SMART Software Operator's Manual

SYSGEN
·INCORPORATED·

SYSGEN SMART Software

Operator's Manual

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How to Use This Manual

This manual describes the installation and use of the SYSGEN SMART software program. If you are familiar with automatic tape backup systems, glance through Chapter 1 and then turn to Chapter 2 for installation instructions.

Chapter 1 introduces the SYSGEN SMART software and includes information for setting up a backup plan. It also describes the required equipment you must have to use the SYSGEN SMART software package.

Chapter 2 guides you through the SYSGEN SMART software installation using step-by-step procedures and illustrations.

Chapter 3 provides step-by-step instructions for automatically scheduling your disk backups for specific times.

Chapter 4 explains how to restore your backed up files from the tape.

Chapter 5 explains the FBACK program for manually backing up and restoring individual files and groups of files.

Chapter 6 explains the IBACK program for manually backing up and restoring the entire disk image.

Chapter 7 describes the specific network commands that are provided with network compatible versions of the SMART software.

Appendixes A through E provide additional technical details including error messages, keyboard functions, and typical questions and answers from users.

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Compliance with FCC Regulations

This equipment generates and uses radio frequency energy and if not installed and used properly; i.e., in strict accordance with this manual, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class B computing device pursuant to Subpart J or Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to correct the interference.

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Chapter **1**

Starting SMART

Congratulations on your purchase of a SYSGEN Tape Subsystem and SMART software. SYSGEN engineers and programmers have taken the latest disk-drive and tape-backup technologies and simplified their use through intelligent programming. Using SMART software, you can fully automate the essential backup of your hard disk drive. You can set the backup to take place at times when your computer is least used, or, if you wish, you can manually perform the same functions using special utilities.

SMART software offers the flexibility to control the backup process in any way that you like. The following chapters take you step-by-step through the process of installing your software, and then setting up the program to back up selected files at selected times.

Some versions of SMART software include compatibility with Novell NetWare. If you are not sure whether this feature is included with the product you purchased, an enclosed addendum lists the current Novell compatible products.

This manual discusses both standard and network versions of the program. If your software does not have network compatibility, ignore the sections and commands that reference network operations.

We hope that you will find this SYSGEN product a time-saving and efficient addition to your office or home.

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REQUIRED EQUIPMENT

The SMART software requires the following operating environment:

- An IBM PC, PC XT, PC AT, or a true IBM compatible system,
- A minimum of 192K bytes of memory,
- An IBM DOS 2.x or 3.x System Diskette,
- A SMART Software Diskette, version 4.00 revision A or later,
- One of the SYSGEN tape backup subsystems and the manual supplied for that product,

Before beginning the installation of your SMART software, your hard disk drive must be connected and ready for use. Formatting and partitioning of the hard disk drive should have been previously completed (refer to your DOS manual and hard disk drive documentation if you need information on completing these procedures).

Also, ensure that your SYSGEN tape subsystem is physically connected to your computer system as described in the appropriate SYSGEN Owner's Manual.

OPTIONAL EQUIPMENT

Some computer systems are equipped with a real-time clock card which maintains the correct time whenever the computer is turned on. SMART software works with real-time as the basis for all automatic backups. If you do not have a real-time clock card in your system, you must manually enter the correct time and date each time that you *boot your system*.

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A BRIEF PHILOSOPHY OF BACKUP

Experienced computer users rarely question the need for regularly backing up their program and data files. Backing up data becomes a carefully managed routine based on a clear understanding of the consequences of unexpected equipment failure or human error. Without a copy of important data files, something as simple as a 10-second power outage could result in a severe loss of time and money.

For those who are new to computers, we'd like to emphasize the importance of developing and following a carefully conceived backup plan based on the pattern of your computer use, whether you use your computer for business or personal reasons. You will need to put some thought to how you want to schedule your backups and which files are most important to you and how often your most important files change. Fortunately, the flexibility of SYSGEN's SMART software helps simplify this task by giving you three separate means for handling your backups.

Automatic Backup: For most people, the simplest way to handle their backup needs is to fully automate the process. As part of the software installation and setup process, you are asked a series of questions that allow you to select the days and times you would like each backup to take place. You can also select the files and subdirectories that you would like backed up. Once you have entered these values, the SMART software does the rest. Backups take place like clockwork at the selected times whenever your system is powered on.

Image Backup: The fastest method of backup is the image backup. The software program literally copies the data patterns exactly as they are stored on the disk resulting in what is analogous to a photographic "image" of your disk drive. While being extremely fast, an image backup cannot be broken down into individual files, so that when you want to restore the data to your disk drive, the entire data pattern is copied back in exactly the same form as it was stored. One of the best reasons for an image backup is to provide an archival record of your disk drive at a point in time. Chapter 6 of this manual describes the program that handles image backup, IBACK.

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File Backup: The ability to backup and restore individual files on demand gives you the greatest flexibility of all the backup methods. The files that you select for backup are grouped into bundles called filesets. A catalog of these filesets is compiled by the SMART software; files can be selected in any combination to be restored to the disk. With this ability, you can tailor your backup to suit any current need. If a branch office across the county needs a particular set of financial records stored in a subdirectory, you could backup all the files in that subdirectory in a matter of seconds and have the tape cartridge ready to hand over for use. FBACK allows you to specify your choices on the command line (if you're familiar with the program) or guides you through the program operation with menus and prompts. Chapter 5 describes the use of FBACK.

DECIDING ON A BACKUP PLAN

A complete backup plan involves consideration of several different factors:

- Number of data cartridges or cassettes to be rotated within your system
- The need for any permanent archival records that will be stored and not included in the rotation
- The frequency that critical data is modified during the business day, and how difficult it could be to lose data at some point in the day
- The times in the day when it would not interrupt other processing activities to have the backup take place

Before you decide on a working backup plan that will take care of your business, you will probably want to get more familiar with the SMART software. You also may want to come back to this section later when you understand the capabilities of the software better, and spend some more time developing a backup plan.

Also, there is one factor to keep in mind when devising a backup plan involving rotation of tape cartridges using the automatic backup

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mode. Each time the tape cartridge is removed (for instance, at the end of the week), the new cartridge must be reinitialized by running the program TAPUTL. The tape cartridge that you removed may no longer be used in the automatic sequence (unless it is erased), but you can access any files on it through FBACK.

To help in your planning, consider the following suggestions for working backup plans:

Basic Backup Plan: For companies or individuals that don't deal in crucially important business records every day, a simple backup plan should easily suffice to meet security needs. We suggest rotating two tape cartridges or cassettes. On the first cartridge, create a batch file under TAPUTL to automatically perform a complete file backup of everything on your hard disk drive including system files, hidden files, and all subdirectories. Then, create a second batch file to automatically back up only those files that are modified each day. At the end of the week, remove the first cartridge and start a second cartridge by performing another complete file backup. Set up the SMART software to continue backing up modified files only.

Using this method, you will never lose an excessive amount of work, even if the active cartridge in the tape drive is damaged Remember that the tape cartridges or cassettes used in the automatic backup process must contain automatic backups only (no manual backups from FBACK or IBACK).

More Elaborate Backup Plan: Perhaps your computer system has a variety of uses that range from simple word-processing to the storage of insurance records that are very important to your business. You might want to expand on the previous system by adding more tape cartridges to the system.

Because the installation of the computer programs on your hard disk drive is quite complex, you decide to perform an image backup (using IBACK) each week to capture the exact state of the disk drive. You might bring two cartridges into this rotation, each Monday performing an image backup while the last week's cartridge remains in storage.

To cover the important insurance records, you set up an automatic backup procedure that backs up your key data subdirectory at 11:00 and 16:00 each day. You include two cartridges into this rotation and alternate them week-by-week.

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You also provide another tape cartridge for those people in the office who want to perform individual file-by-file backups of their word-processing files (only at the end of the day after the automatic backup has been completed).

Highly Protective Backup Plan: Companies that are in the information business may not even be able to tolerate the loss of the data accumulated in half a day. Additionally, for legal or business reasons, they may need to maintain permanent archives that cover company activities for years. For smaller, simpler businesses, the following suggestions may seem excessive.

At the end of each business quarter, a complete file backup of all subdirectories is accomplished, and the tape cartridge is carefully marked and deposited in an area set aside for archiving.

Additionally, a 3-month rotation scheme is implemented using 12 tape cartridges. An image backup is performed on Monday of each week using a new cartridge until all 12 cartridges are filled with data. The following week the oldest cartridge in the series is erased and used for the new image backup. This cycle continues indefinitely, always providing a full 12 weeks of records.

The critical day-to-day records are handled using a twice daily automatic backup of only those subdirectories that include vital data. If a disk crash takes place, once the repair has been completed the disk can be fully restored by first restoring the most recent image backup from the 12-week rotation, and then restoring the most recent files from the daily backup. These more recent files from the daily backup are, in effect, superimposed over the earlier data files from the image backup. Of course, the remainder of the files from the image backup are left untouched.

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RECOMMENDATIONS PRIOR TO BACKUP

Before actually running the SMART software to backup your hard disk, please consider the following two suggestions.

Run CHKDSK: The DOS program CHKDSK detects problems in the way files are stored on the hard disk drive. CHKDSK links lost clusters to repair files if you specify the **/F** switch as shown in the following example.

CHKDSK C:/F <Enter>

By cleaning up your hard disk drive before a backup is performed, potential problems can be avoided. Check your DOS manual for more information on CHKDSK.

Remove Memory Resident Programs: Some memory-resident programs take up substantial areas in your computer's main memory, areas which are used for temporary storage by the SMART software when transferring data during a backup. Your backup will run much more quickly if you remove memory-resident programs from your computer's memory before a backup. Since most memory-resident programs include a command to purge them from memory, you could install this command in a batch file used for backup (see Appendix B for information on creating backup batch files). The program can then be reinstalled upon completion of the backup.

Because memory-resident programs sometimes use the computer's resources in unpredictable ways, you should be aware of the potential for problems whenever performing manual or automatic backups. If you notice problems that occur when running SMART software in automatic mode, try reordering the sequence of installation for memory resident programs in your AUTOEXEC.BAT file. If problems persist despite reordering, it may be necessary to clear memory of the troublesome program before running backups.

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WHERE TO GO FROM HERE

Chapter 2 explains how to install the SMART software. If you are installing SMART software for first time, go to the section entitled *First-Time Software Installation*. If you are updating your SMART software, refer to the section entitled *Installing Updated SMART Software*.

FREE TELEPHONE SUPPORT

All of the information you need to install your SMART software and perform backup and restore operations is provided in this manual. The index and table of contents should quickly guide you to specific information that you need during normal program operation. However, if you run into a situation where you cannot get SYSGEN hardware or software to function correctly, we provide two telephone numbers to offer further support. There is no charge for this service.

If you need assistance getting a product or application to work correctly, or need an equipment problem corrected in the normal warranty period, call the SYSGEN technical support line.

SYSGEN Tech Support:
(408) 263-1171

If you need to obtain an RMA number for repair work, request upgrade materials or documentation, obtain pricing on parts, or receive estimates for repair work, call the SYSGEN customer service line.

SYSGEN Customer Service:
(408) 263-1043

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Chapter **2**

Installing SMART

This chapter guides you through the installation of the SMART software. The procedures are written assuming that you have the most common computer configuration: your diskette drive is designated A: and your hard disk is designated as drive C:. If you have a different configuration, simply substitute the appropriate drive letters that are used for your system.

WORKING COPY OF YOUR SMART SOFTWARE

As a safeguard against damage or loss, before installing your SMART software make a working copy of the original diskette. The DOS command DISKCOPY or any other convenient copying utility can be used for this purpose. The SMART software diskette is not copy protected.

Use the working copy for installing the software on your hard disk. Store the original diskette in a cool, clean environment away from magnetic fields.

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QUICK TEST OF YOUR TAPE BACKUP SYSTEM

To verify that your SYSGEN Tape Backup system is correctly installed, we recommend the following quick test before you set up the SYSGEN SMART software for automatic operation. This test simply backs up one file from your hard disk, and then displays the file status to indicate a successful backup.

1. Complete the procedures in the *Owner's Manual* of your SYSGEN Tape Subsystem product. If this product includes a hard disk drive, install the hard disk software before continuing. Ensure that all cables are connected as described in the *Owner's Manual.*

2. Boot your computer system in the normal manner.

3. Insert the working copy of the SMART software diskette into Drive A of your computer system, and close the drive door.

4. Enter the drive and program name:

   A: FBACK <Enter>

5. The program displays the prompt:

   Backup, Restore, Catalog, or Quit?

   Select the Backup option by typing:

   B <Enter>.

6. The program displays:

   Enter file names:

   Type in the file name. Be sure to include the drive letter where the file is located. For example:

   C:\COMMAND.COM <Enter>

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7. Press **<Enter>** to skip over the second request for a file name since you only want one file backed up.

8. The program displays:

   Enter initial date: [1-01-1980]

   Press **<Enter>** to accept the default.

9. The program displays:

   Enter initial time: [0:00]

   Press **<Enter>** to accept the default.

10. The program displays:

    Enter final date: [12-31-2099]

    Press **<Enter>** to accept the default.

11. The program displays:

    Enter final time: [23:59]

    Press **<Enter>** to accept the default.

12. The program displays:

    Enter comment, if any:

    Press **<Enter>** to ignore the comment line.

13. The program displays:

    Include subdirectory processing? [N]

    Press **<Enter>** to accept the default.

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14. The program displays:

    Backup only files marked as Modified? [N]

    Press **<Enter>** to accept the default.

15. The program displays:

    Delete existing data on tape? [N]

    Type **Y <Enter>** to correctly initialize a a new tape.

The program then displays the following information:

Constructing Fileset Directory
Deleting old data on tape.
New Fileset is 0.
Backup in progress...

C:\COMMAND.COM

1 files were backed up in fileset 0.
Number of tape rewrites = 0

If this procedure works on your computer, you can be assured that your SYSGEN equipment is functioning properly. You can confidently proceed with the installation of the automated backup sequence described in the following section.

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FIRST-TIME SOFTWARE INSTALLATION

Use the following instructions to install the SYSGEN SMART software. If you are updating your software from an earlier revision, refer to the section *Installing Updated SMART Software* at the end of this chapter.

Note:

Memory resident programs can cause difficulties during software installation. To avoid problems, remove these programs from memory before beginning installation. Refer to the documentation for each individual program for removal instructions.

---

1. Boot your system as you normally would. If you do not know how to boot your system, refer to your *IBM DOS Manual.*

2. Insert your SMART Software Diskette into Drive A:.

3. Close the drive door.

4. Type:

   A: <Enter>

5. Type:

   INSTALL <Enter>

Your screen display should be similar to the one shown in Figure 2-1.

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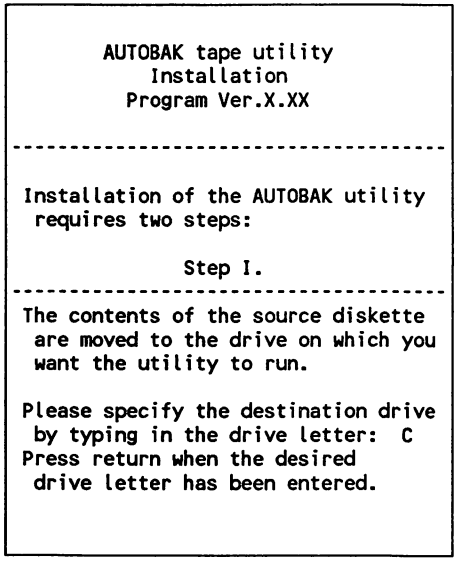
Figure 2-1. Installation Screen



Notice that you have a prompt message requesting you to specify your hard disk drive letter. The *default* response is C:. If your hard disk drive is C:, then press the **<Enter>** key.

If your hard disk drive is not drive C:, type the correct letter, then press **<Enter>**.

We recommend installation of the SMART files into the root directory of your drive. If you want to install the files in another location, consult *Appendix D* of this manual for the correct procedure.

Once you press the **<Enter>** key, the screen changes and you will be able to see the files that the system is copying from your floppy diskette to your hard disk. The installation appends both your CONFIG.SYS and AUTOEXEC.BAT files, but will not overwrite any information in either of these files. When the copying has completed, your screen display should look like Figure 2-2.

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Figure 2-2. Clock Card and Boot Screen

```
        AUTOBAK tape utility
            Installation
          Program Ver.X.XX

------------------------------------

                Step II.
------------------------------------
To complete the installation, answer
 the following questions concerning
 your operating environment.

Do you have a real time clock card
 installed in your system? (Y/N)
 Press return after making entry. N

What drive does your system boot
 from? Enter the drive letter:
Press return when the desired   C
 drive letter has been entered.
```

As you can see in Figure 2-2, the first prompt asks you whether or not you have a real-time clock card. Press **<Enter>** if you do not have a real-time clock card, **or** type **Y** and press **<Enter>** if you do have a real time clock card.

You are now prompted to enter the letter of the drive from which you boot your system. If you are booting from the floppy drive and its letter is A:, then type **A** and press **<Enter>**. (When you get to the point in the procedure where you are asked to reboot, you will need to have an unprotected diskette containing DOS at hand, as well as your SYSGEN tape utilities diskette.)

If you are booting from your hard disk and its drive letter is C:, you can simply press **<Enter>** to accept the default answer. Otherwise, you must enter the appropriate drive letter.

Once you have completed these two prompt messages, the screen clears and displays the "completed" screen shown in Figure 2-3.

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Figure 2-3. Installation Complete Screen

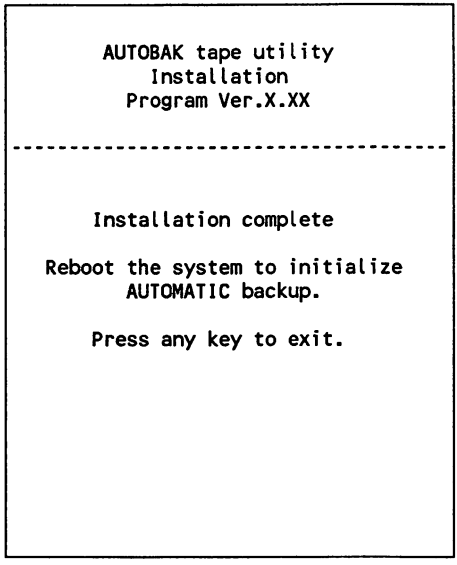

Figure 2-3 shows that the software installation is complete. However, before you can use this software, you must make sure you have a blank or reusable tape in the tape drive. After you reboot your system, you will see a prompt message on the screen asking you whether or not you want to erase the tape.

If you don't intend to boot from Drive A, open the Drive A door (so that the system will look to the hard disk to boot). Reboot by pressing the **<Ctrl><Alt><Del>** keys simultaneously.

Once you have rebooted, you should see a screen similar to Figure 2-4 (if you have inserted a blank tape into the drive). If you are still using the tape from the earlier Quick Test, the program detects a time/date stamp mismatch and asks if you want to delete existing data on tape. Answer **Y** to this question and to the next (Are you sure?) to delete your earlier FBACK test file.

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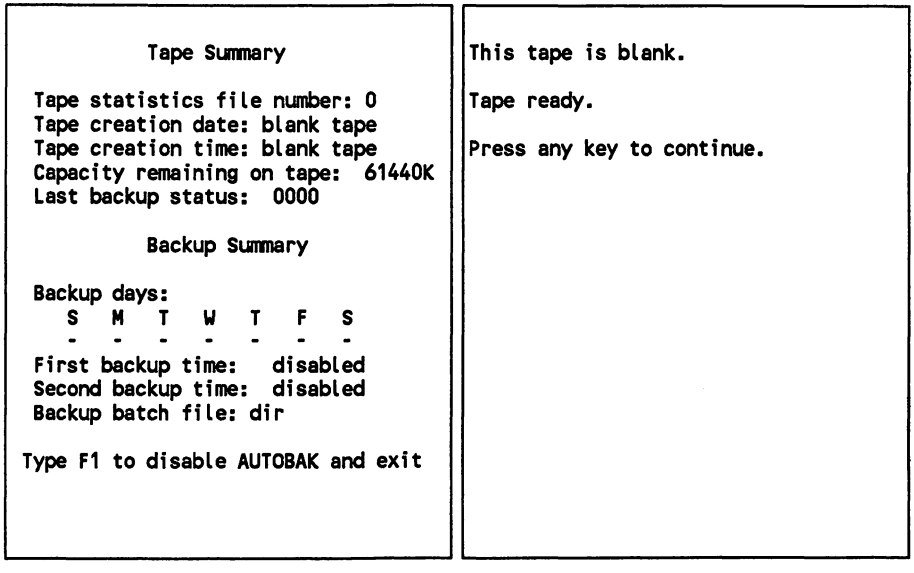
Figure 2-4. Tape Summary Screen



This summary screen contains information about the tape you have inserted in the drive as well as a Backup Summary. As this is a blank tape, there is no tape creation time or tape creation date.

As for the Backup Summary, you have not yet specified the times or days you want your automatic backups to take place.

If your screen does not display this Tape Summary screen, you should turn to Appendix B, *Changing Your AUTOEXEC.BAT File*. Or you may wish to retry the procedure booting from Drive A using a DOS diskette without an AUTOEXEC.BAT file.

If you do see this screen, then you have successfully installed the SMART software. You can now proceed to Chapter 3 and learn how to use the software to create your automatic backups.

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INSTALLING UPDATED SMART SOFTWARE

Use this procedure if you are *updating* your SMART software from version 3.08 Rev A or an earlier version. The procedure explains how to edit your AUTOEXEC.BAT file and which files to delete prior to the installation.

Before you delete the existing Tape Utility (TAPUTL) commands in the AUTOEXEC.BAT file on your boot drive, copy your current AUTOEXEC.BAT file to another file so that you will have a backup file in case you need it later. For example, copy AUTOEXEC.BAT to AUTO.BAT. Then, edit the original file using the DOS EDLIN program. Follow these steps:

1. At the DOS prompt, type:

   EDLIN AUTOEXEC.BAT <Enter>

   EDLIN retrieves the file and supplies an asterisk (*) as a prompt.

2. List the file by typing from the * prompt:

   L <Enter>

3. Look for the following list of commands (your line numbers will probably be different):

   ```
   10: REM SYSGEN TAPUTL
   11: SET TAPESTAT=12345678901234567890123456789012345
   12: SET TAPERR=0000
   13: C:AUTOBAK
   14: C:TAPUTL/I C:\
   ```

4. At the * prompt, enter the beginning line number, a comma, the ending line number, and **D** (for delete). For example:

   *** 10,14d <Enter>**

   Note that you must substitute your actual line numbers for 10 and 14.

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5. To list the file, at the * prompt, type:

   L <Enter>

   Check to see that the lines have been deleted.

6. To end and save the file, at the * prompt type:

   E <Enter>

7. When you return to the DOS prompt, to eliminate possible conflicting files in your root directory, type:

   DEL C:*.@@@ <Enter>

   DEL C:AUTOBAK.* <Enter>

   DEL C:FBACK.EXE <Enter>

   DEL C:IBACK.EXE <Enter>

   DEL C:TAPUTL.EXE <Enter>

   DEL C:REST.BAT <Enter>

   DEL C:TMPVOL.COM <Enter>

   DEL C:CHNGDMA.EXE <Enter>

   DEL C:SYSGEN <Enter>

8. *Reboot your system.* Perform a first-time installation using the SYSGEN SMART Utilities Diskette.

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CHANGING THE DMA CHANNEL

SYSGEN ships each tape subsystem configured to use Direct Memory Access (DMA) Channel 3, the recommended channel for tape backup. On some computer systems the use of DMA Channel 3 may cause conflicts during computer operation. If you have a SYSGEN Model 5500A controller board in your system, a utility program, CHNGDMA, allows you to switch to DMA Channel 1. Do not use this utility unless you have a DMA conflict in your system.

To run the program, type:

CHNGDMA <Enter>

Follow the prompts displayed on screen to switch the DMA Channel in use.

Figure 2-5. CHNGDMA Screen

```
Sysgen DMA Select Utility  vX.XX

***WARNING*** Do not change DMA channel unless there is a conflict


Current DMA channel is 3
New DMA channel will be 1

Do you want the DMA channel changed (Y/N) ?Y


DMA channel has been changed

C:\>
```


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USING TMPVOL

Another utility program included on your SMART software diskette is called TMPVOL (Temporary Volume). TMPVOL directs the SMART software to store temporary files in a location other than the C: root directory. This may be desirable if you have a hard disk that is filled to capacity and you do not want any additional files written to it. Temporary files can be stored on any valid hard disk drive, or floppy disk drive (as long as a formatted diskette is installed with a minimum of 350K of available space).

To see how to run TMPVOL, type:

TMPVOL <Enter>

The program responds:

Usage: tmpvol /D (where D = a - z)

To assign Drive E as the storage location for temporary files, type:

TMPVOL /E <Enter>

The SMART software program will then use Drive E for file storage. The default value is changed at this point, patched into the SMART software. To change the values again, you must run TMPVOL and specify a different drive designation.

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Chapter **3**

Using the SMART Tape Utilities

This chapter explains the commands used to set up your tape backup procedures for automatic operation. To access the Tape Utility Program, type **taputl** from your root directory and press **<Enter>**.

If you plan to rotate tapes within a weekly or monthly backup cycle, TAPUTL must be run each time you enter a new tape into the backup sequence.

Figure 3-1 illustrates the TAPUTL (**TAPe UTiLity**) Main Menu.

Figure 3-1. TAPUTL Main Menu

```
      TAPUTL -- Version X.XX
    SYSGEN Autobackup Utility
-----------------------------------
            Main Menu
-----------------------------------
    HELP WINDOW
    Change backup times
    Change backup days
    Create backup batch file
    Select backup batch file
    Display Summary
    Browse tape statistics
    Change tape / check tape ID
```

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The first option, accessible by pressing **<Enter>**, is the help window. The Help Window explains the keys used to select a command from the Main Menu. Once you have read this screen, you can press the **<Enter>** key to return to the Main Menu.

SELECTING FROM THE MAIN MENU

The Main Menu has 8 commands including the Help Window.

The selected command is shown by a blinking, highlighted bar (the selection bar). To select another command, use the **<Up Arrow>** or the **<Down Arrow>** keys to move the selection bar to your choice. (The **<NumLock>** key must be disengaged for the arrow keys to work).

1. Make sure the **<NumLock>** key is deactivated.

2. Press the **<Down Arrow>** key to practice moving the selection bar from line to line.

3. Notice that the selection bar "loops" from the last command to the first command.

4. Select the "Change backup days" command.

5. Press **<Enter>**. The screen should look similar to the one shown in Figure 3-2. Notice that the new screen appears in a window on top of the Main Menu.

Use this same procedure to select any command that you wish; the command is activated when it is highlighted and you press **<Enter>**.

MENU SELECTION OF BACKUP VALUES

Three of the commands on the TAPUTL Main Menu contain selections that can be activated on a temporary basis (the values will be lost when the computer is powered down) or a permanent basis (the values will be stored for future reference). These commands are

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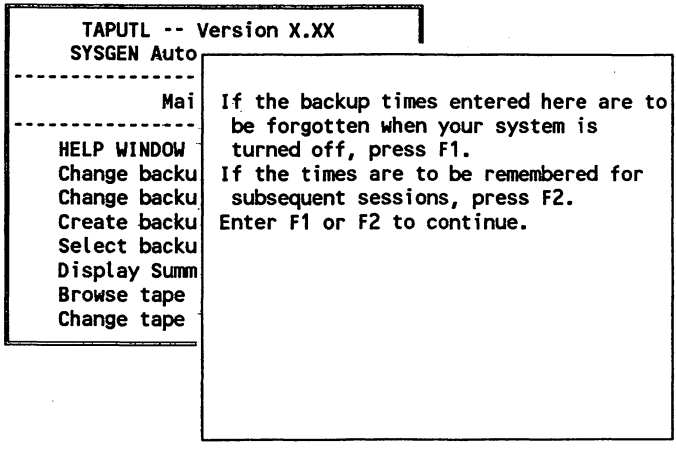
"Change backup time," "Change backup days," and "Select backup batch file." Figure 3-2 shows the screen that appears superimposed over the Main Menu.

Figure 3-2. Temporary vs. Permanent Screen



Two function keys, F1 and F2, affect the selections that you make as you run the program. Table 3-1 explains the use of F1 and F2.

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Table 3-1. F1 and F2 Function Key Usage

Press	Usage
<F1>	When you choose this key, any changes you make to the screens go into effect immediately. However, the changes you make are temporary; the changes are lost when your computer is turned off.
<F2>	When you choose this key, any changes you make to the screens take place immediately. These changes become permanent ; they are stored on the hard disk for use in later sessions.

The remainder of this chapter guides you through the process of entering changes to the TAPUTL Main Menu. You may not want to enter permanent changes until you understand the steps more fully. We suggest that, at this point, you make the changes temporary.

Press **<F1>** to select temporary changes. For example, if at 08:45 you select a backup time of 09:00 and press **<F1>** to note the selection as temporary, the program will proceed to backup your hard disk at 09:00. When the computer is turned off, the backup time reverts to the previous permanent value.

Turn to Section 1 to learn how to "Change backup times" so that the software can back up your data when you specify.

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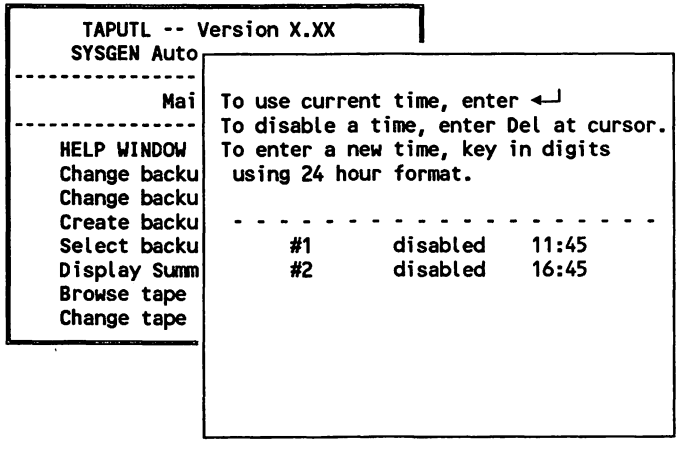
Changing Backup Times

Figure 3-3 illustrates the screen for changing backup times. You can accept the default times as shown on the screen or enter your own times to use for backups.

Figure 3-3. Changing Backup Times Screen



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The SMART software provides two backup times for each 24-hour period, using a 24-hour clock. This means that you must use the digits 00 through 23 for the hour designation. Be sure to enter the colon when you type in the times (as in 3:45). Table 3-2 shows the hours as displayed using a 24-hour clock.

Table 3-2. Comparison of Clock Formats

For	Type	For	Type
8 AM	08:00	8 PM	20:00
9	09:00	9	21:00
10	10:00	10	22:00
11	11:00	11	23:00
12 AM	12:00	12 AM	00:00
1	13:00	1	01:00
2	14:00	2	02:00
3	15:00	3	03:00
4	16:00	4	04:00
5	17:00	5	05:00
6	18:00	6	06:00
7	19:00	7	07:00

To back up your files at 11:30 AM and again at 9:00 PM., use the following steps to enter these two new times. If you make a typing mistake, you can use the **<Backspace>** key to correct it.

1. Type **11:30** and press the **<Enter>** key.

2. Type **21:00** and press the **<Enter>** key.

If you want only a single backup to occur each day, simply type **<Enter>** to accept the default for the second backup time shown on the menu.

When you press the **<Enter>** key again, the screen redisplays the Main Menu.

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DISABLING AND DELAYING AUTOMATIC BACKUPS

The times that you set for automatic backups to take place are not absolute. A backup can be delayed until you have completed a task you have started. You can also disable any backup until you decide to restart it.

When it is time for a backup to take place, a *tone* sounds to remind you that it is time for the system to carry out a backup.

You can simply ignore the tone and continue entering your data. However, once you have exited the program and returned to the DOS prompt, the backup will begin immediately.

To cancel the backup, you can press the **<Alt>** and **<Left Shift>** keys simultaneously. This stops the tone and disables your scheduled backup.

If you choose to delay the backup until you return to DOS, the time of the backup will be different from your scheduled time. Be sure you make a note of this on your tape.

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Changing Backup Days

To access the "Changing backup days" option from the TAPUTL Main Menu:

1. Press the **<Down Arrow>** key until the "Change backup days" command is highlighted.

2. Press the **<Enter>** key to select this command.

The Main Menu will be overlaid with the same screen as was shown in Figure 3-2 allowing you to choose between temporary or permanent changes using the **<F1>** or **<F2>** keys.

Unless you have already determined the ideal days and times for backup, use the **<F1>** key to make your choices temporary while trying the examples in this section.

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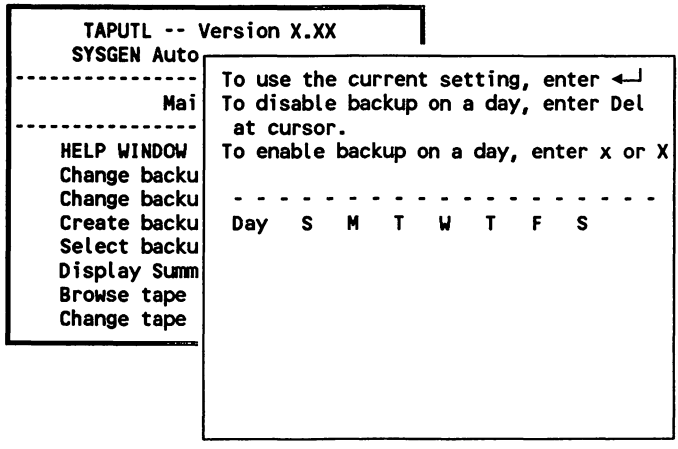
Figure 3-4. Change Backup Days Screen



As displayed in Figure 3-4, a *caret* marks the position for the selection of a day. Type 'x' or 'X' to select a day for backup; type **<Enter>** to skip over a day. You can mark all 7 days if you want. In the following example, Sunday is left unmarked, Monday through Friday are marked, and Saturday is unmarked.

1. Press **<Enter>** to leave Sunday unmarked.

2. Type **X** to mark Monday as a day you want the SMART software to backup your files.

3. Type an **X** to mark Tuesday, Wednesday, Thursday, and Friday.

4. Press **<Enter>** to leave Saturday unmarked.

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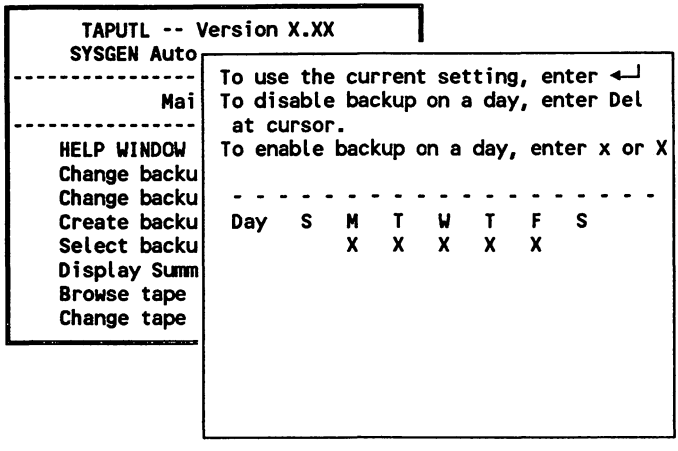
Figure 3-5 shows the results of these entries.

Figure 3-5. Selected Backup Days



The **<Backspace>** key does not work on this screen. If you mark a day incorrectly, then you must leave the command screen and reselect the command from the Main Menu.

If you have previously marked a day and you want to remove the mark, press the **<Del>** key.

You can also use this screen to check the days you have marked for your backups to take place without making any changes to the screen.

Press the **<Esc>** key to leave the screen as it is.

Use **<F1>** or **<F2>** at the beginning of the sequence to determine if your selections will be temporary or permanent.

The next section explains how to create a batch file containing a list of the files that you want backed up automatically.

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Section 3

Creating a Backup Batch File

This section explains how to set up the SMART software to back up selected files and subdirectories.

To access this option, first return to the TAPUTL Main Menu. Then follow these steps:

1. Move the selection bar so that it highlights the "Create batch file" command.

2. Press **<Enter>** to select this command.

Figure 3-6 illustrates the screen for this option.

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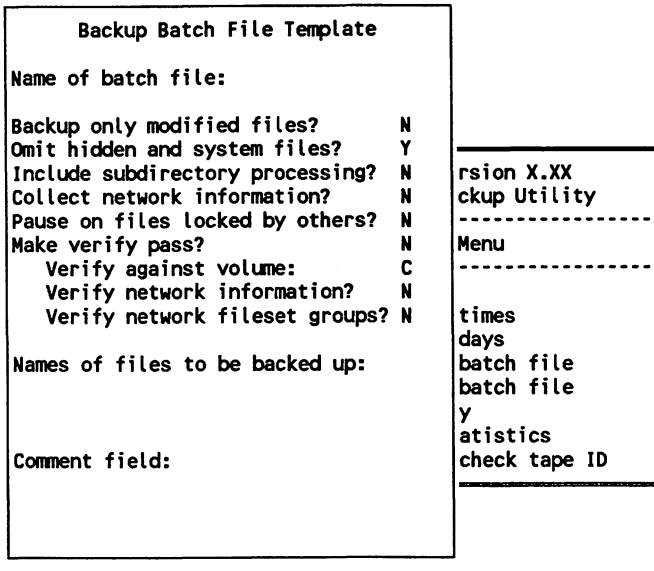
Figure 3-6. Creating a Batch File Screen



The SMART software prompts you through a series of questions to specify the names of the files and subdirectories to back up, and other considerations to tailor the backup to your needs. The last three questions refer to backups that take place in a network environment. Refer to Chapter 7 for specific information on backups over the network. If you are not actively using the program to backup network files, you can ignore these questions by pressing **<Enter>** to accept the defaults. The following list summarizes the questions you will be asked.

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1. *Name of batch file:* To name the batch file, type up to 8 characters in this field--just like the names used in DOS. Each batch file name should be unique and should have meaning for you.

   As an example, type **todays** and press **<Enter>** to create a batch file named Todays.bat. (The software adds the .bat extension to the name you give the file.)

2. *Backup only modified files:* If you answer "Y" to this question, the program only backs up files that have been modified since the previous backup. For a first-time backup, you will probably want to include all files.

   Press **<Enter>** to accept the default response of "N.".

3. *Omit hidden and system files:* Hidden and system files are not normally displayed in a directory listing even though they are present in the directory. These files will be included in your backup unless you specify "Y" to omit them. Some programs have their protection schemes in "hidden" files. If you do not back them up, you may not be able to use the programs when you restore the programs. Other programs can cause problems if their copy-protected hidden files are copied. Check your application software documentation for more information on the use of these files.

   For this example, type **N** and press **<Enter>**.

4. *Include subdirectory processing:* To back up all files in the current directory and all of its subdirectories, you must answer "Y" to this prompt.

   Type **Y** and press **<Enter>**.

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5. *Make verify pass?:* The Verify option commands the program to compare the backup files with the source files. When you select this option, the program displays the filenames, identifies files that deviate from the source files, and displays a summary report. When Verify is engaged the backup process takes longer since the program makes two passes: one to backup the data and another to compare the backed up data with the source file. However, this option is valuable for detecting potential problems that threaten data integrity. To engage Verify:

   Type **Y** and press **<Enter>**

   The program also asks *Verify against volume:* and suggests the default drive value C. Select the volume, designated by a valid drive letter, that you want to use for the verification process.

6. *Names of files to be backed up:* The SMART software accepts three lines of file names. Each line can have up to 36 characters. However, you can use the DOS *wild cards* in your responses. Wild cards are the question mark (?) and the asterisk (*). For a first-time backup, you need to back up all of your files and subdirectories. As an example, suppose you have three subdirectories named Accounts\Regional, Accounts\Local, and Summary\Annual on your hard disk. You must include the drive letter when specifying subdirectories and files.

   Type **c:\accounts\regional*.*** and press **<Enter>** to back up all of the files in this partition.

   Type **c:\accounts\local*.*** and press **<Enter>** to back up all of the files in this partition.

   Type **c:\summary\annual*.*** and press **<Enter>** to back up all of the files in this third partition.

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Note:

To back up all files in all subdirectories, you can type:

c:*.*

However, you *must* have specified subdirectory processing for this to work properly.

---

7. *Collect/Restore Network Information:* This option instructs the SMART software to include in the backup all trustee assignments and file attributes for selected files and subdirectories. Typically, you would want to answer "Y" for this option when in a network environment.

   For the example, type Y and press **<Enter>**.

8. *Wait at end on files locked by others:* This option, if selected, directs the program to return to locked files skipped over during the backup and wait for them to become unlocked so that they can be included in the backup. If you are backing up only your own files, or the no one is logged onto the network, you do not need to be concerned with this option.

   For the example, type N and press **<Enter>**.

9. *Comment field*: This optional field of up to 36 characters can be used to enter a comment describing the backup. In the example shown in Figure 3-7, the comment is simply Daily backup.

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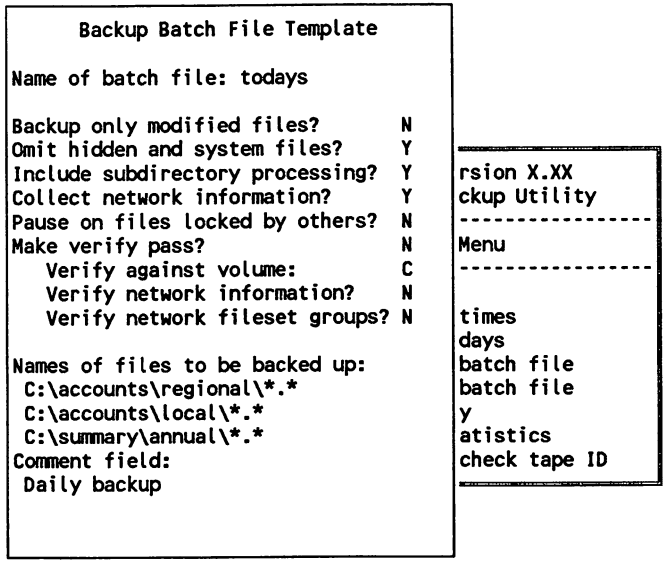
Figure 3-7. Completed Batch File Screen



All of the entries you make on this screen are used in a single line DOS command. DOS has a fixed limit to the number of characters you can put in each field. If you must use three lines of 36 characters each to designate the files you want the software to back up, then you must limit the number of characters in the Comment field.

Once you have pressed the **<Enter>** key, the software returns to the TAPUTL Main Menu.

You can create more than one of these batch files, but only one of them is in effect at any given time.

The active batch file is selected by making the menu choice "Select backup batch file," and answering the prompts. The act of creating a batch file does not automatically select it for use. The batch file to be used in a backup operation is recognized by the program from the name chosen during the "Select backup batch file" sequence.

The next section explains the procedure for activating a batch file.

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Selecting a Backup Batch File

This section explains selecting a batch file to direct your backup operations. Batch files must have been created prior to this option to be available for selection. To access this option, start from the the TAPUTL Main Menu.

1. Move the selection bar until it highlights "Select backup batch file".

2. Press **<Enter>** to select this command.

3. Press **<F1>** if you want to make the change temporary for use with the examples.

Figure 3-8 illustrates the screen used selecting a batch file.

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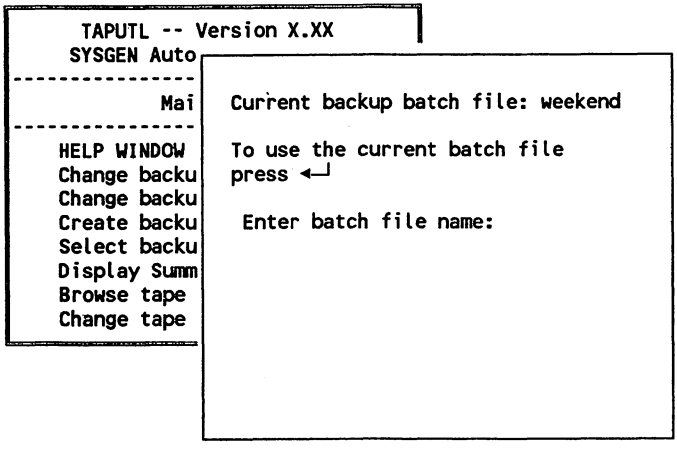
Figure 3-8. Select Current Batch File Screen



Note that the program fills in the default value "dir" in the block for backup batch file name. "Dir" does nothing more than display the contents of the directory; no files are backed up unless this value is replaced by creating a backup batch file.

Selecting the active backup batch file is simple. In example in the last section the Weekend batch file was active. To change this to the Todays batch file, type **todays** and press **<Enter>**. The software then uses the batch file entitled Todays.

If you make a mistake while typing, you can use the **<Backspace>** key to delete the incorrect characters and retype them correctly.

If you type the name of a batch file that does not exist, the software ignores the entry and continues using the current batch file. When you press the **<Enter>** key, the screen returns to the TAPUTL Main Menu.

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Viewing the Display Summary

The Display Summary shows the results of the entries that you made and supplies information about the current backup tape. To access this option, start from the TAPUTL Main Menu.

1. Move the selection bar until it highlights the "Display Summary" command.

2. Press the **<Enter>** key to select the command.

Figure 3-9 shows an example of a Display Summary screen. The information on your Display Summary screen may be somewhat different.

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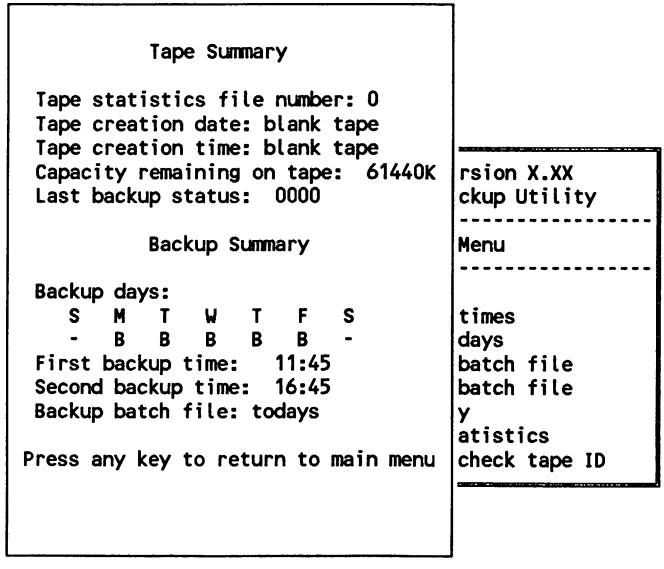
Figure 3-9. Display Summary Screen



The first part of this screen conveys information about the backup tape inserted in your tape subsystem. In the example, the inserted tape is blank.

Whenever you have the SMART software back up your files, it "names" the backup by automatically writing the time and date of the first backup on the tape. When you remove the tape, you should mark this time and date on the tape's label. Otherwise, you are going to be spending an inordinate amount of time using the Display Tape ID screen to identify the backup tape.

The second part of this screen gives the Backup Summary. It notifies you of the current batch file and when you have designated the backups to occur.

This screen provides information to you, but does not accept entries or changes.

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Note:

If you choose to retain your batch files, and backup times and dates for future use by pressing the **<F2>** key, this information will show up after you have rebooted your system. Your new selections will immediately replace current values.

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Browsing the Tape Statistics

The Tape Statistics command allows you to review your automatic backup tapes without having to read each tape.

Your screen must be displaying the TAPUTL Main Menu to select this command.

1. Move the selection bar until it highlights the "Browse tape statistics" command.

2. Press the **<Enter>** key.

Figure 3-10 shows an example of the Browse Tape Statistics screen. Be sure you label your tapes with this information before you place them into storage. This same information is stored in a statistics file on your hard disk.

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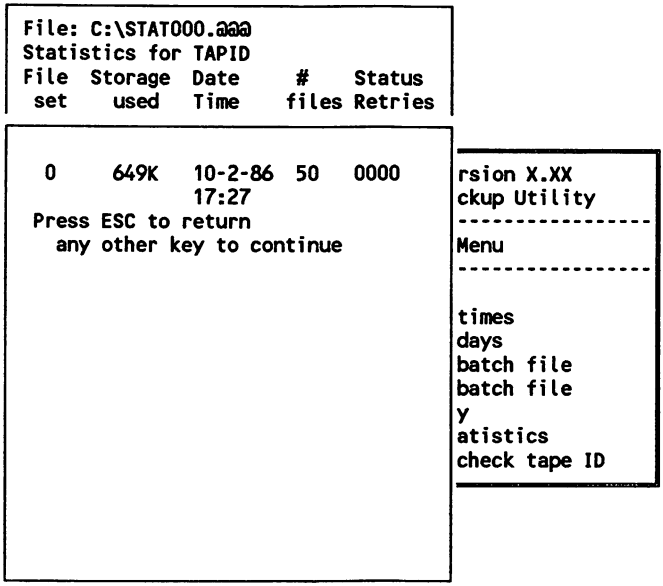
Figure 3-10. Browse Tape Statistics Screen



Notice that each statistics file record contains the following information.

- the fileset number for the backup
- the storage space used by the backup
- the date and time the fileset was created
- the number of files in the fileset
- the completion status of the backup operation
- the number of rewrites during the backup
- the flag status

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Note:

If you abort a backup, only the error message corresponding to the error completion status is shown in the window.

Press **<Esc>** to leave this screen.

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Section 7

Changing Tapes and Checking Tape IDs

You can use the "Change tapes/Check tape ID" command to check the time and day of a backup. You can use this command to check a series of tapes until you find a particular one you are looking for. Use the following instructions to display this command. Your screen must first be displaying the TAPUTL Main Menu.

1. Move the selection bar so that it highlights the "Change tape/Check tape ID" command.

2. Press the **<Enter>** key to select the command.

Figure 3-11 shows a screen similar to the one on your display.

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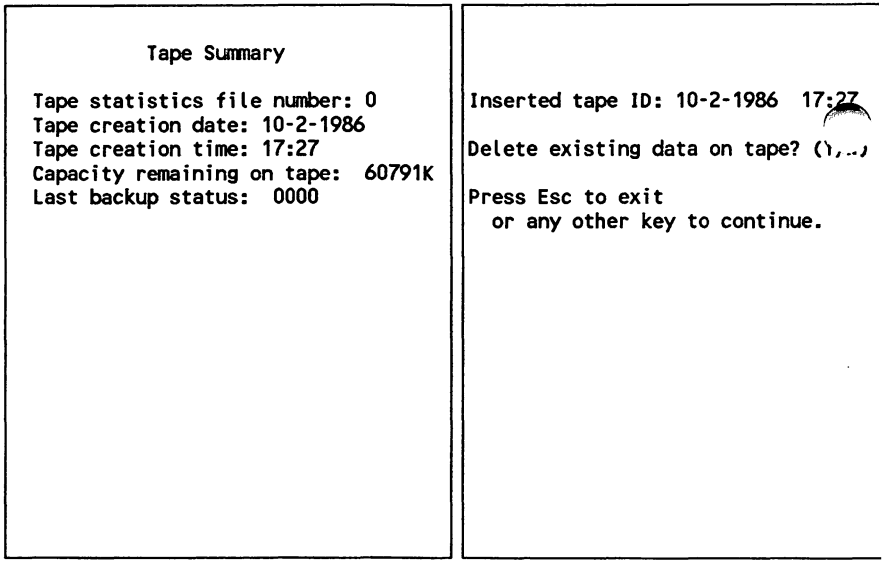
Figure 3-11. Change Tape/Check Tape ID Screen



You can erase the tape at this point if you want to.

To erase the inserted tape, type **Y**. (Do not press the **<Enter>** key after pressing **Y**; it will negate the **Y**.)

You are then given a second chance to change your mind. If you decide you don't want to erase the tape, you can type **N**. If you still want to erase the tape, type **Y**.

To exit this screen without making any changes, press the **<Esc>** key.

This concludes all of the options on the TAPUTL Main Menu. The next section explains the *TAPUTL Command Line Options.* These options can be used, once you are experienced and comfortable with the program, to give you more control over the automatic backup operation.

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Section 8

Setting TAPUTL Command Line Options

This section introduces the options available with TAPUTL. These options can be accessed singly, or in certain combinations that must abide by simple rules. Table 3-3 lists and explains these line options. For detailed information on the use of the options, refer to Appendix D.

Table 3-3. TAPUTL Command Line Functions

Option	Explanation
/I	Initializes the AUTOBAK.COM operation
/C	Checks tape ID
/U	Updates tape statistics and tape parameter files
/R	Restores files by tape ID and fileset number
/D	Prompts for time and date
/Q	Returns to DOS after entries have been made

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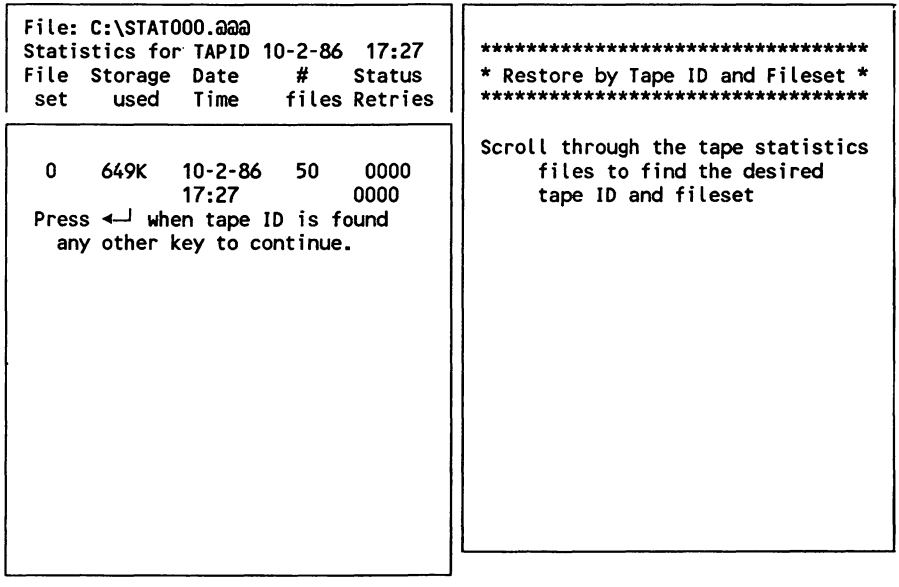
Restoring Non-Network Files

A batch file included with your SMART software allows you to restore your filesets from your tapes. The batch file only works in a non-network environment; do not attempt to use it to restore files on the network.

To access the batch file, type **rest** and press the **<Enter>** key after the DOS prompt.

A screen similar to that shown in Figure 4-1 appears.

Figure 4-1. Restore Tape Statistics Screen



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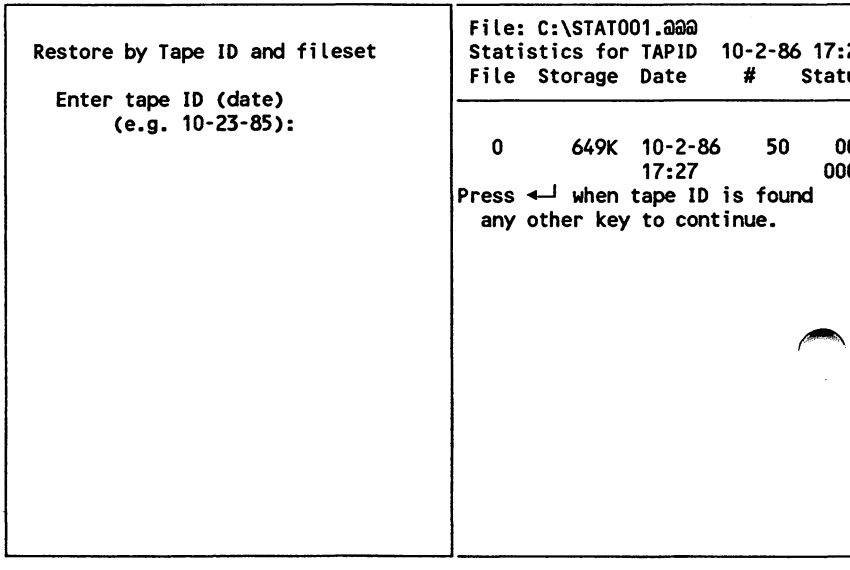
Use the **<Down-Arrow>** key to scroll through the information displayed. You can only scroll from the newest backup to the oldest not vice-versa. This could take some time if you have many backups on tape and you are looking for an older one.

Once you have found the correct tape ID (the time and day of the backup) and the fileset you want to restore, press the **<Enter>** key.

A prompt appears asking for tape ID and fileset information as shown in Figure 4-2.

Figure 4-2. Tape Information Entry Screen



Press the **<Enter>** key after each entry.

The program compares the tape you asked for with the current tape in the drive. If the two tape IDs don't match, the software prompts you to insert the proper tape.

Once you insert the correct tape, specify the destination drive and the files you want to restore to your disk. You can also specify whether you want subdirectories restored.

Figure 4-3 is an example of a completed screen.

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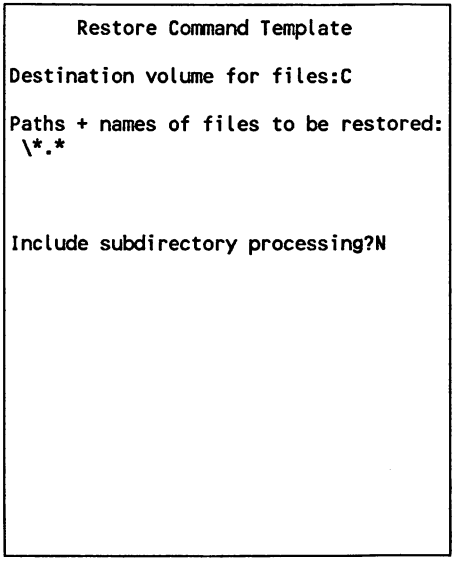
Figure 4-3. Example of a Completed Restore Screen



When you have entered your selections, the SMART software begins restoring your files. The screen scrolls and displays additional information as the restore proceeds, but the program does not require any user intervention at this point.

If you need to restore files to the network, consult the section on the FBACK command.

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Chapter **5**

Using FBACK

Performing a manual backup, using FBACK, gives you greater direct control over the backup specifications. This chapter describes use of the FBACK program. FBACK allows you to do a file-by-file backup onto tape *filesets* and to restore your data manually. Table 5-1 defines the tasks you can do using the FBACK program. Some of these options are invoked through single-line commands; others are accessed through menu prompts. If the program detects that you are logged onto the network, additional command switches are available to control different aspects of the network backup or restore operation.

Table 5-1. FBACK Options

Option	Task
Backup	Make a copy of one or more files onto a SYSGEN tape drive. (Both single-line and menu-prompt modes.)
Restore	Restore one or more files from a SYSGEN tape drive onto a hard disk volume. (Both single-line and menu-prompt modes.)
Catalog	List information about the contents of a tape. (Both single-line and menu-prompt modes).
Restore Group	Restore one or more files from a SYSGEN tape drive to the current directory. (Used only in single line command mode.)

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Table 5-1. FBACK Options (cont.)

Option	Task
File Compare	Compare the contents of a hard disk volume with a tape fileset. (Used only with single-line command mode.)
Quit	Leave FBACK program and return to DOS. (Used only in menu-prompt mode.)

MENU AND SINGLE LINE COMMAND MODE

FBACK allows you to direct backup operations either by responding to on-screen prompts or using single-line commands.

Section 1 describes the FBACK Backup option in prompt mode.

Section 2 describes the FBACK Restore option in prompt mode.

Section 3 shows you to gain information about the files stored on a tape by using the Catalog option.

Section 4 explains the single line command options and gives examples of using them.

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FBACK ERRORLEVELS

If you are going to use the single-line commands in a batch file (other than in TAPUTL auto mode), you should be aware of the following error return codes.

The FBACK program generates error return codes for use in batch files. These codes are shown in Table 5-2.

Table 5-2. Error Return Codes and their Meanings.

Return Code	Activity
0	Operation successful
2	File compare failed
4	System error

The following batch file tests for a file compare error and generates an error message. Use the DOS EDLIN program to create a file using the ".BAT" extension and enter the following statements. Execute these statements by typing the name of the batch file.

```
FBACK/F /0 *.* c:
IF ERRORLEVEL 2 goto miscomp
GOTO END
:miscomp
REM File compare error detected
:end
```

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FBACK NETWORK COMPATIBILITY

If you have a network version of the SMART software, then FBACK supports backup and restore operations under Novell's Advanced NetWare including network parameters and supervisory functions. The SMART software includes several network-specific command functions that can be activated only when a network log-on has occurred. If you are not sure whether your version of SMART is network compatible, check the addendum included with this manual that lists current network products.

The network-specific commands are covered in this chapter in the areas appropriate to the given command. Additional information about using the SMART program in a network environment appears in Chapter 7.

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Section **1**

Backing up With FBACK

This section describes how to use the FBACK prompt mode to back up files onto tape filesets. With the prompt mode, you have several responses from which you can choose. Each of these responses is described in detail. Once you have become familiar with the choices, you may want to enter your options directly on the command line. This single line command mode is described in Section 4.

Type **fback** and press **<Enter>**.

Figure 5-1 shows the information that appears on your screen.

Figure 5-1. FBACK Copyright and Menu Screen

```
C:\>fback
FBACK   V4.00 -- Sysgen QIC-FILE60 File Backup/Restore Utility
                 Copyright (c) 1983, 1984, 1985, 1986, 1987 Sysgen Inc.

Backup, Restore, Catalog, or  Quit?
```

The Menu shows the four FBACK options you can select using the prompt mode: BACKUP, RESTORE, CATALOG, or QUIT.

In the following example, you will back up the files *.DOC and C:\SMART\USER?.* that you created or modified during a one-week period from June 7, 1985 through June 14, 1985.

Notice that you may use *wild cards* (* and ?) to specify file names.

Type **B** and press **<Enter>**.

The screen now prompts you to enter the names of the files you want to back up.

Type **c:*.doc** and press **<Enter>** following "Enter file name." The prompt message appears a second time.

Type **c:\smart\user?.*** and press **<Enter>** following this second prompt. The same prompt message appears a third time.

Press **<Enter>** to indicate that you have finished entering file names.

The program now prompts you to enter an initial date. Enter a date if you want to back up files created or modified on or after a specific date. In this example, you want to back up these files beginning June 7, 1985. If you wanted to accept the default response of 1-01-80, you would press the **<Enter>** key.

If you have some files without date stamps and want to back them up, you must change the initial date prompt to 00-00-1980. You must use dashes to separate the month, day, and year.

Type **06-07-1985** and press **<Enter>** to enter an initial date.

Once you have pressed **<Enter>**, the screen responds by displaying another prompt message. This message prompts you to enter an initial time. Notice that its default answer is 00:00. This default will back up the files you specify whether or not they have time stamps. If you want to back up the specified files that you created or modified beginning at 9:30 AM, you would change the default response to 09:30.

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Press **<Enter>** to accept the initial default time.

The screen now prompts you to enter a final date. Because you only want the files backed up for a one-week period, you must change the default answer from 12-31-2099 to June 14.

Type **06-14-1985** and press **<Enter>**.

The next message prompts you to enter a final time. Because you did not enter any initial time, you can accept the default final time of 23:59. Notice that you must enter the time using the 24-hour format. If you do want a specific time interval, check Table 3-2 for the correct time format.

Press the **<Enter>** key to complete this response.

The next prompt is a comment field. You may use this field to remind yourself of the nature of this fileset, or to add helpful information. You may enter up to 40 characters to be shown on subsequent operations. As an example, you could call this fileset "Documentation for Users" to remind you later of the files contained in this fileset. If you don't want to add a comment line, simply press **<Enter>**.

Type **Documentation for Users** and press **<Enter>**.

To make sure that all of the *.DOC files are included in this backup, you need to type Y in response to the "Include Subdirectory processing" message. If there are any .DOC files in subdirectories, they will be backed up. If you do not want to include the subdirectories, you may accept the default answer of N.

Type **Y** and press **<Enter>** to complete this entry.

If you have already made other backups of these files, you may want to include only those files that have changed since your last backup operation. The prompt message "Backup only files marked as

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Modified" allows you to do this. For a first backup, you would normally choose No.

Type **Y** to back up only the files you have changed since the previous backup and press **<Enter>**.

You are now asked if you want to delete the existing data on the tape. If you type No, the FBACK program scans the entire tape to find the end of the last fileset. It will then begin writing the new backup at that point. This allows you to have multiple backups on the same tape.

Warning:

If you plan to continue using a tape for automatic backups, do not perform a manual backup on it. The automatic backup program must use tapes with *only* automatic backups on them.

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If you do not want the existing data on the tape, you may have the FBACK program erase the tape by typing Y in response to this message. Assume that this is a new tape that you are using for the first time. You must always erase a new tape before you use it for the first time.

Type **Y** and press **<Enter>** for this prompt message.

If you have logged onto the network, at this point the program asks several questions about the backup that are specific to network use.

The screen now displays several messages summarizing the choices you have made. For the above example, it displays:

```
Constructing Fileset Directory
Deleting old data on tape.
New Fileset ID is 0.
Backup in progress ...
C:CHAP1.DOC
C:CHAP2.DOC
C:CHAP3.DOC
C:\SMART\USER1.DOC
C:\MANUAL\CHPT1.DOC
C:\SMART\USER1.DOC
C:\SMART\USER2.TXT
7 files were backed up in fileset 0.
```

You asked for all of the modified .DOC files on every subdirectory and all of the modified files starting with USER? on the \SMART subdirectory. This summary allows you to see exactly which files were backed up. Notice that C:\SMART\USER1.DOC was backed up two times as it filled each of the two requirements.

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Once your backup completes, the FBACK program returns to the Menu screen. You may want to stay within the FBACK program and select another command.

If you want to leave the FBACK program, select Q and the tape begins rewinding. During the time that the tape is rewinding, do not attempt any other operations. The integrity of the data on the tape could be compromised unless the tape is fully rewound. When the tape drive motor stops spinning and the DOS prompt returns to the screen, you can remove the tape from the drive, label it, and store it in its protective case.

Never exit from the program using a **<Ctrl> C**.

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Restoring With FBACK

Restore is the second command in the FBACK Menu. You can restore one or more files from a specific fileset to the same directory or subdirectory from which you backed it up. You can also restore one file or a group of files to the root directory.

In the following example, you are going to restore a file named CHAP2.DOC to volume C: on the hard disk. You can use the information from the previous section.

Type **fback** and press **<Enter>** to display the FBACK Menu (if necessary).

Type **R** to select the Restore option.

The screen displays a message prompting you to type the volume letter to which the file is to be restored. If you do not specify a volume letter, the file will be restored to the current hard disk volume.

Type C and press **<Enter>** for this example.

You are prompted to enter the fileset number. In the backup example, we backed up this file on Fileset 0.

Type **0** and press **<Enter>**.

Now you can enter the name of the file you want to restore.

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Type **chap2.doc** and press **<Enter>**. The same prompt message displays again.

Press **<Enter>** to indicate you have finished entering file names.

The program now prompts you to enter an initial date. If you are restoring a single file, it does not generally make sense to specify a date and time range. However, for practice, you may enter the same date you used when you backed up the fileset. In this example, you want to restore the CHAP2.DOC file beginning June 7, 1985. If you wanted to accept the default response of 1-01-80, you would press the **<Enter>** key.

If you have some files without date stamps and want to restore them, you must change the initial date prompt to 00-00-1980.

Type **06-07-1985** and press **<Enter>** to enter an initial date.

Once you have pressed **<Enter>**, the screen responds by displaying another prompt message. This message prompts you to enter an initial time. Notice that its default answer is 00:00. This default answer will restore the files you specify whether or not they have time stamps. If you want to restore the specified file(s) that you backed up with a time stamp of 9:30 AM, you would change the default response to 09:30.

Press **<Enter>** to accept the initial default time.

The screen now prompts you to enter a final date. Because you only want to restore the CHAP2.DOC file backed up during a specific one-week period, you must change the default answer from 12-31-2099 to June 14, 1985.

Type **06-14-1985** and press **<Enter>**.

The next message prompts you to enter a final time. As you did in the initial time prompt, you can accept the default final time of 23:59. However, if you do want a specific time interval, check Table 3-2 for the correct time format.

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Press the **<Enter>** key to complete this response.

Once you have answered all of the prompt messages, the FBACK program displays the following on the screen.

```
Rewinding tape.
Restoring from Fileset 0 to volume C
C:CHAP2.DOC
1 file(s) restored on volume C.
```

If the CHAP2.DOC file had not been in Fileset 0, you would see a "File not found" message on the screen. The next section explains the FBACK Catalog command that allows you to find in which fileset a file actually resides.

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Cataloging With FBACK

If you forget the files that you have backed up on a tape, you can use the FBACK CATALOG command to display information about them.

Type **fback** and press **<Enter>** to display the FBACK Menu (if necessary).

Type C to select the Catalog command.

The first prompt message asks you if you want to scan through all of the filesets on the tape beginning with Fileset 0. If you want to know everything on the tape, type Y in response to this message.

If you only need to know about a specific fileset, type N in response to this message. The program then prompts you to enter the starting and ending fileset numbers you want to scan.

Type Y and press **<Enter>** as there is only one fileset in this example.

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You are asked if you want to display the fileset labels only. If you choose Y, your catalog listing shows only the fileset size, the time and date information, and the comment.

Type N to this prompt and press **<Enter>** to display information about files within a fileset.

Now you can choose the file names you want to display. If you want to display all of the file names, type **Y** and press **<Enter>**. This is useful when you want to verify that certain files are on the tape.

If you do not want to display all the file names, then type N to this prompt and press **<Enter>**.

In this example, you only want to display the files ending with .DOC.

The next prompt message allows you to do this. It asks you to enter the file names you want to see.

Type ***.doc** and press **<Enter>**. The prompt message displays again.

Press **<Enter>** to indicate that this is the only file name you want.

The screen displays the names of the files on fileset 0 that have the .DOC extension.

```
C:\CHAP1.DOC
C:\CHAP2.DOC
C:\CHAP3.DOC
C:\MANUAL\CHPT1.DOC
C:\SMART\USER1.DOC
```

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Note:

If you choose to display only specific file names and have specified multiple filesets, FBACK omits any fileset that does not contain any of the specified files.

Figure 5-2 illustrates the information you will see on your screen.

Figure 5-2. Example Catalog Entry

```
FILESET          COMMENT                          SIZE   FILES    DATE     TI
-------          -------                          ----   -----    ----     --

0  "Documentation for Users                  "    176  K      5  6-08-1985 11

PATH                          NAME          SIZE  FLAG     DATE       TIME
----                          ----          ----  ----     ----       ----

C:\
                          CHAP1    DOC     59960     0    6-07-1985      1
                          CHAP3    DOC       222     0    6-08-1985      1
                          CHAP2    DOC     56928     0    6-08-1985  11:10

C:\MANUAL\                CHPT1    DOC     59960     0    6-07-1985  08:31

C:\SMART\                 USER1    DOC     59960     0    6-07-1985  08:31



Backup, Restore, Catalog, or  Quit?
```


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Table 5-3 describes what the headings on the Catalog screen mean.

Table 5-3. Catalog Screen Headings

Heading	Definition
Fileset	The number assigned to one or more files included in a backup operation.
Comment	40 characters that provide information about the files in a fileset.
Size	Total size of the fileset.
Files	Number of files in a specific fileset.
Date	Date the backup began for this fileset.
Time	Time the backup began for this fileset.
Path	The unique sequence of DOS directory (and subdirectory) names that specifies the route between the root directory and a given file. A backslash character separates each directory.
Name	File name (same as that shown in a DOS DIR command).
Size	Size of file (same as a DOS DIR command).

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Table 5-3. Catalog Screen Headings (cont.)

Heading	Definition
Flag	Set bits to indicate file attribute.

Flag	File Attribute
0	Archive bit cleared
1	Read only file
2	Hidden file
3	Read only and hidden file
4	System file
5	Read only and system file
6	Hidden and system file
7	Read only, hidden, and system file

Date	Date of file creation or update (same data as given in DOS DIR command).
Time	Time of file creation or update (same data as given in DOS DIR command).

Once you have become familiar with these FBACK commands and options, you may want to use "shortcuts." Section 4 shows you how to use the FBACK single line command options.

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Using FBACK Single Line Command Options

You can designate your FBACK command and options directly from DOS or from a batch file instead of using the FBACK Menu and prompt mode. Type your choices on the same line as the FBACK command. You have the same options available to you; Backup, Restore, and Catalog. In addition, you also have the File Compare and Restore Group options. With File Compare, you can compare the contents of files or filesets on tape with those on the hard disk. Using Restore Group, you can restore files to the current directory. When in this mode, the /Q does not stand for Quit. This option executes a retension pass.

Table 5-4 gives the common options you can use with the FBACK commands and their definitions.

Table 5-4. Common FBACK Line Options

Option	Definition
/fromdate	Specify files starting with a certain date. The date must be separated by dashes; e.g., 06-01-1985. If not specified, this date defaults to 01-01-1980. You must specify a starting date if you are going to use an ending date (*/todate*).

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Table 5-4. Common FBACK Line Options (cont.)

Option	Definition
/todate	Specify files ending with a certain date. The date must be separated by dashes; e.g., 06-07-1985. If not specified, this date defaults to 12-31-2099.
/fromtime	Specify files starting with a certain time. The time must contain a colon; e.g., 12:30. If not specified, this starting time defaults to 00:00.
/totime	Specify files ending with a certain time. The time must contain a colon; e.g., 16:45. If not specified, this final time defaults to 23:59.
filespec	Specify the file names to be backed up. Must include any extensions. Use *vol*:*.* to back up all files. FBACK command will be rejected if no file is specified.
/S	Include all files in the current directory and subdirectories.
vol	Specify the destination volume letter; e.g., C.
/Q	Execute a retension pass on the tape before executing a command.
/K	Collect or restore network information about file attributes, trustee assignments, and other network details.
/W	Continue monitoring all locked files at the end of the backup. Back up each as it becomes unlocked.

Notice that you do not have to specify a Quit command as you do with the FBACK Menu. This function is built-in. Once you press the **<Enter>** key, FBACK "knows" that this command is to be executed immediately.

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FBACK LINE COMMAND-BACKUP

The format for an FBACK backup single line command with options is:

FBACK/B*ackup* **/DEL***ete* **/M /N /S /K /W** ***filespec ... /fromdate /fromtime /todate /totime /"comment"*** **/Q**

You must enter the options in the order shown, although you may omit some of the options. The characters or words in italics are for your information only. For instance, *filespec* is an indication that you should substitute the name of a file. However, the diagonals are required whenever you enter initial dates and times and final dates and times.

Table 5-5 defines the options unique to the Backup single line command.

Table 5-5. Backup Options

Option	Definition
/B	Back up files from a hard disk volume to a SYSGEN tape drive.
/"comment"	Identify type of files in operation. You may enter up to 40 characters to be displayed in subsequent operations. A comment must be enclosed between quotation marks; e.g., "Monday".
/DEL	Delete all previously recorded data on the tape before this backup begins.
/M	Back up only those files modified since the previous backup.
/N	Omit all hidden files and system files from this backup operation.

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You can use these options in addition to the common options shown in Table 5-4.

FBACK Backup Examples

The following examples show how you can use the options to create a single line command.

FBACK/B /DEL /S C:*.* /"Backup all"

Delete old data on the tape (or when using a new tape). Back up all files both in the root directory and subdirectories of disk volume C and add the comment "Backup all."

FBACK/B /M C:\ACCOUNT*.SAL

Do not delete old data on tape, but allow FBACK to write this backup at the end of the existing data. Back up those files under the path name given which have been modified since the last backup.

FBACK/B C:\SMART\MANUALS.DOC C:\XY*.DOC

Back up files under two different path names in one single line command.

FBACK/B /K F:\ROCKS*.* /07-22-1987 /07-28-1987

Back up all of the files in network directory F: within the ROCKS subdirectory if dated between the 22nd to 28th of June 1987. Include network information in the backup.

FBACK/B /K /W Z:*.*

Back up all of the files in the network subdirectory Z: including network information in the backup. Wait at the end for locked files to be unlocked to include these files in the backup.

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FBACK LINE COMMAND-RESTORE

The format for an FBACK restore single line command with options is:

FBACK/R*estore* **/P /S /K /W /A** */fileset filespec... /fromdate /fromtime* /todate */totime vol:* **/Q**

The command letter (in this case, /R) is order-dependent. You must enter the options in the same order as shown in the format, but you may omit some options. As you can see, the format for the restore single line command is similar to the backup single line command. Notice that you may enter more than one file specification. Again, the items in bold are command letters and those in italics are given for information.

Table 5-6 defines those options used only with Restore command.

Table 5-6. Restore Options

Option	Definition
/R	Restore one or more files from the SYSGEN tape drive to a hard disk volume.
/fileset	Specify the group of files to be restored. Default is Fileset 0.
/P	Prompt user before overwriting any file on disk that is either marked read-only, or is of a later date than the file on the tape.
/A	Restore multiple filesets backed up from the network with the same time and date stamp.

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FBACK Restore Examples

The following are examples of how to use the Restore options to form a single line command.

FBACK/R /S /0 *.* C:

Restore all files in Fileset 0 onto disk volume C:, including all subdirectories.

FBACK/R /1 \ACCOUNT*.SAL /2-02-1985 /00:00 /2-28-1985 /23:59 D:

Restore all files with a .SAL extension in the ACCOUNT subdirectory from Fileset 1 within the given date and time range onto disk volume D:.

FBACK/R /0 \SMART\MANUALS.DOC \XY*.DOC C:

Restore files under two different path names from Fileset 0 to disk volume C:.

FBACK/R /P /A /07-22-1987 /07:00 /Z:

Restore files backed up at 7:00 A.M. on 07-22-1987 to network subdirectory Z:, prompting the user before overwriting files that are marked read-only or more recent than the backed-up file. Include all filesets marked with the same time and date stamp.

FBACK LINE COMMAND-RESTORE GROUP

The format for an FBACK restore group single line command with options is:

FBACK/R*estore* **/S** */fileset filespec... /fromdate /fromtime /todate /totime vol:* **/G /Q**

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You must enter the options in the order shown in this format, but you may omit options. Notice that this format is very similar to the Restore command format. Table 5-7 shows the options unique to Restore Group.

Table 5-7. Restore Group Options

Option	Definition
/G	Specify a file or files to be restored only to the current directory.
vol:	Specify the disk volume letter on which the files are to be restored; e.g., C:. This option is required in the single line command mode.

FBACK Restore Group Examples

```
FBACK/R /0 \*.* C: /G
```

Restore all files from the root directory in fileset 0 to the current directory on disk volume C:.

```
FBACK/R /1 \ACCOUNT\*.SAL /2-02-1985/00:00 /2-28-
1985/23:59 C: /G
```

Restore files from Fileset 1 under path name and given date and time range to the current directory on disk volume C:.

```
FBACK/R /3 \BILL\MANUALS.DOC \XY\1.DOC C: /G
```

Restore two different files under two different path names from Fileset 3 to the current directory on disk volume C:.

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FBACK LINE COMMAND-FILE COMPARE

You can only use the File Compare command in single line command mode. The format for an FBACK file compare single line command with options is:

FBACK/F*ilecomp* **/S** */filesetfilespec... /fromdate /todate /fromtime /totime vol:* **/Q**

You must enter the options in the order shown in the above format, although you may omit options. File Compare is a good way to make sure your backup operation was successful and that the data on your tape matches the data on your hard disk.

Table 5-8 defines the File Compare option.

Table 5-8. File Compare Options

Option	Definition
/F	Compare the files stored on a tape with those on a hard disk volume.
/K	Expands the file compare operation to include multiple filesets backed up from the network at one time, related by having a common time and date stamp.

FBACK File Compare Examples

FBACK/F /0 *.* C:

Compare all of the files of the current system directory in Fileset 0 with disk volume C:.

FBACK/F /K *.* Z:

Compare all of the files in the multiple filesets backed up from network directory Z:.

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FBACK/F /1 \BILL\MANUAL.DOC \XY\1.DOC C:

Compare two different files under two different path names in Fileset 1 with disk volume C:.

FBACK/F /S /0 *.* C:

Compare all of the files both in the root and subdirectories of Fileset 0 with disk volume C:.

FBACK LINE COMMAND-CATALOG

The format for an FBACK Catalog single line command is as follows:

FBACK/*C**atalog* **/L** */firstset* */lastset filespec...*

You must enter the options in the above order, although any of the options may be omitted. Notice that you may enter more than one file specification. Again, the items in bold are command letters and those in italics are given for information.

Path names are not allowed in Catalog. The FBACK/C command automatically searches all directories and subdirectories.

Table 5-9 defines those options used only with the FBACK Catalog command.

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Table 5-9. Catalog Options

Option	Definition
/C	List information about files backed up on a tape.
/L	Display the Fileset Label information only (no file breakdown is given).
/firstset	Specify the first fileset to be cataloged. If this entry is omitted, the program assumes all filesets on the tape.
/lastset	Specify the last fileset to be cataloged. If this entry is omitted, the program assumes the last fileset is the same as the first fileset; therefore, FBACK processes only one fileset.

FBACK Catalog Examples

FBACK/C

List information on files of every fileset on the tape.

FBACK/C /5 /7 MANUAL.DOC

List information on all files named MANUAL.DOC in filesets 5, 6, and 7.

FBACK/C /L /1 /3

List information on filesets 1, 2, and 3, but not the information on individual file names in each fileset.

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Chapter **6**

Using the IBACK Program

The IBACK program allows you to back up volumes onto tape *images*; each image represents the total quantity of data contained within a specified volume. Data stored within an image cannot be divided into individual files. Each backup and restore is done sector by-sector.

IBACK cannot operate in a network environment.

Table 6-1 defines the tasks you can do using the IBACK program.

Table 6-1. IBACK Options

Option	Task
Backup	Make a copy of one or more hard disk volumes onto a SYSGEN tape drive.
Restore	Restore one or more hard disk volumes from a SYSGEN tape drive onto a hard disk drive.
Catalog	List the contents of a tape.
Quit	Exit the IBACK program and return to DOS.

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MENU AND SINGLE LINE COMMAND MODE

IBACK allows you to direct image backup operations either by responding to on-screen prompts or using single-line commands.

Section 1 describes the IBACK Backup option in prompt mode.

Section 2 describes the IBACK Restore option in prompt mode.

Section 3 shows you how to use the Catalog option to find the volume contents of a tape.

Section 4 explains the single line command options and gives examples of using them.

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Section 1

Backing up With IBACK

This section describes how to use the IBACK prompt mode to back up a volume. Prompt mode guides you through the process of specifying the details of an image backup. The same questions that are answered in prompt mode can be entered directly using command mode as described in Section 4.

Type **IBACK** and press **<Enter>**.

The IBACK Menu Screen appears.

Figure 6-1. IBACK Copyright and Menu Screen

```
C:\>iback
IBACK   VX.00 -- Sysgen QIC-FILE60 Volume Backup/Restore Utility
                 Copyright (c) 1983, 1984, 1985, 1986, 1987 Sysgen Inc.

Backup, Restore, Catalog, or  Quit?
```

Four IBACK options can be selected: BACKUP, RESTORE, CATALOG, or QUIT.

In the following example, you will back up volume C: that contains the documentation files.

Type **B** and press **<Enter>**.

The screen now prompts you to enter the volume letter you want to back up.

Type **c** and press **<Enter>** following "Backup which volume(s)."

The next prompt is a comment field that you can use to remind you later of the contents of the backup. Up to 40 characters may be entered to be displayed in subsequent operations. As an example, you could call this backup "Documentation volume." To skip the comment line, press **<Enter>**.

Type **Documentation volume** and press **<Enter>**.

The program asks if you want to delete the existing data on the tape. If you type "N," the IBACK program scans the entire tape to find the end of the last backup and begins writing the new backup at that point. Several backups can be contained on one time, depending on the length of each backup. Tapes with FBACK backup filesets can also include IBACK backups.

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Warning:

Do not attempt to store this manual IBACK backup on the same tape with the TAPUTL automatic backup.

To remove the existing data on the tape, type **Y** to have the IBACK program erase the tape.

Assuming that this is a new tape that you are using for the first time, you must type Y to initialize the tape.

Type **Y** and press **<Enter>** to continue.

The screen displays several messages summarizing the choices you have made. For the above example, it displays:

```
Rewinding tape
Deleting old data on tape.
New Image ID is 0.
```

The screen displays the characteristics of the volume you are attempting to backup; in this example, volume C. Your screen should display similar values:

```
Sector size       = 512
Cluster size      = 4096
Directory entries = 512
Total clusters    = 2586
```

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You may want to write down the actual values that the program displays for later reference. The screen then displays the number of tape rewrites that were necessary to back up the volume. If the number of tape rewrites reaches more than 2 per megabyte, your tape may be getting worn.

Once your backup completes, IBACK returns to the Menu screen. You can continue to select commands from the IBACK menu.

To leave the IBACK program, select Q. The tape is then rewound. This takes a few moments, do not try to interrupt the rewinding or you could threaten the data integrity on the tape. When the rewinding has stopped, remove the tape from the drive, label it, and store it in its protective case.

Caution:

Attempting to use the Print Screen key or any memory-resident programs while IBACK is running can cause an error message to be generated.

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Restoring With IBACK

Restore is the second command in the IBACK Menu. To restore, you must know the specific Image ID to which you backed up the volume.

In the following example, you are going to restore a volume from the SYSGEN tape drive to the hard disk. You can use the information from the previous section.

Type **IBACK** and press **<Enter>** to display the IBACK Menu (if necessary).

Type **R** to select the Restore option.

The program prompts you to enter the Image ID number. In the backup example, we backed up this volume on Image ID 0.

Type **0** and press **<Enter>**.

Now you can enter the volume letter to which you want to restore.

Type **c** and press **<Enter>**.

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You cannot restore a volume Image onto a volume of a different size. If the following parameters do not match *exactly* (except for the total number of clusters which may be different), the restore operation does not take place. The values shown in this example may differ from the values on your tape. Once you have answered all of the prompt messages, the IBACK program displays the following on the screen.

```
Rewinding tape.
Sector size          = 512
Cluster size         = 4096
Directory entries    = 512
Total clusters       = 2586
```

The screen displays the number of bytes the program restored from Image ID 0 to volume C:; e.g., 3694 bytes.

At this point, the Restore operation is completed.

You next see the number of tape rereads necessary to restore the volume to the disk. If it is higher than 2 per megabyte, you may need to replace your tape.

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Section 3

Cataloging With IBACK

The IBACK CATALOG command display the contents of tapes.

Type **IBACK** and press **<Enter>** to display the IBACK Menu (if necessary).

Type **C** to select the Catalog command.

The program asks if you want to scan through all of the Image IDs on the tape beginning with Image 0. If you want to know everything on the tape, type **Y** in response to this message.

If you only need to know about a specific Image backup, type N in response to this message. The program then prompts you to enter the starting and ending Image ID numbers you want to scan.

Type **Y** and press **<Enter>** since there is only one Image backup in this example.

You will then see a "Rewinding tape" message on the screen. Figure 6-2 illustrates the information you will see on your screen.

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Figure 6-2. Example Catalog Entry

```
Backing up   9177  K bytes on Volume C to Image 0.

        Number of tape rewrites  =  0

Rewinding tape.

Backup of Volume C complete.

Backup, Restore, Catalog, or  Quit?  c

Scan ALL Image ID?  [Y]
Rewinding tape.


IMAGE ID                COMMENT                  SIZE   VOLUME   DATE
--------                -------                  ----   ------   ----

    0       "Documentation volume            "  9177  K   DOS C  10-2-1986 1

Rewinding tape.

Backup, Restore, Catalog, or  Quit?
```


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Table 6-2 defines the headings on the Catalog screen. .

Table 6-2. Catalog Screen Headings

Heading	Definition
Image ID	The number assigned to the volume backed up on a tape.
Comment	40 characters that provide information about the volume in an image.
Size	Total size of the Image backup.
Date	Date the backup began for this image.
Time	Time the backup began for this image.

Once you have become familiar with these IBACK commands and options, you can enter them more directly in command line format as described in Section 4.

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Using IBACK Single Line Command Options

You can designate your IBACK command and options directly from DOS or from a batch file instead of using the IBACK Menu and prompt mode. Type your choices on the same line as the IBACK command. You have the same options available to you; Backup, Restore, Catalog, and Quit.

Table 6-3 gives the common options you can use with the IBACK commands and their definitions.

Table 6-3. IBACK Line Options

Option	Definition
/B	Specify a sector by sector backup of a volume.
/R	Specify a sector by sector restore of a backed up volume.
/C	Specify a list of the tape Image contents.
/Q	Execute a retension pass before executing a command.

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Table 6-3. IBACK Line Options (cont.)

Option	Definition
/M	Cause program to prompt for additional tape(s) if needed to complete the backup. You must begin with a blank tape; otherwise, this option erases the current data. This option is used in IBACK/B only.
/Z	Display the size of memory available for buffer space.
/DEL	Delete previously recorded data on a tape before doing a backup.
/ImageID	Specify the number of the Image where the volume is backed up.
vol:	Specify the source or destination volume letter; e.g., C.

Notice that you do not have to specify a Quit command as you do with the IBACK Menu. This function is built-in. In this mode, the /Q option executes a tape retension pass.

IBACK LINE COMMAND-BACKUP

The format for an IBACK backup single line command with options is:

IBACK/B*ackup* **/DEL***ete vol: ... /"comment"* **/Q**

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Enter all options in the order shown, although you may omit some of the options. Boldface characters represent exact commands or options. The characters or words in italics are for your information only. For instance, *vol* is an indication that you should substitute the letter of a volume. However, the diagonals are required whenever you enter any of the options.

IBACK Backup Examples

The following examples show how you can use the options to create a single line command.

IBACK/B /DEL C: /"First Backup"

Delete old data on the tape (or when using a new tape). Back up disk volume C and add the comment "First Backup."

IBACK/B D: /"Second disk"

Do not delete old data on tape, but allow IBACK to write this backup at the end of the existing data. Back up volume D and add comment "Second disk."

IBACK LINE COMMAND-RESTORE

The format for an IBACK restore single line command with options is:

IBACK/R*estore /ImageID vol*: **/Q**

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You must enter the options in the same order as shown in the format, but you may omit some options. As you can see, the format for the restore single line command is similar to the backup single line command. Again, the items in bold are command letters and those in italics are given for information.

IBACK Restore Examples

The following are examples of how to use the Restore options to form a single line command.

IBACK/R /0 C:

Restore contents of Image 0 onto disk volume C.

IBACK/R /1 D:

Restore contents of Image 1 onto disk volume D:.

IBACK LINE COMMAND-CATALOG

The format for an IBACK Catalog single line command is as follows:

IBACK/*Catalog /fromID /toID* **/Q**

Enter these options in the order shown, although you may omit options. The items in bold are command letters and those in italics are given for information.

Table 6-4 defines those options used only with the IBACK Catalog command.

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Table 6-4. Catalog Options

Option	Definition
/fromID	Specify the first Image to be cataloged. If this entry is omitted, the program assumes all Images on the tape.
/toID	Specify the last Image to be cataloged. If this entry is omitted, the program assumes the last Image is the same as the first Image; therefore, IBACK processes only one Image.

IBACK Catalog Examples

The following examples show how to express Catalog options within a single line command.

IBACK/C

List information on all volume Images on the tape.

IBACK/C /5 /7

List information in Images 5, 6, and 7.

IBACK/C /3

List Image 3 only.

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Chapter **7**

Network Backups with SMART Software

Using the current version of the SMART Software, backups of files on a Novell NetWare network can be accomplished. Several network-specific commands have been added to the SMART command set. These specific commands are described both in this section, and in the body of the manual where switches for the various functions are covered. This chapter discusses those commands that are specific to network operation, and fundamental considerations while using the SMART software in a network environment.

USER AND SUPERVISOR BACKUPS

SMART software supports backup operations across the network both at a user level and at a supervisor level. Most of the basic SMART commands work the same as in the past, whether or not the backup is taking place on the network. However, access to files on the network is controlled by the privileges granted by the NetWare system supervisor (or system administrator). For example, a single user may have "read" access to a NetWare subdirectory and may backup files under this subdirectory, but unless that user also has "write" access, the same files could not be restored to the subdirectory.

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User-Level Backup

Backups for a single user should be limited to personal files in public partitions, or trustee assignments which are granted under NetWare. A trustee assignment is essentially a set of access definitions granted to a user allowing specified files to be manipulated in certain ways. A file can be opened, read, written, searched, or otherwise handled according to the nature of the trustee assignment on an individual subdirectory.

User backups of individual files or subdirectories include the network information attached to these files and subdirectories. Thus, when files are backed up by SMART software and then restored to the original subdirectory, they retain all the access characteristics that were originally assigned to them.

Supervisor-Level Backups

At the supervisory level, network parameters become an important consideration during the structuring of a backup operation. Beyond the normal programs and data stored on the file server, the supervisor maintains responsibility for a variety of user information, passwords, log-on scripts, electronic mail, and the contents of public subdirectories.

Fortunately, this complex collection of information is consolidated by Novell into specific subdirectories. The volume "SYS" contains a subdirectory, "SYSTEM," with two important hidden files; NET$BIND.SYS and NET$BVAL.SYS contain the pertinent user and network information. The FBACK program recognizes and automatically backs up these files even while the network is active as long as the supervisor ensures that the subdirectory "SYSTEM" under the volume "SYS" is included in the backup instructions. These specific hidden files are known as the Novell Bindery.

Electronic mail files are included in the subdirectory "MAIL" under the volume "SYS." To ensure that all electronic mail and log-on scripts are backed up, the supervisor must back up the entire MAIL subdirectory.

Public files are stored in the subdirectory PUBLIC under the volume SYS, and can be backed up by specifying globally all the files contained within the subdirectory.

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Beyond these distinctions, operation of the SMART software is identical for a single-user and the network supervisor.

Security for the Novell Bindery

Because the hidden files contained in the Novell Bindery contain information like user passwords, backup tapes including this information should be carefully secured. The information stored in the Novell Bindery essentially represents the security of the network. For this reason, we recommend that backup tapes including bindery information be stored in a secure location and access to these tapes should be provided only to those parties responsible for network operation. Bindery files should be kept separate from work files and should not be backed up as a matter of course.

SMART NETWORK COMMAND SWITCHES

The network version of the SMART software features the following command switches that apply to network use only. The functions carried out by these commands can also be specified by answering prompts in the TAPUTL menu.

/K Collect/Restore network information: Designates that during an FBACK backup or restore operation, files containing network information be backed up or restored as well.

/W Wait at end on files locked by others: Instructs the backup program to wait for locked files to be unlocked and closed to allow these files to be included in the backup operation.

/A Restore all network fileset groups: Extends an FBACK restore beyond the usual limit of one fileset to include multiple filesets from a network backup.

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/K Collecting and Restoring Network Information

This option instructs the program to save or restore under FBACK all trustee assignments and subdirectory file attributes. FBACK creates a file called NETIMAGE.TMP to contain this information. NETIMAGE.TMP is stored in the first fileset backed up.

During a network backup with this option active, FBACK checks to see if the specified files reside on local or network drives. Local files are backed up without further network information. Specified files that belong to a network drive are grouped into filesets containing 100 files, all files in the group are locked to prevent data corruption during the backup, and then FBACK writes the entire group to tape. As files are written, they are unlocked so as to be available for use on the network. This process continues through whatever number of filesets are required to backup all specified files. All filesets backed up through this process will have the same time and date labels, allowing them to restored at a later time as a group.

Activating this option can be done either from the command line, by specifying "/K," or by answering the "Y" to the equivalent prompt from the TAPUTL menu while setting up a backup batch file.

This option does not save the system information on the Novell network (such as passwords and electronic mail).

When restoring files backed up with this option, the files must be restored to their original directories for the file attributes and trustee assignments to be valid.

/W Waiting for Locked or Open Files

Whenever FBACK encounters a file that is locked on the network (meaning another user has currently opened that file for use), it is temporarily skipped during the backup process. The network user or supervisor can select, by using this option, whether FBACK will return to back up files that were locked as soon as they are unlocked, or whether these files will be eliminated from the backup list.

This option can be activated either from the command line, by specifying "/W," or from the TAPUTL menu. Within the TAPUTL sequence, when the program asks "Wait at end on files locked by others? [Y]," answer "Y" if you want the program to continue monitoring the locked files to back them up after they are unlocked.

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/A Restoring Network Fileset Groups

FBACK groups network files into filesets of 100 during backup, locking the entire group at the beginning of the backup and then unlocking individual files as they are written to tape. No other network user can access these files during backup until FBACK releases the files by unlocking them.

A typical network backup could conceivably require several filesets to cover all the backed up files. Normally, during a restore operation, the FBACK program stops after restoring one fileset. By activating the option to restore network fileset groups, FBACK continues to restore multiple filesets marked with the same time and date stamp until the entire network restoration has been completed.

To activate this option, specify "/A" on the FBACK/R (RESTORE) command line, or answer "Y" to the TAPUTL prompt: "Restore network filesets as a group? [Y].

HANDLING OF LOCKED FILES

To prevent the corruption of files during network operation, Novell will lock files that are in use by a user on the network. Other files that are not available to more than one user (such as those being used on a local drive) could possibly be open at the time of backup. Neither locked nor open files can be backed up by the SMART software. The program, however, includes a feature that lets you skip over these locked and open files, and return to them later, waiting until the files are closed or unlocked before including them in the backup. See the information on Waiting for Locked or Open Files for an explanation of this feature.

REST.BAT

The batch file REST.BAT is provided on the SMART diskette to prompt the user through non-network restore operations. This batch file *cannot* be used to restore files in the network environment.

To restore files to the network, use the RESTORE option included under the FBACK command.

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Appendix **A**

Keys and Their Functions

The SMART Software recognizes the following special-purpose keys during program operation.

The symbols on the keytops (shown on the left-hand side of the table) match the key names used throughout this manual.

Press	To
	Exit from any option or from the TAPUTL Main Menu.
	Delete an entry or exit from certain options.
	Turn off the backup-alert tone and disable the currently scheduled backup.
	Causes temporary changes to become immediately effective. Changes are lost when the computer is rebooted.

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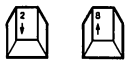
Press	To
	Causes permanent changes that become effective immediately.
	Scroll up or down to highlight an option on the Main Menu.
	Activate the **<Up>** and **<Down>** arrow keys for scrolling (if Num Lock is engaged).
	Enter or select your entry. Or to return to the Main Menu at the end of most commands.
	Erase a character that you have entered. (Not available on all command screens.)

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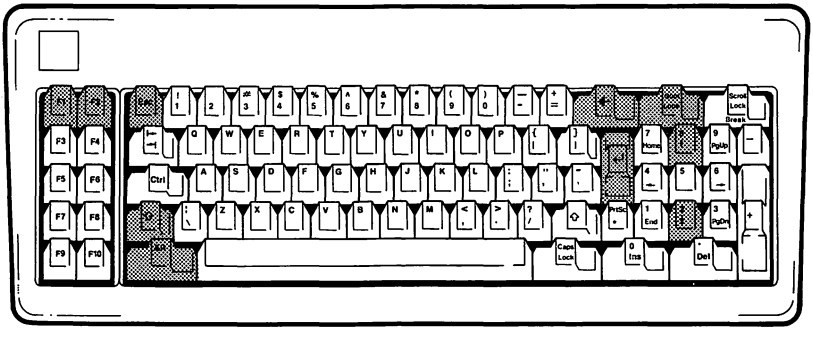
KEYBOARD REFERENCE

Please refer to the keyboard illustration for the location of the keys described in this section.



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Appendix **B**

Automating Backups

The more automated the backup process, the less chance of data loss from either human error or equipment failure. This Appendix explains three tools that control different aspects of the backup operation:

- Changing your AUTOEXEC.BAT File
- Operation of AUTOBAK.COM
- Backup Batch Files

CHANGING YOUR AUTOEXEC.BAT FILE

When you install your SYSGEN SMART software, it either creates an AUTOEXEC.BAT file (if one does not exist), or adds the following lines to the existing AUTOEXEC.BAT file (assuming that your hard disk drive is C:).

```
REM SYSGEN TAPUTL VX.XX
SET TAPESTAT=12345678901234567890123456789012 3
SET TAPERR=0000
C:AUTOBAK
C:TAPUTL/I C:\
```

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In the last line of this append, you may have the \D option for time/date query if you do not have a clock card. If you later add a clock card, you do not have to reinstall the SMART software. You only need to edit this AUTOEXEC.BAT file and delete the \D from this line.

SMART software requires that the tape batch statements be executed at boot time. This means the placement of these lines is important. If these lines fall after a batch file or program name that does not return to the AUTOEXEC.BAT file, then these lines will never be executed.

In the following example, *dosshell* is the figurative name of a file that does not return to the AUTOEXEC.BAT file. Notice that the appended lines fall after dosshell.

Sample AUTOEXEC.BAT File

Type the command **type autoexec.bat** and press the **<Enter>** key.

The screen will display your AUTOEXEC.BAT file. Your file may be quite different from the following sample.

```
MODE COML:9600,N,8,L,P
ALLCLOCK
PATH C:\MALL;C:\ORVAL
DOSSHELL
REM SYSTEM TAPUTL VX.XX
SET TAPESTAT=12345678901234567890123456789012345
SET TAPERR=0000
C:AUTOBAK
C:TAPUTL/I C:\
```


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Use the DOS program EDLIN to move the dosshell batch file name after the SMART initialization commands. The edited file will look like the following sample.

```
MODE COML:9600,N,8,L,P
ALLCLOCK
PATH C:\MALL;C:\ORVAL
REM SYSTEM TAPUTL VX.XX
SET TAPESTAT=12345678901234567890123456789012 3
SET TAPERR=0000
C:AUTOBAK
C:TAPUTL/I C:\
DOSSHELL
```

Display Variable

By installing a display variable in your AUTOEXEC.BAT file, you can change the colors of the TAPUTL screen. The display variable is initially set to 0 which is the monochrome value. To adjust the value for a color display, you must insert the following line in your AUTOEXEC.BAT file:

SET VSI=1 <Enter>

The line may be inserted at any point before the line "REM SYSGEN TAPUTL VX.XX." Use the DOS EDLIN program, or a similar line editor, to make the addition to your AUTOEXEC.BAT.

Under most conditions, the installation of the display variable is optional. However, if you are using a Leading Edge D computer, "VSI=1" must be installed for correct operation.

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OPERATION OF AUTOBAK.COM

One of the commands added to the AUTOEXEC.BAT file is the AUTOBAK.COM. This is the SMART "control" program. Once loaded, it remains resident in memory and checks the backup times that you have set against the current time. When the time for a backup is reached, AUTOBAK.COM lets you know by sounding a 6 second tone.

It then checks the status of your computer to see if it can actually start the backup operation. Some of the parameters checked are for Command.com executing and no key entries in the keyboard buffer. An additional check is done to verify that no batch file is running.

The user prompt line is forced to the default and the path command is altered to include the path to the SMART software. Finally, the user-created backup batch file is executed.

At the conclusion of the backup, the user path and command line prompt are returned to their original values.

Other Considerations

AUTOBAK.COM chains into the software interrupt vector 1CH. If there is some other program using this first, then AUTOBAK correctly chains this program to execute after AUTOBAK.

Some programs do not correctly chain into this interrupt; for example, Borland International's Sidekick™ software. To avoid problems, you must load these programs before AUTOBAK.COM.

When using TAPUTL/C and TAPUTL/U, AUTOBAK must be running and these programs must both be run in the same batch file. Failure to execute both of these will result in strange errors. You may not return to the correct path (among other possible errors). The SYSGEN SMART software is set up to create the correct batch file structure for operation.

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BACKUP BATCH FILES

You can produce a backup batch file with your text editor. The general form of this file is shown in the following sample:

```
REM ********************************
REM  First check for a valid tape ID
TAPUTL/C
REM  If tape ID is invalid, go to exit
If errorlevel 1, goto exit
REM
FBACK/B /N F:\*.*
REM Update statistics and tape parameter files
TAPUTL/U
REM Check for FBACK or TAPUTL failure
If errorlevel 1, goto exit
REM
FBACK/B /N C:\UTIL\*.*
REM Update statistics and tape parameter files
TAPUTL/U
REM
REM          Abort exit
REM
:Exit
REM*********************************
```

If the TAPUTL/U command fails in its operations or if FBACK returns an error completion code, the batch file returns an error message. The batch file will continue if you press **<Enter>** to clear the error window.

In this case, the error level on return is 3. Note that when the batch file is invoked, a Path command precedes and follows it.

Furthermore, console input is provided by a temporary INT 16H handler in the Autobak file. Consequently, any abort routine must read the console for the pending Path command. It then restores to your original path. The error handling routines in the TAPUTL/C and TAPUTL/U command line switch options do this.

Multiple FBACK command lines may be included in a single batch file if each is followed by a TAPUTL/U command and then an error level test. If the TAPUTL/U command makes an error return, then a branch has to be made to exit.

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Appendix **C**

Questions and Answers

Certain questions commonly recur from users of SYSGEN tape subsystems. We've summarized those that we hear most often and provided some suggestions for solutions.

GENERAL QUESTIONS

Q. Why am I able to backup a single file or subdirectory, but can't backup the entire disk volume?

A. Some of the data on the hard disk may be unreadable..

Suggestions for correcting condition

- If the diagnostic information reported during the complete backup varies by a small number, the tape media may be marginal in that area.
- Run the DOS CHKDSK.COM program on the hard disk to search for lost clusters. Allow the program to make any necessary corrections.

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- If a single file is suspected of causing the problem, back up the questionable file. If it can be successfully backed up, perform a catalog listing (accept all defaults to the prompts). If both single-file backup and catalog listing work successfully, delete the file from the disk and then attempt a full volume backup.

UPGRADING TO A NEW VERSION OF DOS

Q. What precautions should I take when upgrading from DOS 2.X to DOS 3.X?

A. A simple procedure, described in the following text, will eliminate potential problems resulting from the upgrade.

Suggestion for avoiding upgrade problems

- Before performing the upgrade--while still operating under DOS 2.X--backup the entire hard disk on a file-by-file basis. Omit all hidden or system files and COMMAND.COM (these files can cause problems following the upgrade). When all files are backed up, reboot the system under DOS 3.X. After reformatting the disk, restore the backed-up files to the hard disk. This procedure should eliminate potential incompatibility problems between the DOS versions.

PERFORMING TAPE BACKUPS

Q. Can I remove the tape from the tape drive unit immediately after the backup is completed when using the prompt mode operation?

A. NO! Removing the tape prematurely can cause data corruption and possibly prevent a future restore operation from the tape. The tape must always be rewound before it is removed from the tape unit; the software takes care of rewinding as long as you exit from the program normally.

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Suggestion for avoiding problems

- When using the prompt-mode of operation, when the backup operation is completed, the program displays the following choices:

  Backup, Restore, Catalog, or Quit

  When you wish to leave the program, always enter "Q" for Quit. The tape will then be automatically rewound and any temporary files that were created will be erased.

Q. Why am I unable to make the automatic backup feature work when a manual backup operation works fine?

A. There may be a problem in the AUTOEXEC.BAT file.

Suggestions for correcting condition

- Rename your AUTOEXEC.BAT file to AUTO.BAT and reboot the system.

  Install the SMART software by running the INSTALL program from the SYSGEN diskette. Answer NO to the prompt about the clock card.

  Reboot the system once the INSTALL program has been completed.

This procedure creates a new AUTOEXEC.BAT file that contains the necessary software required for automatic backup. Run the TAPUTL program to create a batch file for an automatic backup. One file backup is all that is required.

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Once the automatic backup feature works, you can add command statements from your original AUTOEXEC.BAT file (renamed AUTO.BAT) one at a time; check the automatic operation after each statement is added. Use the DOS program, EDLIN.COM, to modify the AUTOEXEC.BAT (some word processing programs may add undesired characters to the batch file). Your PC-DOS or MS-DOS manual contain full instructions on the use of EDLIN.

Q. Can I store multiple backups on the same tape?

A. Yes. The stored backups can also be a combination of image backups and file-by-file backups. Do not, however, attempt to store automatic backups on the same tape with manual backups. Although you can run FBACK on a tape including automatic backups, you cannot perform subsequent automatic backups once the FBACK fileset has been written on the tape.

Warning:

If you exceed the storage capacity of the tape, an error message will be generated with the last backup. *Do not attempt to use the data from any backup tagged with an error message.*

Q. Does the SYSGEN tape need to be formatted prior to performing a backup?

A. No formatting is needed. During a backup operation, each data block is given its own unique ID number. However, when using a new tape for the first time, you must answer Yes to the prompt: Delete existing data on the tape? This prepares the tape for its first use.

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Q. Can the SYSGEN tape subsystem backup and restore individual files?

A. Yes. Using the manual file-by-file method of backup allows you to backup one or more files as well as restore one or more files. Automated file-by-file backup allows this option as well.

Q. What is the correct method to enter file names?

A. The following examples demonstrate some of the ways.

Enter file names: COMMAND.COM
Enter file names: EDLIN.COM
Enter file names: \DATA\file.ext
Enter file names: A:BASIC.COM
Enter file names: \Account\DATA.EXT

Q. Can the SYSGEN tape subsystem restore an individual file from an image backup?

A. No. The image backup consists of a mirror image pattern of the entire disk volume. Since the image backup operation transfers data in sequential order from disk to tape, the data files are not accessible in any logical order. Individual files cannot be extracted from the backup data; the entire volume must be restored.

Q. Can the Image backup of one disk volume be restored to a different disk?

A. Yes, as long as the characteristics of the hard disk that you intend to restore the data to match those of the disk volume that you backed up the data from. The characteristics to consider are: cluster size; number of clusters; the number of directory entries, and directory size. (Number of clusters may vary slightly.)

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Warning:

Data from an IMAGE backup should only be restored to a computer running the same version of DOS that was running during the backup. Never attempt to restore data to a new disk running a different version of DOS; data loss could result.

Q. Does SYSGEN software compensate for differences in the location of defective sectors from disk to disk?

A. Yes. SYSGEN software will not restore data to a defective sector; alternate sectors are used in such an instance as long as DOS knows they are bad.

Q. Can I keep the backup utility programs in a subdirectory?

A. Yes. However, we recommend storing these programs in the root directory. STATxxxx.@@@, TAPEPARM.@@@, and all backup batch files must be in the root directory to operate the automatic software.

Caution:

If you execute the file-by-file backup utility programs from a subdirectory and do not specify the path to the main directory, you will only backup files at the current subdirectory level and below.

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Q. What are the TAPEPARM and STAT files? Can they be deleted?

A. TAPEPARM and STAT files are created by the SMART software Tape Utility during automatic backups. These files provide identification information linking a specific backup operation to a tape cartridge. As the STAT files are created, they are numbered sequentially, so the highest number represents the most recent backup operation. Earlier STAT files may be deleted, as long as the most recent version is retained on the disk. Do not delete the TAPEPARM file.

Q. I am trying to restore an image backup on my new hard disk but it doesn't fit. What can I do?

A. The image backup uses the characteristics specified on the original disk (number of clusters, number of directory images, etc.). Attempting to restore data to a disk with different characteristic will not work. If possible, restore the original hard disk entries and back up the data using the file-by-file method. (Total number of clusters can vary slightly from disk to disk.)

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Appendix **D**

TAPUTL Options

The TAPUTL options allow you to modify the existing automatic backup batch files to accommodate individual needs and preferences. These modifications should only be attempted by a knowledgeable user, and strict attention should be paid to the conditions under which each option can be used.

Used properly, the options can provide a more customized approach to backups and restores. For instance, if you want to prompt for time and date during initialization, you can add the following command line.

TAPUTL/I /D C:

The C:\ option specifies the root directory where TAPUTL files will reside (the destination volume).

During the initial installation of the SMART software, the TAPUTL options are determined by your responses to the prompts and then stored in the appropriate batch file. The contents of the batch files can be changed as you wish at any time. The following subsections explain these options in greater detail.

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TAPUTL/I OPTION

[Use only in AUTOEXEC.BAT file]

This option initializes the AUTOBAK.COM operation whenever you boot. TAPUTL/I first searches the specified root directory for a file called TAPEPARM.@@@ to get the current tape statistics and the default backup settings. If the software does not find the TAPEPARM.@@@ file, it creates one with the following values:

Tape statistics file = 0
Time/date stamp = blank tape
Previous completion status = 0
Backup batch file = dir
Backup days = all disabled
Backup times = all disabled

If the software finds the TAPEPARM.@@@ file, it initializes the settings to the current file contents.

To make these backup settings during initialization, the software looks up the patch addresses for the AUTOBAK.COM program and inserts the appropriate values into the resident program.

TAPUTL/Q OPTION

[For use only in AUTOEXEC.BAT file]

The TAPUTL/Q option works the same as the TAPUTL/I option in terms of initializing the automated backup process. The one difference is that TAPUTL/Q exits immediately to DOS following the initialization without prompting the user to strike a key.

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TAPUTL/I /D <PATH> OPTION
[For use only in AUTOEXEC.BAT file]

If the time/date switch (/D) is present on the command line at boot time, you are prompted to enter the time and date. As the SMART software depends on you to start each session with the correct time and date, you should have this switch set if you do not have a real-time clock card.

The <PATH> specifies the location where the SYSGEN utilities are stored; the program needs this information to find the necessary files for operation. For example, if you have stored the SYSGEN utilities in a subdirectory called UTIL one level down from the root directory, you would enter:

C:\UTIL for the path.

The values found in TAPEPARM.@@@ also indicate the tape that should be in the tape drive. The inserted tape's ID is compared against the expected value. If they do not match, you are requested to insert another tape.

More information about the AUTOEXEC.BAT file is given in Appendix B.

TAPUTL/C OPTION
[For use in automatic backup batch files]

Before the SMART software begins a backup, it checks to make sure the inserted tape has the correct tape ID. The software determines the correct tape ID at boot time when TAPUTL/I is executed, or when a "Change tape" command is executed from the TAPUTL Main Menu. This option should only be used in a backup batch file; otherwise, your current PATH will be modified.

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TAPUTL/U OPTION

[For use in automatic backup batch files]

You can always do a manual backup using the FBACK command. However, be sure you keep your manual backups and your automatic backups on separate tapes. After each backup operation is completed, the TAPESTAT and TAPERR parameters contain summary information about the backup. The TAPUTL/U line option extracts that information for you.

For instance, the amount of space remaining on your tape changes with each backup operation. The amount of storage used by the backup is subtracted from the current remaining capacity on the tape and the new value is stored in TAPEPARM.@@@. This option should only be used in a backup batch file; otherwise, your current PATH will be modified.

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TAPUTL/R OPTION
[For use with REST.BAT file]

The TAPUTL/R option sets up a restore operation, allowing you to control the restore by entering details in response to prompts. When this command is encountered in the batch file, you are first shown the "Browse tape statistics" screen.

1. Select the tape ID you want by entering the time and day the tape was backed up.

2. Scan the screen for the fileset names you want to restore.

3. Type the names of the filesets you want to restore.

The software compares the inserted tape against the Tape ID you have requested. If there is no match, it continues prompting you until you finally insert the correct tape.

The software then prompts you to complete the following:

Destination volume
Subdirectory processing
File names to be restored (3 names of up to 36 characters each).

This information is used to construct a file named R.@@@.

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Appendix **E**

Error Messages

The error messages encountered while running SMART software can originate from a number of sources. This description breaks the messages down into three categories: error messages relating to the installation program, error messages associated with a numerical error code, and error messages that appear (uncoded) while running the Tape Utility programs.

INSTALLATION ERROR MESSAGES

This program requires 192K of memory.

The installation program aborts if you do not have at least 192K of memory in your computer.

Need DOS 2.00 or newer

You must have a DOS version of 2.00 or newer. If not, you cannot use your SMART software.

Not enough memory

You must have at least 192K of memory in your computer before you can use SMART software.

These are the only error messages you are likely to see during the installation of the SMART software.

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NUMBERED ERROR CODES

The following diagnostic error codes generally occur during an operation as a result of failures, either on the controller board or tape drive.

<20> **Illegal command** received by the SYSGEN controller board. The controller board did not recognize the command sent by the program.

Possible solution: This may indicate a system problem. Run your system diagnostic to determine if you have a bad unit. Also try reseating the tape controller in its slot.

<40> **Excessive rewrites.** This indicates that the program had difficulty writing data blocks to the tape. The error code is followed by three bytes of diagnostic information indicating the number of bytes (in hexadecimal) that had been successfully saved at the time the error was detected.

Possible solutions:

- The tape cartridge or cassette is of poor quality. Insert another tape and try again.
- Ensure that the connecting cable between the tape drive and the controller board is firmly seated.
- The read/write heads are dirty or contaminated. Clean the heads.
- Reseat the controller board.
- If none of these suggestions corrects the problem, you may have a hardware problem. Contact your SYSGEN dealer or contact SYSGEN directly.

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<41> **Tape is write protected.** The program attempted to write to the tape and found it write protected.

Possible solutions:

Check the cartridge or cassette to see if the write protection wheel or notch is engaged.

- The write-protect sensor in the tape drive is malfunctioning. The drive needs servicing.
- Ensure that the connecting cable between the tape drive and the controller board is firmly seated.

<42> **Cassette (or cartridge) is not in.**

Possible solutions:

- Check the cartridge or cassette to see that it is inserted properly. If not, reload it. Appendix F describes the correct installation procedure.
- The cassette/cartridge-installed sensor in the tape drive is malfunctioning. The equipment needs servicing.
- The controller board is faulty and needs replacement.
- Ensure that the connecting cable between the tape drive and the controller board is firmly seated.

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<43> **Cassette (or cartridge) full.** During the FBACK or automatic backup operation, the program filled up the existing space on the tape cassette or cartridge before completing the backup. (This error will appear again if you try to use the same tape in a Restore or Catalog operation.)

Possible solution:

- You tried to backup more data than the tape can hold. Repeat the backup on another tape with sufficient storage capacity. (The software does not allow a single backup to be extended over two tapes except when running IMAGE backups.)
- If you feel that your tape should have sufficient storage remaining, but you still get this error, you may have a tape with excessive rewrites. Change tapes.
- The tape cassette or cartridge may be defective.
- The controller board is defective.
- Ensure that the connecting cable between the tape drive and the controller board is firmly seated.
- Contaminated read/write heads may be causing excessive rewrites, wasting tape space. Clean the heads.

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<44> **Missing block or read error.** This code indicates that the program is having difficulty reading a data block from the tape. The code is followed by three bytes of diagnostic information indicating the number of bytes (in hexadecimal) that have been successfully read at the time the error was detected.

Possible solutions:

- If this is the first time the cassette or cartridge was used and you have answered "N" for the "delete old data" prompt in the backup operation. You must enter "Y" in order to purge invalid data on the tape that causes subsequent read problems.
- The tape is poor quality. Backup some files onto another tape cartridge or cassette and restore them to ensure that your equipment is working properly.
- The controller board is defective. The board requires servicing.
- Ensure that the connecting cable between the tape drive and the controller board is firmly seated.
- The read/write heads are dirty or contaminated. Clean the heads.
- Contact your SYSGEN dealer, or contact SYSGEN directly.

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<45> **Missing or unexpected BOT/EOT.** The controller board has difficulty detecting the Beginning-of-Tape or End-of-Tape positions.

Possible solutions:

- Possible tape problem. Try another tape.
- Dirty BOT/EOT sensor. Try cleaning the sensor.
- Ensure that the connecting cable between the tape drive and the controller board is firmly seated.

<46> **Hit termination mark.** The program expected to read more data than encountered on the tape.

Possible solutions:

- Check that the SYSGEN controller board is not conflicting with any other installed boards.
- Use another tape cassette or cartridge and repeat the previous operation.
- The tape drive equipment may be defective. Have the equipment serviced.
- The controller board is bad.
- Ensure that the connecting cable between the tape drive and the controller board is firmly seated.

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<4A> **Tape cassette (or cartridge) changed between backups:** You have changed or disturbed the tape within the tape drive. The program repositions the tape before starting another backup operation (except for the IMAGE backup operation).

<4C> **No valid data detected from the tape during allotted time.**

Possible solution:

- Tape defect: try another tape cassette or cartridge.
- Try using the tape cassette or cartridge in another tape drive.
- The controller board is defective. The board must be serviced.
- Ensure that the connecting cable between the tape drive and the controller board is firmly seated.

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TAPUTL ERROR MESSAGES

The Tape Utility program displays error messages you may encounter while using the Menu. These are listed below in alphabetical order.

AUTOBAK.COM is not resident

When the software searched the resident portion of AUTOBAK.COM, it could not access it. Call up the Autoexec.bat file and move the appended lines so that they fall before any command that does not return to the AUTOEXEC.BAT file. (Refer to Appendix B.) AUTOBAK.COM must be run before you can use the Tape Utilities.

Backup aborted. Incorrect tape ID

This occurs during an AUTOBAK operation when TAPUTL/C detects an incorrect tape ID. Make sure that the tape with the current ID, as shown in the Display Summary window, is inserted in the tape drive before you attempt a backup.

Destination volume must be the default drive when using the /G command.

The destination volume must be the current directory when executing the FBACK Restore Group option.

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Error accessing xxxxxxxx.xxx

The following group of errors associated with this top-level message tell you when the error occurred as well as in which file. The last part of this message displays the type of error as listed below.

Attempt to write on write protected disk

This can occur when the utility has been installed on a floppy disk. Remove the write protect tab to use the disk.

File not found

Either you have misspelled the name of a file or it has been erased.

Invalid access code

The file attributes have been changed so that it is not accessible.

Error in reading from temporary file

Indicates a possible bad spot on disk or defective data. Note that a minimum of 350K storage space must be present on a floppy disk or hard disk to allow the program sufficient buffer space. Try the operation again using a different volume. The utility TMPVOL changes the selected volume.

File(s) are not on the specified volume

The files you requested during a File Compare or a regular backup operation cannot be located. Check your disk volume directory.

Files do not have the same size.

A comparison does not take place if the files' sizes are different.

IMAGE ID/Fileset not found

The FBACK/IBACK program cannot find the number you specified. Run Catalog to list all Images/Filesets on the tape and try again.

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FBACK completion error

This error happens during the execution of a TAPUTL/U command. It is generally followed by a short descriptive message of the type of error.

Out of directory space

Your directory space is filled. Delete some old files from your directory.

Tape cassette (or cartridge) inserted upside down

The tape cassette or cartridge has been incorrectly installed in the drive. Turn the tape over and try the operation again.

Tape cassette (or cartridge) write-protected

The program detected the presence of the write-protect notch or wheel. If you are sure that you have a tape that you can write to, remove the write protection and try again.

Tape cassette (or cartridge) is full

The tape cassette or cartridge has no room left for additional data. The last backup attempted is not complete. Retry the backup with a different tape.

Tape controller error

This may or may not be a serious error. The severity depends on the description that follows this message. Find the error message from the following list.

Beginning of tape not found

This might be a problem with this tape or tape drive. Attempt the operation with another tape.

End of filemark reached

Faulty backup. Try another tape.

End of tape data reached

Faulty backup. Try another tape.

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Missing block
Program missed reading a sequential block of data. Try another tape.

No tape in drive
Insert a tape in the tape drive and continue.

No response from tape controller
You may have a conflict with another board in your computer system or a defect in the controller board. Check for incompatibility problems in your system.

No valid block on tape
Unable to read valid data. Try another tape.

Tape change detected
Check the tape ID on the tape for the correct ID.

Tape full
Your tape cannot complete another backup. Insert a blank or previously erased tape.

Tape improperly loaded
Remove the tape and reinsert it into the tape drive.

Tape write protected
Remove the write-protect from the tape. Turn the SAFE arrow or flip the tabs to the write allowed position.

Tape file not a fileset
You have attempted to restore an Image Backup using FBACK.

Too many Filesets on this tape
A maximum of 256 (0-255) filesets are allowed on a tape. You attempted to exceed this limit. Change tapes and retry the operation.

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Unable to create temporary file in root directory

The system may be filled. Try deleting old files. If you still get this error message, you may have a problem with your hardware. Try using the TMPVOL utility to solve the problem.

Unable to create 2nd temporary file in root directory

Same as the previous message.

Unable to write temporary file

You may be using a write-protected diskette. If so, remove the write-protect tab. Another possibility is that the disk is full. Try deleting some files you no longer need. You can also try using the TMPVOL utility to solve the problem.

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Glossary of Terms

In this Glossary are terms and phrases used throughout this manual.

allocation unit The unit of disk space (in bytes) that is used by DOS to calculate the availability and usage of the disk.

append Add data onto the end of a file or file space.

AUTOEXEC.BAT file A file for which the system first searches upon booting. This file contains commands that automatically set your system to your parameters. You can use a word processing program to make changes or additions to this file.

backup Duplicate data stored on a floppy diskette or a cartridge tape for purposes of later retrieval. This data is usually retrieved if the current data on the primary system becomes unreadable.

boot The setting up and loading of the operating system in the computer's main memory. There are two types of boot: *cold boot* and *warm boot*.

byte A storage unit equivalent to one character of information.

caret A triangle-shaped character that indicates the current choice on a screen.

Catalog A listing of the information of filesets and/or files, or Images on a tape; in this manual, one of the FBACK options.

cluster See *allocation unit*.

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cold boot The process of setting up and loading the operating system into the computer's main memory. All equipment is turned off. To initiate a cold boot, turn all of the equipment on.

command line In DOS, the line following the DOS prompt that contains a command.

Compare See *File Compare*.

date stamp The date a file was created or last modified as shown in the DOS DIR command.

default A pre-set standard answer supplied by a program to simplify tape operations. You can change default answers by typing over them and pressing the **<Enter>** key.

delete Erase, remove, or eliminate.

destination volume The volume to which you are sending data.

directory A portion of disk space used by DOS to create an index of the data found on that logical drive. Also, a portion of a tape fileset that lists the files contained in the fileset.

disk volume A fixed portion of the disk that can be handled as a unit and designated with a letter designation.

DOS The IBM Disk Operating System; a collection of programs that makes it easier to use the computer. The SYSGEN tape software operates with IBM DOS 2.x and higher versions.

DOS prompt The on-screen letter and symbol that represents the default volume under the operating system; such as C>.

extender Three suffix characters preceded by a period after the name of a file.

File Compare A comparison of the contents of a tape fileset with the contents of a volume; in this manual, an FBACK option.

fileset A collection of files that are moved to a temporary location and then either backed up to tape or restored to the disk.

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fileset ID The number assigned by the subsystem to a collection of files stored on a tape during an FBACK operation.

filespec The complete name of a file including the volume designation letter, the pathname, the file name, and the extender.

final date In an FBACK operation, the ending date for backing up or restoring files.

final time In an FBACK operation, the ending time for backing up or restoring files.

Image ID The number assigned by the subsystem to a volume stored on a tape during an IBACK operation.

initial date In an FBACK operation, the start date for backing up or restoring files.

initial time In an FBACK operation, the start time for backing up or restoring files.

megabyte Approximately one million bytes.

menu A list of available options in an interactive program that can be selected with one keystroke.

path name The unique sequence of DOS subdirectory names that specifies the route between the Root directory and a given file. Each subdirectory must be preceded by a backslash.

prompt message A message on the screen that requires a response from you to complete a task.

prompt mode A mode of operation in which you can interact with the computer by entering responses to displayed messages.

restore The process of copying previously backed up data from a storage media.

reread The repeated attempt by the tape or hard disk drive to read data that has been requested.

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rewrite The repeated attempt by the tape or hard disk drive to write data that has been requested.

Root directory The master directory in which all other directories and subdirectories are contained.

sector The amount of disk space required to store 512 bytes of data.

selection bar A highlighted bar on the Tape Utility Main Menu that indicates the current task you can select.

single line command mode A mode of operating in which all selected options for a given command are entered in a single string.

subdirectory A directory that reports to a "higher" directory in the disk hierarchy. This method of organizing the hard disk makes it easier to find files.

system file A special hidden file that contains part of the DOS; e.g., IBMBIO.COM, IBMDOS.COM.

user memory The amount of computer memory actually available for use by the computer user.

time stamp The time the file was created or last modified. (See *date stamp*.)

user path A sequence of DOS directory and subdirectory names that specifies the route between the main directory and a given file. A backslash (\) must precede each directory and subdirectory; for instance, \ROOT\SMART\T1 defines the path through two subdirectories to a file named T1.

warm boot A method of loading and starting the computer's operating system without powering your equipment off and then on. A warm boot is initiated by pressing the **<Ctrl><Alt><Del>** keys simultaneously.

wraparound The cursor or selection bar can loop from the last line on the screen back to the first and vice-versa.

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wild card The characters * and ?, when used to specify any character, in a file specifier.

write-protect To prohibit writing on a tape or a diskette.

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Addendum to
SYSGEN SMART Software
Operator's Manual

P/N 87-01063-02 Rev A

The Revision D version of the *SYSGEN SMART Software Operator's Manual* covers both network-compatible and non-network tape drive products. This addendum lists the current SYSGEN products that can operate with Novell NetWare. Additional products will be added to this list as they acquire network compatibility.

Network compatible SYSGEN products:

- QIC-FILE-60
- IMAGE-60
- NET-FILE-60
- NET-FILE-120

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