
Colorado Backup User's Guide

F1214 Rev A

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Welcome to Colorado Backup

If you've ever had a hard drive crash or a computer virus attack your system you know the importance of protecting your files and information. We hope you bought a tape backup system *before* experiencing any of these disasters. Colorado Backup software works with your Colorado tape drive to make sure you don't have to spend even a day without your data. It only takes three steps to make sure you can get your data back should something happen:

1. Make regular backups. This keeps the data on tape up to date. If you installed the Windows 95 version of Colorado Backup, this is described in Chapter 1. If you installed the Windows version of Colorado Backup, this is described in Chapter 2. If you installed the DOS version of Colorado Backup, this is described in Chapter 3.
2. Compare your backups. This ensures that the data on tape exactly matches the data on your disk and that you will be able to restore the backup when the need arises. For details on comparing, see "How Do I Know If My Backups Are Good?" on page 1-5. For Windows and DOS, consult the on-line manuals.
3. If you are using Colorado Backup for Windows 95, make a recovery diskette. A recovery diskette allows you to quickly start your system, begin rebuilding your hard drive and restore your tape backups. For details, see "Disaster Recovery" on page 1-35.

Instructions for all the basic and advanced functions of Colorado Backup for Windows 95, as well as troubleshooting tips and error messages, are included in the following pages.

Chapter 1:

Using Colorado Backup for Windows 95

This chapter lists step-by-step procedures for the most commonly performed backup tasks in Colorado Backup for Windows 95 by Cheyenne. If you installed Colorado Backup for Windows, read “Chapter 2: Using Colorado Backup for Windows”. If you installed Colorado Backup for DOS, read “Chapter 3: Using Colorado Backup for DOS” instead.

The following procedures assume that you have already installed your tape drive and backup software. If you have not, first follow the instructions in the *Installation Guide* that came in the tape drive box.

Tips to Get You Started

Here are a few strategies to make sure you get the most out of your backup system.

- First, make a Full System Backup as described in the next section. This will back up all your local drives and your system registry. You must have a Full System Backup in order to completely restore your system in case of a hard drive crash. Include this type of backup in your backup routine. (If you do not have a Full System Backup, the minimum needed to get your system running is a backup of the entire Windows 95 directory. However, this will not restore all your data.)

- Read about the other types of backups you can make in the section “Understanding Backup Concepts” on page 1-4. This can help you decide which types of backups you want to make.
- Develop a regular backup routine. We recommend using our Automated Daily Backup to set up a hands-off, reliable way to make sure you always have current backups of your files. Read about this in the section “A Hands-off Approach to Backups” on page 1-6.



***WARNING:** If you create backups under more than one operating system, use a separate set of tapes for each operating system. Label each tape appropriately.*

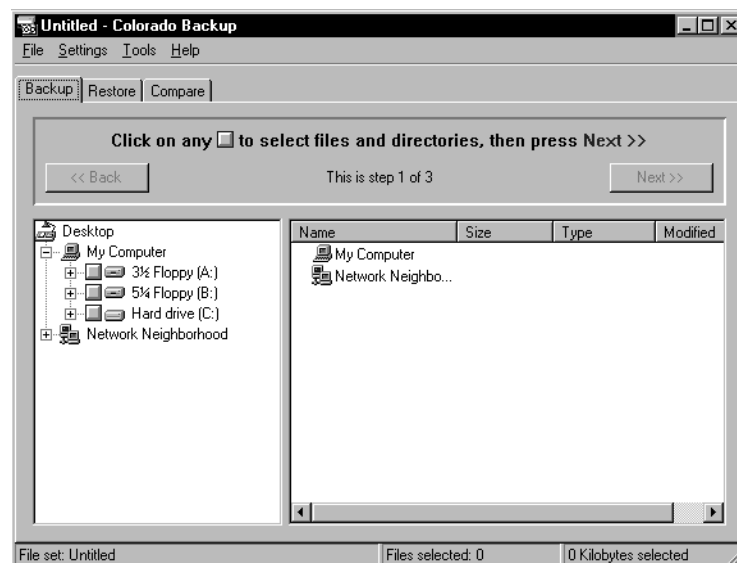
Making Your First Full System Backup

Let's get started by making a Full System Backup. That is, everything on your computer's hard drive(s) will be copied to your tape. A Full System Backup includes your system registry (the registry files are part of the Windows 95 operating system and are necessary for your system to work properly) and ensures that your entire system can be restored in the case of a sudden power failure, software problem, mechanical failure, or user mistake. You don't need to perform a Full System Backup each time you make a backup, but you should do one the first time you make a backup, thereafter at regular intervals, and when you install new hardware or software on your system.

To make a Full System Backup:

1. You will need at least one formatted tape. If the tape does not say “formatted” or “preformatted”, you must format it first; see the section “Preparing a Tape for Use” on page 1-21.
2. Insert the tape into the tape drive. After the cartridge is inserted, you will hear the sound of the tape being wound back and forth. These noises indicate that the tape drive is finding the beginning of the tape, determining the tape's length and format, and positioning the read/write head.

3. The Full System Backup icon appears after the first time you start and stop the software. To start Colorado Backup from the Start menu select Programs, Colorado Backup for Windows 95, then Colorado Backup. A few information screens are shown, including a screen that will ask you if you want to create a Disaster Recovery diskette. For more information on Disaster Recovery, see “Disaster Recovery” on page 1-35. Following the information screens, the main screen appears:



4. Now close Colorado Backup by clicking on the X in the upper right hand corner. The Full System Backup icon appears on your desktop:



5. Double-click on the Full System Backup icon. A backup of all your local drives and your system registry will begin. After the backup is finished, the software will automatically compare the files on tape to the files on the drive to make sure they match.
6. When the operation is finished a dialog box will appear indicating the backup is complete.

7. Click on OK. A screen displaying information about the backup appears. Click on OK. The main screen reappears.

Understanding Backup Concepts

Why Should I Back Up My Computer?

Backups provide insurance against the loss of data due to hard drive failure or human error. This loss can occur at any time. Backups also allow you to return to older file versions, to free up space on your hard drive, and to transfer files easily from one computer to another.

How Often Should I Back Up?

You should back up your data as often as you use your computer. If you use your computer every day, you should back up every day. If you only use your computer once a week, you should back up once a week. When deciding on your backup routine ask yourself this question: How many days would it take for me to recreate my current hard drive if I were to lose everything right now?

Which Kind of Backup Should I Use?

Colorado Backup offers several types of backup: Automated Daily, Full System, Total, Modified Files Only, and Selective. Use whatever combination of backups meets your particular needs.

- Full System Backup backs up your entire system including all of your computer's local hard drives and your registry files. The registry files are part of the Windows 95 operating system and are necessary for your system to work properly. You will need to have a backup of the registry files in order to recover from a system crash. You don't need to perform a Full System Backup each time you make a backup, but you should do one the first time you make a backup, thereafter at regular intervals, and whenever you install new hardware or software. Instructions for doing a Full System Backup begin on page 1-2.

- Automated Daily Backup offers the easiest way to set up a backup routine. This feature lets you schedule a Full System Backup to occur at convenient times, such as over lunch or after work hours. Once the schedule is set, leave a tape in the drive, leave your computer on, and the software does the rest. You can also schedule other types of backups and operations. Automated Backup is described more fully in the section “A Hands-off Approach to Backups” on page 1-6.
- Selective Backup backs up the files or drives you select. Keep in mind that a Selective Backup does not make a copy of your system registry. A backup of a drive or files ensures that you have a copy of your program and data files and will be able to get back to work quickly if you accidentally delete a file. Selective backups are described starting on page 1-9.
- Modified Files Only Backup backs up only those files that have changed or been added since the last backup. This type of backup saves time and tapes since you are backing up fewer files each time. The disadvantage is that restoring a file might take longer, since you may have to look at more than one tape to find the most current version of the file.

Backup Strategy: First, do a Full System Backup. Then, the simplest and fastest backup strategy is a weekly Full System Backup with daily Modified backups. We recommend that you use two sets of tapes so that you are never overwriting your last backup with your current backup.

How Do I Know If My Backups Are Good?

Colorado Backup for Windows 95 is set up to automatically verify that the files you backed up to tape match those on your disk. The verify occurs right after the backup and is part of the backup operation. Comparing your backup ensures that the files on tape match those on your drive, so you will be able to restore your backup when you need to. We suggest you leave this option turned on. At a minimum you should verify after making your first few backups and after making any changes to your computer system. By verifying backups, you can also verify that your hardware and software are correctly installed.

A Hands-off Approach to Backups

Use Automated Daily Backup to back up your hard drive at a specified time, such as after work hours, or over lunch each day. Just pick a time for the backups to occur, put a tape in the drive, leave your computer running, and the software takes care of the rest.

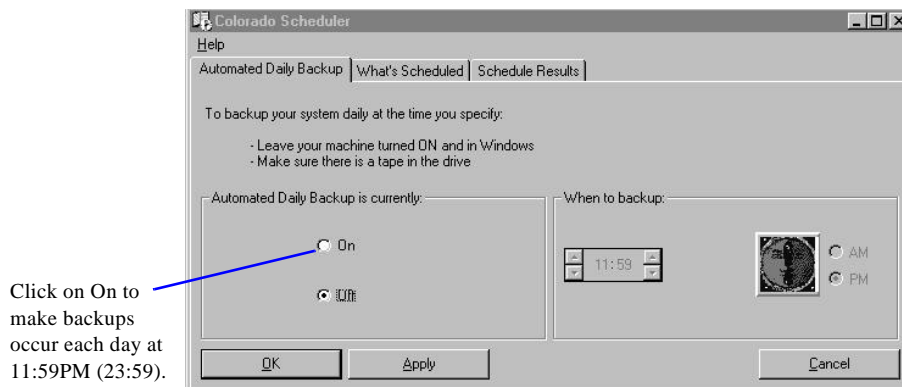
How Automated Daily Backup Works

Automated Daily Backup will make a Full System Backup (back up every file on your hard drive(s) including your system registry) every day.

Because a Full System Backup will overwrite all data on a tape, if you would like to have more than one day's worth of backups on hand, use more than one tape.

To set up Automated Daily Backup:

1. From the Start menu, select Programs, then Colorado Backup for Windows 95, then Scheduler. The Colorado Scheduler screen appears:



2. Click on On. Backups will occur at 11:59PM (23:59). If you want your backups to start at a different time, change the time by clicking on the arrows.

NOTE: If you cannot fit an entire backup on one tape, the backup will stop and the software will prompt you to insert another tape when the

first tape is full. You may want to keep this in mind as you pick the time for the automated backup to occur.

3. Click on OK. The Scheduler icon will appear on the lower right hand side of your screen in the notification area of the task bar (next to the clock).



4. Insert a formatted tape into the tape drive.

In Order for Automated Daily Backups to Run

- Leave your computer on. You may want to close as many programs as you can. This helps the backup run more efficiently.
- Make sure a formatted tape is in the tape drive.
- Make sure the Scheduler icon is showing in your Windows 95 task bar and Automated Daily Backups are turned on.

Changing the Schedule of the Full System Backup

If you want to schedule a Full System Backup, but not every day, you can change it.

To change the schedule:

1. Start Colorado Scheduler. From the Start menu, select Programs, then Colorado Backup for Windows 95, then Scheduler. The Colorado Scheduler screen appears.
2. Click on the What's Scheduled tab toward the top of the screen.
3. Highlight Full System Backup, then click on the Modify Schedule button on the bottom of the screen. A warning screen appears.
4. Click on Yes to continue. The Schedule Item screen appears.

5. Select the days and time you want the Full System Backup to occur, then click on OK. You will be returned to the Colorado Scheduler screen. Click on OK.

Scheduling a Backup of Selected Files

You may want to schedule a backup of certain files you have selected. For example, you could back up all your client's files 3 times a week. Setting up this type of schedule involves only two basic steps:

- Selecting the files you want to back up regularly.
- Scheduling the files to be backed up at the times you specify.

To schedule a backup of selected files:

1. First, you'll select the files you want to back up using Colorado Backup. Full instructions are in the section, 'Backing Up Entire Drives or Selected Files' on page 1-9.
2. Select a destination for the backup — your tape drive — by clicking on the name of your tape drive on the left side of the screen.
3. Click on Next. The Backup options screen appears. Choose the options for the backup, then click on Schedule this Backup.
4. The Name this Scheduled Backup screen will appear. Give the backup a name that you will easily recognize, such as "John Smith's data."
5. The Schedule Item screen appears. Select the days and time you want the backup to occur and click on OK.
6. An information box will tell you your backup is now scheduled. Click on OK.
7. The backup of your file set is now scheduled to occur.

Backing Up Entire Drives or Selected Files

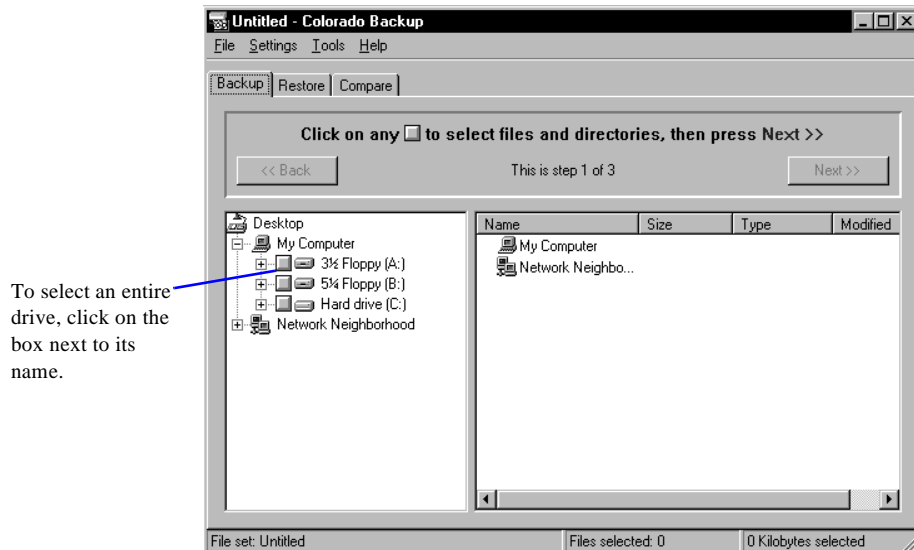
If you don't want to do a Full System Backup you can select the drives or files you want to back up. You can select individual files and directories (convenient for transferring files from one computer to another or taking work home) or you can select an entire drive or several drives. Just keep in mind that this type of selective backup may not back up the system registry. To back up your system registry (which should be done at regular intervals or when you make changes to your system) perform a Full System Backup, explained on page 1-2, or backup your Windows directory.

Archiving

Another reason to back up only a few selected files is to free up space on your hard disk (called archiving). Archiving is copying files that you no longer use or seldom use from your hard drive to tape. The copied files can then be deleted from your hard drive to provide additional disk space. And, if you find that you ever need the archived file in the future, it can be easily restored from the tape. When archiving it is best to designate a special tape, one that you don't do your regular backups on. When you're finished, label it or write-protect it so you won't overwrite the data on the tape (see the literature that came with the tape cartridge for instructions on how to write-protect).

To back up an entire drive or selected files:

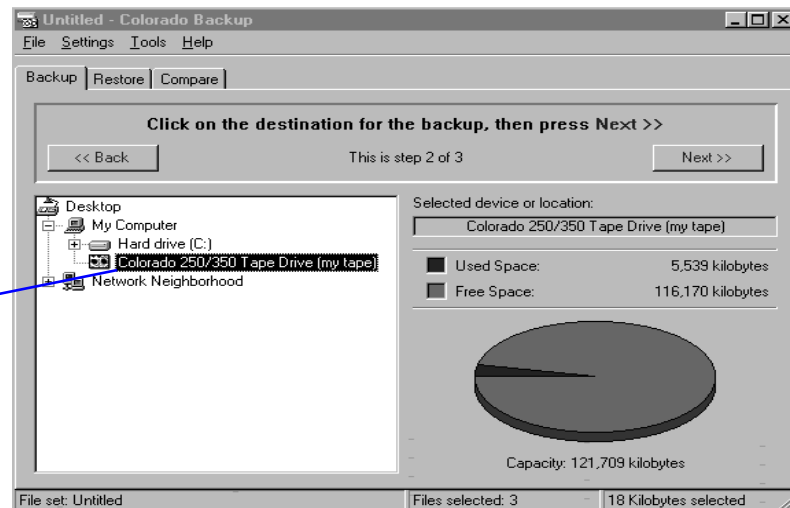
1. Start Colorado Backup. The main screen appears:



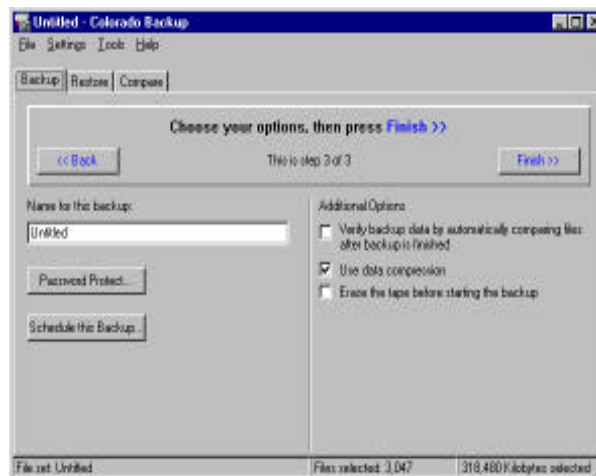
2. Select the items you want to back up.
 - **To Select an Entire Drive or Drives**
Click on the box next to the drive(s) you want to back up. This selects all the files on the drive(s). A checkmark will appear in a box next to the drive. A checkmark also appears next to each file in the right pane of the window.
 - **To Select a Few Files or Directories**
Click on the disk icon next to the drive that contains the files you want to back up. Its files and directories will be displayed on the right side of your screen. Then click on the boxes next to the files and directories you want to back up. (To open a directory double-click on the folder icon next to it.) The checkmark in the box indicates that the file or directory has been selected. Click on the Next button in the

upper right-hand corner of the screen. The screen for selecting the backup destination appears:

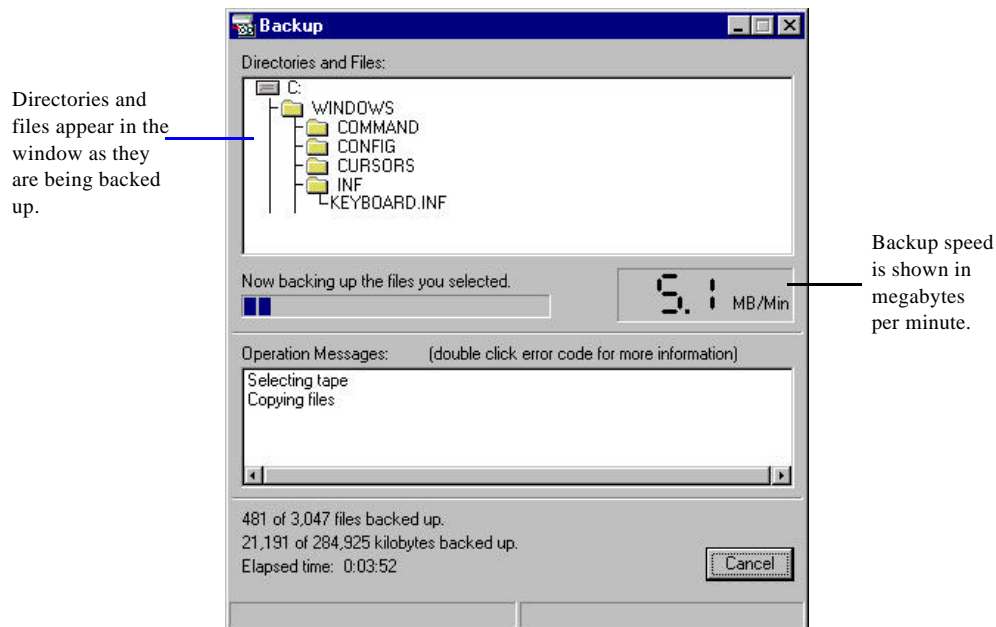
Click on the name of your tape drive to select it as the destination for the backup.



3. Select a destination for the backup — your tape drive — by clicking on the name of your tape drive on the left side of the screen. A pie chart indicates how much of your tape has been used.
4. Click on Next. The Backup Options dialog box appears:



5. Select the options for your backup. A name for the backup is filled in automatically, but you can rename it if you wish. Compression and Verify are turned on and Erase is turned off by default. Click on the box in front of the option if you wish to change the setting.
6. Click on Finish. The backup will begin. The Backup window will display the progress of the backup, including the backup speed:



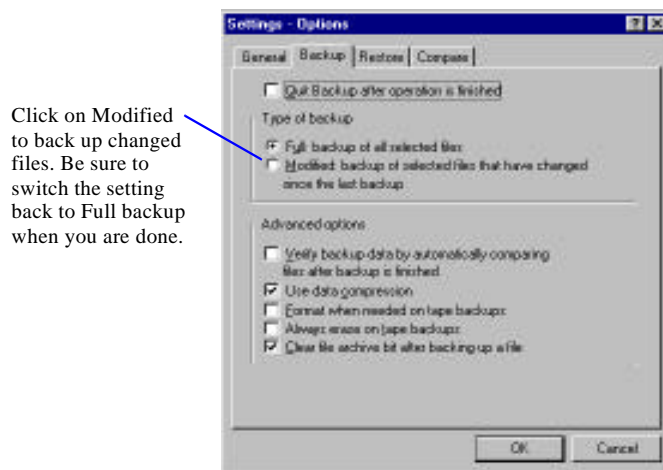
7. After the backup is finished, a dialog box will appear indicating the backup is complete.
8. Click on OK. A screen displaying information about the backup appears. Click on OK. The main screen reappears.

Backing Up Only Changed Files

A Modified backup will copy to tape only files that have changed since they were last backed up. This type of backup saves space and can be used as part of a backup routine. For instance, you could perform a Full System Backup up once a week, and a Modified backup three times a week.

NOTE: The Modified setting will stay in effect until you change it back to Full backup of all selected files...

1. Start Colorado Backup. The main screen appears.
2. From the Settings menu, select Options. The Options screen appears. From the tabs towards the top of the screen, select Backup. The Backup options screen appears:



3. Click on the button next to Modified: backup of selected files that have changed...
4. Perform a backup like you normally would. (Details are in the section, "Backing Up Entire Drives or Selected Files" on page 1-9.)
5. All files that have changed since the last backup will be included.

Using File Sets

If you find that you back up certain files regularly, you can create a file set to record your file choices. Then simply double-click on the file set name to start your backup.

Creating a Custom File Set for Backups

Creating a file set begins like making a regular backup.

To create a file set:

1. Start Colorado Backup. The main screen appears. Select the files you want included in the file set then, click on Next.
2. Select a destination for the backup — your tape drive — by clicking on the name of your tape drive on the left side of the screen. A pie chart indicates how much of your tape has been used.
3. Click on Next. The Backup options screen appears. Choose the options for the backup.
4. From the File menu select Save As, then type in a name for the file set. For instance, if you are always backing up accounting files you might call the file set Accounting, then click on Save.
5. Click on Finish to start the backup. After the backup is finished, a dialog box will appear indicating the backup is complete.
6. Click on OK. A screen displaying information about the backup appears. Click on OK. The main screen reappears.

Backing Up a File Set

Backing up a file set is easy. You don't even need to open the backup software.

To back up a file set:

1. Start Windows 95 Explorer. (From the Start menu select Programs, then Windows Explorer.)
2. Go to the Backup directory located in the Windows directory. (First, double-click on the Windows directory to display its contents, then double-click on the Backup directory.)
3. Double-click on the name of your file set. The backup will begin.

Scheduling a Backup of a File Set

You can schedule the software to back up a file set you created. For more information read the section, ‘Scheduling a Backup of Selected Files’ on page 1-8.

Restoring Files to Your Hard Drive

Restoring is the process of copying files from a tape to your hard drive. When you accidentally delete a file, transfer work to another computer, or need to retrieve an earlier backup of a file that you have archived, you'll do a Restore. The files will be restored to the same place on your hard drive and will contain the same information as they did when they were last backed up. Or, you can choose to restore them to a different location.

Sometimes you will only be restoring one file; at other times you may need to restore all the files as in the case of a hard drive crash. This section describes both scenarios.

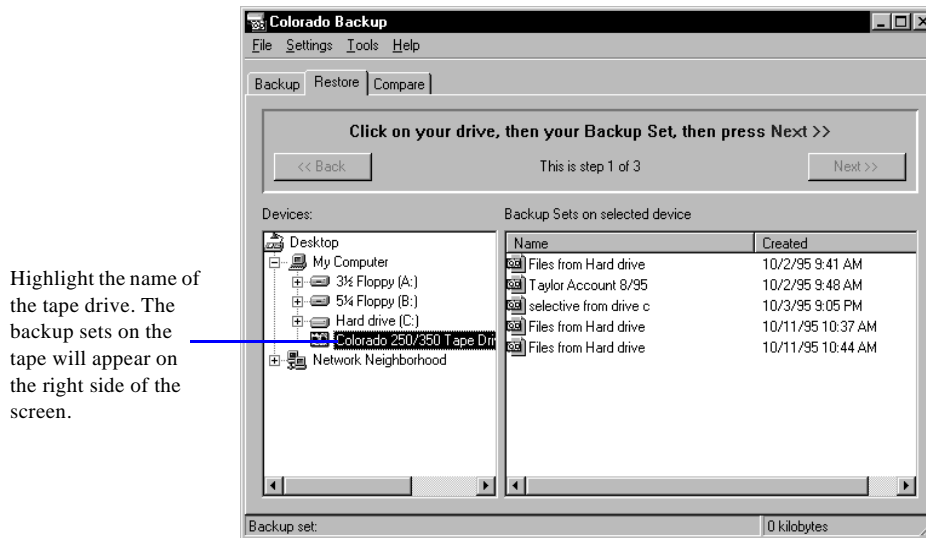
NOTE: If you have a hard drive crash or a system crash, you will want to restore all of the files from your latest Full System Backup tape (because it includes your system registry). Then if you made Modified or Selective backups after the Full System backup, restore them in the order they were created. Read the section, “Disaster Recovery” on page 1-35.

To restore files and directories to your hard drive:

1. Insert the tape that contains the files you want to restore into the tape drive.

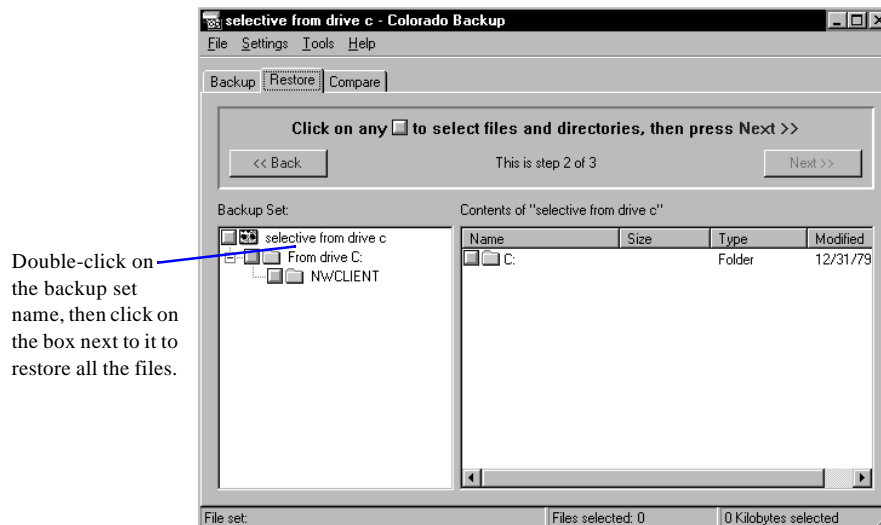
Note: To easily locate the correct tape, use the Backup Catalog, as described on page 1-24.

2. Start Colorado Backup. The main screen appears. From the tabs towards the top of the screen, select Restore. The Restore screen appears:



3. Highlight the name of the tape drive on the left side of your screen. The backup sets on the tape will appear on the right side of the screen.
4. Highlight the backup set that contains the files you want to restore, then click on the Next button in the upper right hand corner of the screen. You will hear the tape being wound back and forth while the tape drive finds the backup set on the tape. (This may take some time, depending on

where the backup set is located on the tape.) A screen appears displaying the contents of the backup:

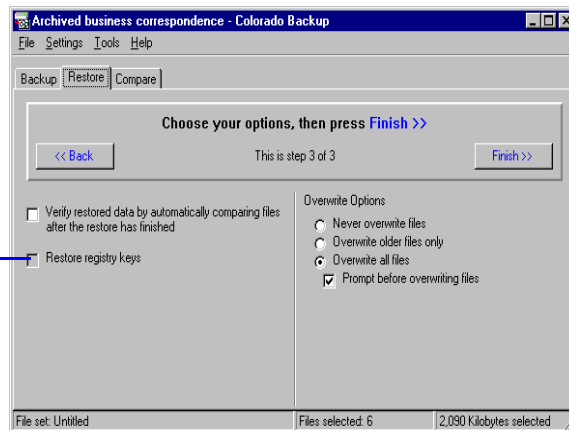


5. Select what you want to restore.

- To restore all of the files in the backup set, double-click on the backup set name (to collapse the directory) then click on the box next to the backup set name. A checkmark will appear.
- To restore selected files, double-click on the folder to display its contents. The files and directories in the backup set appear on the right hand side of the screen. Click on the box next to the files and directories you want to select. A checkmark will appear next to the file and a partial checkmark will appear next to the folder and backup set name.

6. Click on the Next button in the upper right-hand corner of your screen. The Restore options screen appears:

The Restore registry keys check box will be enabled if the directories to be restored from the backup set contain the Windows 95 registry files.



7. Select your restore options. If you want to overwrite (replace) files that exist on your hard drive make sure Overwrite files is selected. Remember, if Overwrite is selected, the files on your hard drive will be replaced with the files from the tape.
8. If you need to restore your Windows 95 registry files, click Restore Registry Keys. This option will not be available if the backup set you are restoring from does not contain the complete Windows 95 directory.

NOTE: Make certain you wish to restore your registry keys before selecting this option. Restoring registry keys from an out-of-date tape could cause system problems, such as disrupting programs that were installed after the tape backup was made.

9. OPTIONAL: If you wish to restore your files to a different location, from the Settings menu, select Options, then Restore. Click on the circle next to your choice, then continue with the next step.
- Original location will restore the files on tape to the same directory structure on your hard drive. For example, if the files on tape are in the C:\utility\tools\ directory they will be restored to the same place.
 - Alternate location lets you restore the files on tape to a different directory on your hard drive. For example, if the files on tape are in

the C:\utility\tools\ directory you can restore them to the C:\project directory. The directories from the tape will then be inside the project directory resulting in a directory structure of C:\utility\tools\project\.

- Alternate location, single directory lets you restore the files on tape to a single directory on your hard drive. For example, if the files on tape are in the C:\utility\tools\ directory you can restore them to the C:\project directory. All the files will be in that single directory and the directory structure from the tape will not be restored.
10. When you have made your selections, click on Finish. The Restore begins. After the restore is finished, a dialog box appears indicating the restore is complete.
 11. Click on OK. A screen appears indicating the number of files and amount of data restored.
 12. Click on OK. The main screen reappears.

Viewing the Contents of a Tape

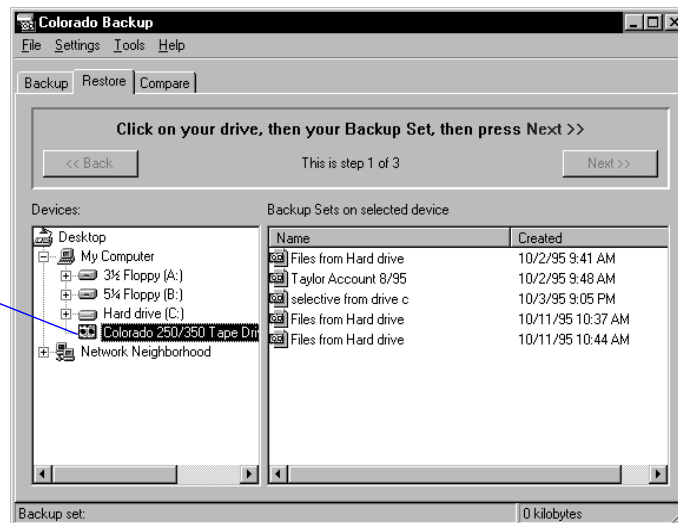
Just as you can view the contents of a disk using the Windows 95 Explorer, you can also view the contents of a tape using Colorado Backup. You might want to view a tape's contents before restoring files or erasing a tape.

To view the contents of a tape:

1. Insert the tape you want to view into the tape drive.
2. Start Colorado Backup. The main screen appears.

3. From the tabs towards the top of the screen click on Restore. The Restore screen appears:

Click on the tape drive name to display the contents of the tape in the drive.



4. Click on the name of your tape drive on the left side of the screen. The backup sets included on the tape will appear on the right side of the screen.
5. If you want to view the contents of a backup set, double-click on it. You will hear the tape being wound back and forth while the tape drive finds the backup set on the tape, then the files and directories it contains are displayed.

NOTE: Viewing the tape information this way will automatically add the backup information into the Backup Catalog. See "Adding backups to the Backup Catalog" on page 1-34 for details.

6. When you are done viewing, click on the Backup tab towards the top of the screen to return to the Backup screen.

Preparing a Tape for Use

All tapes must be formatted before you use them for the first time. Formatting a tape takes from three minutes to five hours depending on your tape drive model, the speed of your controller, and the length of the tape. Preformatted tapes are ready for making backups immediately, saving you the time it takes to do a format.

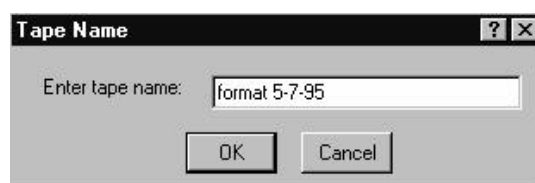
NOTE: Formatting erases all data on a tape. The data cannot be recovered.

To prepare a tape for use:

1. Insert the tape you want to format into the tape drive.
2. Start Colorado Backup. The main screen appears.
3. From the Tools menu, select Format Tape.

NOTE: If you have more than one tape drive attached to your system you will first need to highlight a tape drive in the Restore or Compare screen.

4. The Tape Name screen appears:



5. Enter a new name for the tape or accept the default name. Click on OK.
6. When the format is finished, a screen appears indicating the format is complete. Click on OK. Another screen appears indicating how long the format took.
7. Click on OK. The main screen reappears.

Erasing a Tape

If you have a tape that contains data you no longer need, you can erase it and reuse the tape. This procedure usually takes less than a minute.

To erase a tape:

1. Insert the tape to be erased into the tape drive.
2. Start Colorado Backup. The main screen appears.
3. From the Tools menu, select Quick Erase Tape or Secure Erase Tape. A tape that has been Quick Erased can be Unerased (to make the data available again) as long as no data is written to the tape after it is erased. Secure Erase erases the data permanently and takes almost as long as formatting.

NOTE: If you have more than one tape drive attached to your system you will first need to highlight a tape drive in the Restore or Compare screen.

4. A warning screen appears. If you want to erase the data from your tape, click on Yes to proceed.
5. When the erase is finished, a screen appears indicating the erase is complete. Click on OK.
6. A screen indicates how long the operation took. Click on OK. The main screen reappears.

Unerasing a Tape

If you accidentally Quick Erased a tape that you want data from, you can Unerase it with this utility. A tape that has been written to since the Quick Erase cannot be Unerased.

NOTE: Tapes erased using Secure Erase, however, cannot be unerased. PowerTape, T4000s, HP Surestore DAT, and PowerDAT tapes cannot be unerased.

To unerase a tape:

1. From the Tools menu, select Unerase Tape. A warning screen appears.

NOTE: If you have more than one tape drive attached to your system you will first need to highlight a tape drive in the Restore or Compare screen.

2. Click on Yes to proceed. After the unerase is finished, a dialog box will appear indicating the operation is complete.
3. Click on OK. The screen indicates how long the operation took.
4. Click on OK. The main screen reappears.

NOTE: Unerase is not supported by the Backup Catalog. An erased volume will have to be manually viewed to re-enter it into the Backup Catalog. See "Deleting backups from the Backup Catalog" on page 1-34 and "Adding backups to the Backup Catalog" on page 1-34 for more information.

The Backup Catalog

The Backup Catalog provides an easy way to locate the data on your tapes. A database is created on your hard drive that allows you to quickly scan what files are on which tapes, without having to swap tapes in and out of your tape drive or scan tapes for information. You also can easily start a restore operation for the files you've selected. Note that all files selected must be on the same tape, and that the Backup Catalog cannot restore files backed up to non-tape media.

Starting the Backup Catalog

The Backup Catalog can be turned on in three ways.

- From the Start menu, select Programs, Colorado Backup for Windows 95, then Backup Catalog.
- From within the Colorado Backup window, under the Tools menu select Open Backup Catalog.
- From the Colorado Backup program group, double-click the Backup Catalog icon.

NOTE: You can open the Backup Catalog whether or not the main Colorado Backup application is started.

When the Backup Catalog is started, all backups made will automatically be logged in the Backup Catalog. Already existing backups can be manually added to the Backup Catalog by viewing the tape. See "Viewing the Contents of a Tape" on page 1-19 for details. The Backup Catalog icon will appear on the Windows 95 task bar when the Catalog is running.

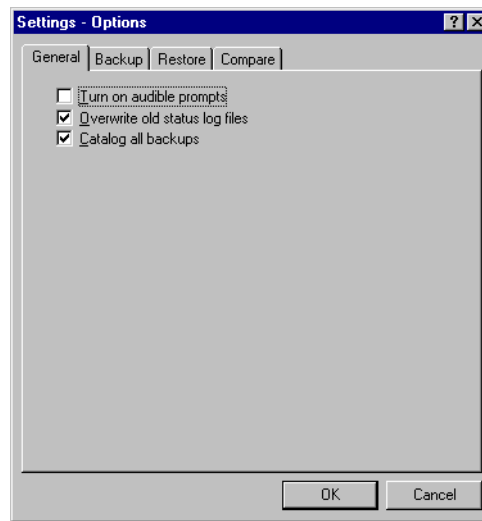


The icon can also be used to access the Backup Catalog error log. See "The Backup Catalog Error Log" on page 1-34 for details.

To Disable the Backup Catalog

If you do not want backup information stored in the Backup Catalog, you can disable the Backup Catalog as follows:

1. From the Settings menu in Colorado Backup, choose Options. The Options screen appears:



2. Click on the button next to Catalog All Backups to remove the check mark. Backup information will not be stored as long as this option remains unselected.

Viewing the Contents of Your Backups

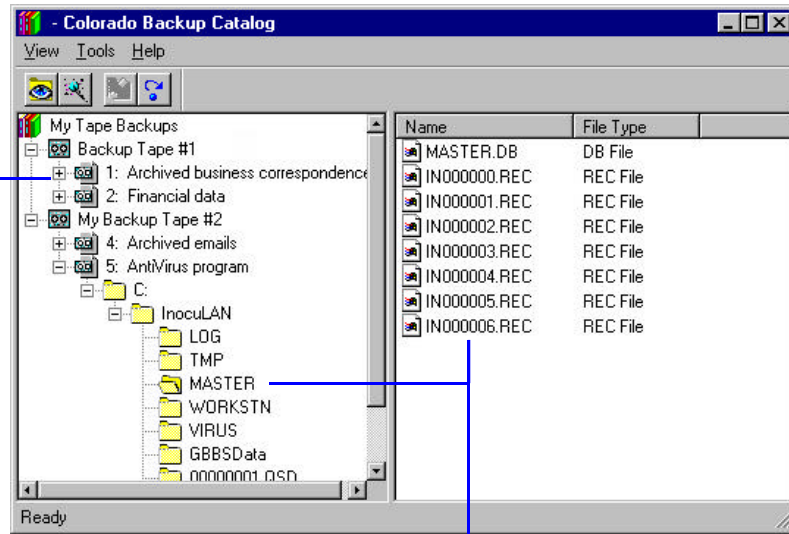
The Backup Catalog provides a simple way to locate the information you need, even if it is spread out among several tapes and backups, or located on other hard drives or networked computers.

To view tape backups in the Backup Catalog:

1. Start the Backup Catalog.


The Backup Catalog will appear:


This window shows all of your backups by name. By double-clicking on the tape names, you can view the individual backup sets. Double-clicking on a backup set shows the drives and directories.





This window displays the contents of whatever is selected in the left pane.

- Click or double-click on icons in the Backup Catalog located under the My Tape Backups icon. As you click on icons in the left pane, the contents will be seen in the right pane.

Double-click  to view a list of all tapes.


Double-click  to view a list of all backups on a tape.


Double-click  to view a list of all files and directories in a backup.


Double-click  to view all files within a directory.


To view non-tape backups in the Backup Catalog:

Colorado Backup for Windows 95 can also backup to hard drives or networked computers. These backups will be located under the My Other Backups icon.

Double-click  to view a list of all non-tape backup sets.

Double-click  to view a list of all backup sets on the hard drive or networked computer.

Double-click  to view a list of all files and directories in a backup.

Double-click  to view all files within a directory.

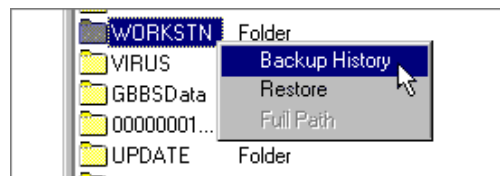
NOTE: Non-tape backups can be viewed in the Backup Catalog, but you cannot use the Restore Wizard with them. Use the full path information to help you locate the files, and use the Colorado Backup program to restore files.

Viewing the backup history of a file or directory

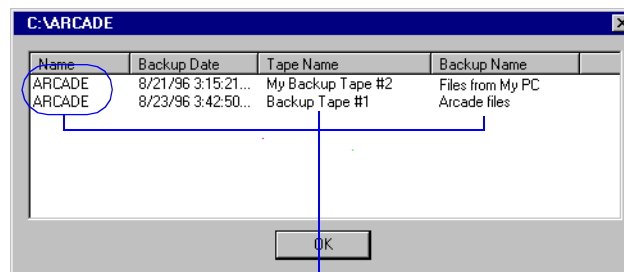
You can search for the most recent backup of a file or directory, and the tape the backup is on, by using the Backup History feature.

To view the Backup History:

1. In the right pane of the Backup Catalog, right-click on the directory or file to display the shortcut menu. Then click on Backup History:



2. The Backup History information appears, showing the date and location for each time the file or directory was backed up.



The Backup Catalog will display every backup of a single file or directory (circled), even if was backed up to different tapes with different backup names.

Searching for a file or directory

The quickest way to locate a file or directory is to use the Backup Catalog's flexible search tool. You can search based on a filename, directory name, backup name or tape name, as well as backup date. You can find the most recent copy or a particular version.

To search for a file:

1. In the opening window of the Backup Catalog, select the Tools menu, then Find. You can also click on the Find icon:



The search window will appear:

Click here to return to the tree-view of the Backup Catalog.

You can access the Backup History and full path information of files displayed here by right-clicking on them.

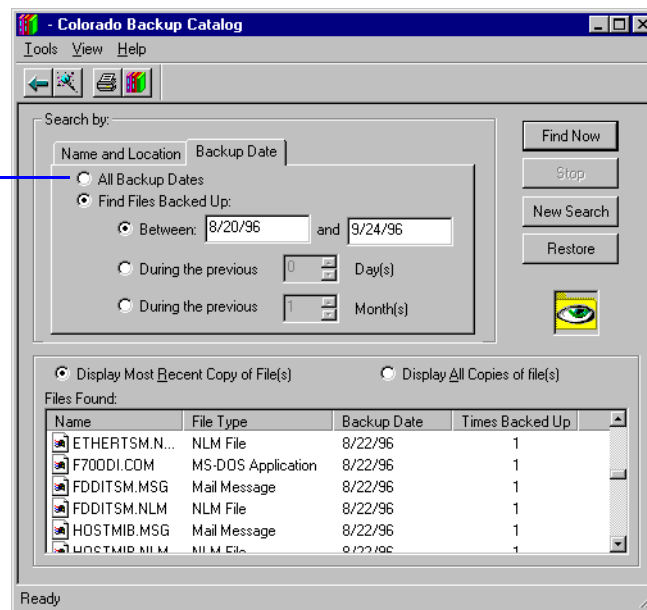
Name	File Type	Backup Date	Times Backed Up
ETHERTSM.NLM	NLM File	8/22/96	1
F700DI.COM	MS-DOS Application	8/22/96	1
FDDITSM.MSG	Mail Message	8/22/96	1
FDDITSM.NLM	NLM File	8/22/96	1
HOSTMIB.MSG	Mail Message	8/22/96	1
HOSTMIB.NLM	NLM File	8/22/96	1

2. Enter the name of the file or directory you are looking for in the Find What box. You can also search using the asterisk wildcard (for example, *.exe, or ab*.doc) or the question mark wildcard. The question mark serves as a placeholder for one character. For example,????.txt will find all files with four-letter names ending in .txt. Common file

extension types, such as .bmp and .doc, are included in the drop-down list.

3. Select the tape to search in the Look In Tapes box. You may search all tapes or one particular tape.
4. Select the backup to search in the Look In Backups box. If you select All Tapes you must also search All Backups. When you select a particular backup tape, the backups from that tape are displayed in the Look In Backups box.
5. If you are looking for only the most recent copy of a file or files, select the Display Most Recent Copy of File(s) radio button. If you are looking for an older backup of a file, choose Display All Copies of File(s).
6. If you wish to narrow your search based on date information, click on the Backup Date tab.

All Backup Dates is the default value.



7. Click the Find Files Backed Up radio button.

8. Select the date criteria you want to use in your search. Between lets you select a range of dates. You may also select based on Previous Number of Days or Months.
9. When you have made all your selections, click Find Now. All files matching your search criteria will appear in the Files Found box.

Restoring files from the Backup Catalog

The Backup Catalog provides an easy-to-use Restore Wizard that guides you through restoring files that are found in the Backup Catalog database.

To restore files using the Restore Wizard:

1. If you want to restore specific files only, highlight them in the Backup Catalog before starting the Restore Wizard. This will let you quickly restore the files you selected.

If you want to restore an entire backup, you do not have to highlight files before starting the Restore Wizard.

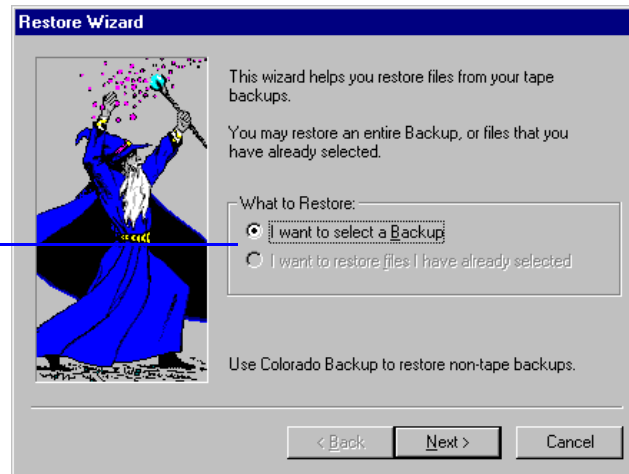
NOTE: Non-tape backups can be viewed in the Backup Catalog, but you cannot use the Restore Wizard with them. Use the full path information to help you locate the files, and use the Colorado Backup program to restore files.

2. Start the Wizard from within the Backup Catalog by selecting the Tools menu, then Restore. Or, you can click the Restore Wizard icon on the toolbar.



The Restore Wizard screen appears:

This option will only be highlighted if you have selected files or directories prior to starting the Wizard.



3. If you have selected specific files to restore, “I want to restore files I have already selected” will be highlighted. Clicking Next will then skip ahead to Step 7.

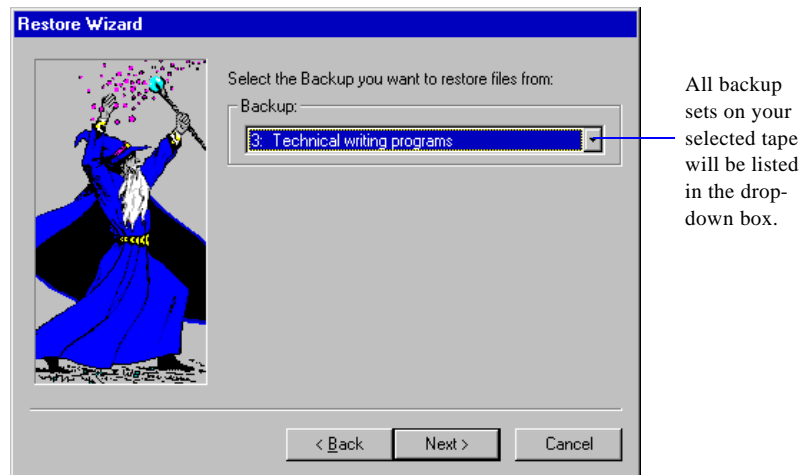
If you choose “I want to select a Backup,” clicking Next will bring you to the tape selection screen:

All tapes in the Backup Catalog will be listed in the drop-down box.



4. Select a tape from the Tape drop-down box.
5. Select an option from What to Restore. If you choose “All Backups on this Tape” you will skip ahead to Step 7 below after clicking Next.

If you choose “I want to select a Backup from this tape,” clicking Next will bring you to the backup selection screen:



6. Select a backup from the drop-down box, and then click Next. The following screen appears:

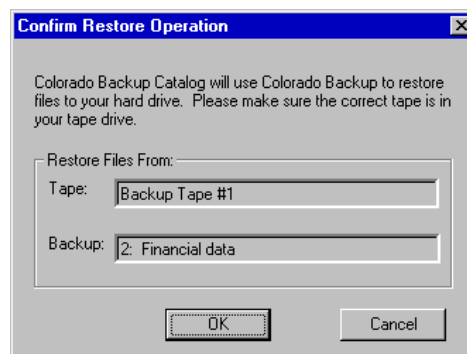


7. Choose your restore options

You must decide if the files you are restoring will replace the files of the same name on your hard drive (Overwrite all files), replace only files that are older than the files being restored (Overwrite older files only), or will never replace files on the drive (Never overwrite files).

If you are restoring your Windows directory you can choose to restore your registry settings by clicking on Restore Registry Keys. Please make sure you wish to do so before selecting this option. Restoring registry files from an out-of-date tape could cause system problems, such as disrupting programs that were installed after the tape backup was made.

8. Click Finish when your selections are completed. The Restore Wizard will ask you to verify your restore information and to insert the appropriate tape.



9. Select OK to begin the restore process. The Colorado Backup program will appear and start the restore process.

NOTE: If Colorado Backup is performing an operation (backup, restore, erase, etc.) when you click OK, the restore process will not be able to run. Please wait for Colorado Backup to finish ongoing operations before starting the restore.

10. A message box will tell you when the restore process is complete. Click OK to close. If Colorado Backup was running before you started the Restore Wizard, it will continue to run. If it was not running at the time, it will shut down when the restore is complete.

Deleting backups from the Backup Catalog

Each time you run a backup with the Catalog all Backups option selected, the software will write information to the Backup Catalog database. If you run backups frequently, the database may grow quite large over time. However, there are two ways to reduce the size of the catalog database.

- **Manual deletion:** highlight a tape or backup in the Backup Catalog and press the delete key. This will only delete the database information, it will not delete information on the tape itself. Therefore, you may still recover the corresponding files, but you won't be able to find them using the Backup Catalog.
- **Automatic deletion:** every time you format or erase a tape that was recorded in the Backup Catalog, that information is passed to the catalog and all corresponding entries are automatically deleted.

Adding backups to the Backup Catalog

You can manually add tape information to the Backup Catalog. This may be information from tapes made before you installed this version of Colorado Backup, or from tapes made without the "Catalog all backups" option turned on. To add tape information:

1. Insert a tape into your tape drive and start the Colorado Backup program.
2. Click the Restore tab.
3. Click on the tape drive icon in the Devices window. The backups on that tape will be shown in the right-pane of the program.
4. Double-click on a backup. The program will read the backup information on the tape and display it in the right-pane. This information will also be added to the Backup Catalog.

The Backup Catalog Error Log

The Backup Catalog automatically maintains an error log. This log will list the times the Backup Catalog started and stopped, as well as any errors that may have occurred.

To view the error log, right-click on the Backup Catalog icon in the notification area of the Windows 95 task bar (near the clock) and choose View Error Log.



The error log can grow quite large with continued use. You can clear the error log by right-clicking the Backup Catalog icon and choosing Clear Error Log.

Disaster Recovery

This section lists step-by-step procedures for creating a disaster recovery diskette, and for restoring data after a catastrophic data loss.

Why Do I Need Disaster Recovery?

The programs and data stored on your computer can be lost or damaged in a number of ways. Equipment damage, such as hard-drive failure, data loss due to a computer virus, or simple user error are among the most common causes of data loss.

While regular tape backups protect your data, recovering from a disaster can be a lengthy process. Typically, you must reinstall the operating system, then reinstall the backup software, then restore your data from tape. Colorado Backup's disaster recovery procedure streamlines this process by letting you boot your computer from a diskette. Then you can quickly access your tape and begin moving data back to your hard-drive. There is no need to reinstall the operating system or any programs. It all happens automatically.

When the disaster recovery procedure is completed, you need only to reboot your computer and you are back to where you were before disaster struck. The time saved by the disaster recovery process can be vital.

When should I use Disaster Recovery?

If you can start your computer and run the Colorado Backup software, you should not go through the Disaster Recovery process. Use the normal restore procedure.

Disaster Recovery should be used only when a regular tape restore process won't work. Examples of this include:

- Windows 95 will not start on your computer.
- Your hard drive fails and your computer cannot access any information on it.

What if I use hard drive compression?

Hard drive compression creates a possible difficulty for Disaster Recovery. For example, you may have a 1 GB hard drive that stores 2 GB of data when compression is used. In this case, your full system backup would contain 2 GB of data on tape. If your hard drive fails and you install a new 1 GB drive, your 2 GB tape backup will not fit on the 1 GB hard drive.

If you use hard drive compression, we recommend that in addition to a full system backup, you make a backup of only your Windows 95 directory. If you have to restore to a hard drive that can't contain all your data, run Disaster Recovery using the Windows 95 tape. After restoring, reboot, then compress the new drive. After that, you can use the Colorado Backup software and the full backup tape to replace the remainder of your data.

Creating Recovery Disks

Creating recovery disks is a simple task performed from within the main window of the Colorado Backup software.

Special considerations when using disk managers

If your hard drive is using a disk manager, such as Disk Manager by On Track, or EZ Drive by Micro House, Colorado Backup will not be able to create a working recovery diskette. The diskette creation process will run to completion, but the diskette will not work properly and you will not be able to run a successful disaster recovery.

To create recovery diskettes:

1. Label two formatted floppy diskettes “Recovery Disk 1” and “Recovery Disk 2.” Insert Disk 1 into your floppy drive. On multiple-drive systems, you must use your primary, or bootable, drive.

NOTE: The diskette creation process will not format the diskettes for you, but it will erase all data on the diskettes, so make sure you have copied any important information from the diskettes before continuing.

2. From the **Tools** menu of the Colorado Backup window, select **Create Recovery Disk**.

The Colorado Backup software will also prompt you to create a recovery disk when you start the program. The following prompt screen will appear. Click Create Recovery Disk to start the disk creation process.



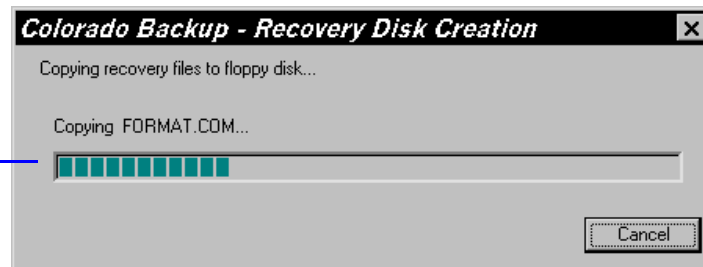
3. The Recovery Disk Creation window appears.

If your system has more than one floppy drive, this screen will ask you to select the appropriate drive. Please choose your primary, or bootable, floppy drive.



4. With your floppy diskette in the drive, click Continue. The program will then begin copying files onto the recovery diskette:

The progress of the disk creation is seen in the window.



You will be prompted to insert the second diskette. A message box will inform you when the process is completed:



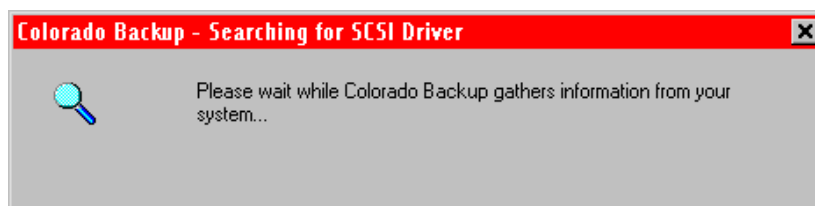
5. Remove the diskettes and store them in a safe place. Click on OK.

NOTE: The recovery diskettes you have just created will be vital to restore your data in the event of a disaster. We recommend that you write-protect the diskettes and store them in a safe and easily accessible location.

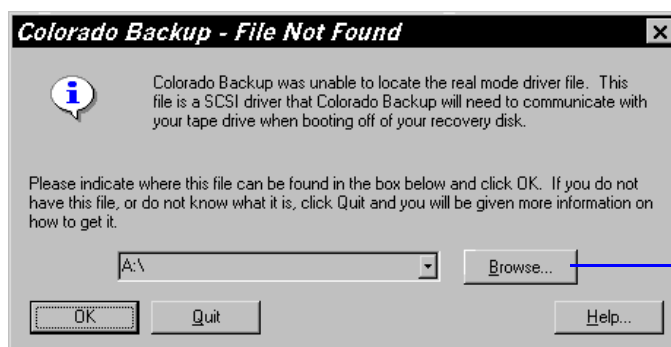
Special considerations for SCSI drives

Due to the nature of SCSI devices, Colorado Backup may not be able to locate the SCSI drivers needed to create the recovery disk.

If your system uses a SCSI tape drive, the following screen will appear as Colorado Backup searches for the necessary driver:



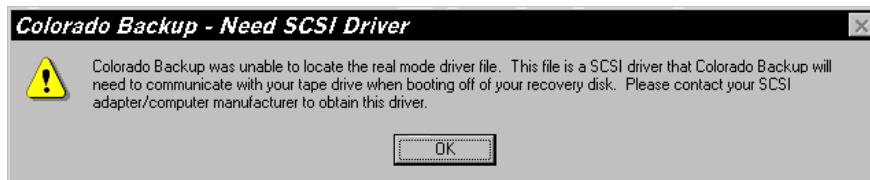
If a driver cannot be found, Colorado Backup will prompt you to enter the location of the driver. In many cases, the driver will be available on a diskette from the hardware manufacturer, or through an Internet or Bulletin Board download:



Use the Browse button to direct Colorado Backup to the SCSI driver's location.

If you know the driver's location, direct the software to the location, and click OK to continue the Recovery Disk creation process, as outlined in the previous section.

If you do not have the file, click Quit for more information, as shown below:



How often should I update my recovery disks?

To best insure a successful system recovery, we recommend you create new recovery disks whenever one of the following occurs:

- You install a new tape drive.
- You make changes to your tape drive settings.
- You install a new hard drive, CD drive, or any other new hardware device.
- You upgrade your operating system.

NOTE: It is not necessary to update your recovery disks when you install new software (other than an operating system). However, you should always maintain an up-to-date tape backup in order to restore your system to a condition most like it was before data was lost. Considering this, it is a good idea to do a full backup anytime you install a new software package.

Recovering from a Disaster

To recover from a disaster, you will need the following:

- Your Colorado Backup recovery diskettes.
- The most recent backup tape which contains either a full system backup or, at minimum, a backup that includes the entire Windows directory.

NOTE: The Disaster Recovery process will not work with tapes created using an earlier version of Colorado Backup.

Before starting the recovery process, you must also keep in mind that you cannot change the location of your files or the layout of your hard drive before the recovery. For example, assume your hard drive is partitioned into two logical drives (C: and D:) with Windows 95 installed on drive D:. Your backup tapes contain this information.

If your hard drive fails and you replace it with a new one, the new drive must also be partitioned into C: and D: drives, with Windows 95 returned to the D: directory by the recovery process. If you configure your new drive into one C: drive, the recovery will not work correctly.

To run the recovery process:

1. Shut down your computer.
2. Insert the first recovery disk into the floppy drive and the backup tape into the tape drive.
3. Start the computer. The computer will boot off of the recovery disk and display the following:

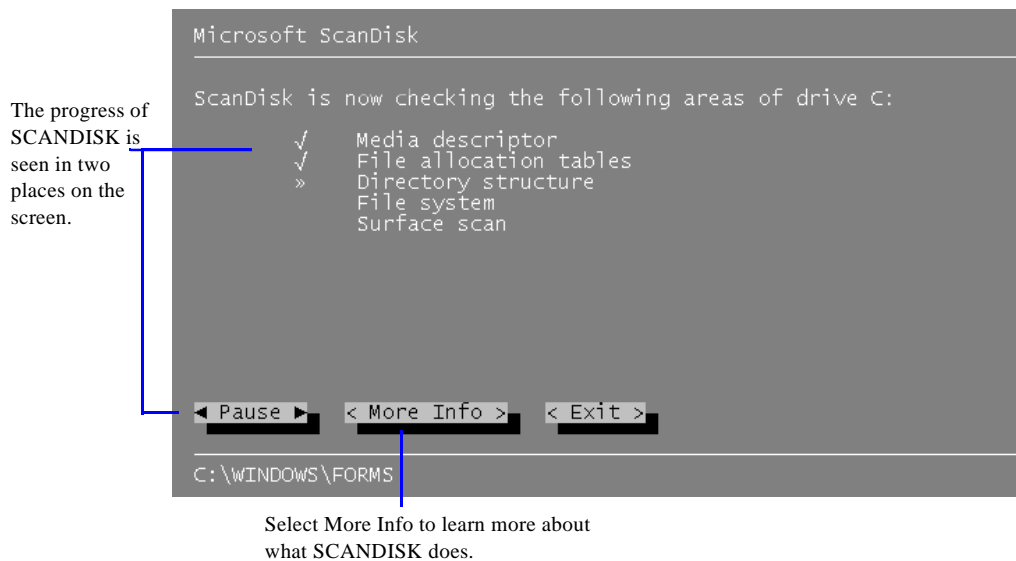
```
Colorado Recovery by Cheyenne, Version 3.00
Copyright (c) 1995, 1996 Hewlett-Packard Company, All Rights Reserved.

Colorado Recovery will run SCANDISK.EXE to perform a routine check of your
hard drive(s). This will take a few moments.

Continue
Quit Program
```

Before restoring your data, the program will run the SCANDISK.EXE utility. This will ensure that the hard drive has not been damaged and is capable of receiving the data from the tape.

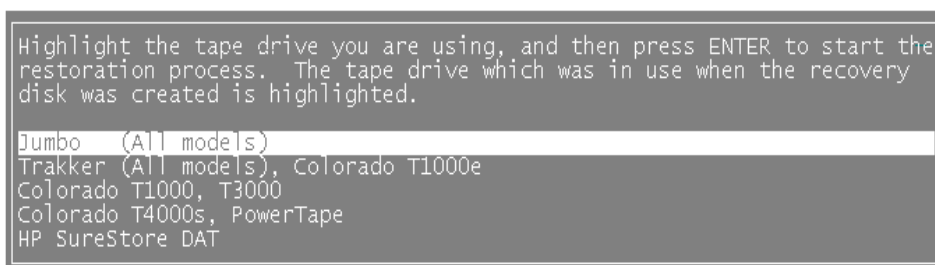
4. Press Enter to run SCANDISK. The disk scanning process may take a few minutes. The following screen will show the progress of the disk scan:



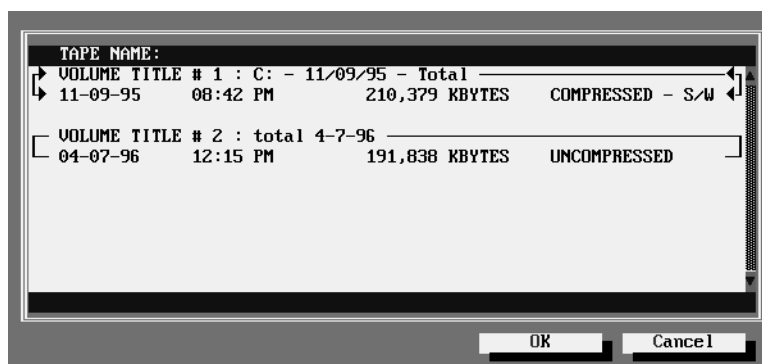
When SCANDISK is complete, you can select View Log to see details of the scanning operation. SCANDISK can normally repair whatever damage it discovers on your hard drive.

5. When SCANDISK has finished checking your drive, select Exit to quit SCANDISK and continue the recovery process.
6. You will then be prompted to highlight the tape drive you use. The screen below is an example. What you see on your computer may vary

depending on the tape drive you have installed. Select the correct tape drive by using the up and down arrow keys, and then press Enter.



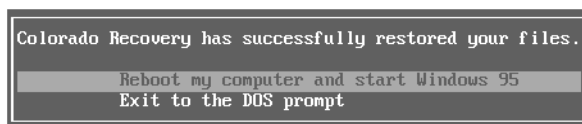
7. The volumes on your tape will be displayed. Select the backup volume to restore and choose OK. The screen will be similar to the following:



The restore process will begin and files will start to be copied from the tape to your hard drive.

After a restore, the volume selection screen reappears and you may choose another volume to restore. When finished, choose Cancel.

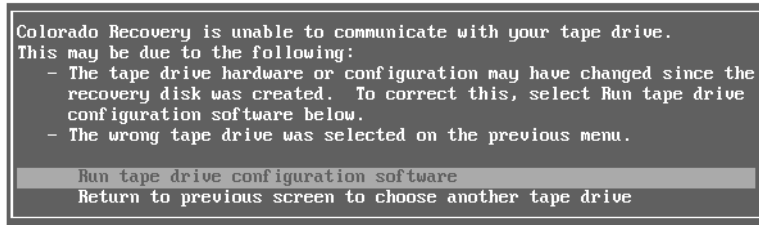
8. When the restore process is complete, the successful restore message appears:



9. You may now choose to reboot your computer or exit to the DOS prompt. If you reboot at this time, your computer will start up as a fully restored Windows 95 machine.

Troubleshooting the restore process

If your tape drive is not properly configured, or if you selected the incorrect tape drive on the drive selection screen, you may receive this message:



If you receive this message, first choose the *Return to previous screen* option and make sure you did not accidentally select the incorrect tape drive. Verify your tape drive model number and reselect.

If the problem persists, choose the *Run tape drive configuration software* option and follow the configuration steps on the screen.

Special considerations when using disk managers

If your hard drive is using a disk manager, such as Disk Manager by On Track, or EZ Drive by Micro House, Colorado Backup will not be able to create a working recovery diskette. The diskette creation process will run to completion, but the diskette will not work properly and you will not be able to run a successful disaster recovery.

Network Compatibility

Colorado Backup for Windows 95 is fully integrated with the networking capabilities of Windows 95. The software can back up long filenames and data on remote stations. However, if you perform a Full System Backup on a remote station, the backup will contain your registry, not that of the remote station.

NOTE: Colorado Backup for Windows 95 will back up peer nodes, but no server-specific information.

Can Colorado Backup for Windows 95 Read Backups Made with Other Software?

The Colorado Backup software for DOS, Windows 95, and Windows has some interchangeability. Below is a chart to explain what the different software packages can read.

Software Package	Can Read Backups from:		
	Colorado Backup for DOS	Colorado Backup for Windows	Colorado Backup for Windows 95
Colorado Backup for DOS ver. 4.5 and previous	Yes	Yes	No
Colorado Backup for DOS ver. 4.6 or later	Yes	Yes	Yes
Colorado Backup for Windows	Yes	Yes	No
Colorado Backup for Windows 95	Yes	Yes	Yes

Uninstalling Colorado Backup for Windows 95

To remove Colorado Backup for Windows 95 from your system:

1. From the Start menu, select Programs, Colorado Backup for Windows 95, then Uninstall.
2. An information screen appears. Select Continue to uninstall the software.
3. When the uninstall is complete a screen appears. Select OK.

Questions and Answers

Q: What if I have a C: and a D: hard drive to back up?

A: Colorado Backup for Windows 95 allows you to back up more than one hard drive at a time.

Q: What if all the data on my hard drive doesn't fit on one tape?

A: Colorado Backup will prompt you to insert a new tape when the first tape is full to continue the backup on the next tape.

Q: How do I protect a backup from being read by someone else?

A: You can password protect a backup, then anyone trying to view or restore the data must first enter your password.

Q: Can I use tape backup to free up space on my hard drive?

A: You can back up files, then delete them from your hard drive. It is important to perform a compare operation prior to deleting them from your drive. This insures that the copy of the file(s) on the tape matches the file(s) on the drive.

Q: How do I restore files from Full System and Modified Backups?

A: If you need to restore one file, locate the latest tape that contains the file by inserting the tapes then double-clicking on the backup sets to view the file list. Restore the file from the tape with the latest date. If you have a hard drive crash and need to do a Total Restore, first restore the Full System Backup, then restore each successive Modified Backup with Overwrite on.

Q: What if I accidentally erase a tape?

A: If the tape was erased with Quick Erase the data can be recovered, providing it has not been written to since the Quick erase operation occurred. From the Tools menu, select Unerase. This will unerase the tape.

NOTE: Data erased with Secure erase cannot be recovered. Unerase does not work on PowerTape, PowerDAT, HP SureStore DAT drives or T4000s drives.

Chapter 2:

Using Colorado Backup for Windows

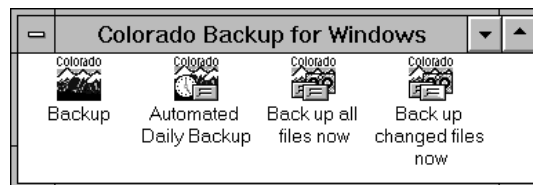
If you are using Colorado Backup on a Windows system, documentation is available in on-line form. To access the on-line documentation.....

This chapter lists step-by-step procedures for the most commonly performed backup tasks. Read this chapter if you installed Colorado Backup for Windows. If you installed Colorado Backup for DOS, read “Chapter 3: Using Colorado Backup for DOS” instead. If you installed Colorado Backup for Windows 95, read “Chapter 1: Using Colorado Backup for Windows 95” instead.

The following procedures assume that you have already installed your tape drive and backup software. If you have not, first follow the instructions in the Installation Guide that came in the tape drive box.

Three Approaches to Making Backups

Colorado Backup for Windows offers three different ways to make backups.



One-Button Backups - This feature lets you start a backup by simply double-clicking on icons found in the Colorado Backup for Windows Group in the Program Manager. Read more about this feature on page 2-9.

Automated Daily Backups - This feature lets you schedule backups to occur at convenient times, such as over lunch or after work hours. Once the schedule is set, leave a tape in the drive, leave your computer on with Windows running and the software does the rest. If you like this approach, read more about it on page 2-7.

Custom Backups - This method, described in the following section, offers you the most control over how you make a backup. You set the options and type of backup you want. You start a backup by dragging the icon of the drive you wish to back up onto the tape drive icon.

Making A Total Backup

Let's get started making what's called a "Total Backup", that is, everything on your C: hard drive will be copied to your tape. A Total Backup is the most commonly performed backup command. It ensures that your entire hard drive can be restored in case you lose data due to a sudden power failure, software problem, mechanical failure, or user mistake.

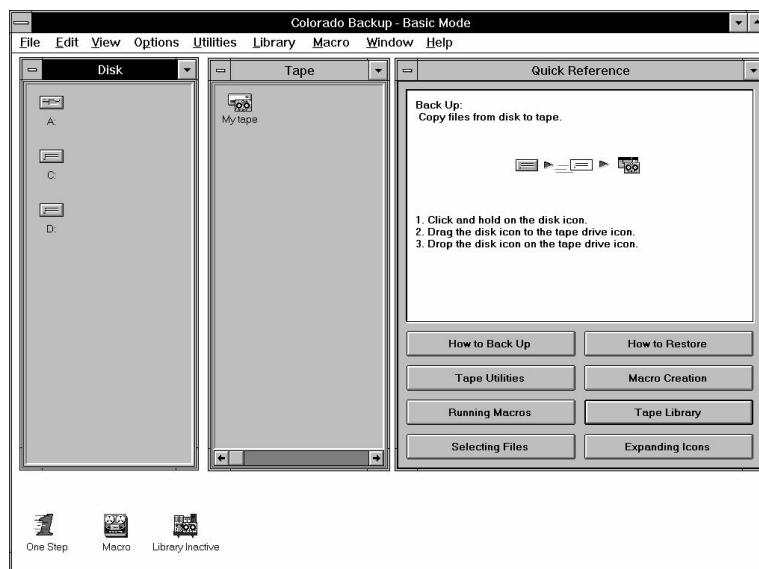
To make a Total Backup:

1. You will need one formatted tape. If the tape does not say "formatted" or "preformatted", you must format it first; see the section "Preparing a Tape for Use" on page 2-24.
2. Insert the tape into the tape drive. After the cartridge is inserted, you will hear the sound of the tape being wound back and forth. These noises indicate that the tape drive is finding the beginning of the tape, determining the tape's length and format, and positioning the read/write head.

3. To start the Colorado Backup software, in Windows, double-click on the Backup icon:

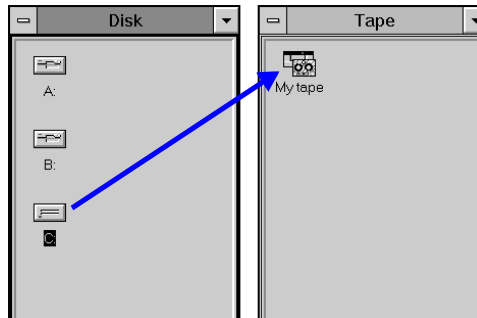


The Main screen appears:

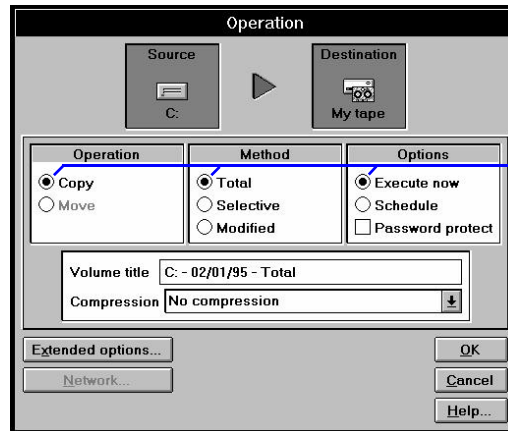


4. Drag and drop the hard drive icon onto the tape drive icon. *To drag and drop:* With your mouse, point to the icon for the hard drive that you want to back up. Press and hold the left mouse button. Move the mouse until

the hard drive icon is on top of the tape drive icon. Release the mouse button.



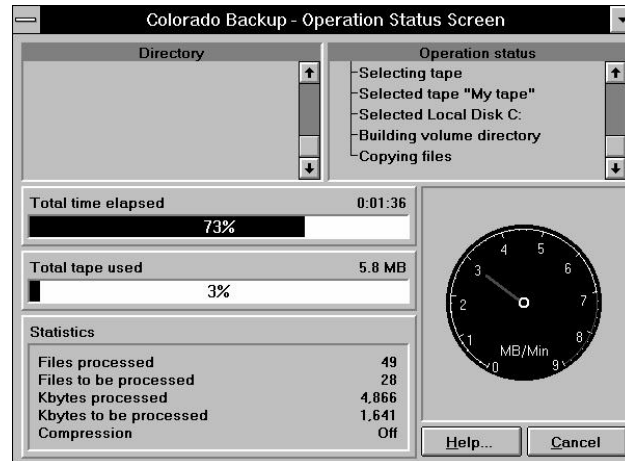
The Operation dialog box appears:



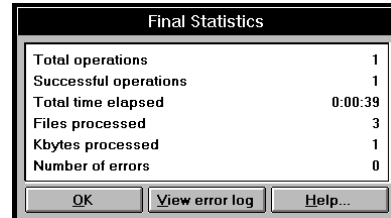
The default settings Copy and Total indicate that you are doing a total backup.

- Each backup that you make is saved on tape as *avolume*. The software automatically gives the volume a name in the “Volume title” box to help you remember what type of backup it is and the date it was made. Or, if you wish, you can give the volume your own name.

6. Click on **OK**. The Operation Status screen appears:



When the backup is finished, the Final Statistics box appears:



7. Click on **OK**. The Main screen appears. (Or, if there were errors, click on **View error log**.)
8. We recommend running a Compare operation simultaneously (called Auto Compare) with a backup. This ensures the files on tape match the files on disk and that no corruption occurred during the backup operation. It is especially important to run Compare after your first backup to ensure the system is working correctly. Read about Compare in the section “Ensuring a Reliable Backup” on page 10.
9. Remove the tape from the tape drive, label it, and store it in a safe place.

Understanding Backup Concepts

Why Should I Back Up My Computer?

Backups provide insurance against the loss of data due to hard drive failure or human error. *This loss can occur at any time.* Backups also allow you to return to older file versions, to create more space on your hard drive, and to transfer files easily from one computer to another.

How Often Should I Back Up?

You should back up your data as often as you use your computer. If you use your computer every day, you should back up every day. If you only use your computer once a week, you should back up once a week. If you are still unsure about how often to back up, ask yourself this question: How many days would it take for me to recreate my current hard drive if I were to lose everything right now?

Which Kind of Backup Should I Use?

Colorado Backup offers three types of backup: Total, Modified Files Only, and Selective.

- **Total Backup** backs up your entire hard drive to a tape. It ensures that you have a copy of every file you might need to restore. If you were to use only Total Backups, however, it would take a lot of time and you would use a lot of tapes.
- **Modified Files Only Backup** backs up only those files that have changed or been added since the last Total Backup. This type of backup saves time and tapes since you are backing up fewer files each time. The disadvantage is that restoring a file might take longer, since you may have to look at more than one tape to find the most current version of the file.

TIP: The simplest and fastest backup strategy is a weekly Total Backup combined with daily Modified Files Only Backups. We recommend that you use two sets of tapes so that you are never overwriting your last backup with your current backup.

- **Selective Backup** backs up only the files or directories that you specifically select, or *tag*. This type of backup is used mainly to transfer files from one computer to another or to free up space on your hard drive (called *archiving*).

How Do I Know Whether My Backups Are Good?

To ensure that you will be able to restore your backup when you need to, you must do a Compare. The Compare command compares the files on the tape to the files on your hard drive to make sure that they are exactly the same. At a minimum, you must Compare after making your first few backups and after making any changes to your computer system. Instructions on how to compare begin on page 2-10.

A Hands-off Approach to Backups

Use Automated Daily Backup to back up your hard drive at a specified time, such as after work hours, or over lunch each day. Just pick a time for the backups to occur, put a tape in the drive, and leave your computer running in Windows. The software takes care of the rest.

How Automated Daily Backup Works

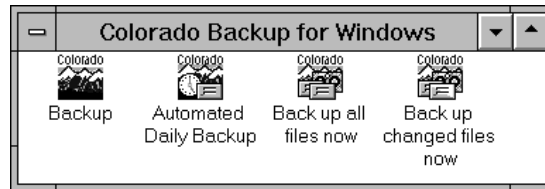
Automated Daily Backup will make a Total Backup (back up every file on your hard drive(s)) each Monday. On Tuesday through Sunday it will make a Modified Backup (back up any files that have changed since the

Monday backup). Every Monday, the tape will be erased, and the process will start over with another Total Backup.

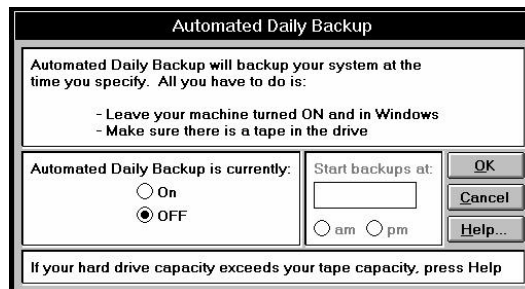
If you like to have two weeks worth of backups on hand, we suggest you alternate two tapes. If you think you may need to restore a file from three weeks ago, alternate three tapes, and so on.

To set up automated daily backup:

1. In the Windows Program Manager, display the Colorado Backup for Windows program group.



2. Double click on the **Automated Daily Backup** icon. The Automated Daily Backup screen appears:



3. Click on the **On** button. Backups will occur at 11:59PM (23:59). If you want your backup to start at a different time, type it in, then click on **OK**.
4. Insert a tape into the drive.

In Order for Automated Backups to Run

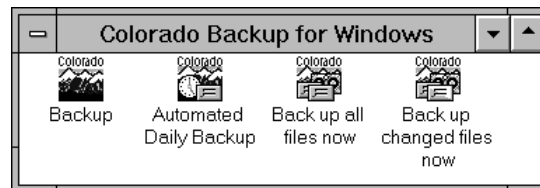
- Leave your computer on, with Windows running. You may want to close as many programs as you can. This helps the backup run more efficiently.
- Make sure a tape is in the drive.

Starting a Backup with One Button

You can start a Total or Modified Backup by double-clicking on an icon in the Colorado Backup program group.

To start a backup with one button:

1. In the Program Manager, display the Colorado Backup for Windows program group.



2. Put a tape in the drive.
3. Double-click on either the **Back up all files now** or the **Back up changed files now** icon.
4. The operation will start immediately. Each of your hard drives will be backed up and stored in a separate volume (backup) on your tape. While the backup is being made, you can minimize the software by clicking on the triangle that points downward in the upper right hand corner of the screen.
5. When the backup is completed, the software will run a Compare operation to make sure no errors occurred during the backup.

6. When the backups and compares are completed the software will close. To see if any errors occurred during the backup you can view the Error log. To view the Error log, start Colorado Backup, then double-click on the **Macro icon** in the bottom of the screen. A macro window will appear. Highlight the macro you want to view errors for, then from the **View** menu click on **Error log**, then **Macro errors**.

Ensuring a Reliable Backup

To ensure that you will be able to restore your backup when you need to, you must do a Compare. The Compare command compares the files on the tape to the files on your hard drive to make sure that they are exactly the same. We recommend you use Compare after each backup. At a minimum, however, you must Compare after making your first few backups and after making any changes to your computer system. By comparing files, you can also verify that your hardware and software are correctly installed. Instructions on how to compare are in the next section.

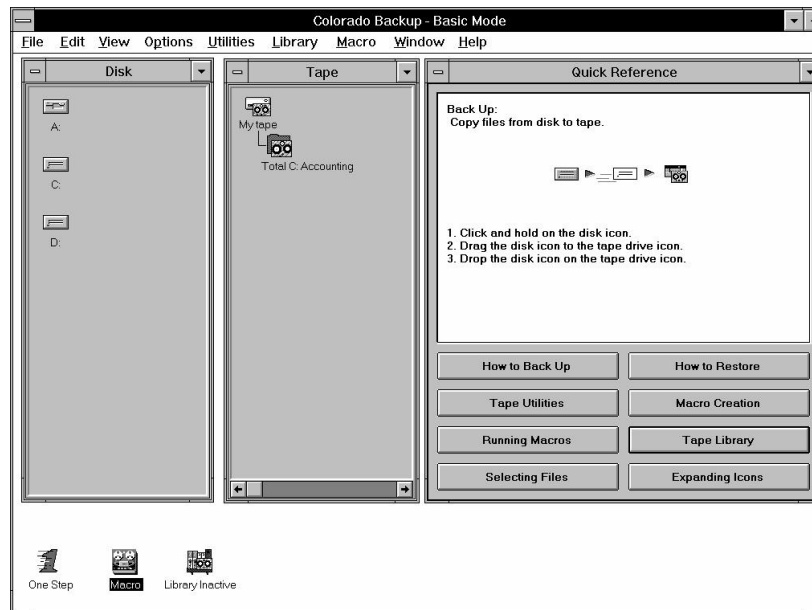
The Compare command reads the files that were backed up on tape, compares them to the files on your hard drive, and verifies that they are identical. This procedure ensures that you will be able to restore the files if you ever need to.

In this section we will do a Total Compare, that is, everything in a certain tape volume (or backup set) will be compared to the hard drive.

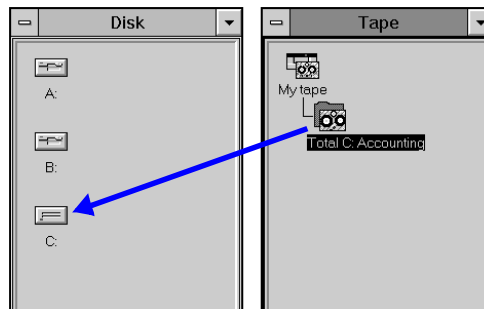
To do a Total Compare:

1. Insert a tape into the tape drive.

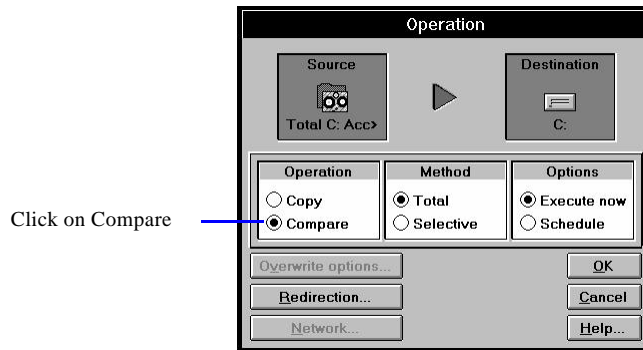
2. Start the Colorado Backup software. The Main window appears:



3. Drag and drop the *tape volume icon* (not the tape drive icon) that contains the files that you want to compare onto the icon for the hard drive that also contains the files.

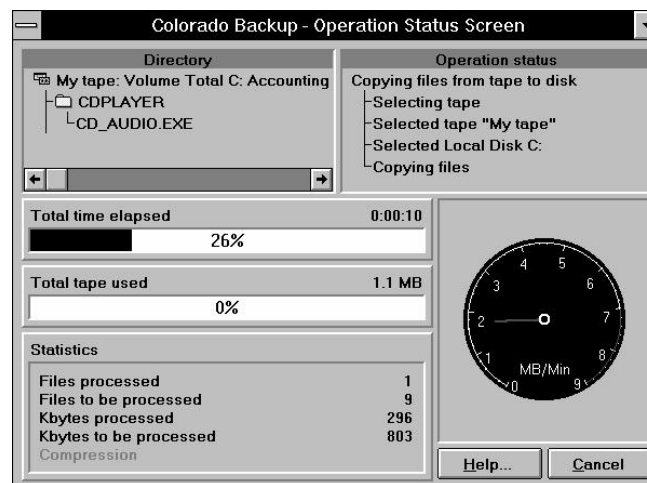


The Operation dialog box appears:

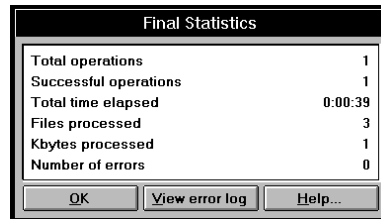


4. In the Operation box, click on **Compare**.

5. Click on **OK**. The Operation Status screen appears:



6. When the Compare is finished, the Final Statistics box appears:



7. Click on **OK**. The Main window returns. (Or, if there were any errors, click on **View error log**.)
8. Remove the tape from the tape drive and store it in a safe place.

Backing Up Specific Files

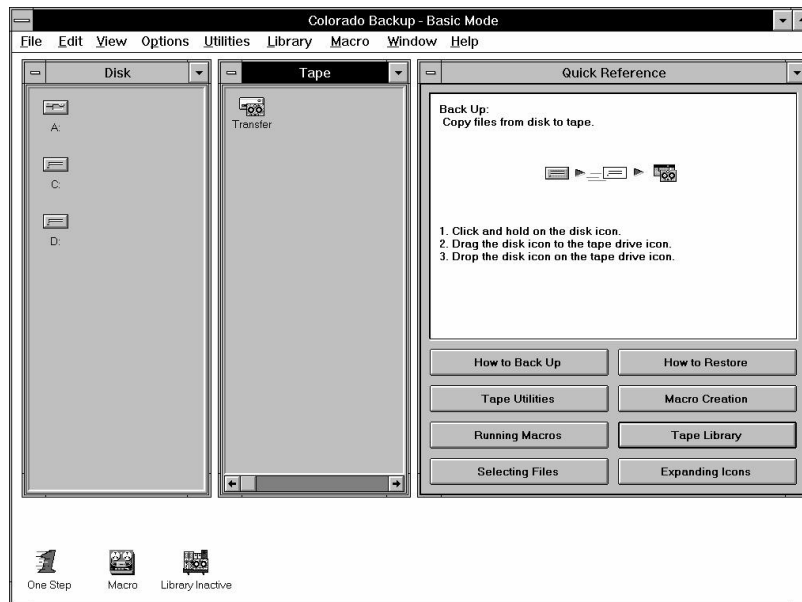
Sometimes you may want to back up only certain files rather than your entire hard drive. Backing up a few selected files is convenient if you want to transfer files from one computer to another such as when you want to take work home from the office or send a large desktop publishing file to a service bureau for high-quality output.

Another reason to back up only a few selected files is to free up space on your hard disk. This process is called *archiving*. Archiving is copying files that you no longer use or seldom use from your hard drive to tape. The copied files can then be deleted from your hard drive to provide additional disk space. And, if you find that you ever need the archived file in the future, it can be easily restored from the tape. When archiving, designate a special tape, one that you don't do your regular backups on and label it or write-protect it (see the literature that came with the tape cartridge for instructions on how to write-protect).

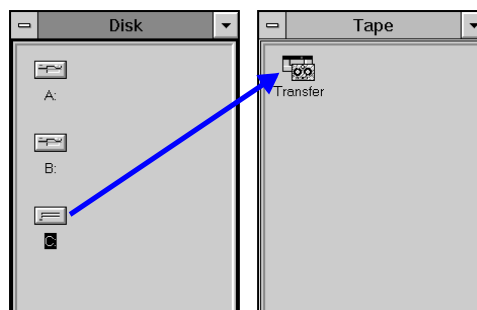
To back up specific files:

1. Insert a tape into the tape drive.

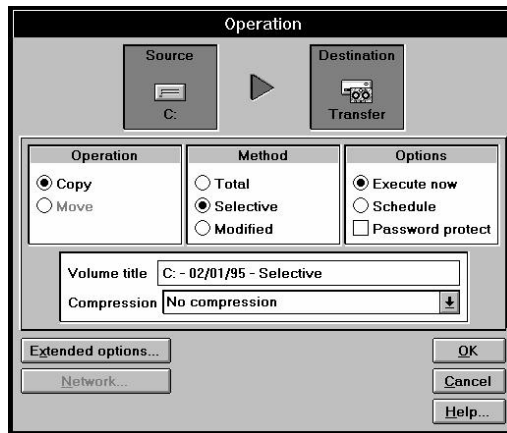
2. Start the Colorado Backup software. The Main window appears:



3. Drag and drop the icon for the hard disk that you want to back up onto the tape drive icon.

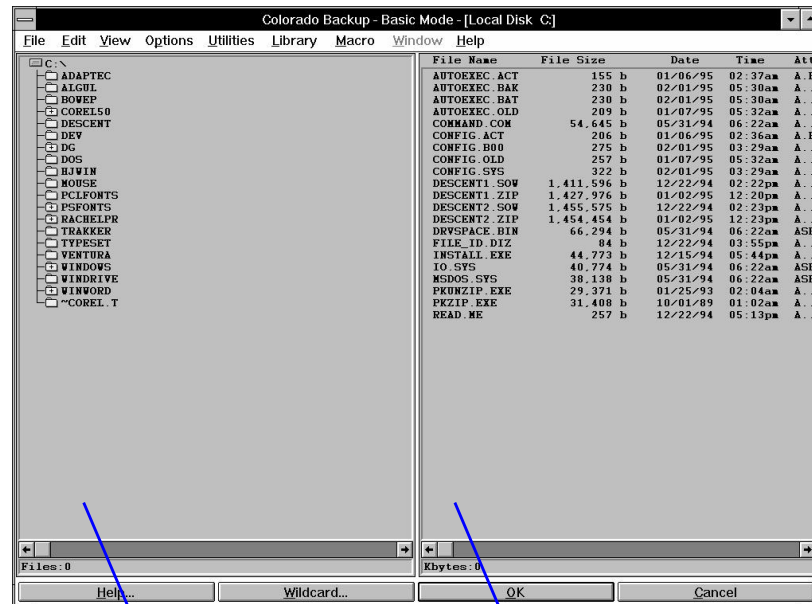


The Operation dialog box appears:



4. In the Method box in the center of the screen, click on **Selective**.
5. Each backup that you make is saved on tape as a *volume*. The software automatically gives the volume a name in the “Volume title” box to help you remember what type of backup it is and the date it was made. Or, if you wish, you can give the volume your own name.

6. Click on **OK**. The Mouse Button Usage and File Tagging screen appears. Click on **OK**. The directory and files window appears:



The left half of the window displays the directory tree.

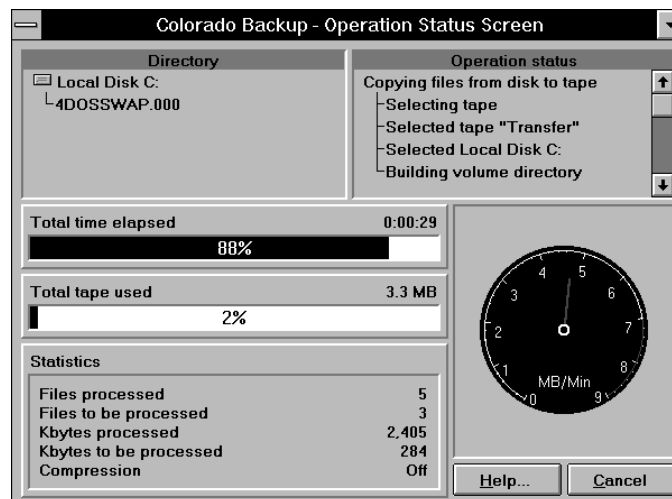
The right half of the window lists the files in the highlighted directory.

7. Select, or *tag*, the files that you want to back up using the actions in the following table. A ► appears next to each file that's tagged and next to each directory in which all the files and subdirectories are tagged. A ► appears next to each directory in which only some of the files and subdirectories are tagged.

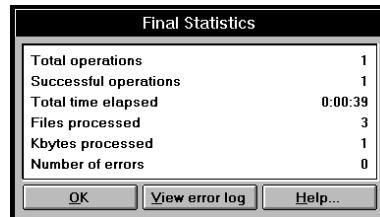
To:	With the mouse:
Tag a file	Click on the filename with the right mouse button.
Tag a directory, including all of its files and subdirectories	<ol style="list-style-type: none"> 1. If the directory is marked with a minus sign (⊖), click on the directory folder to highlight it, then double-click to hide its subdirectories. 2. Click with the right mouse button.

To:	With the mouse:
Tag all files in a directory, excluding any subdirectories	1. If the directory is marked with a plus sign (⊕), click on the directory name to highlight it, then double-click to show its subdirectories. 2. Click with the right mouse button.
Display the files in a directory	Click on the directory name.
Show subdirectories	On a directory marked with a plus sign (⊕): 1. Click on the directory name to highlight it. 2. Double-click.
Hide subdirectories	On a directory marked with a minus sign (⊖): 1. Click on the directory name to highlight it. 2. Double-click.

8. When you are done tagging, click on **OK**. The Operation Status screen appears:



When the backup is finished, the Final Statistics box appears:



9. Click on **OK**. The Main screen returns. (Or, if there were errors, click on **View error log**.)

Restoring Files to Your Hard Drive

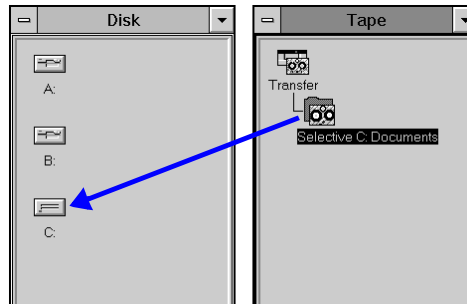
Restoring is the process of copying files from a tape to your hard drive. When you accidentally delete a file, transfer work to another computer, or need to retrieve an earlier version of a file that you have archived, you'll do a Restore. The files will be restored to the same place on your hard drive and will contain the same information as they did when they were last backed up.

Sometimes you will only be restoring one file; at other times you may need to restore all the files as in the case of a hard disk crash. In this section we will be restoring selected files or directories, the most common type of restore.

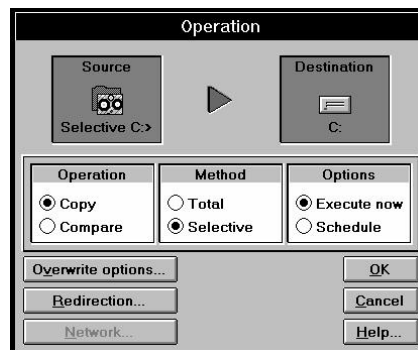
To restore selected files or directories:

1. Insert the tape that contains the files you want to restore into the tape drive.
2. Start Colorado Backup. The main window appears.

3. Drag and drop the icon for the tape volume (not the tape drive icon) that contains the files you want to restore onto the icon for the hard drive to which you want to restore the files.

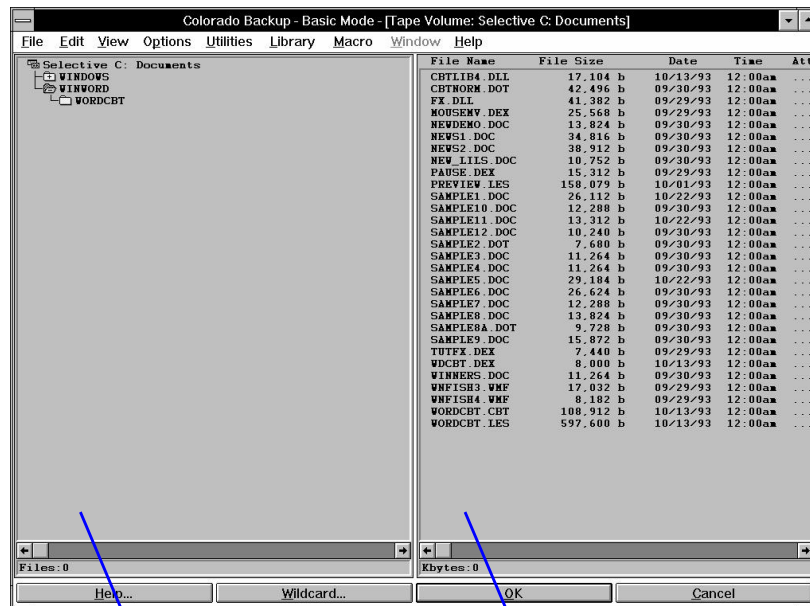


The Operation dialog box appears:



4. In the Method box, click on **Selective**.

5. Click on **OK**. The Mouse Button Usage and File Tagging screen appears. Click on **OK**. The directory and files window appears:



The left half of the window displays the directory tree.

The right half of the window lists the files in the highlighted directory.

6. Select, or *tag*, the files that you want to back up using the actions in the following table. A ► will appear next to each file that's tagged and next to each directory in which all the files and subdirectories are tagged. A ► will appear next to each directory in which only some of the files and subdirectories are tagged.

To:	With the mouse:
Tag a file	Click on the filename with the right mouse button.

To:	With the mouse:
Tag a directory, including all of its files and subdirectories	<ol style="list-style-type: none"> 1. If the directory is marked with a minus sign ([-]), click on the directory folder to highlight it, then double-click to hide its subdirectories. 2. Click with the right mouse button.
Tag all files in a directory, excluding any subdirectories	<ol style="list-style-type: none"> 1. If the directory is marked with a plus sign ([+]), click on the directory name to highlight it, then double-click to show its subdirectories. 2. Click with the right mouse button.
Display the files in a directory	Click on the directory name.
Show subdirectories	On a directory marked with a plus sign ([+]): <ol style="list-style-type: none"> 1. Click on the directory name to highlight it. 2. Double-click.
Hide subdirectories	On a directory marked with a minus sign ([-]): <ol style="list-style-type: none"> 1. Click on the directory name to highlight it. 2. Double-click.

7. When you are done tagging, click on **OK**. The Operation Status screen appears. When the Restore is finished, the Final Statistics box appears.
8. Click on **OK**. The Main screen returns. (Or, if there were errors, click on **View error log**.)

Viewing the Contents of a Tape

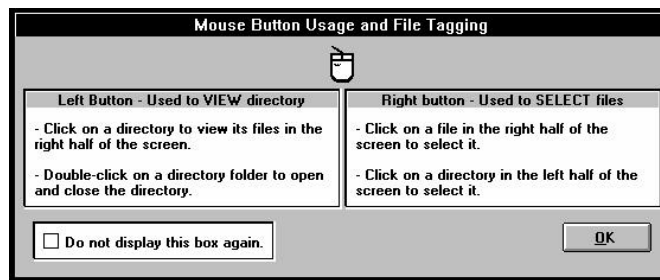
Just as you can view the contents of a disk using the Windows File Manager, you can also view the contents of a tape using Colorado Backup. You might want to view a tape's contents before restoring files in order to locate the files that you need or before erasing a tape.

To view the contents of a tape:

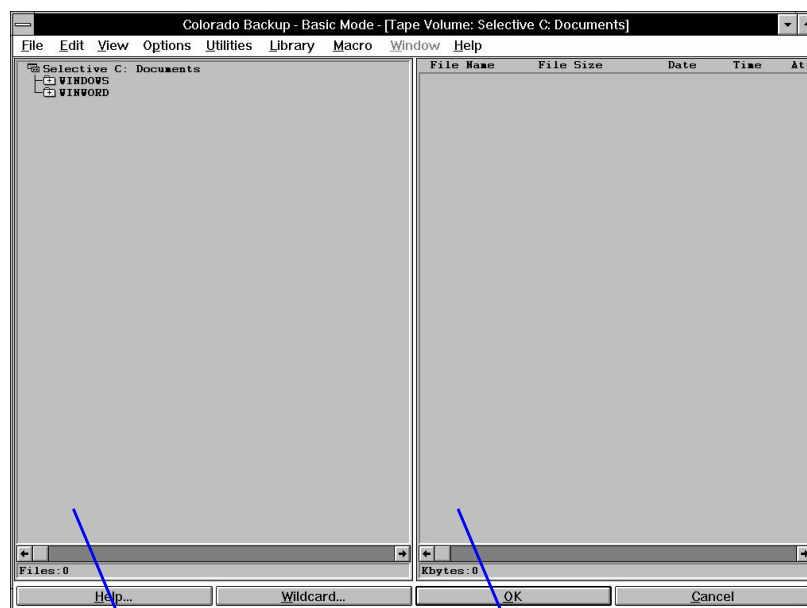
1. Double-click on the tape volume icon that contains the files you want to display.



The following information screen appears:



2. Click on **OK**. The directory and files window appears:



The left half of the window displays the directory tree.

The right half of the window lists the files in the highlighted directory.

3. You can move through the directory tree with the following actions:

To:	With the mouse:
Display the files in a directory	Click on the directory name.
Show subdirectories	On a directory marked with a plus sign (+): 1. Click on the directory name to highlight it. 2. Double-click.
Hide subdirectories	On a directory marked with a minus sign (-): 1. Click on the directory name to highlight it. 2. Double-click.

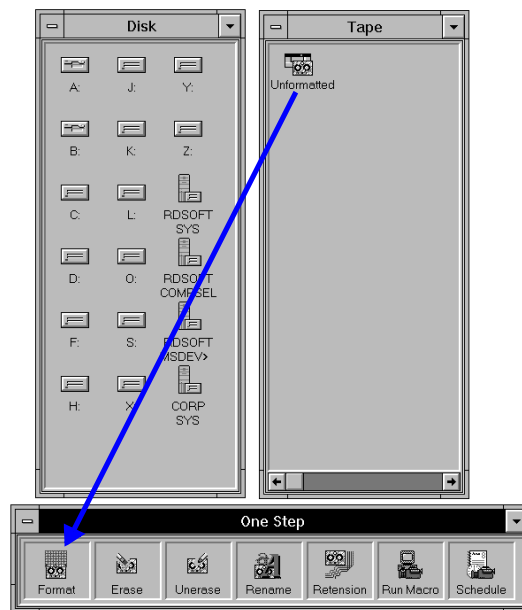
4. When you are done viewing, click on **OK**.

Preparing a Tape for Use

All tapes must be formatted before you use them for the first time. Formatting a tape takes from 30 minutes to five hours depending on your tape-drive model, your floppy controller's speed, and the length of the tape. Preformatted tapes are ready for making backups immediately, saving you the time it takes to do a format. See “Chapter 4: Choosing Tapes” for a list of the tapes to use.

To prepare a tape for use:

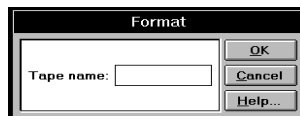
1. Insert the tape that you want to use into the tape drive.
2. Double-click on the One Step icon to display the One Step window.
3. Drag and drop the tape drive's icon onto the Format icon in the One Step window.



A warning message appears:



4. Click on **OK**. The following Format box appears:



5. Type in a name for the tape. If you do not type a name, the software names the tape using the current time and date.
6. Click on **OK**. The Operation Status screen appears. When the format operation is complete, the Final Statistics box appears.
7. Click on **OK**. The Main screen returns. (Or, if errors occurred, click on **View error log**.)

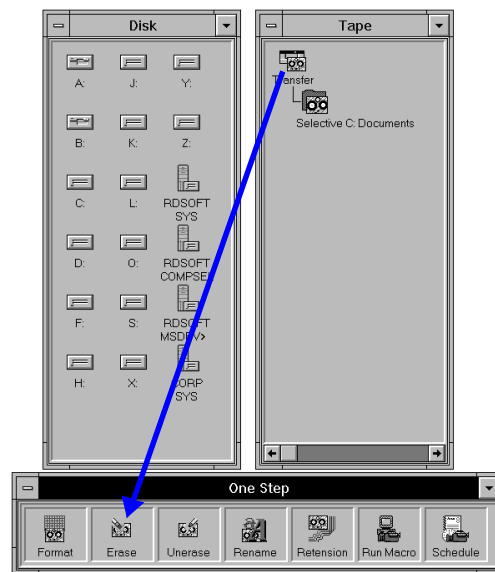
Erasing a Tape

If you have a tape that contains data you no longer need, you can erase it and reuse the tape. This procedure usually takes less than a minute.

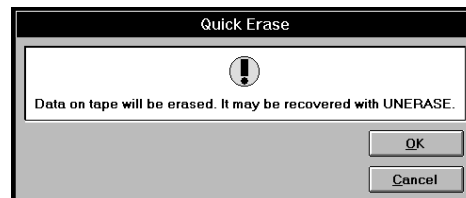
To erase a tape:

1. Insert the tape that you want to erase into the tape drive.
2. Double-click on the One Step icon to display the One Step window.

3. Drag and drop the tape drive's icon onto the Erase icon in the One Step window.



A warning appears:



4. Click on **OK**. The Operation Status screen appears. When the Erase is done, the Final Statistics box appears.
5. Click on **OK**. The Main screen returns. (Or, if there were errors, click on **View error log**.)

The Tape Library

The Tape Library keeps a record of the information on your tapes. If you need to restore a file, but don't know which tape contains the version you need, use the Library to view the contents of your tapes before you restore.

Turning the Library On or Off

The Tape Library is turned *off* when you install the software. It must be turned *on* to keep track of your tapes.

To turn on/off the tape library:

1. From the **Library** menu, select **Active/Inactive**.
2. Click on the button next to **Active** to turn the library on, or **Inactive** to turn the library off, then click on **OK**.

Each backup, erase, format or tape rename you perform will be reflected in the Tape Librarian record as long as the library is turned on.

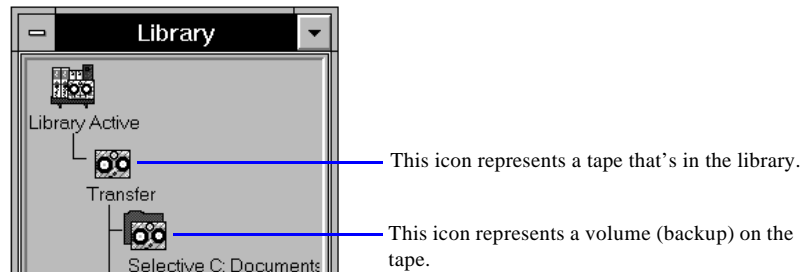
To view the library window:

1. Double-click on the **Library Active** icon.



Library Active

2. The Library window will appear.



Naming Tapes and Backups for the Library

After you have several tapes in the library, descriptive tape and backup names become important. Colorado Backup automatically names backups with the type of backup and the date. However, you may want a more descriptive title for your records. For example, if you made a special backup of accounting information, you might want to name the backup "Accounting: 1st quarter 94".

Labeling tapes is also important. For example, if you want to restore files using the Library, it will ask for the tape by name. You will want to have your tapes clearly labeled so you can locate them quickly. By default, many tapes have a name based on the date and time they were first formatted or created, such as 0209930215. You may want more descriptive names that are easier to work with.

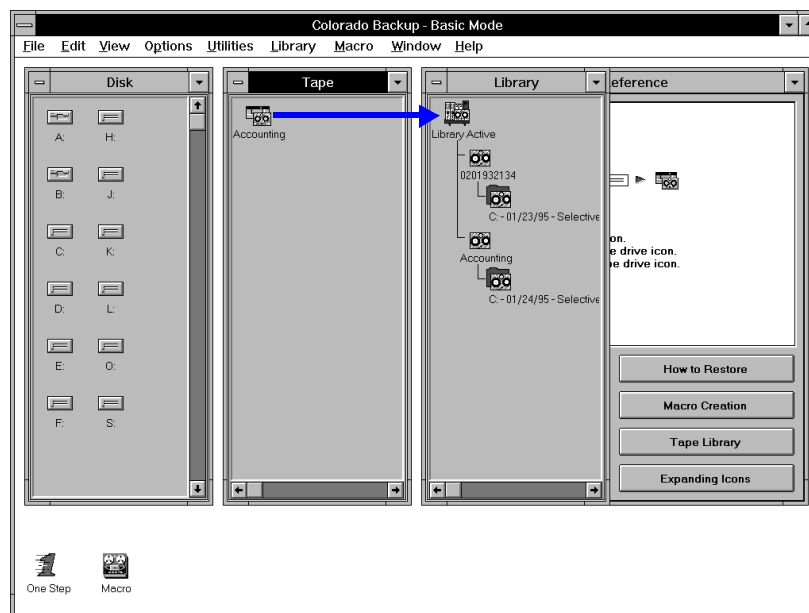
Adding Tapes to the Library

After the library is turned on, every backup you make will be reflected in its contents. However, if you have tapes you made before the library was turned on, you can add those as well.

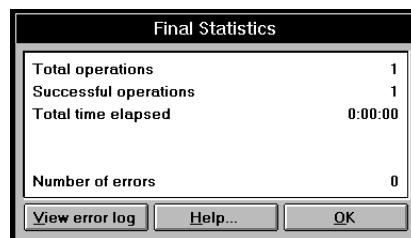
To add tapes to the library:

1. Insert the tape you want to add to the library into your tape drive.

- Double-click on the **Library Active** icon. The Library window will appear.
- Drag and drop the tape icon onto the Library window. The operation screen will appear as the tape is added to the library.



- After the tape has been added, the Final Statistics screen appears. Click on **OK** to return to the main screen. The tape icon will appear in the Library window.



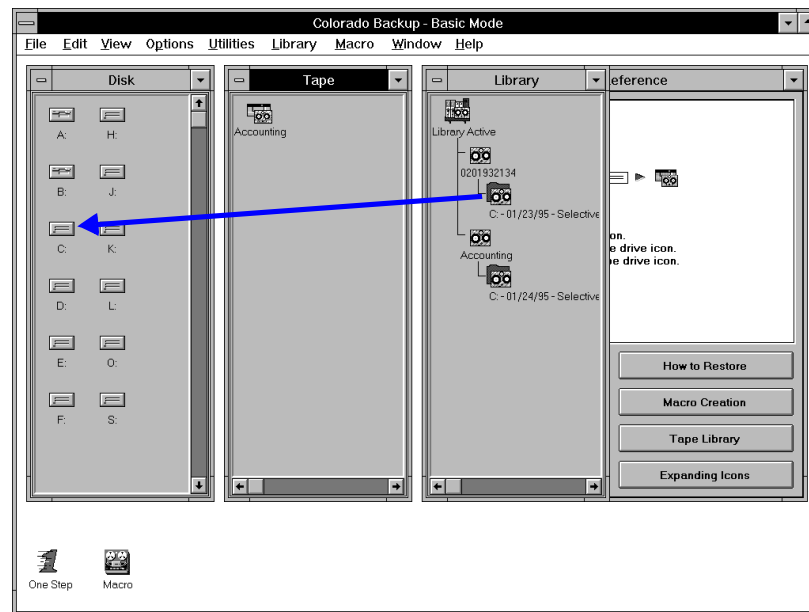
Restoring Files from the Library

You can restore files using the library. It works like a regular restore, except that you will be prompted to insert the correct tape if it is not already in the drive.

You can easily search through the tapes in the library to locate specific files.

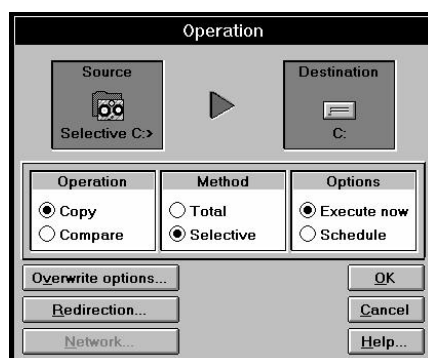
To restore files from the Library:

1. Double-click on the **Library Active** icon to display the Library window.

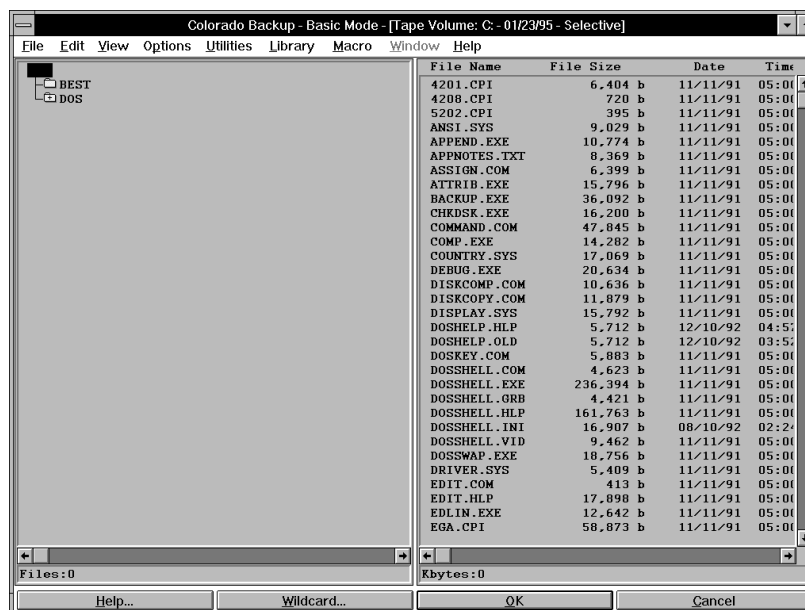


2. Drag and drop the icon of the volume you want to restore onto the hard drive icon.
3. The Operation screen appears. If you only want to restore a few files, click on **Selective** then click on **OK**. The file selection screen will appear

as shown in the next step. If you want to restore all the files in a backup, leave **Total** selected, then click on **OK** and continue with step 5.



4. Tag (select) the files you want to restore, then click on **OK**.



5. The Operation Status screen appears. (You will be prompted to insert the correct tape if it is not already in the drive.)
6. When the restore is finished, the Final Statistics screen appears. Click on **OK** to return to the main screen or **View error log** if any errors occurred.

Macros

A macro lets you perform several operations at the same time, one after another with the click of a button. For instance you could create a macro to back up your C: drive, then your D: drive and then compare them both. A macro is basically a recording of operations. You turn on a recorder, do the operations you want the macro to perform, then turn the recorder off.

The Easiest Way to Use Macros

Colorado Backup automatically created two helpful macros when you installed the software. One will back up all the files on all the drives on your system (excluding floppy drives). The other will back up only files changed since your last total backup. An explanation on how to use these macros is found on page 2-9 under the heading, “Starting a Backup with One Button”.

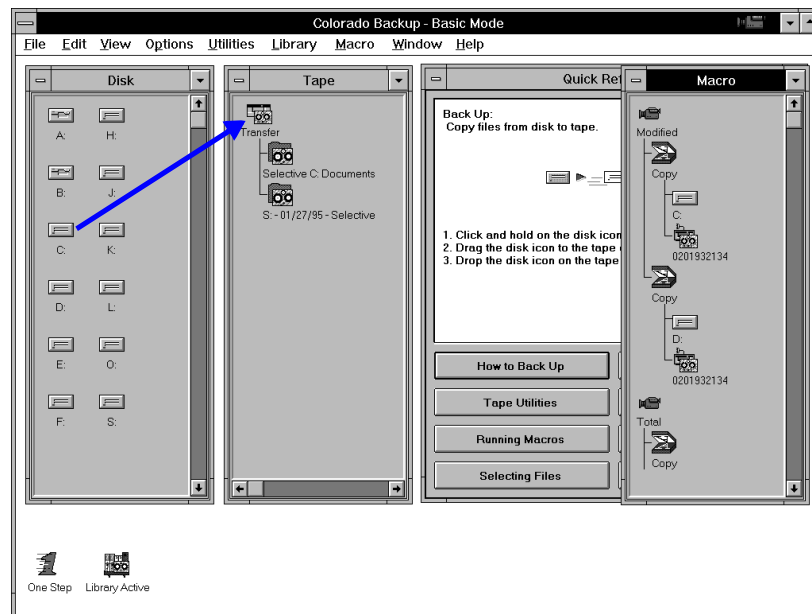
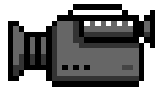
Creating Your Own Macros

In addition to the two macros the software created for you, you can create your own macros. We'll show you how to create a macro to make a selective backup (a backup of specific files you choose).

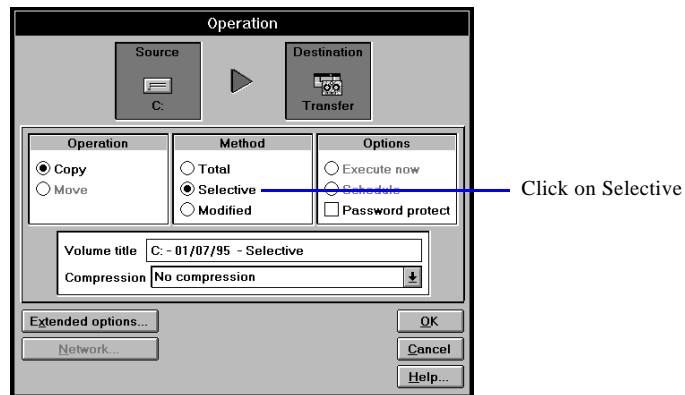
To create a selective backup macro:

1. Double-click on the **Macro** icon to display the Macro window. (Two macros created by the software during installation labelled, “Automated Modified” and “Automated Total”, will appear in the window.)

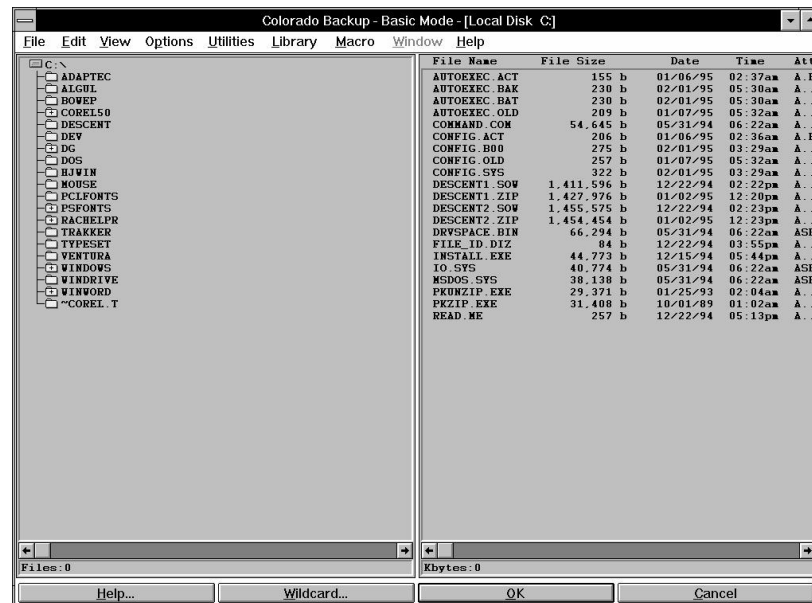
2. From the **Macro** menu, click on **Start recording**. A small, blinking video recorder will appear in the upper right hand corner of your screen.



3. Drag and drop the icon for your C: drive onto your tape drive icon. The Operation box appears:



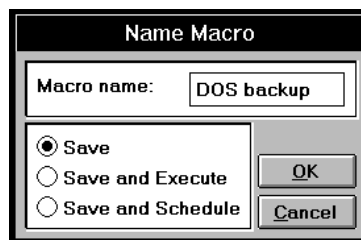
4. In the Operation box, click on **Selective**, then click on **OK**. The file selection screen appears:



5. Select (tag) the files you want included in the backup, then click on **OK**.

To:	With the mouse:
Tag a file	Click on the filename with the right mouse button.
Tag a directory, including all of its files and subdirectories	1. If the directory is marked with a minus sign ([-]), click on the directory folder to highlight it, then double-click to hide its subdirectories. 2. Click with the right mouse button.
Tag all files in a directory, excluding any subdirectories	1. If the directory is marked with a plus sign ([+]), click on the directory name to highlight it, then double-click to show its subdirectories. 2. Click with the right mouse button.
Display the files in a directory	Click on the directory name.
Show subdirectories	On a directory marked with a plus sign ([+]): 1. Click on the directory name to highlight it. 2. Double-click.
Hide subdirectories	On a directory marked with a minus sign ([-]): 1. Click on the directory name to highlight it. 2. Double-click.

6. From the **Macro** menu, click on **Stop recording**. The Name Macro box appears:



7. Type in a name for the macro you created. In this example we'll use the name, DOS backup. After you've entered the name, click on **OK**. (If you want to make the backup right away, click on Save and Execute. If you

would like to schedule your macro to run at a specific time, click on Save and Schedule.)

A macro icon with the name you typed in will appear in the Macro window.

Running Macros

To run a macro:

1. Double-click on the **Macro** icon to display the Macro window.
2. Double-click on the **One Step** icon to display the One Step window.
3. Drag and drop the icon of the macro you want to start onto the **Run Macro** icon in the One Step window.

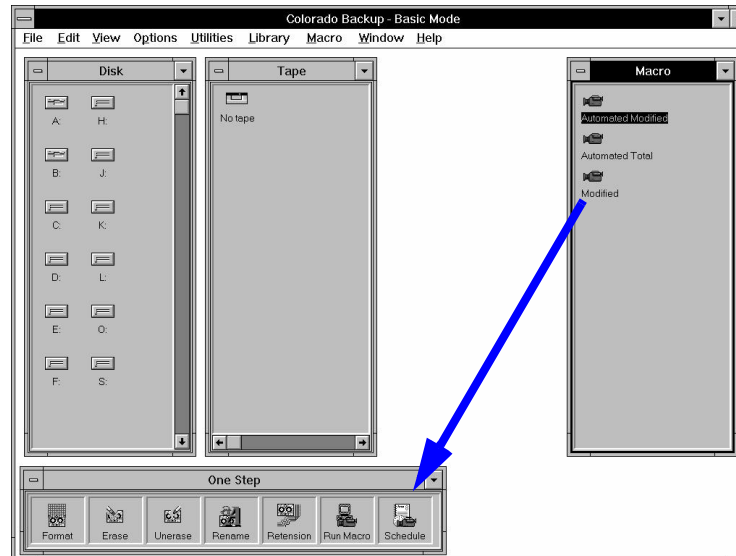
Scheduling a Macro

You can schedule a macro to occur at a convenient time, such as after work hours or during your lunch.

To schedule a macro:

1. Double-click on the **Macro** icon to display the Macro window.

2. Double-click on the One Step icon to display the One Step window.

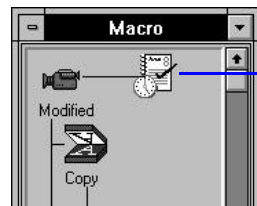


3. Drag-and-drop the icon of the macro you want to schedule onto the **Schedule** icon in the One Step window. The Schedule screen appears:



4. Select the days and times you want your backup to run. For example, if you wanted to schedule a backup to occur every Monday, Wednesday and Friday you would click on Weekly in the Schedule Type box, then click on the days of the week.

When you are finished setting your schedule, click on **OK**. You will be returned to the main screen. A small schedule icon will now appear next to the macro icon you scheduled.



This icon indicates that the Modified macro has been scheduled.

Preparing for a Hard Drive Crash

The best way to minimize the impact of a hard drive crash is to be prepared for it. Follow the directions below to create a bootable diskette that will start your computer from your floppy drive and quickly give you an operational version of Colorado Backup for DOS. If you have performed regular backups, restoring your hard drive to its most recent state may be as easy as a few Copy operations.

To make a bootable diskette:

A hard drive crash is likely to make your hard drive inoperable, so it is important to make a bootable diskette that will start your computer from the A: drive.

***IMPORTANT:** We strongly recommend that you make your bootable diskette NOW so that it will be ready when you need it.*

1. Insert a blank high-capacity diskette into your A: drive.
2. Format the diskette. Use the /S option to create a system diskette that can start your computer. Type:

```
FORMAT A: /S
```

3. Copy the DOS FORMAT, FDISK and SYS command files to the diskette by typing:

```
COPY C:\DOS\FORMAT.COM A: (Press ENTER)
COPY C:\DOS\FDISK.EXE A: (Press ENTER)
COPY C:\DOS\SYS.COM A: (Press ENTER)
```

4. Store the bootable diskette and your Colorado Backup for DOS diskette together in a safe place. If an emergency ever arises requiring the bootable diskette, follow the instructions in the next section.

Recovering from a Hard Drive Crash

The hard drive crash recovery procedure requires three steps:

1. Starting your computer (either with a bootable diskette or by reformatting your hard drive).
2. Installing Colorado Backup for DOS.
3. Restoring your files from a backup tape to your hard drive.

NOTE: Tape volumes made in Colorado Backup for Windows can be read and restored by Colorado Backup for DOS.

IMPORTANT: Each hard drive situation is different. You may need to restore only a few files to make your system operable again. Check for simple solutions before making drastic changes to your hard drive.

To start your computer after a disk crash:

With a bootable diskette:

1. Insert the diskette into your A: drive and turn on your computer. This boots your computer.
2. After booting the computer, you can format your hard drive if necessary. Read your DOS documentation for formatting instructions.



CAUTION: Formatting a hard drive destroys all files and directories. DO NOT format your hard drive if you are not sure it is necessary.

3. Install Colorado Backup for DOS.

Without a bootable diskette:

If you did not make a bootable diskette in preparation of hard drive problems, either repair the damage to your hard drive or consult a qualified technician. You must be able to boot your computer and have an operable hard drive before you can proceed with the following instructions on installing Colorado Backup for DOS.

To install Colorado Backup for DOS:

1. Insert the Colorado Backup for DOS diskette into your floppy drive.
2. At the DOS prompt, type `A:` and press ENTER. (Type `B:` if the diskette is in drive B:)
3. Type `INSTALL` and press ENTER. Follow the instructions on the screen. When installation is complete, you are returned to the DOS prompt.

To restore your files:

1. Switch to the Colorado Backup directory. For example, if you installed the software in the `TAPE` directory, you would type:

```
CD \TAPE
```

2. To start the Colorado Backup software, type:

```
TAPE
```

3. Insert the tape that contains the backup you want to restore to your hard drive.
4. From the Main menu, open the **Options** menu and select **Software Setups**. Mark the check box next to the **Overwrite existing files during restore**.

NOTE: You may need to use the keyboard to select commands until the mouse drivers are restored. Use the ARROW keys and TAB.

5. From the **Main menu**, select **Restore**. From the **Restore** menu, select **Total**. This copies the entire contents of the tape to the hard drive, including your Windows software. (If you are restoring from a combination of Total and Modified Files Only backups, "Questions and Answers" on page 2-41.)
6. Exit Colorado Backup for DOS.
7. Remove the diskette from your A: floppy drive and reboot your computer by pressing (CTRL+ALT+DEL).

Questions and Answers

Q: What if I have a C: and a D: hard drive to back up? A: You can double-click on the **Back up all files now** icon in the Colorado Backup program group or drag and drop the **Automated Total** macro icon onto Run Macro in the One Step box. This will back up all the drives on your system one after another.

Q: What if all the data on my hard drive doesn't fit on one tape? A: Colorado Backup will prompt you to insert a new tape when the first tape is full.

Q: What if I forget to format a tape before starting a backup? A: Colorado Backup will automatically format the tape, however, this will add from 30 minutes to five hours depending on your tape drive model, the controller's speed, and the length of the tape.

Q: How do I protect a backup from being read by someone else? A: You can password protect a backup, then anyone trying to view or restore the data must first enter the password. In the Operation dialog box, put an X in the Password protect check box. You will be prompted to enter a password. Passwords are case sensitive; for example, MYbackup, Mybackup and MYBACKUP would be considered different passwords.

Q: Can I use tape backup to free up space on my hard drive? A: The Move feature will copy files to tape, then delete them from your hard drive. Start a backup by dragging and dropping, then select Move in the operation screen.

Q: How do I restore files from Total and Modified Backups? A: If you need to restore one file, locate the latest tape that contains the file by inserting the tapes, then double-clicking on the tape volumes to bring up the Directory window. Restore the file from the tape with the latest date. If you have a hard drive crash and need to do a Total Restore, first restore the Total Backup, then restore each successive Modified Backup with Always overwrite on. On the Operation screen, click on the Overwrite options button, then click on Always overwrite.

Q: Is there a way to fit more data on a tape? A: Use the compression option to reduce the size of each backup by an average of 2:1 (depending on the type of data in the backup). The data that is compressed and then restored is exactly the same as the original data. To turn compression on, in the Operation box, click on the Compression drop-down menu, then click on either speed optimized or space optimized.

Q: What if I accidentally erase a tape? A: Drag and drop the tape icon onto the **Unerase** icon in the One Step window. This will unerase the tape providing it has not been written to since the erase operation occurred.

Chapter 3:

Using Colorado Backup for DOS

This chapter lists step-by-step procedures for the most commonly performed backup tasks. Read this chapter if you installed Colorado Backup for DOS. If you installed Colorado Backup for Windows 95, read “Chapter 1: Using Colorado Backup for Windows 95” instead. If you installed Colorado Backup for Windows, read “Chapter 2: Using Colorado Backup for Windows” instead.

The following procedures assume that you have already installed your tape drive and backup software. If you have not, first follow the instructions in the Installation Guide that came in the tape-drive box

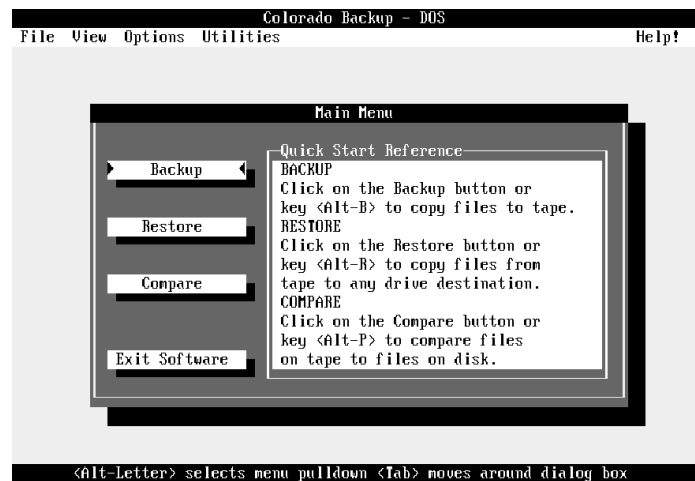
Making Your First Backup

Let's get started making your first backup right away. You will be making what's called a Total Backup, that is, everything on your C: hard drive will be copied to your tape. A Total Backup is the most commonly performed backup command. It ensures that your entire hard drive can be restored in case you lose data due to a sudden power failure, software problem, mechanical failure, or user mistake.

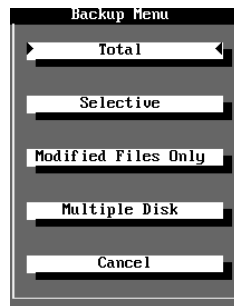
To make a Total Backup:

1. You will need one formatted tape. If the tape does not say “formatted” or “preformatted”, you must format it first; see the section “Preparing a Tape for Use” on page 3-19.

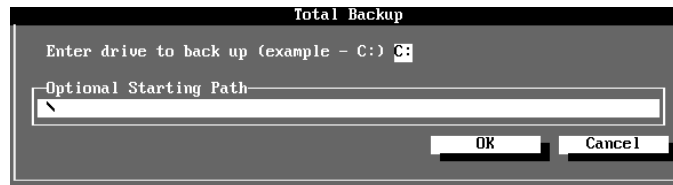
2. Insert the tape into the tape drive. After the tape is inserted, you will hear the sound of the tape being wound back and forth. These sounds indicate that the tape drive is finding the beginning of the tape, determining the tape's length and format, and positioning the read/write head.
3. To start the Colorado Backup software, at the DOS prompt, change to the directory where your tape software is stored (for example if it is in the CBD directory you would type `CD \CBD`) and press ENTER.
4. Type `TAPE` and press ENTER. The Main Menu appears:



5. From the Main menu, select Backup. The Backup menu appears:



6. From the Backup menu, select Total. The first Total Backup screen appears:

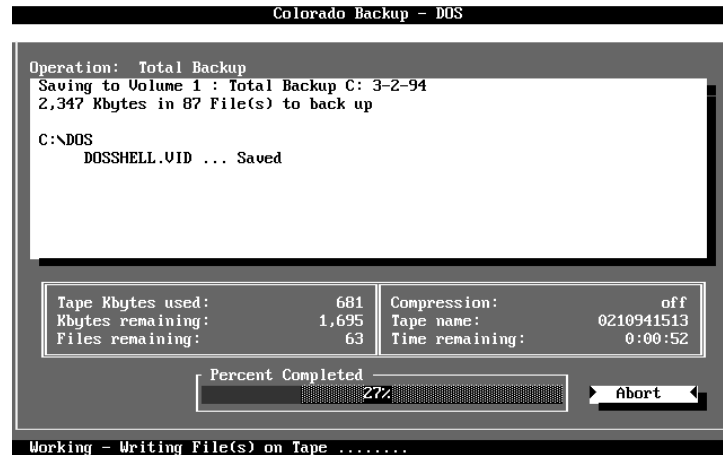


7. To back up your entire hard drive, type its drive letter.
8. Select OK. A screen showing the number of files and the number of kilobytes (Kbytes) that will be backed up will appear. Then the next Total Backup screen appears:



9. Each backup that you make is saved on tape as a volume. Type a name in the Volume title field to help you remember what the backup contains. A good volume title would include the type of backup (Total in this case) the letter of the hard drive you are backing up, what computer is being backed up, and any other information you want to include. For example, you might type "Total C: Accounting".

10. Select Backup Now to start the backup. The Operation screen appears:



When the backup is finished, the Percent Completed gauge will show 100%.

11. Select OK.
12. From the Backup menu, select Cancel. The Main menu returns.
13. Remove the tape from the tape drive, label it, and store it in a safe place.

Understanding Backup Concepts

Why Should I Back Up My Computer?

Backups provide insurance against the loss of data due to hard drive failure or human error. This loss can occur at any time. Backups also allow you to return to older file versions, to create more space on your hard drive, and to transfer files easily from one computer to another.

How Often Should I Back Up?

You should back up your data as often as you use your computer. If you use your computer every day, you should back up every day. If you only use your computer once a week, you should back up once a week. If you are still unsure about how often to back up, ask yourself this question: How many days would it take for me to recreate my current hard drive if I were to lose everything right now?

Which Kind of Backup Should I Use?

Colorado Backup offers three types of backup: Total, Modified Files Only, and Selective.

- Total Backup backs up your entire hard drive to a tape. It ensures that you have a copy of every file you might need to restore. If you were to use only Total Backups, however, it would take a lot of time and you would use a lot of tapes.
- Modified Files Only Backup backs up only those files that have changed or been added since the last Total Backup. This type of backup saves time and tapes since you are backing up fewer files each time. The disadvantage is that restoring a file might take longer, since you may have to look at more than one tape to find the most current version of the file.

TIP: The simplest and fastest backup strategy is a weekly Total Backup combined with daily Modified Files Only Backups. We recommend that you use two sets of tapes so that you are never overwriting your last backup with your current backup.

- Selective Backup backs up only the files or directories that you specifically select, or tag. This type of backup is used mainly to transfer files from one computer to another or to free up space on your hard drive (called archiving).

How Do I Know Whether My Backups Are Good?

To ensure that you will be able to restore your backup when you need to, you must do a Compare. The Compare command compares the files on the tape to the files on your hard drive to make sure that they are exactly the same. At a minimum, you must Compare after making your first few backups and after making any changes to your computer system. Instructions on how to compare are in the next section.

Ensuring a Reliable Backup

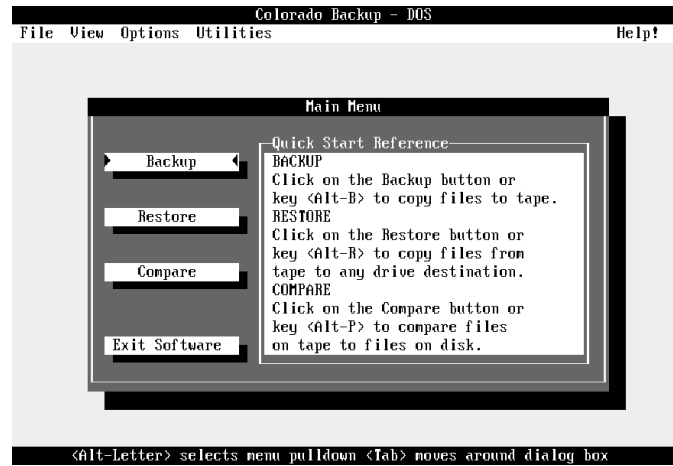
The Compare command reads the files that were backed up, compares them to the files on your hard drive, and verifies that they are identical. This procedure ensures that you will be able to restore the files if you ever need to. By comparing files, you can also verify that your hardware and software are correctly installed.

In this section we will do a Total Compare, that is, everything in a certain tape volume (or backup) will be compared to the hard drive.

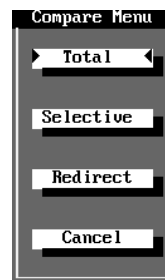
To do a Total Compare:

1. Insert a tape into the tape drive.

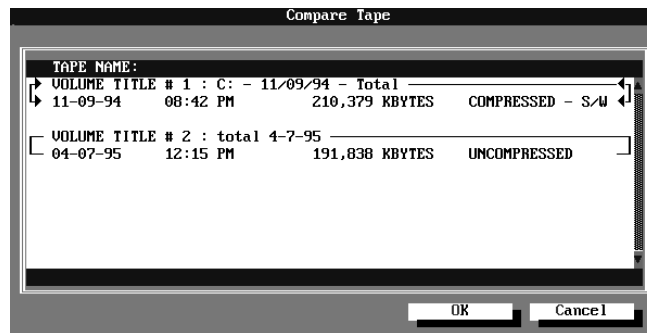
2. Start the Colorado Backup software. The Main menu appears:



3. From the main menu, select Compare. The compare menu appears:



4. From the Compare menu, select Total. The first Compare Tape screen appears:

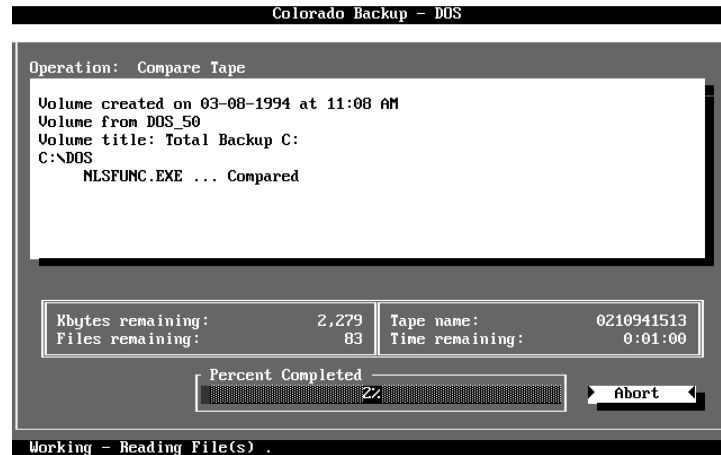


5. Highlight the volume, or backup, that contains the files that you want to compare by clicking on it's name with your mouse or by pressing arrow keys.
6. Select OK. The following Compare Tape screen appears:



7. Type the letter of the drive that contains the files to compare.

8. Select OK. The Operation screen appears:



When the Compare is finished, the Percent Completed gauge will show 100%.

9. Select OK.
10. From the Compare Tape screen, select Cancel.
11. From the Compare menu, select Cancel. The Main menu returns.
12. Remove the tape from the tape drive and store it in a safe place.

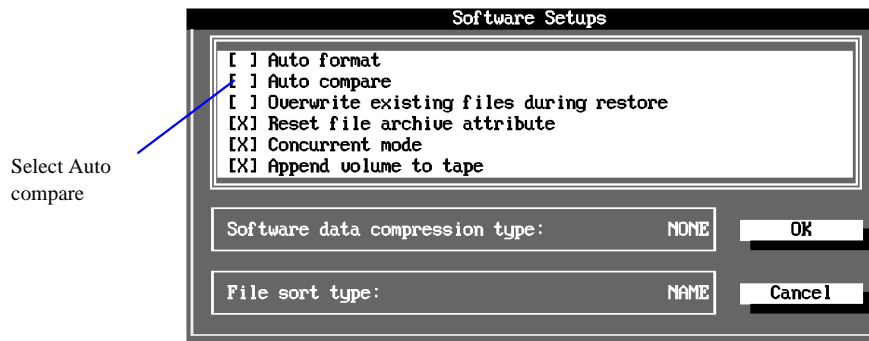
Making Compare Automatic

In this section, we show you how to perform a compare each time you make a backup.

To automatically compare after backup up:

1. Select Options from the menu bar by clicking on it with the mouse or by pressing ALT+O.

2. Select Software Setups by clicking on it or by pressing ALT+S. The Software Setups screen appears:



3. Mark the Auto compare check box by clicking on it with your mouse or by using the ARROW keys, then the SPACEBAR.
4. Select OK. This option will remain set until you change it.

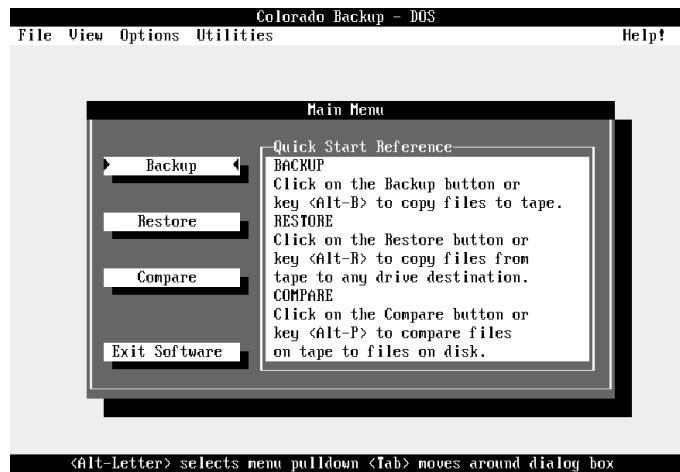
Backing Up Specific Files

Sometimes you may want to back up only certain files rather than your entire hard drive. Backing up a few selected files is convenient if you want to transfer files from one computer to another. For example, perhaps you want to take work home from the office or send a large desktop publishing file to a service bureau for high-quality output.

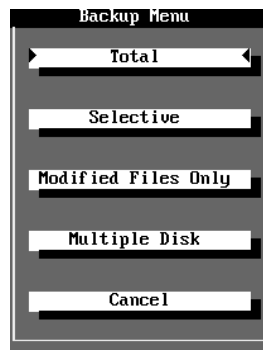
Another reason to back up only a few selected files is to free up space on your hard drive. This process is called archiving. Archiving is copying files that you no longer use from your hard drive to tape. The copied files can then be deleted from your hard drive to provide disk space. And, if you find that you ever need the archived file in the future, it can be easily restored from the tape. When archiving, designate a special tape, one that you don't do your regular backups on and label it or write protect it (see the literature that came with the tape cartridge for instructions on how to write protect it).

To back up specific files:

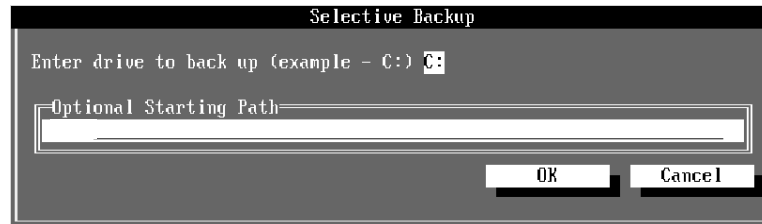
1. Insert a tape into the tape drive.
2. Start the Colorado Backup software. The Main menu appears:



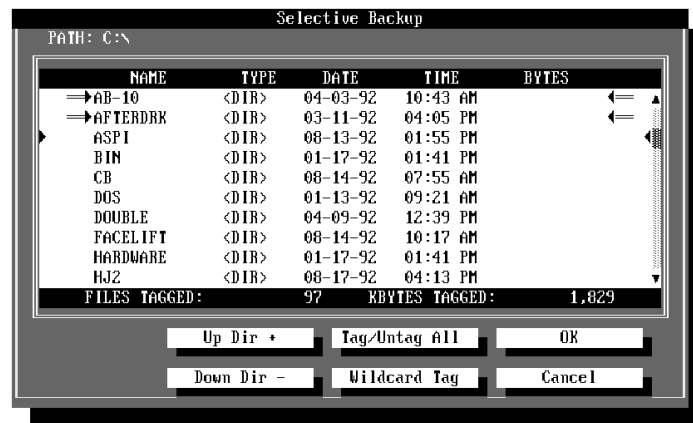
3. From the Main menu, select Backup. The Backup menu appears:



4. From the Backup menu, choose Selective. The following screen appears:



5. Type the letter of the drive you want to back up.
6. Select OK. A screen with the file and kilobyte count appears. Then the following screen appears:



7. Select, or tag, the directories and files you wish to back up using the actions in the following table. An arrow will appear next to each tagged file or directory.

To:	With the mouse:	With the keyboard
Tag a file	Click on the filename with the right mouse button	Use arrow keys to move around on the screen, then press SPACEBAR
Tag a directory including all files and subdirectories	Click on the directory name with the right mouse button	Use arrow keys to move around on the screen, then press SPACEBAR

Tag all files and directories at the current level and below	Click on the Tag/Untag All button	Press T
Tag files by date or by using wildcard characters (* and ?)	Click on the Wildcard Tag button	Press W
Display the contents of a directory	Click on the directory name to highlight it, then click on the Down Dir button	Use arrow keys to highlight the directory, then press D or -
Move up a level in the directory tree	Click on the Up Dir button	Press U or +

8. When you are done tagging files, select OK. The Selective Backup screen appears:



9. Each backup that you make is saved on tape as a volume. Type a name in the Volume title: field. A good volume title would include the type of backup (Selective in this case), the letter of the hard drive you are backing up, what computer is being backed up, and any other information you want to include. For example, you might type "Selective Backup 3-10-94".

10. Select Backup Now. The Operation screen appears:



When the backup is finished, the Percent Completed gauge will show 100%.

11. Select OK.

12. From the Backup menu, select Cancel. The Main menu returns.

Restoring Files to Your Hard Drive

When you accidentally delete a file, transfer work to another computer, or need to retrieve an earlier version of a file that you have archived, you'll do a Restore. Restoring is the process of copying files from a tape to your hard drive. The files will be restored to the same place on your hard drive and will contain the same information as they did when they were last backed up.

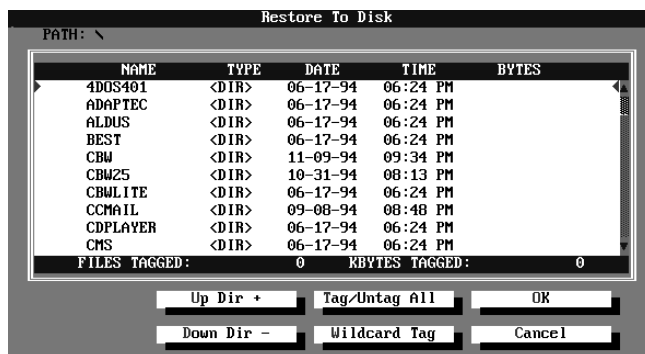
Sometimes you will only be restoring one file; at other times you may need to restore all the files as in the case of a hard drive crash. In this section we will be restoring selected files or directories, the most common type of restore.

To restore selected files or directories:

1. Insert the tape that contains the files you want to restore into the tape drive.
2. Start Colorado Backup. The Main menu appears.
3. From the Main menu, select Restore.
4. From the Restore menu, choose Selective. The volume selection screen appears:



5. Highlight the volume that contains the files you want to restore.
6. Select OK. The following Restore to Disk screen appears:



7. Select, or tag, the files or directories that you want to copy to your hard drive using the actions in the following table. An arrow will appear next to each tagged file or director.

To:	With the mouse:	With the keyboard
Tag a file	Click on the filename with the right mouse button	Use arrow keys to move around on the screen, then press SPACEBAR
Tag a directory including all files and subdirectories	Click on the directory name with the right mouse button	Use arrow keys to move around on the screen, then press SPACEBAR
Tag all files and directories at the current level and below	Click on the Tag/Untag All button	Press T
Tag files by date or by using wildcard characters (* and ?)	Click on the Wildcard Tag button	Press W
Display the contents of a directory	Click on the directory name to highlight it, then click on the Down Dir button	Use arrow keys to highlight the directory, then press D or -
Move up a level in the directory tree	Click on the Up Dir button	Press U or +

8. When you are done tagging files, select OK. The following Restore to Disk screen appears:



9. Type the letter of the hard drive where you want to restore the files.

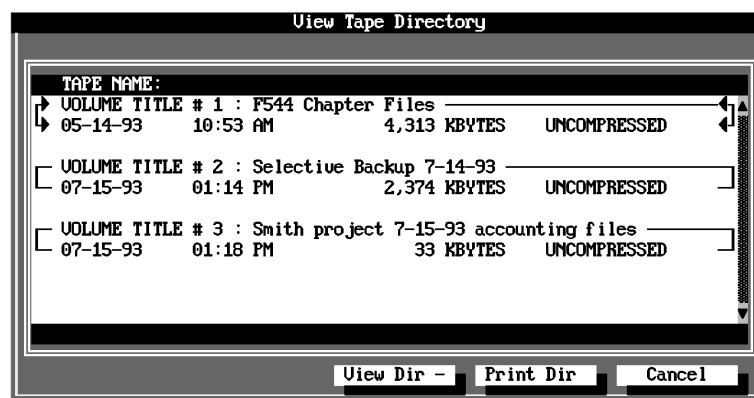
10. Select OK. The Operation Status screen appears. When the Restore is complete, the Percent Completed gauge shows 100%.
11. Select OK. (Or, if there were errors, select the Error Log button.)
12. From the Restore to Disk screen, select Cancel.
13. From the Restore menu, select Cancel. The Main menu returns.

Viewing the Contents of a Tape

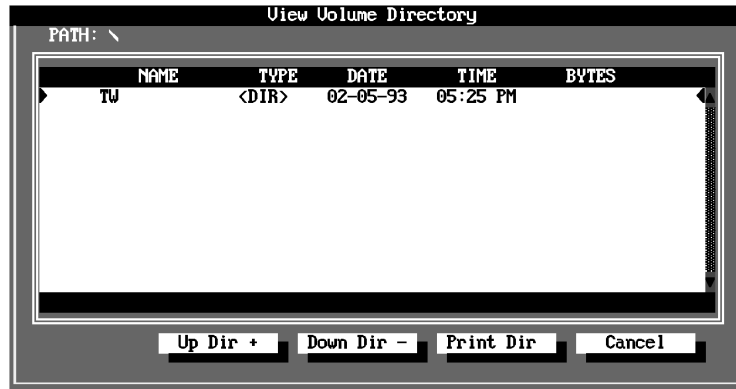
Just as you can view the contents of a disk using the DOS DIR command, you can also view the contents of a tape using Colorado Backup. You might want to view a tape's contents before restoring files in order to locate the files that you need or before erasing a tape.

To view the contents of a tape:

1. Insert the tape to be viewed into the tape drive.
2. From the menu bar, select View.
3. Select the Tape Directory command. The following View Tape Directory screen appears:



4. Highlight the tape volume you want to view by clicking on it with the mouse or by using the UP-ARROW and DOWN-ARROW keys.
5. Select the View Dir button. The View Volume Directory screen appears:



6. You can move around through the directory tree using the following actions:

To:	With the mouse:	With the keyboard
Highlight a directory	Click on the directory name.	Use the arrow keys
Display the contents of a directory.	Click on the directory name to highlight it, then click on the Down Dir button	Use the arrow keys to highlight the directory name, then press D or -
Move up a level in the directory tree	Click on the Up Dir button	Press U or +

7. When you are done viewing, select Cancel.
8. On the View Tape Directory screen, select Cancel. The Main menu returns.

Preparing a Tape for Use

All tapes must be formatted before you use them for the first time. Formatting a tape takes from 30 minutes to five hours depending on your tape drive model, your controller's speed, and the length of the tape. Preformatted tapes are ready for making backups immediately, saving you the time it takes to do a format. See “Chapter 4: Choosing Tapes” for a list of the tapes to use.

To prepare a tape for use:

1. Insert the tape that you want to use into the tape drive.
2. Select Utilities from the menu bar.
3. Select Format. A warning appears:



4. Select OK. The following screen appears:



5. Type a name for the tape. If you do not type a name, the software names the tape using the current time and date.
6. Select OK. The Operation screen appears. When done formatting, the Percent Completed gauge will show 100%.
7. Select OK. The Main menu appears. (Or, if errors occurred, select the Error Log button.)

Erasing a Tape

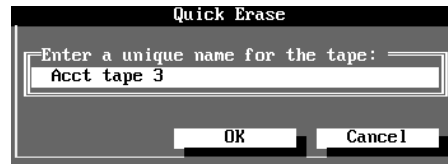
If you have a tape that contains data you no longer need, you can erase it and reuse it. This procedure usually takes less than a minute.

To erase a tape:

1. Insert the tape that you want to erase into the tape drive.
2. From the Utilities menu, select Quick Erase.
3. From the Quick Erase menu, select Total. A warning appears:



4. Select OK to continue with the Erase. The following screen appears:



5. Type a name for the tape. If you don't type a name, the software names the tape using the current time and date.
6. Select OK. The Operation screen appears. When the Erase is done, the Percent Completed gauge will show 100%.
7. Select OK. The Main menu returns.

Automating Backups

Use the Scheduler feature if you want Colorado Backup to automatically perform tape operations for you. For example, you can schedule a

backup to occur every night at ten o'clock. This not only ensures that you have a regular backup, but also gives you the flexibility to have backups performed when they will not interrupt your work schedule. In addition to backups, you can also schedule the formatting of a tape, or the execution of a custom batch file that you provide.

Scheduler is able to run at pre-determined times (even when you are away from your desk) because it is a TSR (terminate and stay resident) program. This means that Scheduler loads into your computer's memory and is available to perform an operation at any time you specify. When you choose to install Scheduler, the appropriate lines for loading it into memory are automatically inserted into your AUTOEXEC.BAT file.

Checking Whether Scheduler Is Installed

You must choose to install Scheduler; it is not installed by default. It is easy to check whether you installed Scheduler on your system.

To verify whether Scheduler is installed:

1. Select Utilities from the menu bar.
2. If the word "Scheduler" appears greyed-out, it is not installed.

Removing or Installing Scheduler

Scheduler is removed or installed by running the CONFIG program. De-installing Scheduler removes the lines added to your AUTOEXEC.BAT file when it was installed.

To remove or install Scheduler:

1. Change to the directory where Colorado Backup for DOS is installed with the CD command. For example, if your software is in the \CBD directory, the command would look like this: CD \CBD
2. Type CONFIG and press ENTER.

3. Select Hardware Configuration to continue. Answer the dialog boxes as is appropriate for your system.
4. When the Scheduler screen appears, leave the box blank to remove Scheduler, or put an X in the box to install Scheduler. Click on OK.
5. You will need to reboot the system for the changes to take effect.

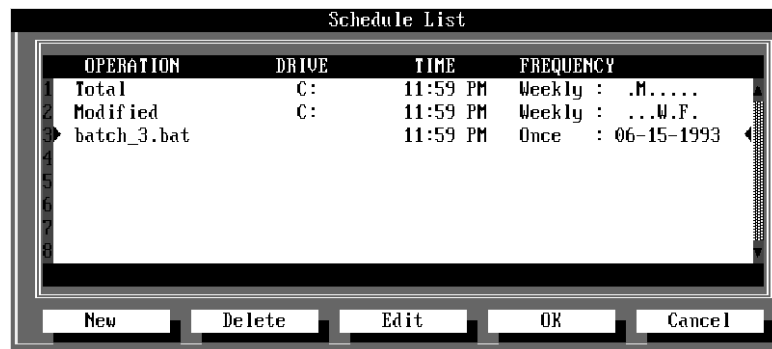
Scheduling a Total Backup, Modified Backup or Format

Scheduling each of these operations is very similar. Follow the same steps, but select the desired operation when appropriate.

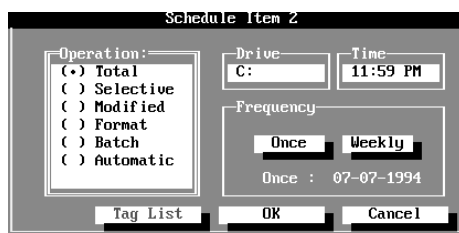
To Schedule a Total Backup, Modified Backup or Format:

1. From the Utilities menu, select Scheduler. The Schedule List screen appears:

This screen lists all scheduled operations. From this screen you can create, edit, and delete schedules.



2. Click on New. The Schedule Item screen appears:



Schedule Item 2

Operation:

- (*) Total
- () Selective
- () Modified
- () Format
- () Batch
- () Automatic

Drive: C: Time: 11:59 PM

Frequency:

Once Weekly

Once : 07-07-1994

Tag List OK Cancel

3. Choose Total, Modified or Format in the operation field.
4. Enter the drive you want to back up in the drive field. This step does not apply if you are scheduling a format.
5. Decide whether you want to schedule this operation one time or on a regular basis.

To perform the operation once, click on Once in the Frequency field then enter the date the operation is to run. To specify a time, click on the Time field and type in the new time. To set up an ongoing schedule, click on Weekly, then click on the days of the week you want the operation to occur.

6. Click on OK when you have finished making selections. This returns you to the Scheduler List screen. Press OK to accept the schedule entries.

Before Scheduler Starts an Operation

- Be sure a tape is inserted into the tape drive.
- Scheduler will interrupt programs with a dialog box giving you an opportunity to start the operation at the designated time or postpone it for up to twenty four hours. However, if you do not respond within 30 seconds, the software will start the operation.
- If you are running Windows when an operation is scheduled to begin, the computer will wait until you leave Windows, then start the operation.

Scheduling a Batch File

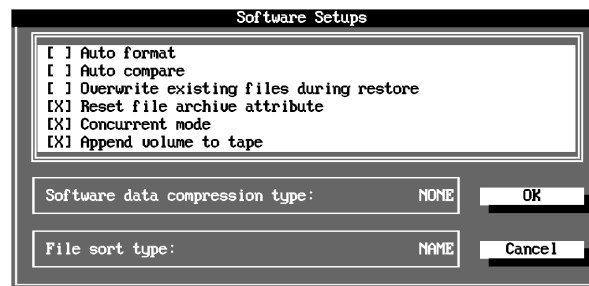
You can schedule custom batch files. Name the batch file BATCH_X.BAT (where the X represents the line number of the batch file in the Schedule list screen). For example, if you were going to schedule a batch file on the second line in the Schedule list screen, the batch file would be called BATCH_2.BAT. The batch file must be stored in the same directory as the tape software.

Customizing Colorado Backup

Customize your tape operations by selecting the performance options available to you in Software Setups.

To customize Colorado Backup:

- From the Options menu, select Software Setups. The Software Setups screen appears:



This screen offers eight ways to customize your software operations:

- Auto format Automatically formats a tape prior to a backup operation. If a tape is unformatted, the format will be completed without warning. However, if the software detects there may be data on a tape, or the tape is in an incompatible format, you will be prompted to continue before the format begins.

- **Auto compare** Performs a second pass over each file written to tape to perform a byte by byte comparison to the original files. This option will not work on a linked tape operation.
- **Overwrite existing files during restore** The files on tape will overwrite files with the same name and path on the hard drive during a Restore operation.
- **Reset file archive attribute** The file archive attribute is a DOS attribute to mark files that have changed since they were last backed up. Colorado Backup uses this attribute to identify files to be included for Modified Files Only Backups. When selected, the file archive attribute is reset (all archive bits are erased) during the backup, so only files changed since that backup will be included in the next Modified Files Only Backup.
- **Concurrent mode** When on, the tape and disk run simultaneously using separate DMA channels. If you get “excessive retry” errors during tape operations, your computer may not support concurrent DMA operation. Turn this option off to eliminate the errors. Turning off this option slows tape drive performance.
- **Append volume to tape** With this option on, volumes already on a tape are left intact and new volumes are added after the last volume. Volumes will be added until the capacity of the tape is reached. Turn the option off to erase all data on the tape before making a backup.
- **Software data compression type** This option allows you to select what type of compression you want to use, if any:

None	Data will be written to tape uncompressed.
Optimize Space	This will compress your data by approximately 50%.
Optimize Time	This compresses your data on average by 40%, and it will take less time to complete your backup.

To change your data compression options, click on the current setting shown at the right of the “Software data compression type:” box.

See Appendix A for more details about compression.

TIP: If you share your data with a non-Colorado Memory Systems tape drive user, do not use data compression. Our data compression may not be compatible with their tape drive.

- **File sort type** File sort options determine the order in which the files are selected and listed in a tape operation.

To change your file sort options, click on the current setting shown to the right of the "File sort type:" box. The sort options appear at the bottom of the screen. Place the cursor on the sort type of your choice.

No Sort	Files are displayed in the same order as they appear on the source disk.
Name	Files are displayed in alphabetical order by filename.
Extension	Files are displayed in alphabetical order by extension.
Date	Files are selected and displayed in chronological order of the file's origination or change date.

Network Compatibility

Colorado Backup for DOS is fully network compatible. To receive information about compatibility call our QICFAX service and ask for the Network Compatibility Information Document. Phone numbers for technical assistance can be found on the last page of this manual.

Preparing for a Hard Drive Crash

The best way to minimize the impact of a disk crash is to be prepared for the worst. Follow the directions below to create a bootable diskette that will start your computer from your floppy drive and quickly give you an operational version of Colorado Backup for DOS. If you have performed regular backups, restoring your hard drive to its most recent state may be as easy as a few Copy operations.

To make a bootable diskette:

A hard drive crash is likely to make your hard drive inoperable, so it is important to make a bootable diskette that will start your computer from the A: drive.

IMPORTANT: We strongly recommend that you make your bootable diskette NOW so that it will be ready when you need it.

1. Insert a blank high-capacity diskette into your A: drive.
2. Format the diskette. Use the /S option to create a system diskette that can start your computer. Type:

```
FORMAT A: /S
```

3. Copy the DOS FORMAT, FDISK and SYS command files to the diskette by typing:

```
COPY C:\DOS\FORMAT.COM A: (Press ENTER)
```

```
COPY C:\DOS\FDISK.EXE A: (Press ENTER)
```

```
COPY C:\DOS\SYS.COM A: (Press ENTER)
```

4. Store the bootable diskette and your Colorado Backup for DOS diskette together in a safe place. If an emergency ever arises requiring the bootable diskette, follow the instructions in the next section.

Recovering from a Hard Drive Crash

The hard drive crash recovery procedure requires three steps:

1. Starting your computer (possibly with a bootable diskette).
2. Installing Colorado Backup for DOS.
3. Restoring your files from a backup tape to your hard drive.

NOTE: Tape volumes made in Colorado Backup for Windows can be read and restored by Colorado Backup for DOS.

IMPORTANT: Each hard drive situation is different. You may need to restore only a few files to make your system operable again. Check for simple solutions before making drastic changes to your hard drive.

To start your computer after a hard drive crash:

With a bootable diskette:

1. Insert the diskette into your A: drive and turn on your computer. This boots your computer.
2. After booting the computer, you can format your hard drive if necessary. Read your DOS documentation for formatting instructions.



CAUTION: Formatting a hard drive destroys all files and directories. DO NOT format your hard drive if you are not sure it is necessary.

3. Install Colorado Backup for DOS.

Without a bootable diskette:

If you did not make a bootable diskette in preparation of hard-drive problems, either repair the damage to your hard drive or consult a qualified technician. You must be able to boot your computer and have an operable hard drive before you can proceed with the following instructions on installing Colorado Backup for DOS.

To install Colorado Backup for DOS:

1. Insert the Colorado Backup for DOS diskette into your floppy drive.
2. At the DOS prompt, type A: and press ENTER. (Type B: if the diskette is in drive B:)
3. Type INSTALL and press ENTER. Follow the instructions on the screen. When installation is complete, you are returned to the DOS prompt.

To restore your files:

1. To switch to the Colorado Backup directory type:

CD \CBD (or whatever directory your tape software is installed in)

2. To start the Colorado Backup software, type:

TAPE

3. Insert the tape that contains the backup you want to restore to your hard drive.
4. From the Main menu, open the Options menu and select Software Setups. Mark the check box next to the Overwrite existing files during restore.

NOTE: You may need to use the keyboard to select commands until the mouse drivers are restored. Use the ARROW keys and TAB.

5. From the Main menu, select Restore. From the Restore menu, select Total. This copies the entire contents of the tape to the hard drive. (If you are restoring from a combination of Total and Modified Files Only backups, "Questions and Answers" on page 3-29.
6. Exit Colorado Backup for DOS.

Questions and Answers

Q: What if I have a C: and a D: hard drive to back up? A: You can back up both drives in a single operation. From the Backup menu, select Multiple Disk.

Q: What if all the data on my hard drive doesn't fit on one tape? A: Colorado Backup will prompt you to insert a new tape when the first tape is full.

Q: What if I forget to format a tape before starting a backup? A: Colorado Backup will automatically format the tape, however, this will add from 30 minutes to five hours depending on your tape drive model, the floppy controller's speed, and the length of the tape. From the

Options menu, select Software Setups, then put an X in front of “Auto format”.

Q: How do I protect a backup from being read by someone else? A: You can password protect a backup, then anyone trying to view or restore the data must first enter the password. On the same Backup screen where you enter the volume title, put an X in front of “Password protect”.

Q: Can I use tape backup to free up space on my hard drive? A: Do a Selective Backup to copy those files that you no longer need to tape, Compare the backed up files to those on the hard drive to make sure they are identical, then delete the files from your hard drive.

Q: How do I restore files from Total and Modified Backups? A: If you need to restore one file, locate the latest tape that contains the file by inserting the tapes, then from the Utilities menu, selecting Tape Directory. Restore the file from the tape with the latest date. If you have a hard drive crash and need to do a Total Restore, first restore the Total Backup, then restore each successive Modified Backup with overwrite on. To turn overwrite on, from the Options menu, select Software Setups, then put an X in front of Overwrite existing files during restore.

Q: Is there a way to fit more data on a tape? A: Use the compression option to reduce the size of each backup by an average of 2:1 (depending on the type of data in the backup). The data that is compressed and then restored is exactly the same as the original data. On the same Backup screen where you enter the volume title, select the Software data compression type field and choose either optimize space or optimize time.

Q: Can I verify each backup without going through a separate Compare operation? A: Colorado Backup can automatically compare a backup after making it. From the Options menu, select Software Setups, then put an X in front of Auto compare.

Q: How do I make a backup at the same time every day? A: Use the Colorado Backup Scheduler. Scheduler must first be installed. To install Scheduler, at the DOS prompt change to the tape software directory, then type CONFIG. Then to schedule a backup at the same time every day, from the Utilities menu, select Scheduler.

Q: What if I erase a tape by accident? A: Data erased using Quick Erase can be restored providing it has not been overwritten with another backup. From the Utilities menu, select Quick Unerase.

Chapter 4:

Choosing Tapes

Tapes are available unformatted or preformatted. Unformatted tapes must be formatted before you use them the first time. Preformatted tapes are ready for making backups immediately, saving you the time it takes to do a format. All Colorado tapes are preformatted.

NOTE: Where tapes are available in different lengths, use the extra length tapes for maximum capacities.

Tape Drive	Colorado Tape to Use		
	Tape	Length	Approximate Compressed Capacity
Jumbo/Trakker 120	DT-120	307.5'/93.7m	120 MB
Jumbo/Trakker 250 & JS20	DT-250	307.5'/93.7m	250 MB
Jumbo/Trakker 350	DT-350 DT-250	425'/129.2m 307.5'/93.7m	340 MB 250 MB
Jumbo/Trakker 700	DT-740	400'/121.9m	680 MB
Jumbo 1400	DT 1400	400'/121.9m	1.4 GB
HP Colorado T1000/T1000e	DT-1000	750'/228.6m	800 MB
HP Colorado T4000s	DT-8000 DT-4200 (wide)	740'/226.4m 400'/122.4m	8GB 4.2 GB
PowerTape 1GB	DT-1100	950'/289.6m	1.2 GB
PowerTape 2GB	DT-2400	950'/289.6m	2.4 GB
PowerTape 4GB	DT-4000	950'/289.6m	4.0 GB

PowerDAT PD-60	5T-90	90m	2.0 GB
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NOTE FOR POWERDAT USERS: You can use only DDS Media Recognition System cartridges for making backups. You can, however, read data from non-DDS Media Recognition System cartridges.

DDS compatible cartridges can be recognized by this logo.



Chapter 5:

Caring for Your Tape Drive

Go to the section for your tape drive to learn how to perform routine maintenance procedures.

120/250/350, T1000, T1000e, or JS-20

Periodic cleaning of the end-of-tape sensor and read/write head will help to keep your tape drive operating at its peak. These two procedures are the only routine maintenance you need to perform.

Cleaning the End-of-Tape Sensor

The end-of-tape sensor detects the end of the tape by projecting light through a series of holes towards the end of the tape. Dust should not be allowed to accumulate around this end-of-tape sensor because it will block the light path. You should clean the end-of-tape sensor:

- After every eight hours of tape operation, approximately 20 backups or restores
- Or when dust accumulates
- Or if a tape comes unspooled

To clean the end-of-tape sensor:

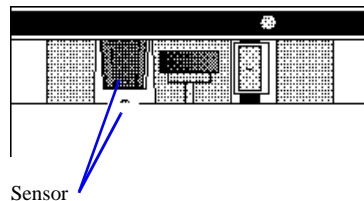
- You will need an aerosol can of compressed air—purchased at an office supply or computer store



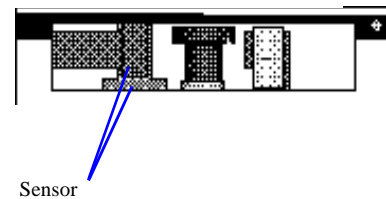
CAUTION: Do not use shop air or air from an oil-lubricated compressor.

1. Turn off the computer.
2. Hold open the tape drive door.
3. Note the location of the sensor. It is approximately two inches back from the door.

120, 250, or 350 tape drive:



T1000, T1000e, or JS-20 tape drive:



4. Use the can of compressed air to blow the dust away from the two areas of the sensor.
5. Always clean the read/write head afterward as described in the next section.

Cleaning the Read/Write Head

During tape operations, the read/write head touches the tape surface. Over time, particles are removed from the tape which can build up on the read/write head and cause errors. Therefore, you should clean the read/write head:



CAUTION: DO NOT clean the read/write head on a Jumbo 700, Trakker 700, Jumbo 1400 or T4000s tape drive.

- After every eight hours of tape operation, approximately 20 backups or restores.
- Or when errors occur. Residue buildup on the read/write head can cause the following message to display:

CAUTION-EXCESSIVE READ ERRORS
 CLEAN READ/WRITE HEAD -OR- REPLACE TAPE CARTRIDGE

- Or after cleaning the end-of-tape sensor.

To clean the read/write head:

You will need the following supplies:

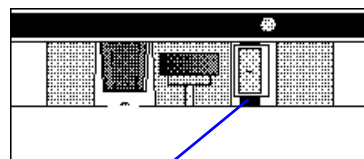
- Sponge-tipped swabs
- 90% isopropyl alcohol



CAUTION: Do not use cotton swabs as they may leave behind fibers that can damage the read/write head. Do not use 70% rubbing alcohol: it can leave behind water or a residue. Do not use any abrasive to clean the head or apply a lubricant to any part of the drive.

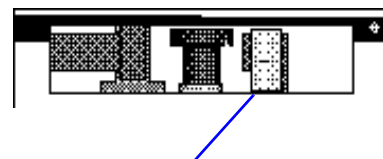
1. Turn off the computer.
2. Hold open the tape drive door.
3. Note the location of the read/write head. It is approximately two inches back from the door.

120, 250, or 350 tape drive:



Read/write head

T1000, T1000e, or JS-20 tape drive:



Read/write head

4. Dip a sponge-tipped swab in 90% isopropyl alcohol.

5. Rub the swab back and forth over the read/write head in the direction of tape motion several times.
6. Let the read/write head dry completely before using the tape drive.

The 700 1400, or T4000s Tape Drive

You do not need to perform any routine maintenance on the Jumbo 700, 1400, T4000s, or Trakker 700 tape drives.



CAUTION: Do NOT clean the read/write head of a Jumbo 700, Trakker 700, Jumbo 1400 or T4000s tape drive.



CAUTION: Do NOT degauss or demagnetize the read/write head of a Jumbo 700, Trakker 700, Jumbo 1400 or T4000s tape drive. Damage to your tape drive will result.

PowerTape Tape Drive

Periodic cleaning of the read/write head will help to keep your tape drive operating at its peak. During tape operations, the read/write head touches the tape surface. Over time, particles are removed from the tape which can build up on the read/write head and cause errors. You should clean the read/write head:

- After every eight hours of tape operation.
- Or when errors occur. Residue buildup on the read/write head can cause the following message to display:

CAUTION-EXCESSIVE READ ERRORS.
CLEAN READ/WRITE HEAD-OR-REPLACE TAPE CARTRIDGE

To clean the read/write head:

- You will need a cleaning cartridge kit. Follow the instructions included with the kit.

PowerDAT Tape Drive

Periodic cleaning of the read/write head will help to keep your tape drive operating at its peak. During tape operations, the read/write heads touch the tape surface. Over time, particles are removed from the tape which can build up on the read/write heads and cause errors. You should clean the read/write heads:

- After every 25 hours of use.
- When the Caution signal is displayed (flashing amber and green lights).

To clean the tape heads:

You will need one of the following cleaning cartridges:

Cleaning Cartridges	
Brand Name	Part Number
Colorado	CC-1
Hewlett-Packard	92283K



CAUTION: Only use an approved Cleaning Cartridge to clean the tape heads. Do not use swabs or other means of cleaning the heads.

1. Insert the cleaning cartridge into the drive. The tape drive automatically loads the cartridge and cleans the heads. At the end of the cleaning cycle, the drive ejects the cartridge. This takes approximately 30 seconds.

If the cleaning cartridge is ejected after only 15 seconds, you should discard that cartridge and repeat the process with a new one.

2. Record the date on the label of the cleaning cartridge so that you know how many times you have used it. Discard the cleaning cartridge after you have used it 25 times.

Chapter 6:

Error Messages

Error messages inform you when there is a problem with the software or hardware. For instance, they can appear if the software fails to communicate with your tape drive, if you have made a selection that is not permitted, or if you entered invalid information.

If you installed the Windows version of Colorado Backup, error messages begin in the next section. If you installed the DOS version of Colorado Backup, error messages begin on page 6-16.

Colorado Backup for Windows 95 Errors

Error messages are reported in a dialog box that appears on screen immediately following the occurrence of an error.

Write down the error number and any instructions the message might offer to remedy the situation. This information will be helpful to the Customer Support engineers should you need to call for assistance.

Errors that start with a 0 then a letter begin on page 6-5.

010D - File list manager error.

1. Shut down Windows 95, turn off and restart your computer.
2. Run the Windows 95 ScanDisk and Disk Defragmenter utilities.
3. Close other applications while running Colorado Backup.
4. Try a different tape. Make sure the tape is compatible with your drive.
5. Uninstall Colorado Backup and reinstall.

0209 - Memory manager error.

1. Try a different tape. Make sure the tape is compatible with your drive.
2. Shut down Windows 95, turn off and restart your computer.
3. Run the Windows 95 ScanDisk and Disk Defragmenter utilities.
4. Close other applications while running Colorado Backup.
5. Reformat tapes that cause this error. All data on tape will be lost.

0514/0515 - Error reading the tape.

1. Select Refresh from the File Menu (or press F5).
2. Try a different tape. Make sure the tape is compatible with your drive.
3. Retention the tape.
4. Shut down Windows 95, turn off and restart your computer. Remove then reconnect power to your external tape drive.
5. Close other applications while running Colorado Backup.
6. Close printer status and control programs.
7. Disable conflicting drivers in SYSTEM.INI.
8. Clean tape drive. Refer to your tape drive's user's guide for proper cleaning procedure.
9. Reformat tapes that cause this error. All data on tape will be lost.

0516 - Error reading backup directory.

1. Shut down Windows 95, turn off and restart your computer. Remove then reconnect power to your external tape drive.
2. Run the Windows 95 ScanDisk and Disk Defragmenter utilities.
3. Close other applications while running Colorado Backup.
4. Try reading the directory of another backup. You may not be able to restore the data from this backup.

081E - Too many bad sectors.

See solutions for error 1153 on page 6-2.

1153 - Unrecoverable sector on tape.

1. Clean tape drive. Refer to your tape drive's user's guide for proper cleaning procedure.
2. Try a different tape. Make sure the tape is compatible with your drive.
3. Disable screen savers and power saving features such as Suspend or

Advanced Power Management.

4. Close other applications while running Colorado Backup.
5. Reformat tapes that cause this error. All data on tape will be lost.
6. This tape may not be usable.

1154 - Format operation has failed

1157 - Tape drive hardware error.

115B - Drive communication error.

115D - Drive communication error.

115F - Format operation has failed.

1168 - Unable to read from or write to this tape.

1314 - Attempting Tape Error Recovery.

1. Shut down Windows 95, turn off and restart your computer. Remove then reconnect power to your external tape drive.
2. Run the Windows 95 ScanDisk and Disk Defragmenter utilities.
3. Close other applications while running Colorado Backup.
4. Close printer status and control programs.
5. Try a different tape. Make sure the tape is compatible with your drive.
6. Clean tape drive. Refer to your tape drive's user's guide for proper cleaning procedure.
7. Disable screen savers and power saving features such as Suspend or Advanced Power Management.
8. Reformat tapes that cause this error. (All data on tape will be lost.)
9. Verify power and data cable connections to tape drive.

132A - Bad file header.

132E - The file is unreadable.

1. Shut down Windows 95, turn off and restart your computer.
2. Run the Windows 95 ScanDisk and Disk Defragmenter utilities.
3. Close other applications while running Colorado Backup.
4. Retention the tape.
5. Try a different tape. Make sure the tape is compatible with your drive.
6. Clean tape drive. Refer to your tape drive's user's guide for proper cleaning procedure.
7. Reformat tapes that cause this error. (All data on tape will be lost.)

1328 - File is different.

The contents of this file have changed since it was backed up. The copy of the file in your backup is readable, but is different from the source file. Close other applications during backup to reduce the occurrence of this error.

See solutions for errors 132A and 132E on page 6-3.

1562 - Colorado Backup was unable to read from disk, network drive, or tape drive.**1563 - Colorado Backup was unable to write to disk, network drive, or tape drive.**

1. Run the Windows 95 ScanDisk and Disk Defragmenter utilities.
2. Disable screen savers and power saving features such as Suspend or Advanced Power Management.
3. Verify power and data cable connections to tape drive.
4. Open Colorado Backup. Click Restore. Verify tape drive is listed.
5. If your tape drive is connected to a printer port, the port may be sharing hardware resources with a sound card, fax modem, scanner or other device.

1590/1596/1597/1598 - Data transfer failure.

1. Verify power and data cable connections to tape drive.
2. Connect the tape drive data cable directly to your computer's printer port.
3. Shut down Windows 95, turn off and restart your computer. Remove then reconnect power to your external tape drive.
4. Run the Windows 95 ScanDisk and Disk Defragmenter utilities.
5. Close printer status and control programs.
6. Close other applications while running Colorado Backup.
7. Try a different tape. Make sure the tape is compatible with your drive.

15A0 - Driver Timeout

See solution for Lockup on page 6-5.

0D07 - Write access denied.

1. File was in use when Colorado Backup attempted to reset the file's archive bit. Close other applications while running Colorado Backup.
2. Attempting to overwrite a read-only file.
3. Attempting to restore to a network drive to which you do not have write access.

0D1B - Operating system error.

See solutions for Error 010D on page 6-1.

0D38 - File in use.

1. Close other applications while running Colorado Backup.
2. This error is common when backing up a network drive. Close all applications on the computer being backed up to minimize the occurrence of this error.

Lockup

Invalid Page Fault

Fatal Exception xx

15A0 - Driver Timeout

1. If you use a Disk Overlay such as On-Track or MicroHouse EZ Drive to recognize your hard disk, contact the hard disk manufacturer to verify your version is Windows 95 compatible.
2. Verify the computer's day, date, year and time are correct.
3. Scan your computer for viruses. (Make sure your anti-virus program is removed from memory during tape operations.)
4. Open Control Panel, System, and Performance. Memory should report the correct amount of RAM in your computer. File System and Virtual Memory should both read 32-bit, and it should report "Your system is configured for optimal performance." If any of these items is not correct contact your computer vendor or Microsoft for assistance.
5. Open Control Panel, System, and Device Manager. If any items have a minus sign and a yellow circle or red "x" next to the name, this indicates there is a problem with that device. Contact your computer vendor or Microsoft for assistance.
6. Open Control Panel, System, Device Manager, and HPTape. Remove any items that are duplicated and restart Windows 95.

7. Open Control Panel, System, Device Manager, and TapeDrives. Verify the proper tape drive is installed. Remove any incorrect entries and restart Windows 95.
8. See the solutions for Error 1154 on page 6-3.

Colorado Backup for Windows Errors

If You Get an Error Message

Error messages are reported in a dialog box that appears on screen immediately following the occurrence of an error. Depending on the severity of an error, you will have the option to continue or quit the application.

Write down the error number and the number in the additional information box, and any instructions the message might offer to remedy the situation. This information will be helpful to the Customer Support engineers should you need to call for assistance.

Fatal Exit Error File

If a fatal program error occurs the file CBWERR.TXT is created in the directory where the Colorado Backup for Windows program is located. Open the text file in any ASCII text editor, such as Windows' Notepad. Note the contents of this file before speaking to a Customer Support engineer.

Error Messages

2F3 - An internal error has occurred.

1. Not enough memory. Increase the amount of free memory to at least 2 MB and 70% resources.

2. Driver conflict in WINDOWS\SYSTEM.INI. See list of known conflicting drivers on page 6-14. Disable driver.
3. Tape is full. Insert a new tape and try the operation again.
4. Run CHKDSK or SCANDISK for possible corruption on your hard drive.
5. In USA: Call the Colorado QIC-FAX service at 1-800-368-9673 and request document #2400.

7C0 - Setup has failed to read the data from disk.

Bad installation diskette. Call Customer Support for new diskette or download software from Bulletin Board. See the last page of this manual for the phone numbers.

7C1 - Setup has failed to write the data from disk.

Lack of usable space on your hard disk. Defragment the disk or delete files to free up space.

10E - List manager- fatal error.

1. Low memory. Exit Colorado Backup and Windows, then push the Reset button on your computer. Open Windows and Colorado Backup and retry the operation.
2. Files or directories deleted after starting a backup. Restart the operation.
3. Lost allocation units. Run CHKDSK or other utility to find lost allocation units.

20A - Memory manager - fatal error.

All memory handles in Extended Memory are in use. Turn your computer off and on again, then retry the operation in Colorado Backup for Windows.

73D - User manager timeout.

1. Bad tape (possibly formatted with Central Point Software). Reformat the tape or insert a new one.

2. Lost Clusters/Bad Sectors on your hard drive. Run DOS CHKDSK or a disk utility to check hard disk.
3. Bad or incompatible floppy controller. Change FC-10 or TC-15 settings.
4. Bad CMSWTAPE.386 file. Delete CMSWTAPE.386 from \WINDOWS\SYSTEM.INI and reinstall Colorado Backup. (See General Protection Fault on page 6-14.)
5. In USA: Call the Colorado QIC-FAX service at 1-800-368-9673 and request document #2400.

73E - No Windows timers available.

Colorado Backup for Windows cannot access a needed timer from the Windows operating system. Exit applications and Windows, then turn your computer off and on again. Retry the operation.

74C - Conflicting drivers remarked from SYSTEM.INI

Exit and restart Windows.

81E - Too many bad sectors**81F - An unknown program error has occurred.**

Bad tape. Change tapes and retry the operation.

111A/111B - Firmware error.

1. Tape unspooled. Change tapes and retry the operation.
2. End-of-tape sensor is dirty. Clean your tape drive (See "Chapter 5: Caring for Your Tape Drive".)
3. Bad tape drive (blinking light on drive). Call Customer Support.

115B/115D - Drive Communication error.

1. SmartDrive loaded in AUTOEXEC.BAT and CONFIG.SYS. Delete SmartDrive from CONFIG.SYS.
2. Data cable installed incorrectly. Check both ends of tape drive's data cable. Ensure that color stripe aligns with pin 1 on both connectors and that connectors are well seated.

3. 32-Bit Access enabled. Disable by double-clicking on Control Panel icon. Click on Virtual Memory, then Change. If check box for 32-Bit Access is on, remove mark.
4. Incompatible version of SmartDrive. Switch versions. (If using version from DOS, try Windows version.)
5. Configured a Colorado parallel port drive as a Jumbo. Remove the tape drive configuration and reconfigure. Select the correct drive as the drive being configured.

209 - Memory Manager Error.

1. Temporary memory conflict. Reboot your computer.
2. Lost clusters/disk fragmentation. Run CHKDSK or disk utility to check hard drive.
3. Bad or unformatted tape. Reformat tape or insert different tape. Verify that you have the correct tape for your drive model.
4. Incorrectly configured tape controller. Remove the tape drive configuration and reconfigure making sure you select the correct controller board.
5. Conflict with memory caching. Disable internal/external cache.
6. Configuration problem with EMM386. Remove NOEMS.
7. Conflict with Dr. DOS. Delete Colorado Backup for Windows then reinstall and configure tape drive. Exit Colorado Backup for Windows and delete INSTALL.TMP from Colorado Backup directory.
8. In USA: Call the Colorado QIC-FAX service at 1-800-368-9673 and request document #2400.

295 - No DMA memory available

1. Conflict with Direct Memory Access (DMA). 1) If you are using QEMM, try adding DMA=64 to the QEMM line in CONFIG.SYS.
2. In \WINDOWS\SYSTEM.INI\ [386Enh] section, increase DMA buffer size to 64.

512 - No tape in selected drive.

Tape operations can't be started until a tape is inserted in the drive. Insert a formatted tape.

514 - Tape header error.

1. Tape may be loose. Perform a Retension on tape.
2. Bad or unformatted tape. Reformat or change tape in drive.
3. If you are using a parallel port drive such as a Trakker there may be software conflicts with Print Manager or other scanner/printer software. Close these programs before use.
4. If you are using a tape controller board such as an FC-10, FC-20 or TC-15, there may be a DMA conflict. Try DMA 3 if available before others.
5. Incorrect preformatted tape. Check tape specifications for your tape drive. (See "Chapter 4: Choosing Tapes".) Reformat if needed.

516 - Tape directory error.

1. Try the operation with a different tape or backup.
2. If you are using a tape controller board such as an FC-10, FC-20 or TC-15, there may be a DMA conflict. Try DMA 3 if available before others.
3. Try a compare operation with the DOS version of Colorado Backup.

615 - Task manager fatal error.

1. Software installed in second level subdirectory, such as C:\TAPE\CBWLITE\. Delete Colorado Backup's directory and reinstall in a first level directory such as C:\CBWLITE\
2. Software moved after installation. Delete Colorado Backup and reinstall.
3. Interrupt conflict. Change IRQ setting on other peripherals or, if using an FC-10, FC20, or TC-15 controller board with the tape drive, change IRQ setting.
4. Cable installed incorrectly. Check both ends of tape drive's data cable. Ensure that color stripe aligns with pin 1 on both connectors and connectors are well seated.
5. Video driver conflict. Get updated driver from video card manufacturer.

733 - Unable to establish communication with the Task Manager.

Colorado Backup cannot find CMSWTAPE.386. 1) Check to make sure CMSWTAPE.386 is the first item in the [386Enh] section of your SYSTEM.INI file in the Windows directory. 2) If this fails, reinstall Colorado Backup. (See General Protection Fault on page 6-14.)

1104 - Motor is jammed or stalled.

1. Something obstructing the drive's motor. Check drive motor for obstructions. Remove if not badly intertwined with moving parts.
2. Serious motor problem indicated by blinking light on drive. Call Customer Support.

1105 - Tape is write-protected.

Tape's Record switch is in write-protect position. Move the Record switch to record position.

1124 - Edge seek failed.

Drive cannot find the edge of the tape. If you attempt operation again and get an error 514, call Customer Support.

1154 - Bad format.

Different or bad tape formatting. Reformat tape.

1165 - No drive detected.

1. Power not connected to drive. Check drive's power and cable connection.
2. Bad or loose connection on data cable. Check both ends of tape drive's data cable. Configured a Colorado parallel port drive as a Jumbo. Remove the tape drive configuration and reconfigure.
3. Incorrectly configured tape controller. Remove the tape drive configuration and reconfigure making sure you select the correct controller board.
4. Reinstall the Colorado Backup software.

1500 - Required device driver not found.**1510 - Unsupported version of device driver was found.**

Using a previous version of Colorado Backup's CMSWTAPE.386 file. Search the WINDOWS\SYSTEM directory for VASPID.386. Delete VASPID.386 and reinstall Colorado Backup to ensure the correct version is in use.

1596/1597 - Data cannot be reliably transferred across parallel port.

1. Possible conflicting software includes Windows Print Manager, or similar programs shipped with printers and scanners. Close these programs first.
2. For T1000e drives, try changing data transfer mode to a slower mode, i.e. Enhanced Parallel Port to Unidirectional. Also try increasing read and/or write delay values.
3. In USA: Call the Colorado QIC-FAX service at 1-800-368-9673 and request document # 2965.

D07 - Write denied.

Open file found when copying. Close files and retry operation.

F02 - Tape drive controller configuration failed.

Problem with the configuration information for a Jumbo drive using an FC-10, TC-15, TC-15M, or FC20.

1. Reboot computer and try operation again.
2. Check board to make sure it is seated properly.
3. Reconfigure the board.

F03 - Interrupt conflict detected.

Two devices using the same IRQ channel. If you are using an FC-10, TC-15, or FC20, modify the configuration settings by selecting a different IRQ setting or change IRQ settings for conflicting hardware peripherals.

F2A - Parallel port interrupt not available or in use.

Colorado Parallel port drive: Colorado Backup cannot use your parallel port interrupt. Either your parallel port does not have an interrupt or you have some other hardware that is using the parallel port interrupt.

1. Some hardware that may be using the parallel port interrupt are sound cards and FAX/modem cards. If you think you have a conflict refer to your user's manual for the conflicting hardware and set it to use a different interrupt (e.g., 5, instead of 7). This may involve changing configuration files, resetting hardware jumpers, or both.
2. Possible conflicting software includes Windows Print Manager, or similar programs shipped with printers and scanners. Close these programs first.
3. In USA: Call the Colorado QIC-FAX service at 1-800-368-9673 and request document # 2965.

F29 Unable to detect a Colorado parallel port drive.

1. Refer to the installation section of the manual for proper connection of the Colorado parallel port drive. Make sure it is the first device off of the parallel port. Do NOT run it through a switch box.
2. The parallel port drive has been changed and not reconfigured for the new drive. Remove the current configuration and reconfigure for the current drive.
3. Test the parallel port drive on a different computer or try a different drive on the same computer.

Attempting tape error recovery message.

If recovery fails, check for:

1. Dirty tape drive. Clean your tape drive. DO NOT clean the read/write heads on Jumbo 700, 1400, or Trakker 700 tape drives. See "Chapter 5: Caring for Your Tape Drive".
2. Bad tape. Replace tape and try operation again.
3. DMA or IRQ conflict. Make sure your tape drive is not sharing DMA or IRQ channels with other devices. If you have a tape controller card

(FC-10, FC20, TC-15, SC-50, SC-50M) manually reconfigure the drive and select different settings.

General Protection Fault

1. Bad block on the tape. Try another tape.
2. Lost Clusters/Bad Sectors on your hard drive. Run the DOS CHKDSK or a disk utility to check hard drive.
3. Driver conflict in WINDOWS\SYSTEM.INI. See list of drivers and instructions for disabling them in the next section.
4. Memory conflict. If you are using EMM.386, open your CONFIG.SYS file and type REM before the line EMM386.EXE to disable the memory manager.
5. Conflict with IMouse. Open your AUTOEXEC.BAT and CONFIG.SYS files. If this driver is present, type REM before the line the driver appears on to disable it.
6. Conflict with the tape drive's dedicated controller. If you are using an FC-10, TC-15, or FC20, reconfigure your controller. Avoid using DMA channel 2.
7. Colorado Backup cannot find CMSWTAPE.386. Check to make sure CMSWTAPE.386 is the first item in the [386Enh] section of your SYSTEM.INI file in the Windows directory.

Known Conflicting Drivers

The following is a list of drivers for Windows applications that are known to commonly conflict with Colorado Backup for Windows. If the drivers are installed in your system, they appear as shown below when viewing the contents of your SYSTEM.INI file in the Windows directory:

```
DEVICE=CPBVXD.386
DEVICE=FASTBACK.386
DEVICE=MYBACKUP.386
DEVICE=VFINTD.386
DEVICE=VIRWT.386
DEVICE=VITD.386
```

If any of the listed drivers appear in SYSTEM.INI, disable them by typing a semicolon (;) in front of the first character of the line.

Example

```
DEVICE=Driver name.386 (Currently in use)  
;DEVICE=Driver name.386 (Disabled)
```

Restart Windows before attempting another tape operation in Colorado Backup.

Sound Boards

Using a sound board with Colorado Backup may require special consideration to avoid IRQ and DMA conflicts. This is particularly true when using a Colorado parallel port drive such as Trakker. Most sound boards use an interrupt that corresponds with a parallel port. If your sound board is using the IRQ or DMA channel reserved for the parallel port your drive is attached to, sound quality can be affected or your computer may lock up often.

To correct this problem, select another available IRQ channel for your sound board. See your documentation that came with the sound board for instructions.

FAX Modems and Voice Mail Systems

Device drivers installed with software for fax modems and voice mail systems can conflict with Colorado Backup. A driver conflict can produce errors when a FAX or voice mail is received while Colorado Backup is running.

Try disabling the FAX or voice-mail reception during tape operations. Use either the Program Manager's Control Panel or the control program for your board to disable the device.

Colorado Backup for DOS

Messages referenced by an error number are listed in numerical order. If a DOS error occurs during operation of your tape drive, refer to your DOS manual for an explanation.

Backup System Error Messages

Error 1: Too many bad sectors.

More than 5% of the sectors on the tape are unreadable. Indicates either a dirty tape drive read/write head, a worn tape, or a tape drive or diskette controller hardware problem. 1) Clean the tape drive read/write head. DO NOT clean the read/write heads on Jumbo 700, 1400, or Trakker 700 tape drives. See "Chapter 5: Caring for Your Tape Drive". Try the operation again. 2) Try the operation with a new tape cartridge. 3) Switch to non-concurrent DMA mode on the Software Setups screen. 4) If applicable, terminate the tape drive as explained in the Installation Guide. 5) If the error recurs, call Customer Support or your dealer organization.

Error 2: Tape is not formatted.

See Error 59 for solutions.

Error 4: Insufficient memory.

Your computer does not have enough free memory to start or complete the specific operation. The minimum free memory required is 460KB (525KB is recommended). If memory-resident software is installed, removing it may free enough memory. If the menu software displays this message, try performing the operation from the command line.

Error 5: Tape is full**Error 6: Tape directory is full****Error 10, Error 11: Program error.**

See Error 12 for remedies.

Error 12: Error correction failed.

The Reed-Solomon error correction facility was unable to reconstruct the files. 1) Clean the tape drive read/write head as explained in “Chapter 5: Caring for Your Tape Drive” and try the operation again. DO NOT clean the read/write heads on Jumbo 700, 1400, or Trakker 700 tape drives. 2) Make sure the tape drive is properly grounded as explained in the Installation Guide. 3) Switch to non-concurrent DMA mode on the Software Setups screen under the Options menu. 4) If applicable, terminate the tape drive as explained in the Installation Guide. 5) Disable software caching such as SmartDrive. 6) If error 12 occurs during a backup or compare, run a disk compression utility. 7) Take computer out of turbo mode. 8) Check for TSR conflicts. 9) If the error recurs, call Customer Support or your dealer organization.

Error 13: Unexpected end of volume.

The end of the tape volume was found before the process was complete. See Error 12 for remedies.

Error 14: Program error.

The tape contains corrupted data. The original drive data may have been corrupt when backed up. See Error 12 for remedies.

Error 15: Direct file seek failed - repositioning tape.

This is a self-correcting problem.

Error 16, Error 17, Error 21: Program error.

See Error 12 for remedies.

Error 22: Error while writing bad sector map.

An error occurred while mapping bad sectors. The current backup is unusable. However, previous backups are still valid.

Error 25: Attempting to write non-MRS media

An error occurred because an attempt was made to write to a non-MRS (Media Recognition System) tape. Write operations can only be

performed on MRS tapes. Read operations, however, are allowed on non-MRS tapes.

Error 26: This volume format is not readable by Colorado Backup for DOS.

The backup may have been made by a different software such as Colorado Backup for Windows.

Error 33: Unknown drive or tape type detected.

The tape drive or tape cartridge being used is unrecognized by the software. 1) Check the tape compatibility chart in “Chapter 4: Choosing Tapes”. Also, see Error 12 for possible solutions.

Error 34: Program Error

See Error 12 for possible solutions.

Error 40: File not readable.

See Error 12 for an explanation.

Error 41: Disk not found.

The specified drive does not exist. Enter a valid drive letter.

Error 42: Not a valid path.

The software detected invalid characters in the command line path. Correct and reenter.

Error 44: Program error.

See Error 12 for remedies.

Error 45: Volume not found.

The specified volume does not exist on the tape.

Error 46: Empty directory or no files matching path.

If you are doing a Modified Files Only Backup, no files have changed since the last backup.

Error 47, Error 48, Error 49, Error 50: Program error.

See Error 12 for remedies.

Error 52: Insufficient memory.

Your computer does not have enough free memory to start or complete the specific operation. The minimum free memory is 460KB (525 is recommended). If memory-resident software is installed, removing it may free enough memory. If the menu software displays the message, try performing the operation from the command line.

Error 53: Error correction failed, nn file(s) unreadable.

See Error 12 for an explanation.

Error 54: Error while updating tape directory.

An error occurred while the software was trying to update the tape directory after a backup. The backup is invalid. Perform the backup again.

Error 55: Tape is unreadable.

See Error 12 for remedies. Reformatting may also make the tape usable, but the data it contains cannot be recovered.

Error 56: No data on tape. Tape is erased.**Error 57: Drive is not compatible with this software.**

This version of the backup system software is unable to support the tape drive. May also indicate a communication problem. 1) Recheck your tape adapter board settings in Hardware Setups from the Utilities menu. See Error 12 for remedies.

Error 58: Tape format incompatible with drive/software.

The tape has a format which the software or tape drive is unable to support. Format the tape.

Error 59: Tape is not formatted.

The tape drive may not be able to read the tape. 1) Clean the tape drive read/write head as explained in "Chapter 5: Caring for Your Tape Drive" and try the operation again. DO NOT clean the read/write heads on Jumbo 700, 1400, or Trakker 700 tape drives. 2) Switch to NON-concurrent DMA mode on the Software Setups screen. 3) Format the tape. Be aware that formatting erases all data on the tape. 4) If you are using one of our controller boards this error may be caused by using an interrupt channel for the tape drive that conflicts with other hardware. Refer to the controller board's installation guide for more information. 5) Check for memory resident programs. 6) Disable software caching. 7) Take the computer out of turbo mode.

Error 60: Tape format incompatible with drive/software.

The tape has a format which the software or tape drive is unable to support. Format the tape.

Error 61: Volume is a continuation from a previous tape.

Only the first tape of a linked volume can have its volume directory accessed.

Error 62: Tape chaining terminated by user

Confirms that a linked tape volume was not created. The current backup is invalid.

Error 65: Invalid password

The password entered does not match the password on the current tape volume. Passwords are case sensitive and must be entered exactly as they were when the password was entered. For instance, MYBACKUP and mybackup would be considered different passwords.

Error 66: Redirection not allowed on this volume

Occurs if you attempt to restore files to a different directory from a backup volume which does not allow redirection. You must restore the desired files to a directory on disk of the same name as the one on the tape.

Error 67: Automatic compare unsuccessful.

A fatal error occurred during an automatic compare. Run another compare on the backup to ensure that it is valid. Run the backup again if necessary.

Error 68: Insert first tape in chain.

If access to any files in a linked backup is denied, insert the first tape of the linked series in the tape drive so its directory can be updated. The backup is completed as usual when the first tape is inserted in the drive.

Error 70: Program error

The TAPE.TXT language file is missing. Run the install program instead of just copying the files. Make sure you are starting the tape program from the directory where the program was installed.

Error 77, Error 78, Error 79: Program error.

See Error 12 for remedies.

Error 81: Unusable sector detected.

During a backup, a tape sector not mapped as bad by the format process caused a write error. The current backup is unusable. The bad sector is mapped as bad for all subsequent backups. 1) Perform the backup again using the same tape to correct the problem. 2) Run a CHKDSK on all hard drive partitions and clean up lost cluster/allocation units. Read your DOS manual for further information. 3) You can also reformat your tape.

Error 82: Unexpected end of tape.

The tape drive detected the end of the tape before the process was completed. See Error 12 for remedies.

Error 83: Drive communication failure.

There was an error in the host-to-drive communication process. Check all data cable connections and try the operation again. There may be a DMA conflict; manually reconfigure the board.

Error 84: Tape is write protected.

Slide the write protect switch to the RECORD position before using this tape. With PowerTape, you rotate a switch on top of the tape to the unlock position.

Error 85: No tape cartridge in drive.

If a cartridge is inserted, remove and reload it.

Error 86: Seek error.

The software cannot determine where the tape is positioned. 1) See Error 12. 2) Try clean booting the system with a DOS bootable diskette. Read your DOS manual for more information on making a DOS bootable diskette. 3) Reformatting the tape may make it usable, but the data it contains cannot be recovered.

Error 87: No tape drive detected.

The software is unable to communicate with the tape drive. 1) Make sure that all cables are installed correctly and all connections are secure. 2) Reinstall the backup system software as explained in the Installation Guide. 3) Make sure the tape drive is properly grounded as explained in the Installation Guide. 4) Terminate the tape drive as explained in the External Kit Hardware Installation Guide.

Error 88, Error 89: Program error.

See Error 12 for remedies.

Error 90: Tape controller/software incompatibility.

1) The software is unable to support your tape or diskette controller or your computer may not support concurrent DMA mode. Switch to non-concurrent DMA mode on the software setups from the Options pull-

down menu and retry the operation. 2) If you are using one of our controller boards, this error may be caused by using an interrupt channel for the tape system that conflicts with other hardware in your system. To correct this error refer to your tape controller Hardware Installation Guide for configuration information. 3) If you are using an Award BIOS version below 3.05, in Software Setups, set the Concurrent mode option to OFF. With versions 3.05 and above you can set this option to ON.

If you are using a parallel port drive, such as Trakker

1) Enable or change the hardware interrupt on the parallel port. (See step 6 under error 194.) 2) Read steps for error 122 and 123. 3) With Trakker, if the TAPE.TXT file is missing, run the installation program, rather than just copying the files.

Error 91: No tape controller detected.

The software cannot communicate with your tape or diskette controller or your computer has no tape or diskette controller. Check system configuration for an alternate diskette controller.

Error 92: Tape format failure

Format operation failed. Remove the tape from the tape drive and reload it. If this error occurs again, use a different tape.

Error 93: Drive communication failure.

See Error 83 for an explanation.

Error 94: Tape controller/software incompatibility.

The software is unable to support your tape or diskette controller.

Error 95, Error 96: Program error.

See Error 12 for remedies.

Error 97: Tape is not formatted.

Format your tape.

Error 98: Program error.

See Error 12 for remedies.

Error 99: Tape drive error (xx).

With error 99, your tape drive must be powered off and back on to reset the error. In addition, note the sub-code error remedy detailed below and retry your tape operation.

Sub-codes:

øa or 27 = Broken tape or dirty tape sensor - Remove the tape if broken or spooled off, clean sensor and insert another tape as described in “Chapter 5: Caring for Your Tape Drive”.

øb = Gain set error - you must reformat the tape before backing up any more files. Data on the tape is unusable.

1a = Power-on reset occurred; 1b = Software reset occurred

ø4 = Motor jammed - make sure there are no obstructions blocking the motor's motion, insert a different tape, and try the operation again.

If your tape drive does not reset, the tape drive may be damaged, call your dealer or service support organization.

Error 100: Tape controller/software incompatibility.

The software is unable to support your tape or diskette controller.

Error 102: Too much electrical interference.

An electrical device is interfering with the tape drive. Be sure your tape drive is grounded. Refer to the Installation Guide for more information.

Error 103: Drive communication failure.

See Error 83 for an explanation.

Error 104: Program error.

See Error 12 for remedies.

Error 105: New cartridge inserted.

Inserting a new tape cartridge invalidated the current operation. Restart the operation.

Error 109: Attempt to write on a QIC-350 formatted tape with a SCSI drive

An error occurred while trying to write to a QIC-350 formatted tape. These tapes are read-only tapes.

Error 122, Error 123: Trakker Communication Failure

1) Use the cable that came with Trakker. 2) Run the configuration program and select Advanced Options. If you received an error 122, select a higher control delay setting, if you received an error 123 select a higher data delay setting. 3) Turn on your turbo mode. 4) Reinstall the Trakker software. 5) Try a different parallel port or install another parallel port card.

Error 127, Error 128, Error 129, Error 130, Error 131, Error 132, Error 133: Program error.

See Error 12 for remedies.

Error 134: Operation canceled.

Results from a user-canceled tape operation. No action is necessary.

Error 135, Error 136, Error 137, Error 139, Error 140: Program error.

See Error 12 for remedies.

Error 138: Program error

File could not be created during restore.

Error 141, Error 142, Error 143: QICxxxx tape in QICxxxx drive.

(xxxx represents tape and drive format) The tape you are using is incompatible with your drive for this operation.

Error 144: Cannot access foreign operating system volume.

You cannot access a tape volume made from a backup of a different operating system.

Error 145: Invalid tag file format.

The tag file contains invalid commands or is otherwise invalid. Make a Selective Backup with the menu software to format the TEMPLIST.TAG file.

Error 146: Invalid tag file options.

The tag file contains invalid options. Make a Selective Backup with the menu software to format the TEMPLIST.TAG file.

Error 147: Different drives appear in tag file.

Only one drive letter can appear in each tag file.

Error 148: Tag file not found.

The specified tag file is not in the directory with the backup system software. 1) Move the file to the tape software directory. 2) Make a Selective Backup with the menu software to create a tag file in the tape software directory.

Error 149, Error 150, Error 151: Program error.

See Error 12 for remedies.

Error 153: Disk not ready.

The specified disk was not available when the tape software tried to access it.

Error 156, Error 157, Error 158, Error 159, Error 161, Error 162, Error 163, Error 164, Error 165, Error 166, Error 167, Error 170: Program error.

See Error 12 for remedies.

Error 171: Error writing setups file.

Your hard disk may be full. Delete unwanted files and install the backup system software again. On a network, you may not have rights to the setup file in which case you cannot modify it.

Error 172, 173: Program error.

See Error 12 for remedies.

Error 174: Too many open files.

Not enough file handles are available to the backup system software. 1) You may need to terminate other software running at the same time. 2) Modify your CONFIG.SYS file to allow more files (FILES=NN) to be open, and reboot your computer.

Error 175: Disk full.

Destination disk is full.

Error 176: Unable to create destination directory

Indicates a DOS error condition. Often results from a full destination disk.

Error 177: Unable to switch to destination directory

The backup system software was unable to change to the selected destination directory during a restore or compare operation. Make sure your computer is running under DOS version 4.0 or above.

Error 178: Program error.

Error creating temporary CONFIG.SYS file.

Error 179: Program error.

Error closing temporary CONFIG.SYS file.

Error 180: Unable to create temporary file

During the installation process, a necessary temporary file could not be created. Make sure your boot disk is not filled to capacity and reinstall the backup system software.

Error 181: Program error.

Error closing CONFIG.SYS file.

Error 182: Program error.

See Error 12 for remedies.

Error 183: Invalid directory name.

The directory name entered contains invalid characters.

Error 184, Error 185: Program error.

See Error 12 for remedies.

Error 186: Can't access file for writing

The tape software encountered an error while attempting to modify your CONFIG.SYS file. This error results from CONFIG.SYS being marked read-only. Remove the read-only attribute and reinstall Colorado Backup.

Error 187: Program error.

Error writing CONFIG.SYS file.

Error 188: Unable to create backup file

The installation software modified your CONFIG.SYS and/or AUTOEXEC.BAT file but was unable to rename the original because of a file name conflict.

Error 189: Not enough memory to count files/bytes.

Not enough system memory to read full directory structure. See Error 4.

Error 190: No valid I/O address available for tape controller.

None of the I/O addresses valid for use with the tape controller are available. You must either remove a device that uses one from your computer or reinstall another device to use a different I/O address to make one available to the tape controller. See your tape controller Hardware Installation Guide for I/O channel usage information.

Error 191: No tape controller detected.

There is no tape controller installed in your computer or the tape controller is not properly seated in the expansion slot. Be sure you secure the tape controller with a screw.

Error 193: Invalid DMA or IRQ with tape controller in 8-bit slot.

An 8086/8088-based computer cannot use DMA channels above 3 or IRQ values above 7. Make sure your tape controller is configured using appropriate values. See your tape controller Installation Guide for more information.

Error 194: Unable to detect tape controller at given I/O address.

The tape controller is either not installed, not properly seated in the expansion slot, or another device in your computer is already installed at the selected I/O address. 1) Be sure you secure the tape controller with a screw. 2) Check your peripheral device manuals for I/O address usage to determine if there is a conflict. 3) Make sure all cables are plugged in securely and oriented properly.

Parallel port drives: Here are a few things to try if you are using a drive such as a Trakker.

1. Make sure the power cord is inserted all the way into the parallel port drive. If the light comes on and the tape moves back and forth when a tape is inserted into the drive, then the drive is getting power.
2. Make sure all cables are plugged in securely and oriented properly. You may want to review the drive's installation guide.
3. Make sure the data cable is plugged into the port marked "To Computer" on the Trakker.

4. Try plugging the Trakker directly into the PC if you have a parallel switch box or any other parallel devices installed.
5. Verify your parallel port interrupt is set to IRQ 5 or IRQ 7 and the parallel port address is set to 378h, 278h or 3BCh. This may be done with jumpers on your parallel port card, through your CMOS setups or it may not be selectable. Refer to the documentation of your parallel port or the documentation for your computer system.
6. Reinstall the software.
7. Try a different parallel port or install another parallel port card.

Error 195: DMA sharing not allowed.

You cannot select the same DMA channel for both the tape controller and data compression parameters. See your tape controller Hardware Installation Guide for more information.

Error 200: Program error

This file is in use or is inaccessible because of access rights. Clear all file locks from the file in use or being displayed as in use.

Error 220: Could not open virtual memory file.

Not enough free disk space to open the virtual memory file. 1) Delete unwanted files from your hard disk to make room for the virtual memory file. 2) If the error recurs, call Customer Support or your dealer organization.

Error 221: Fatal expanded memory error.

The backup system software cannot use your expanded memory. Run the Configuration program to turn off expanded memory support. (To start the configuration program at the directory where your tape software is stored, type CONFIG and press ENTER.)

Error 222: Not enough disk space for virtual memory file.

Not enough free disk space to open the virtual memory file. 1) Delete unwanted files from your hard drive to make room for the virtual memory file. 2) If the error recurs, call Customer Support or your dealer organization.

Error 223: Incompatible or insufficient expanded memory.

The expanded memory in your computer is not compatible with LIM 4.0 EMS or you do not have enough expanded memory available to load the requested directory structure. 1) Install a LIM 4.0 EMS driver. 2) Add more expanded memory. 3) Use the Configuration program to indicate that no LIM 4.0 driver is installed. (To start the configuration program, at the directory where your tape software is stored, type CONFIG and press ENTER.)

Error 240, Error 241, Error 242, Error 243, Error 250, Error 251, Error 253: Program error.

See Error 12 for remedies.

Error 450: Error opening output file

The file specified in the Print to File field during Print Tape Directory could not be opened for writing. Possible causes: 1) Too many open files. 2) An invalid path was specified. 3) An attempt was made to write to a read-only file.

Error 451: No print destination specified

You must choose a print destination. Select either Print to File or Print to Printer.

Error 452: Printer error.**Error 453: Error while printing.****Error 454: Printer not ready.****Error 455: Printer out of paper.**

These are general printer errors. Possible causes are: 1) The printer specified was not found; check printer connections. 2) The printer is out of paper. 3) The printer is off-line.

Error nnn: Internal install error nnn.

Various numbers can appear when one of these errors occurs. It indicates an abnormal condition in the operation of the backup system. Try the operation again.

Error 30000: Novell access error (xxxxxx)

1) This message indicates a Novell software error. Note the numbers that appear in parenthesis on your screen and call Customer Support or your dealer organization. 2) See error 200. 3) If the errors recur, call Customer Support or your dealer organization.

File Error Messages

These messages appear in the list of filenames displayed on the screen during backup, restore, compare, or search operations.

Access denied

During a backup, you may receive this message in any of the following cases:

1. You may be trying to backup a corrupted file.
2. The filename does not adhere to the DOS naming conventions.

During a restore, you may receive this message in any of the following cases:

1. You are trying to overwrite a read-only file.
2. You are trying to overwrite a file with the transaction tracking attribute enabled.
3. You are trying to restore a file which was in use during backup.

Disk full

A restore operation filled the disk to its capacity. The restore operation is aborted at that point. You must delete files from the disk and begin the restore again to recover all the files in the tape volume.

DOS error (nnn)

Indicates an operating system error. Consult your DOS manual.

File in use

You may receive this message in any of the following cases: 1) You are trying to backup a file that is currently in use. 2) You are trying to backup a dynamic file that is always open such as a print queue file or transaction file.

File creation error

DOS did not allow the file to be created. Consult your DOS manual. Some system files are read-only and cannot be restored.

File size error.

There is a difference between the actual file size and the file size indicated in the directory table.

File exists (not restored)

A file that exists on the disk cannot be restored unless the Overwrite option in the backup system is enabled. Delete the file or enable the Overwrite option on the Software Setups screen under the Options pull-down menu.

File linked (cannot access)

The specified filename is linked to another file. The data cannot be accessed.

File not found

The specified file was not found on the disk or tape.

Invalid access code

DOS version 3.0 or higher file access error. Consult your DOS manual.

Is different

Compare operation message. The specified file on the disk does not match the file of the same name on the tape.

Path not found

Invalid directory path on the tape or the disk.

Too many open files

Increase the number of file handles in your CONFIG.SYS file. Consult your DOS manual.

Unreadable file

The Reed-Solomon error correction facility was unable to reconstruct the file. 1) Clean the tape drive read/write head as explained in “Chapter 5: Caring for Your Tape Drive” and try the operation again. DO NOT clean the read/write heads on Jumbo 700, 1400, or Trakker 700 tape drives. 2) Switch to Non-Concurrent DMA operation under Software Setups. If the file is still unreadable, its data is possibly corrupt.

Operational Errors

The following warning messages appear under the Information Window at the end of a tape operation.

Insufficient memory to display directory contents

Your computer does not have enough free memory to display the contents of the selected directory. Remove any memory-resident software and try the operation again.

Insufficient memory to sort directory contents

Your computer does not have enough free memory to sort the contents of the selected directory. Files are instead displayed unsorted, directly from the tape or disk directory.

Linked files do not affect byte count.

Tagging a linked file does not increase the byte count when you have already selected the file to which the current file is linked.

Tape configuration file cannot be found. Please reinstall your software.

You may need to remove the tape software directory from the path statement. Tape software must be executed from the directory created by the software during installation. Otherwise, verify your tape software is installed correctly.

Tape is full

The tape is too full to accept any more data. You can erase the tape (found under the Utilities menu). You may also set the software so it does not put multiple backups on the tape. (Under the Options menu in Software Setups remove the X from the Append Volume to Tape option. This option erases the tape before a new backup is started.)

Unable to tag/untag item - tag list full

The maximum number of allowable tags has been reached.

Warning excessive format errors. Clean head and reformat tape

Appears if the number of bad sectors encountered during a Format operation is excessive. Clean the tape drive read/write head as explained in “Chapter 5: Caring for Your Tape Drive” and try the operation again. DO NOT clean the read/write heads on Jumbo 700, 1400, or Trakker 700 tape drives.

Scheduler Messages

All entries filled

You must delete a line(s) from the Schedule screen to schedule any more operations. To access the Schedule screen, choose Scheduler from the Utilities pull-down menu.

Date has already passed.

You must enter a current date or a date in the future.

Entry incomplete

You must fill all applicable fields on this line before you can move the cursor to another line or exit the Schedule screen.

Schedule file for unattended backup resident program is missing

You must reinstall the tape software as explained in the Installation Guide.

Time has already passed.

You must enter a time in the future.

Scheduler not installed: see manual

Scheduler is not loaded into your computer's memory.

Chapter 7:

Troubleshooting

This chapter introduces you to troubleshooting techniques you can try if you experience a problem with your tape drive. Many times you can solve the problem yourself.

Save Yourself a Call

If you experience a problem with your tape drive, this chapter contains a few suggestions you might want to try before calling Customer Support. It may sound intimidating to troubleshoot your own machine, but these procedures are simple and take only a few minutes. The first group of recommendations contains general troubleshooting tips, the following sections offer more specific solutions to problems you might be encountering.

How to Troubleshoot

Troubleshooting entails trying to isolate the component of your system that is causing a problem. Generally the procedure is:

1. Change one thing, for example, make sure all the cables are snugly connected.
2. Try the operation that failed again.
3. If the operation still fails make another adjustment. This time you might try a different tape. You may want to reset what you changed to its original step before making another change.

4. Try the operation that failed again.

Example: If you are having trouble restoring data from a tape to your hard drive you might first try to restore some information from a different tape. If this works, that means the other tape might be causing a problem. If it doesn't work, then you can eliminate the chance that the tape is causing the problem.

Things to Try First

Below are some general troubleshooting procedures to try. The sections following offer even more specific information. Remember — after each procedure, try the operation again. This way you'll know which action solved the problem.

- Turn off the computer's power, then turn it on again (called “cycling power”).
- Disconnect, then reconnect all cables and review the Installation Guide. Sometimes just reconnecting a cable aligns it correctly or adjusts the pin connections and fixes a faulty connection.
- Check that all of your expansion boards are fully seated. They can be knocked loose during installation.
- If applicable, try the operation with a different tape.
- Verify that you are using approved tapes. Read about approved tapes in “Chapter 4: Choosing Tapes”.
- Reinstall the tape software. Sometimes a file necessary to run the software becomes corrupted. If you plan to reinstall to the same directory, delete the software files first. You may want to reinstall to a different directory.
- Verify that all the power cords are plugged in and connected. Make sure your monitor is turned on or plugged in.
- Make sure your tape drive is away from any source of radio broadcasting interference such as a monitor, personal stereo, radio or laser printer.

- If you are upgrading your Colorado Backup software, make sure you erase the previous version before installing the new software or install it to a new directory.
- If you received an error message while using the software, write down the message number and look up the solution in “Chapter 6: Error Messages”.
- Make sure the tape you are using is formatted.

Some Common Symptoms and Solutions

Symptom:

You hear the tape moving back and forth for a long period of time, but the operation does not proceed.

Possible Solutions:

- Clean the read/write head as described in “Chapter 5: Caring for Your Tape Drive”. 9 DO NOT clean the read/write head on Jumbo 700, 1400, T4000s or Trakker 700 drives.
- Make sure the tape is formatted. If you are not sure, with the DOS version of Colorado Backup, from the View menu, select the View Tape Status. The View Tape Status option displays the date of your last tape format. With the Windows version of Colorado Backup, click on the tape icon to highlight it, then select View, Status info, Tape Status.
- Make sure that the tape you are using is fully inserted into the tape drive. Do this by removing and reinserting the tape.
- Carefully examine the tape you are using. If the tape has come off of the reel, clean the end-of-tape sensor as described in “Chapter 5: Caring for Your Tape Drive”. Then use another tape and retry the operation.
- If the tape has been heavily used for a long time, retension your tape before performing any operations (this utility is not available with all

drives and will appear greyed out). With the DOS version of Colorado Backup, from the Utilities menu, select Retension. With the Windows version of Colorado Backup, drag and drop the tape icon onto the Retension One Step command. If you use Colorado Backup for Windows 95 highlight the tape drive, then from the Tools menu select Retension.

Symptom:

Tape drive does not respond after you start an operation or quits working in the middle of an operation.

Possible Solutions:

If you installed an FC-10, FC20, or ITC-15 board with your tape drive, check that the I/O base address, DMA, and IRQ are properly set. Refer to the board's installation manual for instructions on changing these settings.

- Make sure your drive is getting power. Check cabling and outlets. You might want to try using a different lead from the power supply.
- Remember, change only one setting at a time, then try the operation again. You'll want to isolate which setting change corrected the problem. It is also a good idea to make a note of your original settings.

Symptom:

When you start Colorado Backup for DOS, the message on the bottom of the screen reads "Hardware Configuration: Unsuccessful". Or when you start Colorado Backup for Windows, the tape icon appears with an X through it. Click on the icon for a description of the error.

Possible solution:

- Check to make sure that all the cables are connected properly (for example, not twisted or upside down). If you have a tape controller board such as an FC-10, FC20 or TC-15 try adjusting the I/O base address setting. Refer to the board's installation manual for instructions on changing this setting.

Scheduler Troubleshooting (DOS version only)

A memory-resident program, also referred to as a TSR (Terminate and Stay Resident) program, remains ready to be called up at a moment's notice. Scheduler is a memory-resident program included with Colorado Backup (you have the option to load it during installation). If you installed Scheduler with Colorado Backup, it is automatically loaded into your computer's memory when you turn on your computer.

The memory resident program that runs Scheduler is called AUTOBACK. When you install Scheduler, the installation program inserts the following commands in your AUTOEXEC.BAT file:

```
REM START OF SCHEDULER  
C:\TAPE\AUTOBACK  
REM END OF SCHEDULER
```

It is not unusual for memory-resident programs to interfere with each other. To use several such programs together successfully, they must in some cases be loaded into memory in a specific order. The order may have to be determined experimentally. Generally Scheduler runs only when it's the last TSR loaded. However, below are some ways to customize how AUTOBACK is loaded if you're experiencing problems:

Check the AUTOEXEC.BAT file. The lines regarding AUTOBACK should be the last lines in the AUTOEXEC.BAT program. This makes it the last TSR loaded in memory.

Make sure the system is at a DOS prompt. Scheduler won't run from the menu of Colorado Backup.

If Scheduler is not working you may want to try loading it in the lower 640K of your computer memory. Keep in mind that this will leave less room for other programs. To do this simply add /LOW after the line in your AUTOEXEC.BAT file:

```
C:\TAPE\AUTOBACK /LOW
```

If you must load other TSRs after AUTOBACK you may want to try using the NOTLAST option so AUTOBACK will not disable when

another TSR loads after it. To do this, simply add /NOTLAST after the line in your AUTOEXEC.BAT file:

```
C:\TAPE\AUTOBACK /NOTLAST
```

NOTE: Whether Scheduler works reliably with this option varies among computer systems and configurations. If you try this, we suggest you check your tape to make sure the backup occurred by using the Tape Directory command under the View menu.

General Memory Tips

Colorado Backup for DOS requires at least 460KB bytes of available conventional memory to execute (525 is recommended). Colorado Backup for Windows requires at least 2MB of free memory to execute. If Colorado Backup runs out of memory (the hangs or an error message occurs) and cannot complete the current operation, you may want to review the following items:

- Use the CHKDSK or MEM command to determine available memory. Refer to your DOS manual for instructions.
- Check to see if the memory in your computer is functioning correctly. Sometimes rebooting your computer corrects the memory problem.
- Run Colorado Backup for Windows without other programs running at the same time. This frees all available memory and processing power for the software.
- Check your AUTOEXEC.BAT file to see what memory-resident programs are running in your computer.
- For DOS software: In CONFIG.SYS you can improve performance by adjusting the buffer size. Start by adding the line `BUFFERS = 17` (or greater) to your CONFIG.SYS. Refer to your DOS manual for instructions.
- For Windows software: SHARE is a DOS program that loads file-sharing and locking capabilities onto your hard drive. Colorado Backup for Windows will run without SHARE, but its use is strongly recommended. To verify that SHARE is running, view the contents of

your AUTOEXEC.BAT and CONFIG.SYS files. Newer versions of DOS load SHARE.EXE in AUTOEXEC.BAT while earlier versions load it in CONFIG.SYS.

Light on Tape Drive Front Panel

An LED light on the front of your tape drive indicates when there is trouble with the system. The number of blinks and whether it is on at all are clues to what action you should take.

Jumbo, Trakker, T1000 and T1000e Tape Drives	
LED Display	Action
Light always on	Call Customer Support
Light never on (even if a tape is inserted)	Check power connections, then Call Customer Support
Single blink	<p>Check to see if the tape is unspooled, if so clean drive. Instructions are in "Chapter 5: Caring for Your Tape Drive". DO NOT clean the read/write head on Jumbo 700, 1400, T4000s or Trakker 700 drives. Often the tape can be respooled and the data recovered. Call the QICFAX number listed on the last page of this manual to request information.</p> <p>Check to make sure the power connection is good. You may want to try another outlet.</p> <p>If tape doesn't move (make noise) when inserted call Customer Support.</p>
Two, three or four blinks	Call Customer Support

Changing Your Tape Drive Configuration

Colorado Backup for DOS and Windows each have a configuration program that allows you to change the settings on your tape drive, tape controller board, and software.

Run Configuration if you add or change tape controller boards, need to adjust the board's I/O address, IRQ or DMA setting. DOS configuration allows you to install or remove the Scheduler option or EMS support.

To start Configuration in Windows:

1. Click on the tape drive icon to highlight it.
2. Click on Options on the menu bar.
3. Click on the option that applies:

Configure new tape drive Use this option when installing new hardware such as a tape drive or board or configuring hardware after using the Remove tape drive configuration option.

Remove tape drive configuration Use this option to remove the current settings for your hardware. This is recommended prior to adding new hardware to your system.

Modify tape drive configuration Use this option to make changes to the current hardware settings. This option applies only if you have a tape controller board such as an FC-10, FC20 or TC-15.

To start Configuration in DOS:

1. Change to the directory where you installed Colorado Backup. For example, if you installed it on your C: drive in the CBD directory you would type

`CD \CBD and press ENTER.`
2. Type `CONFIG` and press `ENTER`. In the DOS Configuration program, in addition to changing information about hardware, you can install or remove Scheduler or EMS support by placing or removing an X from the check boxes.

Using Diagnostics to Troubleshoot (DOS only)

Diagnostics is included with Colorado Backup for DOS software to give you information about your computer system and help you troubleshoot your tape drive and software.

Diagnostics also helps verify that your tape drive and software are installed correctly with the Basic Confidence Test, a main feature of this diagnostic package.

Diagnostics does not work for parallel port or SCSI drives.

Can Using Diagnostics Harm My Computer?

Nothing you do with this program can harm your system. Feel free to explore the various tests and utilities without fear of causing damage. However we strongly recommend that you write down your original configuration as you go through the tests. (The original settings are displayed at the beginning of most tests.)

Who Should Use Diagnostics?

For novice or less technical users, these tests may address unfamiliar concepts. However, people with any level of expertise can successfully use this tool. Again, no changes or tests performed by this program can harm your computer or equipment.

If you find that you need additional help call Customer Support. They may ask you to run a few of the tests while you're on the phone.

Expert users will find these tests offer a convenient way to troubleshoot and adjust the configuration of their system.

When to Use Diagnostics

- After installing the tape drive and software to insure proper installation.
- When experiencing problems with your tape drive and other suggestions in this chapter have not helped.
- After making changes to your configuration such as adding a tape controller board, upgrading your software or adding a peripheral to your computer that might conflict with your tape drive.

What Diagnostics Can Tell You

Diagnostics is a combination of tests and utilities that offer information about your tape drive system and help diagnose and correct problems you may encounter. Below is a list of the main features and uses of diagnostics.

- Verify that power and data cables are properly connected.
- Check for conflicts between your tape drive and other devices and select proper settings to correct problems.
- Troubleshoot problems relating to your computer's memory.
- Display detailed information about your computer, tape, tape drive, device drivers and TSRs.
- Verify that your tape drive can perform read/write and format functions.
- Record and print out results of the diagnostics session.
- Clean boot your system (start your computer without extra memory resident programs and device drivers being loaded).

Installing Diagnostics

Diagnostics is automatically installed when you install Colorado Backup for DOS Software. If you are using Colorado Backup for Windows you will need to install and use Colorado Backup for DOS in order to use Diagnostics.

Tests and Utilities Included in this Program

Diagnostic Tests
Basic Confidence Test
I/O Conflict Detection
IRQ Conflict Detection
Communication Test
Format Test
Read/Write Test

System Information and other Utilities
Drive Information
Tape Information
System Information
Installed TSRs
Installed Drivers
Record Session
Print Report
Clean Boot
DMA Configuration

Starting Diagnostics

To start the Diagnostics program:

1. From the DOS prompt, change to the directory where your Colorado Backup for DOS software is installed. For example, if it is in your CBD directory, you would type `CD\CBD`.
2. Type `TAPE DIAGNOSE` and press `ENTER`. The main Diagnostics screen appears.

Using Diagnostics to Verify Installation

Run the Basic Confidence test to make sure your tape drive was installed correctly or after you've made changes to your hardware configuration.

To start the Basic Confidence Test:

1. From the C: prompt, change to the directory where your tape software is stored. For example, if it is in your CBD directory you would type `CD\CBD`.
2. Type `TAPE DIAGNOSE` and press ENTER. The main Diagnostics screen appears.
3. Click on Basic Confidence Test. The test begins immediately. The completed tests appear at the top of the screen with a check mark beside them.
4. At the end of the test, a screen appears reporting the results of each test and any action you may need to take.
- 5.

Chapter 8:

Network Operation

NOTE: This chapter applies only to Colorado Backup for Windows.

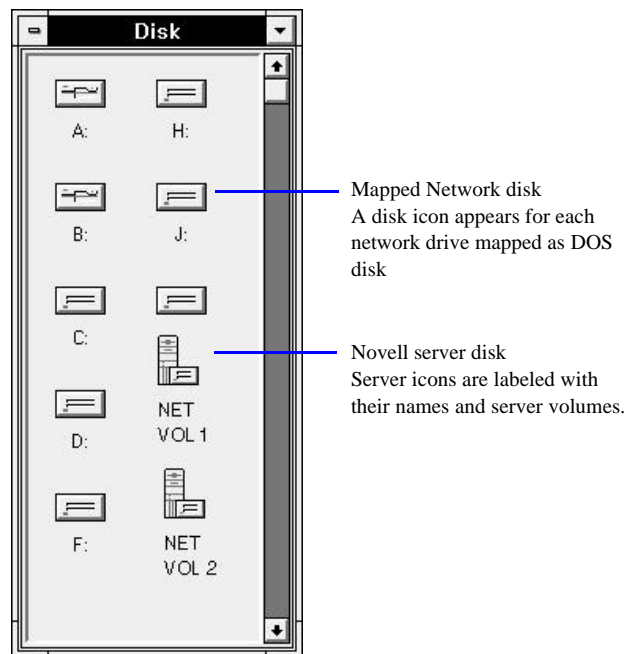
Colorado Backup for Windows supports tape operations over local area networks using Novell Netware. This chapter explains how to perform tape operations to and from mapped network disks and Novell disk servers.

Topics discussed in this chapter include:

- Novell Netware compatibility
- Tape operations from mapped disks
- Tape operations from Novell server disks
- Directory placement for Novell tape volumes
- Tape linking

Mapped Disks and Novell Server Disks

All mapped network disks appear in the Disk window with their designated drive letter. Novell disk volumes are labeled with their server names.



Mapped Disks

Mapped network disks are used in tape operations in the same manner as a local disk. The information that can be copied to and from these disks is limited to DOS files and DOS data. You cannot back up or restore the bindery, trustee rights or other extended network attributes.

Novell[®] Netware[®] Compatibility

Novell disks can appear as both mapped disks and as server disks.

Colorado Backup will back up and restore Novell Netware directories from disks mapped as DOS disks. All files will appear on tape as DOS files.

Tape volumes from a Novell server disk that are copied to a mapped disk or a DOS disk will only restore the DOS information. Security rights and extended attributes cannot be copied to a mapped disk.

Lantastic®

Colorado Backup for Windows supports operations on Lantastic peer-to-peer network disks. The tape software works with mapped network drives, just as it does with DOS drives.

Special Considerations

- Do not use a server as a workstation during tape backups. This increases the likelihood of the tape software encountering open files on the server's disk. Colorado Backup cannot copy open files.
- When Colorado Backup for Windows is installed on a LANtastic server's shared drive, Windows sees local drives as network disks and issues a warning that the installed application may be unavailable at a later date. This happens even when the disk is the non-dedicated server's local disk.
- The server should not be accessed by other workstations while the server is being backed up.
- Indirect files should be backed up only from the physical disk on which they reside.
- LANtastic requires that the DOS SHARE program is running. Do not remove SHARE from STARTNET.BAT or AUTOEXEC.BAT file.
- Do not rely on Wildcard tagging or Library Search to back up LANtastic indirect files. LANtastic uses characters for file-modification dates that are not allowed in DOS. Colorado Backup defaults the unreadable dates to the earliest allowable DOS date of January 1980.

- LANtastic adds the name of its server to the pathname, which may make paths exceed the maximum of 64 characters allowed by DOS. If you restore LANtastic files and receive an error message indicating the path is too long, use File Redirection to restore the files to a path within the 64-character limit.
- The file QCONTROL on a Lantastic server is always open and, therefore, cannot be copied to tape by Colorado Backup. However, LANtastic will automatically recreate the missing file.

Novell Netware Lite

Colorado Backup for Windows supports operations on Novell Netware Lite peer-to-peer network mapped disks.

Windows for WorkGroups

Colorado Backup for Windows supports operations on Microsoft Windows for WorkGroups mapped disks.

All applications on any WorkGroups node that is running a backup should be closed before starting the operation. Colorado Backup for Windows does not attempt to determine whether applications are running on any network node.

For best results, we discourage using the Windows for WorkGroups CHAT icon to chat with a node running a tape operation. This also applies to other applications that will communicate with a node such as MAIL, SCHEDULE, and NETWATCHER.

Peer-to-peer Networks in Conjunction with Novell Netware

Many peer-to-peer networks work in conjunction with Novell NetWare. If you are using a peer-to-peer network with Netware, all peer-to-peer functionality is added to that of Netware. All network disks, including Netware resources, that have been mapped to DOS disk letters will be available to Colorado Backup for Windows. Please refer to the Novell

section for information on Novell file, directory, and rights issues for more information.

Special Novell Information

To back up the contents of a Novell server disk, Colorado Backup must have the following information:

- Special file-header information for each file on the disk
- Access rights for each directory
- Access rights for each file with Netware 386
- Novell bindery information
- User disk-space restrictions
- Macintosh special information
- Trustees for all files and directories

Copying Special Novell Information

Special Novell information is used primarily for system security. The special information determines what information on the server can be accessed by each user. Only the System Supervisor, or those logged in with equivalent rights, can back up or restore all network information.

Backing Up Network Specific Information

When backing up data from a Novell disk server, all users can copy the following information for the files and directories to which they have read, filescan, and access control rights:

- Extra file-header information for each file on the server disk
- Extra information for each directory
- Access rights for each directory

- Access rights with each file with Netware 386
- Directory restrictions
- Macintosh files special information

Backing Up Files

There are special considerations when backing up data from Novell server disks:

Run the tape software from the workstation on which the tape-drive hardware is installed.

- Backing up the Bindery requires enough free server disk space to copy Bindery files to new names on the disk. The files are copied to filenames with the extension CBW (NET\$OBJ.SYS is copied to NET\$OBJ.CBW, NET\$PROP.SYS is copied to NET\$PROP.CBW, and so on). After Colorado Backup copies the *.CBW files to tape, they are deleted from the server disk. If copying was not successful, the duplicate files remain in the SYSTEM directory.
- If a Supervisor's backup of the Bindery fails for any reason, the Trustee information for all files and directories following the Bindery files will not be backed up to the tape.
- Bindery files may be deleted if more than one backup operation of the Bindery is performed at the same time. Before starting your backup, make sure no other users with Supervisor rights are backing up the Bindery.
- It is recommended that you run the Novell BINDFIX program before any backup operation involving a Novell server disk.
- Set the Sort preferences for Files and Directory tree to no sort. Opening a server's directory containing gigabytes of data can take several minutes.
- To ensure a complete backup of the network, perform backups while all users are logged off. When starting a backup operation, turn off

the Allow backup of network drive with users logged in option. This prevents the operation from starting if users are logged in.

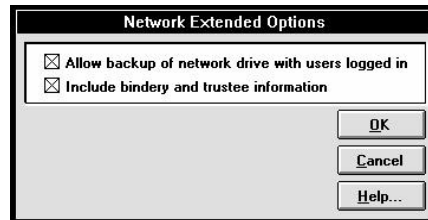
- Transaction files that are open during a Copy or Move operation are viewed by the software as an open file and their contents will not be copied to tape.
- Compare your files immediately after copying them to tape. Performing a Compare operation after time has passed since the backup will likely produce errors because of changes in file time stamps and Trustee assignments.
- The directory information for tape volumes created from Novell server disks is automatically placed at the end of tape volume.
- When creating macros that back up data from a Novell server, make sure you are logged in at the level at which the macros will be used. For example, if a user was logged on as Supervisor when a macro was created they must be logged on as Supervisor when the macro is used.
- When you are viewing or copying Novell files in Colorado Backup and receive an error message indicating the path exceeds the DOS limits, edit or add these two lines in your SHELL.CFG file:

```
MAX CURRENT DIR LENGTH = 255  
MAX PATH LENGTH = 255
```

Network Extended Options

To change extended network options for making a backup:

1. Begin a backup by dragging and dropping the Novell server disk icon onto the tape icon.
2. When the operation screen appears, click on the Network... button. The Network Extended Options screen appears:



Allow backup of network drive with users logged in -- The option is on by default to instruct the software to proceed with the backup of a network server while users are logged in. The presence of users increases the likelihood of network files being in use. Colorado Backup cannot copy open files.

Turn this option off to ensure that all users are off the network before a disk-to-tape operation is started.

NOTE: "System" users, such as those created by the MHS system, may appear as normal users logged into the system. If they are the only users logged in, you can turn on this option with minimal errors.

Include Bindery and trustee information—The option is on by default to include the Bindery and trustee information for the directories and files being copied. Only those logged in as Supervisor or Supervisor equivalent will be able to copy the Bindery information.

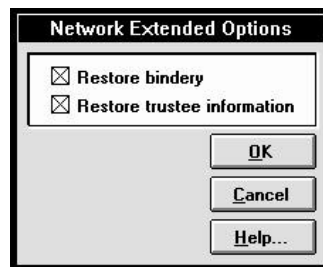
Turn this option off to copy the file and network information without the Bindery or trustee information.

3. Click on OK to return to the Operation dialog box.

4. Make your selections for Operation, Method, Options, and Extended options, then click on OK to proceed with the operation

To change network extended options for restoring/comparing files:

1. Begin a restore or compare operation by dragging and dropping the volume icon onto the server icon.
2. When the Operation screen appears, click on the Networks... icon. The Extended Network Options screen appears.



Restore bindery—This option is available only to those logged in as a Supervisor or Supervisor equivalent. It is on by default to copy the Bindery information back to the server. Bindery information includes users, groups, and print queues. Trustee information cannot be restored to a file or a directory if it does not exist in the Bindery.

Turn the option off to omit the Bindery information.

Restore trustee information—This option is available to all network users. It is on by default to copy Trustee information for each file and directory. Trustees are users and groups with access to file information.

Turn the option off to omit the Trustee information from the files and directories that are copied to the disk.

3. Select your options, then click on OK to return to the Operation dialog box.
4. Make selections for Operation, Method, Options, Overwrite options, and Redirection, then click on OK to proceed with the operation.

Restoring Files

There are special considerations when restoring data from tape to a Novell server disk:

- You must be logged in as Supervisor or equivalent to restore all special network information.
- Do not attempt to copy rights information from one version of NetWare to another. Colorado Backup does not translate Bindery and trustee information.
- Bindery files are restored first to the *.CBW files created when they were copied from the disk. The current *.SYS files are copied to the same filenames with the extension CBO. After the files are changed to *.SYS, the *.CBW files are deleted from the SYSTEMS directory. If there are errors while restoring Bindery files, use the NET\$*.OLD files (created by the Novell BINDFIX program) or rename the *.CBO files to *.OLD and use the BINDREST program to restore the old bindery. Also, the *.CBW files will not be deleted if errors occur.
- When restoring Bindery files, make sure no other tape operations are in progress.
- It is recommended that you run the Novell BINDFIX program before any Copy operation involving a Novell server disk.
- Restore the volume's data only to the server from which it was originally backed up.
- When creating macros that restore data to a Novell server, make sure you are logged in at the level at which the macros will be used. For example, if a user was logged on as Supervisor when a macro was created they must be logged on as Supervisor when the macro is used.
- If you are viewing or copying Novell files in Colorado Backup and you receive an error indicating the path exceeds the DOS limits, edit or add these two lines in your SHELL.CFG file:

```
MAX CURRENT DIR LENGTH = 255  
MAX PATH LENGTH = 255
```

- Note your Overwrite settings. Overwriting files also overwrites their security information for the selected file and all other directories in the path. Tapes used to create a linked volume for a Novell server disk have the entire directory for the volume written on the last tape of the series. All other tapes have partial directories that include directory information for the data on the tape and previous tapes in the linked series.

Directory Placement for Novell Tape Volumes

Backup operations performed from Novell server disks automatically place the tape volume's directory information at the end of the volume.

There are two primary benefits of placing the directory location after the actual volume:

- Saves tape space when unreadable files are encountered
- Eases in accessing directories for linked tapes

Unreadable Files and Tape Space

Writing the directory at the end of a volume can save tape space if unreadable files are found.

The most common source of unreadable files is making backups while files are open. This is especially true on a network where many users are logged in at varying times and working on network files. Unreadable files are handled differently when the directory is written at the end of the volume, as with Novell server volumes.

Writing the directory at the end causes the software to report unreadable files as errors, but does not reserve tape space for them. The files are written with a byte size of zero.

Linked-Tape Directories

The difference in directory placement for DOS and Novell volumes becomes apparent when tapes are linked together to copy a single volume. Colorado Backup can create a single tape volume that exceeds a single tape's capacity.

Each time a tape is about to reach its capacity, Colorado Backup reserves enough space in Novell volumes to write a directory. The directory includes files and directories for the current tape and directory information for all previous tapes in the linked-tape volume. The final tape is the only one containing a complete directory for the linked volume.

If you double-click on the tape icon for the third tape of a Novell series of five linked tapes, you can see and tag the directory information for the first, second, and third tape, but not the fourth and fifth.

A total restore of the linked volume to the server disk must be initiated from the last tape in the series.

Appendix A:

Data Compression

Colorado Backup software offers data compression which can double the capacity of your tapes. You only need to read this appendix if you want to know more about how compression works.

What is Data Compression?

Data compression reduces the number of bytes used to represent a file when written to tape. The encoding of data removes groups of bytes that appear repeatedly throughout a file's data and replaces them with shorter codes. Data compression does not alter the data on your disk; if the compressed data on tape is restored it is the same as the original data.

As an example, we can apply data compression principles to the following sentence:

Now is the time for all good men to come to the aid of their country.

This sentence contains 69 characters, including spaces. There are a couple of word patterns that repeat themselves. The pattern “the” with a space in front appears three times. The pattern “to” with a space before and after appears two times. Now, to compress the amount of space needed to type the sentence, a single character is assigned to represent the patterns. A “+” represents “_the”, and “#” represents “_to_”. The sentence now looks like this:

Now is+ time for all good men#come#+ aid of+ir country.

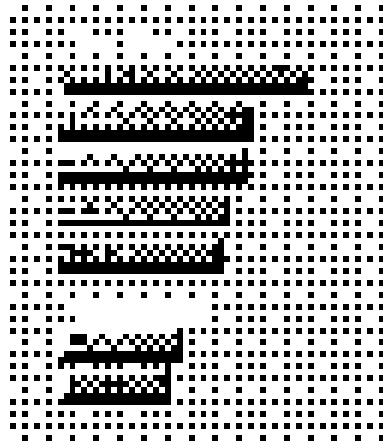
Substituting single characters for repetitive letters and space patterns reduced the number of characters in the sentence from 69 to 55. That's a 20 percent reduction, or a compression ratio of 1.2 to 1.

Compression Ratios

All files do not compress at the same rate. The typical compression ratio for most types of data is approximately 2:1 although this ratio varies. Some data types compress more and some less.

Compression efficiency depends on the amount of repetition in the file. Therefore, files like spreadsheets with an abundance of empty space between columns or rows are likely to compress at a high rate—3.4:1. Others that have few repeating groups of bytes, such as executable files (*.EXE and *.COM), do not compress as much.

This chart displays types of files and their typical compression ratios:



Streaming

The most efficient transfer of data to tape occurs when the computer's processor supplies data to the tape drive at a rate which the drive can accept it and write it to tape without interruption. This is known as streaming. You can tell when the tape drive is streaming by the continual hum of the running tape drive.

When a computer's processor cannot supply data as fast as the tape drive can write it to tape, the transfer is interrupted. This is called falling out of stream. The tape drive must pause, rewind, then resume, often repeatedly, when falling out of stream.

Whether your tape drive streams will depend on the CPU, hard disk and BUS speeds, the amount of available memory, whether your system is using an expanded memory manager and if you have memory resident programs loaded.

Speed and Compression

If you are able to stream and use compression, you will get the fastest backups. For example, with a Jumbo tape drive, streaming without compression yields approximately 2.2 MB/min. Whereas streaming with compression yields approximately 4.5 MB/min based on a 500 Kbps controller, the most common type as well as approximately 2:1 compression.

TIP: If your tape drive does not stream, you will have to experiment between compression types, or no compression at all, to see which one results in the fastest backup times.

Hardware vs. Software Compression (DOS and Windows)

Colorado Backup for DOS and Windows offers hardware compression (if you have installed a controller board) and two types of software compression: Optimize Time and Optimize Space.

Determining which type of compression you want to use depends on several factors such as:

- Do you have a controller board?
- What speed of computer do you have?
- Are you more concerned with the speed of your tape operations or how much data you can fit onto one tape?

Keep in mind the above questions as you decide which type of compression will meet your needs.

Hardware Compression

Hardware compression is available for Jumbo tape drives if you have a TC-15 or TC-15M (for the PS/2) controller board. Hardware compression is not available for Trakker drives. Approximate compression ratio: 2:1

Software Compression

Software compression is available for any Jumbo or Trakker drive. There are two types of software compression:

Optimize Space: This type of compression optimizes the amount of data that fits on a tape. However, an operation using Optimize Space compression may run slower than Optimize Time depending on what type of computer you have. Approximate compression ratio: 2:1

Optimize Time: This compression option offers a bit less compression, but will generally run at a faster rate than the Optimize Space option depending on the type of computer you have. Approximate compression ratio: 1.8:1

Colorado Backup for Windows 95 Compression Options

When you install Colorado Backup for Windows 95, the compression option is turned on.

To turn data compression off:

1. From the Settings menu, select Options.
2. From the tabs across the top of the screen choose Backup. The Backup options screen appears.
3. Click on the button next to Use data compression.

Optimum Performance with Software Compression

Software compression performs best with a suitable host computer. You receive optimum performance using Software Compression with a 486/33 Mhz or faster computer. Slower processing speeds will limit the speed of compression of your tape operations.

Speed Guidelines with Compression

These are simply guidelines to follow, each computer is different. The best method for determining the type of compression to use is to

experiment with different settings until you get the best speed/compression ratio for your needs. You can tell when you are getting the best speed when your tape is streaming.

	Faster Time
Slower Computer	Optimize Time or hardware compression
Faster Computer	Optimize Space

Selecting Compression

With the DOS version of Colorado Backup, the default compression setting can be selected from Software Setups under the Options menu.

In the Windows version of Colorado Backup, drag and drop to start a backup. On the Operation screen, click on the arrow at the right of the Compression drop-down list box, then click on the desired type of compression.

In Windows 95 data compression is on when you install the software. You can change the setting under the Settings menu, in Options, Backup.

Backing Up and Restoring Compressed Files

Backing Up

If your hard disk contains files that have been compressed by programs such as PKZIP®, they will not be further compressed by Colorado Backup. In fact, when compressed again, the file size may actually grow a small amount.

If you use compression programs such as Stacker®, or Microsoft's DoubleSpace, it is still a good idea, to use compression during backups;

otherwise the compressed files will be uncompressed completely as they are written to tape.

Restoring

Tapes can contain both compressed and uncompressed volumes. The software recognizes compressed volumes and restores them to their original size when written to a disk. No special user input is needed to restore a compressed file.

Appendix B:

Optimizing Performance

This appendix contains the steps you can take to make sure that you are getting the fastest possible backups and restores.

If you are using the Windows or Windows 95 version of Colorado Backup, performance tips begin in the next section. If you are using the DOS version of Colorado Backup, performance tips begin on page B-2.

Colorado Backup for Windows and Windows 95

The following tips will help you get the fastest possible backups:

- Running operations with the Operation Status screen minimized will increase the performance of the software. When the screen is visible, much of your computer's processor time is consumed by updating the information being displayed.
- Run Colorado Backup for Windows or Windows 95 without other programs running at the same time. This frees all available memory and processing power for the software.
- Windows: We recommend 2 MB of free memory as a minimum. However, memory above 2 MB allows the software to use memory most efficiently.
- Windows 95: We recommend 4 MB of memory as a minimum. However, memory above 4 MB allows the software to use memory most efficiently.
- Backing up a directory with several hundred files in it will slow the speed of your operations dramatically because of the way your operating system keeps track of files. For best performance, keep directories as small as possible.

- Compression takes up valuable processor time. Unless a machine is very fast, tape streaming (transferring data without interruption) will not occur when compression is being used. Perform two backups on the same set of files--one with compression and another without--to see which is faster for your computer.

Colorado Backup for DOS

Optimizing Memory Use

The Colorado Backup software uses a storage area in which it builds the directory structure for the files it is going to back up. The storage area can be in either expanded memory, conventional memory, or on your hard disk, depending on how your computer is equipped and set up:

- If you have expanded memory, consisting of an expanded memory board and its accompanying software on an 8086 or 80286 computer or consisting of extended memory and an expanded-memory emulator on an 80386 or 80486 computer, it will be used first for storing the directory structure. The more expanded memory you can use, the faster your backups will be.
- If you don't have expanded memory or if it gets used up, then the directory structure will be stored in conventional memory. Conventional memory is the basic type of memory found on all computers and consists of the first 640 KB of memory on your computer.
- If your conventional memory also gets used up, the directory structure is then stored on your hard disk. Disk storage results in the slowest backups. You want to avoid this situation if at all possible.

Therefore, to get the fastest possible backups and restores you want to: 1) use expanded memory by loading the DOS or Windows emm386.exe device driver and 2) free up as much conventional memory as possible.

If you are unsure of what types of memory you currently have, you can find out by using the MS-DOS[®] 6.X MEM command.

To see what memory your computer has:

At the DOS prompt, type MEM and press ENTER.

You will get a display similar to the following:

```
655360 BYTES TOTAL CONVENTIONAL MEMORY
655360 BYTES AVAILABLE TO MS-DOS
630256 LARGEST EXECUTABLE PROGRAM SIZE

7897088 BYTES TOTAL EMS MEMORY
5210112 BYTES FREE EMS MEMORY

7340032 BYTES TOTAL CONTIGUOUS EXTENDED MEMORY
      0 BYTES AVAILABLE CONTIGUOUS EXTENDED MEMORY
5144576 BYTES AVAILABLE XMS MEMORY
      MS-DOS RESIDENT IN HIGH MEMORY AREA
```

This line indicates the amount of conventional memory on your computer - memory up to the first 640K.

This line reports the amount of expanded memory on your computer.

This line shows the amount of extended memory on your computer - memory beyond the 1 megabyte boundary.

Modifying CONFIG.SYS and AUTOEXEC.BAT

Example CONFIG.SYS File

The following example CONFIG.SYS file contains the commands needed to maximize expanded and conventional memory. All commands shown are MS-DOS 5.0 commands. For more information on the commands, refer to the MS-DOS User's Guide and Reference. Compare the example files to your own CONFIG.SYS file, then edit your file if necessary.



CAUTION: Before making any changes to your current CONFIG.SYS file, make a copy of the file under a different name in case you need to go back to the original version.

These commands would be added in the same order as they are shown here.

```
DEVICE=HIMEM.SYS
DOS=HIGH,UMB
DEVICE=EMM386.EXE
DEVICEHIGH=<devicedriverfile>
-Remainder of CONFIG.SYS-
```

DEVICE=HIMEM.SYS

Use HIMEM or another extended-memory manager to take advantage of

extended memory if you have an 80286, 80386, or 80486 with extended memory installed. This must be the first line in your CONFIG.SYS file.

DOS=HIGH, UMB

If you use the HIMEM extended-memory manager in the first line, this must be the second line. This command runs DOS in extended memory instead of in conventional memory.

DEVICE=EMM386.EXE

Use EMM386 or another expanded-memory manager to use extended memory as expanded memory. Use EMM386 on 80386 and 80486 computers only. To use expanded memory on 8086 or 80286 computers, you must have an expanded-memory board and its software installed, in which case you would substitute that command here.

DEVICEHIGH=<devicedriverfile>

Use the DEVICEHIGH command instead of the DEVICE command to load all remaining device drivers into the upper memory area instead of into conventional memory. For example, DEVICEHIGH=ANSI.SYS.

Remainder of CONFIG.SYS

Examine all remaining commands to see whether you still need to use them and delete any that are unnecessary. Any drivers loaded unnecessarily will take up memory, thereby slowing down your backups.

Example AUTOEXEC.BAT File

The following example AUTOEXEC.BAT file contains the command needed to maximize expanded and conventional memory. For more information on the LOADHIGH command, refer to the MS-DOS User's Guide and Reference. Compare the example files to your own AUTOEXEC.BAT file, then edit your file if necessary.



CAUTION: Before making any changes to your current AUTOEXEC.BAT file, make a copy of the file under a different name in case you need to go back to the original version.

This command would be added as it is shown here.

```
LOADHIGH <memory-resident program>  
-Remainder of AUTOEXEC.BAT-
```

LOADHIGH <memory-residentprogram>

Use the **LOADHIGH** command before any program that is started to run it in the upper memory area rather than in conventional memory. For example, **LOADHIGH DOSKEY**.

Remainder of AUTOEXEC.BAT

Examine all remaining commands to see whether you still need to use them and delete any that are unnecessary. Any command that is started unnecessarily will take up memory, thereby slowing down your backups.

Editing CONFIG.SYS and AUTOEXEC.BAT

To edit your CONFIG.SYS and AUTOEXEC.BAT:

1. Save a copy of CONFIG.SYS and AUTOEXEC.BAT under different names. For example:

```
COPY CONFIG.SYS CONFIG.BAK
COPY AUTOEXEC.BAT AUTOEXEC.BAK
```

2. Examine the commands in the example files above and decide which ones you want to add to your current files.
3. Edit your CONFIG.SYS and AUTOEXEC.BAT using EDIT, Notepad or another ASCII editor.
4. Save changes to CONFIG.SYS and AUTOEXEC.BAT.
5. Reboot by pressing CTRL+ALT+DEL.

Command Line Operation

Running Colorado Backup from the command line instead of from the menu can, in some cases, speed up your backup depending on your computer and its configuration.

How to Write Command Line Operations

Executing operations from the command line is simple. Each operation consists of the word **TAPE**, followed by the name of the operation, such as **BACKUP**. After the operation name you may add switches that further customize the operation, such as **/J**, which turns on data compression. Below are a few rules for writing command line operations:

- The first word for any tape operation is always **TAPE**.
- The second word is the name of the specific command, for instance **TAPE BACKUP**. A list of the commands begins after this section.
- The third item in the command line is the name of the drive and/or file(s) to backup. It can include a drive letter, path or Wildcards. For example, **TAPE BACKUP C:*.***.

This is followed by the options. For instance, **TAPE BACKUP C:*.* /M** would back up only the modified files. A list of the options also appears after this section.

The following tables list the available commands and command line options.

Tape Commands

TAPE BACKUP	Backs up hard drive to tape
TAPE COMPARE	Compares tape to hard drive
TAPE ERASE	Erases tape — available as Quick, Partial, or Secure erase.
TAPE FORMAT	Formats tape for use.
TAPE HELP	Displays available commands/ options
TAPE RENAME	Renames a tape. Not available with PowerDAT or PowerTape drives.
TAPE RESTORE	Restores tape to hard drive.
TAPE RETENSION	Rewinds tape from end to end.

TAPE SEARCH	Provides directory of a tape volume.
TAPE SETUPS	Changes default settings
TAPE UNERASE	Restores data to a tape erased with Quick Erase. Tape cannot have been overwritten since erasure.
TAPE VERIFY	Verifies that your tape is readable

Command Line Options

/A, /-A	Appends to (/A) or overwrites (/A) tape
/B="filename"	Creates an error log
/C, /-C	Turns on (/C) or off (/C) automatic compare
/D:mm-dd-[yy]yy	Performs action on files written on or after date
/F="filename"	Specifies files to back up
/H	Help
/I	Turns off tape linking question. Option does not apply to PowerTape or PowerDAT.
/J, /-J	Turns on (/J) or off (/J) data compression
/K, /-K	Optimize time (/K) or space (/K) data compression
/L="password"	Turns on password protection
/M, /-M	Backs up only modified files (/M) or all files (/M)
/N="tape name"	Assigns name to tape
/O, /-O	Turns on (/O) or off (/O) file overwrite during restore
/P, /-P	Turns on (/P) or off (/P) printing filenames to the screen
/Q, /-Q	Selects Quick (/Q) Security (/Q) erase
/R, /-R	Turns off (/R) or on (/R) the reset archive attributes
/S, /-S	Includes subdirectories (/S) or only the specified path (/S)
/T="comment"	Adds a comment or volume title to backup (44 letters)
/V=n	Specifies volume number
/W	Changes default settings
/Y /-Y	Disables System cache (/Y) or returns System cache (/Y) to the original setting on 486 computers. Does not apply to PowerTape or PowerDAT.
/Z, /-Z	Automatically formats (/Z) an unformatted tape prior to a backup.

Example Commands

Total Backup of C drive:

The following command will write over existing volumes on the tape and perform a Total Backup of drive C:, then compare the data on tape to the data on your drive.

```
TAPE BACKUP C:\*.* /-A /C
```

The /-A tells the tape drive to overwrite existing data on the tape.

The /C tells the tape drive to compare the data after making the backup.

Network total backup of F: and G: drives:

```
CD\TAPE
ECHO * THIS WILL ERASE THE TAPE BEFORE THE BACKUP *
TAPE BACKUP F:\*.* /-A/S/I/J/C/T="TOTAL BACKUP OF F
DRIVE"/B = "ERROR_F.LOG"
TAPE BACKUP G:\*.* /A/S/I/J/C/T="TOTAL BACKUP OF G
DRIVE"/B = "ERROR_G.LOG"
```

Optimizing Colorado Trakker and T1000e

Choose the Fastest Parallel Port

Trakker

Trakker recognizes two types of parallel ports: unidirectional and bi-directional. Backup speeds for the two types of parallel ports are the same; restore speeds are quicker with a bi-directional port.

T1000e

The T1000e recognizes three types of parallel ports, unidirectional, bidirectional and Enhanced (EPP).

Backup speeds are the same between bidirectional or unidirectional ports; backups run fastest with an EPP port.

Restore speeds differ with each type of port. EPP is the fastest port, then bi-directional, then unidirectional (slowest).

Plug your Trakker or T1000e into the fastest parallel port available on your system.

Determining Which Parallel Port Your Drive Is Attached To

In DOS:

1. Plug your drive into a parallel port.
2. At the DOS prompt, type `CD \CBD` (or whatever directory your tape software is stored in) and press `ENTER`.
3. Type `TAPE` and press `ENTER`.

The Main menu appears.

4. Open the Options menu and select the Hardware Setups command.

The Hardware Setups screen appears indicating which parallel port your drive is plugged into.

5. Repeat this procedure until Trakker is plugged into the desired parallel port.

In windows

1. Start Colorado Backup for Windows.
2. Highlight the tape drive.
3. From the View menu select Status info then Drive Status.
4. A screen appears indicating the parallel port your drive is attached to.

In Windows 95:

1. From the Start menu, select Settings then Control Panel.
2. From the Control Panel window double click on the System icon.
3. From the top of System screen, click on the Device Manager Tab.
4. Double-click on the name of the tape drive. The settings screen will appear.

Configure the Parallel Port to its Full Capability

The Trakker or T1000e configuration program reports how your parallel port is currently configured. However, your board may actually have the capability to run faster. To determine whether this is the case, read your parallel port's manual to find out the type and compare this to the type reported by Trakker or T1000e:

	If the parallel port manual says:	And the Trakker configuration program says:	Do this:
	Unidirectional	Unidirectional	No action necessary.
	Bi-directional	Unidirectional	Reconfigure the parallel port to run in bi-directional mode as described in the parallel port manual.
	Bi-directional	Bi-directional	No action necessary.
Trakker Only	Enhanced (fast)	Unidirectional	No action necessary.
Trakker Only	Enhanced (fast)	Bi-directional	You may be able to reconfigure the parallel port to run in bi-directional mode as described in the parallel port manual.
T1000e Only	Enhanced (fast) Enhanced (fast)	Unidirectional Bi-directional	You may be able to reconfigure the parallel port to run in bi-directional mode as described in the parallel port manual.
T1000e Only	Enhanced (fast)	Enhanced	No action necessary

Plug Your Trakker or T1000e In First

If you have multiple devices, for example a network card or other kinds of drives, plugged into the same parallel port as Trakker, try plugging Trakker directly into the computer, then the other devices into the back of Trakker. That way Trakker can take advantage of the capability of the computer's parallel port.

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