

Norton Disk Editor®

Reference Guide

Norton Disk Editor™ Reference Guide

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Norton Disk Editor

Norton Disk Editor is a sophisticated tool that lets you view and alter files and low-level, file-system data that would be otherwise inaccessible. You can use Norton Disk Editor to access a damaged disk's directory or File System area, or copy data from an irreparably damaged disk.

This chapter explains how to use Norton Disk Editor to:

- Examine files (page 5).
- Search for files by content or technical information (page 9).
- Tour the File System area of a disk (page 13).
- View data structures through display templates (page 19).
- Locate “missing” volumes (page 20).
- Make and save changes to disk sectors (page 24).

Note: While there is no harm examining file data, changing the information on a disk can damage the contents in a file, delete the file, or even damage the entire disk. This manual does not include instructions on how to make repairs to damaged disk structures, or how to interpret and identify damaged data. Do not save any changes to your disk when using Norton Disk Editor unless you are certain about the changes you have made.

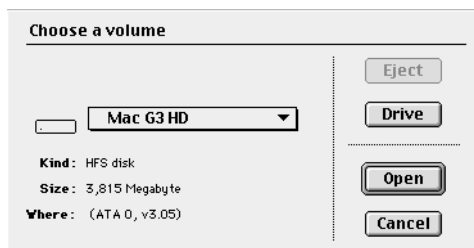
Viewing file contents

Norton Disk Editor lets you view the raw contents of any file in ASCII or hexadecimal format.

To start Norton Disk Editor:

- 1 Start Norton Utilities.
The Norton Utilities Main Menu window appears.
- 2 Choose Norton Disk Editor from the Utilities menu.

The Choose a Volume dialog box appears.



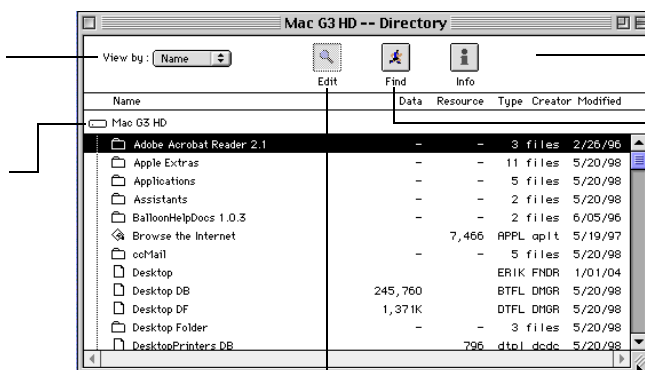
3 Select a volume.

4 Click Open.

The Directory window appears.

Choose a sort order: Name, Date, Size, Kind, Type, or Creator

Double-click to open or close folders



View information and attributes for selected item

Search for files by Content, Filename, Type/Creator, Attribute, File Number, or Directory ID

Click to open the Hex View window for the selected file, or double-click the filename

Note: To become more familiar with Norton Disk Editor, use SimpleText or a word processor to create a small test file that includes some easily recognizable words. This will help you recognize parts of the file when you view it with Norton Disk Editor. Also, you won't damage critical information if you accidentally save the file after making changes.

To view a file in Norton Disk Editor:

1 Start Norton Disk Editor.

The Choose a Volume dialog box appears.

2 Select a disk from the list.

3 Click Open.

The volume's directory window appears.

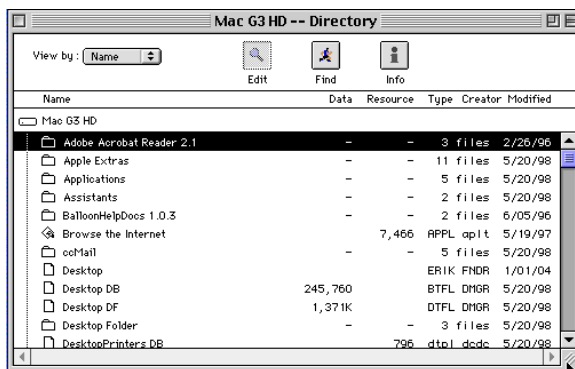
- 4 Do one of the following:
 - Select a file from the list.
 - Click Find and enter search criteria to search for a file.

Found files are listed in the directory window.

For detailed search techniques, see “Searching for data” on page 9.

- 5 To view information about the selected file or folder, click Info.

An information window appears.



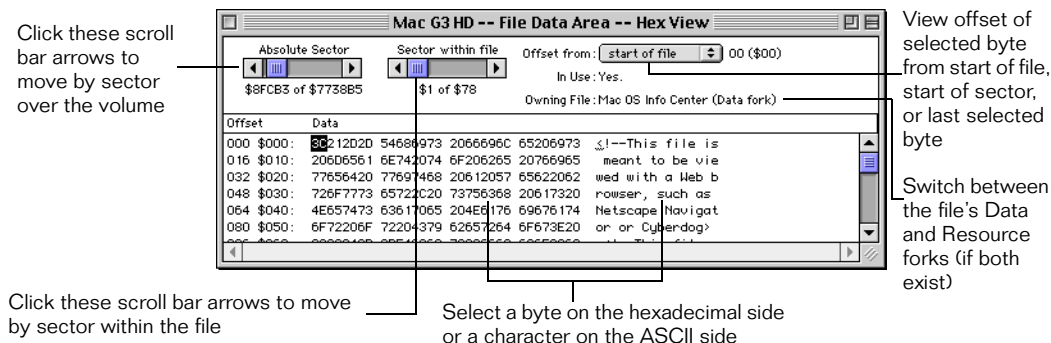
This window displays the following information about a file or folder:

- Filename
- Creation and modification dates
- The date a file was last backed up
- Whether a flag or attribute (if both exist) is set on a file or folder.

To view the file contents in Hexadecimal View:

- 1 In the Norton Disk Editor directory window, select a file.
- 2 Click Edit, or double-click the filename.

The File Data Area window in Hex View appears.



Norton Disk Editor displays numbers in both decimal and hexadecimal notation. All hexadecimal numbers are prefaced with a dollar sign (\$) symbol. All other numbers are decimal (except for data values in the Hex View window).

Tip: To display a file's contents without first opening Norton Utilities, drag the file's icon to the Norton Disk Editor icon in the Norton Tools Folder.

- 3 Use the Sector Within File scroll bar to move sector by sector within the file.

A file is saved to disk in blocks composed of one or more sectors. If your file does not completely fill the last block, you may see random characters that are not part of your file.

Note: In Hex View you can make changes to the file. You are prompted to Save or Don't Save the changes when you move to the next sector. Unless your changes are intentional, always choose Don't Save. For details on editing file contents, see "Making modifications" on page 24.

To switch to ASCII view:

- Choose View in ASCII from the Display menu.

ASCII (American Standard Code for Information Interchange) is the coding scheme that assigns numerical values to each text and control character. Depending upon the application that created the file, this may or may not be readable.

To find the offsets of a particular byte:

- 1 In Hex View or ASCII View, select a byte.

The Offset From list lets you find out the distance of a particular byte from the beginning of the file, the beginning of the sector, or from another byte in the file.

You can select any byte in the Hex or ASCII side of the Hex View window, or any character in the ASCII View window.

- 2 In the Offset From list, choose one of the following:

- Start Of File
- Current Offset
- Start of Sector

The distance from the selected byte appears to the right of the list.

- 3 If the selected file has a resource fork and a data fork, click Data Fork/Resource Fork in the upper-right of the window to toggle between the two forks.

Searching for data

Norton Disk Editor has powerful disk searching capabilities. You can search within a chosen file or over the entire disk.

To search for data:

- 1 In a Directory window, click Find.

The following search dialog box appears.

Select a
search type

The screenshot shows a search dialog box with the following elements:

- A label "Look for:" followed by a dropdown menu currently showing "File Name".
- A text input field labeled "File Name:" containing the text "norton utilities".
- A checkbox labeled "Ignore Case" which is checked.
- At the bottom, there are two buttons: "Cancel" and "Find".

- 2 Specify the type of search in the Look For list. The types of searches available are:
 - ASCII/Hex

- Enter a search string in ASCII or hexadecimal.

- File Name

Enter all or part of a file or folder name for the search. You can also make the name search case-sensitive.

- Type/Creator

Search by type or creator signatures.

- Attribute

Specify which Finder Flags or File Attributes must be set for the match. For example, if Is Alias is checked, only aliases are found.

- File Number

Search for a file by its identifying number.

- Directory ID

Search for a folder by its identifying number.

Depending on the type of search you selected, your options change. For example, if a volume is not mounted on the desktop, some search methods may not be available. Searches other than ASCII/Hex are only possible when you have opened a logical drive.

To define ASCII/Hex searches:

- 1 Choose ASCII/HEX from the Look For list.

The ASCII/Hex search options appear.

Specify what to
search for in the list _____

_____ Specify the current
file or entire disk
for the search

- 2 Specify whether to restrict the search to the current file or search the entire disk in the Search list.
- 3 Leave the default Ignore Case selected if you want to find both upper and lower case text (“Fred” and “FRED” are matches).
- 4 Select Match Only At Offset check box to eliminate extraneous matches.

A match occurs only if the search string occurs at the specified number of bytes from the beginning of a sector.

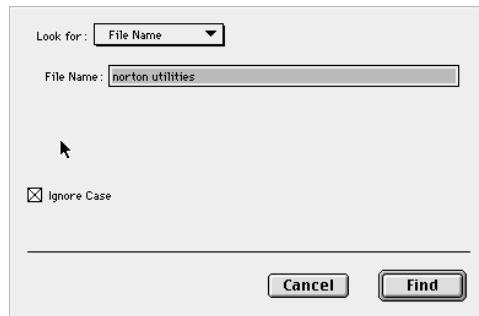
5 Click Find.

To locate the next match, choose Find Again from the Edit menu after a match is found.

To search by File Name:

1 Choose File Name from the Look For list.

The File Name search options appear.

A screenshot of a search dialog box titled "Look for:". The "Look for:" dropdown menu is set to "File Name". Below it, the "File Name:" text box contains the text "norton utilities". There is a checkbox labeled "Ignore Case" which is checked. At the bottom right, there are two buttons: "Cancel" and "Find".

2 Enter all or part of a file or folder name for the search.

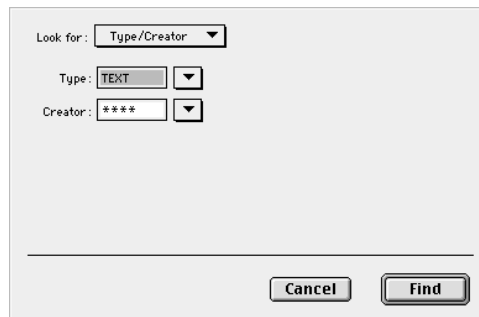
3 Clear the Ignore Case check box to make the search case-sensitive.

4 Click Find.

To search by Type/Creator:

1 Choose Type/Creator from the Search By list.

The Type/Creator search options appear.

A screenshot of a search dialog box titled "Look for:". The "Look for:" dropdown menu is set to "Type/Creator". Below it, there are two rows of controls. The first row is labeled "Type:" and has a text box containing "TEXT" and a dropdown arrow. The second row is labeled "Creator:" and has a text box containing "****" and a dropdown arrow. At the bottom right, there are two buttons: "Cancel" and "Find".

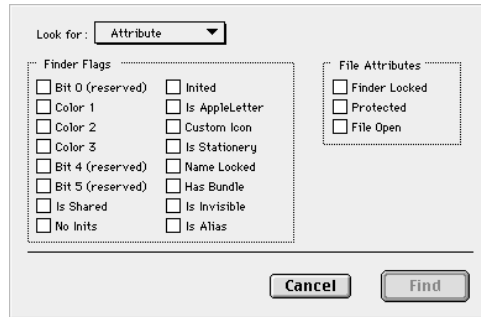
Note: Type and Creator codes are always case-sensitive.

- 2 Select a Type from the list, or enter a file type in the text box.
- 3 Select a Creator from the list, or type a creator directly.
- 4 Click Find.

To search by Attribute:

- 1 Select Attribute from the Look For list.

The Attribute search options appear.

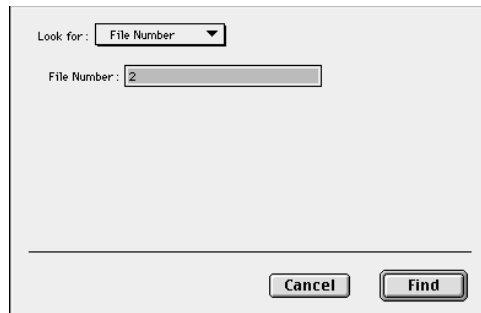


- 2 Specify which Finder Flags or File Attributes must be set for the match.
For example, if Is Alias is checked, only aliases are found.

To search by File Number:

- 1 Select File Number from the Look For list.

The File Number search options appear.



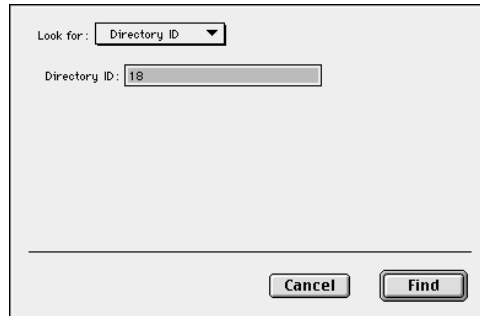
- 2 Enter the file's identifying number in the File Number text box.
- 3 Click Find.

The file with the corresponding number appears in the directory list.

To search by Directory ID:

- 1 Select Directory ID from the Look For list.

The Directory ID search options appear.

A screenshot of a search dialog box. At the top, it says "Look for:" followed by a dropdown menu currently showing "Directory ID". Below this is a text box labeled "Directory ID:" containing the number "18". At the bottom of the dialog are two buttons: "Cancel" and "Find".

- 2 Enter the folder's identifying number in the Directory ID text box.
- 3 Click Find.

Viewing disk system objects

You can use the Objects menu commands to view your disk's File System area, where its bookkeeping information is stored. You can choose a specific object from the Objects menu, or select from the View As list in the Display menu, to view objects by sector.

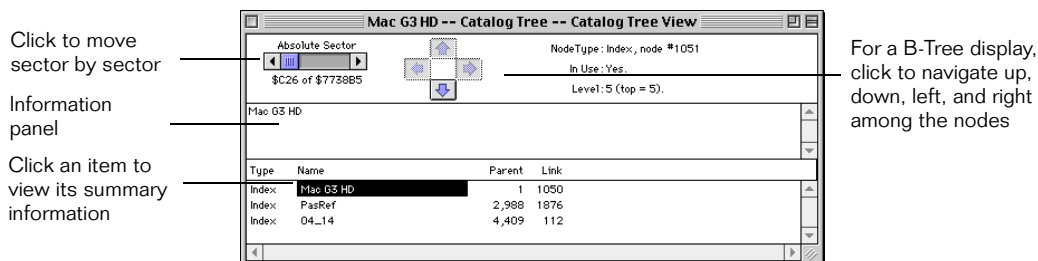
The physical layout of these data structures begin at the initial sector (sector 0) of your disk and continue one after the other until you reach the disk's data area, where file contents are stored.

Note: HFS+ (Macintosh Extended Format) directory structures cannot be accessed through the Objects menu. The current version of Norton Disk Editor recognizes file system structures on HFS volumes only. If you open an HFS+ volume in the Norton Disk Editor, the editor allows you to access structures in the HFS wrapper. However, you will not be able to see information about data you have saved to the drive. HFS+ support is planned for a future version of Norton Disk Editor.

To view File System area objects:

- 1 Select a volume.
The directory window appears.
- 2 Choose a command from the Objects menu.

A window displays the view you chose.



Note: To open a new window, hold down the Option key while choosing an Object menu command.

Each object is displayed through its template. See “Viewing data through templates” on page 19 for more information on using templates.

The display window is divided into three portions.

- Upper portion contains navigation controls, which vary depending upon the type of object displayed.
- Middle portion displays a description
- Lower portion displays the data through a template that formats the data for easy viewing.

Note: It is beyond the scope of this manual to describe methods for manipulating and repairing the directory structures accessible through the Norton Disk Editor.

- 3 Click any of the fields in the lower portion to view a brief explanation in the middle portion of the window.

File system settings

The following list describes the available file system settings.

- Driver Descriptor Map (DDM)
Written to disk only during initialization (low-level formatting), the DDM stores information about the disk itself. For example, the Number of Sectors on the Device is the size of the disk. To view the DDM, the disk must be opened as a physical volume; otherwise the command is dimmed. See “Physical and logical disks” on page 18 for more information.

- Partition Map

Contains information about all partitions on the disk. Every sector on the disk except the DDM must belong to a partition, including the partition map itself. Device drivers occupy their own partitions. For example, your drive may have three partition blocks (the Partition Map itself, the driver, and the HFS volume). Add the Partition Map Lengths for each block. The total is one less than the number of sectors reported in the DDM. To view the Partition Map, the disk must be opened as a physical volume. Otherwise the command is dimmed. Because logical format information is not read when the disk is opened as a physical volume, sectors after the partition map are displayed in a data (Hex) window.

- Boot Blocks

These sectors on your disk contain information that is read at startup, including a variety of system options. Click any item to read about it in the information window. If you click the scroll bar arrow to the next sector, the view changes to Hex. You are viewing the actual machine instructions that start your computer, as well as other boot block data.

- Master Directory Block (MDB)

Sectors in this format contain additional information about the disk volume you are currently exploring, such as size, number of files, and free bytes. Click any item for a brief description of its purpose.

The several sectors directly after the Master Directory Block are the Volume Bitmap (click the right arrow of the horizontal scroll bar once to see the first sector). The Volume Bitmap, displayed in Hex View, shows which data sectors are occupied. A 1 indicates “occupied” and a 0 indicates “free.” For example, the hexadecimal digits FF (with a binary value of 11111111) mean 8 consecutive sectors are in use. A byte of 00 represents 8 free sectors. Free sectors are not assigned to any file, although they may contain data left over from previously erased files.

Tip: For an interactive, visual display of the Volume Bitmap, look at Speed Disk’s disk map.

- Extents Tree Header

Shows the bookkeeping information about the disk’s *Extents B-Tree*, which is a data structure that keeps track of file fragments. Not all files can be stored in one set of contiguous sectors—particularly files that have been extensively modified and are also large, such as databases and spreadsheets. Up to three fragments of each fork of a file can be

stored in the Catalog Tree record for the file. The Extents Tree keeps track of the location of all excess fragments, including which fragment belongs to whom, where it begins on the disk, and how large it is.

- Extents B-Tree

Shows the contents of the Extents B-Tree itself, one node at a time. You can navigate up, down, left, and right among nodes in the tree. Select any element of this tree to view a summary of related information.

- Catalog Tree Header

The *Catalog B-Tree* keeps track of file and folder names and locations. This information is used by the Finder to locate files. The desktop you usually see is mainly a user convenience. The actual organization of a disk directory is kept in the Catalog Tree. The Catalog Tree Header describes the size and shape of the tree so the File System can navigate it properly.

- Catalog B-Tree

Shows the Catalog B-Tree. You can navigate up, down, left, and right among nodes in the tree using the arrows. Select any element of this tree to view a summary of related information.

- Directory

Although not technically a disk object, the Directory view is a folder-and-file view of your disk organization and interprets the file structures for you. This is the mode the window is in when you launch Norton Disk Editor.

File system views

From the Display menu you can select three file system views:

- Current folder

Shows the contents of the currently opened folder.

- All files flat

Shows every file and folder on the disk in a flat list. Folders cannot be opened in this view.

- All files outline

Shows all folders and their contents in a fully-expanded hierarchical display.

To open a folder, double-click it. To find out about a file or folder, select it and then click Info.

To examine any file, select it, and then click Edit to view the file contents or click Info to view the attributes.

Using the Command key shortcuts

The Command key combination, **⌘-E** is a powerful shortcut key in Norton Disk Editor.

- From a Directory view, **⌘-E** opens up the Hex View window for the selected file.
- From a Hex View, **⌘-E** jumps to the Catalog Tree Node where that file is stored.
- From a Catalog Node, **⌘-E** takes you back to the Hex View of the current file.
- From an Extents Leaf Node, **⌘-E** goes to the Catalog Tree Node for the file that the cursor is on, if it can be found.

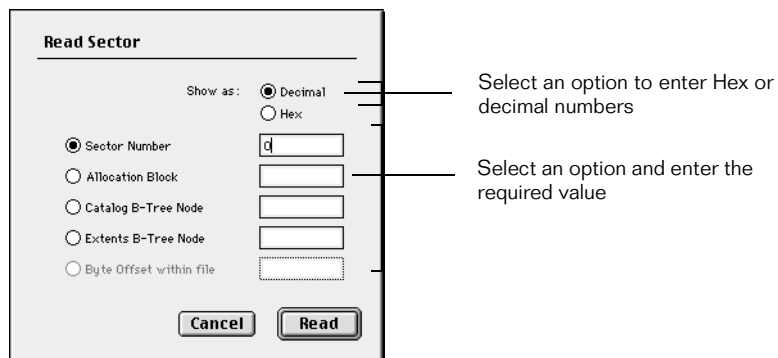
Viewing particular sectors

In addition to searching for Hex values or file information with the Edit menu's Find command, Norton Disk Editor can easily locate particular sectors.

To locate sectors:

- 1 Choose Read Sector from the Objects menu.

The Read Sector dialog box appears.



- 2 Specify an absolute sector to view.

Physical and logical disks

When a disk is first formatted, the disk surface is merely prepared to receive data. Before the computer's operating system can actually store any data, logic must be added to the physical organization. The process of writing the various indexes and directories that support this organization is called "logical formatting," or initializing. Think of the low-level format as the construction of an empty grid, and the logical format as the creation of a dynamic directory to locations in the grid. The computer's operating system deals with a disk's logical structures, called volumes.

Note: When you erase a hard disk using the Erase Disk command, only the logical format information in the File System area of the disk is changed. However, when you erase a floppy disk with the Erase Disk command, both a physical and a logical format are performed. This is why you can recover data from an erased hard disk but not from an erased floppy disk.

With Norton Disk Editor you can access either a disk's physical structure or its logical structure.

Note: Norton Disk Editor currently is not able to access the physical drive portion of IDE (ATA) drives.

To access the physical drive of a SCSI device:

- 1 Choose Open Volume from the File menu.
The Choose a Volume dialog box appears.
- 2 Select Scan SCSI bus from the list.

Note: You must scan the SCSI bus before you can access physical drives.

Norton Disk Editor scans for other SCSI devices.

- 3 Press and hold the Command and Shift keys while you open the Choose a Volume list a second time.

The name of the drive is the manufacturer's name, not the one you gave it on the desktop. For example, rather than "Fred's Disk," it might say "QUANTUM drive."

If the drive is not listed, such as when you are repairing a damaged drive, see "Locating volumes" on page 20.

- 4 Select the drive from the physical devices listed.
- 5 Click Open.

The Driver Descriptor Map (DDM), which stores information about the disk itself, and the Partition Maps, which contain information about all hard partitions on the disk, can now be viewed. When you access a physical drive, these are the only two elements that are displayed through object templates. The rest of the disk is shown in Hex View.

There are a few differences between a physical view and a logical view of a disk in Norton Disk Editor:

- Only the DDM and Partition Map can be selected from the Objects menu (or appear through their templates in AutoView). The rest of the disk is accessible by sector and displayed in a Hex window.
- The total of absolute sectors is greater in a physical view because the total includes the sectors used to store the DDM and partition maps, as well as the logical volumes. In a logical view, the count begins with the boot blocks, which are the start of the logical format (or volume).


Note: You can open separate physical and logical views of the same disk for comparison. For example, first open a physical drive. Then choose Open Volume from the File menu to open the logical volume. Two display windows appear.

Viewing data through templates

Display templates are a good way to locate landmarks on a damaged disk if you are attempting a reconstruction. You can use the templates when you open either a physical or logical disk.

Search the disk for particular hexadecimal values that you know denote a structure, and then switch to its template to see if the found values are appropriate. You can sometimes identify the type of data an object contains by trying the different views until you find one in which the data makes sense.

If AutoView is checked with the View As command from the Display menu (the default), the sector is displayed through its proper template (if the sector is an object), which changes as you scroll sector by sector. If AutoView is not checked, the last Object template selected is used for all sectors.

Tip: Press -J to toggle between the display template and the Hex View. The cursor is located at the offset of the selected field in the Hex View.

To select a view template:

- 1 Select any sector on the disk and choose View As from the Display menu to select a template from its submenu.

To try this technique, use the Absolute Sector scroll bar to view the very last sector on your logical disk in Hex View.

- 2 Click the left-pointing arrow in the scroll bar once to back up one sector.
- 3 Choose Master Directory Block from the Display menu's View As submenu.

The Alternate Master Directory Block appears. This sector is a backup copy of the Master Directory block, written when the disk is initialized. The drive's name may appear as "Untitled" or a similar name, and the number of files on the disk may appear to be zero. The Alternate Master Directory Block is designed to be used by drive repair utilities.

Caution: In a Hex View you can make changes to the data. Do not make or save any changes when you are just browsing!

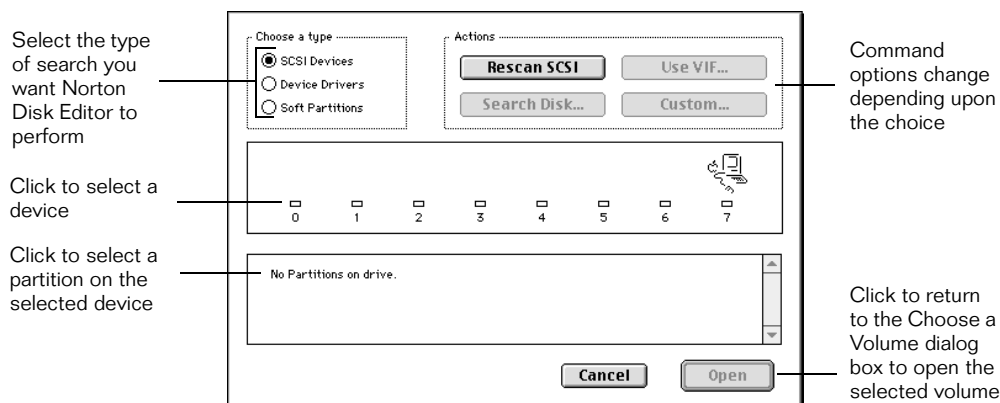
Locating volumes

For those times when a disk does not appear in the Choose A Volume dialog box, Norton Disk Editor has other means to help. It can try to locate a disk drive by looking for three kinds of information: it can attempt to locate SCSI devices by their ID numbers, it can look for device-driver software, or it can attempt to locate soft partition information. When you select one of the three options, the panel changes to reflect the type of information needed to locate the device.

To locate a volume:

- 1 Choose More from the Choose A Volume list.

A dialog box appears to specify the search criteria.



2 Choose a type option:

- **SCSI Devices**

Displays the SCSI ID numbers and SCSI device icons. IDE devices are not displayed in this dialog box.

- **Device Drivers**

Displays all active device driver icons and names.

- **Soft Partitions**

Lists any existing soft partitions.

The window changes to reflect the type of device information needed to locate the item.

3 Click Rescan SCSI to search for more devices.

Click Open to return to the Choose a Volume dialog box and open the selected volume.

The following procedures describe how to search by each option.

To choose a SCSI Device:

1 Select the SCSI Devices type.

2 Click Rescan SCSI to rescan for available SCSI hard drives and partitions on them.

The center panel of the dialog box displays the available SCSI devices on your system. ID numbers occupied by a device are indicated by a filled rectangle. Open rectangles show unassigned ID numbers.

A device icon appears above each occupied ID slot. ID 7, which you cannot select, is always the computer itself.

Note: This display does not differentiate between internal and external SCSI busses; all devices are displayed as if on one bus. If SCSI IDs are duplicated between busses, some devices may not appear.

- 3 Click a device icon.

The volume partitions on that device (if any) appear in the lower panel of the dialog box.

- 4 Select a partition name.

- 5 Click Open.

The Choose a Volume dialog box appears to let you open the selected volume.

If the partition you are seeking does not appear in the lower panel, and you have selected a SCSI device, four buttons become available.

The following is a list of these additional search buttons:

- Rescan SCSI

Forces Norton Disk Editor to look at all available SCSI drives again. It may be that a device had not warmed up and “reported in,” so this option may succeed in locating a missing device.

- Search Disk

Searches an entire SCSI device looking for HFS volumes, providing access to volume partitions that otherwise might be unavailable. Norton Disk Editor automatically attempts to determine disk size. Before you begin the disk scan, be sure to confirm the size. If the size is incorrect or not listed, you can enter it in either megabytes or in total number of sectors.

- Use VIF

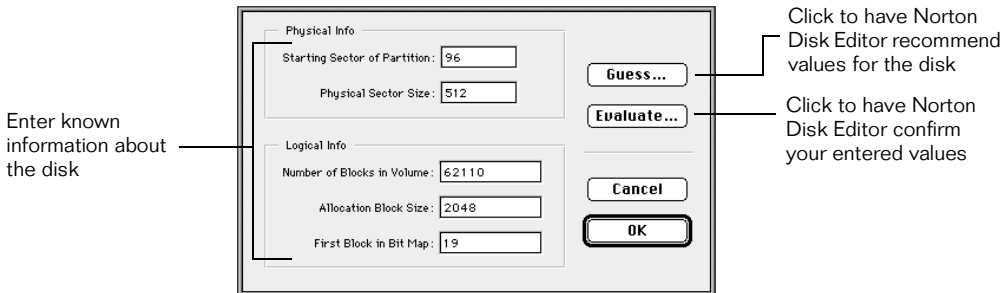
This option, included for compatibility with earlier versions of Norton Utilities, locates a drive or partition by finding and using a Volume Information File (VIF) created with Norton Utilities version 3.5 or earlier. In those versions, VIFs are created during the Norton Utilities Installation or by choosing Create VIF from the Option menu of Norton Utilities main window. When you click Use VIF, a dialog box appears to locate the appropriate VIF file.

- Custom

Enter specific data regarding the disk volume you want to recover. This information includes the starting sector on the physical device for the logical volume, the physical sector size, the number of

blocks in the logical volume, the allocation block size, and the first block in the volume bitmap.

- Click **Guess** to have Norton Disk Editor attempt to determine appropriate values.
- If you enter values yourself, click **Evaluate** to have Norton Disk Editor check to see if such a volume exists.



- 6 To open the physical drive from this dialog box:
 - a Press and hold the Command and Shift keys while you click on the icon appearing at the SCSI ID you wish to open.

A list of items appears in the box. The last line shows the name of a drive manufacturer, such as “QUANTUM” or “SEAGATE”, and the words “Entire SCSI Drive”.
 - b Select this item and click Open to access the physical drive.

To choose a device driver:

You can also search for volumes by looking for their *device drivers*. A device driver is software used to run the physical hardware where the volume resides.

Note: Although IDE (ATA) drives will not show up on the SCSI bus and cannot be accessed physically, you may be able to access logical volumes on IDE drives through the device driver.

- 1 Select Device Drivers.
Available devices appear in the center panel of the dialog box.
- 2 Select a device icon.
Volumes on that device appear in the lower panel of the dialog box.
- 3 Select a partition name.
- 4 Click Open.

The Choose a Volume dialog box appears so you can open the selected volume.

To choose a soft partition:

You can also scan available devices for soft partitions. A soft partition is a logical volume partition on a hard drive created by formatting software. For example, if you have partitioned a 4 GB drive into four one-gigabyte volumes, selecting Soft Partition causes those four volumes to display. There is another type of soft partition, which is actually a file on the hard drive and can be accessed by software applications as if it is a volume, that is not located by this method.

- 1 Select Soft Partitions.

Available devices appear in the center panel of the dialog box.

- 2 Select a device icon.

If soft partition volumes exist on the selected device, they appear in the lower panel of the dialog box.

- 3 Select a partition name.

- 4 Click Open.

The Choose a Volume dialog box to open the selected volume.

- 5 If you have soft partitions that do not appear, click Find More to select the soft partition filename.


If Norton Disk Editor has a problem with the specified file, it prompts you to enter the starting block number.

Making modifications


You can make modifications to the disk only from a Hex View window, and you can write changes to only one sector at a time.

Caution: Use the Hex View window carefully. Making inappropriate changes to critical sectors may cause damage to files, cause files or folders to disappear, or render your hard drive or system unusable.

To switch to hex view:

- Press -J, or select View In Hex from the Display menu.

To erase a sector:

- 1 Press -Shift-Delete to fill the sector with zeros.
The current sector is filled with zeros.
- 2 Select a different sector.
You are prompted to discard or save changes.
- 3 Click Save.

To save changes:

- Choose Write Sector from the Objects menu.
Make sure that this is what you really want to do. This action cannot be undone. The command is disabled unless changes have been made.
If you choose Write Sector, you will not be prompted to Save Changes when you move to another sector.

Note: Before you save any changes, either write down or print the current data values. If you make a mistake, you can re-enter the original values and start over.

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