SYSGEN QIC-FILE Tape Drive

Owner's Manual

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How to Use
This Manual

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This manual describes the installation of the
60-megabyte SYSGEN QIC-FILE Tape Drive. The
installation procedure you follow depends on the Tape
Drive you purchased.

Chapter 1 reviews the required equipment you must
have to install the SYSGEN QIC-FILE Tape Drive.

Chapter 2 guides you through the hardware
installation of the externally-mounted version of the
QIC-FILE Tape Drive using steps and illustrations.
Although the chapter explains how to install the drive
in an IBM XT, you can also install it in an IBM PC or
an IBM AT computer.

Chapter 3 provides step-by-step instructions for
installing the internal version of the QIC-FILE Tape
Drive on an IBM AT.

At the back of this manual are appendixes that
explain how to remove and replace the IBM chassis
cover and the specifications for the QIC-FILE Tape
Drive.

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 the Owner's Manual, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A 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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Before You
Begin

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Backing up your files onto a tape may mean the
difference between success and disaster. With the
SYSGEN QIC-FILE subsystem, you can quickly and
easily backup and restore large files between your hard
disk and a cartridge tape. The SYSGEN QIC-FILE
subsystem is a formatted 60-megabyte magnetic tape
cartridge that transfers data at speeds of greater than
3.75 million bytes per minute. You can choose to
transfer one or more files, or can back up an entire
volume.
   You either have the externally-mounted or the
internally-mounted QIC-FILE subsystem. Both have
been rigorously tested to assure you reliable, quality
products.

INSTALLATION REQUIREMENTS

You must have an IBM PC, XT, or AT computer with at
least 192K of memory. Besides this manual, your
shipment should include the following:

■   QIC-FILE cartridge tape drive

■   QIC-FILE controller board

■   SYSGEN SMART software diskette

■   *SYSGEN SMART Operator's Manual*

If you purchased the internally-mounted QIC-FILE
subsystem, you should have an additional, separate
interface cable. This is a gray, 50-pin flat, ribbon
cable to connect the controller card to the internal unit.
    In addition to the equipment and documentation you
received in your shipping kit, you need:

■   a 6" standard screw driver

■   a small Phillips screw driver

    This concludes the equipment you need to install
your SYSGEN QIC-FILE Tape Drive.

WHERE TO GO FROM HERE

You are now ready to install your tape unit. Chapter 2
describes the installation of the external SYSGEN
QIC-FILE Tape Drive on an IBM XT computer.
However, you can also attach the external SYSGEN
QIC-FILE Tape Drive to an IBM PC or IBM AT
computer.
    Chapter 3 describes the installation of the internal
SYSGEN QIC-FILE Tape Drive on an IBM AT.
    Make sure all of the peripheral equipment you have
already attached to your IBM computer is operational
before you begin this installation.
    Be sure you select the correct installation procedure
for the equipment you purchased.

Installing an
External QIC-FILE

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You can install the external version of the QIC-FILE
Tape Drive on the IBM PC, XT, or AT computer.

The controller card for the SYSGEN QIC-FILE Tape
Drive is a short card; that is, it fits into a single short
slot on the IBM XT main board. However, you cannot
use short slot 8 on the IBM XT. You can use any other
slot for this installation if it is not being used.

With this external version, you also received an
interface cable permanently attached to the QIC-FILE
Tape Drive. You will attach this interface cable to the
QIC-FILE controller card.

Make sure you have removed all power cords from
the rear of your computer before you begin this
installation.

INSERTING THE CONTROLLER CARD

The instructions in this chapter assume you have an
IBM XT with one floppy drive and one fixed disk.
These instructions also assume you are using an IBM
monochrome monitor.

1.   Use the Phillips screw driver to remove the
      grounding screw from the controller card metal
      bracket. Refer to Figure 2-1.

Figure 2-1. Removing the Grounding Screw
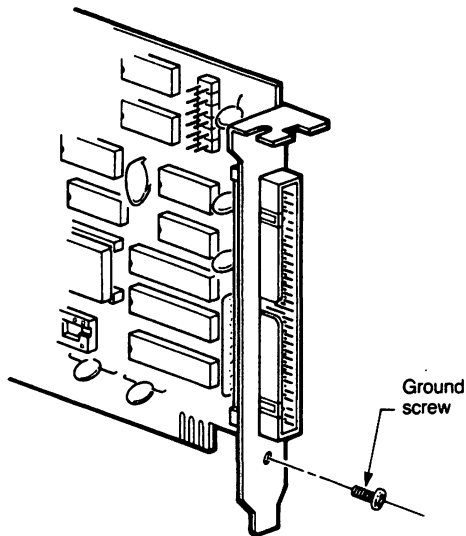
Ground
screw

2.   Save this grounding screw.

3.   Remove the cover from your IBM PC. Refer to
     Appendix A for instructions.

4.   Touch the metal plate at the front of the
     computer to rid yourself of any static electricity
     before you touch any internal components.

5.   Use your screw driver to remove the bracket
     screw holding the blank metal plate for any
     empty slot on the rear of the computer chassis.

6.   Save the bracket screw.

7.   Remove the blank bracket plate.

8. Loosen the bracket screws on the metal plates
    surrounding this slot. This allows the card to
    seat itself properly.

9. Insert the QIC-FILE controller card as shown in
    Figure 2-2. The fingers must be pointed down.

Figure 2-2. Inserting the QIC-FILE Card
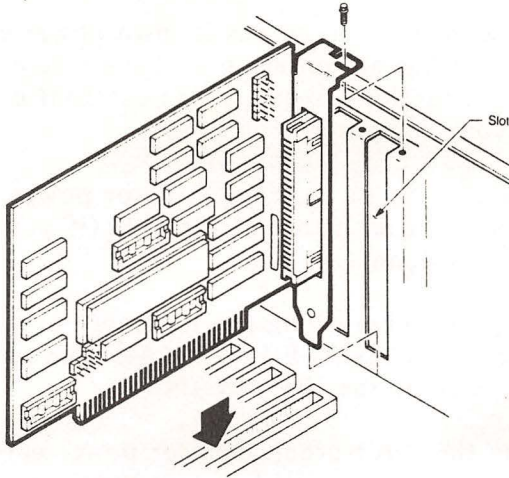
Make sure this card is seated firmly in the slot. If it
is not, your tape drive will not work properly.
Now you need to put everything back together.

1. Take the bracket screw you saved and insert it
    into the metal bracket. This bracket is attached
    to your QIC-FILE controller card.

2. Tighten the metal bracket to the computer
    chassis.

3. Retighten the bracket screws on the surrounding
    metal brackets.

4.   Replace the cover of the IBM computer. Refer to
        Appendix A for instructions.

You now have your controller card inserted. Do not
reattach any of the power cords as yet.
You must now attach the external power supply.

ATTACHING THE EXTERNAL POWER SUPPLY

The external power supply has its own power cord.
(Notice that it has an outlet on its back side.) Use the
following instructions to attach the external power
supply to your computer.

1.   Remove the three-prong monitor power cord
        from the back panel of the IBM (if you have not
        already done so).

2.   Plug the three-prong power supply power cord
        from the QIC-FILE into the Monitor socket on
        the back of the IBM chassis.

3.   Plug the three-prong monitor power cord into the
        back of the QIC-FILE power supply power cord.

Figure 2-3 illustrates this connection.

Figure 2-3. Attaching the Power Cords

Sysgen's tape
unit power cord
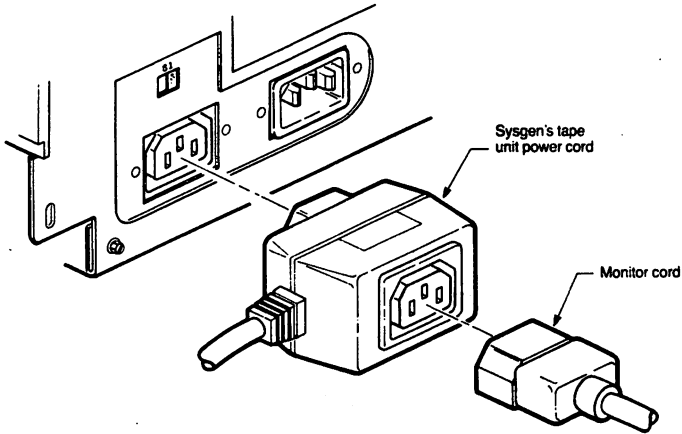
Monitor cord

Note: If you are using a color monitor or a non-IBM monitor, please refer to the manual that came with your monitor for power cord attachment.

You must now attach the interface cable to complete this installation.

ATTACHING THE INTERFACE CABLE

The QIC-FILE interface cable is a 50-pin connector cable keyed to go only one way. At one end of this cable is a black grounding wire. You will attach this wire to the grounding screw at the back of the metal plate. This is required for FCC compliance only. Refer to Figure 2-4.

Figure 2-4. Attaching Cable and Grounding Wire
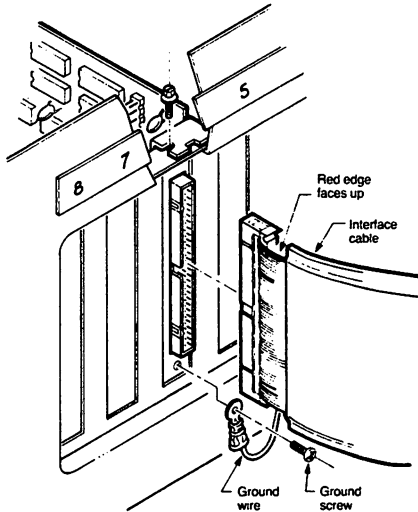
Use the following instructions to attach the
grounding wire and the interface cable.

1.   Check the interface cable for the two guide
     notches. These should be placed to the left as
     you face the rear panel of the computer.

2.   Hold the cable in this position while you use the
     screw driver to attach the grounding wire to the
     metal bracket. Use the grounding screw you
     saved.

3.   Insert the interface cable into the 50-pin
     connector of the QIC-FILE controller card.

4.   Make sure the cable is firmly seated.

This concludes the installation of the external
version of the QIC-FILE Tape Drive. You must now
reattach your peripheral equipment cables and replace

the IBM cover. Refer to Appendix A, Section 2 for this procedure.

Once you have replaced the cables and the cover, you can turn on your computer and boot your system. Check to make sure each piece of equipment is functioning correctly.

You can now turn to the *SMART Software Operator's Manual* and install the software.

Installing an
Internal QIC-FILE

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In this chapter, you will install an internal SYSGEN QIC-FILE Tape Drive in an IBM AT computer. Do not use the procedures given in this chapter if you have an external SYSGEN QIC-FILE Tape Drive.

This chapter assumes that your IBM AT computer has a fixed disk and one floppy disk drive. If your IBM AT computer has two floppy disk drives, you need to contact your dealer about removing the second floppy drive. Otherwise, you will have no place to insert the internal QIC-FILE Tape Drive.

Section 1 explains the procedures you must follow before you can insert the internal drive.

Section 2 steps you through installing the SYSGEN QIC-FILE Controller Card and attaching its interface cable.

Section 3 describes the procedure for inserting the internal tape drive.

Section 4 explains how to attach the interface cable from the controller card to the internal tape drive.

Section 5 steps you through the procedure for reattaching the disk cables.

Section 6 completes this chapter with "buttoning up" your IBM AT computer.

Getting Ready to
Install the Drive

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Before you can install the internal version of the
SYSGEN QIC-FILE Tape Drive in your IBM AT
computer, you need to remove all power cords from the
back of the IBM computer. You also need to remove the
IBM chassis cover and prepare the space for your drive.
If you don't know how to remove the IBM chassis cover,
turn to Appendix A. After you have removed the
chassis cover, turn back to this section.

REMOVING THE MOUNTING SCREWS

Figure 3-1 illustrates the removal of the mounting
screws that hold the fixed disk, the floppy disk, and the
cover plate in place. You need to remove these
mounting screws and their brackets.

Figure 3-1. Removal of Mounting Screws
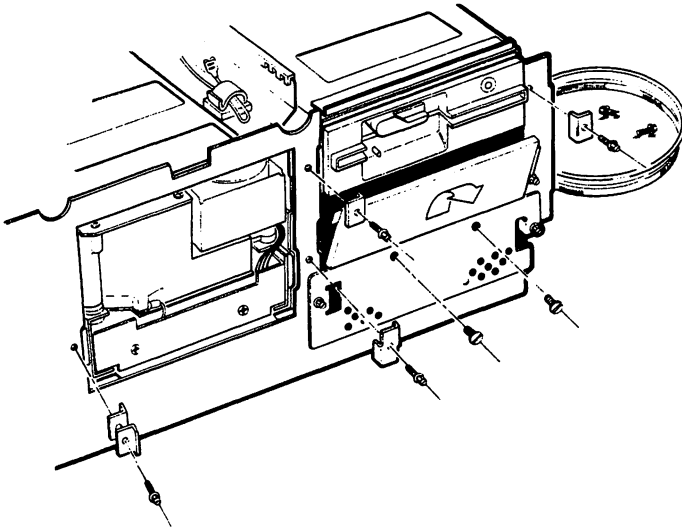
1.   Use your standard 6" screw driver to remove the
       mounting screws and their mounting brackets as
       shown in Figure 3-1.

2.   Save these screws and brackets. You will use
       them again.

3.   Push on the bottom of the grey cover plate. It
       should pop loose from the black face plate.

4.   Lift the cover plate up and out.

   You do not need to save this gray cover plate. You
will not use it again.
   You have three slots on the right side of your IBM
AT computer. The floppy disk occupies the top slot.
The middle and bottom slots are normally empty. Your
SYSGEN QIC-FILE Tape Drive will slide into the

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middle slot. You cannot install it into the bottom slot. This slot is reserved for a second fixed disk drive.

You now need to disconnect the cables and power cords for the fixed disk and the floppy disk.

DISCONNECTING THE CABLES

To allow yourself some room to work, you are going to disconnect the cables and cords from the floppy disk drive. Figure 3-2 illustrates the cables and cords you are to disconnect.

Figure 3-2. Disconnecting Cables and Power Cords
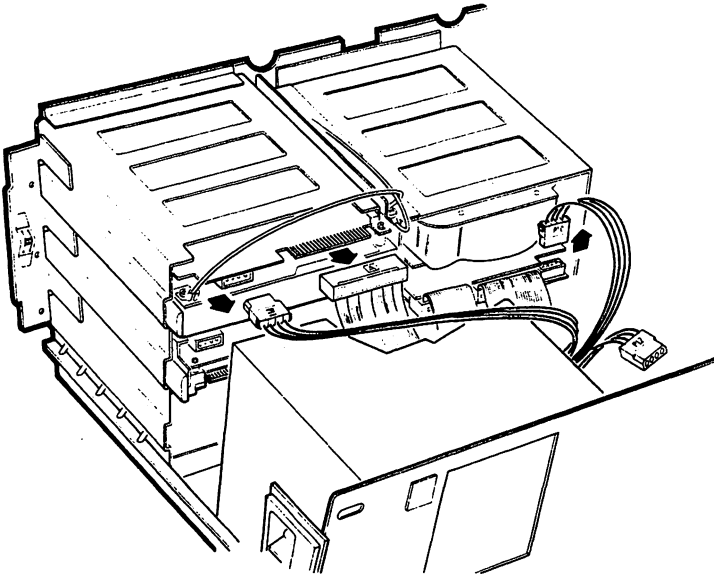
1. Disconnect the P11 tri-color power cord from the back of the floppy drive.

2. Disconnect the blue ribbon cable marked A from the back of the floppy drive.

3.	Pull the floppy drive out from the chassis about 2". This creates some working space for you.

4.	Disconnect the P10 tri-color power cable from the back of the fixed disk.

5.	Pull out the Fixed Disk about 2" to give yourself some working room.

Once you have disconnected these, move the tri-color power cables over the power supply so that they are out of the way.

You are now ready to insert the SYSGEN QIC-FILE tape drive into the computer.

Inserting the
QIC-FILE Drive

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You are now ready to insert the tape drive unit into
your IBM AT. Gently lift the drive from its packaging
and set it down on a flat surface.

Warning:
     Do not drop the tape drive. You
     could ruin the head alignment.

    Use the following instructions to insert the SYSGEN
QIC-FILE Tape Drive. Refer to Figure 3-3.

Figure 3-3. Inserting the Tape Drive
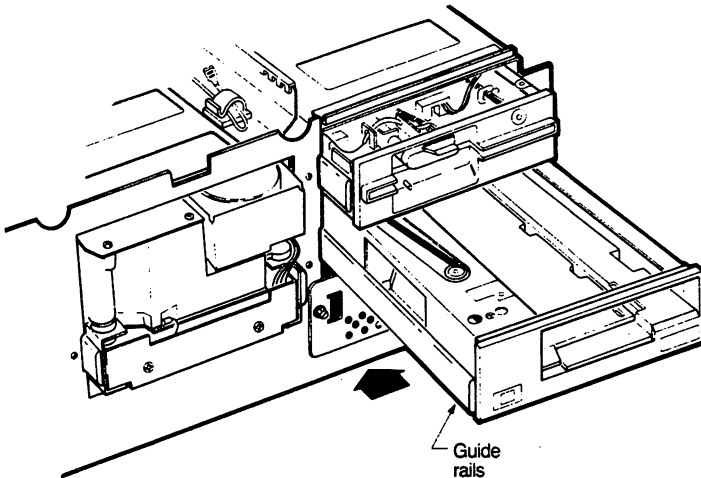
Guide
rails

1.   Turn the IBM AT so that the front is facing you.

2.   Lift the drive gently so that the front of the tape
      drive is facing you.

3.   Make sure the guide rails are correctly aligned
      with the guide slots. Refer to Figure 3-3.

4.   Slide the tape drive into the middle slot at the
      front of the IBM AT.

5.   Leave about 1" of the tape drive protruding from
      the front of the computer.

      This completes the instructions for inserting the tape
unit. The next section explains how to install the
QIC-FILE controller card and attach its cable.

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Installing
the QIC–FILE
Controller Card
and Cable

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You are now ready to attach the interface cable to the
QIC-FILE controller card and then insert the card into
one of the card slots in your IBM AT computer.

The AT computer has 8 slots. You probably already
have cards inserted into some of the slots. Notice that
some of the slots have two connectors at their base and
others, such as slot 6, have only one. The SYSGEN
QIC-FILE controller card is a PC Bus card and uses
only one connector. This means that you can insert it
into a one-connector slot such as slot 6. You can,
however, use any available slot. The following
instructions assume that you are using slot 6 for the
QIC-FILE controller card.

ATTACHING THE CABLE TO THE CARD

It is easier to attach the gray interface cable to the
controller card before you insert the card. Figure 3-4
illustrates this connection.

Figure 3-4. Attaching the Interface Cable
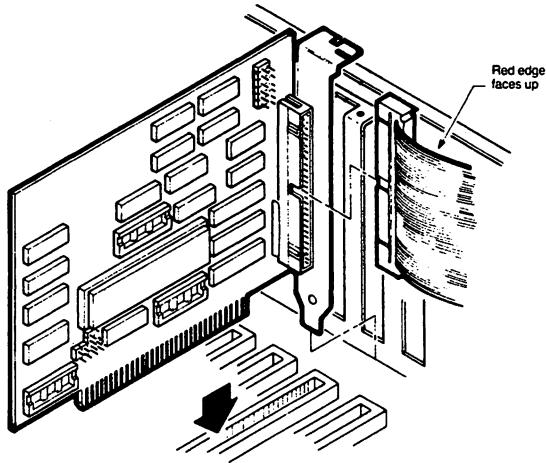
1. Hold the interface cable so that the red wire is on top.

2. Hold the connector card so that the metal bracket is furthest from you and the metal connector pins on the card are facing the interface cable.

3. Line up the connector with the pins and gently push the cable connector onto the pins.

4. Make sure the cable seats firmly on its header. Do not bend any of these pins.

Now you are ready to insert the controller card into slot 6 (or another slot of your choosing).

INSERTING THE CONTROLLER CARD

You now have the interface cable attached to the
controller card. Figure 3-4 showed the controller card
being inserted into slot 6.
   Use the following instructions to insert the controller
card.

1.   Use your standard 6" screw driver to loosen the
     bracket screw holding the blank metal plate of
     slot 6.

2.   Remove the bracket screw, but save it for later
     use.

3.   Remove the blank metal plate. You do not need
     to save this.

4.   Loosen the bracket screws for all I/O expansion
     cards. This allows the IBM System Board to
     adjust to the new card.

5.   Hold the QIC-FILE connector card so that the
     "fingers" of the card point down.

6.   Make a 90° fold in the interface cable so that
     you can push the controller card into the slot.
     The unattached part of the cable should be
     vertical.

7.   Make sure the card is firmly seated.

8.   Retrieve the bracket screw you removed from the
     blank metal plate.

9.   Use this bracket screw and your screw driver to
     attach the controller card's rear plate to the back
     panel of the IBM AT.

10.   Retighten the other bracket screws you had
       previously loosened.

   This concludes the instructions for inserting the
controller card and attaching one end of the interface
cable to the card. Proceed to the next section to attach
the interface cable to the internal tape drive.

Attaching Interface
Cable to Tape Drive

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You have already attached one end of the QIC-FILE interface cable to the controller board. In this section, you will attach the other end of the cable to the QIC-FILE Tape Drive and reattach the drive cables.

Figure 3-5 illustrates the folds you must make in the interface cable so that it lies correctly in the computer.

Figure 3-5. Folding the Interface Cable

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You have already folded the 50-pin, gray interface cable one-quarter turn when you inserted the controller board. The remaining cable should now be vertical.

1.　　Lay the cable flat over the other I/O expansion cards in slots 7 and 8 (if any).

2.　　Lay the interface cable down the side of the last expansion card.

3.　　Make a second 90° fold so that the cable is now horizontal.

4.　　Slide the interface cable connector under the tri-color power cords. Do not allow the cable to block the air holes on the power supply.

6.　　Pull the interface cable between the front of the IBM power supply and the back of the drives.

7.　　Locate the 50-finger connector at the bottom, back, center of the tape drive.

8.　　Make a last 90° fold in the interface cable so that the red wire is furthest from the fixed disk drive. Insert the cable end into the 50-pin connector. Refer to Figure 3-5.

Make sure that the connector on each end of the interface cable is firmly seated. When you have finished attaching this interface cable, you can reconnect the cables you disconnected. The next section explains how to do this.

Reattaching the
Cables
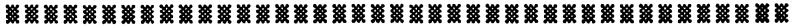
The last step in installing your SYSGEN QIC-FILE
Tape Drive is the cable reattachment. Use the
following steps and Figure 3-6 to reconnect the cables.

Figure 3-6. Reconnecting Cables and Power Cords
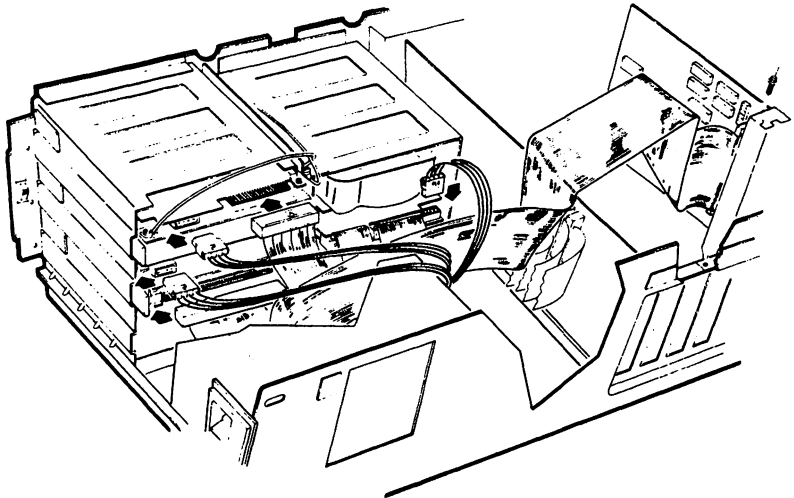
1.   Find the tri-color power cord marked P12.

2.   Insert P12 into the 4-prong connector at the
      back of the tape drive.

3. Find the tri-color power cord marked P11.

4. Insert P11 into the 4-prong connector at the back of the floppy disk drive.

5. Find the tri-color power cord marked P10.

6. Insert P10 into the 4-prong connector at the back of the fixed disk drive.

7. Find the light blue ribbon cable marked A.

8. Attach the end of this ribbon cable to the 36-finger connector at the back of the floppy disk drive.

You can now slide the tape drive, the fixed disk drive, and the floppy drive into the IBM AT.

Buttoning up
the IBM AT

Now that you have completed connecting all the cables
and power cords, you need to put your IBM AT together
again. You will need the bracket screws that you saved
when you removed the mounting brackets from the
front panel of your IBM AT computer and your screw
driver.

REPLACING THE FRONT PANEL SCREWS

Retrieve the mounting brackets and bracket screws that
you removed from the front panel of the IBM AT.
Figure 3-7 shows you where these mounting brackets
should be placed.

Figure 3-7. Replacing the Brackets and Screws
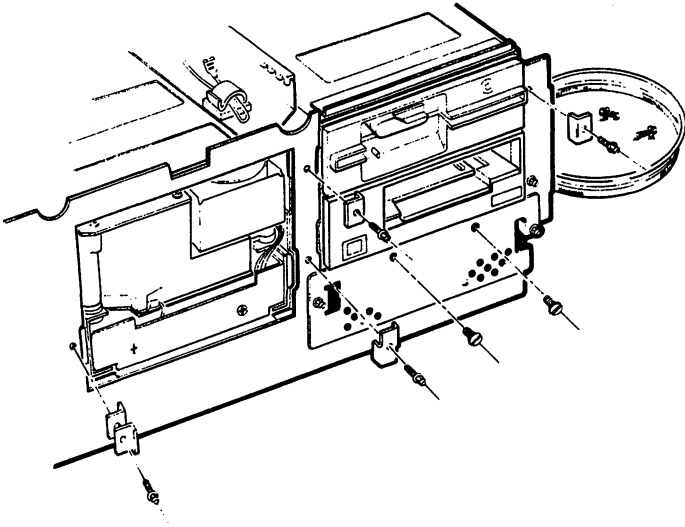
1.   Push the fixed disk unit completely into the IBM
       chassis.

2.   Find the two right-angle mounting brackets and
       one bracket screw.

3.   Place these two right-angle mounting brackets so
       that they form a "T". Place this "T" bracket over
       the hole at the left side of the fixed disk as
       shown in Figure 3-7.

4.   Use your standard 6" screw driver and the
       bracket screw to attach it to the left side of the
       fixed disk.

5.   Find the double-sided mounting bracket.

6.   Use your screw driver to attach it between the
       fixed disk and the SYSGEN QIC-FILE Tape
       Drive.

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7.   Attach one of the remaining right-angle brackets
        to the left side of the floppy disk drive.

8.   Attach a second right-angle bracket to the right
        side of the floppy disk drive.

9.   Attach the last right-angle bracket to the right
        side of the SYSGEN Tape Drive.

   Make sure you have tightened these mounting screws.
Now, you can replace the cover of your IBM AT. If
you need instructions, refer to Appendix A, Section 2.
   Once you have replaced the cables and cover, you
can turn on your computer and boot your system.
Check to make sure each piece of equipment is
functioning correctly.
   You can now turn to the *SMART Software Operator's
Manual* and install the software.

Removing
and Replacing
the IBM Cover

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You must remove the IBM chassis cover to install the
SYSGEN QIC-FILE controller card. Follow the
instructions in this appendix to do so. After you have
completed the installation, use the instructions in
Section 2 to replace the IBM chassis cover.

Warning:
> Make sure you have turned off your
> computer and any peripheral equipment
> you have attached to it and have removed
> all of the AC power cords from the rear
> panel of the computer before you use the
> procedures in this appendix.

Removing the
Computer Cover

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Make sure all of your equipment is turned off. Remove
all power cords from the rear panel of your computer.
Now you can use the following steps to remove the
cover of your IBM computer. Refer to the drawing
shown in Figure A-1.

Figure A-1. IBM Back Panel
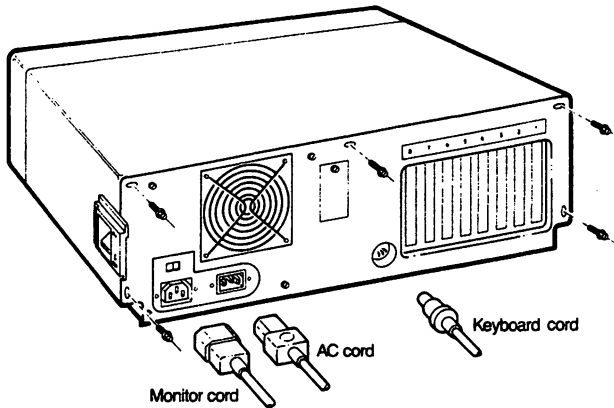
1.   Turn your computer so that you can see the back
      panel.

2.   Remove all power cords from the back of the computer and from the wall outlet or power source (if you have not already done so).

3.   Use a standard screw driver to remove the cover mounting screws from the cover (either 2 or 5 screws depending on the type of IBM computer you have).

4.   Put the mounting screws in a safe place as you are going to reuse them.

5.   Turn your computer, carefully, so that you can get to the front of it.

6.   Slide the cover toward you as shown in Figure A-2. When the cover won't slide any further, tilt the cover up and remove it from the base of the computer.

Figure A-2. Removing the IBM Cover
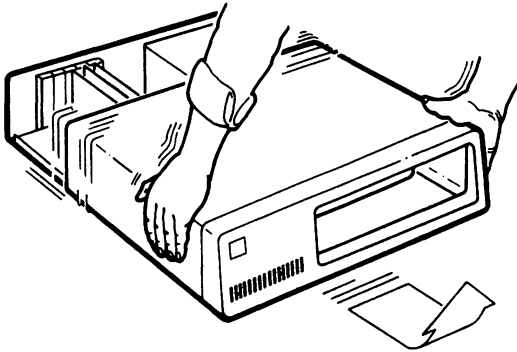
7.　　Set the cover to one side.

8.　　Rid yourself of any static electricity by touching the metal frame of the computer.

This completes the instructions for removing the cover of an IBM computer. Turn to Chapter 2 or Chapter 3 an install the SYSGEN QIC-FILE controller card. Then return to this appendix, Section 2, if you need instructions in replacing the IBM cover.

Replacing the
Computer Cover

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After you have installed the QIC-FILE controller card
or the QIC-FILE controller card and the internal
QIC-FILE Tape Drive, you can use the instructions in
this section to replace the cover of your IBM computer.
Refer to the illustration shown in Figure A-3.

Figure A-3. Replacing the Cover

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1. Make sure that you have turned off the computer and any peripheral equipment attached to the computer.

2. Lift the cover so that the front of the cover is facing you.

3. Tilt the cover up and slide it until it is on the side guide rails.

4. Lower the cover and slide the cover straight until it covers the base.

5. Replace the mounting screws using a standard screw driver.

6. Reconnect the power cords you removed as shown in Figure A-4.

Note: You may have additional power cords to reattach for other peripheral equipment such as a printer.

Figure A-4. Reconnecting Power Cords
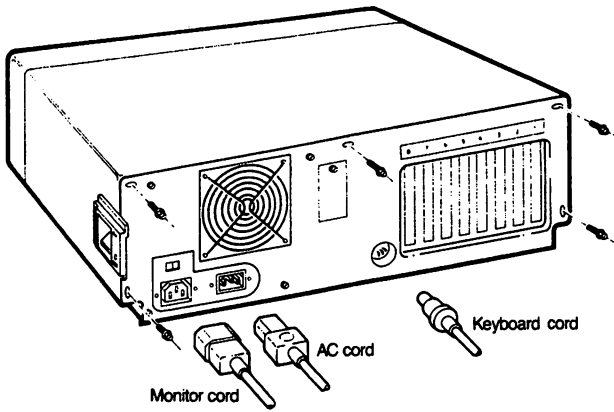
This completes the instructions for replacing the cover of your computer. You can now boot your computer to make sure it is working.
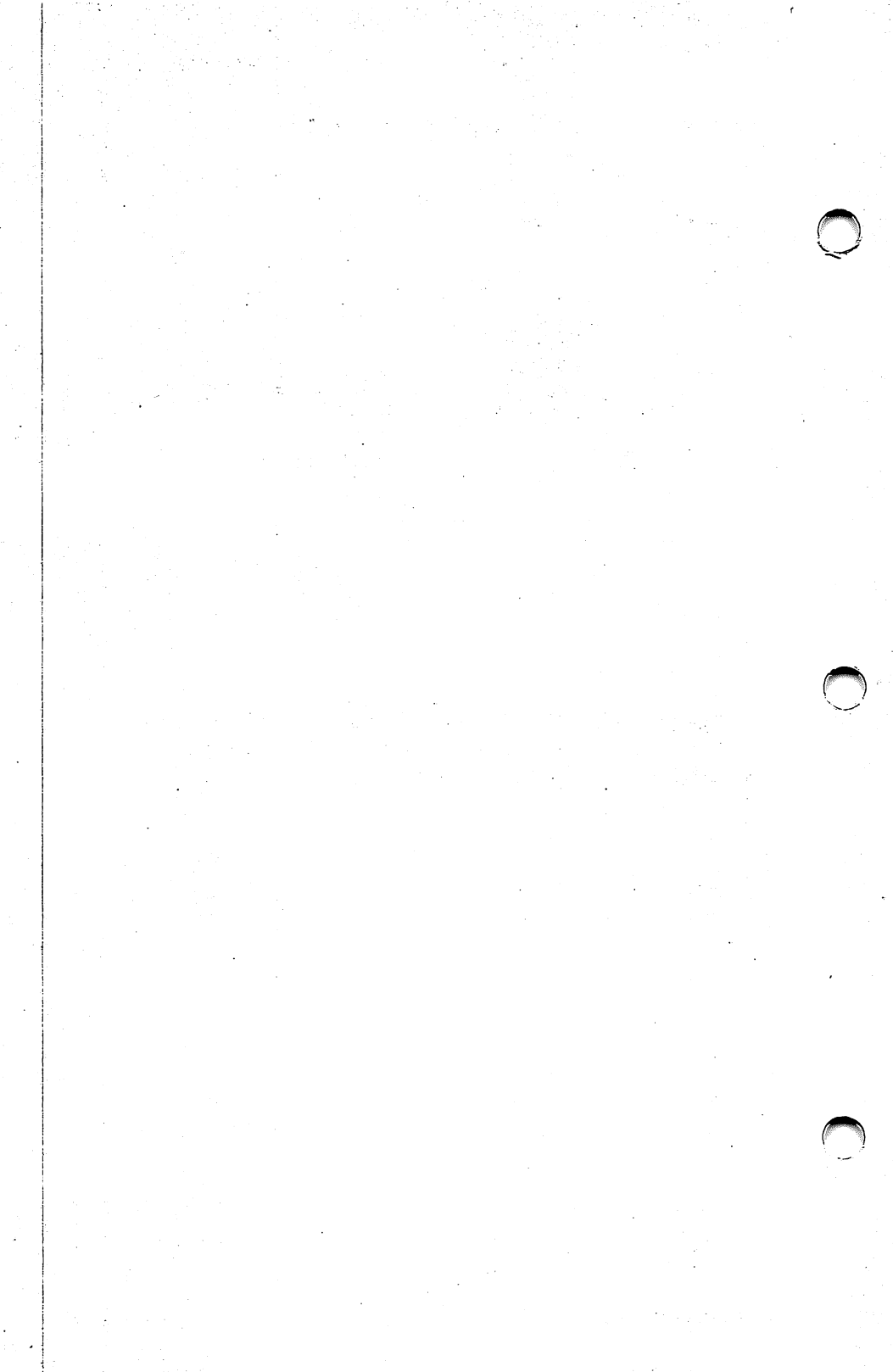
Appendix **B**

SYSGEN QIC-FILE
Specifications

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Read this appendix if you are interested in the
specifications of the SYSGEN QIC-FILE Tape Drive.

Power Requirements

For External QIC-FILE from:

PC	5 volts: 1 Amp (5 Watts)
A/C Pwr	115 volts: 2 Amps

For Internal QIC-FILE from:

PC	5 volts: 1.6 Amp (10 Watts)
Standby	12 volts: 0.2 Amp
Operate	12 volts: 1.6 Amp ($\pm$.8 A)
Surge	12 volts: 4.0 AMP max up to 300 msec.

Operating Environment

Ambient Temperature
5-40°C (operating)
0-60°C (storage)

Relative Humidity (non-condensing)
20-80% (operating)
20-80% (storage)

Hardware Reliability

10,000 hr. MTBF (calculated) (POH)

Cartridge Drive Specification

No. of Tracks	9 (serpentine)
Record Format	GCR coding
Record density	10,000 flux changes/inch or 8000 BPI
Tape motion	90 inches/second

Times:	
Tape start	300 ms
Tape stop	300 ms

Cartridge Tape

Scotch^{TM} DC-600A high density data cartridge (or equivalent)

Capacity	60 Mbytes per cartridge
Life (usable)	1000 passes
Length	600 feet

SYSGEN QIC-FILE Controller

Electrical	Conforms to IBM PC, XT, and AT standards
Software	I/O register address 290h-29fh
DMA channel #1	Non-interrupt driven

SMART Software
Operator's Manual

SYSGEN
·INCORPORATED·

SYSGEN SMART Software

Operator's Manual

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How to Use
This Manual

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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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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.

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*.

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

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.

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.

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.

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

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.

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 >

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.

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.

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.

Figure 2-1. Installation Screen

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

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

Installation of the AUTOBAK utility
 requires two steps:

              Step I.
------------------------------------
The contents of the source diskette
 are moved to the drive on which you
 want the utility to run.

Please specify the destination drive
 by typing in the drive letter:  C
Press return when the desired
 drive letter has been entered.

```

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.

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.

Figure 2-3. Installation Complete Screen

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

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


          Installation complete

    Reboot the system to initialize
           AUTOMATIC backup.

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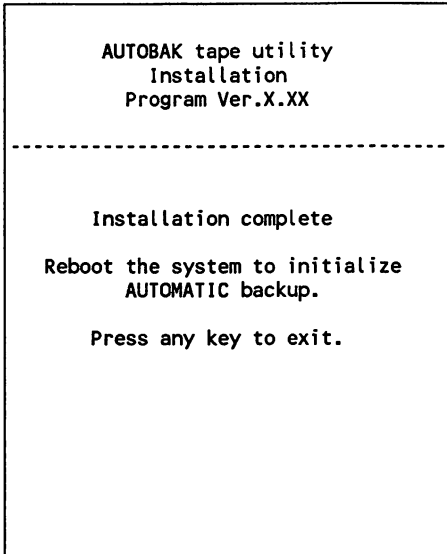
Figure 2-3 shows that the software installation is complete. However, before you can use this software, you must make sure you have a blank or reusable tape in the tape drive. After you reboot your system, you will see a prompt message on the screen asking you whether or not you want to erase the tape.

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.

Figure 2-4. Tape Summary Screen

```
        Tape Summary              This tape is blank.

Tape statistics file number: 0    Tape ready.
Tape creation date: blank tape
Tape creation time: blank tape    Press any key to continue.
Capacity remaining on tape:  61440K
Last backup status:  0000

        Backup Summary

Backup days:
  S   M   T   W   T   F   S
  -   -   -   -   -   -   -
First backup time:    disabled
Second backup time:   disabled
Backup batch file: dir

Type F1 to disable AUTOBAK and exit
```

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.

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 = 12345678901234567890123456789012345678901234567890123
       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.

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.

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 sysgem.

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:\>
```

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.
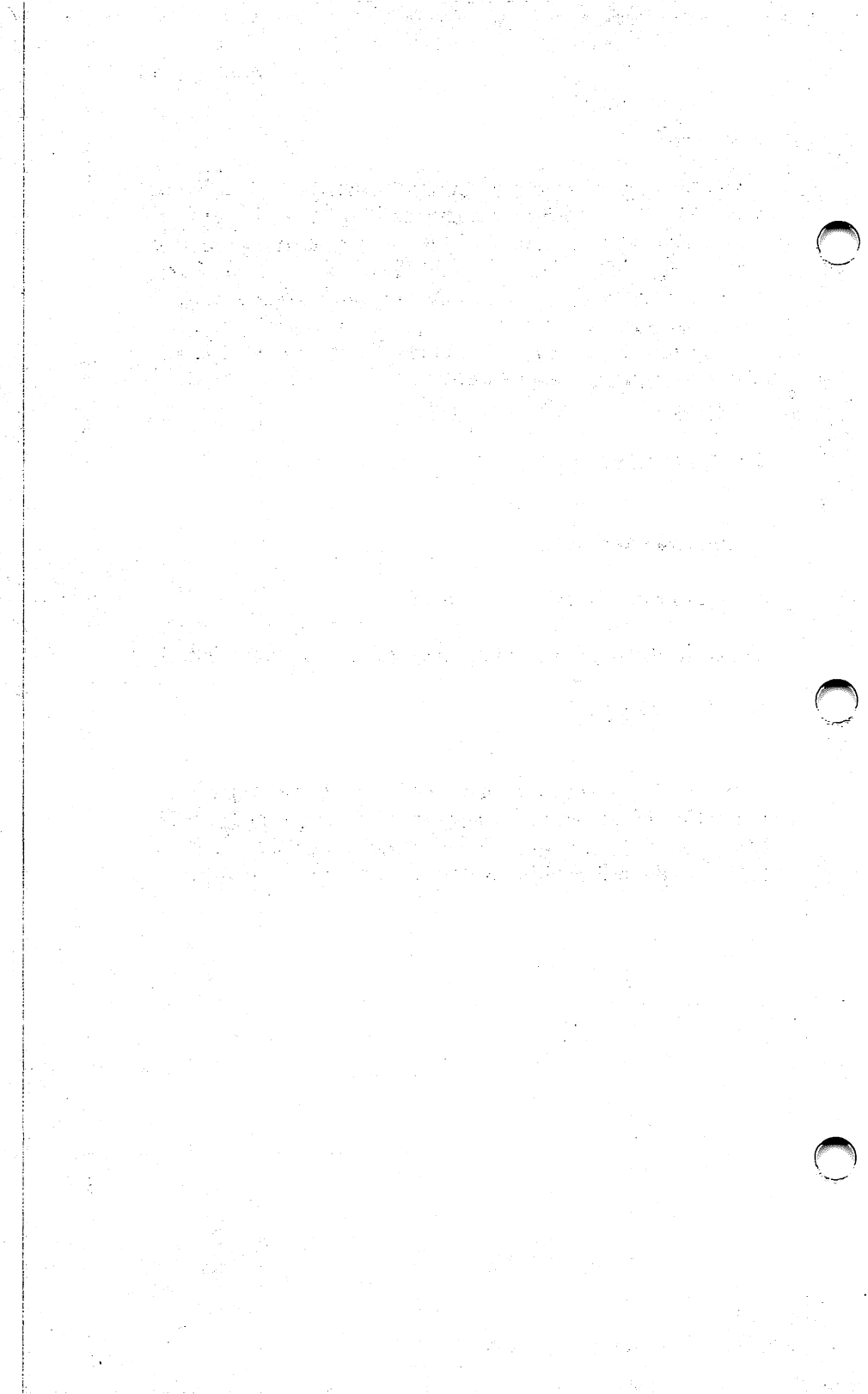
Using the SMART
Tape Utilities

■■■

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
```

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

"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

```
┌─────────────────────────────────┐
│     TAPUTL -- Version X.XX      │
│     SYSGEN Auto ┌───────────────────────────────────────┐
│ ---------------- │                                       │
│           Mai  │ If the backup times entered here are to│
│ ---------------- │  be forgotten when your system is     │
│ HELP WINDOW    │  turned off, press F1.                 │
│ Change backu   │ If the times are to be remembered for  │
│ Change backu   │  subsequent sessions, press F2.        │
│ Create backu   │ Enter F1 or F2 to continue.            │
│ Select backu   │                                        │
│ Display Summ   │                                        │
│ Browse tape    │                                        │
│ Change tape    │                                        │
└─────────────────┘                                        │
                  │                                        │
                  │                                        │
                  └───────────────────────────────────────┘
```
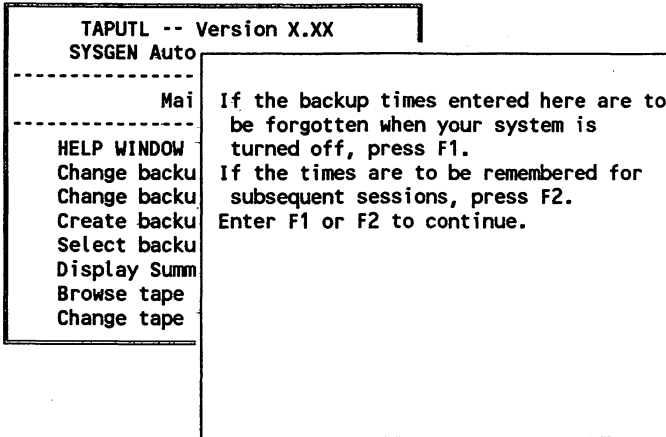
Two function keys, F1 and F2, affect the selections that you make as you run the program. Table 3-1 explains the use of F1 and F2.

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.

Section 1

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

```
      TAPUTL -- Version X.XX
      SYSGEN Auto
      ---------------
              Mai | To use current time, enter ↵
      ---------------| To disable a time, enter Del at cursor.
      HELP WINDOW  | To enter a new time, key in digits
      Change backu |   using 24 hour format.
      Change backu |
      Create backu | - - - - - - - - - - - - - - - - - - -
      Select backu |      #1       disabled     11:45
      Display Summ |      #2       disabled     16:45
      Browse tape  |
      Change tape  |
```
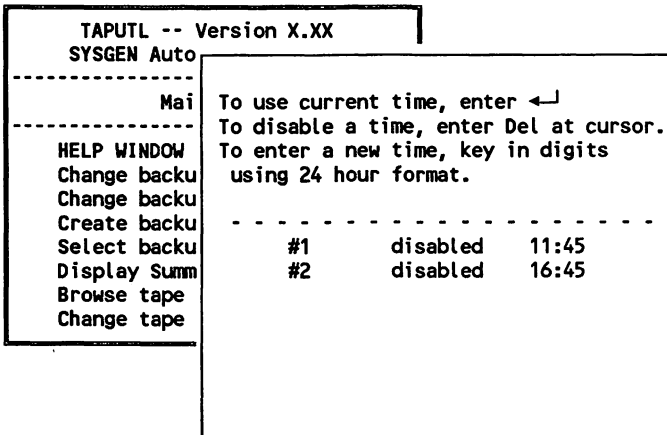
The SMART software provides two backup times for each 24-hour period, using a 24-hour clock. This means that you must use the digits 00 through 23 for the hour designation. Be sure to enter the colon when you type in the times (as in 3:45). Table 3-2 shows the hours as displayed using a 24-hour clock.

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.

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.

Section 2

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.

Figure 3-4. Change Backup Days Screen

```
    TAPUTL -- Version X.XX
    SYSGEN Auto
----------------  To use the current setting, enter ←┘
           Mai  To disable backup on a day, enter Del
----------------   at cursor.
    HELP WINDOW   To enable backup on a day, enter x or X
    Change backu
    Change backu  - - - - - - - - - - - - - - - - - - -
    Create backu  Day   S   M   T   W   T   F   S
    Select backu
    Display Summ
    Browse tape
    Change tape
```

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.

Figure 3-5 shows the results of these entries.

Figure 3-5. Selected Backup Days

```
  ┌─────────────────────────────────┐
  │  TAPUTL -- Version X.XX          │
  │  SYSGEN Auto ┌──────────────────────────────────────────┐
  ─────────────  │ To use the current setting, enter  ◄─┘    │
          Mai │ To disable backup on a day, enter Del     │
  ─────────────  │  at cursor.                               │
    HELP WINDOW │ To enable backup on a day, enter x or X  │
    Change backu │                                           │
    Change backu │ - - - - - - - - - - - - - - - - -         │
    Create backu │ Day   S   M   T   W   T   F   S           │
    Select backu │           X   X   X   X   X               │
    Display Summ │                                           │
    Browse tape  │                                           │
    Change tape  │                                           │
  └──────────── │                                           │
                 │                                           │
                 │                                           │
                 │                                           │
                 └──────────────────────────────────────────┘
```
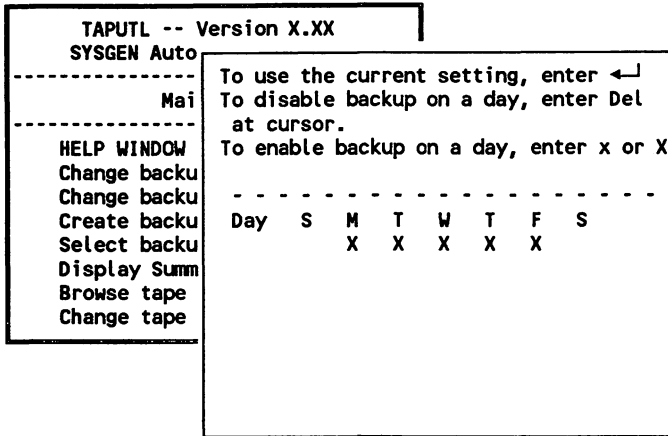
The <Backspace> key does not work on this screen. If you mark a day incorrectly, then you must leave the command screen and reselect the command from the Main Menu.

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.

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.

Figure 3-6. Creating a Batch File Screen

```
        Backup Batch File Template

Name of batch file:

Backup only modified files?        N
Omit hidden and system files?      Y
Include subdirectory processing?   N   rsion X.XX
Collect network information?       N   ckup Utility
Pause on files locked by others?   N   -----------------
Make verify pass?                  N   Menu
   Verify against volume:          C   -----------------
   Verify network information?     N
   Verify network fileset groups?  N   times
                                       days
Names of files to be backed up:        batch file
                                       batch file
                                       y
                                       atistics
Comment field:                         check tape ID
```

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.

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 >.

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.

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.

Figure 3-7. Completed Batch File Screen

```
         Backup Batch File Template

Name of batch file: todays

Backup only modified files?        N
Omit hidden and system files?      Y        ┌──────────────────┐
Include subdirectory processing?   Y        │ rsion X.XX       │
Collect network information?       Y        │ ckup Utility     │
Pause on files locked by others?   N        │ ---------------- │
Make verify pass?                  N        │ Menu             │
   Verify against volume:          C        │ ---------------- │
   Verify network information?     N        │                  │
   Verify network fileset groups?  N        │ times            │
                                            │ days             │
Names of files to be backed up:             │ batch file       │
 C:\accounts\regional\*.*                    │ batch file       │
 C:\accounts\local\*.*                       │ y                │
 C:\summary\annual\*.*                       │ atistics         │
Comment field:                              │ check tape ID    │
 Daily backup                               └──────────────────┘
```

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.

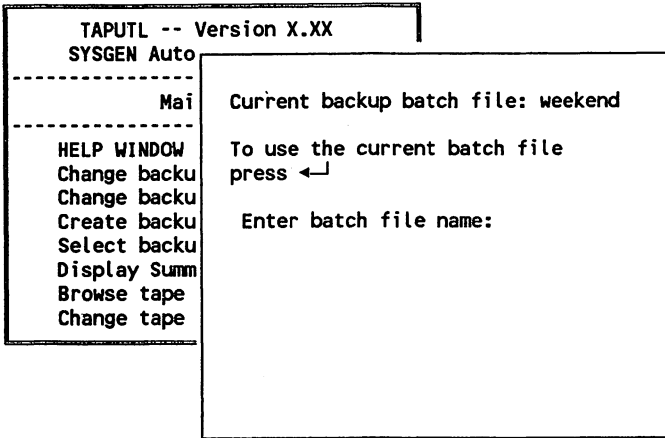The next section explains the procedure for activating a batch file.

Section 4

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.

Figure 3-8. Select Current Batch File Screen

```
┌─────────────────────────────────────┐
│     TAPUTL -- Version X.XX          │
│     SYSGEN Auto┌────────────────────────────────┐
│ --------------- │                                │
│         Mai │   Current backup batch file: weekend │
│ --------------- │                                │
│   HELP WINDOW │   To use the current batch file  │
│   Change backu │   press ◄─┘                     │
│   Change backu │                                │
│   Create backu │    Enter batch file name:       │
│   Select backu │                                │
│   Display Summ │                                │
│   Browse tape │                                 │
│   Change tape │                                 │
└───────────────┘                                │
                 │                                │
                 │                                │
                 └────────────────────────────────┘
```

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.
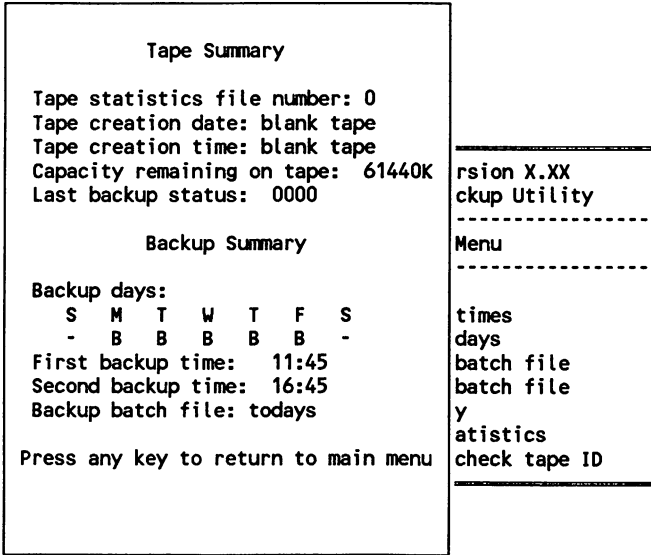
Section **5**

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.

Figure 3-9. Display Summary Screen

```
        Tape Summary

Tape statistics file number: 0
Tape creation date: blank tape
Tape creation time: blank tape
Capacity remaining on tape:  61440K  | rsion X.XX
Last backup status:  0000              | ckup Utility
                                       | -----------------
        Backup Summary                 | Menu
                                       | -----------------
Backup days:
  S   M   T   W   T   F   S            | times
  -   B   B   B   B   B   -            | days
First backup time:   11:45             | batch file
Second backup time:  16:45             | batch file
Backup batch file: todays              | y
                                       | atistics
Press any key to return to main menu   | check tape ID
```

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.

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.

Section 6

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.

Figure 3-10. Browse Tape Statistics Screen

```
File: C:\STAT000.aaa
Statistics for TAPID
File  Storage  Date     #     Status
 set    used   Time   files Retries


  0     649K   10-2-86  50    0000     rsion X.XX
                17:27                  ckup Utility
 Press ESC to return                  -----------------
   any other key to continue          Menu
                                       -----------------

                                       times
                                       days
                                       batch file
                                       batch file
                                       y
                                       atistics
                                       check tape ID
```

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

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.

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.

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

```
        Tape Summary

Tape statistics file number: 0        Inserted tape ID: 10-2-1986  17:27
Tape creation date: 10-2-1986
Tape creation time: 17:27             Delete existing data on tape? (Y,..)
Capacity remaining on tape:  60791K
Last backup status:  0000             Press Esc to exit
                                        or any other key to continue.
```
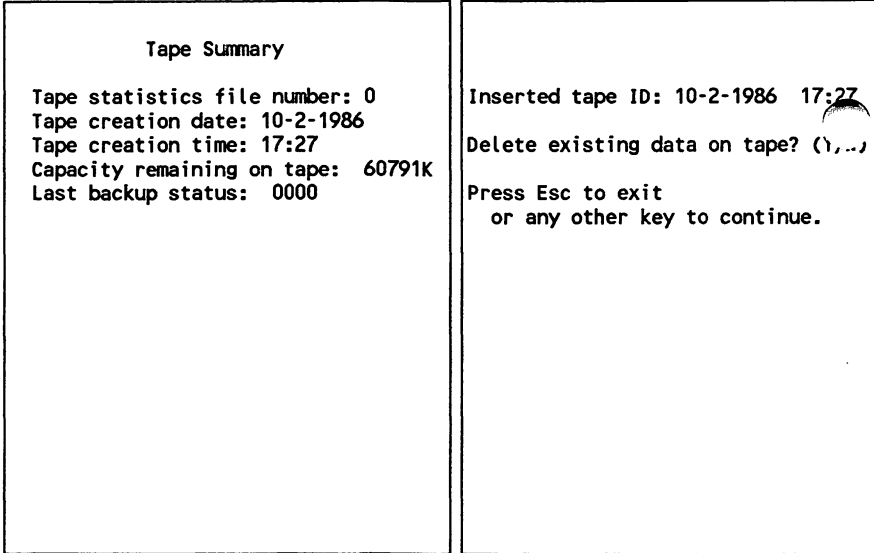
You can erase the tape at this point if you want to.

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.

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
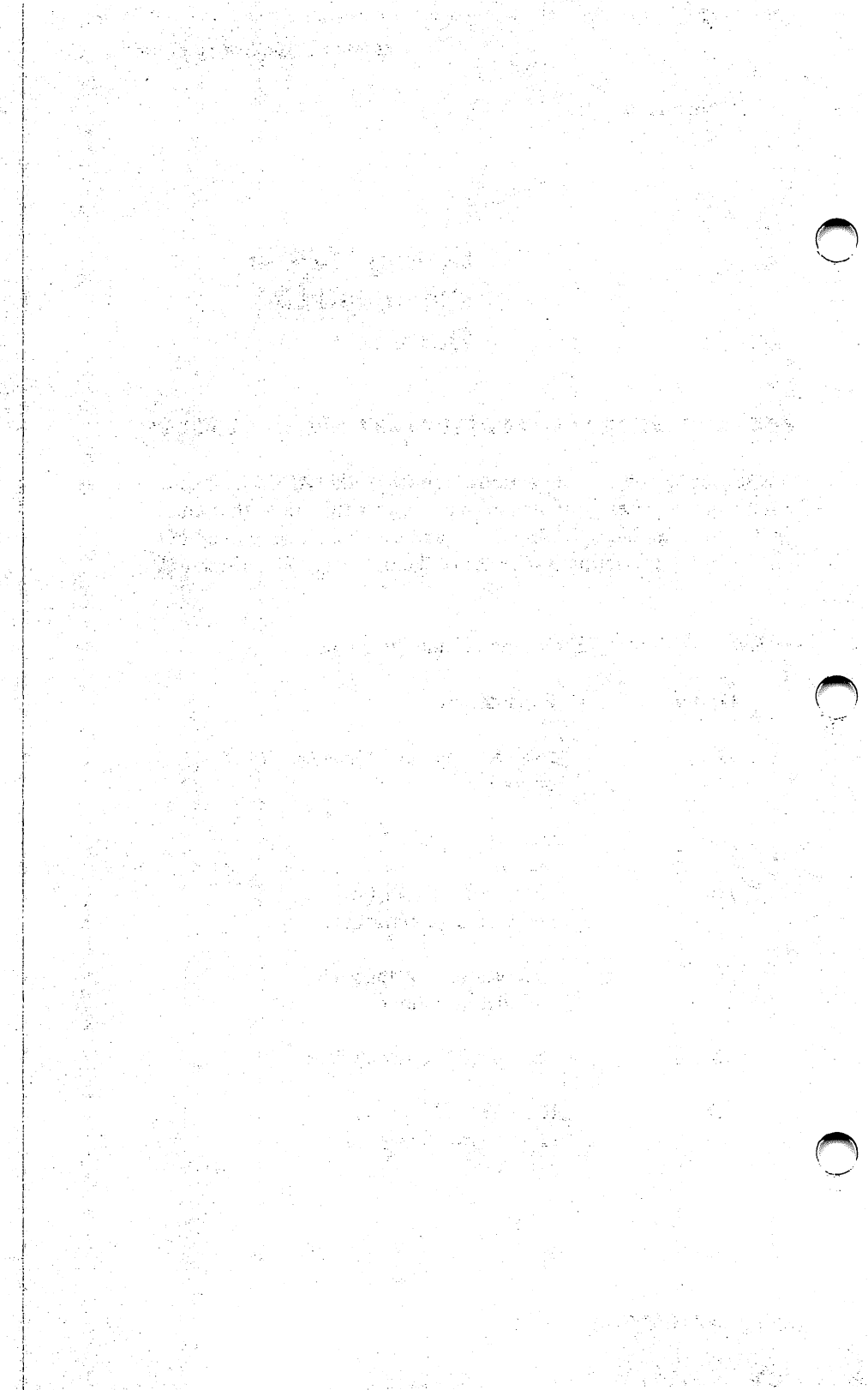
Restoring Non-Network Files

■■■

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

```
File: C:\STAT000.aaa
Statistics for TAPID 10-2-86  17:27
File  Storage  Date     #     Status
 set    used   Time   files Retries


 0    649K   10-2-86  50    0000
               17:27         0000
 Press ◄─┘ when tape ID is found
   any other key to continue.
```

```
**********************************
* Restore by Tape ID and Fileset *
**********************************

Scroll through the tape statistics
   files to find the desired
   tape ID and fileset
```

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

```
┌─────────────────────────────────┬─────────────────────────────────┐
│                                 │ File: C:\STAT001. aaa           │
│   Restore by Tape ID and fileset│ Statistics for TAPID  10-2-86 17:2│
│                                 │ File  Storage  Date     #    Statu│
│    Enter tape ID (date)         │ ─────────────────────────────────│
│       (e.g. 10-23-85):          │                                  │
│                                 │  0      649K  10-2-86   50    00  │
│                                 │               17:27         000  │
│                                 │ Press ◄─┘ when tape ID is found  │
│                                 │  any other key to continue.      │
│                                 │                                  │
│                                 │                                  │
│                                 │                                  │
│                                 │                                  │
│                                 │                                  │
│                                 │                                  │
│                                 │                                  │
│                                 │                                  │
└─────────────────────────────────┴─────────────────────────────────┘
```

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.

Figure 4-3. Example of a Completed Restore Screen

```
        Restore Command Template

Destination volume for files:C

Paths + names of files to be restored:
 \*.*



Include subdirectory processing?N
```

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.
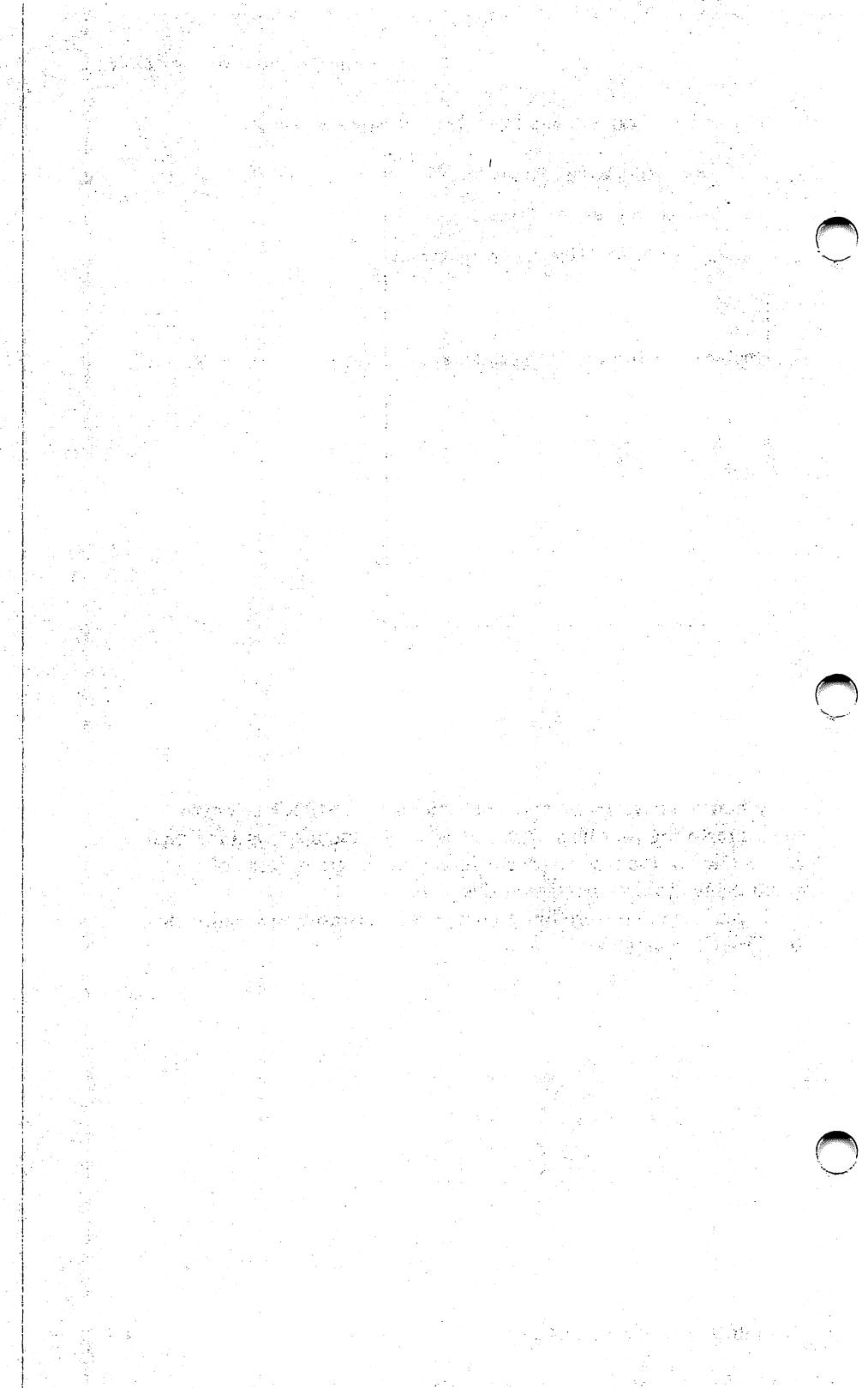
Chapter **5**

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
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.)

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.

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
```

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.

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.

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

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.

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.

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.

Section 2

Restoring
With FBACK

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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.

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.

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.

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.

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

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?

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).

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

Heading	Definition
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.

Section 4

Using FBACK Single Line Command Options

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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*).

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.

FBACK LINE COMMAND-BACKUP

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

FBACK/Backup **/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.

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.

FBACK LINE COMMAND-RESTORE

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

FBACK/Restore **/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.

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/Restore /S /fileset filespec... /fromdate /fromtime /todate /totime vol: /G /Q**

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:.

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 /*fileset filespec... /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:.

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/Catalog **/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.

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.

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.

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.

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.

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

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.

Section 2

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** >.

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.

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.

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?
```

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.

Section 4

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.

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/Backup /DELete vol: ... /"comment" /Q

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/Restore */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.

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.

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.

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.

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.

/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.

/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.

Appendix **A**
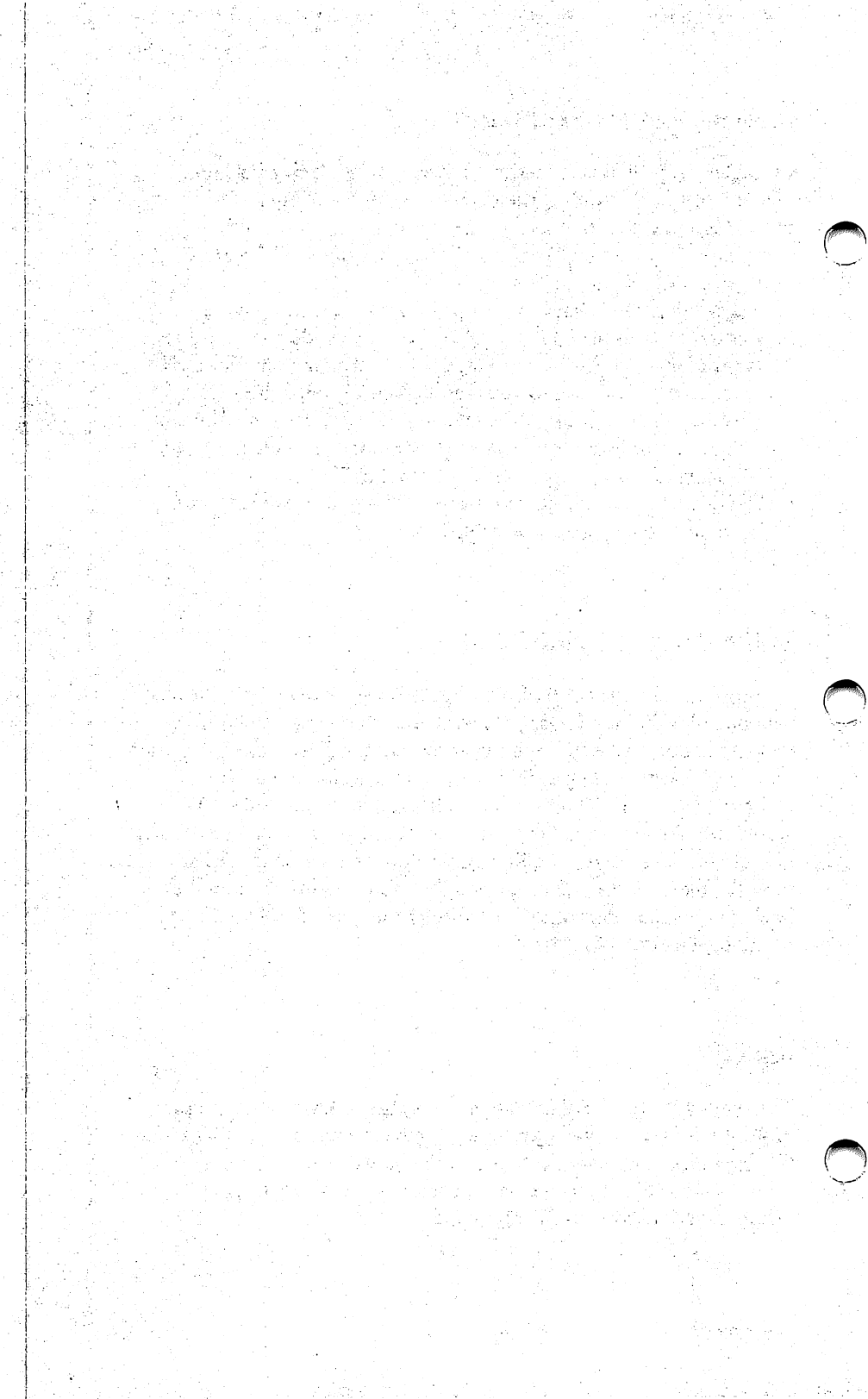
Keys and
Their Functions

■■

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**

Esc   Exit from any option or from the
               TAPUTL Main Menu.

Del   Delete an entry or exit from certain
               options.

Alt   ⇧   Turn off the backup-alert tone and
      Left   disable the currently scheduled
               backup.

F1   Causes temporary changes to
               become immediately effective.
               Changes are lost when the
               computer is rebooted.

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.)

KEYBOARD REFERENCE

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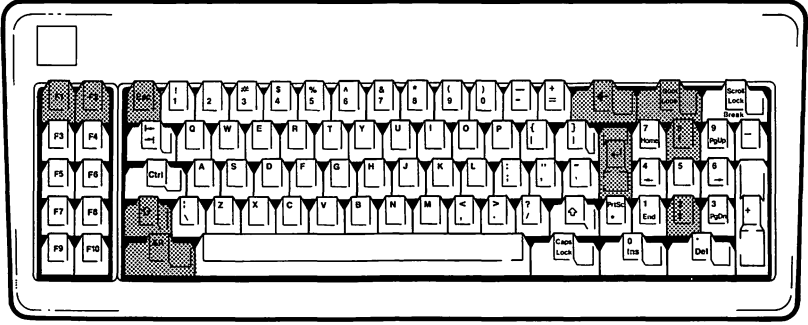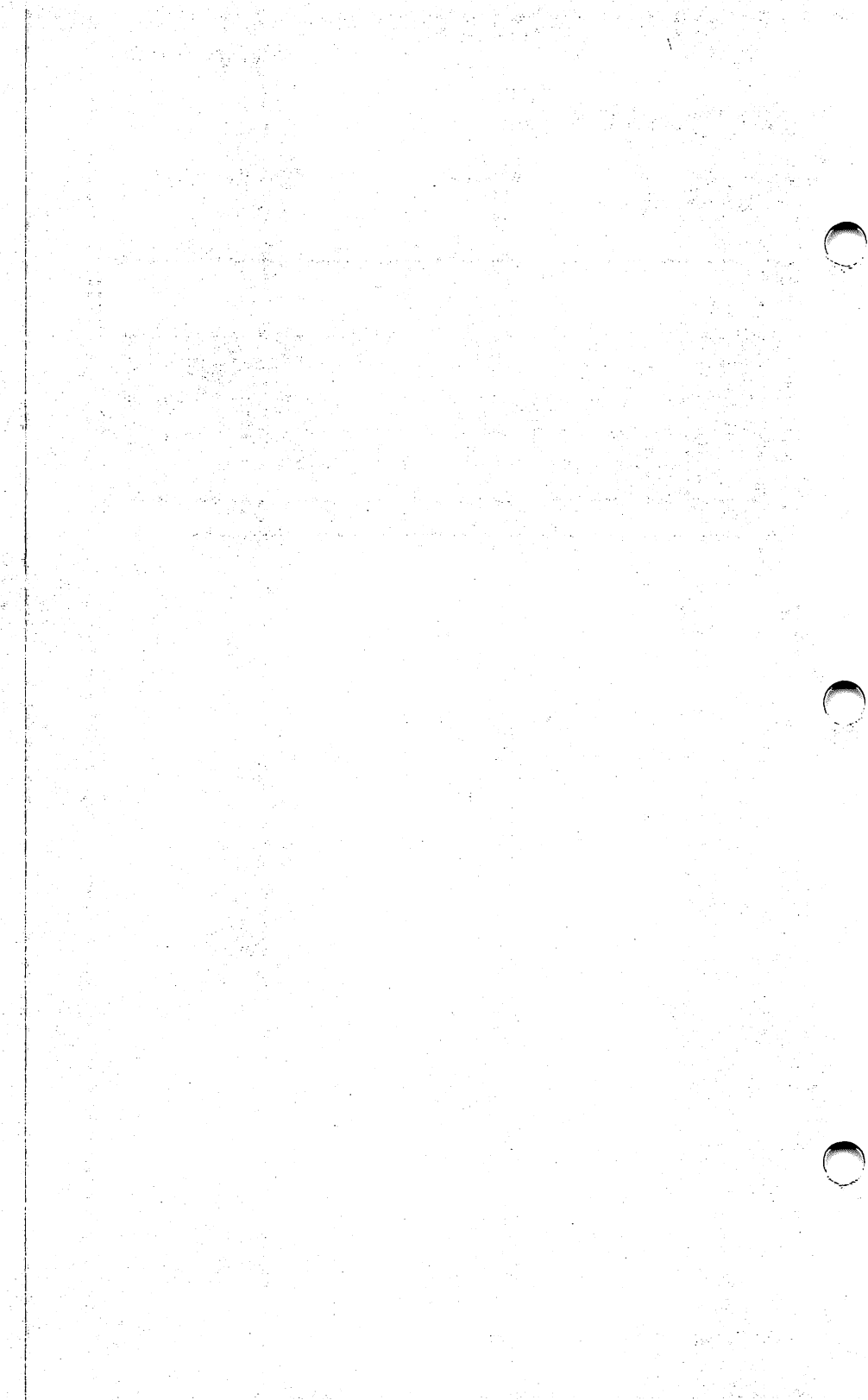
Automating
Backups

■■

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 = 123456789012345678901234567890123
SET TAPERR = 0000
C:AUTOBAK
C:TAPUTL/I C:\
```

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=1234567890123456789012345678901234567890123
SET TAPERR=0000
C:AUTOBAK
C:TAPUTL/I C:\
```

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 = 1234567890123456789012345678901 23
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.

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[TM] 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.

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.
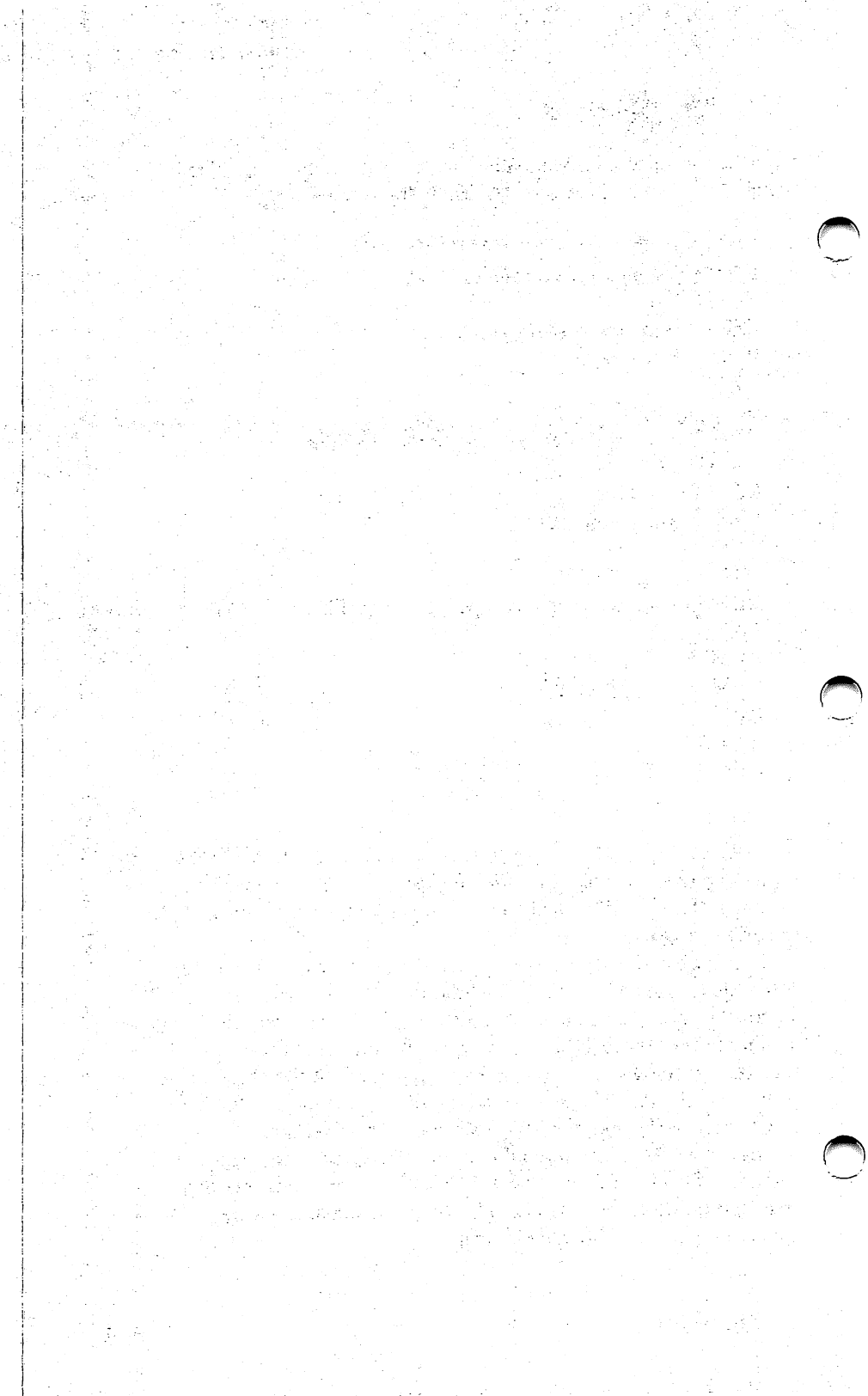
Questions and
Answers

■■

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.

- 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.

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.

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.

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.)

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.

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.)

C-7
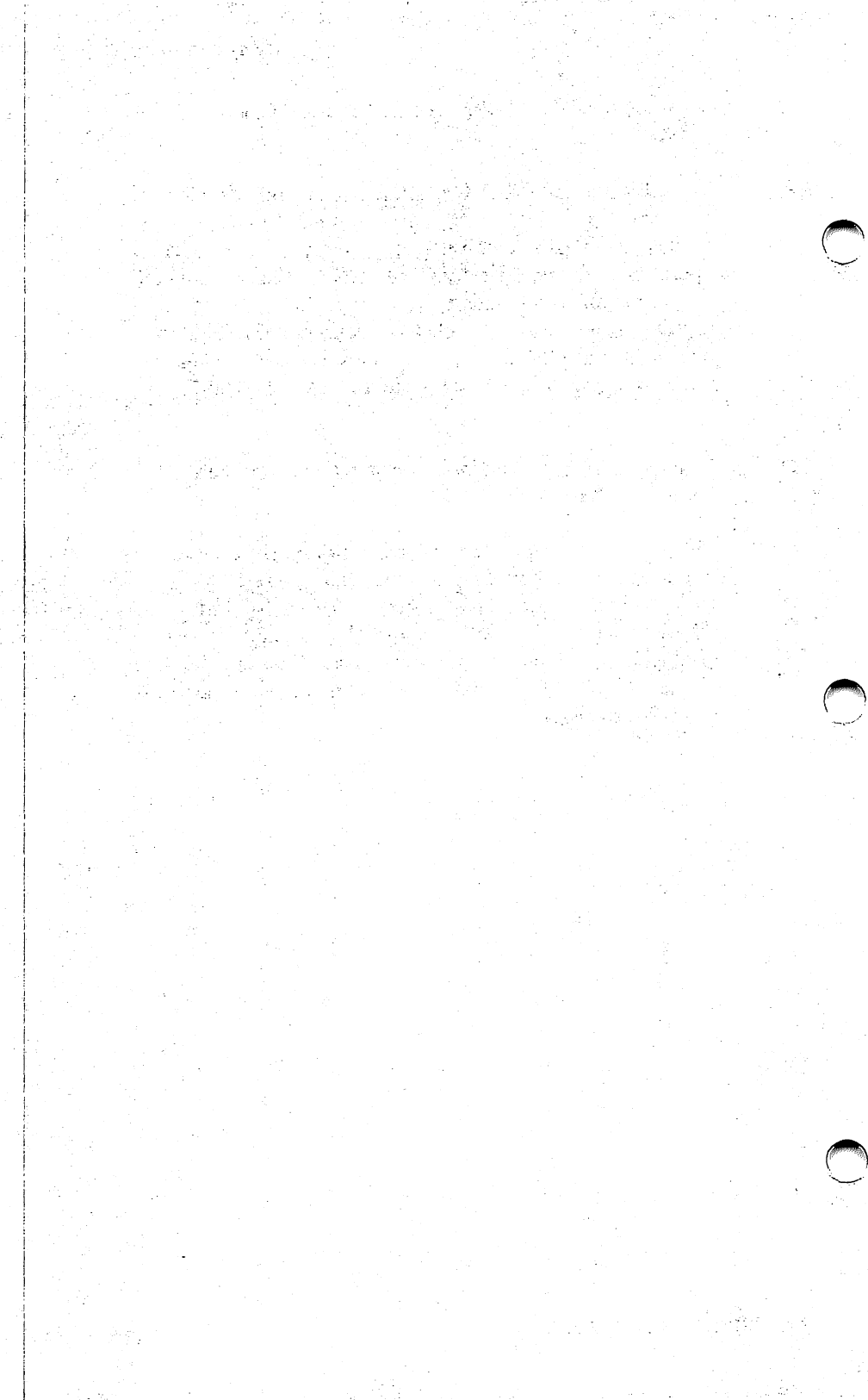
TAPUTL
Options

■■■

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.

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.

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.

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.

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.@@@.
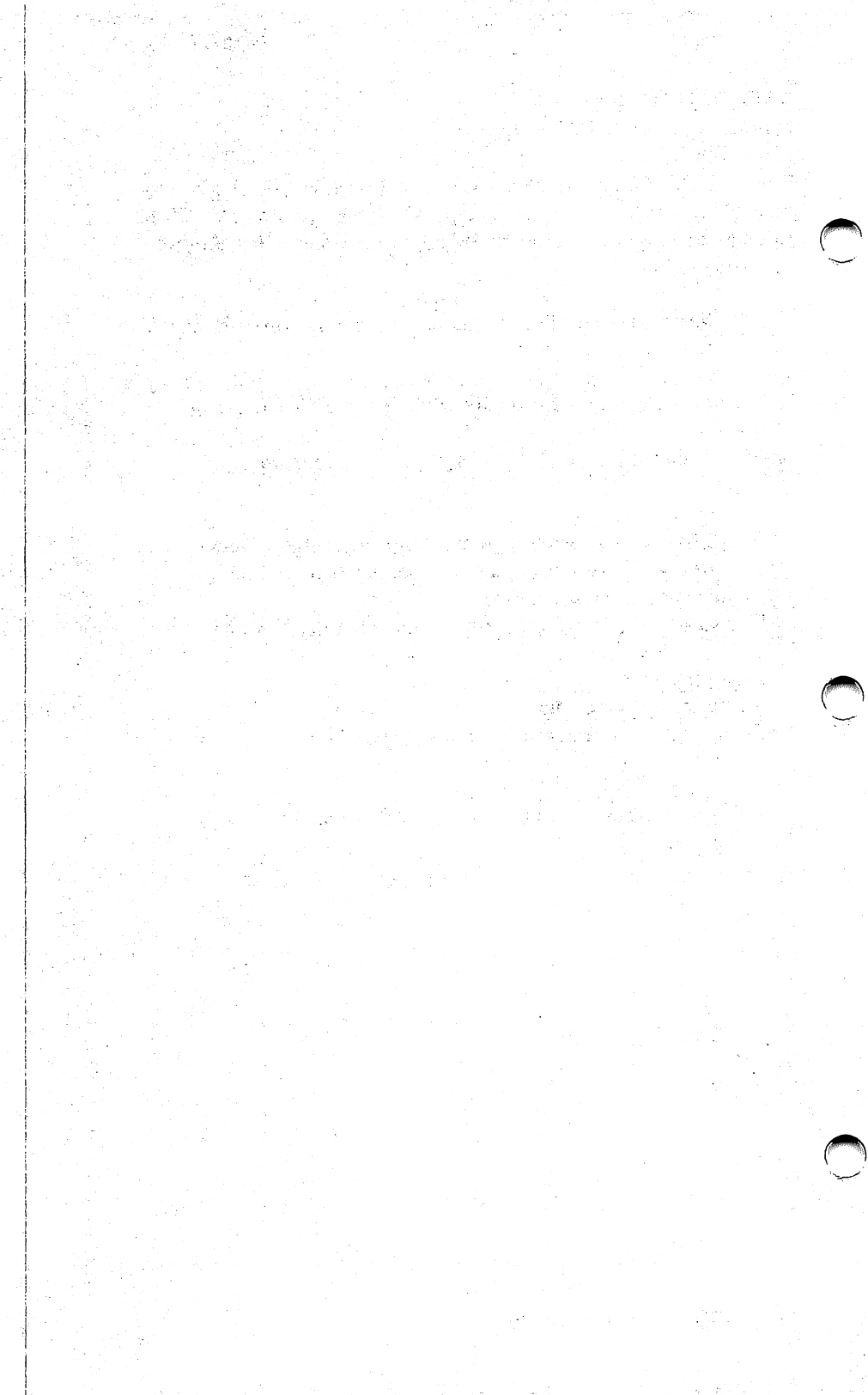
Error
Messages

■■■

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.

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.

<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.

<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.

<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.

<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.

<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.

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.

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.

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.

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.

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.

Glossary of Terms

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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*.

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.

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.

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.

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.

Index

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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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