've selected a Backup Instruction, click **Begin** to start the backup. Only the files you specified are backed up.
8. Finish the backup as normal, inserting disks as necessary, including reinserting the first disk at the end of the backup.

When you specify a Backup Instruction in an initial backup, all incremental backups performed with that backup set follow the same instruction. If, for example, you chose "Backup only documents" in your initial backup, any applications you add are not added to the documents-only backup set.

If you want to change the instruction of an existing backup set during an incremental backup, press and hold the Option key and click on the existing instruction. The pop-up menu reappears, and you can select a different instruction. This changes the contents of your backup set.

Selective Restores

You can also use SUM BackUp to perform selective restores of your hard disk. After you click **Restore** and select your source and target volumes, you'll be able to select a *Restore Instruction* from the pop-up menu that has four options: restore everything, restore only applications, restore only documents, or restore a single file or folder.

Missing Disks

If one of the disks in your backup set is missing, you can use SUM BackUp to recreate the disk (during a backup) or skip the missing disk (if you're restoring).

Suppose you're in the middle of a backup and SUM BackUp asks for a disk you don't have. If you click the **Missing** button at the bottom of the window, SUM Backup recreates the missing disk.

If you are restoring files with your backup set and you don't have the disk that SUM BackUp is asking for, click the **Missing** button. SUM BackUp skips over that disk and continues restoring files from the next disk.

You cannot recreate the first disk of the backup set because that disk contains the directory. Make sure you don't lose this disk since you cannot recreate that disk if it is damaged or lost. As a precaution, use SUM QuickCopy to make an extra copy of the first disk of your backup set.

Resuming the Backup

If for any reason your Macintosh experiences an unexpected shut down while you're in the middle of a backup, you can resume the backup exactly where you left off.

If SUM BackUp stops unexpectedly due to a power outage or a system crash, look for the file "Directory" in the same folder as SUM BackUp on your hard disk. Drag this file to the first disk of your backup set and update the set. Then, launch SUM BackUp again. Once the program is launched, click **Backup**, choose your source volume, choose the new updated target disk, and click **Begin**. SUM BackUp continues from where you left off, and only asks you to insert disks that contain files not backed up the first time around.

Pause or Stop Now

During the backup process, you can pause or stop at any time. While SUM BackUp is backing up files, notice the **Pause** and **Stop Now** buttons in the window.

Pause temporarily halts the backup; when you click **Continue**, the backup is resumed.

Stop Now ends the backup session. You must insert the first target disk, SUM BackUp then updates the directory on the first target disk. The next time you use this backup set, SUM BackUp reads the directory from the first disk and continues the backup where you left off.

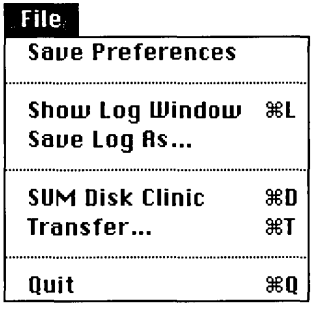
Quitting SUM BackUp

When you finish SUM BackUp, you can exit by choosing one of these commands from the **File** menu:

- **SUM Disk Clinic** takes you to the SUM Disk Clinic Main Menu.
- **Transfer** lets you move directly to another application.
- **Quit** returns you to the desktop.

SUM BackUp Menus

File Menu



Save Preferences

Saves the settings you choose in the **Preferences** menu.

Show Log Window

When checked, this command causes the SUM BackUp Log window to display a report of the backup in progress.

Save Log As

Saves the contents of the Log window as a text file so that you can keep records of your backup. The file can be opened with most word processors.

SUM Disk Clinic

Takes you to the SUM Disk Clinic Main Menu.

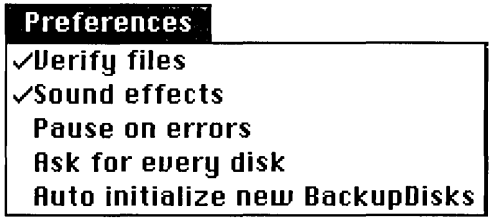
Transfer

Lets you transfer directly to another application.

Quit

Exits SUM BackUp and returns to your desktop.

Preferences Menu



Verify files

Instructs SUM BackUp to compare each backed up file to its original counterpart on the hard disk. We highly recommend you leave this item checked because it helps maintain the integrity of your backups.

Sound effects

When checked, you hear the standard Macintosh "beep" when it's time to insert another disk, respond to a dialog, and so forth.

Pause on errors

When checked, SUM BackUp interrupts the backup if it has trouble backing up a file. Normally, SUM BackUp reports any errors in the Log Window while your backup proceeds, and confirms the integrity of the backup at the end of a session. However, if **Pause on Errors** is checked, the backup is interrupted if an error is reported; you must respond to a dialog to continue.

Ask for every disk

Use this command when you want to recreate a missing backup disk. When this item is checked, SUM BackUp asks for every disk in the BackupSet during an incremental backup. When the program asks for the missing disk, click the **Missing** button, and the backup disk is recreated.

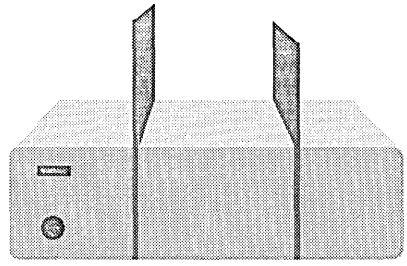
Auto initialize new Backup Disks

When checked, SUM BackUp automatically initializes new disks when they are inserted and selected as target volumes, instead of asking if you want to initialize each new disk.

End of Chapter 7

Notes

SUM Partition



SUM Partition lets you divide a volume into multiple, separate partitions that are treated and managed independently of one another. Think of each partition as a separate disk drive that you can manage like any drive on your system. Partitions have these unique features:

- You can specify the size of each partition as long as you have enough contiguous space available.
- Each partition is identified by a special icon on the desktop so you can easily distinguish it.
- Mounting the partition provides access to the contents, while unmounting it makes the contents unavailable.
- Encryption and password protection provide partition security.

When you encrypt a partition and protect it with a password, the partition cannot be accessed without entering its password first. This lets you protect sensitive documents, such as personnel files, payroll information, financial spreadsheets, and so forth.

SUM Partition works with hard disks *and* floppy disks. Although the program's principle use is with hard disks, the encryption schemes make this program useful on floppy disks under certain situations, which you'll learn about later.

Although the basic procedures are the same with hard disks or with floppies, this chapter assumes you are using a hard disk.

SUM Partition consists of two components:

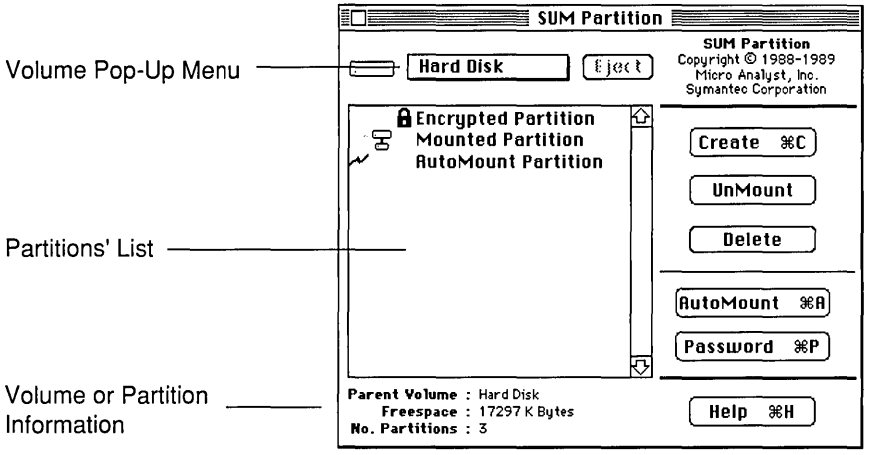

SUM Partition

SUM Partition INIT contains information your system needs, such as the number and location of partitions, thus it *must* be in your startup disk's system folder. Once in your system folder, SUM Partition's icon appears briefly on the screen when you start your Macintosh. If it doesn't appear, it was unable to load, and you cannot access your partitions .


SUM Partition DA

SUM Partition DA is used to create, mount, unmount, and delete partitions. It also lets you select the partitions you want automounted at startup time and change passwords for encrypted partitions.

Using SUM Partition



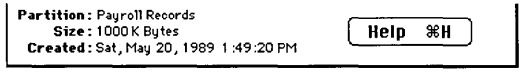
SUM Partition INIT must load into memory at startup time for you to use the partitioning functions, but you use the desk accessory to actually perform the functions. (Do not use SUM Partition with the DA Camera because it can corrupt your partitions. SUM Partition works well with many other screen capture programs.)

To access the desk accessory, choose **SUM Partition** from the *4* menu. You see a window similar to the one shown above.

The currently selected volume appears in the Volume pop-up menu. You can select a different volume by displaying the pop-up menu and choosing from those listed. If you choose a removable volume (such as a floppy disk), the **Eject** button becomes available to remove and insert a different volume.

Notice that near the bottom of the window the amount of free space and the number of partitions on the selected volume are shown.

The *Partitions' List* shows the partitions available on the current volume. You can select a partition in this list by clicking on it but can only select one at a time. When you select a partition in the list, the information at the bottom of the window changes to show the partition's size and the date and time it was created:



The names in the Partitions' List are often preceded by one or more of the following icons to indicate their current status:

Indicates that the partition is *currently mounted*. When you select this partition in the list, the **Mount** button is disabled.

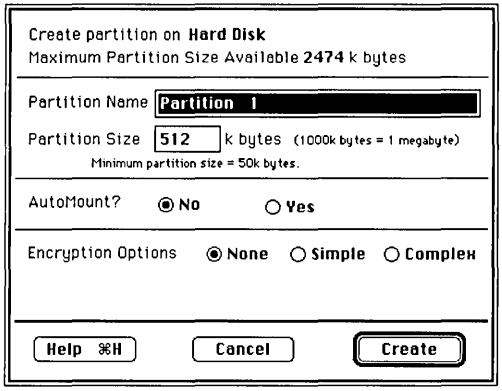
Indicates that the partition is *assigned AutoMount status.*

Indicates that the partition is *assigned a password and encrypted.*

You'll learn more about these icons later in this chapter.

Creating Partitions

To create a partition, click **Create** in the SUM Partition window. The *Create Partition* window appears:



At the top of the window, you see the name of the currently selected volume, and the amount of space it has available for creating partitions. This figure might not match exactly the Free Space shown in the SUM Partition window because partitions can only be created in contiguous free space areas. The amount of free space and the size of the partitions determines how many partitions you can create on a volume.

Keep in mind that you can only create SUM partitions on HFS volumes because SUM Partition does not support the MFS volume format.

Enter the partition's specifications as follows:

Partition Name: Enter the name you want to use to identify the partition. This name appears beneath the partition's icon on your desktop when the partition is mounted.

Partition Size: Notice that 512K is the default partition size; however, the value you enter cannot exceed the "Maximum Partition Size Available."

The value you enter determines the size of the partition. The value is interpreted in kilobytes: that is, if you enter **800**, 800K bytes are allocated to the partition. You can enter any value from 50 to the available space figure shown at the top of the window. However, if you create a partition 400K or smaller, it will not be in HFS format, and therefore, you cannot tune up the partition with SUM TuneUp.

If you want to maximize the amount of free space available on a volume, you can optimize your volume with SUM TuneUp. (See Chapter 6, *SUM TuneUp*, for more information.)

A small part of every partition you create is used to store information about the volume. For example, if you create an 800K partition, you will have slightly less than 800K available for storing data. (This is a normal situation with all volumes. For example, when you format an 800K floppy disk, part of the disk is used for volume information.)

AutoMount?: Select **Yes** if you want this partition to be mounted automatically every time you start your Macintosh. You can change a partition's automount status at any time using the **AutoMount** button in the SUM Partition window (this button is described later in this chapter).

Only those partitions on your startup volume may be assigned automount status. The maximum number of automount partitions you can have on your startup volume is limited by the amount of memory allocated to the Finder.

You cannot automount encrypted partitions. When you select the **AutoMount** option, the **Simple** and **Complex Encryption** options (descriptions follow) are disabled.

Encryption Options: SUM Partition offers three options for encryption.

None – the data in the partition is *not* encrypted. Note that you cannot assign a password when you select this option.

Simple – encrypts the data using simple encryption algorithms. This form of encryption is adequate for most purposes. The advantage it has over **Complex** encryption is that it doesn't require quite as much time to decrypt the data. Note that if you select this option, you *must* assign a password by entering it in the text box just below the **Simple** button. The default password is *My Password*. To use a different password (which is advisable), enter it in the text box. (Make sure you read the section *Password Options* later in this chapter for additional details.)

Complex – encrypts the data using complex encryption algorithms. Here again, if you select this option you *must* assign a password.

When entering passwords, keep in mind that they *are* case sensitive. That is, the uppercase and lowercase characters you enter must match *exactly* those entered when the password was originally assigned.

Two different icons can appear in the Partitions' List to indicate whether a partition is encrypted with the **Simple** or **Complex** method:

 Simple Encryption

 Complex Encryption

Once you have entered all specifications for the partition you want to create, click the **Create** button at the bottom.

During the encryption, do *not* switch off your Macintosh until the encryption process is completely finished.

The time it takes to encrypt a partition is directly related to your Macintosh's processor speed. For example, to encrypt a 1024K partition on a Macintosh SE takes about 20 seconds while on a Macintosh IIci the encryption takes about 4 seconds. These tests were conducted on a standard Macintosh IIci (using System 6.0.4) and Macintosh SE (using System 6.0.3); therefore, your encryption time may vary depending on your system configuration.

When the encryption process finishes, a dialog appears indicating whether or not the partition was created per your specifications.

When you create a new partition, we recommend you create a VIF, the Deleted File Record, and the Volume Restore Record for this partition. If the partition crashes, you can use this information to recover it.

Even if you already have a VIF for your hard disk before you create a new partition, you must create a VIF for that new partition.

If a partition crashes and you don't have a VIF, there is a way to create a substitute VIF. First, create another partition that is exactly the same size as the crashed partition (if you have enough contiguous space). Then, create a VIF for the new partition. Use the VIF from the new partition to recover the crashed partition, and then delete the new partition from the volume.

To avoid such a disaster, create a VIF immediately after you create a new partition.

Mounting Partitions

Before you can access a partition, you must mount it. Mounting causes the partition's icon to appear on your desktop. Once the partition is mounted, you open it the same way you open any other icon – that is, either double-click the icon, or select it and choose **Open** from the desktop's **File** menu.

To mount a partition, do the following:

1. Choose **SUM Partition** from the *4* menu.
2. If necessary, use the pop-up menu to select the volume where the partition you want to mount is located.
3. Select the partition you want to mount in the Partition List by clicking on it. Remember, the icons to the left of the partition names indicate their current status.
4. Click **Mount**, and the selected partition is mounted. You should then see its icon on your desktop.

If the partition you select is encrypted and password protected, a dialog prompts you to enter the password. When you type the password in the dialog, the characters you type do not appear but are represented by asterisks. This prevents unauthorized persons from observing the password as you enter it.

Once the partition is mounted, its icon in the Partitions' List reflects its current status.

Unmounting Partitions

Unmounting a partition removes its icon from the desktop – the partition is no longer accessible until you mount it again.

A Macintosh operating system software limitation prevents you from unmounting partitions at the desktop by launching SUM Partition from the *4* menu. In such cases, the **UnMount** button is disabled and is *only* enabled when you are working within an application. To unmount any partition from the desktop drag its icon to the Trash. Unmounting does not delete the partition from the volume.

To unmount a partition within SUM Partition, do the following:

1. Choose **SUM Partition** from the *4* menu.
2. If necessary, use the pop-up menu to select the volume where the partition you want to unmount is located.
3. Select the partition you want to unmount in the Partitions' List.
4. Click **UnMount**. The selected partition is unmounted, and its icon is removed from the desktop.

Once unmounted, the partition's icon in the Partitions' List changes to reflect its status.

At certain times, you'll need to unmount a partition or will have trouble performing certain operations. For example:

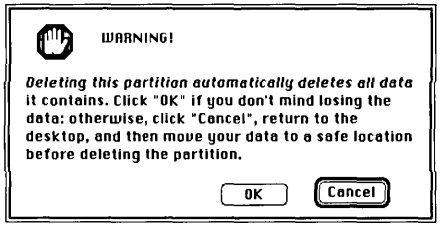
- If you are attempting to recover a partition with SUM Recover, unmount the partition before starting the recovery process.
- If you are using Apple's Desktop Manager, you must have System 6.0.4 to unmount a partition, or your attempts to unmount the partition are ignored.
- Before changing a partition's encryption options or password, unmount the partition.

Deleting Partitions

Deleting a partition removes it permanently from the volume and reallocates its space accordingly. To remove the partition's icon from the desktop but keep the partition on your volume, use **UnMount** rather than **Delete**.

You cannot delete a partition that is currently mounted. To delete a partition, make sure it is not mounted, and then do the following:

1. Choose **SUM Partition** from the *4* menu.
2. If necessary, use the pop-up menu to select the volume where the partition you want to delete is located.
3. Select the partition you want to delete in the Partitions' List.
4. Click **Delete,** and an alert appears informing you that deleting the partition automatically deletes all of the data it currently contains. If you don't mind losing the data or if the partition is empty, click **OK** to proceed with the deletion.



If you want to retain any data in the partition, click **Cancel** and then move the data you want to save to another volume. Then, repeat these steps to delete the partition.

If the partition you are deleting is encrypted and password protected, a dialog prompts you to enter the password. When you type the password in the dialog, the characters you type do not appear but are represented by asterisks.

AutoMounting Partitions

You can select multiple partitions to automount. Each partition you select is automatically mounted when you start your system, and its icon appears on your desktop.

One way to automount a partition is to assign it AutoMount status when you create the partition. (See *Creating Partitions* earlier in this chapter.)

The **AutoMount** button in the SUM Partition window provides another way to assign or remove AutoMount status from a partition. This button works like a *toggle switch.* If the selected partition already has AutoMount status when you click the button, AutoMount is disabled, and vice versa.

Some limitations apply here:

- You cannot assign AutoMount status to an encrypted partition.
- Only partitions on your startup volume can be automounted. The maximum number of automounted partitions allowed depends on the amount of memory allocated to the Finder. You must *not* exceed the amount of memory allocated.
- You cannot change the AutoMount status of a partition that is currently mounted – unmount the partition before proceeding.

To change a partition's AutoMount status, do the following:

1. Choose **SUM Partition** from the *4* menu.
2. If necessary, use the pop-up menu to select the volume where the partition you want to change is located.
3. Select the partition you're changing in the Partitions' List.

4. Click **AutoMount.** The partition's icon in the Partitions' List changes to reflect its current status. If the icon is present, AutoMount status is in effect; otherwise, it isn't.

If the message "Out of Finder memory..." or a mounting error message is displayed while mounting or automounting partitions, unmount as many partitions as needed before continuing.

You can unmount an AutoMount partition at the desktop by simply dragging it to the Trash. To unmount the partition while in another application, see*Unmounting Partitions* on page 8-5.

Password Options

The differences between password protection and encryption are significant. Many skilled computer experts can circumvent password protection with little or no difficulty. Encrypting a partition, however, *scrambles* the data in that partition using special encoding schemes. Even if someone is able to discover the password, the data itself is unusable until it is decoded. Because SUM Partition's encoding/decoding schemes are not accessible, an encrypted partition is fully protected against unauthorized access.

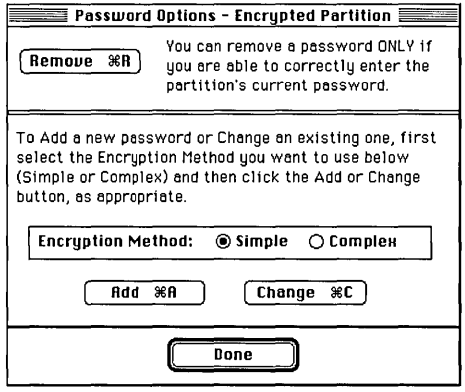
You might find encryption useful with your floppy disks. For example, assume you have sensitive data you want to deliver to a remote location by courier, by mail, or by hand. To protect that information from unauthorized users, you can create a partition on a floppy disk, encrypt the data, and assign it a password known only to you. When the disk arrives at its destination, you give the recipient the correct password, and they have access to the data, assuming that they have their own copy of Symantec Utilities for Macintosh.

Obviously, simply encoding the data in a partition without also assigning a password does not provide any protection whatsoever. **Therefore, when you encrypt a partition, you must also assign a password.**

Normally, you assign a password to a partition and encrypt it at the time it is created. SUM Partition also gives you the ability to remove, add, and change an existing partition's password.

To encrypt a partition or to add, remove, or change passwords for existing partitions, do the following:

1. Choose **SUM Partition** from the menu.
2. If necessary, use the pop-up menu to select the volume where the partition you want to change is located.
3. Select the partition you want to change in the Partitions' List.
3. Click **Password.** You then see a window similar to this:



When you add, change, or remove password protection from a partition, the time it takes depends on two things: the partition's size and your Macintosh's processor. For example, adding a password to a 1024K partition took only 4 seconds on a Macintosh IIci but 20 seconds on a Macintosh SE.

During the password protection process, it appears as if nothing is happening on the screen, even though SUM Partition is working. Until SUM Partition indicates that the process is complete, you should not try to cancel the process or restart your Macintosh. This can be disastrous and could actually delete the partition you are trying to protect.

Removing Passwords

Removing password protection from a partition also decrypts the data in the partition. To remove a password, you must be able to enter its current one.

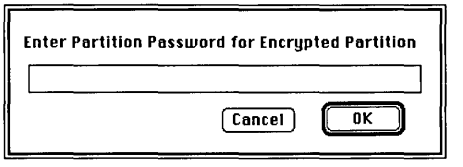
There are different reasons for removing password protection from a partition. For example, you must remove the password protection from a partition before creating its VIF.

To remove the password, click **Remove.** A dialog asks you to enter the partition's current password. If you enter the correct password, SUM Partition decrypts the data and removes the password protection. You cannot continue with the operation until you enter the correct password.

Adding Passwords

Before adding password protection to an existing partition, select the Encryption Method (**Simple** or **Complex**) you want to use. See *Encryption Options* earlier in this chapter for an explanation of the differences between Simple and Complex encryption.

Click **Add,** and a dialog appears prompting you to enter the password you want to assign to the partition. When you type the password, the characters you type do not appear – asterisks replace the characters to prevent anyone from observing the password as you enter it. Passwords should not be more than 22 characters long.



After entering the password, another dialog prompts you to re-enter the password for verification. Again, asterisks appear in place of the characters you type.

CAUTION: There is virtually *no way* to find out a password once it has been entered and assigned. If you forget the password, you can no longer access the partition. Your only way to reclaim the space on the volume in this case is to reinitialize it, which means you must first back up the volume, and then when restoring it, exclude the encrypted partition. When assigning passwords, keep them simple and easy to remember – you might even want to write them down somewhere.

Changing Passwords

Changing an existing password is basically the same as adding a new password with one additional step.

First, select either **Simple** or **Complex** encryption. Then, click the **Change** button.

SUM Partition prompts you to enter the *current* password assigned to the partition. If you enter the correct password, you are then prompted to enter the new password and then verify it.

Once the password is verified, the program begins changing the password. During this process, **do not turn off your Macintosh for any reason.**

Remember, passwords are case sensitve. Uppercase and lowercase characters must match exactly as they were originally entered when the password was assigned.

SUM Partition Icons

The following is a review of the SUM Partition icons, indicating what they represent, how they are used, and where they appear.

Desktop Icons


SUM Partition

This icon represents SUM Partition INIT (a startup document). It must be in the system folder of your startup volume so that it can load automatically when you start your system. The icon appears briefly on your startup screen if the program is able to load successfully. SUM Partition INIT remains in memory and contains the logic your Macintosh uses to handle volume partitions.

Note that the actual name of this component is **@SUM Partition INIT**. The @ symbol causes the INIT to load at startup time *before* Suitcase. If you are using Suitcase, make sure the @ symbol *always* precedes the SUM Partition INIT component name. Otherwise, you'll have problems running the two programs together.


SUM Partition DA

This icon represents SUM Partition DA. SUM Install gave you the option of installing this desk accessory directly into your System file or of simply copying it to your system folder (the later option is provided in the event you are using programs like MasterJuggler or Suitcase).

This icon appears on your desktop when you mount (or AutoMount) a partition. You use it the same way you use a hard disk or floppy disk icon – that is, you gain access to the partition by opening this icon. You can unmount the partition from within an application using the SUM Partition desk accessory: you can unmount the partition from the desktop by dragging this icon to the Trash.

Partitions List Icons

This icon indicates that the partition is currently mounted. If you are working within an application, you can unmount this partition using the **UnMount** button. If you are working at the desktop, the only way to unmount the partition is by dragging its icon to the Trash.

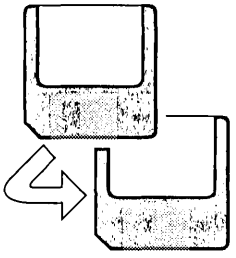
This icon indicates that the partition is assigned **AutoMount** status. Only those partitions on your startup volume can be automounted.

This icon represents a partition that is encrypted using the **Simple** encryption method. To mount this partition, you must be able to enter its password.

This icon represents a partition that is encrypted using the **Complex** encryption method. To mount this partition, you must be able to enter its password.

End of Chapter 8

SUM QuickCopy



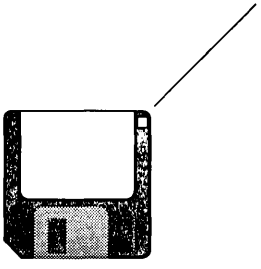
SUM QuickCopy is an extremely fast disk duplication utility. You can use it to make copies of floppy disks – you *cannot* use it to copy information to and from hard disks. The program is especially useful for mass disk duplication and is also an easy way to initialize several floppies at one time.

SUM QuickCopy uses different terms to distinguish one type of disk from another:

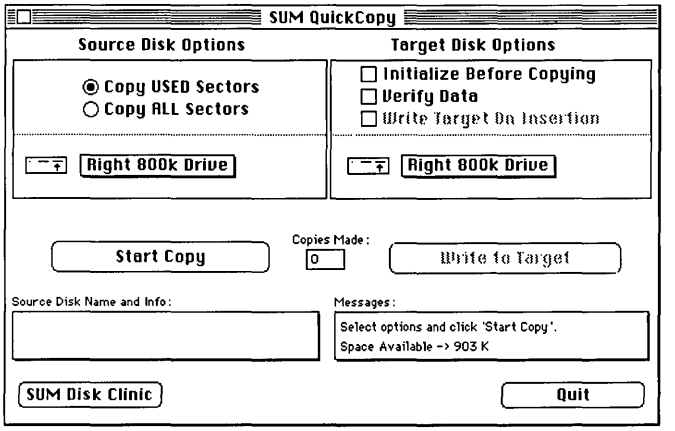
- **Source Disk** refers to the disk *FROM* which the information is to be copied (the original disk).
- **Target Disk** refers to the disk *TO* which the information is being copied (the copy).

Like copying disks on the desktop, SUM QuickCopy has some built-in controls, but it cannot distinguish a Source disk from a Target disk. Therefore, always protect your Source disk or disks by sliding the disk's write-protect tab to the *Read Only* position (that is, push the tab toward the top edge of the disk so you can see through the hole, as in the figure to the left).

Lock your source disk by sliding the Write-Protect Tab so that you can see through this hole.



Using SUM QuickCopy



Launching SUM QuickCopy

To launch SUM QuickCopy from your desktop, do the following:

1. Locate the SUM QuickCopy icon:

2. Click on the icon to select it and then choose **Open** from the **File** menu, or simply double-click the icon.

Once SUM QuickCopy starts, you see a window similar to the one pictured above.

Note the *Space Available* figure shown in the *Messages* area at the bottom, right corner of the window. This figure indicates the amount of memory the program is able to use – which determines how effectively it is able to operate. This can be affected by several different factors. Please read *Memory Usage* at the end of this chapter for more information.

Source Disk Options

You have two options available pertaining to your Source disk (the disk you are copying FROM): **Copy USED Sectors** or **Copy ALL Sectors**.

Copy USED Sectors

This option copies only those parts of the Source disk that contain data. This option is relatively faster than the **Copy ALL Sectors** (unless all sectors on the Source disk contain data).

This is the option you'll probably use most because in most cases, it requires less*Available Memory* than **Copy ALL Sectors** and duplicates disks faster.

Copy ALL Sectors

This options copies *every* sector from the Source disk to the Target disk, whether or not a given sector contains data.

The advantage to this option is that you end up with an *exact* duplicate of the Source disk. Therefore, when making copies of an important master source disk with SUM QuickCopy, this is the option you'll normally use.

This option has two disadvantages:

- More time is required to copy the disk.
- The program requires the maximum amount of *Space Available* to complete the copy.

Copying Applications and Disks

Making unauthorized copies of applications and disks is a violation of federal law and is a detriment to the software development and publishing industry. Symantec Corporation, along with other developers and publishers, urges you obey the federal copyright laws and not use SUM QuickCopy or any other means to make copies of applications and disks except as duly authorized.

Some Macintosh applications are copy-protected, which means only the owner is authorized to make one copy for backup purposes. SUM QuickCopy does not duplicate disks that contain copy-protected files – it simply reports that a disk error has occurred.

Please note that SUM QuickCopy can't be used to copy the data from a crashed floppy disk onto another disk. You should run the Recovery Methods in SUM Disk Clinic to recover a crashed floppy disk.

Selecting the Source Drive

The pop-up menu on the left lists those floppy disk drives you can use to read your Source disk. Select the drive you want to use from this menu.

If your Macintosh SE or SE/30 has an external floppy disk drive, SUM QuickCopy recognizes the external disk drive but not the bottom internal disk drive. Keep this in mind when selecting the Source and the Target disk.

Target Disk Options

A variety of options are available for the Target disk (the disk you are copying TO). If you are making multiple copies of a disk, the Target disk options apply to *every* Target disk.

SUM QuickCopy overwrites the disk directory on your Target disk. Therefore, make sure your Target disks do not contain any data you want to save.

Initialize Before Copying Option

Initializing a floppy disk erases all data on that disk by setting all data bits to zero. All space on the disk is thus available for other files. If you select this option, SUM QuickCopy initializes the Target disk before copying information to it. This option is the equivalent of initializing (or erasing) a floppy disk from the desktop.

You should select **Initialize Before Copying** in the following situations:

- The Target disk is brand new and has never been initialized.
- The Target disk was initialized in a format that is different from that used on the Source disk. For example, if the Source disk is double-sided (800K), but the Target disk was initialized as single-sided (400K). Or the Source is a 400K disk, but the Target is initialized as a high-density disk. The bottom line is simply that the Target disk (or disks) must be initialized in the same format as the Source disk.

- You have selected the **Copy USED Sectors** option for the Source disk and your Target disks contain data that you want to be sure does not remain on the Targets after copies are made.

Although you can initialize a single-sided floppy disk as double-sided, there is an element of risk involved. When disk manufacturers create single-sided disks, they verify only one side of the disk. If you initialize such a disk as double-sided and write data on the unverified side, there is no guarantee that the data will be written correctly. That is, you might be able to use both sides of the disk without problems, but at some point you might not be able to access the unverified portion of the disk. We, therefore, recommend that you do not initialize single-sided disks as double-sided.

Verify Data Option

If you select this option, SUM QuickCopy checks to ensure that data written to the Target disk is readable. Selecting this option increases the amount of time required to make copies, but the additional time might be worth it especially in those cases where your Target disks are recycled.

Write Target On Insertion

This option remains unavailable (grayed out) until *after* a Source disk has been read into memory, *and* SUM QuickCopy has determined that it has enough memory available to create Target disks in a single pass. If a Target disk can be created only by making multiple passes, this option remains unavailable. See *Memory Usage* at this end of this chapter for additional information.

If this option is available and you activate it, SUM QuickCopy begins writing data to the Target disk as soon as you insert it into the designated disk drive.

This is a convenient option and one that can save you some "mousing around." But use this option cautiously because inserting the wrong disk at the wrong time can cause problems. If you do select this option, we strongly recommend setting the Write Protect tab on *all* of your Source disks.

Selecting the Target Drive

The pop-up menu on the right side lists those floppy disk drives you can use to create Target disks. Select the drive you want to use from this menu.

Memory Usage

One reason SUM QuickCopy is so fast is that it reads an entire Source disk into memory and keeps it there until you tell it to read a different Source disk, or you quit the program. It can then create any number of Target disks by simply transferring the information directly from memory to each Target disk you want to create.

If your Macintosh does not have enough memory for SUM QuickCopy to read the entire contents of a Source disk into memory, copies are made by making multiple *passes*. That is, during the first pass, SUM QuickCopy reads as much of the Source disk as memory can accomodate and then writes that information to the Target disk. On the next pass, it asks you to reinsert the Source disk, reads whatever memory can accommodate, and then writes that to the Target disk. Unless you are using high-density disks (1.4 megabyte capacity), two passes are normally sufficient to copy any Source disk.

In general, here is what occurs when you begin a copy operation:

If you have selected the **Copy USED Sectors** option for your Source disk but SUM QuickCopy determines that it *cannot read the entire disk into memory at one time*, an alert appears to this effect. The alert informs you that you must select the **Copy ALL Sectors** option to copy this Source disk.

If you have selected the **Copy ALL Sectors** option and the program determines that it cannot read the entire Source disk into memory, it reads as much information as it can, tells you (in the Message area) the number of disk swaps required to make the copy, ejects the Source disk, and prompts you to insert the Target when required. The program then prompts you through all of the swaps necessary to make the complete copy. In this situation, the **Write Target On Insertion** option and the **Write to Target** button are never enabled.

If you have selected either the **Copy USED Sectors** or **Copy ALL Sectors** option and the program determines that it *can read the entire Source into memory*, the copy can be done in a single pass. In these cases, the **Write Target On Insertion** option and the **Write to Target** button are both enabled.

When you launch SUM QuickCopy under the Finder, the program "grabs" as much memory as it can. But when you launch under MultiFinder, SUM QuickCopy can use only the amount of memory allocated to it. (This memory allocation is controlled by the desktop's **Get Info** dialog. See your *MultiFinder User Guide* for complete details.)

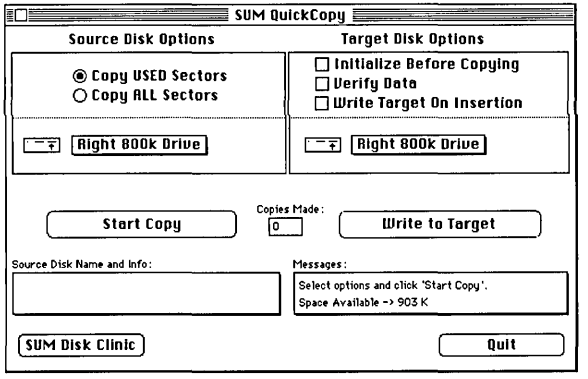
Overcoming Memory Limitations

If you frequently find yourself short of available memory when using SUM QuickCopy, you can create a special startup disk to use in these situations. Your startup disk should contain the following:

- The SUM QuickCopy utility program
- A System file containing only the minimum desk accessories and fonts
- A Finder (do not use MultiFinder)
- No startup documents unless absolutely essential

After starting up your Macintosh with this startup disk, check to make sure the RAM Cache is turned off in the Control Panel.

With this configuration you should be able to copy most 400K and 800K disks. However, to copy most high-density disks, you'll probably need at least 2 megabytes of memory.



Making Disk Copies

This section takes you step-by-step through the *normal* process of copying a Source disk with SUM QuickCopy. That is, it assumes you have enough memory available to copy your Source disk in a single pass. If you don't have enough memory and multiple passes are required, please refer to the section titled *Memory Usage* earlier in this chapter for additional information.

1. Double-check your **Source Disk Options** to make sure everything is set up the way you want.
2. Click **Start Copy**, or press ⌘-S. SUM QuickCopy prompts you to insert the Source disk into the floppy drive you have selected.
3. Insert the Source disk in the appropriate drive. The program reads the Source disk name and other information and displays it for you. It then reads the remainder of the data from the disk and, when finished, activates the **Write to Target** button and the **Write Target On Insertion** option.
4. If you want to use the **Write Target On Insertion** option, select it at this time.
5. Insert a Target disk (the disk you are copying TO) into the floppy drive you have selected.
6. If you selected the **Write Target On Insertion** option, insert a Target disk; otherwise, click **Write to Target**, or press ⌘ -W. SUM QuickCopy begins copying data to the Target disk, and when finished, automatically ejects the floppy from the disk drive.

Once a complete Target disk has been created, you can:

- Click **Start Copy** to read a different Source disk you want to copy, or
- If you selected the **Write Target On Insertion** option, insert a new Target disk into the appropriate disk drive, and SUM QuickCopy immediately begins creating another Target disk, or
- If you did *not* select the **Write Target On Insertion** option, insert a new Target disk into the appropriate disk drive and click **Write to Target** to begin creating another Target disk.

Quitting SUM QuickCopy

After you finish copying disks, click **Quit** to exit from SUM QuickCopy and return to the desktop, or click **Disk Clinic** to return to the SUM Disk Clinic Main Menu.

Initializing Disks

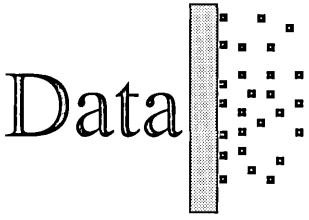
You can use SUM QuickCopy to initialize one or more floppy disks faster and easier than with the standard desktop method. Here's how:

1. Starting at the desktop, initialize a floppy disk in the format you require: HFS or MFS, single- or double-sided. Give the disk a generic name, like Blank.
2. Launch SUM QuickCopy.
3. Select **Copy USED Sectors** for the Source disk.
4. If your Target disks are new disks that have never been initialized, select **Initialize Before Copying**; otherwise, deselect this option.
5. Click **Start Copy**, and when prompted, insert the initialized disk you created in step one (above) into the disk drive you selected for the Source disk.
7. Insert the floppy disk you want to initialize and click **Write to Target**. Repeat this step for each disk you want to initialize. Every initialized disk receives the same name you assigned to your original disk in step one.

End of Chapter 9

Notes

SUM Encrypt



SUM Encrypt is an application for *encrypting* and *decrypting* individual files or all files in one or more folders. SUM Encrypt is designed for use in the U.S. and Canada.

Encryption is a method of coding information based on specific algorithms that makes it unrecognizable for normal purposes. For example, a document created with MacWrite™ and subsequently encrypted would not be recognized as anything other than "garbage" when opened by the creating application. Thus, encryption is an excellent way to protect sensitive information from unauthorized individuals.

Decryption is the exact opposite of encryption – it is the process of converting the encrypted information back into a recognizable form. For example, the MacWrite document mentioned above, once decrypted, could be opened by the creating application just as any other document.

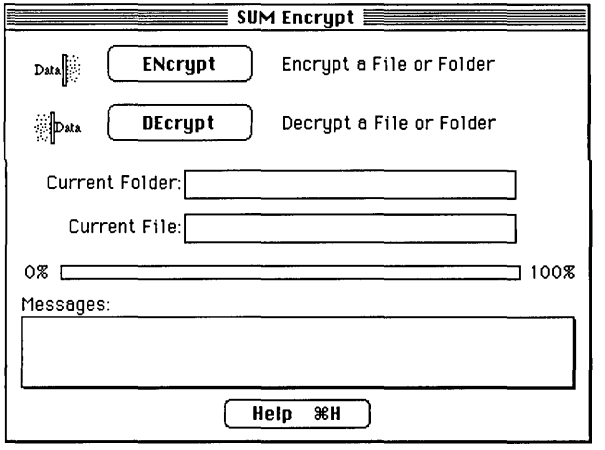
SUM Encrypt offers two encryption methods – **FasCrypt** and **DES** :

FasCrypt is a special form of encryption available only with SUM Encrypt. FasCrypt is significantly faster than DES and is provided in SUM Encrypt primarily for increased speed.

DES (**D**ata **E**ncryption **S**tandard) is an encoding scheme developed by the United States Federal Bureau of Standards.

SUM Encrypt does *not* encrypt application-type files (such as MORE™ II, MacDraw™, and so forth), your System file, or your system folder.

Using SUM Encrypt



Launching SUM Encrypt

To launch SUM Encrypt, do the following:

1. Locate the SUM Encrypt icon on your desktop:

2. To launch SUM Encrypt, click the SUM Encrypt icon and then choose **Open** from the **File** menu, or simply double-click the icon.

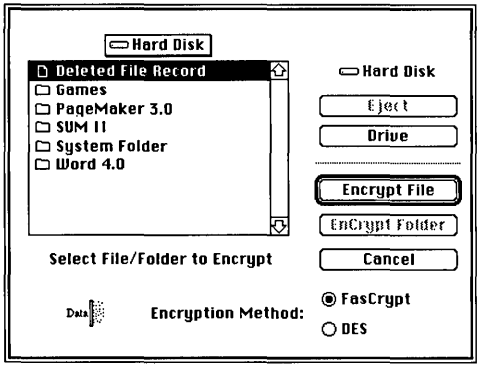
Once the application has started, you see the SUM Encrypt window, like the one pictured above.

You can also launch SUM Encrypt directly while running SUM Disk Clinic by choosing it from the **Launch** menu, which you'll learn how to do later in this chapter.

Encrypting Files

To encrypt individual files or all the files in a particular folder, do the following:

1. Click the **ENcrypt** button (or press ⌘-**E**). A file selector dialog appears similar to the one shown here:



2. Select the encryption method you want to use (**FasCrypt** or **DES**) by clicking the appropriate radio button in the bottom, right corner of the dialog.

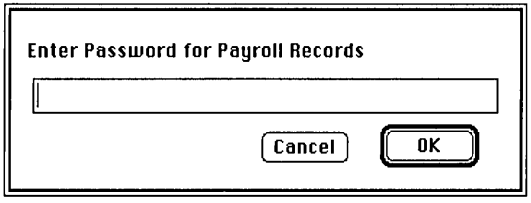
3. When a folder is selected in the list, the **Open** and **Encrypt Folder** buttons are available in the file selector dialog.

   To open the selected folder, click the **Open** button, press **Return**, or double-click the item in the list.

   To encrypt all files (excluding applications) in the selected folder, click the **Encrypt Folder** button.

   When you click on an individual file name in the list, the **Encrypt Folder** button is deactivated, and the **Open** button changes to **Encrypt File**. To encrypt the selected file, click the **Encrypt File** button, press **Return**, or double-click the item in the list.

4. Encryption and password protection work together to protect your files; therefore, when you encrypt a file, you must assign a password. SUM Encrypt prompts you to enter a password prior to encrypting the data by displaying the dialog shown here:



   Type the password you want to assign, which should not be more than 22 characters, and click **OK**. (Please read *Using Passwords* later in this chapter for things to consider about passwords.)

5. To ensure that you have entered the password exactly the way you want it, SUM Encrypt asks you to verify the password by re-entering it.

After assigning and verifying your password, you are back at the SUM Encrypt window. Encryption begins immediately.

If you selected a folder to encrypt, the folder name appears in the *Current Folder* text field. In the *Current File* text field, you see the name of the file currently being encrypted. The *Progress Scale* indicates what percentage of the current file has been encrypted. At the end of the process (and sometimes during), messages appear in the *Messages* area indicating what has transpired.

It is important that you don't encrypt the System files in your system folder.

The time it takes to encrypt/decrypt a file is directly related to your Macintosh's processor speed. For example, encrypting a 22K file on a Macintosh SE (using System 6.0.3) took about 19 seconds, but on a Macintosh IIci (using System 6.0.4), the encryption took only 4 seconds. These times are just estimates, and the time it takes to encrypt/decrypt a file will depend on your system's configuration.

Encrypted File Icons

SUM Encrypt assigns a special icon (shown below) to encrypted files when they appear on your desktop.

If you open one of these icons, the parent application (the one with which the file was originally created) is **not** launched. Instead, SUM Encrypt is launched, and the decryption routine is initiated automatically. However, if the encrypted file's parent application is missing, SUM Encrypt will be unable to launch.

Once the file has been decrypted, SUM Encrypt terminates automatically, and you return to your desktop. The file's original icon reappears, and you can now launch the parent application by opening the icon.

SUM Encrypt behaves differently in MultiFinder due to the way the operating system works. For example, if you are running under MultiFinder and have decrypted a file, that file's icon is restored but is not immediately displayed. To display the icon, close the window where the file is located and then reopen it. At other times when encrypting or decrypting a file, the file's icon may appear the same on the desktop after the process. Close the window where the file's icon is located, and then open it. When you open the window, the icon should look different.

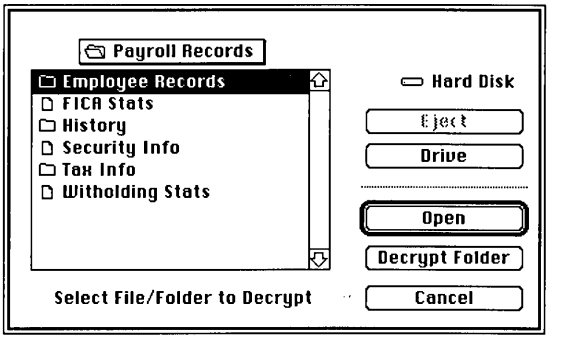
Note that folders containing encrypted files do not have a special icon – they appear as normal folders on your desktop.

Decrypting Files

The preceding section (*Encrypted File Icons*) explained the quickest and simplest way to decrypt individual files (by opening them directly from the desktop). When you need to decrypt more than one file at a time, however, you'll probably want to use the method described in this section.

To decrypt individual files or all files in a folder, do the following:

1. Click the **DEcrypt** button (or enter ***1*-D**). A file selector dialog appears similar to the one shown here:



2. When a folder is selected in the list, the **Open** and **Decrypt Folder** buttons are available in the file selector dialog.

   To open the selected folder, click the **Open** button, press **Return**, or double-click the item in the list.

   To decrypt all files in the selected folder, click the **Decrypt Folder** button.

   When you click on an individual file name in the list, the **Decrypt Folder** button is deactivated, and the **Open** button changes to **Decrypt File**. To decrypt the selected file, click the **Decrypt File** button, press **Return**, or double-click the item in the list.

3. SUM Encrypt prompts you to enter the password assigned to the selected file or folder (see also *Using Passwords* below).

   Type the password assigned to the item (asterisks appear in place of the characters you type) and click **OK**.

After entering the password, you are back at the SUM Encrypt window. Decryption commences immediately.

If you selected a folder to decrypt, the folder name appears in the *Current Folder* text field. In the *Current File* text field you see the name of the file currently being decrypted. The *Progress Scale* indicates what percentage of the current file has been decrypted. At the end of the process (and sometimes during) messages appear in the *Messages* area indicating what has transpired.

Using Passwords

This section discusses some important things to consider when assigning passwords to encrypted files.

Forgotten Passwords

You have no way of accessing an encrypted file without first entering your password. If you forget your password, your data is lost. We recommend, therefore, that you keep passwords short, simple, and easy to remember. You might even consider writing your passwords down somewhere for later reference.

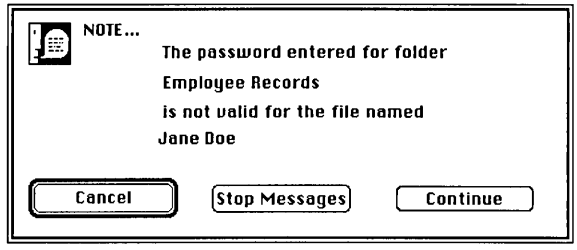
Password Shortcut

When selecting files for encryption, you can select only one file at a time in the file selector dialog. Thus, you are required to enter a password for each individual file you want to encrypt. If you are encrypting many files at one time, consider placing them all into the same folder beforehand. This way, you can select the entire folder and then only have to enter your password one time.

The best way to protect your data is to create a password-protected partition, and then move your encrypted files or folders into this partition. This means that unauthorized users must break two levels of password protection instead of one to view your data.

Multiple Passwords

If you select a folder to decrypt and that folder contains multiple files with different passwords, SUM Encrypt prompts you to enter only one password for the entire folder. All files in the folder that have a matching password will be decrypted. Those files with a different password are bypassed, and SUM Encrypt reports an incorrect password by displaying a dialog similar to this:



Cancel – immediately aborts the decryption process for the current folder.

Stop Messages – continues decrypting the remaining files in the folder but prevents this dialog from appearing every time a password mismatch is encountered. However, files with mismatched passwords are *not* decrypted.

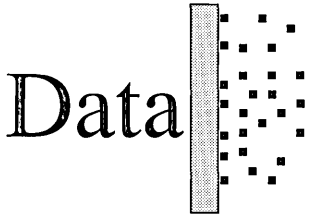
Continue – continues decrypting the remaining files in the folder and the above dialog appears for all subsequent password mismatches.

To decrypt those files that were bypassed, you must handle each one individually as explained under *Decrypting Files* earlier in this chapter.

End of Chapter 10

Notes

SUM UniCrypt



SUM UniCrypt is an application for encrypting and *decrypting* individual files or all files in one or more folders. This version of encryption is for use outside the U.S. and Canada.

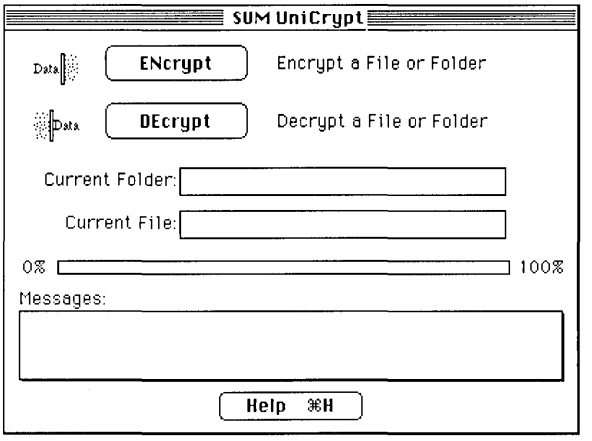
> *Encryption* is a method of coding information based on specific algorithms that makes it unrecognizable for normal purposes. For example, a document created with MacWrite™ and subsequently encrypted would not be recognized as anything other than "garbage" when opened by the creating application. Thus, encryption is an excellent way to protect sensitive information from unauthorized individuals.
>
> *Decryption* is the exact opposite of encryption – it is the process of converting the encrypted information back into a recognizable form. For example, the MacWrite document mentioned above, once decrypted, could be opened by the creating application just as any other document.

SUM UniCrypt offers two encryption methods – **Simple** and **Complex** :

> **Simple**, a fast and easy method of encryption, is provided in SUM UniCrypt primarily for increased speed.
>
> **Complex** is an encoding scheme based on sophisticated algorithms that provide the highest form of security.

SUM UniCrypt does not encrypt application-type files (such as MORE™ II, MacDraw™, and so forth), your System file, or your system folder.

Using SUM UniCrypt



Launching SUM UniCrypt

To launch SUM UniCrypt, do the following:

1. Locate the SUM UniCrypt icon on your desktop:

2. To launch SUM UniCrypt, click the SUM UniCrypt icon and then choose Open from the File menu, or simply double-click the icon.

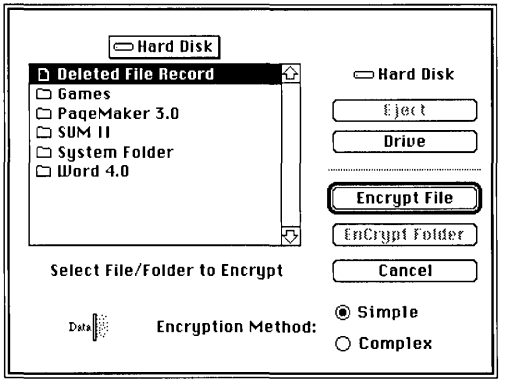
Once the application has started, you see the SUM UniCrypt window, like the one pictured above.

You can also launch SUM UniCrypt directly while running SUM Disk Clinic by choosing it from the Launch menu, which you'll learn how to do later in this chapter.

Encrypting Files

To encrypt individual files or all the files in a particular folder, do the following:

1. Click the **ENcrypt** button (or press ⌘-E). A file selector dialog appears similar to the one shown here:



2. Select the encryption method you want to use (**Simple** or **Complex**) by clicking the appropriate radio button in the bottom, right corner of the dialog.

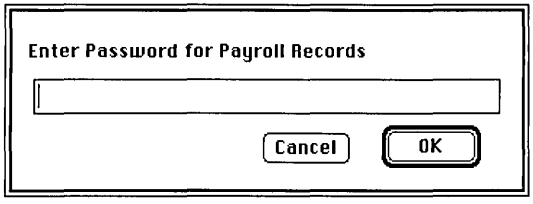
3. When a folder is selected in the list, the **Open** and **Encrypt Folder** buttons are available in the file selector dialog.

   To open the selected folder, click the **Open** button, press **Return**, or double-click the item in the list.

   To encrypt all files (excluding applications) in the selected folder, click the **Encrypt Folder** button.

   When you click on an individual file name in the list, the **Encrypt Folder** button is deactivated, and the **Open** button changes to **Encrypt File.** To encrypt the selected file, click the **Encrypt File** button, press Return, or double-click the item in the list.

4. Encryption and password protection work together to protect your files; therefore, when you encrypt a file, you must assign a password. SUM UniCrypt prompts you to enter a password prior to encrypting the data by displaying the dialog shown here:



   Type the password you want to assign, which should not be more than 22 characters, and click **OK**. (Please read *Using Passwords* later in this chapter for things to consider about passwords.)

5. To ensure that you have entered the password exactly the way you want it, SUM UniCrypt asks you to verify the password by re-entering it.

After assigning and verifying your password, you are back at the SUM UniCrypt window. Encryption begins immediately.

If you selected a folder to encrypt, the folder name appears in the *Current Folder* text field. In the *Current File* text field, you see the name of the file currently being encrypted. The Progress Scale indicates what percentage of the current file has been encrypted. At the end of the process (and sometimes during), messages appear in the *Messages* area indicating what has transpired.

It is important that you don't encrypt the System files in your system folder.

The time it takes to encrypt/decrypt a file is directly related to your Macintosh's processor speed. For example, encrypting a 22K file on a Macintosh SE (using System 6.0.3) took about 19 seconds, but on a Macintosh IIci (using System 6.0.4), the encryption took only 4 seconds. These times are just estimates, and the time it takes to encrypt/decrypt a file will depend on your system's configuration.

Encrypted File Icons

SUM UniCrypt assigns a special icon (shown below) to encrypted files when they appear on your desktop.

If you open one of these icons, the parent application (the one with which the file was originally created) is not launched. Instead, SUM UniCrypt is launched, and the decryption routine is initiated automatically. However, if the encrypted file's parent application is missing, SUM UniCrypt will be unable to launch.

Once the file has been decrypted, SUM UniCrypt terminates automatically, and you return to your desktop. The file's original icon reappears, and you can now launch the parent application by opening the icon.

SUM UniCrypt behaves differently in MultiFinder due to the way the operating system works. For example, if you are running under MultiFinder and have decrypted a file, that file's icon is restored but is not immediately displayed. To display the icon, close the window where the file is located and then reopen it. At other times when encrypting or decrypting a file, the file's icon may appear the same on the desktop after the process. Close the window where the file's icon is located, and then open it. When you open the window, the icon should look different.

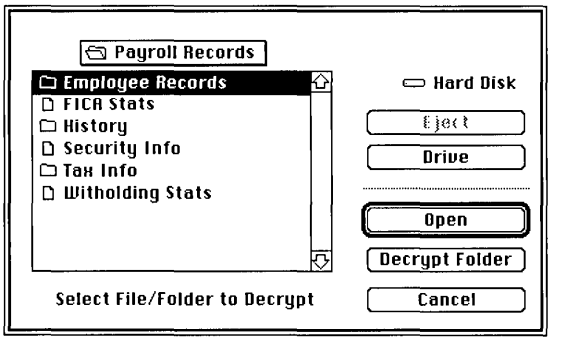
Note that folders containing encrypted files do not have a special icon – they appear as normal folders on your desktop.

Decrypting Files

The preceding section (*Encrypted File Icons*) explained the quickest and simplest way to decrypt individual files (by opening them directly from the desktop). When you need to decrypt more than one file at a time, however, you'll probably want to use the method described in this section.

To decrypt individual files or all files in a folder, do the following:

1. Click the **DEcrypt** button (or enter ⌘-D). A file selector dialog appears similar to the one shown here:



2. When a folder is selected in the list, the **Open** and **Decrypt Folder** buttons are available in the file selector dialog.

   To open the selected folder, click the **Open** button, press **Return**, or double-click the item in the list.

   To decrypt all files in the selected folder, click the **Decrypt Folder** button.

   When you click on an individual file name in the list, the **Decrypt Folder** button is deactivated and the **Open** button changes to Decrypt File. To decrypt the selected file, click the **Decrypt File** button, press **Return**, or double-click the item in the list.

3. SUM UniCrypt prompts you to enter the password assigned to the selected file or folder (see also *Using Passwords* below).

   Type the password assigned to the item (asterisks appear in place of the characters you type) and click **OK**.

After entering the password, you are back at the SUM UniCrypt window. Decryption begins immediately.

If you selected a folder to decrypt, the folder name appears in the *Current Folder* text field. In the *Current File* text field you see the name of the file currently being decrypted. The *Progress Scale* indicates what percentage of the current file has been decrypted. At the end of the process (and sometimes during) messages appear in the *Messages* area indicating what has transpired.

Using Passwords

This section discusses some important things to consider when assigning passwords to encrypted files.

Forgotten Passwords

You have no way of accessing an encrypted file without first entering your password. If you forget your password, your data is lost. We recommend, therefore, that you keep passwords short, simple, and easy to remember. You might even consider writing your passwords down somewhere for later reference.

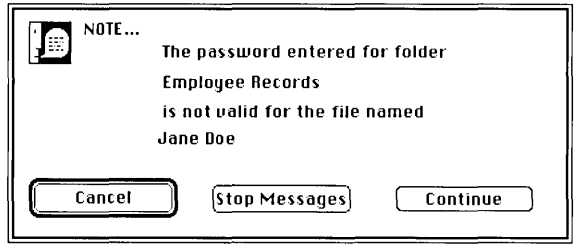
Password Shortcut

When selecting files for encryption, you can select only one file at a time in the file selector dialog. Thus, you are required to enter a password for each individual file you want to encrypt. If you are encrypting many files at one time, consider placing them all into the same folder beforehand. This way, you can select the entire folder and then only have to enter your password one time.

The best way to protect your data is to create a password-protected partition, and then move your encrypted files or folders into this partition. This means that unauthorized users must break two levels of password protection instead of one to view your data.

Multiple Passwords

If you select a folder to decrypt and that folder contains multiple files with different passwords, SUM UniCrypt prompts you to enter only one password for the entire folder. All files in the folder that have a matching password will be decrypted. Those files with a different password are bypassed, and SUM UniCrypt reports an incorrect password by displaying a dialog similar to this:



Cancel – immediately aborts the decryption process for the current folder.

Stop Messages – continues decrypting the remaining files in the folder but prevents this dialog from appearing every time a password mismatch is encountered. However, files with mismatched passwords are *not* decrypted.

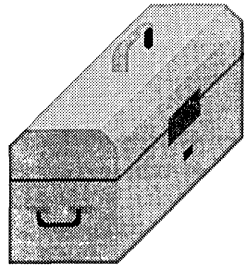
Continue – continues decrypting the remaining files in the folder and the above dialog appears for all subsequent password mismatches.

To decrypt those files that were bypassed, you must handle each one individually as explained under *Decrypting Files* earlier in this chapter.

End of Chapter 10

Notes

SUM Tools



SUM Tools is a disk (or, volume), file, and memory editing utility. Because most Macintosh users rarely have a need to edit these objects, SUM Tools is regarded primarily as a program for *power users* – that is, technically minded individuals who understand how disks and files are structured and what goes on in the memory of the Macintosh.

Some functions are available in SUM Tools, however, that typical Macintosh users might find helpful in certain situations. For example, you can insert Type and Creator codes into files following recovery if these codes were not recovered. You can also get some useful information about your Macintosh that you might not have known was readily available.

For instructions on using SUM Tools to insert Type and Creator codes, please refer to Appendix B. If you would like to see information about your Macintosh, refer to the description of the **System Information** command in the **Macintosh** menu later in this chapter.

Please do not use this program to edit volumes, files, or memory unless you are absolutely sure about what you are doing. Making what might seem to be a minor change to one of these objects can have serious ramifications to the extent that you might not be able to use your system after making such changes. The program does have some built-in controls to prevent accidental changes, but they are in no way foolproof.

Using SUM Tools

Launching SUM Tools

Locate the SUM Tools icon on your desktop. Select the icon and choose **Open** from the **File** menu – or, simply double-click the icon to launch the program.

You can also launch SUM Tools directly from SUM Disk Clinic by choosing it from the **Launch** menu.

Once SUM Tools has started, the menu bar appears on your screen. No windows are open at this point. You won't have a window available until you select the object you want to work with – a file, a volume, or memory.

Selecting Objects

You select the object you want to work with by choosing a command from one of the menus. To work with a file, choose **Edit File** from the **File** menu. To work with a volume, choose **Edit Volume** from the **Disk** menu. To work with memory, choose **Edit Memory** from the **Macintosh** menu.

Choosing **Edit File** displays a file selector for you to locate and open the file you want to edit. Choosing **Edit Volume** displays a volume selector with **Drive**, **Eject**, and **Select** buttons for selecting the volume you want to edit. Choosing **Edit Memory** immediately opens a window displaying memory contents in hexadecimal notation.

You can have as many different windows open on your screen at one time as your Macintosh is able to accommodate.

SUM Tools Windows

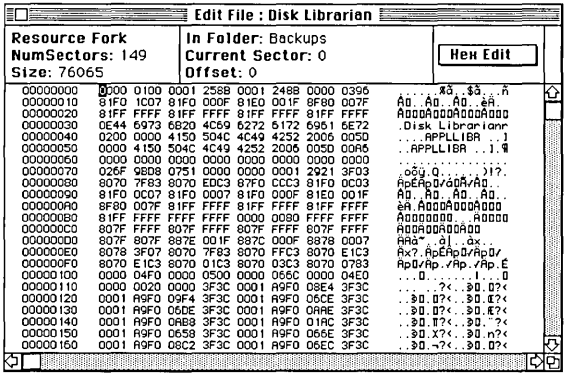
SUM Tools gives you a wide assortment of windows for examining and editing objects. Basically, five different windows are available. When you are editing files or volumes, the windows are almost identical in appearance. When you are editing memory, three of the five basic windows are available as are a great many additional, special purposes windows. This section describes the five basic windows. In the sections that follow, you'll learn how to use these windows and also learn about the differences between them.

(When you are viewing a particular window, we normally refer to this as being in a particular "mode." For example, when you are working with the Hex Edit window, you are in Hex Edit Mode.)

Switching from one window view to another is accomplished by choosing the window you want from the pop-up menu that always appears in the upper right corner.

Hex Edit Window

When you open any object for editing, SUM Tools automatically opens the Hex Edit window, similar to this:



The information you see at the top of the Hex Edit window varies depending on the type of object you are editing. The differences are discussed in later sections.

The Hex Edit window displays an object's contents in both hexadecimal and ASCII notation. The leftmost column shows the relative starting location of each line (in hex). The next eight columns show the actual data content in hex. And the far right column shows the character (ASCII) translation of the hex data.

To edit the object's data content, place the cursor anywhere within the data or ASCII portion of the window and click. This highlights the byte under the cursor. You can then change the data in the selected byte by typing a new value.

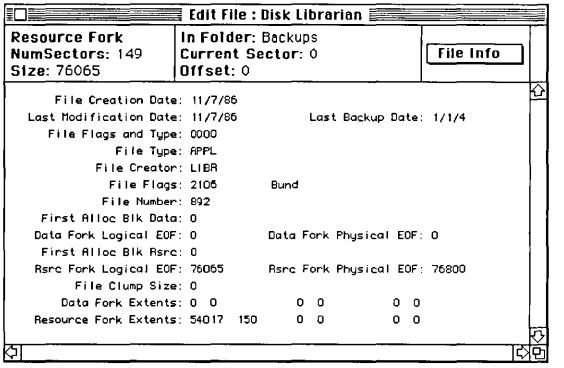
When you click on a byte, notice that the *Offset* or *Cursor* value near the top of the window changes to indicate the cursor's relative position.

When you are editing a File or Volume, typing a new value into a byte does not immediately change the data. To change the data, you must use the **Write** command in the **Edit** menu.

The preceding statement is NOT true when you are editing memory. Whatever value you type into a byte is *immediately* recorded in memory. If you don't know exactly what you are doing at all times, never edit memory!

For instructions on how to navigate through memory or move from one volume or file sector to another, see the applicable section later in this chapter on File Editing, Volume Editing, or Memory Editing.

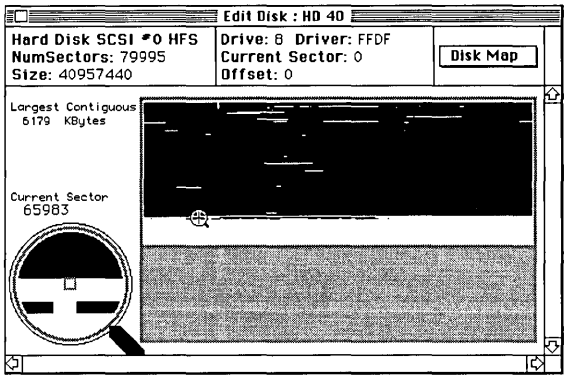
Info Windows



Both the File Info and Disk Info windows convey information specific to the object. While the information displayed in each window is different, the purpose is the same. Although this specific window is not available when editing memory, a variation of it is available if you choose **Mac Info** from the pop-up menu (this is the same window you see if you choose **System Information** from the **Macintosh** menu).

Map Windows

The File Map and Disk Map windows show graphically how information is allocated on a volume. The two windows are almost identical, with a few necessary exceptions. Here is an example of a Disk Map window:



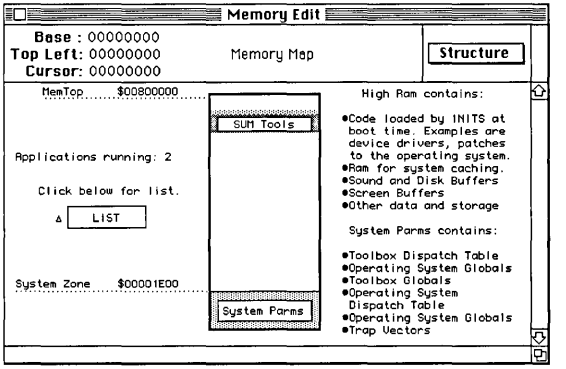
Largest Contiguous (available only in the Disk Map window) indicates the size of the largest contiguous block of free space on the volume. Note that this is not necessarily the same as the total free space available; it indicates contiguous space only.

Current Sector is a real-time value. That is, if you move the cursor directly on top of the allocation map, it changes to a crosshair inside a magnifying glass. As you move the cursor over the allocation map, the current sector value changes constantly to indicate the sector over which the cursor is located.

Below the Current Sector value is a larger magnifying glass. As you move the cursor over the allocation map, you see a magnified version of the map inside the glass.

In the case of a Disk Map, the black area within the allocation map indicates used sectors of the volume; the white area indicates unused sectors; the gray area is a frame (it increases and decreases according to volume capacity). In the case of a File Map, the black area shows where the file is located on the disk.

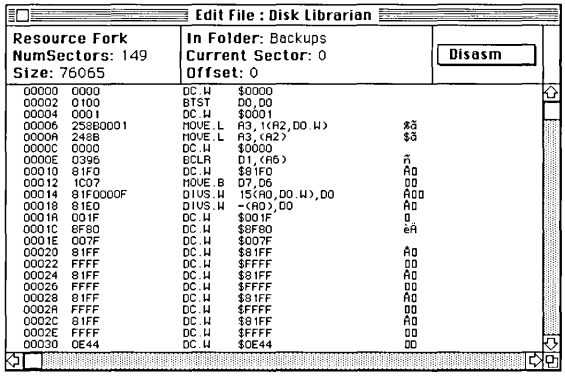
A map of memory can be viewed by choosing **Memory Map** from the **Structure** submenu while editing memory. The memory map, of course, is distinctly different from the File and Disk Map windows. It looks similar to this:



Pressing inside the graphic portion of the map displays the **Structure** submenu. Clicking the *List* box to the left of the graphic shows the applications currently running on your system.

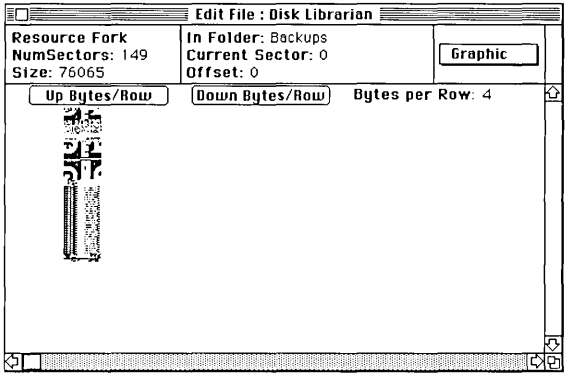
Disasm Windows

These windows (available when editing any object) display the object in its disassembled state; that is, a listing of the program instructions (OpCode, MachineCode, etc.) that are executed by the microprocessor when running a program.



Graphic Windows

The Graphic windows show the object's hexadecimal data in a graphic form:



This form of representing data can be useful to software developers as a way of breaking down data to find out if it is program code, pictures, text, icons, and so forth.

File Editing

File editing allows you to examine and change information contained in a disk file.

To initiate file editing, pull down the **File** menu and choose **Edit File**. A standard file selector dialog appears so you can select the file you want to edit.

After you select a file, SUM Tools displays its contents in a Hex Edit window (see the general description of this window earlier in this chapter).

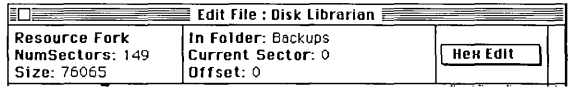
Selecting a Fork

Many Macintosh disk files are comprised of two separate forks: the Resource Fork and the Data Fork. Each fork contains separate components of the file. When initially opening a file, SUM Tools attempts to open the Resource Fork first.

You cannot open both forks into separate windows at the same time. If you want to switch to and edit the fork opposite of the one currently displayed, choose **Resource Fork** or **Data Fork** from the **Which Fork** submenu in the **File** menu.

About the File

The window title bar shows the window name (Edit File) and the name of the file you have selected to edit.



Below the window title bar is information about the file you have selected:

> *Resource Fork* or *Data Fork* indicates which fork is displayed in the window.

NumSectors: Number of sectors in the fork.

Size: Number of bytes in the fork.

In Folder: The folder in which the file is located.

Current Sector: Number of the sector currently displayed in the window.

Offset: Current location of the cursor in the sector relative to its beginning.

Editing File Sectors

To edit a file sector, you must be in Hex Edit mode. See *Hex Edit Window* earlier in this chapter for instructions on changing the actual data values of information in a file sector.

Note that in any other mode (File Info, File Map, Disasm, or Graphic) you cannot do any editing of the file. These modes are strictly for information purposes only.

Reading File Sectors

When you first select a file to edit, SUM Tools always begins by displaying the first sector of the file (that is, sector zero). The Hex Edit Window displays one entire sector at a time. Use the vertical scroll bar to display other parts of the current sector.

To move from one sector to another, you can use either the horizontal scroll bar or the commands in the **Read** submenu (available from the **Edit** menu). See the descriptions of these commands at the end of this chapter.

Writing File Sectors

You can, at any point, write the current sector back to the volume. For example, after changing the data in the sector, you can write that sector back to the volume to save your changes.

SUM Tools makes no logical checks to ensure that the data you are writing to a volume is accurate. Use this function cautiously.

The program has a built-in safety device to prevent accidentally writing to a volume. This safety device is the **Write Lock** command in the **Edit** menu. When the **Write Lock** command is in force (that is, when it is preceded by a check mark), you cannot write to the volume. You must first select the command to remove the check mark, which enables the **Write** command in the same menu. To write the current sector to the volume, choose **Write**.

Searching File Sectors

You can search for specific information in a file sector using the **File Search** command in the **Search** menu. See the command description at the end of this chapter.

Volume Editing

Volume editing allows you to examine and change almost any information on a volume, from boot blocks to data bytes.

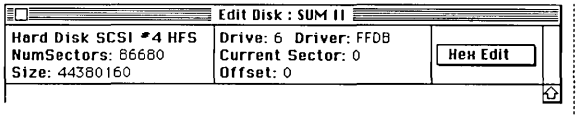
To initiate volume editing, choose **Edit Volume** from the **Disk** menu. A dialog appears so you can select the disk you want to edit. If necessary, use the **Drive** and **Eject** buttons to locate the volume and then click **Select**.

(A special feature is provided for selecting a device to edit. This is useful, for example, if you want to edit an unmounted volume. To use this feature, hold down the Option key while choosing **Edit Volume** from the **Disk** menu. See the description of the **Edit Volume** command later in this chapter for any additional instructions you might need.)

After selecting a volume, SUM Tools displays its contents in a Hex Edit window (see the general description of this window earlier in this chapter).

About the Volume

The window title bar shows the window name (Edit Disk) and the name of the volume you selected to edit.



Below the title bar is information about the volume:

Volume type (*Floppy*, *Hard Disk*, etc.) and format (*HFS* or *MFS*).

NumSectors: Number of sectors on the volume.

Size: Volume capacity in bytes.

Drive: Drive number.

Driver: Driver identification in hexadecimal.

Current Sector: Number of the sector currently displayed in the window.

Offset: Current location of the cursor in the sector relative to its beginning.

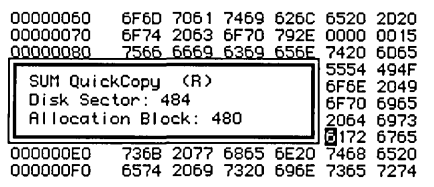
Editing Volume Sectors

To edit a volume sector, you must be in Hex Edit mode. See *Hex Edit Window* earlier in this chapter for instructions on changing the actual data values of information in a sector.

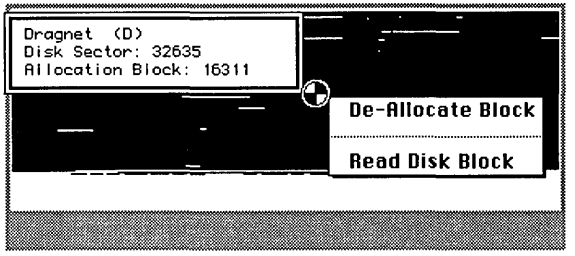
Note that in any other mode (Disk Info, Disk Map, Disasm, or Graphic) you cannot do any editing of the volume. These modes are strictly for information purposes only.

Special Volume Sector Operations

You can find out which file the current sector is part of by placing the cursor in the hex area of the window and then pressing down and holding the mouse button. While the mouse button is depressed, a mini-window pops-up to give you this information, as shown below. Release the mouse button to clear the mini-window.



While you are in Disk Map mode, you can perform a similar function by placing the cursor on top of the allocation map and then pressing down and holding the mouse button. This displays the mini-window described above and also displays a special pop-up menu, as shown on the next page.



This pop-up menu is a *power-user* feature. Please do not attempt to use the commands in this menu unless you know specifically what you are doing.

De-Allocate Block can be used to deallocate the sector currently under the cursor.

Read Disk Block causes an immediate read of the sector currently under the cursor. The sector is read into memory, SUM Tools automatically switches to Hex Edit mode, and the sector data appears in the Hex Edit window.

Reading Volume Sectors

When you first select a volume to edit, SUM Tools always begins by displaying the first sector of the volume (that is, sector zero). The Hex Edit Window displays one entire sector at a time. Use the vertical scroll bar to display other parts of the current sector.

To move from one sector to another, you can use either the horizontal scroll bar or the commands in the **Read** submenu (available from the **Edit** menu). See the descriptions of these commands at the end of this chapter.

Writing Volume Sectors

You can, at any point, write the current sector back to the volume. For example, after changing the data in the sector, you can write that sector back to the volume to save your changes.

SUM Tools makes no logical checks to ensure that the data you are writing to a volume is accurate. Use this function cautiously.

The program has a built-in safety device to prevent accidentally writing to a volume. This safety device is the **Write Lock** command in the **Edit** menu. When the **Write Lock** command is in force (that is, when it is preceded by a check mark), you cannot write to the volume. You must first select the command to remove the check mark, which enables the **Write** command in the same menu. To write the current sector to the volume, choose **Write**.

Searching Volume Sectors

You can search for specific information in a volume sector using the **Disk Search** command in the **Search** menu. See the command description at the end of this chapter.

Memory Editing

PLEASE NOTE: Editing Macintosh memory with SUM Tools requires a great deal of caution. Unlike editing volumes and files, there is no Write Lock feature available to prevent accidentally making a change. So, when you select a byte in the Hex Edit window and type any character on your keyboard, memory is changed immediately and irreversibly – there is no way to undo the change. In some cases, you can reverse the change by restarting your Macintosh; but in other cases, even this is not possible (if, for example, you make a change to Parameter RAM). DO NOT EDIT MEMORY UNLESS YOU ARE PREPARED FOR THIS POSSIBILITY!

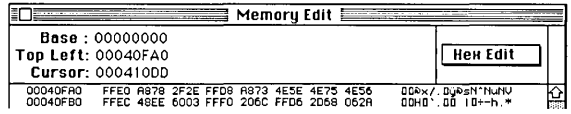
One of the features available with memory editing is the ability to display information about your Macintosh. However, the identical information is also available by choosing **System Information** from the **Macintosh** menu. If all you want to do is see this information, use the menu command rather than entering memory editing mode.

Memory editing allows you to examine and change any information currently in memory.

To initiate memory editing, choose **Edit Memory** from the **Macintosh** menu. The Memory Edit window opens immediately and SUM Tools automatically places you in Hex Edit mode. The Hex Edit window initially displays the contents of low memory starting at address zero.

About Memory

The window title bar shows the window name – Memory Edit .



Below the title bar is information about your current location in memory:

Base: Indicates the area of memory that is being displayed in the window when the scroll box is at the top of the vertical scroll bar. You can adjust the Base by choosing **New Memory Base** from the **Macintosh** menu. See the command description later in this chapter for more details.

Top Left: Indicates the memory address currently displayed at the top left part of the window.

Cursor: Indicates the cursor's present location.

Editing Memory

To edit memory, you must be in Hex Edit mode. See *Hex Edit Window* earlier in this chapter for instructions on changing the actual data values of information in memory.

Note that in any other mode (Mac Info, Structures, Disasm, or Graphic) you cannot do any editing of memory. These modes are strictly for information purposes only.

Special Memory Edit Operations

Pressing down and holding the mouse button while the cursor is in the hex area of the window displays the **Structures** pop-up menu (which can also be accessed via the pop-up menu in the upper right corner of the window). This gives you immediate and direct access to standard or customized structures while you are editing memory. Please see *Using Structures* later in this section for more information.

Navigating Through Memory

Use the vertical scroll bar to move to different locations in memory.

The **File Buffer Base** and **Disk Buffer Base** commands in the **Macintosh** menu provide a way to move to these particular memory locations quickly and easily. See the command descriptions later in this chapter for further explanations.

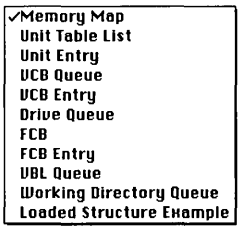
Searching Memory

You can easily locate any hexadecimal or ASCII character string in memory using the **Memory Search** command in the **Search** menu. Once again, see the command description later in this chapter for instructions.

Using Structures

When you are examining or editing memory, it is often very difficult to know exactly what you are looking at in a window. This is because what you are normally seeing is a string of hexadecimal or ASCII characters without any meaningful *structure*. For example, when you look at data in the Hex Edit window, you are viewing the data in an *unstructured* form – but when you look at the same data with the Memory Map *structure*, what you see is much more meaningful and descriptive. But, essentially, what you are seeing is the same information in both cases.

To make it easier for you to peruse and edit memory, SUM Tools provides several predefined structures for your use. And, if you wish, you can also create your own customized structures.



All predefined structures can be accessed through the **Structures** submenu – which is available in the pop-up menu at the upper right corner of the Memory Edit window and, as mentioned earlier, by pressing down and holding the mouse button while the cursor is in the hex area of the Hex Edit window. If you create your own structures, they can be added to the **Structures** submenu.

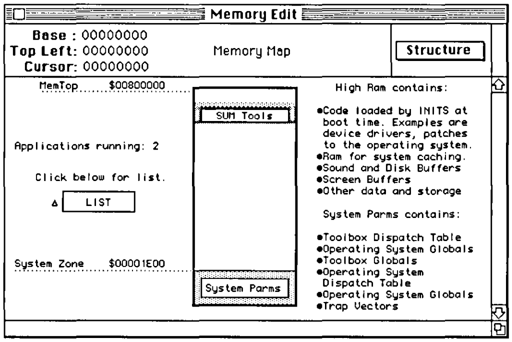
SUM Tools gives you ten predefined structures. An eleventh structure is provided as an example.

If you would like to create your own customized structures, please refer to Appendix C for instructions and examples.

When you use any of the predefined structures, you will sometimes see a delta symbol (Δ) at the beginning of a line. This symbol indicates that the particular line item also has an *underlying* structure. Clicking the line item displays its underlying structure.

Memory Map Structure

This structure provides a graphic illustration of your current Macintosh memory showing where each application is executing and the amount of memory allocated to it. Click the **List** button to see more information about the applications that are currently running.



Unit Table List Structure

This structure shows a list of currently loaded drivers along with some pertinent information about each one.

	#	DevDrvr	Address	Name
∆	2	FFFD	40810000	/Dg<&oD8/DIDDÿ\÷\8ƒ8√J+ngDaD@/D3
∆	3	FFFC	0082F010	.Sound
∆	4	FFFB	0082D72C	.Sony
∆	5	FFFA	A082AB92	.AIn
∆	6	FFF9	A082ABAA	.AOut
∆	7	FFF8	A082ABC2	.BIn
∆	8	FFF7	A082ABDA	.BOut
∆	9	FFF6	0082C19C	.MPP
∆	10	FFF5	0082B480	.ATP
∆	12	FFF3	40810000	/Dg<&oD8/DIDDÿ\÷\8ƒ8√J+ngDaD@/D3
∆	13	FFF2	007FEEEC	.SymPartition
∆	32	FFDF	00005442	.SCSI00
∆	34	FFDD	0000404C	.SCSI 87.07.10 512
∆	35	FFDC	00035150	.M3R SCSI
∆	36	FFDB	0002C414	.DataPakDriver4
∆	48	FFCF	80003840	.Radius GSC

Unit Table Entry Structure

This is an underlying structure for the Unit Table List structure. If you choose this structure while working in the Hex Edit window, SUM Tools assumes that the byte immediately under the cursor is the first byte of a driver entry in the Unit Table.

	48 FFCF	Driver Reference Number
	80003034	Device Control Entry Address
	4C60	DCE Flags
	0	DCE Position
	0	DCE Periodic Ticks
∆	80003840	Device Driver Code Address
	Name	.Radius GSC
	4C00	Driver Flags -> Ctl Status
	51	Driver Ticks
∆	80003932	Open Routine
∆	80003840	Prime Routine (Read and Write)
∆	80003AE8	Control Routine
∆	80003F30	Status Routine
∆	80003AC0	Close Routine

VCB (Volume Control Block) Queue

Displays a list of all current volumes along with additional information from the operating system.

	#	Address	Sig	Driver	Drive	Name
∆	1	000052EC	4244	FFDF	8	HD 40
∆	2	00012508	4244	FFDD	5	DD 50
∆	3	000286B4	4244	FFFB	1	SUM™ #2

VCB Entry Structure

This is an underlying structure for the individual items in the VCB Queue list. If you choose this structure while working in the Hex Edit window, SUM Tools assumes that the byte immediately under the cursor is the first byte of a Volume Control Block.

000286B4	Queue Link
0000	VCB Flags
4244	VCB Signature Word
9EDEE883	VCB Create Date
0000	VCB Attributes

Drive Queue Structure

Provides information about the various drives attached to your Macintosh. Note that this structure includes SCSI devices as well as floppy drives.

Address	Drive	Driver	FSID	Num_Blks	Inplace	Double	WrtProt	NonEject
00002EF8	1	FFFB	0	65535	Yes	Yes	Yes	No
00003800	5	FFDD	0	103690	No	No	No	Yes
000048A2	8	FFDF	0	80000	No	No	No	Yes
0000A618	6	FFDB	0	0	No	No	No	No
00013254	7	FFDC	0	86684	No	No	No	No
00026990	9	FFDC	0	86684	No	No	No	No

FCB (File Control Block) Structure

Provides information about all files currently open on your Macintosh.

FCB Size - 3762 Entry Size - 94 Max Open Files - 40 Open Files - 30

	Address	LEOF	ioRef	File_Name	Vol_Name
Δ	00006796	308693	2	System (R)	HD 40
Δ	000067F4	320512	96	(D)	HD 40
Δ	00006852	320512	190	(D)	HD 40
Δ	000068B0	49432	284	MultiFinder (R)	HD 40
Δ	0000690E	414720	378	(D)	DD 50
Δ	0000696C	414720	472	(D)	DD 50
Δ	000069CA	215071	566	MasterJuggler™ (R)	HD 40
Δ	00006A28	179958	660	Bitmap Fonts 1 (R)	HD 40
Δ	00006A86	294122	754	Standard DAs (R)	HD 40
Δ	00006AE4	14714	848	Switch-A-Roo.FK… (R)	HD 40
Δ	00006B42	1011786	942	Standard (R)	HD 40
Δ	00006BA0	2484	1036	ChicagoSymbols (R)	HD 40
Δ	00006BFE	259848	1130	Bitmap Fonts 2 (R)	HD 40
Δ	00006C5C	4299	1224	Zoom DA (R)	HD 40
Δ	00006CBA	214795	1318	Tempo II 1.0.20 (R)	HD 40
Δ	00006D18	3394	1412	Tempo II Macros (R)	HD 40
Δ	00006D76	4923	1506	Backgrounder (R)	HD 40

FCB Entry Structure

This is an underlying structure for the individual files listed in the FCB structure. If you choose this structure while working in the Hex Edit window, SUM Tools assumes that the byte immediately under the cursor is the first byte of the file's Control Block.

```
Name          MultiFinder
284           ioRefnum
788           FileNumber
768           Flags   ResFrk WrtPerm
49432         Logical EOF
50176         Physical EOF
2805          Current Position
000052EC      VCB Address.  Name -> HD 40
00000000      File Buffer
0             File Directory Block
000002E8      Parent Directory ID
```

VBL (Vertical Blanking) Queue Structure

Provides information about the procedures installed in the VBL queue. These procedures are called 60 times per second.

	Address	ProcPtr	Task_Freq	Task_Phase
Δ	00002EAC	0082E23E	14	0
Δ	0000301C	0082F3FE	51	9
Δ	00004858	00005E18	83	0
Δ	00024E22	0082C7DA	11	0
Δ	00025A04	0082BACC	36	0
Δ	007F0074	007EE46C	1	0
Δ	00774AEA	0078A542	32467	0

Working Directory Queue Structure

Provides information about your working queue of directories.

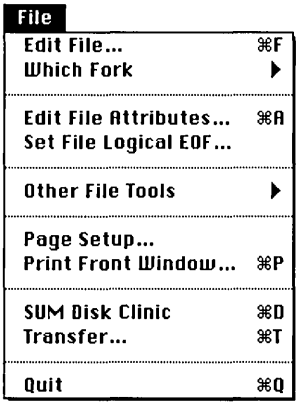
VCB Pointer	DirID	ProcID	Volume Name
000052EC	00000841	00008023	HD 40
000052EC	000002E8	00000000	HD 40
000052EC	000002E8	4552494B	HD 40
00012508	00001C7E	0000000A	DD 50
000052EC	0000084B	00000000	HD 40
00012508	0000139E	0000000A	DD 50
000052EC	000002E8	0000000A	HD 40
000052EC	000008FB	0000000A	HD 40
00012508	00001E4A	0000000A	DD 50
000052EC	00000841	0000000B	HD 40
000052EC	000002E8	0000000B	HD 40

Defining and Loading Structures

There are 11 predefined structures available in the **Structures** pop-up menu in the **Memory Edit** window. These are common File system and operating system structures; however, you can also define and load your own structures. Appendix C, *SUM Tools Structures*, contains complete instructions and examples for defining your own structures.

SUM Tools Menus

File Menu



Edit File

Use this command to select the file you want to edit.

When you select **Edit File**, a standard file selector dialog appears so you can locate and open the file you want to edit. If necessary, use the **Drive** and **Eject** buttons to open a file on a different volume.

You can open and edit only one file at any given time. That is, if a file is already open when you choose **Edit File**, the current file is closed as soon as you open a new one.

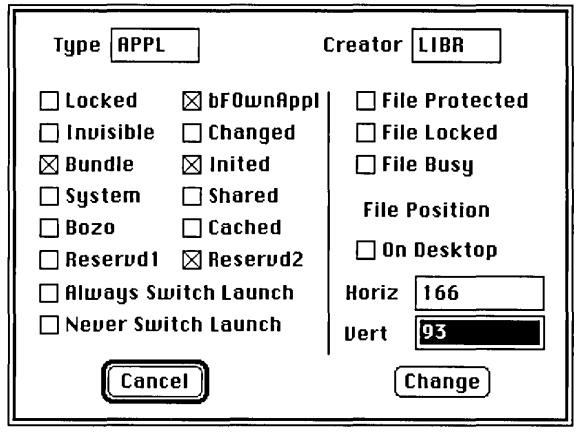
Which Fork

Choosing this command displays a submenu for selecting the fork of the file you want to edit – the **Resource Fork** or the **Data Fork**.

Use this command to select and display the Resource Fork of the file you are editing. A check mark appears next to the command to indicate it is the currently selected fork. You also see the selected fork indicated in the left panel of the Edit File window.

Edit File Attributes

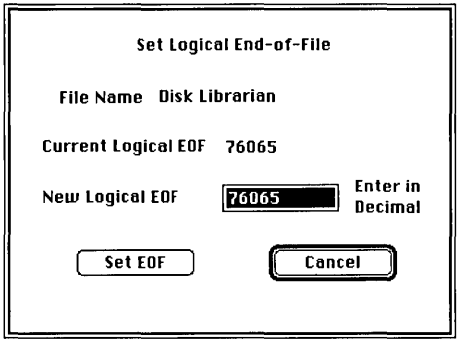
This command displays a dialog showing the attributes assigned to the currently selected file:



You can change the file's attributes by making the appropriate changes in this dialog and clicking **Change**.

Set File Logical EOF

This command can be used to set the logical end-of-file (EOF) marker for the current fork of the file you are editing. Choosing the command displays this dialog:

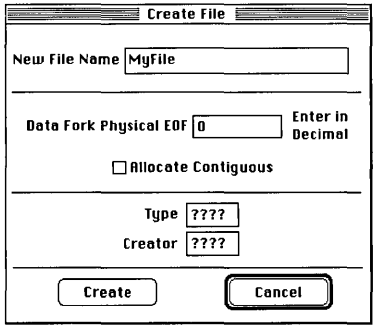


Other File Tools

Choosing this command displays a submenu with commands you can use to create or delete a file.

Create File

Choosing this command displays a dialog in which you must enter the minimum information required to create a new file:



Delete File

Choosing this command displays the standard file selector dialog so you can locate and select the file you want to delete.

Page Setup

Displays the standard Macintosh dialog for setting printer options used in conjunction with the **Print Front Window** command described next.

Print Front Window

Prints the contents of the front-most window now on your screen.

SUM Disk Clinic

Terminates SUM Tools and launches SUM Disk Clinic.

Transfer

Terminates SUM Tools and launches the application program you select.

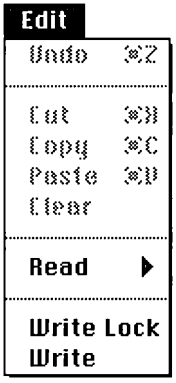
Transfer is especially useful after making changes to a disk or file. You use it to launch the parent application and verify that your changes were correct.

When you use **Transfer** to launch another application, you do not return to SUM Tools when quitting that application – you return to the desktop.

Quit

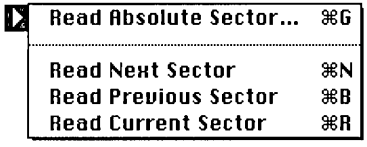
Terminates SUM Tools and returns you to the desktop.

Edit Menu



Read

Displays a submenu containing commands you can use to read the various sectors of the file or disk you are editing.



Read Absolute Sector

Use this command if you know the sector number of the sector you want to read next. You will be prompted to enter the sector number.

Read Next Sector

Reads the next sector of the file or volume.

Read Previous Sector

Reads the previous sector of the file or volume.

Read Current Sector

Rereads the current sector back into memory from the volume and displays it in the window.

This command allows you to discard any changes you might have made to the current sector, provided you have not written the changes to the volume (see **Write** command).

Write Lock

This command provides a measure of safety by preventing you from accidentally writing a modified sector to a volume. When **Write Lock** is active (as indicated by the check mark next to the command), you cannot write to the current volume.

If you make changes to the current sector and you want to save them, you must choose **Write Lock** to deactivate this safety feature. When you choose this command, the check mark is removed from the menu and the **Write** command (see following description) becomes available.

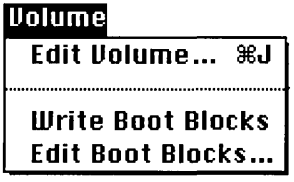
SUM Tools automatically activates the **Write Lock** feature every time you choose a new volume or file to edit.

Write

Writes the current sector back to the volume.

Write is available only when the **Write Lock** feature is deactivated (see preceding command).

Volume Menu



Edit Volume

Use this command to select a volume to edit.

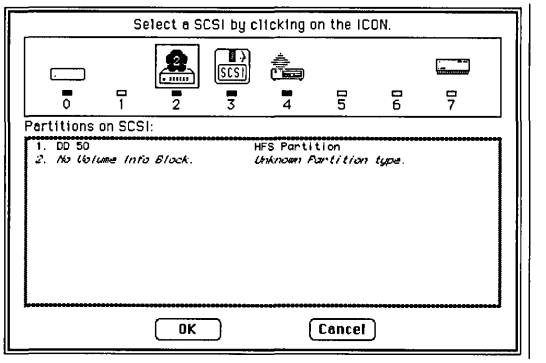
When you choose this command, a dialog appears so you can select the volume you want to use. If necessary, use the **Drive** and **Eject** buttons to locate the volume, and then click **Select**.

After reading the volume, SUM Tools automatically places you in Hex Edit mode.

Special Volume Operations

SUM Tools provides you with a way to edit unmounted volumes and SCSI devices. To select an unmounted volume to edit, hold down the Option key while choosing **Edit Volume** from the **Disk** menu. This dialog appears:

Click one or the other of the two icons in this dialog to specify which type of device you want to edit. If you click the SCSI icon, you see a dialog like the one below. If you click the other icon you see an almost identical dialog, with some minor exceptions.



Click the icon for the device you want to select and click **OK**.

Once you select a device, the SUM Tools windows work as described earlier in this chapter with these differences:

- The selected device does not have to be mounted for you to access it.
- Allocation maps are not available.
- Disk Info is not available if you selected a driver. It is available if you select a SCSI device.
- The information displayed pertains to the drivers and partitions found on the SCSI device.

Write Boot Blocks

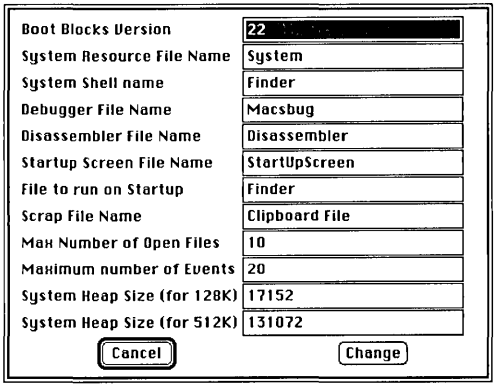
This command writes the boot sectors (sectors zero and one) onto the currently selected volume. The programs asks for your confirmation before writing the boot sectors.

You would not normally write the boot sectors unless you have changed them using the **Edit Boot Sectors** command (described next).

This command changes the boot information on your volume. Used improperly, changing the boot sector information might prevent you being able to start up from the volume.

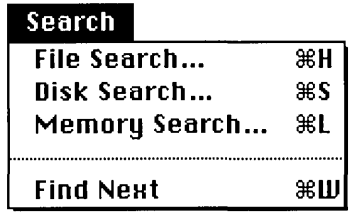
Edit Boot Blocks

This command reads the boot sector information from the current volume and displays it in a dialog similar to this:



You can change the boot sector information by altering it in the dialog. If you make changes that you want to save, click **Change** to clear the dialog from your screen and then choose **Write Boot Blocks** from the Disk menu (see preceding command description).

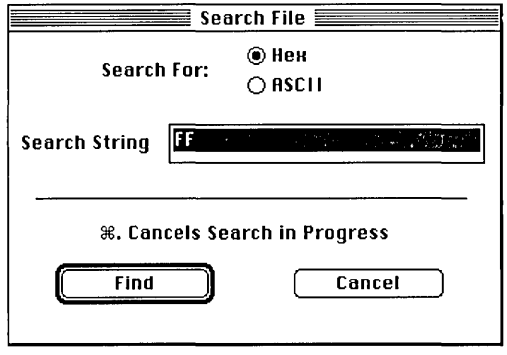
Search Menu



File Search

This command is available only when the Edit File window is active.

File Search displays a dialog you can use to search for hex or ASCII information in the current file fork:



Click either **Hex** or **ASCII**, depending on the type of information you want to locate.

In the *Search String* text box, enter the data you want to locate. (The function is not case-sensitive – you can enter uppercase or lowercase characters.)

Click **Find** to initiate the search, or click **Cancel** to cancel this function. Type ⌘-. to terminate a search in progress.

When you click **Find**, the search proceeds from the beginning of the current sector. If the search string is located, it is displayed in the window and the cursor is placed at the beginning of the string.

To find the next and any subsequent occurrences of the search string, choose **Find Next** from this menu.

Disk Search

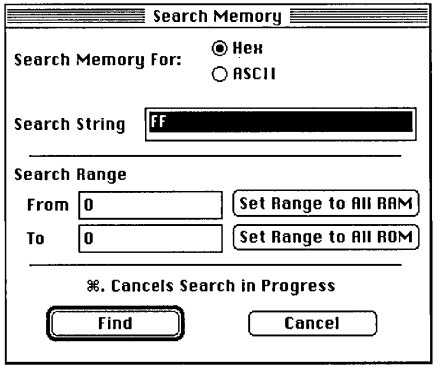
This command is available only when the Edit Disk window is active.

Disk Search displays a dialog exactly like the one displayed by the **File Search** command (see above).

Memory Search

This command is available only when the Memory Edit window is active.

The dialog you see after choosing **Memory Search** is similar to that used for File and Disk searches, but with one important difference. The dialog gives you the ability to specify the area of memory you want to search by entering From and To values:



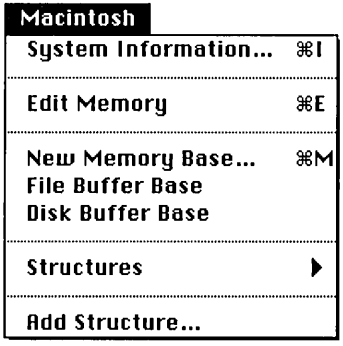
Clicking **Set Range to All RAM** automatically inserts the *lower* limit of your Macintosh memory into the *From* text field and the *upper* limit into the *To* text field.

Clicking **Set Range to All ROM** works similar to the preceding button except that the lower and upper limits of your available ROM are inserted into the appropriate text fields.

Find Next

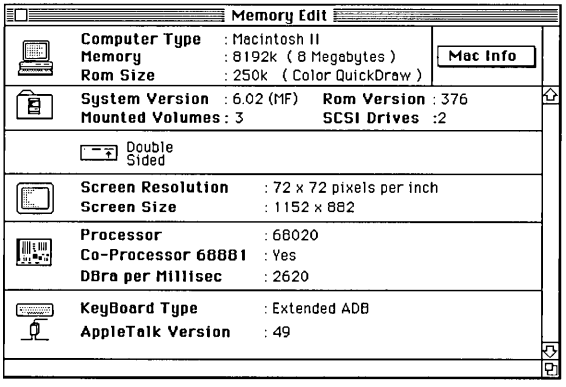
Locates the next occurrence of the search string entered into the File Search, Disk Search, or Memory Search dialogs.

Macintosh Menu



System Information

This command displays a window containing various facts about your Macintosh, such as computer type, memory size, ROM size, and so forth.



You cannot change anything in this window, it is strictly for observation.

You can display this same window by selecting the **Mac Info** command from the pop-up menu in any Memory Edit window.

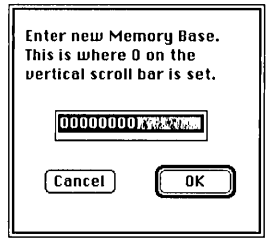
Edit Memory

Choosing this command immediately places you in Memory Edit mode. While in this mode you can examine and edit your Macintosh memory, and you also have access to the various menu commands associated with this function.

Please be sure to read the caution at the beginning of the section titled *Editing Memory* before entering Memory Edit mode.

New Memory Base

This command makes it possible for you to "position" the Memory Edit windows anywhere in your Macintosh memory. When you choose the command, you see this dialog:



Enter the memory address where you want to position the window and click **OK**.

This command effectively adjusts the *base* location of the scroll box in the window's vertical scroll bar. For example, if you enter 1000 in the above dialog and then slide the scroll box to the top of the scroll bar, your window displays memory starting at the address you entered, i.e., 1000.

The purpose of this command is to make it easy for you to set the window location to a specific area of memory and avoid having to subsequently "fish around" to find the same location again after navigating through memory. It is also a useful feature when you know the specific address of the area of memory you want to view in the window.

File Buffer Base

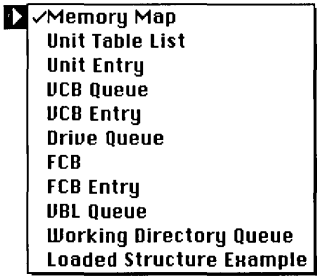
Choosing this command automatically sets your memory base to the area where the File Buffer begins. This makes it easy for you to set the Memory Edit window's position to the same location in memory as the File Edit window.

Disk Buffer Base

Choosing this command automatically sets your memory base to the area where the Disk Buffer begins. This makes it easy for you to set the Memory Edit window's position to the same location in memory as the Disk Edit window.

Structures

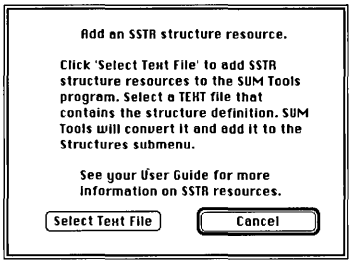
Displays the **Structures** submenu so you can choose the structure you want to use to view memory. See *Using Structures* earlier in this chapter for complete details.



Add Structure

Use this command to add a customized structure you have created to SUM Tools. Instructions for creating customized structures can be found in Appendix C.

Choosing this command displays this dialog:



Click **Select Text File** and a standard file selector dialog appears so you can locate and select the TEXT document containing the customized structure you want to add to SUM Tools. When you click **Open**, SUM Tools converts the TEXT document to a valid structure and then adds your new structure to the **Structures** submenu so that you can use it.

End of Chapter 11

Error Messages

This appendix contains descriptions of SUM error messages. It is divided according to the particular program in which the error message appears. The error messages are listed alphabetically within each section.

Those errors with a problem description reading "Unexpected Error" are extremely rare and should not occur. If you receive such an error, it is probably because some *other* error occurred on your system that SUM II cannot reconcile. In such cases, we recommend you check your hardware and software thoroughly. If you cannot resolve the problem, contact Symantec Product Support.

SUM Install 

Cannot install SUM. Not enough contiguous free space on volume.

PROBLEM...There is not enough contiguous free space on the volume where you are attempting to install SUM. The volume might have enough total free space, but it is not contiguous.

SOLUTION...You can run SUM TuneUp from one of your disk copies to optimize the problem volume and create additional contiguous free space. See Chapter 6 for instructions on using SUM TuneUp.

Cannot install SUM on File Server. Install cancelled.

PROBLEM...The SUM components cannot be installed on file servers.

SOLUTION...None. You cannot do this operation.

Cannot locate volume. SUM Install cancelled.

PROBLEM...Unexpected Error.

Cannot locate volume. Volume Restore Record NOT installed.

PROBLEM...SUM Install cannot locate the volume you have selected for installing the Volume Restore Record. The volume is probably not mounted.

SOLUTION...Finish installing the other SUM components and then rerun SUM Install after mounting the volume in question.

Cannot open volume. SUM install cancelled.

PROBLEM...Unexpected Error.

Not Installed, cannot create...

PROBLEM...Unexpected Error.

Unknown partition type.

PROBLEM...Unexpected Error.

Unknown volume structure. Install cancelled.

PROBLEM...Unexpected Error. A volume where you are attempting to install one or more SUM components has a structure that SUM Install cannot recognize. The program cannot access this volume.

SUM Disk Clinic 

Destination volume MUST have at least 40k free space.

PROBLEM...The volume on which you are attempting to save a backup copy of a Volume Restore Record does not have the minimum amount of free space available (40k bytes).

SOLUTION...You can either use a different Destination volume, or you can remove enough files from the current volume to free up enough space.

Disk is full. Cannot continue.

PROBLEM...There is no free space on the disk where you are attempting to store information.

SOLUTION...Use a different disk.

Disk is locked. Cannot continue.

PROBLEM...The disk on which you are attempting to store information is in a locked state.

SOLUTION...If the disk is a floppy, quit the program, eject the disk, slide the Write Protect tab so that it covers the hole in the disk, and try again.

If the disk is a hard disk, quit the program, choose **Get Info** from the desktop **File** menu, and click to remove the **X** from the "Locked" check box.

If the disk is a removeable disk cartridge, check the manufacturer's instructions for locking and unlocking.

Duplicate file on volume. Cannot continue.

PROBLEM...You are attempting to write a file onto a volume, but the volume already contains a file with the same name. SUM Disk Clinic will not overwrite the existing file.

SOLUTION...Quit the program, remove the existing file from the target volume, and try again. Or if possible, give the file you are attempting to save a different name.

Error backing up record. Cannot continue.

PROBLEM...An undetermined error occurred while trying to create a backup copy of the Volume Restore Record.

SOLUTION...The volume on which you are attempting to store the backup copy might be unusable. Try again using a different volume.

Error creating VIF. Cannot continue.

PROBLEM...Unexpected Error.

Error in split file Control Record. Cannot continue.

PROBLEM...Unexpected Error. A disk read/write error occurred in the Control Record segment while attempting to restore a split file. The file or the disk itself might be damaged.

SOLUTION...This is an unexpected error. Your only solution is to recover the file again.

Error in split file segment. Cannot continue.

PROBLEM...A disk read/write error occurred while attempting to restore a split file. The file or the disk itself might be damaged.

SOLUTION...See preceding error message.

Error opening VIF.

PROBLEM...An undetermined error occurred when trying to open the Volume Information File you selected.

SOLUTION...Use the **Create Volume Info File** command in the **Options** menu to create a new VIF for the device and then try again.

Error removing Shield files.

PROBLEM...Unexpected Error.

SUM Disk Clinic (continued)

Error while unsplitting file. Cannot continue.

PROBLEM...A disk read/write error occurred while attempting to restore a split file. The file or the disk itself might be damaged.

SOLUTION...See "Error in split file Control Record..." on preceding page.

File system error has occurred. Cannot continue.

PROBLEM...An error occurred while attempting to write the file 'DiskClinicInfo' on your startup volume. ('DiskClinicInfo' is the file SUM Disk Clinic places in the system folder on your startup volume to pass required information to the SUM Recover program.)

SOLUTION...Quit SUM Disk Clinic and then select a different volume as your startup device. Restart your system from the new device and rerun SUM Disk Clinic. If you receive this message again, treat it as an Unexpected Error.

If this message isn't displayed on your second attempt, your original startup volume might be damaged somehow, such as a bad disk sector. We recommend you use the Lock Out Bad Sectors option in SUM TuneUp on this volume to see if it does contain bad sectors.

Locked; not available.

PROBLEM...A volume you are attempting to use is locked and, therefore, not available to the program.

SOLUTION...Unlock the volume and try again. (Also see the message "Disk is locked..." on preceding page).

No Device Partition Map on drive.

PROBLEM...The device you are attempting to access does not contain a Device Partition Map. Without this map, the program cannot read or write information on the device.

SOLUTION...You need to load a VIF for this volume. Click **Load VIF** at the bottom of the window and select a VIF for the volume.

None added.

PROBLEM...The program could not locate any volumes while trying to collect new configuration information. The only time this will occur is if electrical power is not reaching a device.

SOLUTION...Turn on the power to your devices.

Not enough memory. Cannot continue.

PROBLEM...SUM Disk Clinic was unable to obtain enough memory to run.

SOLUTION...If you are running under MultiFinder, increase the amount of memory allocated to the program (use the **Get Info** command in the desktop **File** menu) and try again.

If you are running under Finder and have only one-megabyte of memory on your Macintosh, you are probably loading too many startup documents, desk accessories, or fonts, and there is not enough room for the program to run. You'll have to remove one or more of these items and try again. You should also turn off the RAM Cache in your Control Panel if it is currently on.

Out of memory. Cannot configure.

PROBLEM...SUM Disk Clinic ran out of available memory while attempting to create new configuration information (occurs only when you choose **Manual Configure** from the **Options** menu).

SOLUTION...If you are running under MultiFinder, increase the amount of memory allocated to the program (use the **Get Info** command in the desktop **File** menu) and try again.

Source and Destination must not be the same drive.

PROBLEM...When recovering deleted files from a volume on which the Shield Deleted File Record is not installed, this can result in permanent loss of files from the Source volume.

SOLUTION...Select a different Destination volume.

Unable to access Source volume. Is power on and device connected?

PROBLEM...SUM Disk Clinic cannot access the Source volume you have selected for this operation.

SOLUTION...Make sure power is turned on to the device. Check cables for loose connections.

Unable to locate Partition. Please consult 'Error Messages' in your User Guide.

PROBLEM...While attempting to locate a volume partition, the program cannot locate the volume where the partition should be located. This can occur if the name of the volume has been changed since your Configuration Information was created.

SOLUTION...One solution is to change the name of the volume back to what it was originally – that is, at the time your Configuration Information was created.

Perhaps a simpler solution is to create new Configuration Information for your system. You can do this using either the **Manual Configure** or **Automatic Configure** commands in the **Options** menu.

Unable to locate selected application. Cannot launch.

PROBLEM...SUM Disk Clinic cannot locate the application you selected from the Launch menu.

SOLUTION...Install (copy) the application you are attempting to launch to one of your mounted volumes and try again.

Unable to open file.

PROBLEM...An undetermined error occurred when the program attempted to open the file containing your Configuration Information.

SOLUTION...Use the **Automatic Configure** command in the **Options** menu to create new configuration information for your system. This replaces your current configuration information, but there is no alternative.

VIF is invalid.

PROBLEM...The information in the Volume Information File you have selected for recovering your volume is not valid and cannot be used with the device.

SOLUTION...Check to make sure you have selected the right VIF for the device you are attempting to recover. If this is not the problem, use the **Create Volume Info File** command in the **Options** menu to create a new VIF for the device and then try again.

Volume does not contain a Deleted File Record. Cannot continue.

PROBLEM...The Source volume you have selected for recovering deleted files does not contain a Shield Deleted File Record.

SOLUTION...You cannot continue this operation with this Source volume. Check to make sure you have selected the correct Source.

Volume ejected. Cannot continue.

PROBLEM...The Source volume you have selected for recovering deleted files is not available (it has most likely been ejected or unmounted).

SOLUTION...Insert or mount the volume and try again.

Volume is crashed. Do you want to use a VIF for recovery?

PROBLEM...The volume you are attempting to recover has sustained a crash and SUM Disk Clinic is unable to access it. This question asks whether or not you want to use a Volume Information File to access the device.

SOLUTION...If you click Yes, a file selector dialog appears so you can select the VIF you want to use. If you don't click Yes, you cannot continue and the procedure is aborted.

Volume is locked. Cannot continue.

PROBLEM...The Source volume from which you are attempting to recover deleted files is locked. The program cannot restore your files to this volume.

SOLUTION...Quit the program. Unlock the volume and try again.

Your startup disk is locked. Please unlock and try again.

PROBLEM...SUM Disk Clinic cannot write the file 'DiskClinicInfo' in the System Folder on your startup disk because the disk is locked. ('DiskClinicInfo' is the file the program uses to pass required information to the SUM Recover program.)

SOLUTION...Quit SUM Disk Clinic, unlock your startup disk, and start again.

SUM Recover

The following messages appear when using the Quick Fix procedure. These messages indicate the type of problem detected on your volume. Solutions are not provided because Quick Fix attempts to correct these problems for you. If it cannot, SUM Recover terminates the process. Try running SUM Disk Clinic again.

Since you may not be familiar with some of these terms, the *Glossary* contains definitions. For more information about the Macintosh Operating System, the File Manager, and volume data organization, see *Inside Macintosh, Volumes I - VI.*

Allocation map is invalid
Bad Allocation Block Size
Bad Catalog Extent Node ->
Bad Catalog Extent Record ->
Bad Catalog Extents BTH Node
Bad File Extent Node ->
Bad File Extent Record ->
Bad File Extents BTH Node
Bad first block in Bit Map
Bad first block of Bit Map
Bad MDB Catalog Extents
Bad MDB File Extents
Bad MDB Sig bytes
Bad number of Allocation Blocks
Bad Volume Name
Cannot load SCSI Partition maps
Data Fork Err for ->
DDM number of blocks is bad
DDM SCSI Physical Block Size bad
Directory is bad.
Directory OK. Files contain errors.
Extents error.
Loop in Catalog Extents linked list
No SCSI Partition map for volume
Number of Files does not match MDB
Number of Folders does not match MDB
Res Fork Err for ->
Resrc Err for ->
SCSI Device Descriptor Sigs bad
SCSI mapping is bad
Unable to check directory. Check is complete.
Volume Info Block is bad

Cannot create a folder on the Destination volume.

PROBLEM...Unexpected Error.

Cannot create folder.

PROBLEM...Unexpected Error.

Cannot find Volume Restore Record. Job cancelled.

PROBLEM...SUM Recover is unable to locate the Volume Restore Record on the volume you have specified.

SOLUTION...Make sure you selected the right volume. If you did, your only alternative is to recover files from the volume using the **Recover Volume / Volume Restore Record NOT Installed** procedure. (See the Recovery Procedures section.)

Cannot recover file. Allocation used.

PROBLEM...The disk space allocated to the file you are attempting to recover has been used to store other information.

SOLUTION...None. The file cannot be recovered.

Cannot recover file. It cannot be recreated.

PROBLEM...Unexpected Error.

Cannot unmount volume. Job cancelled.

PROBLEM...SUM Recover is unable to unmount the volume you are attempting to restore. The volume cannot be restored unless it is unmounted.

SOLUTION...Try restarting your Macintosh and make sure the power to the device for this volume is turned OFF. Once your Macintosh is running, turn on power to the device. This should prevent the volume from mounting. Rerun the procedure.

CAUTION! This action will CANCEL the continue mode. If you click OK, the action will be allowed, and recover mode will cancel.

PROBLEM...You are recovering multiple files (or split files), and the program is in continue mode; that is, the current volume is full, and the program wants you to select another Destination volume so that it can continue recovering files. However, you have requested that the program cancel the continue mode, and the program asks you to confirm that you want to cancel this mode or return to the recovery process.

SOLUTION... Click **OK** to cancel the recovery process and return to the SUM File Recover window, or click **Cancel** to abort the action you requested and continue recovering files.

Deleted File Record is wrong version.

PROBLEM...The Deleted File Record on the volume you have selected was created with an earlier version of SUM. The record is incompatible with the current version and cannot be used.

SOLUTION...None.

Destination volume is full. Select another volume.

PROBLEM...The volume to which you are recovering files is full.

SOLUTION...Select another volume.

Duplicate file on Destination. File previously recovered.

PROBLEM...You recovered this file previously – it already exists on the Destination volume.

SOLUTION...There is no need to recover this file again. But if you wish, you can recover it to a different Destination volume.

Error creating file on Destination. Job cancelled.

PROBLEM...Unexpected Error.

SUM Recover (continued)

Error opening Packed Signatures file.

PROBLEM...Unexpected Error. The Packed Signatures file might be damaged.

SOLUTION...Try replacing the Packed Signatures document with a copy from your original SUM II Program Disks and try again.

Error opening partition.

PROBLEM...A file system error occurred when attempting to open a partition.

SOLUTION... Unmount the partition and try again.

Error opening resource fork on Destination. Cannot continue.

PROBLEM...Unexpected Error.

Error passing Disk Clinic info. Job cancelled.

PROBLEM...SUM Recover receives instructions from SUM Disk Clinic by reading a file named 'DiskClinicInfo' (which is placed in your system folder). The information in this file is unusable.

SOLUTION...Return to SUM Disk Clinic and go through all of the windows again. This recreates the 'DiskClinicInfo' file.

Error reading Packed Signatures file.

PROBLEM...Unexpected Error. A file system error occurred when attempting to read the Packed Signatures document.

SOLUTION...Try replacing the Packed Signatures document with a copy from your original SUM II Program Disks and try again.

Invalid Volume Restore Record (xxxxx).

PROBLEM...Unexpected Error. SUM Recover has detected an error in the Volume Restore Record you have selected. 'xxxxx' is replaced with a description of the error. The possible error conditions are "corrupted," "size block difference," "driver map," and "startblock invalid."

Locked. Not available.

PROBLEM...This volume is locked. It is not available.

SOLUTION...Unlock the volume

MFS volumes are not supported for this operation.

PROBLEM...The volume you have selected is in the MFS format, which is not supported by SUM II.

SOLUTION...None. You cannot do this operation.

No Deleted File Record on volume.

PROBLEM...There is no Deleted File Record on the volume you have selected.

SOLUTION...Check to make sure you have selected the correct volume.

No space left after creating folders. Select another Destination volume.

PROBLEM...There is no space left on the Destination volume after creating the necessary folders.

SOLUTION...Select a different Destination volume.

No structure found.

PROBLEM...Unexpected Error. During a Directory Scan operation, the program could not find a logical file structure.

Not enough memory.

PROBLEM...SUM Recover cannot obtain enough memory to run. This message might appear when you launch the program or while you are running it.

SOLUTION...If you are running under MultiFinder, increase the amount of memory allocated to the program (use the **Get Info** command in the desktop **File** menu) and try again.

If you are running under Finder and you have only one megabyte of RAM on your Macintosh, you are probably loading too many startup documents, desk accessories, or fonts, and there is not enough room for the program to run. You'll have to remove one or more of these items and try again. You should also turn off the RAM Cache in your Control Panel if it is currently on.

Not enough memory for Signature scan.

PROBLEM...After reading the Packed Signatures document into memory, the program does not have enough memory left to scan your volume using the Signatures.

SOLUTION...The best solution is to try and allocate more memory to the program. See the preceding message description for details.

If allocating more memory does not solve the problem, you can disable Signature scanning by moving the Packed Signatures' document to a different folder or by renaming or deleting it. When you subsequently run SUM Recover, the program gives you the option of bypassing Signature scanning.

Shield Deleted File Record is active. You must use Disk Clinic to select any different recovery method.

This is not an error message – it appears when you launch SUM Recover directly from the desktop without going through SUM Disk Clinic. The message is merely telling you that the program is preset to operate as if you are trying to recover deleted files from a volume where the Deleted File Record is installed. If you want to use the program in any other mode, you must launch it via SUM Disk Clinic and select the Recover Method you want to use.

Split file error. Cannot continue.

PROBLEM...Unexpected Error.

Startup volume cannot be unmounted. Job cancelled.

PROBLEM...The Macintosh file system does not allow your startup volume to be unmounted. SUM Recover must be able to unmount the volume before accessing it.

SOLUTION...Use the Startup Device CDEV in your Control Panel to select a different startup volume. Restart your Macintosh and then rerun SUM Disk Clinic. This allows SUM Recover to unmount the volume as required.

Unexpected error.

PROBLEM...Unexpected Error.

Unexpected error creating VIF.

PROBLEM...Unexpected Error. (This error occurs only in Advanced mode.) An undetermined error occurred while attempting to create a Volume Information File.

You cannot use that disk drive for the backup file. It is reserved for the volume being restored.

PROBLEM...You are attempting to recover a floppy disk on which a Volume Restore Record is installed using a backup copy of the record. However, you have selected the same drive for restoring the volume and for reading the backup record. You cannot do this.

SOLUTION... Use one drive for the floppy disk you are attempting to restore, and use a different drive for obtaining the backup copy of the Volume Restore Record.

SUM TuneUp 

Bad sector found -> xx

PROBLEM...Your volume contains a bad sector. The sector number replaces 'xx' in the message.

SOLUTION...None. SUM TuneUp automatically locks the bad sector, so it cannot be used further.

Device is too fragmented.

PROBLEM...During an Optimize Volume procedure, SUM TuneUp found your volume to be extremely fragmented, and the procedure cannot be performed.

SOLUTION...This message is followed by "Try using Defragment Files first." Display the TuneUp Options dialog, activate the Defragment Files option, and deactivate the Optimize Volume option. Tune up your volume to defragment your files, and afterward try using the Optimize Volume option again.

Directory is full

PROBLEM...The directory on the volume you are attempting to tune up is full. SUM TuneUp cannot defragment a file or optimize the volume because it cannot create new directory entries.

SOLUTION...Remove some files from the volume and try again.

Directory is too fragmented.

PROBLEM...The directory on the volume you are attempting to optimize is so badly fragmented that SUM TuneUp cannot perform the operation without risk of losing data.

SOLUTION...Try removing as many files as you can from the disk and try again.

Disk is full

PROBLEM...During a Defragment Files operation, the program could not find adequate space on the disk.

SOLUTION...Remove some files and try again.

Error creating file.

PROBLEM...Unexpected Error.

Error opening file.

PROBLEM...Unexpected Error.

File is open.

PROBLEM...Unexpected Error.

File resource verification error for: [filename]

PROBLEM...Unexpected Error. During a Verify Files operation, a file resource for the file named in the message could not be verified. The file is probably damaged.

No optimizing was done.

PROBLEM...None. This message is always preceded by another message indicating why the volume could not be optimized.

No System file present.

This is not an error but merely a message indicating that the program could not find a System file on your volume while doing a List All INITs operation.

No system folder on volume.

PROBLEM...During a List All INITs operation, the program could not locate a system folder on the selected volume. Normally, INITs reside in a system folder, and thus, this is the only location where SUM TuneUp looks for them.

SOLUTION...Check to make sure you have selected the right volume.

Not enough memory available.

PROBLEM...SUM TuneUp cannot obtain enough memory to perform the Optimize Volume option.

SOLUTION...If you are running under MultiFinder, increase the amount of memory allocated to the program (use the **Get Info** command in the desktop **File** menu) and try again.

If you are running under Finder and your Macintosh one-megabyte of RAM, you are probably loading too has many startup documents, desk accessories, or fonts. You'll have to remove one or more of these items and try again. You should also turn off the RAM Cache in your Control Panel if it is currently on.

Not enough memory. Turn off cache, remove INIT's, and try again.

PROBLEM...SUM TuneUp cannot obtain enough memory to run.

SOLUTION...Turn off the RAM Cache in your Control Panel and remove as many startup documents as possible from the system folder on your startup volume. Restart your system, launch SUM TuneUp, and try again.

Open files on volume.

PROBLEM...During an Optimize Volume operation, files were found to be open on the volume you are attempting to optimize. This is not allowed.

SOLUTION...Quit SUM TuneUp and close all files that are currently open, including desk accessories. Restart SUM TuneUp and try again.

Sector is allocated to a file. Use Verify File to determine which file is bad. Recover the file and then delete it. Use Lock Out Bad Sectors again to lock out the bad sector.

PROBLEM...A bad sector was found that is currently in use by a file.

SOLUTION...Use the Verify Files option to find out which file occupies the bad sector. Then, run SUM Disk Clinic and use the Recover Volume function to recover this file. Run SUM TuneUp again using the Lock Out Bad Sectors option to prevent further use of this sector. Finally, restore the recovered file to your volume.

Sector is free. Now locked out.

PROBLEM...None. During a Lock Out Bad Sectors operation, a bad sector was found. The sector does not contain any data and has been locked out from further use.

Too many directories open.

PROBLEM...Unexpected Error.

Too many files open.

PROBLEM...Unexpected Error.

Unable to check: file system error

PROBLEM...Unexpected Error.

Unable to defragment, xxxxx

PROBLEM...Unexpected Error. An error occurred during a Defragment Files operation. The 'xxxxx' is replaced by one of these error messages: Unknown, Directory full, Disk is full, File is open, Too many open files, or Too many working directories.

Unable to list INITs. File system error.

PROBLEM...Unexpected Error.

SUM TuneUp (continued)

Unable to open data fork for: [filename]

PROBLEM...Unexpected Error. During a Verify Files operation, the data fork of the named file could not be opened.

Unable to open resource fork for: [filename]

PROBLEM...Unexpected Error. During a Verify Files operation, the resource fork of the named file could not be opened.

Unable to open the file

PROBLEM...Unexpected Error.

Unable to read data fork for: [filename]

PROBLEM...Unexpected Error. During a Verify Files operation, the program could not read the data fork for the named file.

Unable to read resource fork for: [filename]

PROBLEM...Unexpected Error. During a Verify Files operation, the program could not read the resource fork for the named file.

Unable to unmount volume.

PROBLEM...During an Optimize Volume procedure, SUM TuneUp could not unmount the volume you are attempting to optimize. This is an unexpected situation and happens rarely.

SOLUTION...Make note of the error message and contact Symantec Product Support.

Unexpected error, cancelled. D 1

PROBLEM...An orphan occurred during an Optimize Volume procedure. This is an unexpected error and rarely occurs.

SOLUTION...Use the Optimize Volume Option to either remove orphans during optimization or have SUM TuneUp cancel the optimization when an orphan is encountered.

Unexpected error, cancelled. D 2, D 3, and D 4

PROBLEM...An unexpected file system error has occurred.

SOLUTION... If this error should occur, immediately write down the message and contact Symantec Product Support.

Unexpected error, cancelled. D 5

PROBLEM...A bad directory block was found during the optimization.

SOLUTION...Make note of the error message and contact Symantec Product Support.

Unexpected error, cancelled. D 6

PROBLEM...An unexpected file system error has occurred.

SOLUTION...Make note of the error message and contact Symantec Product Support.

Unexpected error, cancelled. D 7

PROBLEM...Usually this message indicates an I/O error.

SOLUTION...If this message occurs, write the message down and contact Symantec Product Support.

Unexpected error. Optimize cancelled.

PROBLEM...An undetermined error in logic occurred during an Optimize Volume procedure. This is an unexpected error and rarely occurs.

SOLUTION...Make note of the error message and contact Symantec Product Support.

Unexpected error #2. Optimize cancelled.

PROBLEM...An undetermined error in logic occurred during an Optimize Volume procedure. This is an unexpected error and rarely occurs.

SOLUTION...Make note of the error message and contact Symantec Product Support.

Unexpected file system error. Ext.

PROBLEM...An undetermined error occurred during an Optimize Volume procedure. This is an unexpected error and rarely occurs.

SOLUTION...Make note of the error message and contact Symantec Product Support.

Volume not mounted. Job cancelled.

PROBLEM...You selected a volume in the pop-up menu and then clicked the Volume Info button, but the volume you selected has since been unmounted.

SOLUTION...Mount the volume and try again.

You cannot optimize your startup volume or the volume from which SUM TuneUp is launched.

PROBLEM...You cannot use the Optimize Volume option in the cases stated in the message.

SOLUTION...If you want to optimize your current startup volume, restart your system from a different volume and try again.

In the second case, the simplest solution is to move SUM TuneUp to a different volume, restart the program, and try again.

SUM BackUp

Access denied.

PROBLEM...This message appears only if you are working on an AppleShare™ network. You do not have access priviledges to the file or folder you have selected.

SOLUTION...Unless you can obtain access priviledges, you cannot continue.

Bad Disk or Locked.

PROBLEM...SUM BackUp had difficulty writing to the disk. The disk might be locked or damaged.

SOLUTION...If the disk is a locked floppy, eject it, reverse the write-protect tab, and try again. If it is a locked hard disk, return to the desktop, select the volume, choose **Get Info** from the **File** menu, and click to remove the **X** from the "Locked" check box. If the disk is a locked removable disk cartridge, follow the manufacturer's instructions to unlock it.

If the disk is not locked, it might be damaged. Try using a different disk. Check the problem disk for damage by attempting to reinitialize or reformat it. If it continues to be a problem, discard it.

Directory Not Found

See "File Not Found" below.

Disk Full.

PROBLEM...There is no more room on the disk, and SUM BackUp could not add another file to it.

SOLUTION...Use a different disk.

File Busy.

PROBLEM...A file you are attempting to access is currently in use. This might occur if you are running under MultiFinder or using the file with a desk accessory.

SOLUTION...Close the file and try again.

SUM BackUp (continued)

File Not Found.

PROBLEM...SUM BackUp cannot find a file or a folder. This can happen, for example, if SUM BackUp has read the directory on the Source volume and (using a desk accessory or MultiFinder) you delete the file before the program attempts to read it.

SOLUTION...Restore the file and try again.

I/O Error

PROBLEM...Unexpected Error. Your disk might be bad. If it is a Target disk, you might want to try reinitializing or reformatting it. If it continues to be a problem, discard it.

Insufficient memory.

PROBLEM...Not enough memory available for SUM BackUp to contain a volume directory in memory. This error is most likely to occur if you are running under MultiFinder. SUM BackUp is shipped with a suggested memory size of 700K, which is enough to hold a directory of up to 3,000 files.

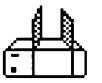
SOLUTION...If this error occurs, SUM BackUp suggests the memory size you should use. Quit the program. From the desktop, choose **Get Info** from the **File** menu and set the Application Memory Size to that suggested. Restart SUM BackUp and try again.

Phase error.

PROBLEM...SUM BackUp had a problem attempting to write to a Backup Volume. This does not necessarily mean the volume is damaged.

SOLUTION...None required. SUM BackUp will recreate the volume.

SUM Partition



An illegal operation was attempted on the startup volume.

PROBLEM...Unexpected Error.

Master Directory Block is Bad.

PROBLEM...Unexpected Error.

Memory is also trashed.

PROBLEM...Unexpected Error.

Unexpected error

PROBLEM...Unexpected Error.

Volume is damaged.

PROBLEM...Unexpected Error.

SUM QuickCopy

Bad volume name.

PROBLEM...SUM QuickCopy cannot recognize the name given to your Source disk.

SOLUTION...Quit SUM QuickCopy, and if necessary, rename the disk according to Macintosh standards.

Disk is write-protected - JOB CANCELLED.

PROBLEM...The write-protect tab on your Target disk is set to the locked position.

SOLUTION...Slide the write-protect tab so it blocks the hole in the floppy disk and try again.

Drives are incompatible - Cannot copy.

PROBLEM...You are trying to copy from a double-sided drive to a single-sided drive.

SOLUTION...Select the same drive for the Source and Target disk and try again.

Error reading disk - JOB CANCELLED.

PROBLEM...The Source disk you are attempting to copy could not be read due to a disk error.

SOLUTION...Your Source disk might be physically damaged or your disk drive could be out of alignment. If you cannot open the disk or access the files it contains with other applications, try using SUM Disk Clinic (Quick Fix and/or Recover Volume functions) to recover you files from the disk.

I/O error.

PROBLEM...SUM QuickCopy cannot write to the current Target disk. This might indicate that the disk is physically damaged or your disk drive is out of alignment.

SOLUTION...Try using a different Target disk. If the problem reoccurs, try using a different Target drive, if possible.

We recommend you set the problem disk aside and check it later. If it continues to show problems, discard it.

Initialization error.

PROBLEM...SUM QuickCopy cannot initialize the current Target disk. This is usually an indication that the disk is physically damaged.

SOLUTION...Use a different Target disk.

We recommend you set the problem disk aside and check it later. If it continues to show problems, discard it.

Insufficient memory.

PROBLEM...Your Macintosh does not have enough memory available for SUM QuickCopy to launch. Following this message you return to your desktop.

SOLUTION...If you are running under Multifinder, you might be able to allocate more memory to the program using the **Get Info** command in the desktop **File** menu.

If you are running under Finder, see *Overcoming Memory Limitations* in Chapter 6 for a possible solution.

Must initialize to copy a 400k disk onto an 800k disk.

PROBLEM...Your Source disk is single-sided (400k), but the current Target disk was initialized as double-sided (800k). The Target must be initialized in the same format as the Source.

SOLUTION...Turn on the Initialize Before Copying option for the Target disk and try again.

Must initialize to copy an 800k disk onto a 400k disk.

PROBLEM...Basically the same problem as the preceding message: the Target disk is initialized in a format different from the Source disk. However, read the following solution before proceeding.

SOLUTION...If you initialize a single-sided disk (400k) as double-sided (800k), there is a risk of not being able to access your data. Read the section *Initialize Before Copying Option* in Chapter 9.

SUM QuickCopy (continued)

No disk in drive.

PROBLEM...You clicked the Write Target button, but there is no disk in the drive.

SOLUTION...Insert a Target disk and try again.

Not enough memory. Select 'Copy ALL Sectors' and try again. SUM QuickCopy will do a multiple-pass copy.

PROBLEM...The amount of memory available to SUM QuickCopy prevents it from being able to read the entire Source disk into memory at one time. Thus, it cannot make copies in a single pass.

SOLUTION...As the message states, you can select the 'Copy ALL Sectors' option, and the program will use multiple passes to make the disk copies.

Another possible solution (if you are running under MultiFinder) is to allocate more memory to the program using the **Get Info** command in the desktop **File** menu.

You might also want to read *Overcoming Memory Limitations* in Chapter 6 for yet another possible solution.

Open files on Target disk – JOB CANCELLED.

PROBLEM...One or more files on your current Target disk are presently open and in use. SUM QuickCopy cannot write to this disk.

SOLUTION...Close any files that are currently open on the Target disk and try again.

Target drive cannot write the format of the Source disk.

PROBLEM...The drive where you are attempting to write a Target disk cannot write in the same format as the Source disk. For example, the Source is a double-sided or a high-density disk, but the drive for writing the Target can only write single-sided disks.

SOLUTION...Reselect your Target drive, making sure it can write disks in the same format as the Source drive. If necessary, select the same floppy drive in both pop-up menus.

Unrecognizable disk – JOB CANCELLED.

PROBLEM...The Source disk you are attempting to copy is not in a format that SUM QuickCopy recognizes.

SOLUTION...Check to ensure that you have inserted the correct Source disk. If you have, return to the desktop and see if you can open the disk and access the files it contains. If you are able to open the disk, contact Symantec Product Support and notify them of this error.

SUM Encrypt (SUM UniCrypt outside the U.S. and Canada)

Disk is write protected.

PROBLEM...The write-protect tab on the floppy disk you are attempting to access is in the locked position.

SOLUTION...Quit SUM Encrypt. Eject the disk and reset the write-protect tab. Reinsert the disk and try again.

File access error on...

PROBLEM...Unexpected Error.

File already open with write permission.

PROBLEM...The file you are attempting to encrypt or decrypt is already open by another application and that application is able to write to the file. SUM Encrypt cannot process the file while it is in this state.

SOLUTION...Switch to the application that is currently using the file, close it, switch back to SUM Encrypt, and try again.

File is busy.

PROBLEM...The file you are attempting to encrypt or decrypt is currently in use and cannot be accessed.

SOLUTION...Quit SUM Encrypt. Close the file in question. Try again.

File is locked. You cannot write to it.

PROBLEM...The file you are attempting to encrypt or decrypt is in a locked state.

SOLUTION...Return to the desktop and use the **Get Info** command in the **File** menu to unlock the file and try again.

Memory full. Unable to open file.

PROBLEM...Unexpected Error.

Too many files open.

PROBLEM...Unexpected Error.

Volume is locked.

PROBLEM...The volume on which you are attempting to encrypt or decrypt files or folders is locked. SUM Encrypt must be able to write to the volume.

SOLUTION...Quit SUM Encrypt. Unlock the volume in question and try again.

Volume not available.

PROBLEM...The volume you are attempting to access is not available. It has probably been ejected.

SOLUTION...Quit SUM Encrypt. Mount the volume in question. Then, restart SUM Encrypt and try again.

End of Appendix A

Notes

Type and Creator Codes

This appendix contains a list of Type and Creator codes used with the Macintosh file system. The purpose of this list is to provide you with a source of reference if, in the course of recovering a file, the Type and Creator codes are missing.

Following the list is a discussion of how Type and Creator codes are used by the Macintosh file system and how you might go about using these codes in conjunction with Symantec Utilities for Macintosh.

This list was compiled from a variety of resources. It is as complete as current, available information permits. If you do not find codes for a particular application or document, we recommend you contact the software developer or publisher direct. They are your most reliable source for this information.

APPLICATION	TYPE	CREATOR
4th Dimension	APPL	4D02
4th Dimension-data	RECH	4D02
4th Dimension-data	FLAG	4D02
4th Dimension-data	SETT	4D02
4th Dimension-data	VAR1	4D02
4th Dimension-data	FILT	4D02
4th Dimension-data	REPT	4D02
4th Dimension-data	TFRM	4D02
4th Dimension-data	EFRM	4D02
4th Dimension-data	TEXT	4D02
4th Dimension-data	INDX	4D02
4th Dimension-data	data	4D02
4th Dimension-data	BAS2	4D02

A

Acta - data	OTLN	ACTA
Acta, Configure	APPL	ACTA
Adobe Illustrator	APPL	ARTY
Adobe Illustrator - data	TEXT	ARTY
After Dark	APPL	ADrk
After Dark - data	ADGM	ADrk
Aldus Freehand	APPL	ACA3
Aldus Freehand -data	ACF3	ACA3
Aldus Persuasion	APPL	PLP1
Aldus Persuasion - data	PRS1	PLP1
Aldus Persuasion - template	.PRT1	PLP1
Allegro LISP CL 1.2	APPL	CCL
Allegro LISP CL 1.2 - data	TEXT	CCL
America On Line	APPL	AOqc
America On line - data	A0db	AOqc
AppleLink	APPL	GEOL
AppleLink - data	PETE	GEOL

C

Canvas	APPL	DAD2
Canvas - data	drw2	DAD2
Claris CAD	APPL	CCAD
Claris CAD - data	MDCA	CCAD
Comic Works	APPL	MMCB
Comic Works - data	CBOK	MMCB
Complete Undelete	CDEV	UNDL
Complete Undelete - data	LogF	UNDL
ConcertWare Inst Maker	APPL	CWIM
ConcertWareInstMake - data	CWIF	CWIM
ConcertWare Player	APPL	CDMP
ConcertWare Player - song	CWMF	CWMP
ConcertWare Writer	APPL	CWMW
ConcertWare Writer - data	CWMF	CWMW
Consultant	APPL	CONS
Consultant - data	ODSA	CONS
Cricket Colorpaint	APPL	DECO
Cricket Colorpaint - data	CRCP	DECO
Cricket Draw	APPL	CRDW
Cricket Draw - data	CKDT	CRDW
Cricket Graph	APPL	CGRF
Cricket Graph - data	CGTX	CGRF

APPLICATION	TYPE	CREATOR
Cricket Pict-O-Graph	APPL	PGRF
Cricket Pict-O-Graph data	STWK	PGRF
Cricket Presents	APPL	CRPR
Cricket Presents - data	PRDF	CRPR

D

Deluxe Music Construction	APPL	UHRU
Deluxe Music - music scores	USC2	USC2
Deluxe Music - instruments	UVOX	UHRU
Desk Organizer	APPL	DESK
Desk Organizer - data	DSKF	DESK
DeskPaint	APPL	DPNT
DeskPaint - data	PICT	DPNT
DeskPaint - data	TIFF	DPNT
DeskPaint - data	PNTG	DPNT
Desktop	FNDR	ERIK
Director	APPL	MMDR
Director - data	VWOV	MMDR
Dollars & Sense	APPL	DAS
Dollars & Sense - data	DASD	DAS
Double Helix	APPL	ATLX
Double Helix - data	HEAP	ATLX
Draw It Again Sam	APPL	DAGS
Draw It Again Sam - data	DADG	DAGS

APPLICATION	TYPE	CREATOR

E

Easy 3D	APPL	EZ3C
Easy 3D - data	EZ3D	EZ3C

F

File Maker II	APPL	FKM4
File Maker II - data	FKM$	FKM4
FoxBase	COMP	F+IN
FoxBase User	F+US	FOX+
FoxBase Install	APPL	F+IN
FoxBase .dbf	F+DB	FOX+
FoxBase .dbt	F+DT	FOX+
FoxBase .inc	TEXT	FOX+
FoxBase .idx	F+IX	FOX+
FoxBase .prg.FMT	F+PR	FOX+
FoxBase .cod	F+CO	FOX+
FoxBase .scx	F+FM	FOX+
FoxBase .vue	F+VU	FOX+
FoxBase .frm	F+FR	FOX+
Full Impact	APPL	GLAS
Full Impact - data	GWKS	GLAS
Full Paint	APPL	PANT
Full Paint - data	PNTG	PANT
FullWrite Professional	APPL	FWRT
FullWrite - data	FWRT	FWRT

APPLICATION	TYPE	CREATOR
H		
Helix	APPL	HELX
Helix - formatted data	HEAP	HELX
Helix - text only	TEXT	HELX
HyperCard	APPL	WILD
HyperCard - stacks	STAK	WILD
L		
LightSpeed C	APPL	KAHL
LightSpeed C - libraries	LIB	KAHL
LightSpeed C - projects	PROJ	KAHL
LightSpeed C - source	TEXT	KAHL
M		
Mac 3D	APPL	MC3D
Mac Draft	APPL	MACD
Mac Draft - data	DRWG	MACD
Mac Draw	APPL	MDRW
Mac Draw - data	DRWG	MDRW
Mac Draw II	APPL	MDPL
Mac Draw II - data	DRWG	MDPL
Mac Link Plus	APPL	DVZU
Mac Paint II	APPL	MPNT
Mac Paint II - data	PNTG	MPNT
Mac Pascal	APPL	PASC
Mac Pascal - data	TEXT	PASC
Mac Project	APPL	MPRJ
Mac Project -data	MPRD	MPRJ
Mac Publisher III	APPL	DOYL
Mac Publisher - articles	TEXT	DOYL
Mac Publisher - data	ISSU	DOYL
Mac Publisher - pictures	PICT	DOYL
Mac SQZ!	APPL	SQZ!
Mac SQZ! - INIT	INIT	SQZ!
Mac Terminal	APPL	TERM
Mac Terminal - data	TEXT	TERM
Mac Write	APPL	MACA
Mac Write - formatted data	WORD	MACA
Mac Write - text only data	TEXT	MACA
Mac Write II	APPL	MWII
Mac Write II - data	MW2D	MWII
Macro Mind Director	APPL	MMDR
Macro Mind Director - data	VWZP	MMWW
MDS Assembly	APPL	ASM
MDS Edit	APPL	EDIT
MDS Exec.	APPL	EXEC
MDS Make	APPL	MMAK
MicroPhone II	APPL	DFBO
MicroPhone II - data	DFBA	DFBO
Microsoft BASIC (binary)	APPL	MSBB
Microsoft BASIC - data (bin)	MSBC	MSBB
Microsoft BASIC (decimal)	APPL	MSBA
Microsoft BASIC - data (dec)	MSBD	MSBA
Microsoft Excel	APPL	XCEL
Microsoft Excel - chart	XLC	XCEL
Microsoft Excel - macro	XLM	XCEL

APPLICATION	TYPE	CREATOR
Microsoft Excel - plot	XLPG	XCEL
Microsoft Excel - text	TEXT	XCEL
Microsoft Excel - worksheet	XLF	XCEL
Microsoft File	APPL	FILE
Microsoft File - data	ISAM	FILE
Microsoft File - form	FORM	FILE
Microsoft File - report	REPT	FILE
Microsoft PowerPoint	APPL	PPNT
Microsoft PowerPoint - data	SLDS	PPNT
Microsoft Word - data	WDBN	MSWD
Microsoft Word 3.0 and 4.0	APPL	MSWD
Microsoft Works - commun.	AWWP	PSI2
Microsoft Works - database	AWDB	PSI2
Microsoft Works - spreadsh.	AWSS	PSI2
Microsoft Works - word	AWWP	PSI2
Microsoft Works 2.0	APPL	PSI2
Microsoft Write	APPL	MSWT
Microsoft Write - data	WDBN	MSWT
Milo Math Processor	APPL	MILO
MindWrite™ 2.0	APPL	PWR1
MindWrite™ 2.0 - data	OUTL	PWR1
More II	APPL	MOR2
More II - data	MOR2	MOR2
More II - translator	mkg	MOR2
MPW	APPL	MPS
MPW - object	OBJ	MPS
MPW - source	TEXT	MPS
Music Paint	APPL	MUSC
Music Paint - data	PNTG	MUSC

APPLICATION	TYPE	CREATOR
O		
Omnis 3 Plus	APPL	OM$$
Omnis 3 Plus - data	OM$D	OM$$
Omnis 3 Plus - library	OM$L	OM$$
Omnis 3 Plus - utilities	OM$U	OM$$
P		
Pack It	APPL	PIT
Pack It - data	PIT	PIT
PageMaker 3.0	APPL	ALD3
PageMaker 3.0 - data	ALB3	ALD3
PageMaker 3.0 - templates	ALT3	ALD3
Panorama	APPL	KAS1
Panorama - data	ZEPD	KAS1
PC Backup	APPL	DSB4
PC Backup - data	BACK	DSB4
Phoenix 3-D	APPL	phnx
Pnoenix 3-D - data	PHXM	phnx
Poster Maker	APPL	PMKS
Poster Maker - data	PHLP	PMKS
Q		
Quark Xpress	APPL	XPRS
Quark Xpress - data	XDTA	XPRS

APPLICATION	TYPE	CREATOR
R		
Ready Set Go!	APPL	MART
Ready Set Go! - data	RSGF	MART
Redux 1.5	APPL	Redx
Redux 1.5 Restore	APPL	RdxR
Redux - directory	RdxD	Redx
Redux - files	RdxF	Redx
Redux - info	RdxI	Redx
Right Now	APPL	nx^n
Right Now - data	nX^d	nX^n
Retrospect	APPL	Rxvr
Retrospect - data	RXV4	Rxvr
S		
SIM City	APPL	MCRP
SIM City - data	CITY	MCRP
Sound Edit	APPL	SFX
Sound Edit - sound files	FSSD	SFX!
Stat Works	APPL	DMST
Stat Works - data	STWK	DMST
Studio/8	APPL	ST/8
Studio/8 - data	PICT	ST/8
Stuff it	APPL	SIT!
Stuff it - data	SIT!	SIT!
SUM BackUp	APPL	SUMb
SUM BackUp - directory	SmbD	SUMb
SUM BackUp - files	SmbF	SUMb
SUM BackUp - info	SmbI	SUMb
SUM Deleted File Record	GLON	INIT
SUM Disk Clinic	APPL	MZRT
SUM Encrypt	APPL	SMZD
SUM Encrypt - data	XCRY	SMZD
SUM Install	APPL	INSZ
SUM Partition - files	LONE	LONP
SUM Partition DA	DFIL	DMOV
SUM Partition INIT	INIT	LONP
SUM QuickCopy	APPL	MCPO
SUM Recover	APPL	GLO2
SUM Recover - signatures	MSET	MZT1
SUM Recover - VIF doc	ZAPD	MZS2
SUM Recover - VIF recover	ZAPD	MZR2
SUM Shield	cdev	LHGC
SUM Tools	APPL	STO1
SUM TuneUp	APPL	MZO1
SUM Volume Restore Record	GLOS	INIT
SuperEdit	APPL	MANP
SuperCard	APPL	RUNT
SuperCard - data	MDOC	RUNT
SuperCard stand alone	APPL	STND
SuperPaint	APPL	SPNT
SuperPaint - data	SPTG	SPNT

APPLICATION	TYPE	CREATOR
T		
TeachText	APPL	ttxt
TeachText - data	TEXT	ttxt
THINK Pascal	APPL	PJMM
THINK Pascal - library	QPLB	PJMM
THINK Pascal - project	QPRJ	PJMM
THINK Pascal - source	TEXT	PJMM
T/Maker	ZSYS	MACS
V		
VersaCAD	APPL	VCAD
VersaCAD - data	2D	VCAD
VersaCAD - workfile	WRK	VCAD
VersaCAD - work library	LIB	VCAD
Video Works II	APPL	MMVW
Video Works II - data	VWZP	MMVW
Video Works II - overview	VWOV	MMVW

APPLICATION	TYPE	CREATOR
W		
WingZ	APPL	WNGZ
WingZ - .scp	TEXT	WNGZ
WingZ - script	WZSC	WNGZ
WingZ - spreadsheet	WZSS	WNGZ
Word Perfect	APPL	SSIW
Word Perfect - data	WPDC	SSIW
Write Now	APPL	nX^n
Write Now - data	nX^d	nX^n
Write Now - data	nX^w	nX^n

About Type and Creator Codes

Your Macintosh uses Type and Creator codes to perform a variety of functions, which perhaps you have come to take for granted.

Creator Codes

One of the things you have probably come to expect is that when you open a document on your desktop, your Macintosh knows which of your applications you want to launch to work with that document. The Creator code (which is actually a part of your document that you cannot see) is what tells your Macintosh which application to launch. That is, when you open the document, the Macintosh file system examines the Creator code, locates the application to which it applies, launches the application, and then opens the document you selected so that it appears in a window.

You might have run into a situation at some time where you attempt to open a document and launch an application only to have your Macintosh tell you the application is either busy or missing. This normally results from one of two conditions:

- The application is, in fact, either in use or not available on your system, or
- The Macintosh file system cannot match the document's Creator code to the application you are attempting to launch.

The first condition is one you can deal with rather easily by making the application available – that is, by installing it on your system or by stopping it from running, as the case may be.

In this discussion we are concerned with the second condition and how it specifically relates to your use of SUM II. But first, what about Type codes?

Type Codes

Type codes, like Creator codes, tell the Macintosh file system certain specific things it needs to know about files.

In the case of documents (that is, files created by applications), Type codes are fairly free form and assigned at the discretion of software developers. However, in the case of executable files (or applications), Type codes must adhere to strict standards.

For executable files, the most common Type codes are 'APPL' (for applications), 'cdev' (for Control Panel devices), and 'init' (for startup documents). If you look at the list of Type and Creator codes on the preceding pages, you'll see that almost all application type files have a Type code APPL. You might also notice that each Type code for the various documents created by these applications is unique.

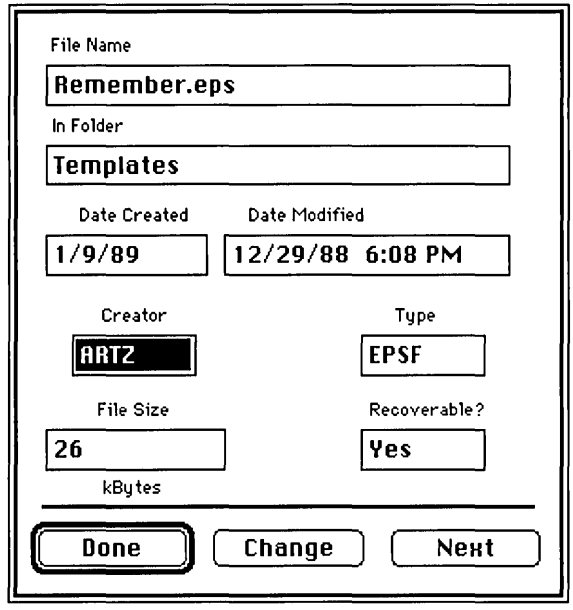
Type codes have a great many uses – far more than are pertinent to this discussion. The most important point to keep in mind here is that in almost every case your applications should have the type code APPL. Your documents should have the specific Type code indicated for that particular type of document in the list on the preceding pages.

Inserting Type and Creator Codes

In Chapter 4, *SUM Disk Clinic*, you learned about the three types of Recovery Methods you can use to recover files from a volume – Directory Scan, Volume Scan, and Floppy Recover.

When you use the Directory Scan method, the programs are almost always able to recover a file's Type and Creator codes along with the data. But, when you use the Volume Scan or Floppy Recover methods, the Type and Creator codes are rarely, if ever, recovered.

So if you use either of the latter two methods, it is up to you to reinsert the correct Type and Creator codes either *during* the recovery process, or immediately *after*. SUM II gives you a way to do this.



During Recovery

The way to insert the correct codes *during* recovery is to use the **Get Info** command while working with the SUM File Recover window in the SUM Recover program. These steps are described in Chapter 5, *SUM Recover*, but we'll reiterate them here briefly for your convenience.

While the SUM File Recover window is on your screen, you click the **Search** button when you are ready to begin searching your volume for files you can recover.

Once the search is complete, your recoverable files appear in the File List Window.

Select the file or files you want to recover in the File List Window and then choose **Get Info** from the **File** menu. You then see a dialog similar to the following:

The information you're concerned with in this dialog, of course, are the Creator and Type text fields. Also of interest is the indication as to whether or not the file is Recoverable. If it isn't, there isn't much use inserting Creator and Type codes because you won't be able to use the file anyway.

If the dialog you see on your screen already has Creator and Type codes inserted, check them against the list in this appendix to make sure they are correct. If they are, you don't need to do anything else.

If the Creator and Type codes are incorrect, or if they are missing altogether, then you need to insert the correct codes by typing them into the text fields.

✱ **Take your time and check your work carefully.** Make sure you are inserting the correct code into the right text field, and also make sure the codes are correct for this particular document or application file.

When everything is correct, click **Change**.

After Recovery

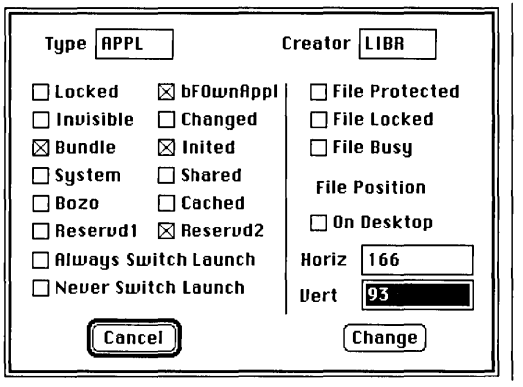
If you don't discover that a file's Type and Creator codes are missing or incorrect until after you have exited from SUM Recover, the best way to insert the correct codes is to use SUM Tools.

Detailed instructions for using SUM Tools can be found in Chapter11, but here again, we'll reiterate them for your convenience.

Launch SUM Tools and after the program starts, choose **Edit File** from the **File** menu.

A standard file selector dialog appears. Locate and open the file you want to work with. The file's data then appears in the Hex Edit window.

Choose **Edit File Attributes** from the **File** menu and you see a dialog similar to this:



From here, the procedure is basically the same as described on the preceding page: check the Type and Creator codes indicated against the list in this appendix. If the codes are correct, no further action is required.

If the codes are incorrect or are missing, insert the correct ones by typing them into the two text fields at the top of the dialog. Once again, double-check to make sure you have entered the correct codes into the correct fields.

Do not change anything else in this dialog unless you fully understand what you are changing.

Once the codes are entered correctly, click **Change**.

End of Appendix B

SUM Tools Structures

This appendix contains instructions for creating your own structures to use with SUM Tools. Structures give you the ability to display memory in a more discernable way than simply looking at strings of hexadecimal characters. This feature is provided mainly for software developers and advanced users.

The structure format is defined, and an example is also provided.

You can use any word processing application that saves files in *pure text format* to create structures. Once a structure is created, you can incorporate it into SUM Tools using the **Add Structure** command in the **Macintosh** menu. SUM Tools converts your structure to an SSTR-type resource.

SUM Tools provides a variety of predefined structures you can access via the **Structures** command. These structures are discussed in Chapter 11, *SUM Tools*.

Structure Definition

Field No.	Content	Comments
1	LHST	The literal characters 'LHST' must be at beginning of file.
2	TEXT	The literal characters 'TEXT'.
3	xxxx	Four characters. Define decimal *x* position for printing.
4	xxxx	Four characters. Define decimal *y* position for printing.
5	a...z	Up to 100 characters. Text used to label this element.
6	VALU	The literal characters 'VALU'.
7	xxxx	Four characters. Define decimal *x* position for printing.
8	xxxx	Four characters. Define decimal *y* position for printing.
9	a...z	Up to 100 characters. Text used to label this element.
10	xxxx	Four characters. Decimal offset from base for this value.
11	xxxx	Four characters. (For future use.)
12	LINE	The literal characters 'LINE'.
13	xxxx	Four characters. Decimal *x* position for Start.
14	xxxx	Four characters. Decimal *y* position for Start.
15	xxxx	Four characters. Decimal *x* position for End.
16	xxxx	Four characters. Decimal *y* position for End.
17	LAST	The literal characters 'LAST'. Indicates end of structure file.

Structure Example

Content	Comments
LHST	Indicates this is a structure file.
TEXT	Indicates data is to be displayed as text.
0200	*x* position is 200.
0065	*y* position is 65.
Example Structure	Text label to print for this structure.
VALU	Print a value.
0020	*x* position is 20.
0080	*y* position is 80.
qLink	Label is printed at x+80,y.
0000	Offset from base (cursor) is zero.
0002	Type to print is hexadecimal long.
VALU	Print a value.
0020	*x* position is 20.
0090	*y* position is 90.
qType	Label is printed at x+80,y.
0004	Offset from base (cursor) is four.
0004	Type to print is hexadecimal integer.
VALU	Print a value.
0020	*x* position is 20.
0100	*y* position is 100.
Decimal Value Long	Label is printed at x+80,y.
0006	Offset from base (cursor) is six.
0001	Type to print is decimal long.
LAST	End of structure file.

End of Appendix C

Notes

Glossary

allocate – To assign or reserve computer storage areas for a specific task.

allocation block map – Starting in block 2 of a disk is an allocation table or map. This map represents all the allocation blocks on a volume with a 12-bit entry that shows whether the block is allocated or not by a file.

AppleTalk Network – A Local Area Network (LAN) that lets everyone in a group connect their Macintoshes, other types of computers, and their peripherals using cables and connectors. Documents, electronic mail, applications, and data can be shared across the network.

Applications – Software programs used to create and modify information and perform other various tasks. Some examples are MORE II, Excel, PageMaker™, Think C, and SAM™ Virus Clinic.

Backup – A procedure that copies and stores data to another disk for archival purposes.

Bad Sector – An unreadable area of a disk containing bad bits, making data within the sector inaccessible.

Baud Rate – The total number of bits transmitted per second. Normally refers to telecommunications.

Binary Tree Header (BTH) – This special node is found at the beginning of every binary tree. There is one for the catalog tree file and one for the extents tree file.

Bit – The smallest unit of information that can be represented in binary notation.

Block – A file unit in which sectors are stored.

Bomb – A message box containing a bomb icon that alerts you when a problem has occurred within your software system. Restarting the system is required.

(*to*) **Boot** – To start up the computer.

Boot Blocks – Information for starting the Macintosh that is contained within the first two sectors of a disk.

Boot Sector – Blocks 0 and 1 on every disk are boot blocks that contain the startup information and the bootstrap loader program.

Bridge – A device that lets you connect AppleTalk networks together.

Byte – A set in memory or on disk usually containing 8 bits.

Catalog Extents – Disk storage space allocated to the directory.

Catalog Tree File – One of the binary trees on an HFS disk that stores all the directory information.

CDEV – A program accessed through the Macintosh Control Panel. Normally CDEV is used to configure software.

Contiguous Space – Space on a hard disk where the tracks and sectors are physically next to each other.

Control Panel – A desk accessory used to adjust various settings on your Macintosh, such as sound, mouse movement, and so forth.

Copy Protection – Routines that software developers build into their programs to prevent illegal copying of software.

Crash – When a system stops working or is working incorrectly, forcing you to restart your system.

Creator Code – A code (which is part of a file) that tells the Macintosh which application created the file.

Daisy Chain – A specific method of spreading signals along a bus. This allows devices to be assigned priorities based on its electrical position along the bus.

Damaged Volume – A hard disk, floppy disk, or volume partition that appears unreadable or needs maintenance. The volume may have damaged data structures, which organize files and documents on a volume.

Data – Information a program outputs.

Data Fork – Part of the file that contains the data accessed through the Macintosh's File Manager.

Defragment – To reorganize the fragments on a disk into contiguous areas to maximize performance.

DES (Data Encryption Standard) – A standard encoding scheme developed by the United States Federal Bureau of Standards.

Defective Media – Volumes that do not pick up the magnetization pattern written by the disk drive.

Deleted File Record – The record where SUM Shield records a deleted file's name and location.

Desk Accessory – A type of application that is accessible at any time, even while another application is running. Desk accessories can be accessed via the menu. Examples are Calculator, Find File, Note Pad, SUM Partition, and so forth.

Desktop – A special program the Macintosh uses to represent files, folders, and volumes on the screen of your computer.

Desktop File – An invisible file that is created on every volume when it is initialized and is subsequently updated to keep track of information about the volume, such as which icons are used on the desktop.

Device – Any peripheral or piece of equipment that can be attached to a computer.

Driver Descriptor Map (DDM) – Identifies the different device drivers that can be loaded during system startup.

Device Descriptor Sigs – Signature bytes used in SCSI boot blocks.

Device Partition – A special type of volume that is actually part of a larger volume and is created either by the device manufacturer or by a Macintosh user with the help of software provided by the manufacturer. Often referred to as "hard partitions," "SCSI partitions," and various other names. Not to be confused with "volume partitions" or "soft partitions."

Directory – A list of a volume's contents. The contents can be listed in numerous ways, such as by type, size, date, color, or icon.

Disk – A device that stores data using a form of magnetic impulses. There are two main types, floppy disks and hard disks. Often referred to generically as a "volume."

Disk Drive – A device that reads and stores data to and from disks.

Document – A file containing information created, modified, and saved using any of various applications.

Downloading – Information retrieved from another computer and stored on your own computer or Bulletin Board Service (BBS).

Driver – Software that tells your Macintosh how to access and work with a device.

Encrypt – Coding data in such a way that makes it unrecognizable for normal purposes.

Erase Disk – Found on the Special menu, this command completely clears the disk of information. If you use this on a floppy disk, there is no chance of recovering your files.

Error Message – An alert indicating that a problem has occurred.

Extents Tree File – One of the binary trees on an HFS disk that is used for file mapping.

FasCrypt – A special form of encryption used only with SUM Encrypt.

File – Accumulative data stored on a disk, either as an application or a document.

File Extent – A series of contiguous allocation blocks. Usually the contents of a file are stored in several extents across parts of a volume.

File Server – A file-sharing system that makes volumes or folders on a hard disk available to multiple users. An example is AppleShare.

Finder – A special Macintosh application used to get information to and from volumes.

Font – A collection of typographical symbols with a consistent typeface.

First block of Bt Map – First block where the volume bit map is stored.

Fork – One of the two parts of a file, either a data fork or a resource fork.

Format – The storage capacity of a disk. Single sided disks can store up to 400K, double sided disks up to 800K, and high density disks up to 1.4 MB (megabytes).

HFS – (Hierarchical File System) A multilevel method of organizing information on a volume so that the files and folders can be stored within folders.

Hard Partition – See "Device Partition."

Highlight – A video effect used to indicate when an object is selected on a computer screen.

Icon – A graphic symbol used to represent a file.

Init File – A type of application file that resides in a system folder and loads into memory during the startup procedure. Often referred to as a "startup document."

Interface – The software or hardware that links a device to the computer.

Initialize – The process of preparing a volume so that you can get information from or save information to the volume. The process writes zeros to each sector of the disk; therefore, in the case of a floppy disk, it eliminates any chance of recovering data because the disk is completely cleared of information.

LAN – (Local Area Network) A network of communication cables that physically links personal computers together. It usually includes cabling, network software, and application software.

Launch – To start an application.

Lock – To prevent a volume or file from being altered.

Master Directory Block (MDB) – The data structure of a flat directory volume where the volume information and the volume allocation block map is stored.

Megabyte – (MB) A unit that measures a computers memory equal to 1024K.

MFS – (Macintosh File System) A single-level method of organizing information on a volume. Used with early Macintosh computers but superceded by HFS (Hierarchical File System).

Modem – A device that makes it possible for computers to exchange information over phone lines.

Mount – Make a volume available for use. For example, when you insert a floppy disk into the drive, the volume is mounted when its icon appears on the desktop.

Multitasking – Hardware or software that enables you to work on more than one task simultaneously.

MultiFinder – A special system software application that makes it possible to have one or more general applications open at the same time.

Nesting – The placing of folders within one another.

Operating System – A special program that controls basic tasks, such as memory management, input/output processing, interrupt handling, and so forth. Also controls operation having to do with ROMs, System file, and the Finder.

Option Card – Specialized functions controlled by an electronic function card. Some examples include accelerators and coprocessors.

Orphan – A block on a volume that doesn't have a directory entry, file allocation, or belong to any file or operating system.

Parameter RAM – An area of memory where Control Panel settings and ongoing basic functions are stored. It is battery powered, so the information is retained even after the machine is turned off.

Partition – A segment of a volume that is treated as a completely separate volume.

Pop-up Menu – A menu that appears somewhere else other than the menu bar, usually in a dialog box, and is identified by a shadowed box.

Port – A connection socket for a cable. Normally located on the back side of a computer.

Printer Driver – A system file that sends information to a corresponding printer.

RAM – (Random Access Memory) The internal memory that stores information temporarily. When power is turned off, all data in RAM is lost. Parameter RAM (see above) is an exception.

RAM Cache – A feature that sets aside and retains information for an application's repeated use. This process is faster than retrieving information from a disk. The settings are located in the Control Panel.

Resource Fork – Part of the file where the data used by the application is stored, for example, icons and menus.

ROM – (Read Only Memory) Permanent memory used to store programs that the computer uses for various system operations, such as the information used at startup.

SCSI – (Small Computer System Interface) An industry standard high-speed interface that transfers data from one device to another.

SCSI Cable Terminator – Hardware devices which attach to a SCSI device or cable. Only one terminator at the beginning and one at the end of a SCSI chain is allowed.

SCSI ID Number – Device ID number that identifies the device and its priority on the chain. Only numbers 0 through 7 can be used to identify the device's priority onthe chain.

SCSI Partition – See "Device Partition."

SCSI Port – A connector located on the back panel of a computer (see "Port" above).

Sector – The storage unit of a volume for basic files.

Serial Interface – A single-path communication line that transmits information sequentially, one bit at a time.

Serial Port – A serial interface connector located on the back panel of the computer.

Signatures – Files with special information that helps SUM Recover locate and recover files from a crashed disk.

Soft Partition – See "Volume Partition."

Startup Disk – A disk containing a Finder and a System file that your Macintsoh uses to get started.

Startup Document – See "Init Files."

System File – A collection of information that starts up the computer. This program combined with a Finder creates an operating system, which cannot be launched like a normal application.

System Folder – A folder that contains the system file and other programs that control your Macintosh.

Trash – An icon displayed on the desktop used for discarding unwanted files.

Type Code – A code (which is part of a file) that specifies the file's type, such as an application, Control Panel device, or startup document.

Virus – A program designed to infect and modify data, altering your Macintosh's behavior, usually meant for destruction.

Volume – Any source that can be read from or written to, such as a hard disk, floppy disk, volume partition, device partition, or tape drive.

Volume Bit Map – A data structure used in the hierarchical file system that contains a sequence of bits with one bit for each allocation block that tells if the block is allocated or available for use.

Volume Information Block – In a hierarchical directory, this block contains the volume information.

Volume Information File – A special file SUM Disk Clinic uses to determine certain characteristics about a specific volume.

Volume Parameter – A directory of information regarding your hard disk, including size, drivers, etc.

Volume Partition – A segment of a larger volume that is created with a special application and can only be accessed using the same application. For example, SUM Partition creates and accesses volume partitions. Contrast with "device partition," which can be accessed by the Macintosh file system.

Volume Restore Record – Record that gives SUM II the ability to restore a crashed or accidentally initialized volume.

Zone – An interlink of networks connected by bridges.

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SYMANTEC™

SUM II™

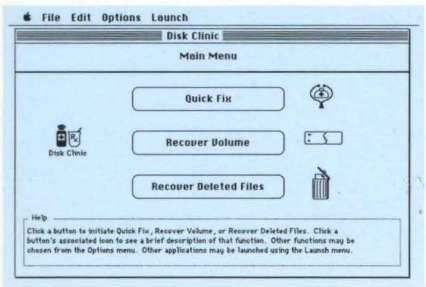
Symantec Utilities for Macintosh

Crashed Disk and File Recovery, Backup, Optimization, and Security

SUM II™ is a completely new version of the award-winning Macintosh utility program. This version offers all of the power and usefulness of SUM Version 1 while incorporating an entirely new interface, three new utility programs, and added features in every other utility. SUM II is the most powerful set of utilities available for ensuring that your data is safe, secure, and efficiently organized.

1989 Macworld World Class Award

1988 MacUser 5-mice rating



SUM Disk Clinic's easy-to-use interface guides you through the recovery process and helps you decide what you need to do.

SUM Backup allows you to easily back up and restore critical files and applications.

System Requirements

- **Works with a Macintosh Plus or higher**
- **Works with any floppy disk, hard disk, SCSI device, volume file, or optical disk**
- **Compatible with AppleShare, TOPS, and MacServe**
- **Requires System v4.2 and Finder v6.0 or higher**
- **Multifinder compatible**
- **Not copy protected**

SUM II Components

New Utilities!

- **SUM Backup** (based on the popular Redux program from Microseeds Publishing) helps you quickly and easily make backup copies of files and applications.
- **SUM Quick Fix** will attempt to repair a crashed hard disk.
- **SUM Encrypt** secures files and folders with two forms of encryption (including DES).

Improved Utilities!

- **SUM Shield** makes data recovery fast and easy when preinstalled and protects your data in the event that a disk crashes or your hard disk is initialized by mistake.
- **SUM Recover** can recover your data from a floppy or hard disk even when SUM Shield is not installed.
- **SUM TuneUp** defragments files, optimizes disk space, erases free space, verifies data, and locks out bad disk sectors.
- **SUM Partition** divides disks into multiple volumes which you can encrypt and password-protect.
- **SUM QuickCopy** duplicates and initializes floppies much faster than the Macintosh desktop.
- **SUM Tools** edits files, disks, and memory, and contains a graphics editor and disassembler.
- **SUM Disk Clinic** helps you "diagnose" disk problems and decide how best to solve them.

SUM Tools compatible only with System 4.2 and 6.X.

International versions of SUM II are available. Call Symantec International Sales at (408) 253-9600.

Symantec's 30-day Money Back Guarantee: If you are dissatisfied with this Symantec software program, return it to your dealer within 30 days for a full refund.

Use of this product is subject to acceptance of the Symantec License Agreement on the sealed diskette envelope included in this package.

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