hp surestore dat tape drive

getting started guide

internal model

Digital Data Storage

dat 24i, dat 40i

hp invent

open this flap for quick start installation poster

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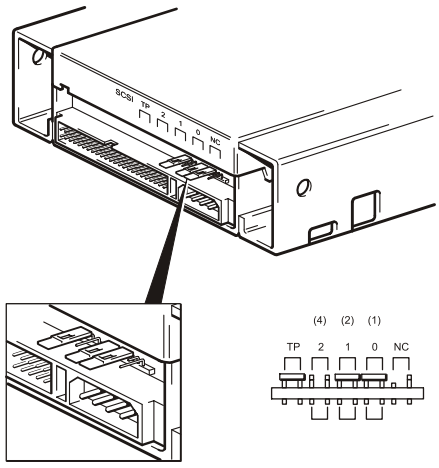
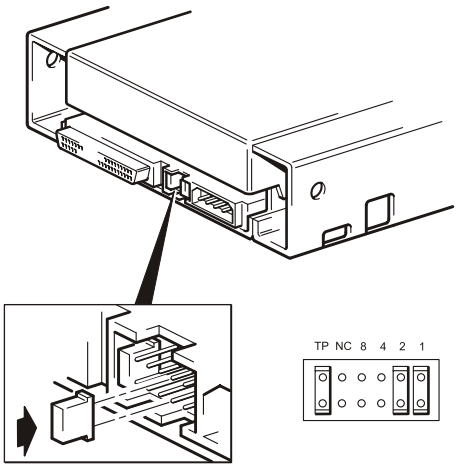


dat 24



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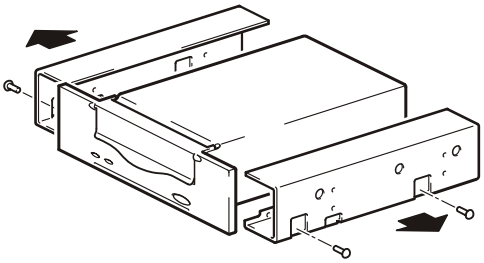

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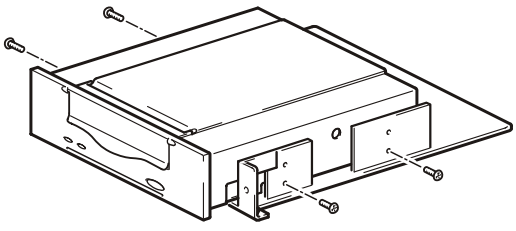

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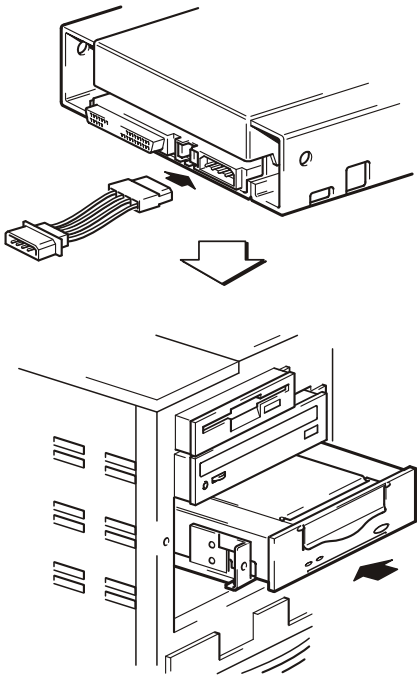

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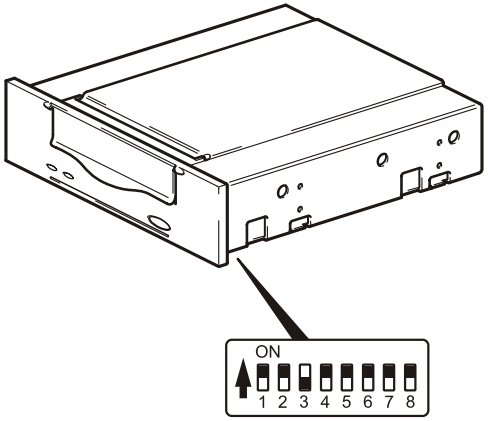
UNIX



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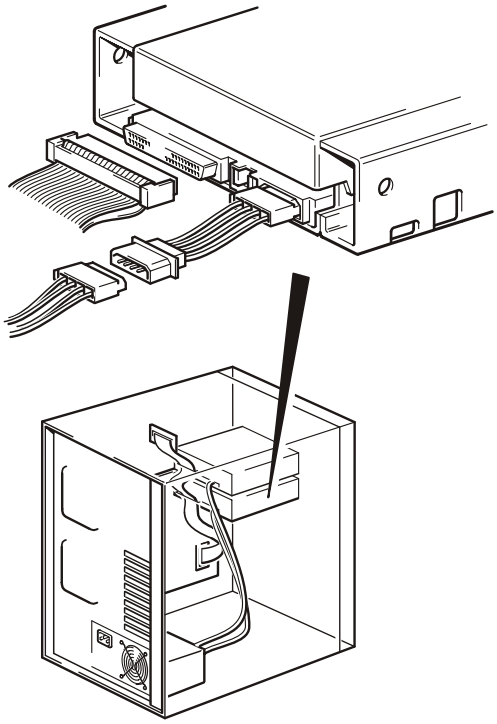

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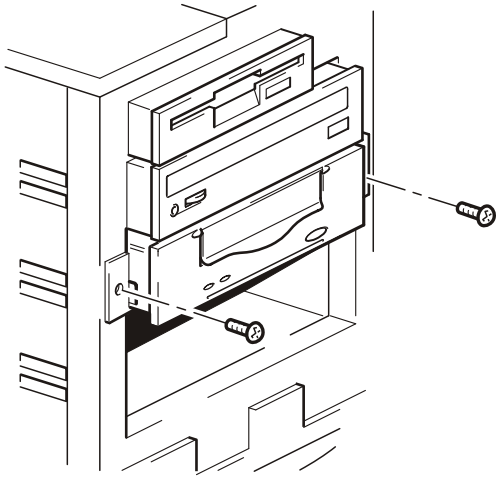

Internal drives - overview

April 2001

Part Number: C1555-90973

Product Details

Write your tape drive details here so you can find them easily if you need them.

Model (type of drive):	
Model (number):	
Serial (number):	
Date purchased/installed:	
SCSI ID:	

Before you start

HP Surestore DAT models

This guide describes how to install and operate the following HP Surestore DAT models:

- DAT 24i
- DAT 40i

Prerequisites

To install and use your new tape drive, you will need the following:

- SCSI host bus adapter on host server
- SCSI cable
- Available 5¼-inch, half-height mounting bay (or 3½-inch, half-height bay if using conversion kit)
- Mounting hardware, if required
- Backup software that supports the tape drive

For the latest list of operating systems that support HP Surestore DAT drives, please consult our World Wide Web site (`www.hp.com/go/connect`).

SCSI host bus adapter

You need a properly installed and configured SCSI host adapter or a built-in SCSI controller on your computer's motherboard (SCSI-2 or SCSI-3 compliant). Connectivity information can be found on our World Wide Web site: `//www.hp.com/go/connect`.Check the server documentation for the specification of any built-in SCSI channels. Do not connect to a RAID controller channel; these are for disk drives only.

If you are installing on a Windows NT 4, Windows 2000 or Novell NetWare system, you can use HP Library & Tape Tools to check your computer's SCSI configuration, see page 35.

HP Surestore DAT drives and SCSI

HP Surestore DAT 24 drives are fast narrow SCSI devices and should be connected to a single-ended (SE) host bus adapter.

HP Surestore DAT 40 drives are ultra wide SCSI devices. For optimum performance the drive should be connected to a low voltage differential (LVD) SCSI host adapter.
HP Surestore DAT 40 drives may also be connected to SE (single-ended) SCSI host adapters, but cable length will be restricted to the SE rather than the LVD specification.

If you would like more information on SCSI specifications and configuring your SCSI bus, read the "SCSI" topic in the electronic *User's Guide* on the *HP Surestore Tape* CD-ROM.

SCSI ribbon cable

You need a SCSI ribbon cable with the correct termination.

HP Surestore DAT 24 drives have a 50-pin narrow SCSI connector. If your computer uses wide SCSI, use the supplied 50-to-68-pin adapter to connect the drive (50 pins) into the wide SCSI bus (68 pins).

HP Surestore DAT 40 drives have a 68-pin wide, high-density SCSI connector. If your computer uses narrow SCSI, use a 68-to-50-pin adapter to connect the DAT 40 drive (68 pins) into the narrow SCSI bus (50 pins). This adapter must be purchased separately (part number C7423A). See the *HP Surestore Tape* CD-ROM for ordering information.

To benefit from the advantages of LVD SCSI, it is important to always use LVD-rated SCSI cabling with HP Surestore DAT 40 drives. If your server or host bus adapter is equipped with a very high density (VHD) wide SCSI connector, you will need to order a VHDCI-to-HD cable. See the *HP Surestore Tape* CD-ROM for ordering information.

Half-height bay

You need a 5¼-inch, half-height bay in which to install the tape drive. If you have 3½-inch bays, use the supplied 5¼ to 3½-inch conversion kit.

Mounting rails

For many servers, no tray or rails are required. Devices simply slide into the computer's chassis and are fixed with screws. Other servers have built-in trays or rails.

Some servers require special mounting tray or rails to fix the drive into the empty bay. The drive comes with mounting hardware for HP Netserver L-series, E-series, Kayak, Brio and Vectra computers and Compaq servers. (Not all HP Netserver E-series and Compaq servers require rails.)

Rails for Dell servers may be ordered separately. Different models of server require different rail kits. Please consult our World Wide Web site (`www.hp.com/go/connect`) for ordering details.

Other computers use non-standard mounting rails and do not include spares. *If this is the case with your system, you will have to order these accessories from the computer manufacturer before you can install the tape drive*.

Backup software

You need backup software that supports the drive. Computer Associates, HP, Veritas, Legato and Yosemite all provide suitable products that have been tested with HP Surestore drives. A TapeWare CD-ROM containing backup software by Yosemite Technologies is supplied with your tape drive. For the latest list of backup applications that support HP Surestore DAT drives, please consult our World Wide Web site (`www.hp.com/go/connect`). For details of how best to optimize your tape drive to achieve the maximum performance with your backup application, consult our World Wide Web site (`www.hp.com/support/dat`).

Applications usually recognize tape drives by their manufacturers' internal identifiers rather than their model numbers, so check the table below for the appropriate reference for your model.

Drive Model	**Internal Identifier**
HP Surestore DAT 24	HP C1537A
HP Surestore DAT 40	HP C5683A

Register your tape drive

Once you have installed and tested your HP Surestore DAT tape drive, please take a few minutes to register your product. This will give you the opportunity to receive up-to-date information about our products, services and support.

Please register via the web (`www.hp.com/go/tapereg`) or by using the Customer Care card in the box.

To ensure your registration is complete, there are a number of questions on the Customer Care card and electronic form that are mandatory. Other questions are optional. However, the more you feel able to complete, the better we can meet your needs.

Note HP and its subsidiaries are committed to respecting and protecting your privacy. For further information, please visit our World Wide Web site (`www.hp.com`) and click on Privacy Statement.

If you have Internet access, register electronically

1. Select the Product Registration topic on the *HP Surestore Tape* CD-ROM.
2. Select the Product Registration web link. This links you to HP's Product Registration web site.
3. Complete the registration form. Mandatory questions are shown in red text.
4. Click on the Submit button to forward your registration immediately to HP.

If you do not have Internet access

1. Complete the Customer Care card supplied with the drive. Mandatory questions are shown in black, bold text.
2. Mail or fax the completed form to HP.

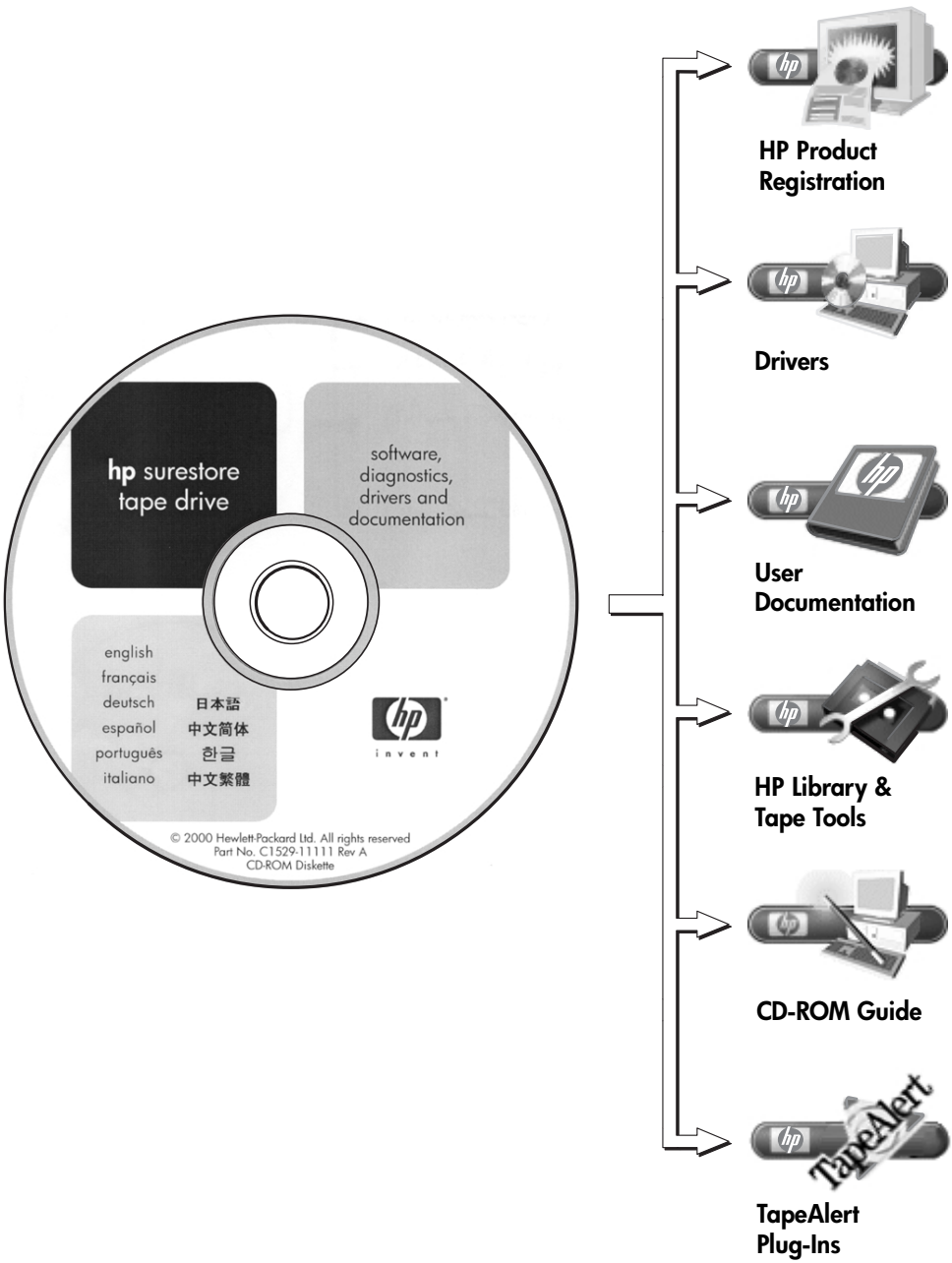

Figure 1: the *HP Surestore Tape* CD-ROM

Using the CD-ROM

The *HP Surestore Tape* CD-ROM contains drivers, useful utilities and information to help you install and use your tape drive.

HP product registration

To register your new tape drive electronically via the web, use the "Product Registration" link on the *HP Surestore Tape* CD-ROM.

Drivers

For detailed information about drivers, refer to the appropriate README file in the `DRIVERS` directories on the *HP Surestore Tape* CD-ROM. There is a separate sub-directory for each operating system. The tape drive must be installed before installing the driver.

User documentation

For more information about using your HP Surestore DAT tape drive, refer to the "User Documentation" topic on the *HP Surestore Tape* CD-ROM.

Refer to your backup application's documentation for instructions on how to back up and restore data.

HP Library & Tape Tools

HP Library & Tape Tools software provides diagnostic and troubleshooting utilities. It allows you to identify your product correctly, check SCSI ID information on the SCSI bus, run tests, carry out firmware upgrades and, if necessary, generate comprehensive troubleshooting information for support calls. For further details see page 35.

CD-ROM Guide

The CD-ROM guide provides:

- An overview of the CD directory structure
- Information about the languages in which the contents of the CD-ROM are available
- A set of URLs and links for further information
- A web link to HP Instant Support. HP Instant Support is a web-based automated problem identification, diagnosis and resolution tool. For further details see page 35.

TapeAlert plug-ins

TapeAlert is a tape drive status monitoring and messaging utility that makes it easy to detect problems that could have an impact on backup quality. From the use of worn-out tapes to defects in the drive hardware TapeAlert provides easy-to-understand warnings of errors as they arise, and suggests a course of action to remedy the problem.

To take advantage of TapeAlert, you need a TapeAlert-compatible tape drive, such as the HP Surestore DAT drive, and TapeAlert-compatible backup software. The *HP Surestore Tape* CD-ROM contains plug-ins for leading network management consoles, such as TapeAlert for Openview, to monitor your tape drive across the network.

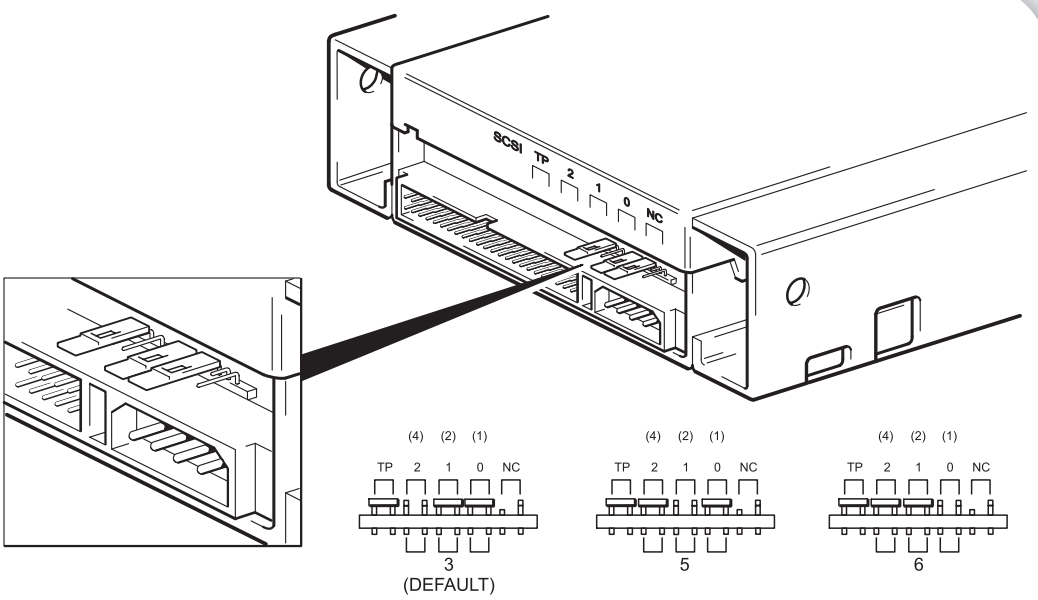

Figure 2a: checking the SCSI ID, HP Surestore DAT 24

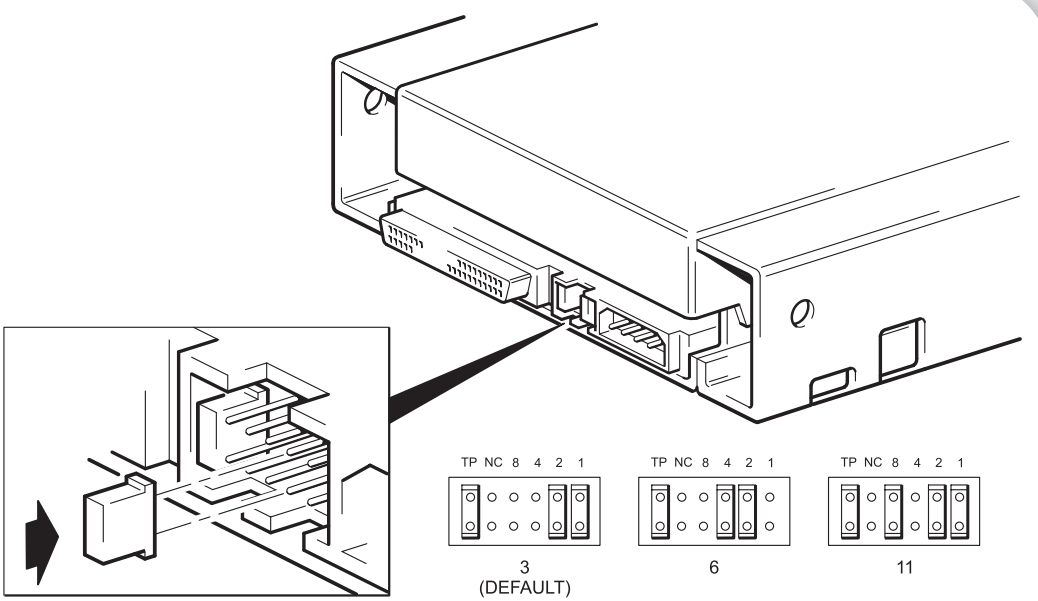

Figure 2b: checking the SCSI ID, HP Surestore DAT 40

Step 1: Check the drive's SCSI ID

Note Your HP Surestore DAT drive is shipped with a default SCSI ID of 3. HP Surestore DAT 24 drives can be assigned any *unused* ID between 0 and 6. HP Surestore DAT 40 drives can be assigned any *unused* ID between 0 and 15. Do not use SCSI ID 7, which is reserved for the SCSI controller, or SCSI ID 0, which is typically assigned to the boot disk.

1 Determine whether you need to change the SCSI ID from the default of 3.

If you are installing on a Windows NT 4, Windows 2000 or NetWare system, you can install HP Library & Tape Tools from the *HP Surestore Tape* CD-ROM and run the "Install Check" to check your computer's current SCSI configuration (see page 35).

If you are installing on a UNIX® system, check the electronic *User's Guide* on the *HP Surestore Tape* CD-ROM, for instructions on how to determine the SCSI IDs of existing devices.

Caution Static electricity can damage electronic components. Always wear an antistatic wriststrap if possible. If not, to equalize the electromagnetic charges, touch a bare metal part of the computer (such as the back plate) before you remove the tape drive from its bag.

2 Change the tape drive's SCSI ID, if necessary.

The SCSI ID is set using jumpers on a set of pins at the rear of the drive. Use your fingers to move the jumpers to the pattern corresponding to the ID you want. Do not remove the TERM PWR jumper. It should always be set.

Spare jumpers will either be on switch itself (but only attached to a single pin) or in the accessories box.

- For HP Surestore DAT 24i models, see figure 2a.
- For HP Surestore DAT 40i models, see figure 2b.

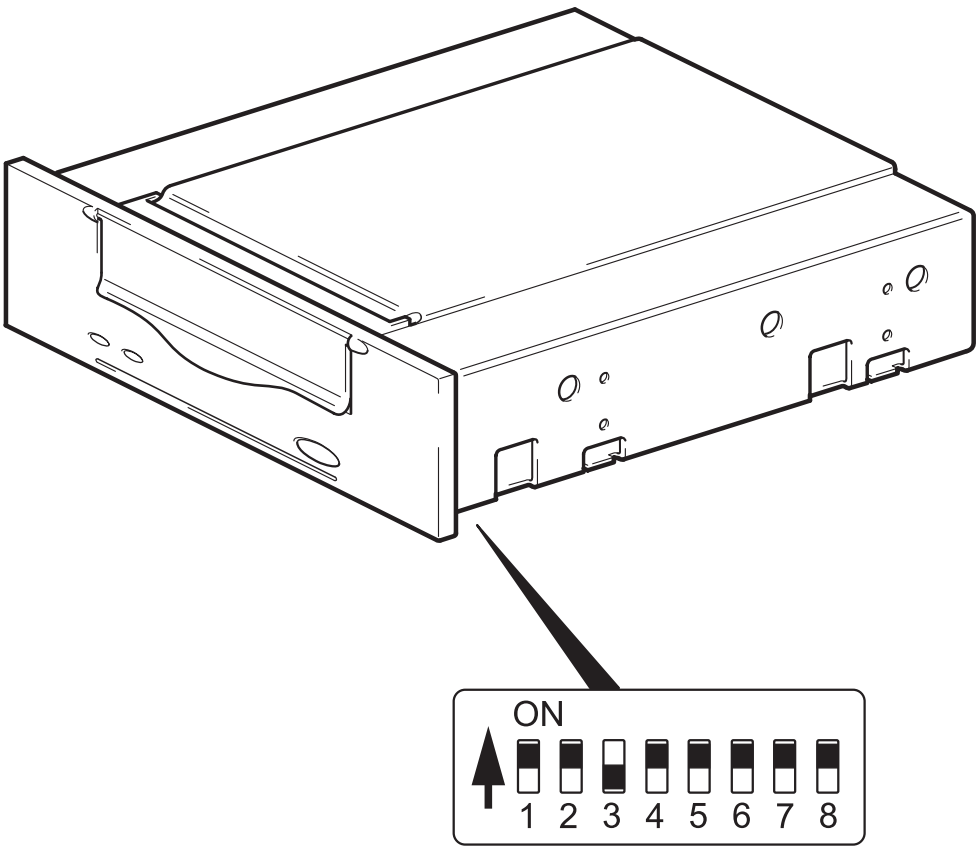

Figure 3: setting the UNIX configuration switches

Step 2: Set the configuration switches (UNIX systems only)

Only read this section if you are installing your drive into a UNIX system. Go straight to step 3 if you are installing your drive into a Windows PC.

1 Check the "UNIX Configuration Instructions" in the electronic *User's Guide* on the *HP Surestore Tape* CD-ROM for specific advice for your operating system. See page 7 for more information about using the *HP Surestore Tape* CD-ROM.

The following table summarizes the *typical* switch settings for different types of computer, but further details are provided in the electronic *User's Guide*.

	Switch Number							
System Type	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Default and most PC systems	**On**	**On**	**Off**	**On**	**On**	**On**	**On**	**On**
Compaq systems	**On**	**On**	**Off**	**On**	**On**	**On**	**On**	**Off**
HP systems (Series 700)	**On**	**On**	**Off**	**On**	**On**	**On**	**On**	**On**
IBM RS/6000 systems	**On**	**On**	**Off**	**On**	**On**	**Off**	**Off**	**On**
SCO/PC UNIX systems	**On**	**On**	**Off**	**On**	**On**	**On**	**On**	**On**
Silicon Graphics systems	**On**	**On**	**Off**	**On**	**On**	**Off**	**Off**	**On**
Sun systems	**On**	**On**	**On**	**On**	**On**	**Off**	**Off**	**On**

2 If your UNIX configuration requires it, change the configuration switches located on the underside of the drive from the default settings shown in figure 3.

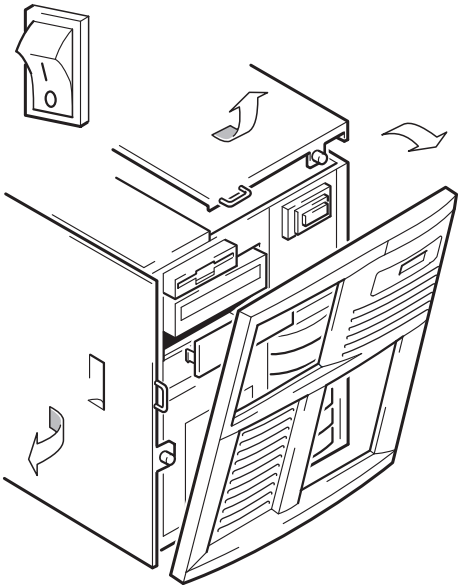

Figure 4a: preparing mounting bay in a typical HP server

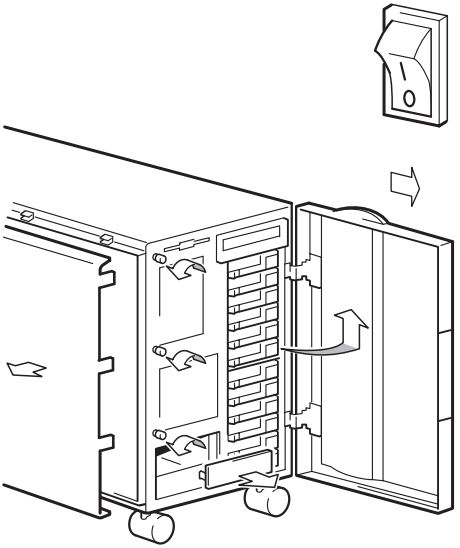

Figure 4b: preparing mounting bay in a typical Compaq server

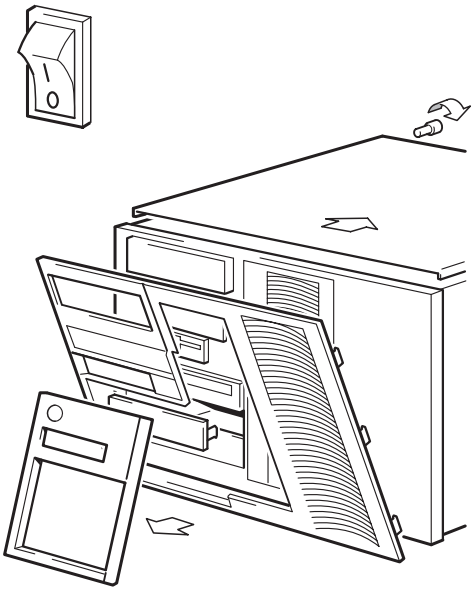

Figure 4c: preparing mounting bay in a typical IBM server

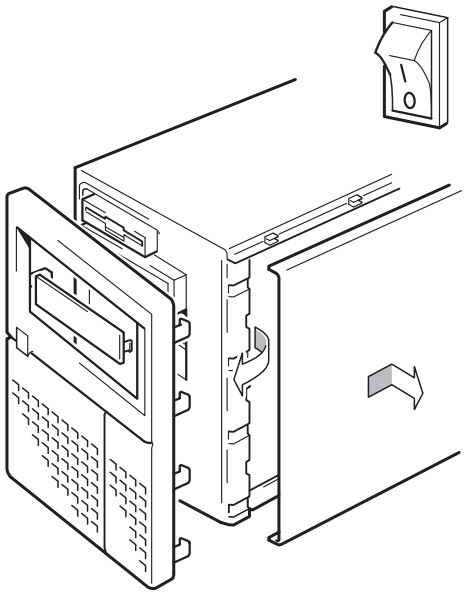

Figure 4d: preparing mounting bay in a typical Dell server

Step 3: Prepare the mounting bay

Caution To avoid personal injury or damage to the computer or tape drive, ensure that the computer is disconnected from the mains while you install the drive.

Static electricity can damage electronic components. Always wear an antistatic wriststrap if one is available. If not, after you have disconnected power from the computer and removed the cover, touch a bare metal part of the chassis. Similarly, touch a bare metal part of the drive before installing it.

1 Assemble the necessary tools and materials:

- Phillips screwdriver
- Flat-bladed screwdriver (if your computer uses slotted screws)
- Torx screwdriver (if your computer uses torx screws)
- Your computer manuals (for reference during installation)

2 Perform a normal system shutdown and turn off the computer and any connected peripherals.

3 Remove the cover and front panel from the computer, as detailed in your computer's documentation.

As you work inside the computer, you may have to disconnect the SCSI cable or power cable from other devices to maneuver the new drive into place. If you have to do this, make a note of their position and connections so you can put them back correctly later.

4 Remove the filler panel from a spare 5¼-inch (or 3½-inch) bay of your computer, as described in your computer's documentation. Keep any screws for use in step 8 on page 23.

5 If you will be installing the tape drive in a 3½-inch bay, you need to use the conversion kit as described in step 4, so that the drive will fit into your computer. *If your computer has 5¼-inch bays, go to step 5 on page 17 now.*

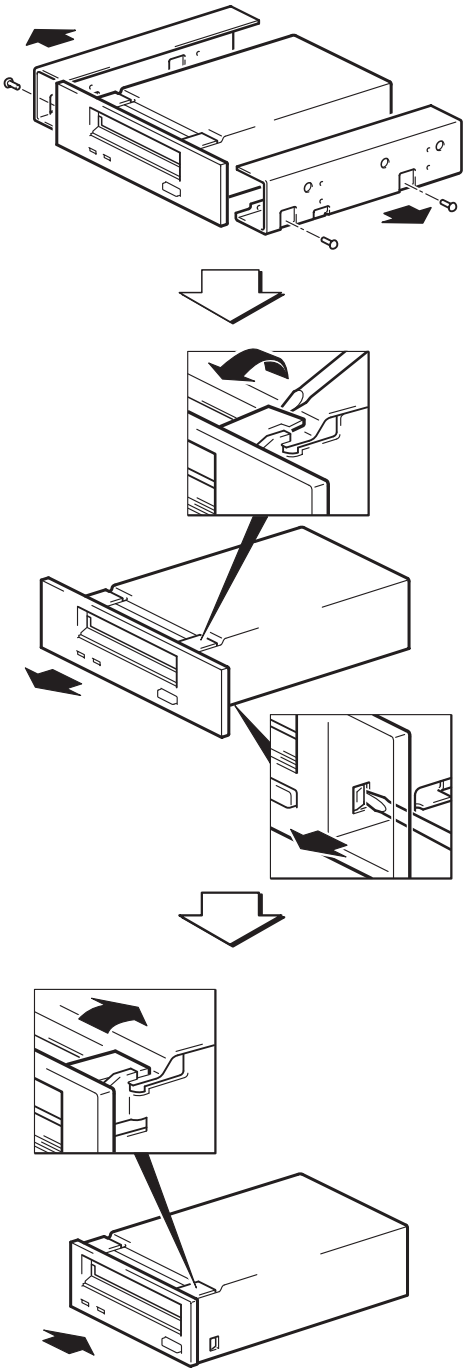

Figure 5a: HP Surestore DAT 24i, using the conversion kit

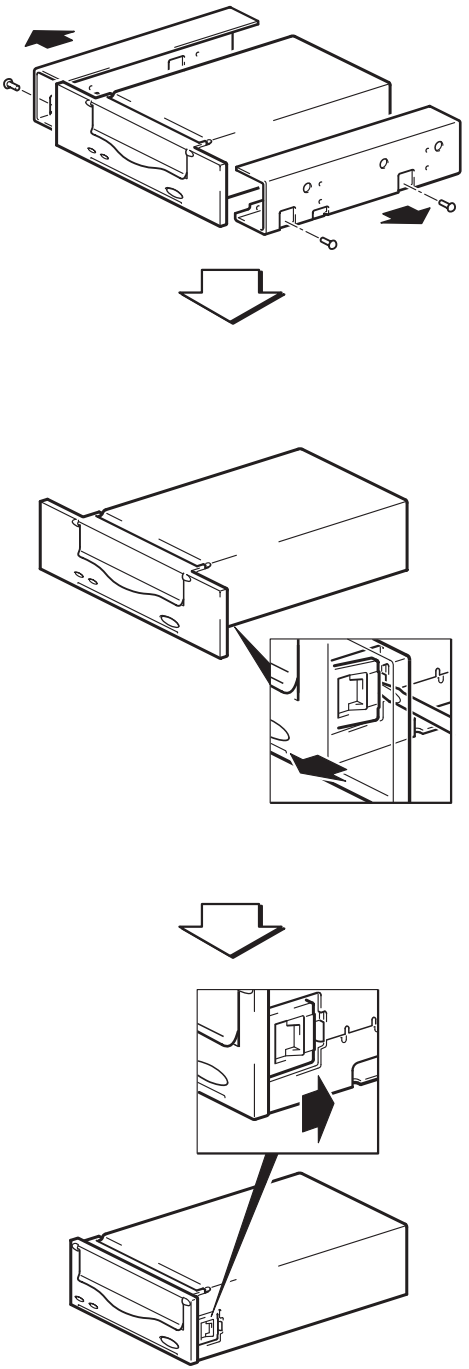

Figure 5b: HP Surestore DAT 40i, using the conversion kit

Step 4: Using the conversion kit (optional)

Only read this section if you are installing your drive in a 3½-inch bay. It describes how to remove the 5¼-inch front panel from the tape drive and replace it with the 3½-inch front panel. If your computer has 5¼-inch bays, go straight to step 5 now.

HP Surestore DAT 24i

1 Unscrew the four screws and remove the rails from the tape drive.

2 Use a screwdriver, as illustrated in figure 5a, to release each side of the 5¼-inch front panel. Then release the top lugs and gently lift the front panel away from the tape drive and remove.

3 Fit the 3½-inch front panel, by aligning the top lugs first and then push firmly until the panel clicks into place.

HP Surestore DAT 40i

1 Unscrew the four screws and remove the rails from the tape drive.

2 Use a screwdriver as illustrated in figure 5b, to release each side of the 5¼-inch front panel from the tape drive and remove it.

3 Fit the 3½-inch front panel, by aligning the side lugs and then push firmly until the panel clicks into place.

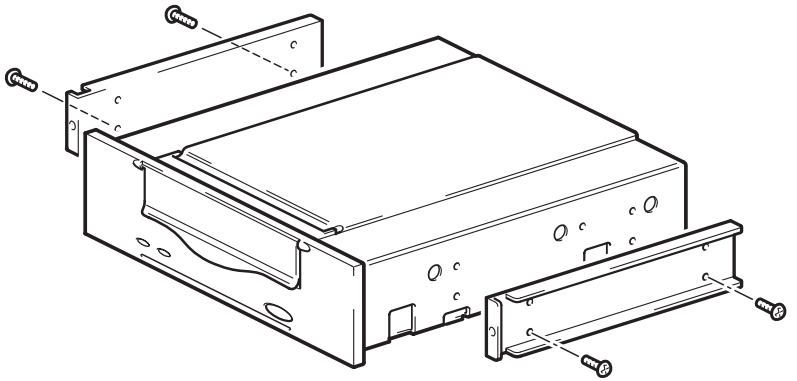

Figure 6a: HP Netserver E-series, Vectra, Kayak or Brio, attaching mounting rails

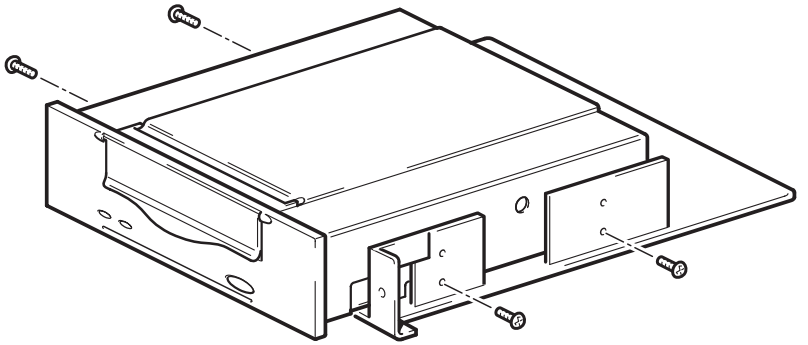

Figure 6b: HP Netserver L-series, attaching mounting tray

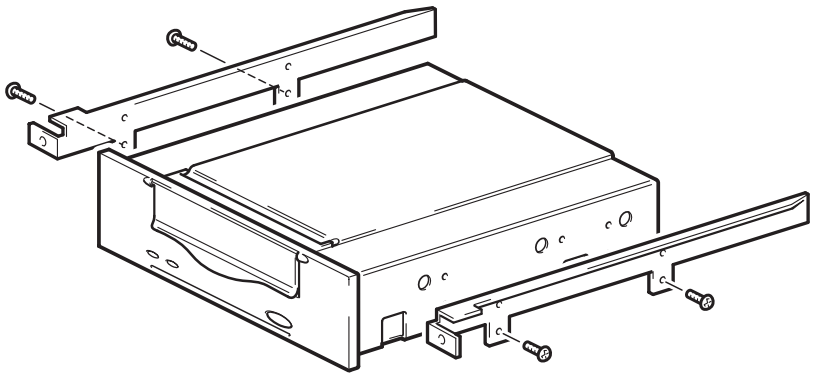

Figure 6c: Compaq, attaching mounting rails

Step 5: Attach mounting hardware

If your computer requires special rails or other hardware to install the tape drive, mount them on the tape drive in this step.

If your computer does not require special mounting hardware, proceed to step 6 now.

1 Attach the appropriate rails.

- If you are installing in a Vectra, Kayak, Brio or HP Netserver E-series that requires mounting rails, fasten the rails to the tape drive using the four screws supplied, as shown in figure 6a.
- If you are installing in an HP Netserver L-series, place the tape drive in the mounting tray supplied, as shown in figure 6b.
- If you are installing in a Compaq computer that requires mounting rails, fasten the rails to the tape drive using the four screws supplied, as shown in figure 6c.
- If your computer uses other mounting hardware, attach it to the tape drive as directed in your computer documentation.

Note Secure the tape drive in the mounting tray using the four screws supplied with the rail kit. You can use either the top or bottom set of holes in the rail. An extra screw is supplied with the rail kit (set of 5) in case one is mislaid. Using screws that are longer than the screws provided may cause damage.

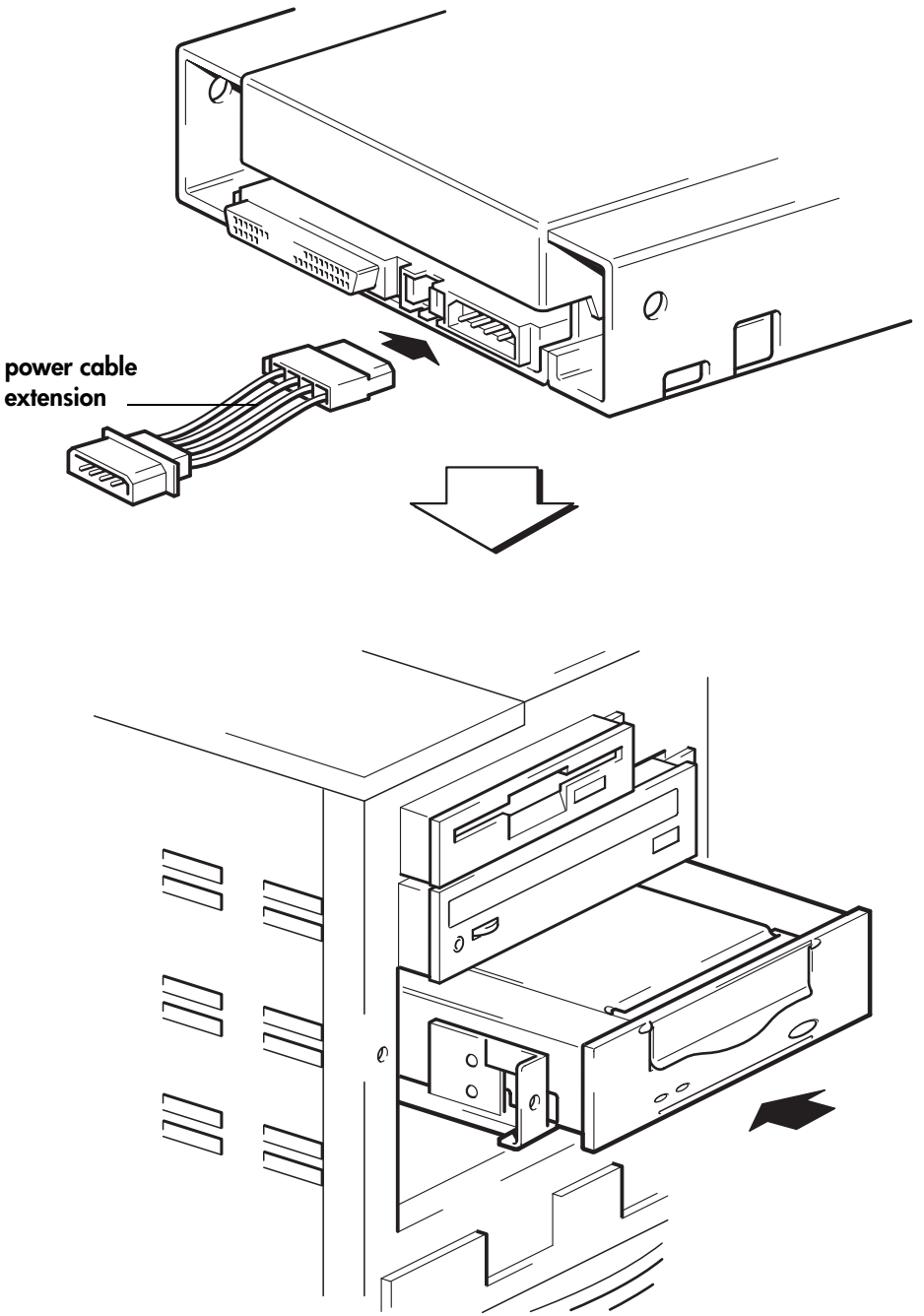

Figure 7: installing the drive

Step 6: Attach power extension cable and install drive

1 Attach the power cable extension to the power connector on the rear of the tape drive, as shown in figure 7.

2 Slide the tape drive into the open bay, aligning the tray or rails with the slots in the bay, as shown in figure 7.

If your computer does not use mounting hardware, check that the holes in the chassis are aligned with the holes in the side of the tape drive.

Do not secure the drive with screws at this point because you may have to move the drive to get the cables into place.

Note Write the model name, product number, serial number, and SCSI ID of your drive on page 2 of this guide. The model name is on the front of the drive and the product and serial numbers are on a label on the bottom of the drive.

3 Install a SCSI host adapter in the selected server or workstation now, if necessary. For information on SCSI host requirements, see page 3.

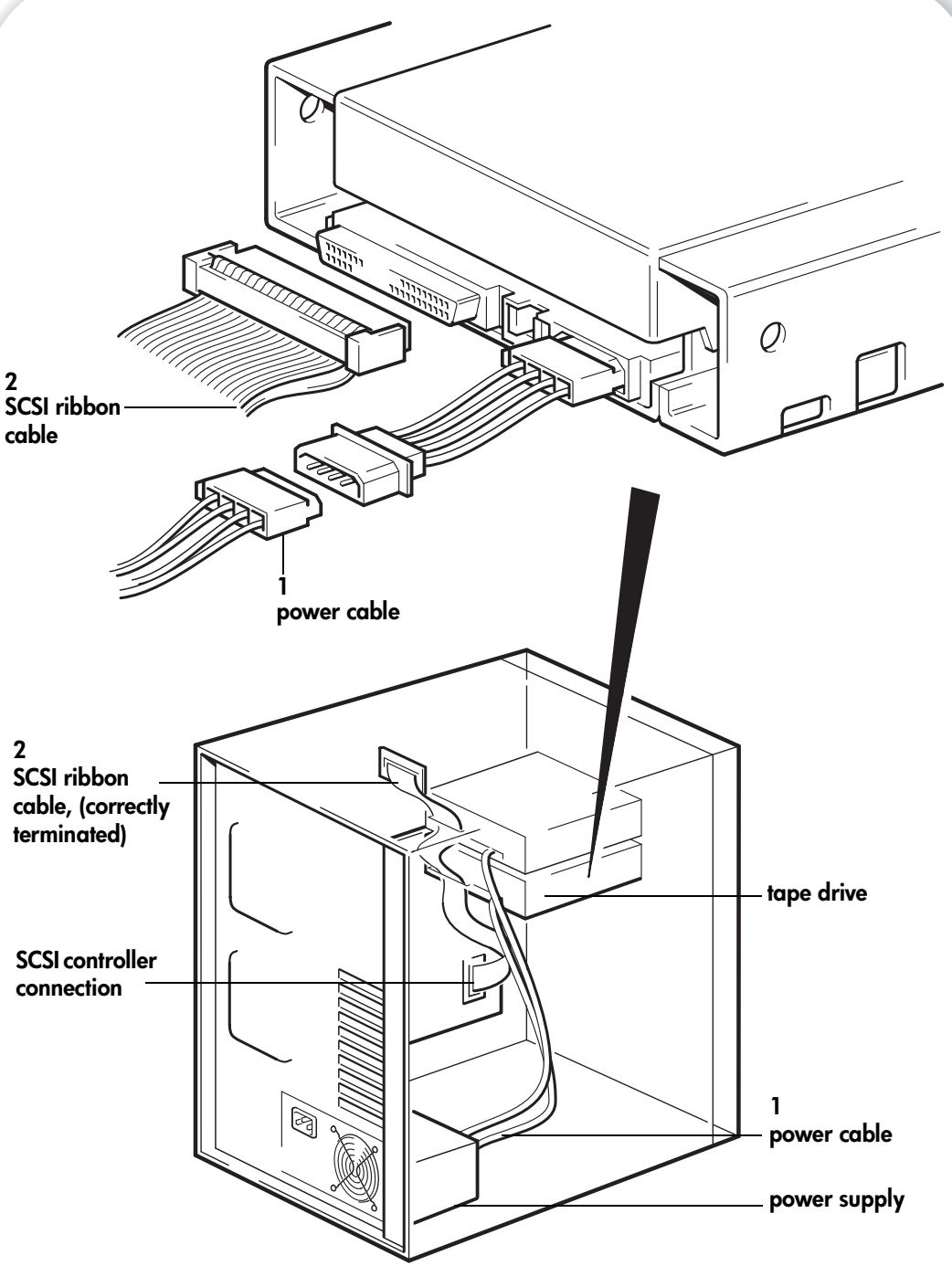

Figure 8: attaching power and SCSI cables

Step 7: Attach power and SCSI cables

1 Attach a spare power cable from the computer's internal power supply to the power connector, as shown in figure 8, item 1.

2 Attach a spare connector on the computer or HBA's SCSI ribbon cable to the SCSI connector of the drive, as shown in figure 8, item 2.

DAT 24i drives only: If your computer has wide SCSI, use a 50-to-68-pin adapter to connect the tape drive to the SCSI bus. Plug the adapter into the 68-pin SCSI connector on the computer and then connect the SCSI cable from the adapter to the 50-pin SCSI connector on the tape drive.

Note If the drive is the last device on the SCSI chain, the SCSI cable must be terminated. Most internal SCSI cables have a terminator attached. This will usually be a small, rectangular block of plastic attached to the cable end and marked 'SCSI Terminator'.

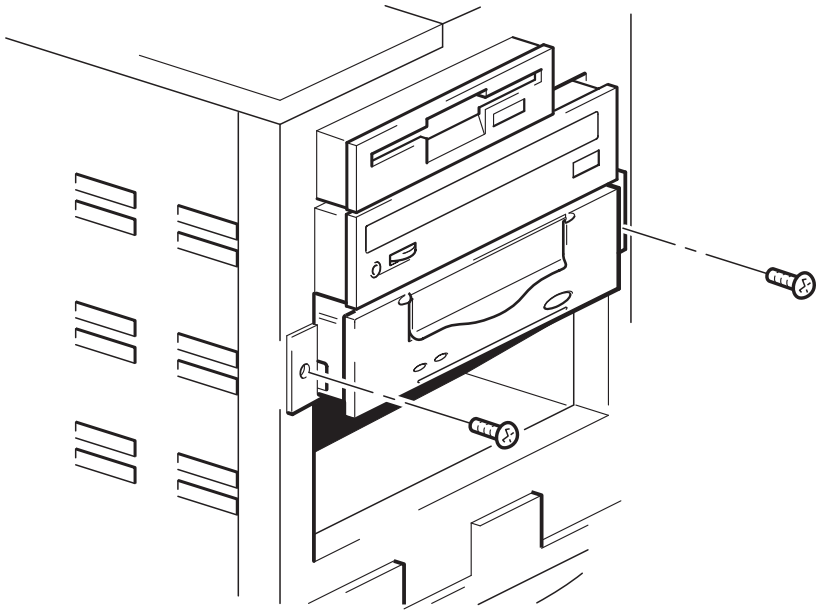

Figure 9a: securing drive to mounting hardware

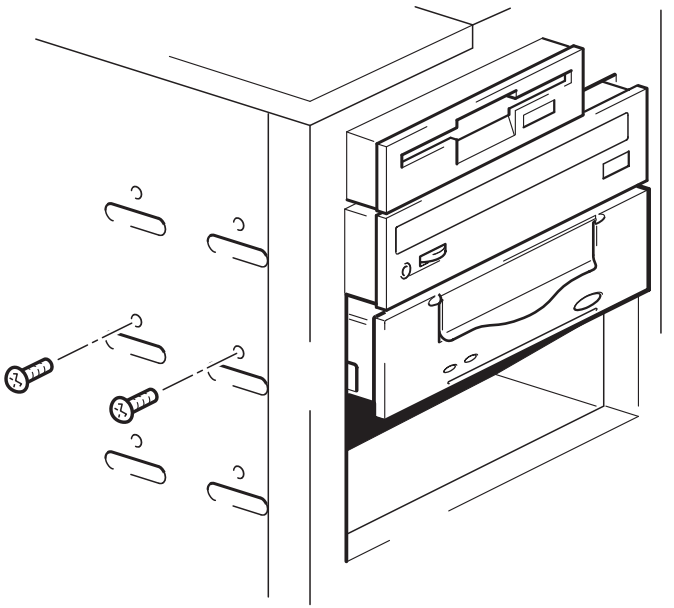

Figure 9b: securing drive, no mounting hardware

Step 8: Secure the drive

Mounting hardware used

1. Secure the tape drive into place. Use the screws you removed in step 2 to fix the drive in place, as shown in figure 9a.

2. Replace the cover on the computer.

No mounting hardware used

1. Secure the tape drive into place. Check that the holes in the chassis are aligned with the holes in the sides of the drive and use the screws provided with the rail kit to secure the drive, as shown in figure 9b.

2. Replace the cover on the computer.

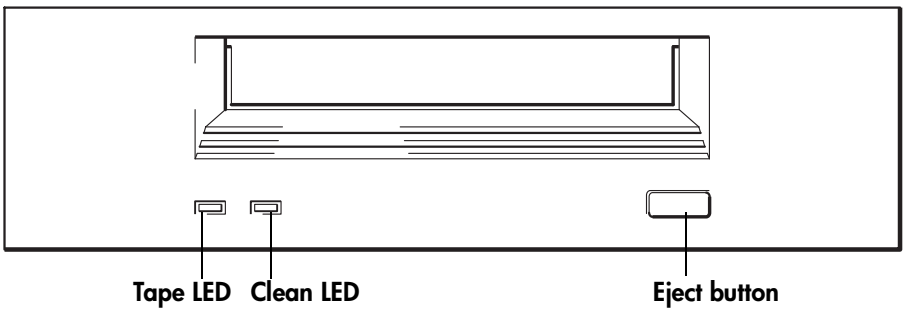

Figure 10a: HP Surestore DAT 24 tape drive controls and indicators

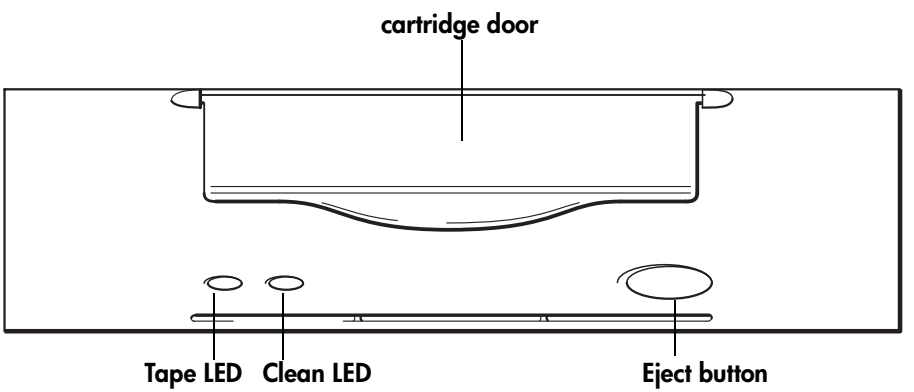

Figure 10b: HP Surestore DAT 40 tape drive controls and indicators

Your HP Surestore DAT tape drive

There are two LEDs and an eject cartridge button on the front panel of your tape drive. See page 29 for more information about loading and unloading cartridges and page 31 for information about forcing ejection.

Front panel LEDs

There are two LEDs, labeled Tape and Clean, as illustrated in the diagram. (See figures 10a and 10b.)

Tape LED	Clean LED	Meaning
on	off	The cartridge is loaded and the drive is ready.
flashing slowly	off	The cartridge is loading or unloading, or self-test is in progress.
flashing rapidly	off	The cartridge is loaded, activity is occurring.
off	on	This is the Error Condition Signal. HP Surestore DAT drives perform a comprehensive self-test during power-up. If a hard error causes the self-test to fail, the clean light changes to steady amber. Run HP Library & Tape Tools to help diagnose the problem. (See page 35.)
off or flashing rapidly	flashing slowly	This is the Media Caution Signal. 1 Wait for the current operation to finish, then insert a different tape and repeat the operation that was being performed. 2 If the media caution signal does not show this time, it indicates that the original cartridge was nearing the end of its useful life. Copy any data you want to keep from the original tape onto a new tape if possible, then discard the old tape. 3 If the media caution signal appears again with the second tape, the tape heads need cleaning. 4 If the media caution signal appears after using a cleaning cartridge, the cleaning cartridge has probably expired and should be discarded.
flashing slowly	flashing slowly	When the two LEDs flash alternately, the tape drive is in disaster recovery mode, restoring the operating system (see “Running HP OBDR” on page 33).

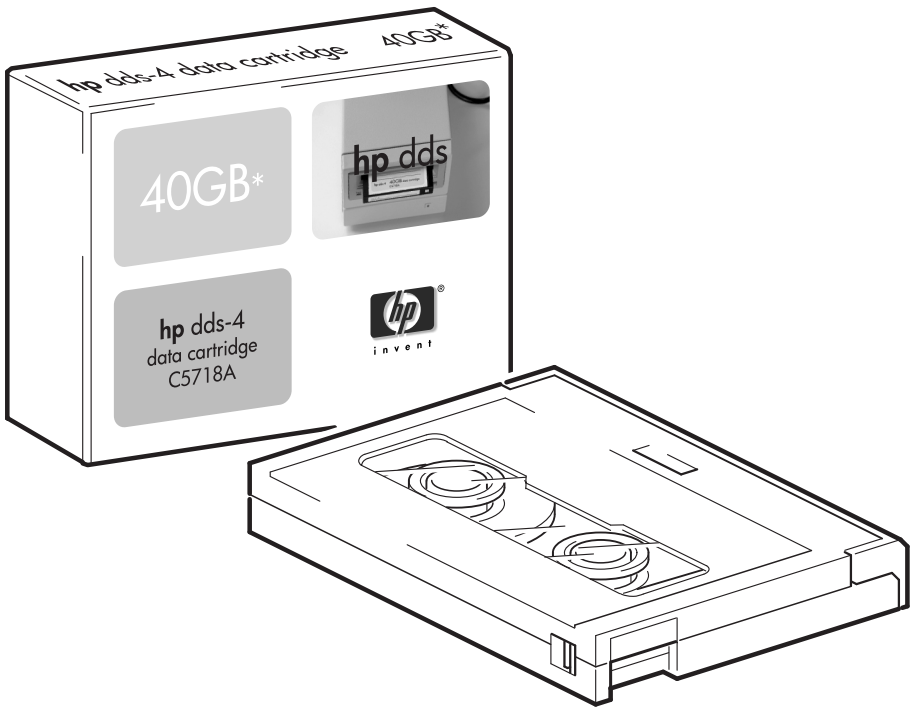

Figure 11: DDS media

Use the correct media

For optimum performance and storage capacity, use tape cartridges that match your drive's format, and normally use only one cartridge per day. **Ideally, use HP's DDS-3 cartridges with DAT 24 tape drives and HP's DDS-4 cartridges with DAT 40 tape drives.**

Although HP Surestore DAT tape drives are fully backward compatible, old tape formats are more abrasive than later generations and using older tape formats can reduce the life expectancy of the tape drive. The compatibility between drive models and cartridges is summarized in the following table. Shaded boxes show the recommended media for each tape drive.

	DDS-1 90 meter	**DDS-2 120 meter**	**DDS-3 125 meter**	**DDS-4 150 meter**
HP Surestore DAT 24	**read/write**	**read/write**	**24 GB***	
HP Surestore DAT 40	**read only**	**read/write**	**read/write**	**40 GB***
* Capacity assumes 2:1 compression.				

Handling cartridges

- Do not touch the tape media.
- Do not attempt to clean the tape path or tape guides inside the cartridge.
- Do not leave cartridges in excessively dry or humid conditions. Do not leave cartridges in direct sunlight or in places where magnetic fields are present (for example, under telephones, next to monitors or near transformers).
- Do not drop cartridges or handle them roughly.
- Do not stick more than one label onto the cartridge label area; extra labels can cause the cartridges to jam in the drive. Stick labels onto the label area only.
- See the insert included with the tape cartridge for storage conditions.

Getting the most out of cartridges and drives

- Use mostly the latest media type (DDS-4 media for an HP Surestore DAT 40 drive, DDS-3 media for an HP Surestore DAT 24 drive).
- Use media for the recommended number of times (DDS-4 and DDS-3=100 backups). Overuse of the tape will cause it to degrade and possibly shed tape debris in the drive. Too many new tapes can also cause wear of the drive as they are rougher than used ones.
- Do not verify (DDS does read-after-write checking automatically).
- Do not overload the computer during backups. Maximize the transfer rate (run overnight with no other processes) and use incremental backups if convenient.
- Do not overuse your tape drive—it is designed for approximately three hours of tape pulling per day, not constant usage—and clean the drive regularly. See page 31.
- Do not bulk erase DDS format cartridges.

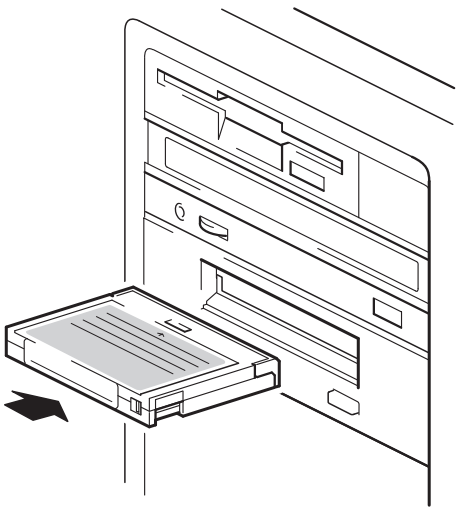

Figure 12a: loading a cartridge,
HP Surestore DAT 24

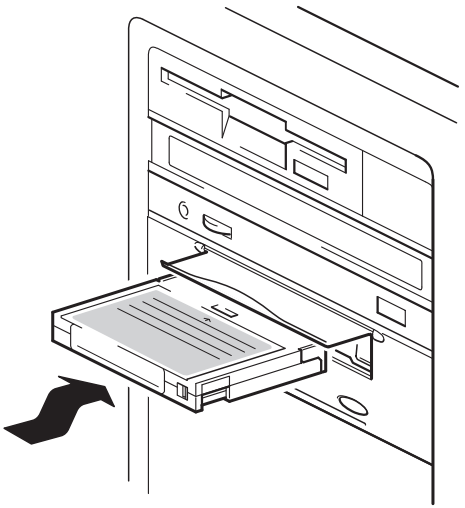

Figure 12b: loading a cartridge,
HP Surestore DAT 40

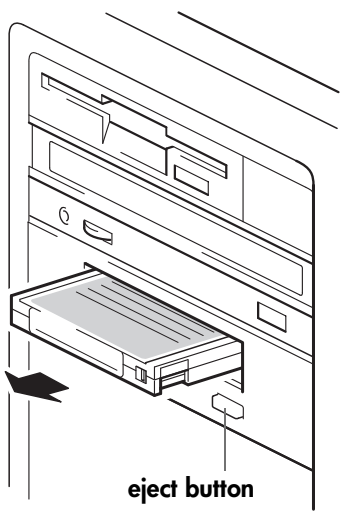

Figure 12c: unloading a cartridge,
HP Surestore DAT 24

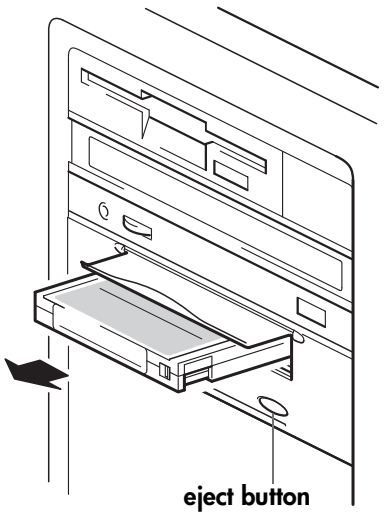

Figure 12d: unloading a cartridge,
HP Surestore DAT 40

Operating the tape drive

Check operation

Once you have installed the drive hardware, you should verify that it is functioning properly before you store your valuable data.

1 Switch on the computer. The tape drive will run its hardware self-test, which takes about 5 seconds. At the end of the hardware self-test, both front panel lights should be off. See "Your HP Surestore DAT tape drive" on page 25 for more information about front panel lights.

2 Verify that the tape drive installation was successful.

For Windows and NetWare systems, use HP Library & Tape Tools as described on page 35.

For UNIX systems, the configuration instructions in the electronic *User's Guide* on the *HP Surestore Tape* CD-ROM include a verification procedure.

Note If you encounter a problem during this verification procedure, turn to "Troubleshooting" on page 36 for help in diagnosing and fixing the problem.

3 You are now ready to install backup software, as required (see page 4), and carry out a backup and restore test to check that the drive can write data to tape. Use a blank cartridge and follow the instructions given in your backup application.

To load a cartridge: HP Surestore DAT 24

1 Insert the cartridge into the slot in front of the drive with the label uppermost, as shown in figure 12a, and apply gentle pressure until the drive takes the cartridge and loads it.

2 The Tape light flashes green while the drive performs its load sequence. When the cartridge is loaded, the Tape light shows steady green.

To load a cartridge: HP Surestore DAT 40

1 Slide the cartridge up under the lip of the cartridge door and insert it into the slot with the label uppermost, as shown in figure 12b. Apply gentle pressure until the drive takes the cartridge and loads it.

2 The Tape light flashes green while the drive performs its load sequence. When the cartridge is loaded, the Tape light shows steady green.

To unload a cartridge: HP Surestore DAT 24 and HP Surestore DAT 40

1 Press the Eject button on the front panel. (See figures 12c and 12d.)

2 The drive completes any task it is currently performing, winds the tape to the beginning, and ejects the cartridge. The sequence will take about 25 seconds for a write-enabled cartridge and 10 seconds for a write-protected cartridge.

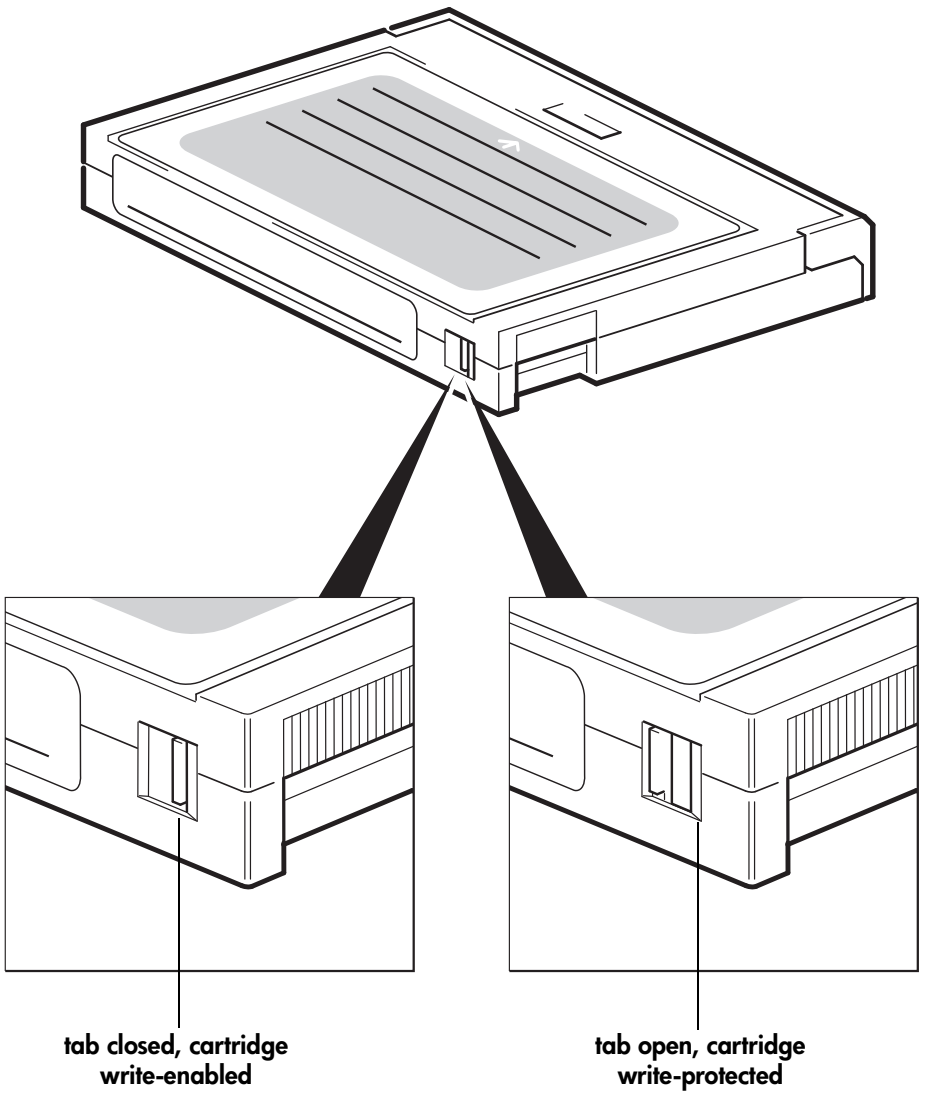

Figure 13: write-protecting cartridges

To write-protect cartridges

If you want to protect the data on a cartridge from being altered or overwritten, you can write-protect the cartridge. To write-protect a cartridge, slide the tab on the rear of the cartridge so that the recognition hole is open. To write-enable a cartridge, slide the tab back so that the hole is closed. Figure 13 illustrates the location of the write-protect tab.

Caution Write-protection will not prevent a cartridge being erased by bulk-erasure or degaussing. **Do not bulk erase DDS format cartridges.** This will destroy pre-recorded servo information and make the cartridge unusable.

Emergency unload

If a cartridge fails to eject using the normal unload procedure, you can force ejection. There are two ways of doing this:

- Press the Eject button three times within 5 minutes.
- Hold the Eject button down for at least 15 seconds.

Following either of these actions, the drive waits until 35 seconds have passed from the time of the first press, to give the normal eject procedure a chance to proceed. After this period, it immediately releases the tape and ejects the cartridge, regardless of what operation it was performing. The drive is then reset as though you had turned the power off and then on again.

Caution You may lose data if you force ejection of a cartridge. The tape may also become unreadable because an EOD (End of Data) mark may not be properly written.

Cleaning cartridges

HP recommends weekly cleaning of the tape drive using an HP cleaning cartridge (part number C5709A). Do not use swabs or other means of cleaning the heads. The cleaning cartridge uses a special tape to clean the tape heads. A cleaning cartridge can only be used 50 times or as instructed on the cartridge packaging. Always place a check mark in a box each time you use the cartridge to clean the drive. Replace the cleaning cartridge when all the boxes are checked. New cleaning cartridges are available from HP. (See the "Ordering Information" topic in the electronic *User's Guide* on the *HP Surestore Tape* CD-ROM.)

1 Insert a cleaning cartridge into the drive. The tape drive automatically loads the cartridge and cleans the heads.

2 At the end of the cleaning cycle, the drive ejects the cartridge. The cleaning cycle takes approximately 30-60 seconds. If the cleaning cartridge ejects in less than 20 seconds, it has probably expired. In this case, discard the cleaning cartridge and repeat the operation with a new one.

3 Remove the cleaning cartridge from the drive.

Note The drive's TapeAlert feature will send a message to your backup application when the tape heads need cleaning or a cleaning cartridge has expired.

Figure 14a: hp obdr, step 1

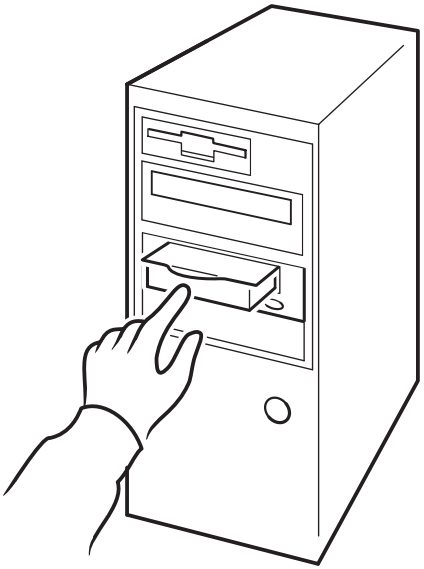

Figure 14b: hp obdr, step 2

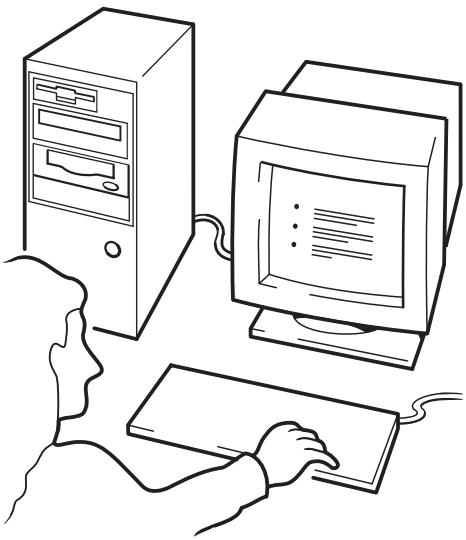

Figure 14c: hp obdr, step 3

Using HP OBDR

Compatibility

HP One-Button Disaster Recovery is a standard feature on all HP Surestore DAT tape drives. However, it can only be used with specific configurations.

To check whether your system (hardware, operating system and backup software) is OBDR-compatible, please refer to our World Wide Web site `www.hp.com/go/connect`.

Note HP OBDR is not applicable to HP-UX and other non-Intel UNIX operating systems, and it is not compatible with Intel-based Solaris systems.

If your system does not support HP One-Button Disaster Recovery, you can still use your tape drive normally to back up and restore data. However, you must remember to create a separate set of emergency recovery disks for your operating system whenever you change your system configuration.

What does HP OBDR do?

Using just the tape drive and the most recent backup cartridge HP OBDR allows you to recover from the following types of system disaster:

- Hard disk failures, as long as the replacement hard disk is the same size or larger than the original and uses the same interface (for example, replace a SCSI hard disk with another SCSI disk)
- Hardware failures where the server is replaced by an **identical** component (for example, it will only recover from a Netserver LC2000 (SCSI) onto another Netserver LC2000 (SCSI) system)
- File corruption because of an operating system error
- File corruption because of an application software error
- Viruses that prevent you from booting your system correctly
- User errors that stop you from booting your system correctly

When you run HP One-Button Disaster Recovery, your tape drive goes through the following sequence:

1. It goes into a special disaster recovery mode that enables it to restore your operating system and reboot. It acts like a bootable CD-ROM. (Your system's ability to boot from CD-ROM is normally enabled by default. If you have changed this setting, you will need to enable it again. Refer to your system BIOS manual for further details.)
2. It returns to normal tape drive mode and restores the data.

Running HP OBDR

Check our World Wide Web site (`www.hp.com/support/datOBDR`) for the latest information about firmware upgrades and troubleshooting before you use HP OBDR.

1 Hold down the eject button on the tape drive. Keeping the eject button pressed down, power on your computer (see figure 14a). Release the button as soon as the LEDs on the front panel flashes in the OBDR sequence. The Tape light and Clean light flash alternately. (If there is a cartridge in the tape drive, you can leave it there.)

2 If there is no cartridge in the tape drive, immediately insert the latest one (see figure 14b). This activates the HP One-Button Disaster Recovery process.

3 Follow the on-screen instructions to set up the operating system (see figure 14c). Normally, you can accept the default response to all the prompts, for example just press <Enter>.

The LEDs will flash in OBDR mode (as described in step 1) while the tape drive restores your operating system to a state where it can run a normal data restore.

4 Once the operating system has been set up and rebooted, the Ready LED display on the tape drive changes to constant green and you can remove the backup cartridge, if you wish. You are now ready to run a normal data restore. Follow the normal process for your restore application.

If restore fails

If the restore fails for any reason, refer to our World Wide Web site (`www.hp.com/support/datOBDR`) for detailed troubleshooting information.

Diagnostics

HP offers a choice of diagnostic tools, available free of charge. Full details, including further advice on how to choose which tool to use, are given in the User's Guide's diagnostics section on the *HP Surestore Tape* CD-ROM.

HP Instant Support (requires online internet connection)

HP Instant Support is a web-based diagnostic tool that provides easy-to-use online solutions. For example, it can automate downloads of software utilities and repair patches direct to your system. We recommend that you use it for ongoing, online support.

It incorporates a "smart search" feature that allows you to describe your problem in non-technical language. The system searches the HP knowledge database and suggests a range of possible solutions.

HP Instant Support also incorporates an "automated self-service" feature. This powerful tool requires that you download the HP Instant Support Tuner, a small program very much like a software plug-in. This will scan your computer, gather and analyze your system data, and suggest automated solutions.

In many cases, HP Instant Support will enable you to resolve problems yourself. However, should you require assistance at any time, clicking on the HP Support Specialist link will automatically transfer your details to an HP Support Specialist, who may wish to work with you to run additional diagnostics. You can use online active messaging (like Web chat) to communicate more detail to the Support Specialist.

You can access HP Instant Support from `//www.hp.com/go/instantsupport`.

Currently, HP Instant Support is only available in North America, Europe, Africa and the Middle East (English only) and only for systems running on Windows NT 4.0 or Windows 2000. The service will be expanded worldwide and across further operating systems during 2001.

HP Library and Tape Tools (does not require internet connection to run)

HP Library & Tape Tools is a stand-alone diagnostic tool that provides a number of utilities for gathering information about your tape drive, for troubleshooting problems, and for downloading firmware updates over the SCSI bus. It checks for the presence of a SCSI controller and its driver software, and identifies the SCSI IDs of existing SCSI devices. You can then select the required device from the device list and run a diagnostic utility for that device. We recommend that you use it to help install and test your tape drive.

You can install the latest version of HP Library & Tape Tools from `//www.hp.com/support/tapetools`.

Installation is simply a question of selecting the required option and following the instructions on the screen.

HP Library & Tape Tools does not work on all operating systems. Compatibility information, updates, and latest version of this software can be found on the HP Library and Tape Tools web site.

Troubleshooting

The first step in problem-solving is establishing whether the problem lies with the cartridge, the drive, the host computer and its connections, the backup software or with the way the system is being operated. If none of the following advice helps you solve the problem, refer to "Other sources of information" on page 40.

Most modern SCSI host bus adapters locate and display attached devices when the system is booting up. If you swap or connect a product when your system is running, you will need to reboot the system. If the device is not detected on boot up, there is probably a problem with the physical hardware: cables, termination, connections, power or the host bus adapter itself. If the device is displayed during boot up but cannot be found in the operating system, this is more likely to be a software problem.

If you encounter a problem during installation and need further clarification, refer to the section below. If a problem arises during testing after you have installed the drive, refer to the symptom-based section "Testing after installation" on page 38.

Problems encountered during installation

Unpacking

Description	Further information
Some parts appear to be missing or damaged.	Contact your vendor if any parts need replacing.

The screws or mounting hardware are not suitable for the server

Description	Further information
Additional parts may be required for fitting the tape drive into the server.	The HP Surestore DAT internal tape drive will fit into most servers without the need for additional hardware other than that originally shipped with your system. If additional parts are required, or the original parts have been lost, contact your server vendor. Mounting hardware is provided with your tape drive for mounting in HP Netserver L-series, E-series, Kayak, Brio and Vectra computers and Compaq servers.

It is unclear which SCSI ID to use

Description	Further information
It is uncertain which ID numbers are available.	Use HP Library & Tape Tools (see page 35) to provide information on your current SCSI settings. The HP Surestore DAT internal drive has its SCSI ID set to 3 by default. This should be left unchanged unless this number is already in use. Full instructions on how to change the SCSI ID are given on page 8.

How should the SCSI bus be configured?

Description	Further information
Correct configuration of the SCSI bus with multiple drives can be a complex area and more help may be required.	Refer to the SCSI Configuration section in the online HP Surestore User's Guide on the *HP Surestore Tape* CD-ROM.

How should the SCSI bus be terminated?

Description	Further information
It is unclear if the bus is already terminated or where an additional terminator should be placed.	Refer to the SCSI Configuration section in the online HP Surestore User's Guide on the *HP Surestore Tape* CD-ROM. Both ends of a SCSI bus must be terminated. Typically, when connecting an internal drive to the ribbon cable already inside your server then both the host bus adapter and the end of the ribbon cable will already be terminated and no further action is required.

Is the correct SCSI host bus adapter installed?

Description	Further information
The server already has a SCSI host bus adapter but it is difficult to determine what type it is.	If your server is in its original configuration (no SCSI adapters have been added or removed) then use `www.hp.com/go/connect` to check the compatibility of your system.
The server may not have a SCSI host bus adapter installed.	Use HP Library & Tape Tools (see page 35) to check whether you have a SCSI host adapter on your system. If not, you will need to purchase one. Refer to the ordering supplies section in the online HP Surestore User's Guide on the *HP Surestore Tape* CD-ROM.

Do drivers need to be installed and, if so, which ones

Description	Further information
It is unclear whether there is a need to install drivers onto the system, and more help is required.	Detailed information specific to your system can be found on the `www.hp.com/go/connect` web site. Typically, if you are using backup software that states support for HP Surestore DAT tape drives, then all the required drivers will be provided. For support on Windows NT/2000, drivers can be obtained from the *HP Surestore Tape* CD-ROM or from `www.hp.com/support/dat`. For support on UNIX systems, see the UNIX Configuration section in the online HP Surestore User's Guide on the HP Surestore Tape CD-ROM.
The required drivers do not appear to be available.	Future drivers will be provided via the support web site when they become available.

Testing after installation

The computer does not reboot after installation

Possible reason	Recommended action
You have installed an additional SCSI host bus adapter and its resources are clashing with an existing adapter.	Remove the new host bus adapter and check the server documentation.
You have disconnected the power or SCSI cable from the computer's boot disk during the drive installation process.	Check that the cables to all devices are firmly connected.

The computer boots but does not recognize the tape drive

Possible reason	Recommended action
The power or SCSI cable is not connected properly.	Check that the cables to the tape drive are firmly connected. Ensure that the SCSI cable does not have any bent pins. Replace, if necessary. (See the "Ordering Information" topic on the *HP Surestore Tape* CD-ROM.)
The SCSI bus is not terminated correctly.	Check that the SCSI bus is actively terminated. (Refer also to the documentation for your SCSI controller and any other SCSI devices you may have.)
You have connected the tape drive to an existing SCSI bus that has other devices connected to it and the SCSI address of your HP Surestore DAT drive is probably identical to the address used by another device.	Make sure that each device on the SCSI bus has a unique ID. We recommend that the HP Surestore DAT tape drive is connected to a dedicated host bus adapter. Do not connect the drive to a disk RAID controller as this is not supported.

The application does not recognize the tape drive

Possible reason	Recommended action
The application does not support the tape drive.	Use HP Library & Tape Tools to check that the drive is installed properly. Refer to our World Wide Web site (`www.hp.com/go/connect`) for details of backup applications that support the HP Surestore DAT tape drive. Load any service packs as necessary.
Some applications require drivers to be loaded.	Check that the correct SCSI and tape drive drivers are installed. Consult the backup application's installation notes for details.

The drive does not work

Possible reason	Recommended action
If the drive does not power up (both LEDs are off), the power cable may not be connected to the drive properly.	Check the power cable connection and try another cable if necessary. If the drive still does not power up, call for assistance.
If the self-test fails (Tape LED is off, Clean LED is amber), there may be a hardware or firmware failure.	If there is a cartridge in the drive, remove it. Power down the drive and power it up again. If the self-test still fails, call for assistance.
There is a hard error on the drive.	The Media Caution (Clean) LED shows steady amber. Try powering the system off and then on again. If the error condition signal still shows, call for service.

Other sources of information

Diagnostic tools

If you experience problems using your tape drive after installation, use HP Instant Support or HP Library & Tape Tools to help you diagnose the problem. See page 35 for information on these diagnostic tools.

You can access HP Instant Support or HP Library and Tape Tools from:

- the product support web page (`//www.hp.com/support/dat`)
- the HP Instant Support web page (`//www.hp.com/go/instantsupport`)
- the HP Library and Tape Tools web page (`//www.hp.com/support/tapetools`)

Further troubleshooting information

You will also find further troubleshooting information on the *HP Surestore Tape* CD-ROM and the HP web site. In particular:

- The online User's Guide on the *HP Surestore Tape* CD-ROM contains an extensive troubleshooting topic.
- The CD-ROM Guide topic on the *HP Surestore Tape* CD-ROM contains a number of useful links, for example, to support and media web sites.
- The HP support website for HP Surestore DAT (`//www.hp.com/support/dat`) takes you to HP's Customer Care website for a wide range of up-to-date information about your product.

How to contact HP

You can also use the HP Customer Call Centers for specialist technical help. Contact details can be found at `//www.hp.com/cposupport/mail_support`. To make the best use of this service, we ask that you work with our Support Specialists to resolve any issues with your drive. This may include downloading diagnostic software, that will assist in the rapid resolution of your problems. If you do not have web access, a full listing of HP Customer Call Centers, correct at time of printing, is given in the electronic *User's Guide* on the *HP Surestore Tape* CD-ROM.

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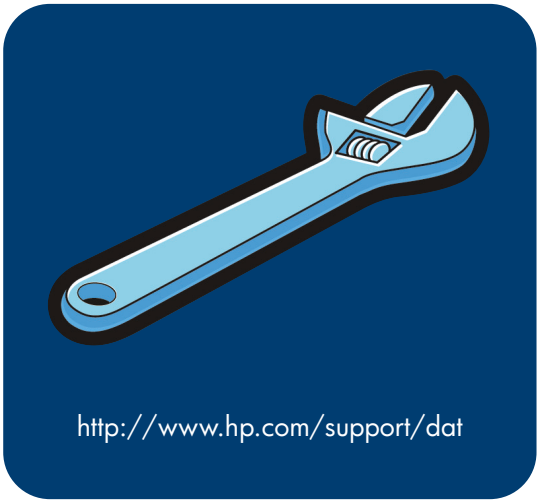

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