

hp surestore dat autoloader

getting started guide

external model



dat 24x6e, dat 40x6e

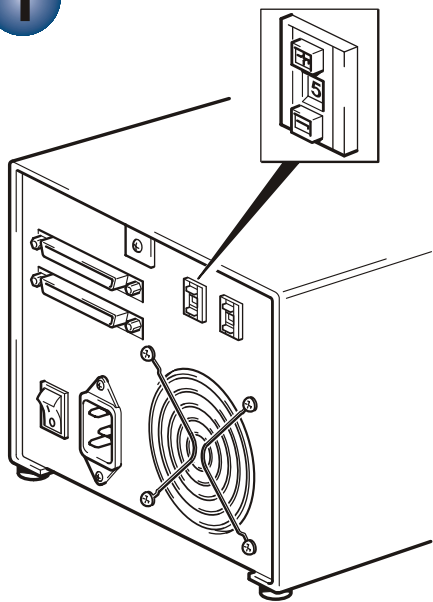


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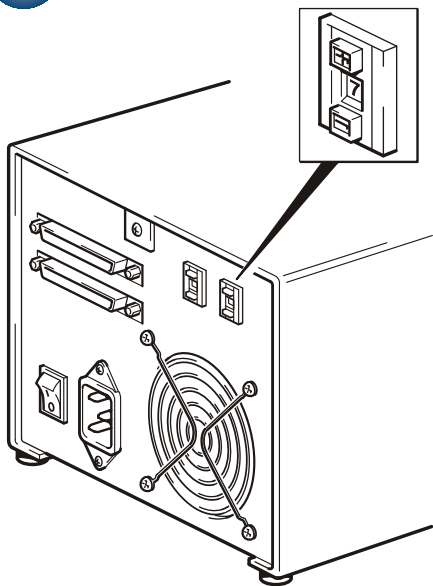
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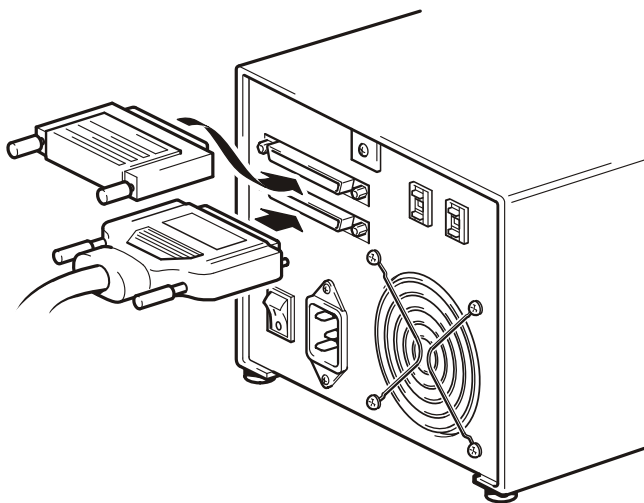
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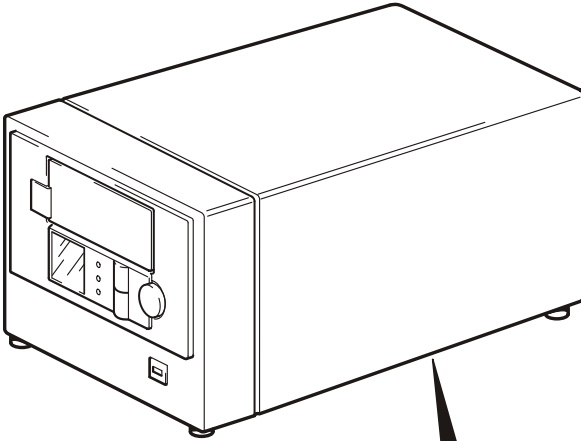


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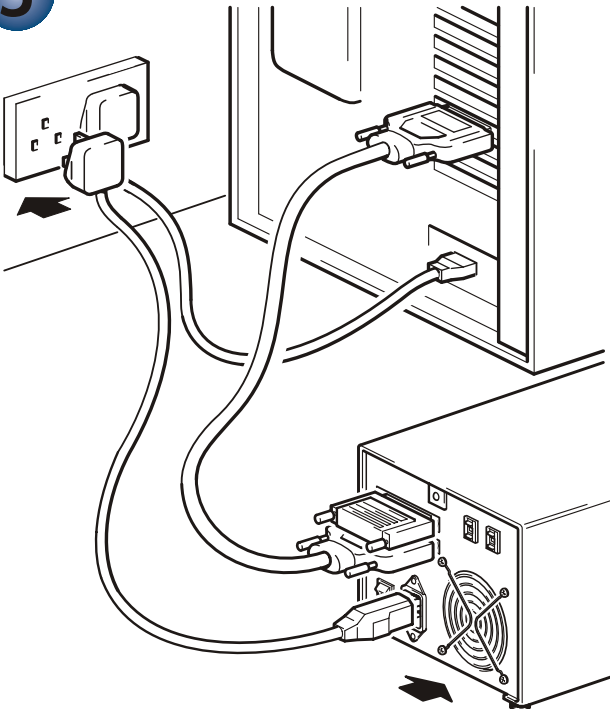


3

UNIX



5



External autoloaders - overview

Before you start, using the CD-ROM and registration

- Check system prerequisites. (Connect DAT 40x6e drives to a LVD-SCSI bus or host bus adapter, connect DAT 24x6e drives to a single-ended SCSI bus.) **page 3**
- Register your autoloader. **page 5**
- Insert the *HP Surestore Tape* CD-ROM and check the contents. **page 7**

Step 1: Check the autoloader's SCSI ID

- Check the autoloader's SCSI ID on the SCSI ID switch on the rear panel of the autoloader. If necessary, change it from the default of 5 by pressing the indented + or - buttons above and below the SCSI ID number. Use a ball-point pen or similar pointed object. To prevent particle contamination, do not use a pencil. **page 9**

Step 2: Check the option switch value (Sun systems only)

- Check the option switches. If you are connecting to a Sun workstation, change the switch to 5. For any other system, the default setting of 7 is correct. **page 11**

Step 3: Set the configuration switches (UNIX systems only)

- If you are connecting to a Unix system, check the Unix configuration switches. **page 13**

Step 4: Attach SCSI cable

- Power off the computer. Attach one end of the SCSI cable (supplied with the autoloader) to the computer's external SCSI connector and connect the other end to the SCSI connector on the rear of the autoloader. If you have an HP Surestore DAT 40x6 autoloader, connect the multimode terminator to the autoloader's other SCSI connector and tighten the screws to secure it. For HP Surestore DAT 24x6 autoloaders, make sure that the supplied terminator is firmly attached to the autoloader's other SCSI connector and the latches are in place. **page 15**

Step 5: Attach power cable

- Plug the power cable securely into the socket on the rear panel of the autoloader. Plug the other end of the power cable into the power outlet. **page 17**

Your HP Surestore DAT autoloader **page 19**

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Product Details

Write your autoloader 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 24x6e
- DAT 40x6e

Prerequisites

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

- SCSI host bus adapter on host server
- SCSI cable
- Backup software that supports the autoloader

For the latest list of operating systems that support HP Surestore DAT autoloaders, 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](http://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 33.

HP Surestore DAT autoloaders and SCSI

HP Surestore DAT24x6 autoloaders are fast narrow SCSI devices and should be connected to a single-ended (SE) host bus adapter.

HP Surestore DAT 40x6 autoloaders are ultra wide SCSI devices. For optimum performance the autoloader should be connected to a low voltage differential (LVD) SCSI host adapter.

HP Surestore DAT 40x6 autoloaders may also be connected to single-ended (SE) 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 cable and terminator

You need a SCSI cable that connects to your computer's external connector. If your autoloader is the only SCSI device or if it is the last device in a daisy-chain of devices, you must install a terminator. For optimum performance, always use the supplied cable and terminator.

The cable provided with the drive will attach to a computer with a wide SCSI connector (68 pins). The cable has been specified for use with LVD systems up to Ultra2 speeds. To benefit from the advantages of LVD SCSI, it is important to always use LVD-rated SCSI cabling and LVD multimode terminators.

If the SCSI cable supplied with your drive is not appropriate for your computer's external SCSI connector, you will need to order a new cable. Refer to the "Ordering supplies" topic in the electronic *User's Guide* the *HP Surestore Tape* CD-ROM.

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. Refer to the "Ordering supplies" topic in the electronic *User's Guide* the *HP Surestore Tape* CD-ROM.

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 autoloader. 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 autoloader to achieve the maximum performance with your backup application, consult our World Wide Web site (www.hp.com/support/dat).

Applications usually recognize autoloaders 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 24x6	HP C1557A
HP Surestore DAT 40x6	HP C5713A

Register your autoloader

Once you have installed and tested your HP Surestore DAT autoloader, 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.

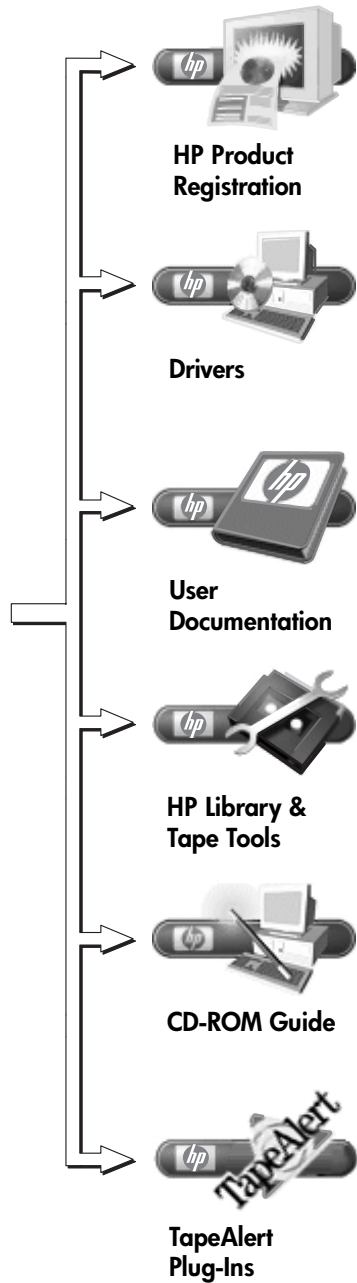


Figure 1: the *HP Surestore Tape* CD-ROM

Using the CD-ROM

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

HP product registration

To register your new autoloader 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 autoloader must be installed before installing the driver.

User documentation

For more information about using your HP Surestore DAT autoloader, 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 33.

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 33.

TapeAlert plug-ins

TapeAlert is a autoloader 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 autoloader, 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 autoloader across the network.

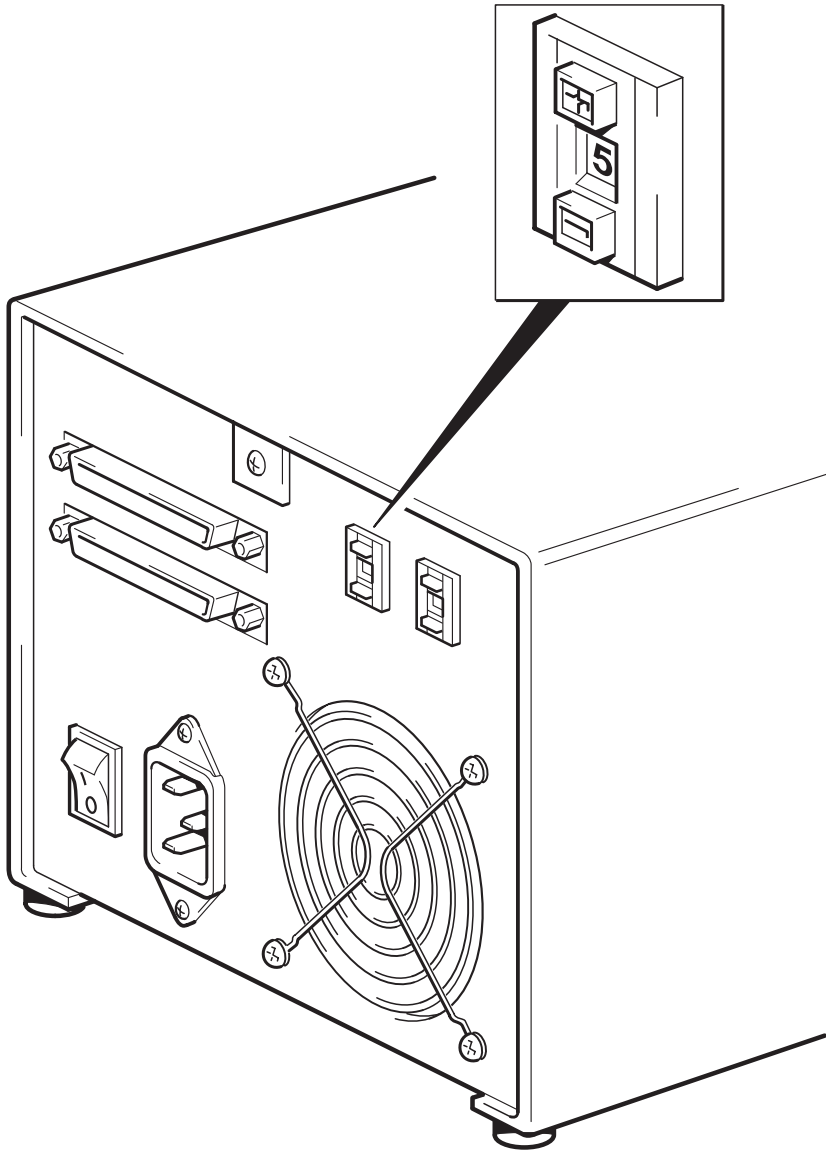


Figure 2: checking the autoloader's SCSI ID

Step 1: Check the autoloader's SCSI ID

Note Your HP Surestore DAT autoloader is shipped with a default SCSI ID of 5. HP Surestore DAT 24x6 autoloaders can be assigned any *unused* ID between 0 and 6. HP Surestore DAT 40x6 autoloaders 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 5.

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 33).

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.

- 2 Change the autoloader's SCSI ID, if necessary.

Use a small screwdriver or a ball-point pen to press the indented SCSI ID selector buttons on the rear panel (see figure 2) until the required value is displayed. Do not use a pencil because small bits of lead could contaminate the drive.

Note The computer and the autoloader SCSI IDs are only checked at power-on. To change the SCSI ID after installation, power down both the computer and the autoloader, change the drive's SCSI ID, power up the autoloader, and then power up the computer.

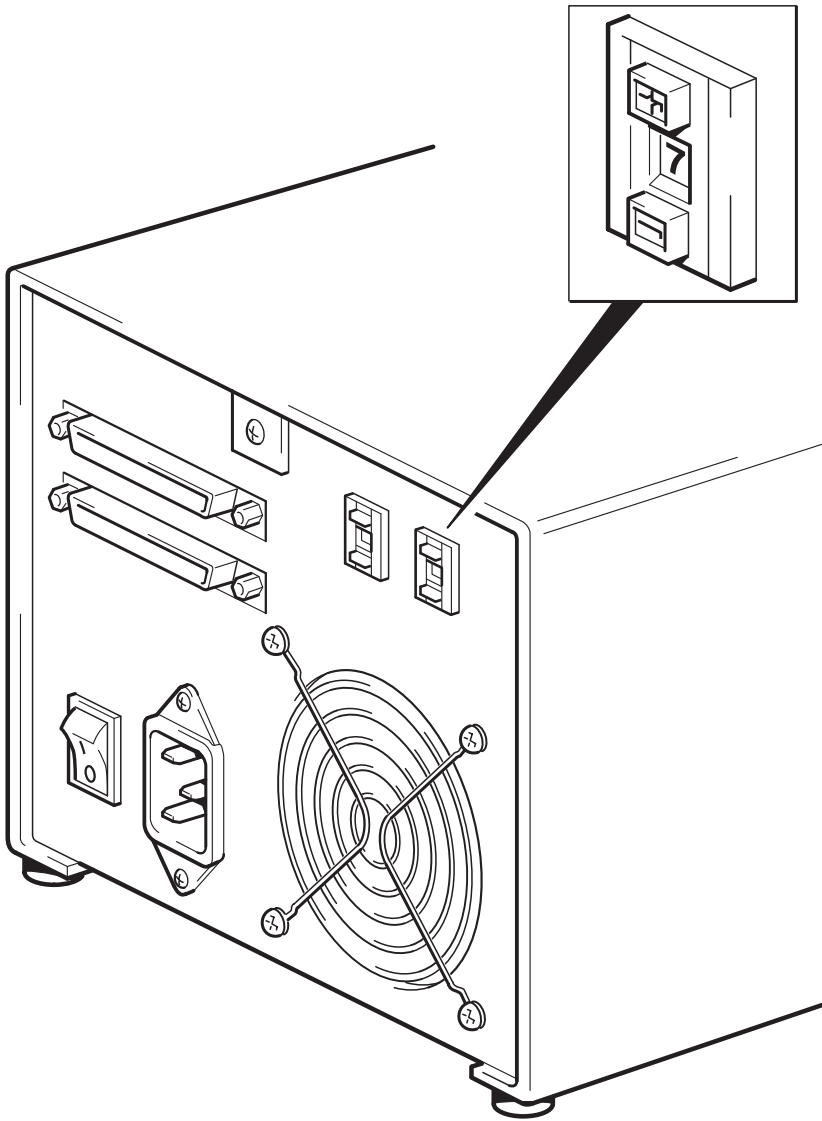


Figure 3: checking the option switch

Step 2: Check the option switch value (Sun systems only)

Only read this section if you are installing your autoloader into a Sun workstation system. Go to step 3 if you are using your autoloader on a UNIX system, or straight to step 4 if you are using your autoloader on a PC system.

The option switch setting is used to configure the autoloader for specific systems and need only be changed from the default of 7 for Sun workstations, which use switch value 5.

System	Value
HP Series 700, DEC, IBM, and Silicon Graphics systems and PCs (Default setting)	7
Sun workstations/servers	5

- 1 Check that the autoloader option switch (right switch) is set to 7 (or 5 for Sun workstations), as shown in figure 3.
- 2 If the option switch is not set to the correct value for your system, reset the number using the + or – buttons above and below the switch.

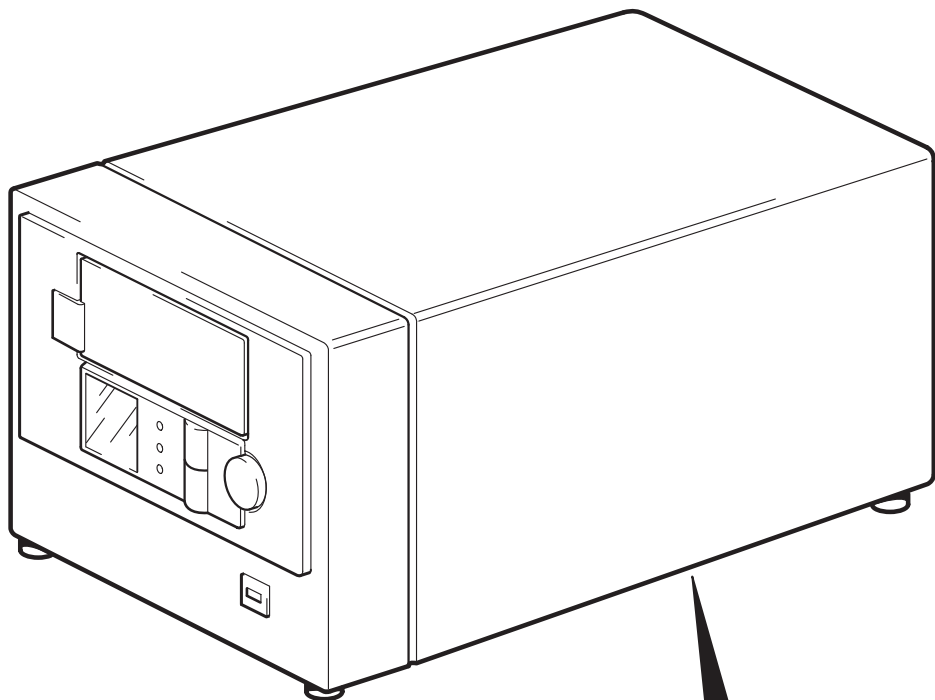


Figure 4: setting the UNIX configuration switches

Step 3: Set the configuration switches (UNIX systems only)

Only read this section if you are installing your autoloader into a UNIX system. Go straight to step 4 if you are installing your autoloader 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.

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

System Type	Switch Number							
	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 autoloader from the default settings shown in figure 4.

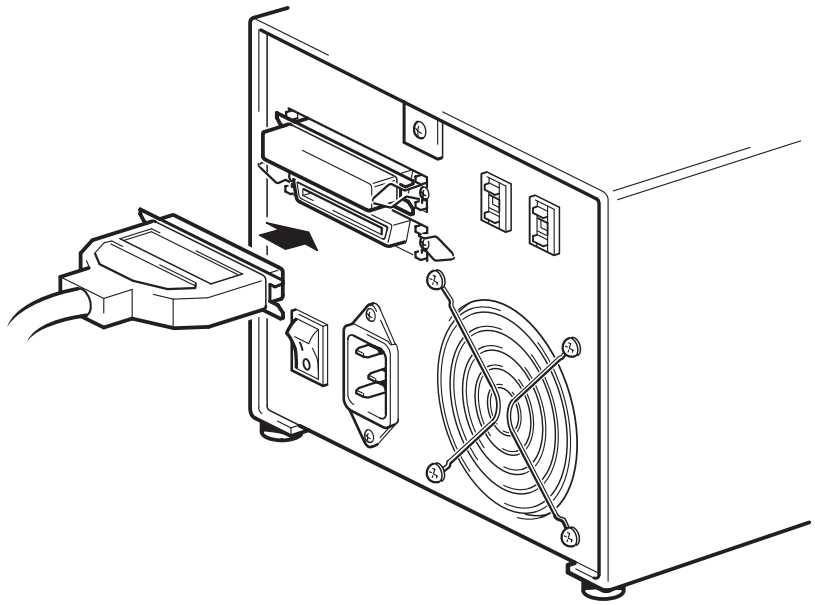


Figure 5a: attaching SCSI cable, HP Surestore DAT 24x6

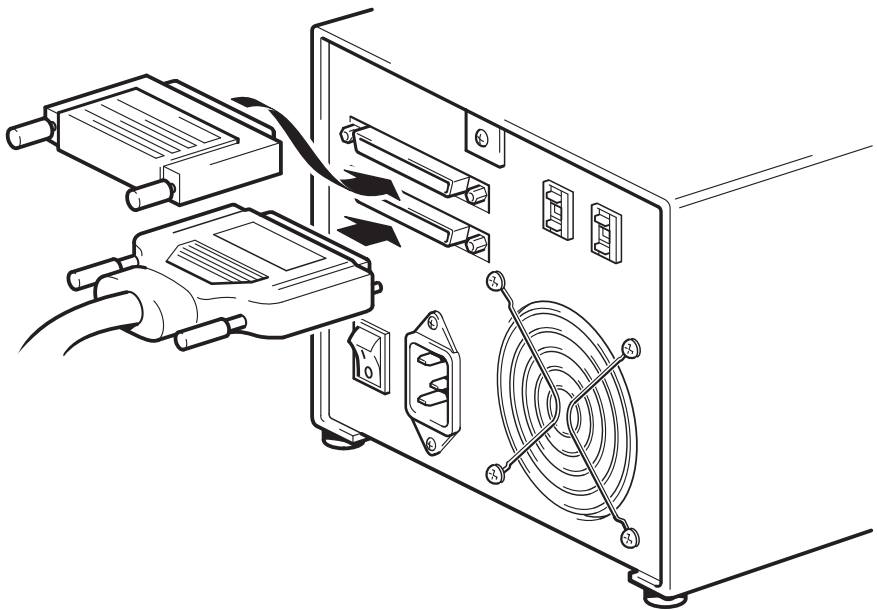


Figure 5b: attaching SCSI cable, HP Surestore DAT 40x6

Step 4: Attach SCSI cable

For optimum performance, we recommend that your HP Surestore DAT autoloader is installed on a dedicated SCSI bus. A 68-pin wide SCSI cable is provided with the autoloader. This cable has been specified for use with LVD systems up to Ultra2 speeds. You may need a different cable if your computer's SCSI connector does not match the cable supplied with your autoloader. For HP part numbers and descriptions, refer to the "Ordering supplies" topic in the electronic *User's Guide* the *HP Surestore Tape* CD-ROM.

Caution To avoid damaging the computer or autoloader, ensure that both are powered off while you attach the SCSI cable.

HP Surestore DAT 24x6e autoloaders

- 1 Perform a normal system shutdown and turn off the computer and any connected peripherals.
- 2 Attach one end of the SCSI cable to the computer's external SCSI connector. Push firmly and secure the cable in place with its retainers.
- 3 Attach the other end of the SCSI cable to one of the SCSI connectors on the rear panel of the autoloader. (See figure 5a.) Snap both of the retaining clips over the connector to secure it firmly in place.
- 4 Make sure that the supplied terminator is firmly attached to the autoloader's other SCSI connector.

Note If you want to attach additional devices to the SCSI bus after the autoloader, you will need to remove the SCSI terminator and attach the next device to this SCSI connector. Make sure that you attach the terminator to the last device in the chain.

HP Surestore DAT 40x6e autoloaders

- 1 Perform a normal system shutdown and turn off the computer and any connected peripherals.
- 2 Attach one end of the SCSI cable to the computer's external SCSI connector. Push firmly and screw the cable securely in place.
- 3 Attach the other end of the SCSI cable to one of the SCSI connectors on the rear panel of the autoloader. (See figure 5b.) Tighten the screws to secure the connector.
- 4 Connect the multimode terminator to the autoloader's other SCSI connector and tighten the screws to secure it. The multimode terminator detects whether the host bus adapter is SE or LVD and automatically provides the appropriate termination.

Note If you want to attach additional devices to the SCSI bus after the autoloader, you will need to remove the SCSI terminator and attach the next device to this SCSI connector. Make sure that you attach the terminator to the last device in the chain.

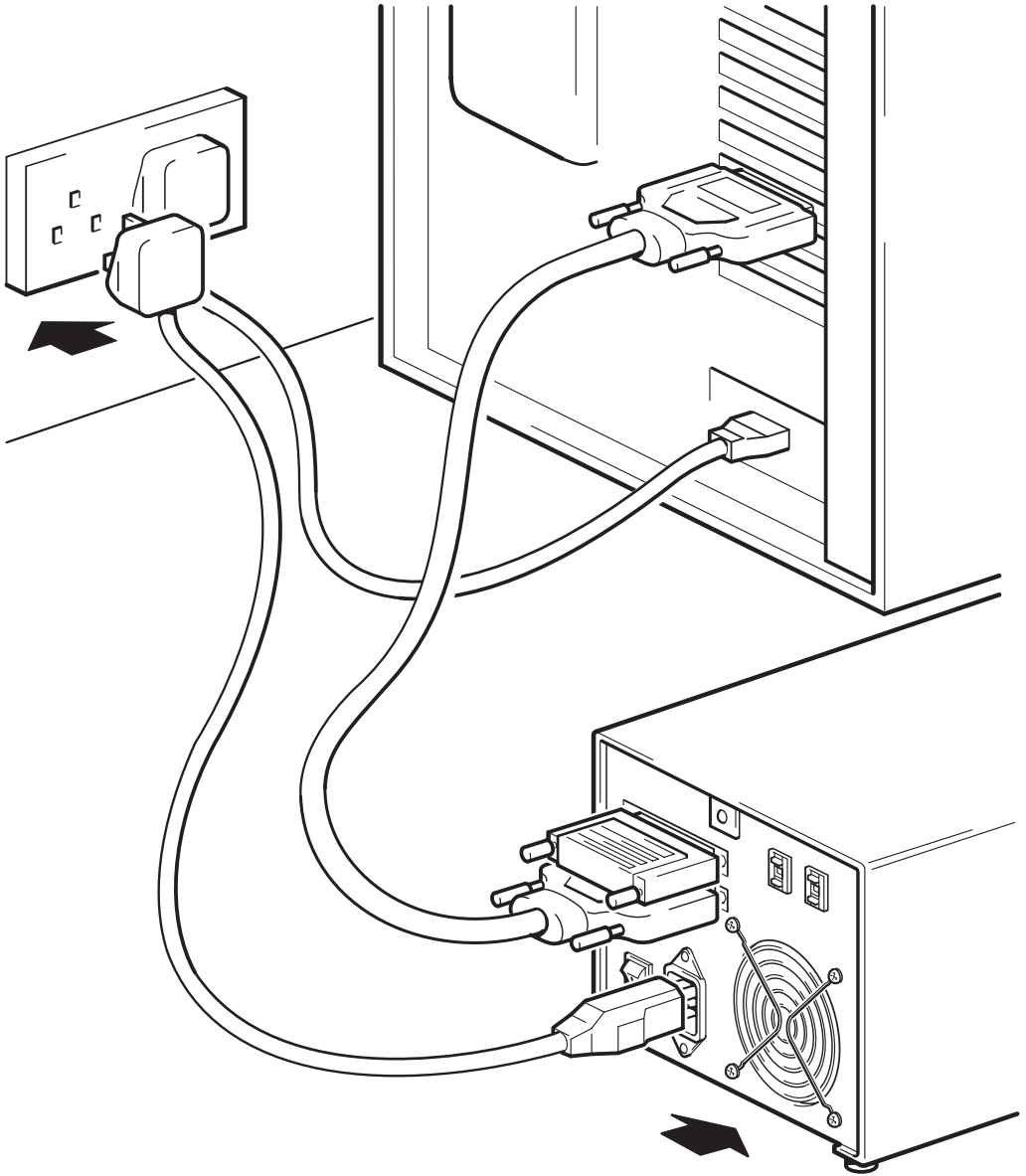


Figure 6: attaching the power cable

Step 5: Attach power cable

An external HP Surestore DAT autoloader will operate using any voltage in the range 100–240 volts (0.7 A, 50-60 Hz). No adjustment is needed. To connect your autoloader to the power supply, proceed as follows:

- 1 Make sure that the autoloader is switched OFF. The power switch is on the rear panel.
- 2 Plug the power cable securely into the socket on the rear panel of the autoloader. (See figure 6.)
- 3 Plug the other end of the power cable into the power outlet.

Note Write the model name, product number, serial number, and SCSI ID of your autoloader on page 2 of this guide for future reference. The model name is on the front of the autoloader and the product and serial numbers are on a label on the bottom of the autoloader. HP Surestore DAT 40x6 models also display the serial number during the self-test warm-up.

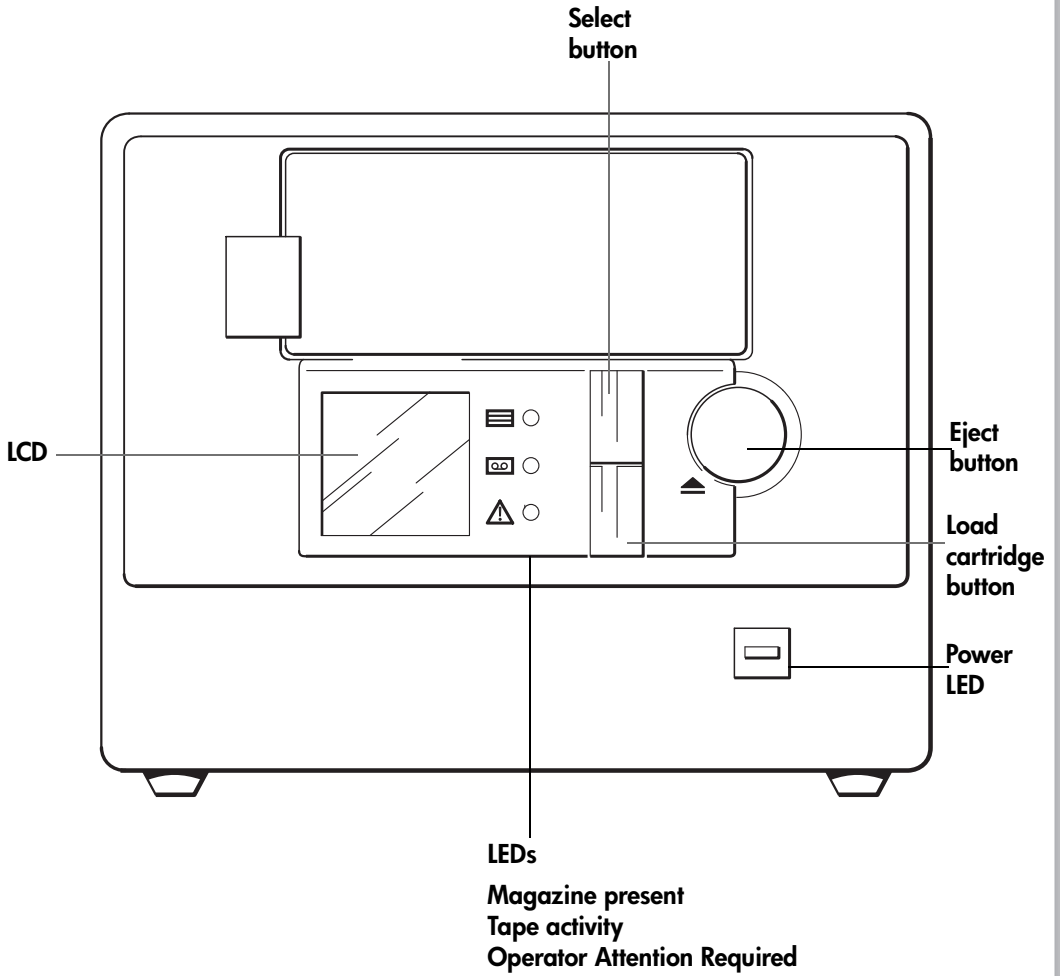


Figure 7: HP Surestore DAT autoloader controls and indicators

Your HP Surestore DAT autoloader

There are three LEDs, an LCD, two buttons and an eject button on the front panel of your autoloader. See page 25 for more information about loading and unloading cartridges and page 39 for information about forcing ejection.

Front panel LEDs

There are three LEDs as illustrated in the diagram. (See figure 7.)

Magazine present (green)

This green light indicates the state of the magazine:

- On indicates that a magazine is loaded.
- Flashing indicates that a magazine is in the process of being loaded, checked, or ejected.
- Off indicates that no magazine is in the autoloader.

Tape activity (green)

- On indicates that a cartridge is present in the drive.
- Fast flashing indicates that the data is being read or written.
- Slow flashing indicates that a cartridge is being loaded or unloaded.
- Off indicates that there is no cartridge in the drive.

Operator attention required (amber)

- On indicates that a serious hardware error has occurred. See page 38.
- Fast flashing (four times per second) indicates that a firmware upgrade is taking place.
- Medium flashing (twice per second) indicates either the tape cartridge is wearing out and should be replaced, or the tape heads need cleaning. See page 38.
- Slow flashing indicates one of the following conditions: the front panel door is open when it should not be, there is a cartridge in the autoloader, but no magazine is present, or a hard fault condition has occurred. See page 38.

Select button

The Select button allows you to select any of the cartridges in the magazine for loading. If you press the button repeatedly, the number on the left of the front panel display cycles through the cartridges available in the magazine.

Load cartridge button

Press the Load Cartridge button to load the selected cartridge from the magazine into the drive and then put the autoloader into stacker mode. In stacker mode, the loaded cartridge is used first; when it is full, or the host computer sends an UNLOAD command, the autoloader replaces it with the cartridge from the next highest numbered slot in the magazine. See page 27 for more information about autoloader modes.

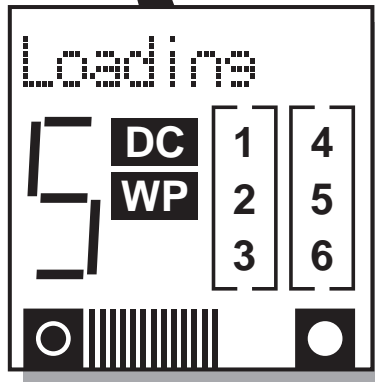
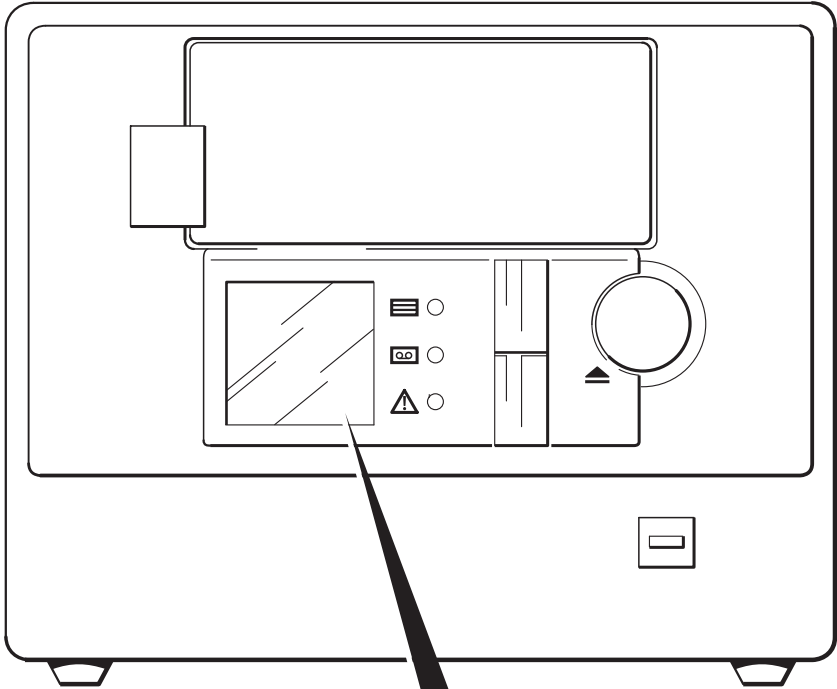


Figure 8: LCD display

LCD

The LCD display shows status information about the autoloader in each of its five regions, see figure 8.

- The ten-character dot matrix display provides information on the autoloader's operating status and potential error conditions.
- The large numeral shows the number of the cartridge currently loaded in the drive or the cartridge that you have selected by pressing the Select button repeatedly.
- "DC" is displayed when data compression is being used for writing. "WP" is displayed when the cartridge is write-protected.
- The six numbered boxes on the right of the display are individually lit to show which magazine slots contain cartridges.
- The display at the bottom of the display shows how much tape has been used in the current partition. The more lines shown, the more tape has been used. When all the lines show, the partition is full.

To localize the display (HP Surestore DAT 40x6 only)

HP Surestore DAT 40x6 models allow you to localize the LED display so that messages are displayed in the desired language.

- 1 Switch on the autoloader and hold down the Select button on the front panel for five seconds to access the `Language?` feature.
- 2 Press the Select button to scroll through the available languages. The selected language is displayed in the LCD display.
If you select `Numeric`, messages will be displayed as numerical codes, which are defined in the electronic *User's Guide* on the *HP Surestore Tape* CD-ROM.
- 3 Press the Load button to store the selected language and exit the language selection utility.

Note To exit the language selection facility without selecting a language, press the Eject button. If the Select button is not pressed for two minutes, the drive will automatically exit the language selection facility without selecting a language.

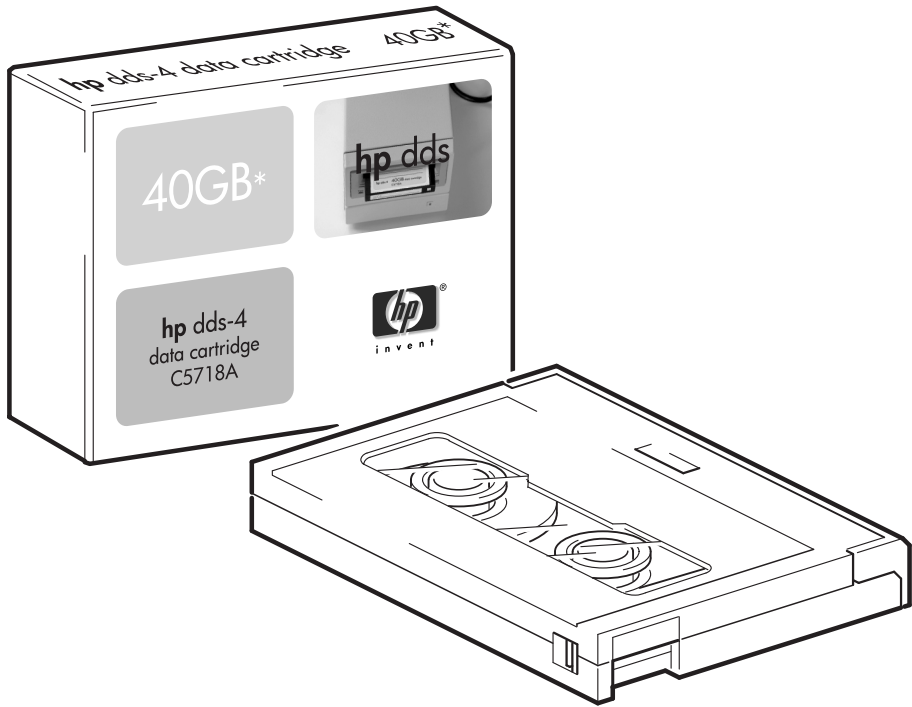


Figure 9: DDS media

Use the correct media

In order to maximize drive and media reliability, normally use the autoloader to provide one week's backup per magazine. Ideally, use five cartridges and one cleaning cartridge in each magazine. This allows you to perform a full backup, up to 24 (DDS-3) or 40 (DDS-4) GB each working day, and ensures that the tape heads are cleaned once a week.

For best performance and error-free operation, use only one brand and type (tape length) of data cartridge in a magazine. For example, do not use DDS-2 (120m) or DDS-3 (125m) with DDS-4 (150m) cartridges. **Ideally, use HP's DDS-3 cartridges with DAT 24x6 autoloaders and HP's DDS-4 cartridges with DAT 40x6 autoloaders.**

Although HP Surestore DAT autoloaders 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 autoloader. The compatibility between drive models and cartridges is summarized in the following table. Shaded boxes show the recommended media.

	DDS-1 90 meter	DDS-2 120 meter	DDS-3 125 meter	DDS-4 150 meter
HP Surestore DAT 24x6	read/write	read/write	24 GB*	
HP Surestore DAT 40x6	read only	read/write	read/write	40 GB*
* Capacity assumes 2:1 compression.				

Handling cartridges

- Do not touch the tape media, drop cartridges or handle them roughly.
- 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 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.
- Make sure that the magazine label is stuck firmly in the recessed label area on the side of the magazine. If the label is stuck somewhere other than in the label area, the magazine may jam in the mechanism.
- See the insert included with the tape cartridge for storage conditions.

Getting the most out of cartridges and autoloaders

- Use mostly the latest media type (DDS-4 media for an HP Surestore DAT 40x6 autoloader, DDS-3 media for an HP Surestore DAT 24x6 autoloader).
- 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 autoloader—it is designed for approximately four hours of tape pulling per day, not constant usage—and clean the drive regularly. See page 29.

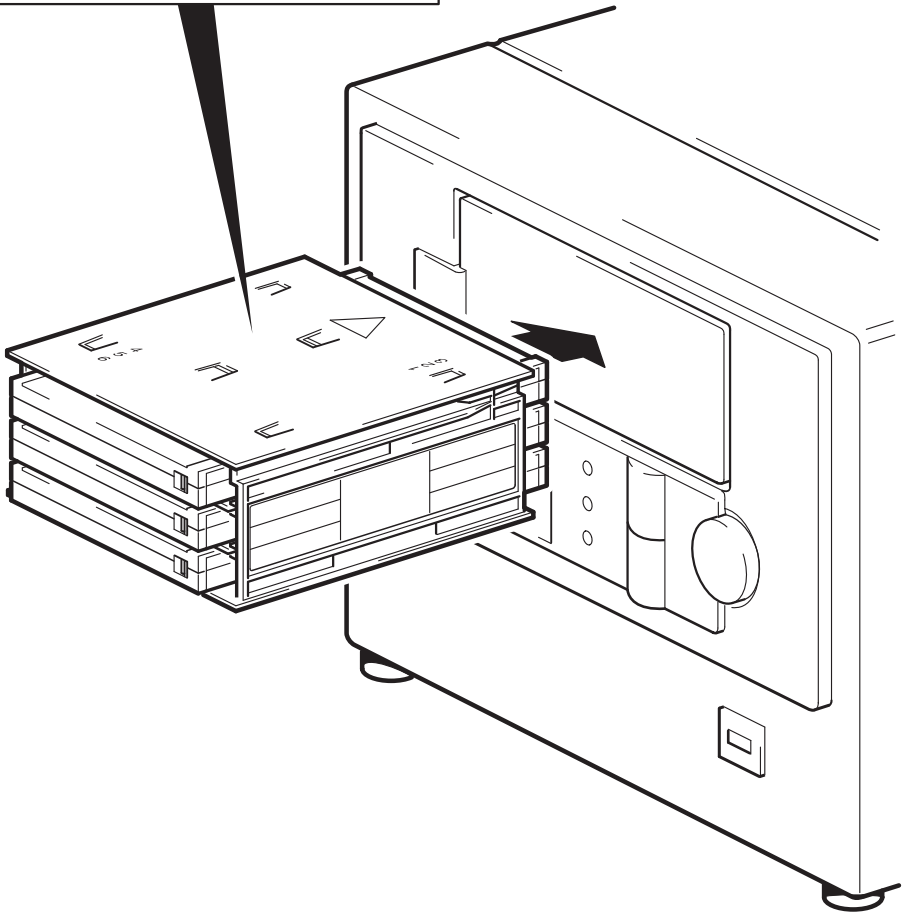
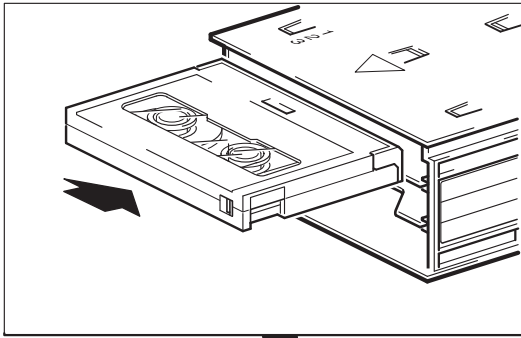


Figure 10: loading the autoloader

Operating the autoloader

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 autoloader.

The power indicator will light up and the autoloader will run its hardware self-test, during which the front panel lights will flash and the message `Self Test` displays.

HP Surestore DAT 40x6 models also display the serial number, the display alternates between the `Self Test` message and the serial number. At the end of the self-test, all lights will go out and the front panel message will say `Insert Mag.` (Read more about the front panel lights and messages in the electronic *User's Guide* on the *HP Surestore Tape* CD-ROM.)

If the self-test fails, the Operator Attention Required light (bottom) changes to steady amber and the other lights go off. If this occurs, try switching the autoloader off, then on again. If the test still fails, call for service.

- 2 Switch on the computer.
- 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 magazine

- 1 Place the required number of cartridges in the magazine so that they point towards the center of the magazine. You can use any number of cartridges from 1 to 6, and can place the cartridges in any of the magazine slots. However, for ease and speed of use, start by using slot 1.
- 2 Insert the magazine through the door in the front of the autoloader. Make sure that the large arrow is uppermost and pointing towards the autoloader, as shown in figure 10.
- 3 Apply steady pressure until the mechanism takes the magazine and pulls it into the autoloader. The autoloader will then check which magazine slots contain cartridges.
- 4 When the magazine check is complete, use either your backup software on the host computer or the autoloader's front panel buttons to select and load a cartridge from the magazine into the drive.
- 5 The drive now performs a load sequence. This takes a maximum of 25 seconds from the time the cartridge is inserted to the time the drive is ready to start acting upon the next command from the host. See the electronic *User's Guide* on the *HP Surestore Tape* CD-ROM for more information about the load sequence and autoloader modes.

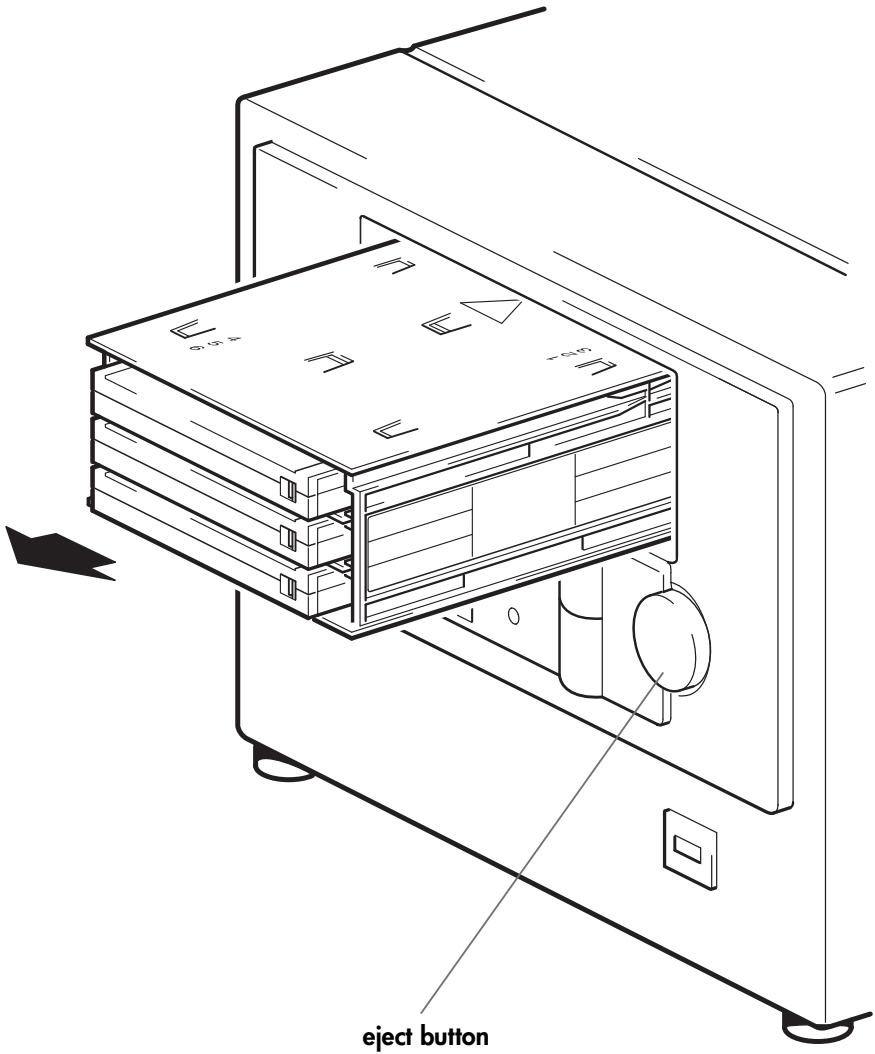


Figure 11: unloading the autoloader

To unload a magazine

- 1 Press the Eject button on the front panel. (See figure 11.)
- 2 The autoloader ejects the magazine. However, if one of the cartridges is still in the drive mechanism when you press the Eject button or the autoloader is busy, it may be a long time before the autoloader will respond to the request because it will finish the task it is performing first. This ensures that the task is terminated in a controlled manner and no data is lost.

Note It is possible for the host computer to disable the Eject button by sending a PREVENT MEDIA REMOVAL command via SCSI. This will remain in force until either the host sends an ALLOW MEDIA REMOVAL command or the autoloader is reset or power-cycled.

Autoloader modes

HP Surestore DAT autoloaders may be operated in either stacker or random mode. Mode is initially determined by what happens after you insert a magazine:

- If the host sends a command to move a cartridge from the magazine to the drive, the autoloader goes into random mode
- If you select a cartridge by pressing the Select button and then load it by pressing the Load Cartridge button, the autoloader goes into stacker mode

See the electronic *User's Guide* on the *HP Surestore Tape* CD-ROM for more information about autoloader modes.

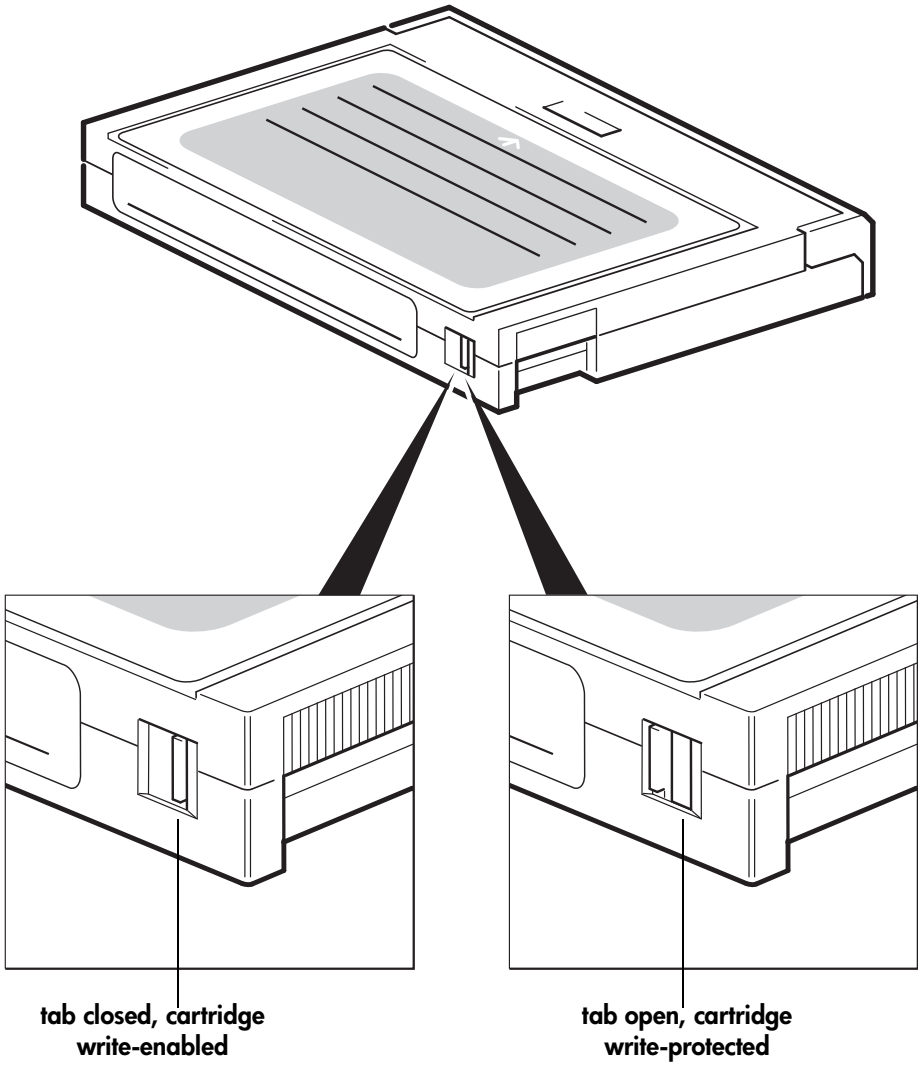


Figure 12: write-protecting cartridges

To write-protect a cartridge

If you want to protect the data on a cartridge from being altered or overwritten, you can write-protect the cartridge, as illustrated in figure 12. 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.

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.

To clean the tape heads

Use only an HP cleaning cartridge (part number C5709A) to clean the tape heads. 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.)

In addition to regular cleaning, use a cleaning cartridge under the following circumstances:

- When a "Clean Me" message is displayed on the front panel and the Operator Attention Required light flashes amber.
- When your backup application warns you that the drive needs cleaning (providing your backup application supports the TapeAlert feature).

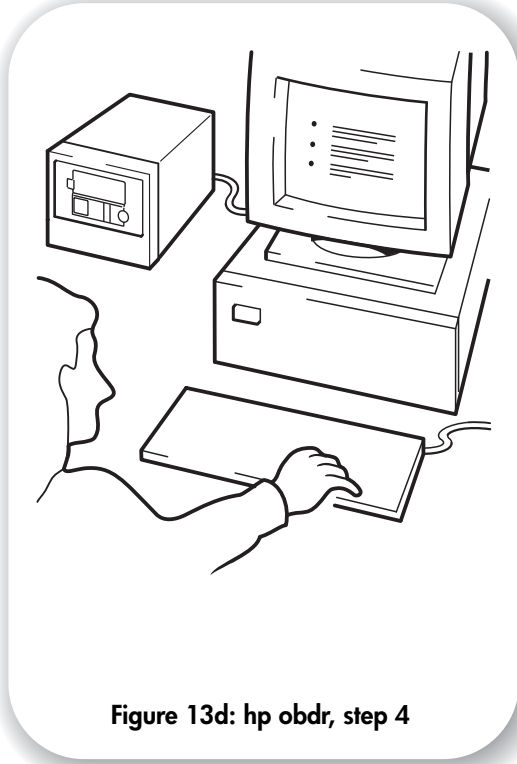
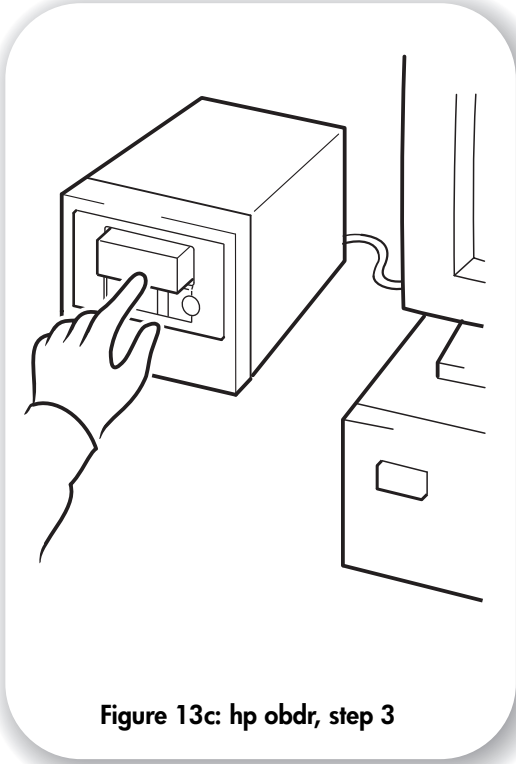
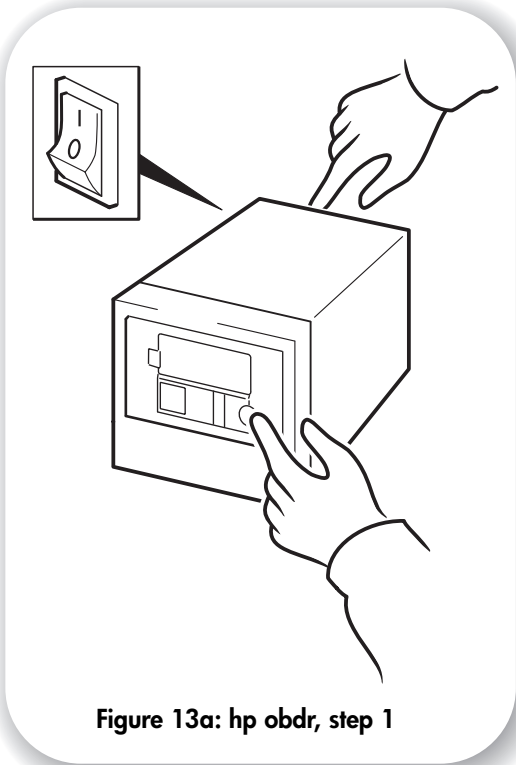
Cleaning the tape heads on an HP Surestore DAT autoloader can be performed manually by the user or automatically by the backup application.

Manual method

- 1 Place a cleaning cartridge in any magazine slot and note the slot number.
- 2 Insert the magazine into the autoloader.
- 3 Press the Select button until the slot number where the cleaning cartridge is located is displayed.
- 4 Press the Load Cartridge button to load the cleaning cartridge into the drive. The drive will then automatically perform the cleaning cycle. The LCD display will display the message "Cleaning" while the cartridge is in use.
- 5 Eject the magazine and mark the label on the cleaning cartridge to keep a record of how many times it has been used.

Automatic cleaning

Certain backup applications that provide autoloader support have provision for automatic use of the cleaning cartridge. In this case the cleaning cartridge is put in a magazine slot (usually slot 6). The application can then be told that slot 6 contains the cleaning cartridge and also when it is to be used. The magazine is then loaded in the usual way and the cleaning cartridge is used at intervals programmed into the application.



Using HP OBDR (HP Surestore DAT 40x6 only)

HP One-Button Disaster Recovery is only available with HP Surestore DAT 40x6 autoloaders. If you have a HP Surestore DAT 24x6 autoloader, ignore this section.

Compatibility

HP One-Button Disaster Recovery is a standard feature on all HP Surestore DAT40x6 autoloaders. 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 autoloader 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 autoloader 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 autoloader 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 autoloader 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. Keeping the eject button pressed down, power on your autoloader (see figure 13a). Release the button as soon as the LCD displays the message "OBDR Mode". (If there is a magazine in the autoloader, you can leave it there.)

Note The cartridge in slot 1 of the magazine is always used to restore your operating system to a state where it can run a normal data restore from the most recent backup cartridge in the magazine.

- 2 Switch on your computer system (see Figure 13b).
- 3 If there is no magazine in the autoloader, immediately insert the latest one (see figure 13c). This activates the HP One-Button Disaster Recovery process.
- 4 Follow the on-screen instructions to set up the operating system (see figure 13d). Normally, you can accept the default response to all the prompts, for example just press <Enter>. The LCD displays the message "OBDR Mode" (as described in step 1) while the autoloader restores your operating system to a state where it can run a normal data restore.
- 5 Once the operating system has been set up and rebooted, the LCD "OBDR Mode" message disappears and the Magazine Present and Tape Activity LEDs display constant green. 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/instant-support](http://www.hp.com/go/instant-support).

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 HP Library & Tape Tools from [//www.hp.com/support/tapetools](http://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 36.

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 SCSI cable shipped with the drive is not correct

Description	Further information
The SCSI cable shipped with the drive does not plug into the SCSI host adapter of the server.	The cable provided will connect to the majority of systems. If a different cable is required, refer to the ordering supplies section in the online HP Surestore User’s Guide on the <i>HP Surestore Tape</i> CD-ROM.

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 33) to provide information on your current SCSI settings. The HP Surestore DAT external autoloader has its SCSI ID set to 5 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 9.

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 <i>HP Surestore Tape</i> 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.	<p>Refer to the SCSI Configuration section in the online HP Surestore User's Guide on the <i>HP Surestore Tape</i> CD-ROM.</p> <p>Both ends of a SCSI bus must be terminated. Assuming that the host bus adapter is already correctly terminated, there are typically three possibilities:</p> <ul style="list-style-type: none">• The autoloader is the only external device on the SCSI bus. It should be terminated with the terminator provided.• The autoloader is being added to the end of a chain of one or more existing external devices. Remove the terminator from the last device on the existing chain, connect the autoloader to the chain, and terminate the autoloader with the terminator provided.• The autoloader is being added to the middle of a chain of existing external devices. Insert the autoloader into the chain and do not use the terminator provided. <p>The terminator plugs directly onto either SCSI connection on the rear of the autoloader.</p>

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 33) 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 <i>HP Surestore Tape</i> 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 autoloaders, then all the required drivers will be provided. For support on Windows NT/2000, drivers can be obtained from the <i>HP Surestore Tape</i> 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 <i>HP Surestore Tape</i> 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 hangs

Possible reason	Recommended action
There are conflicts in your hardware or software configuration, such as two devices with the same SCSI ID or improper termination of the SCSI bus.	Make sure that each device on the SCSI bus has a unique ID. Check that the SCSI bus is actively terminated. (Refer to the documentation for your SCSI controller and any other SCSI devices you may have.)

The computer boots but does not recognize the autoloader

Possible reason	Recommended action
The power or SCSI cable is not connected properly.	Check that the cables to the autoloader are firmly connected. Ensure that the SCSI cable does not have any bent pins. Replace, if necessary. (See the "Ordering Information" topic on the <i>HP Surestore Tape</i> 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 autoloader 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 autoloader is connected to a dedicated host bus adapter. Do not connect the drive to a disk RAID controller as this is not supported.
The autoloader was switched on after the computer booted up. The computer only checks for SCSI devices at power-on.	Switch on the autoloader and then reboot the computer.

The application does not recognize the autoloader

Possible reason	Recommended action
The application does not support the autoloader.	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 autoloader. Load any service packs as necessary.
Some applications require drivers to be loaded.	Check that the correct SCSI and autoloader drivers are installed. Consult the backup application's installation notes for details.
There may be a problem with the SCSI connection.	Check the SCSI cable, termination and SCSI ID as described in "The application does not recognize the autoloader".

The autoloader does not work

Possible reason	Recommended action
If the drive does not power up, the power cable may not be connected to the autoloader properly.	Make sure that the power switch is on and that the power cables are firmly connected. If they are, the device has probably failed. Call for service.
If the self-test fails (Operator Attention LED is steady amber), there may be a hardware or firmware failure.	Power down the autoloader and power it up again. If the self-test still fails, see "Understanding the OAR LED" on page 38.

Understanding the OAR LED

The amber Operator Attention Required LED indicates warning conditions, as described in the following table:

LED display	Meaning
On	A serious hardware error has occurred. <ul style="list-style-type: none">• If you have just installed the drive, check the installation for loose connections and repeat the self-test.• Run HP Library & Tape Tools to determine what the problem is.• If the fault condition persists, write down the message displayed on the front panel and call for service.
Fast flashing (four times per second)	A firmware upgrade is taking place.
Medium flashing (twice per second)	<ul style="list-style-type: none">• The tape cartridge is wearing out and should be replaced. The "Worn Media" message will be displayed in this case. Copy any data you wish to keep onto a new cartridge and discard the old cartridge.• The tape heads need cleaning. The "Clean Me" message will be displayed in this case.
Slow flashing	<ul style="list-style-type: none">• The front panel door is open when it should not be. The "Close Door" message will be displayed in this case.• There is a cartridge in the autoloader, but no magazine is present. The "Stray Tape" message will be displayed in this case. Load an empty magazine to retrieve the cartridge.• A hard fault condition has occurred. The message displayed will give information about the type of error. Look up the message in the electronic <i>User's Guide</i> on the <i>HP Surestore Tape</i> CD-ROM to determine what to do.

Forcing ejection

If you press the Eject button when the autoloader is busy, it may be a long time before the autoloader will respond to the request because it will finish the task it is performing first. However, if you need to unload a cartridge urgently, even at the risk of losing data, you must force ejection.

Caution You can lose data if you force ejection. The tape may also end up invalidly formatted because an EOD (End of Data) mark might not be written. Force ejection only as a last resort to recover a cartridge.

- 1 Hold the Eject button down for at least five seconds (usually between 5 and 10 seconds).
- 2 The autoloader responds as follows:
 - The front panel display will show "Force Eject."
 - The autoloader waits 35 seconds to give the normal eject procedure a chance to occur. Once this time has elapsed, if there is a cartridge loaded in the drive it is immediately unloaded, regardless of what operation the drive was performing. The cartridge is then returned to its slot in the magazine, and the drive is reset as though the power had been cycled. Because the forced ejection may interrupt any operation, it is possible that the drive will not write an EOD (End of Data) mark before the cartridge is ejected. This will cause loss of data and leave the cartridge with an invalid format.
 - If no cartridge is loaded in the drive, the autoloader assumes that you want to eject the magazine. Following the 35-second pause, it does this. The autoloader is then reset as though power had been cycled.

Note A forced ejection will abort any SCSI operations that may be in progress on the autoloader and overrides any SCSI PREVENT MEDIA REMOVAL in effect.

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 33 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](http://www.hp.com/support/dat))
- the HP Instant Support web page ([//www.hp.com/go/instant-support](http://www.hp.com/go/instant-support))
- the HP Library and Tape Tools web page ([//www.hp.com/support/tapetools](http://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:

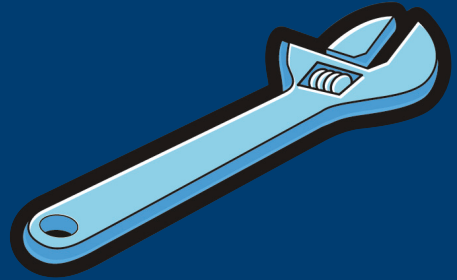
- The online User's Guide on the *HP Surestore Tape* CD-ROM contains an extensive troubleshooting topic.
- The CD-ROM Guide topic on the *HP Surestore Tape* CD-ROM contains a number of useful links, for example, to support and media web sites.
- The HP support website for HP Surestore DAT ([//www.hp.com/support/dat](http://www.hp.com/support/dat)) 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](http://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 online User's Guide on the *HP Surestore Tape* CD-ROM.



<http://www.hp.com/go/storagemedia>



<http://www.hp.com/support/dat>



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