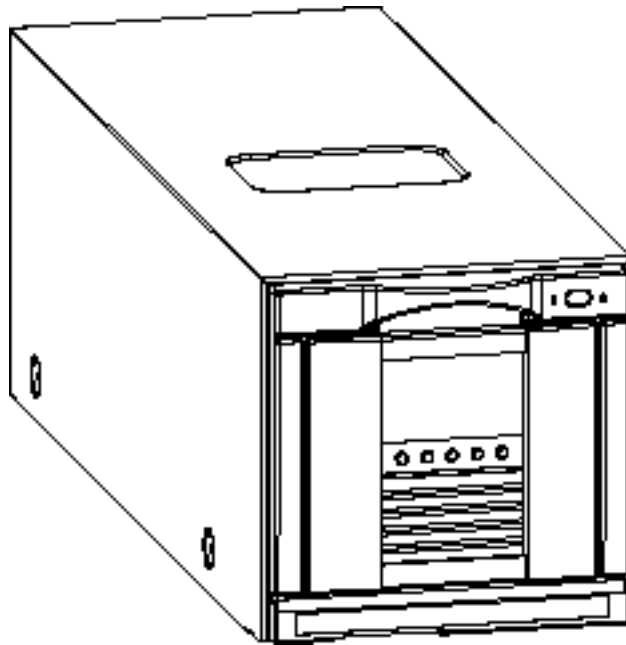


hp surestore tape autoloader user and service guide

model 1 / 9



Part Number: C9254-90000

Edition 4

November 2002

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Notice

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Warranty

Note See **Appendix C** for more information about support and service.

HP Product: HP Surestore Tape Autoloader Model 1/9.

Duration of limited warranty: One Year

1. HP warrants HP hardware, accessories, and supplies against defects in materials and workmanship for the period specified above. If Hewlett-Packard receives notice of such defects during the warranty period, Hewlett-Packard will, at its option, either repair or replace products which prove to be defective. Replacement products may be either new or like-new.
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Typographical Conventions and Terms

Bold:	Menu choices and screens on the library.
[Bold]:	Soft keys to press on the library.
Computer:	Host and SCSI commands.
<i>Emphasis:</i>	Draws attention to items within text.

This table format indicates the menus you need to enter on the library front panel:

Main Menu -> Operations -> Magazine Access
--

Note	Notes explain significant concepts or operating instructions.
-------------	---

Caution	Cautions call attention to an operating procedure or practice that could damage the product if not correctly performed. Do not proceed until you understand and meet these required conditions.
----------------	---

WARNING	Warning call attention to a procedure or practice that could result in personal injury if not correctly performed. Do not proceed until you fully understand and meet the required conditions.
----------------	--

In This Manual

Chapter 1	Autoloader Installation: Describes how to install, rackmount, connect, and power on the autoloader.
Chapter 2	Autoloader Operations: Describes the front panel menu structure, using tapes, loading /unloading tapes, and cleaning the drive.
Chapter 3	Autoloader Administration: Describes configuration options, front panel tests, and how to retrieve information about the autoloader.
Chapter 4	Understanding Errors and Troubleshooting: Describes how to understand error conditions, find error information, interpret LEDs, and troubleshoot autoloader problems.
Chapter 5	Removing and Replacing Parts: Describes how to remove and replace parts, download firmware, and move/ship the autoloader.
Appendix A	Technical Specifications: Describes environmental, autoloader, physical, and SCSI cable specifications.
Appendix B	Error Code and Qualifier Reference Table: Describes environmental, autoloader, physical, and SCSI cable specifications.
Appendix C	Customer Support: Includes support information for the autoloader.
Appendix D	Safety and Regulatory Information: Includes regulatory and certification information for the autoloader.

Printing History

Edition 1	May 2000: C7145-90000 Initial printing.
Edition 2	November 2000: C7145-90005 Added references to the HP Tape Library and Autoloader Drive Manual for specific information for all drive and media types available with the autoloader. Added information about HP Library & Tape Tools, the remote management card, and moving tapes between slots. Modified the contents of the accessory kit.
Edition 3	January 2002: C9254-90000 Deleted the enhanced accessory kit and references to an outdated URL. Added information specific to verifying the host connection, and using HP Library & Tape Tools.
Edition 4	November 2002: C9254-90000 Released for web only. Updated error codes and error code qualifiers.

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Autoloader Installation

1

Chapter Overview

This chapter contains information on the following:

- [Identifying Product Components](#) on page 12
- [Understanding Autoloader Features](#) on page 14
- [Preparing the Autoloader for Installation](#) on page 17
- [Installing the Autoloader into a Rack](#) on page 21
- [Preparing the Host for Installation](#) on page 28
- [Preparing the Autoloader for Installation](#) on page 17
- [Connecting and Powering on the Autoloader](#) on page 29
- [Verifying the Host Configuration](#) on page 31

Identifying Product Components

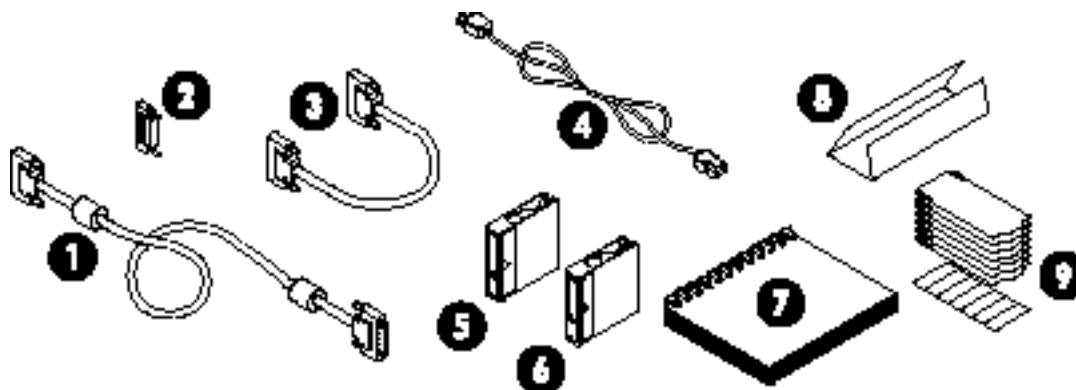


Table 1 Standard Accessory Kit Included with the Autoloader

Component		Description
1	SCSI interface cable	Two-meter SCSI cable with 68-pin connectors.
2	SCSI terminator	68-pin SCSI terminator (HVDS or LVDS) to terminate the SCSI chain.
3	SCSI jumper cable	68-pin cable that connects the controller to the drive.
4	Power cord	Localized power cord.
5	Cleaning cartridge	One cleaning cartridge to clean the drive.
6	Tape cartridge	One tape cartridge included for data backup.
7	User manual	Describes installation, operation, configuration, and troubleshooting information. You can find localized versions of the manual at http://www.hp.com/support .
8	Quick setup poster	Describes installation and configuration procedures.
9	Label kit	Includes two kits: one for the barcode labels and one for the pull-out information tabs.

Note Visit <http://www.hp.com/support> to view localized versions of the manual, access the HP Library & Tape Tools support diagnostic utility, and obtain backup software information for the autoloader.

Table 2 Additional Accessories

Component	Description
Remote management card kit	Enables web management and monitoring of the autoloader through a network connection.
Rackmount kit	Allows you to install up to two autoloaders into a standard 19-inch wide rack.
Cosmetic enclosure kit	Contains a cosmetic cover and feet to convert a rackmount autoloader for standalone use.
Packaging kit	Allows you to ship the autoloader in tested packaging material.

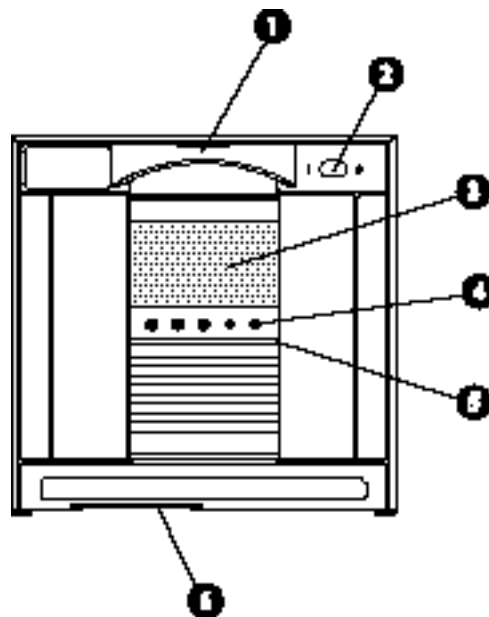
Note To order these kits, contact your local reseller ([Appendix C](#)).

Understanding Autoloader Features

Front Panel Overview

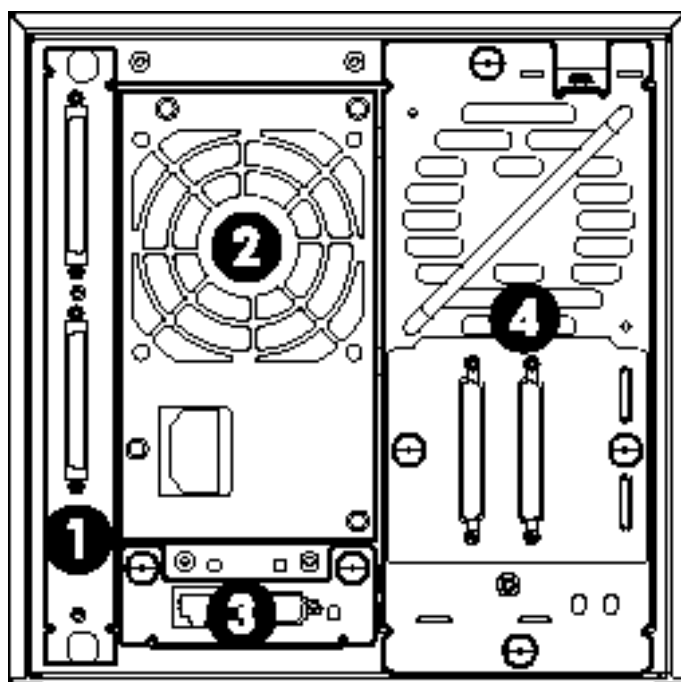
Remember to:

- Remove the internal packaging inside the autoloader front door (see [Preparing the Autoloader for Installation](#) on page 17).
- Install the pull-out information tab in the front slot (see [Preparing the Autoloader for Installation](#) on page 17).



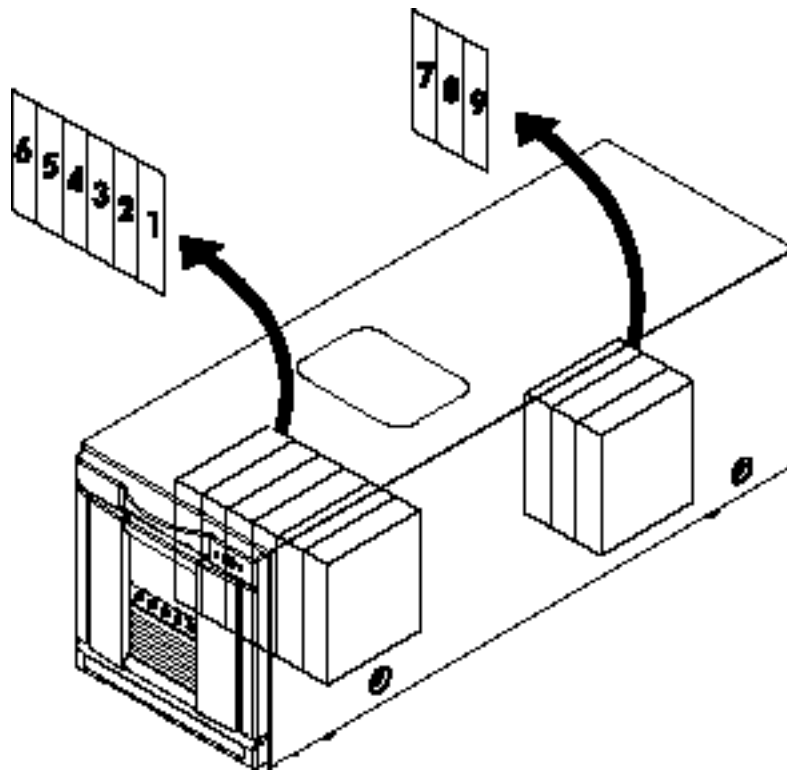
1	Door handle
2	Power (standby) switch
3	Front panel display
4	Soft-button keys
5	LED status bar
6	Slot for pull-out information tab

Back Panel Overview



1	Autoloader controller card
2	Power supply
3	Remote management card (optional)
4	Drive module

Internal Overview



The autoloader includes the following tape storage components:

- Removable magazine with slots numbered 1-6
- Internal back storage slots with slots numbered 7-9

Preparing the Autoloader for Installation

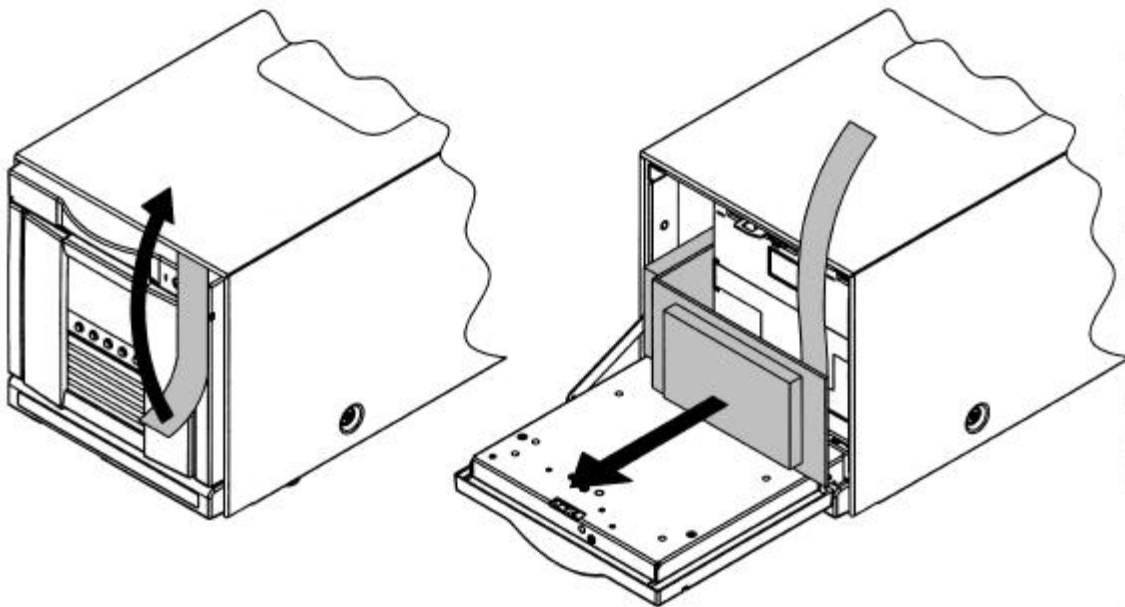
To prepare the autoloader for installation, remove the internal packaging from the autoloader and install the pull-out information tabs.

Removing Internal Packaging

Caution Do not power on the autoloader before removing the internal packaging.

To remove the internal packaging, open the autoloader front door and pull the foam packaging out from around the magazine.

Figure 1 Removing the Packaging



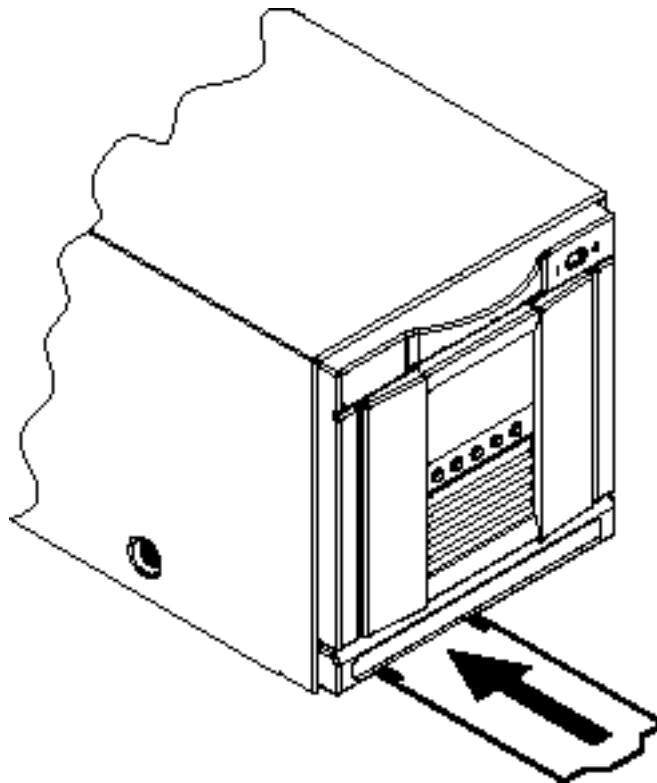
Installing the Pull-Out Information Tab

Select the tab in the language that you prefer, and insert it into the slot on the front of the autoloader (see [Front Panel Overview](#) on page 14). The tab will snap into place when you push it to the back of the slot.

Note You might need to forcefully push the tab all the way to the back of the slot for it to click into place.

Figure 2

Installing the Pull-Out Tab



Choosing a Location

Choose a location that meets the following criteria.

Table 3

Location Criteria

Weight	23 kg (50 lbs)
Room temperature	10-35° C (50-95° F)
Power source	AC power voltage: 100-127 V or 200-240 V Line frequency: 50-60 Hz Note Locate the AC outlet near the autoloader. The AC power cord is this product's main AC disconnect device and must be easily accessible at all times.
Air quality	Minimal sources of particulate contamination. Avoid areas near frequently used doors and walkways, stacks of supplies that collect dust, and smoke-filled rooms. Caution Excessive dust and debris can damage tapes and tape drives.
Humidity	20-80% RH
Clearance	Standalone configuration — includes the cosmetic enclosure and feet (see Installing a Standalone Autoloader in a Rack on page 20): Back 56 cm (22 inches) for cooling and service. Front 86 cm (34 inches) for operator access. Rackmounted configuration (see Rackmounting the Autoloader on page 22) Above Requires 6 EIA (26.67 cm or 10.5 inches) of clearance in a rack. Back Allow adequate room for service access, at least 61 cm (24 inches). Front Requires 86 cm (34 inches) for tape access.

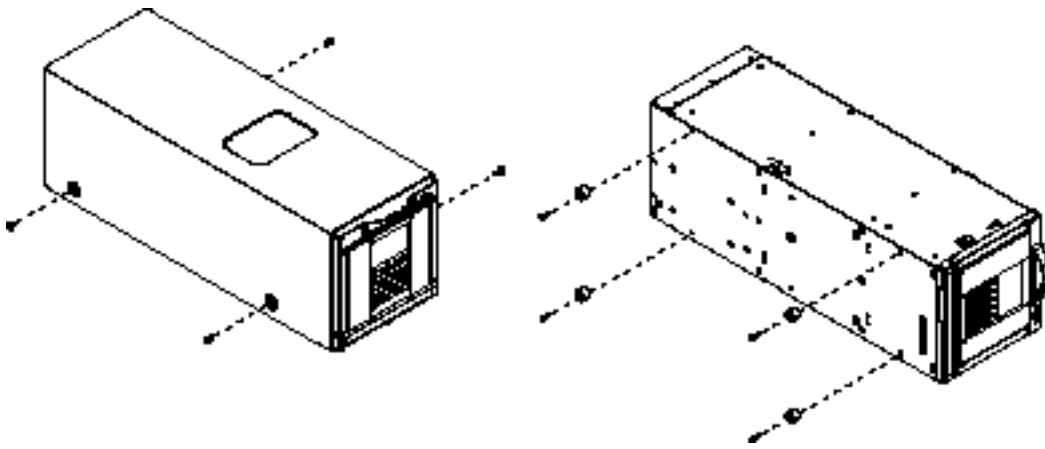
Installing a Standalone Autoloader in a Rack

To install a standalone autoloader into a rack, remove the cover and feet by following these steps:

1. Remove the cover by loosening the four T15 screws (two on each side of the autoloader) that secure the cover to the chassis (see [Figure 3](#)).
2. Lift the autoloader cover off by easing the sides out and lifting it up from the chassis.
3. Gently turn the autoloader on its side, and remove the T15 screws that secure the four feet to the chassis (see [Figure 3](#)).

Figure 3

Removing the Cover and Feet



4. Follow the rackmounting procedures in [Installing the Autoloader into a Rack](#) on page 21.

Installing the Autoloader into a Rack

The rackmount tray holds two autoloaders side-by-side and requires 6 EIA (26.67cm or 10.5 inches) of clearance in the rack. For standalone autoloaders, see [Preparing the Host for Installation](#) on page 28.

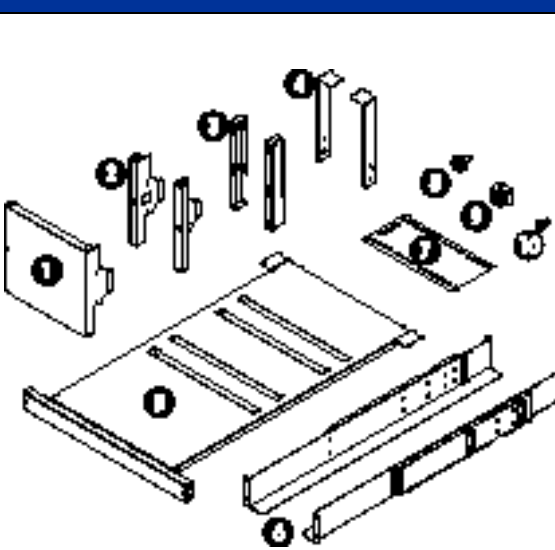
Tools and Parts

Ensure that you have the following:

- Phillips #2 screwdriver
- Torx screwdriver with T-15, T-20, and T-25 bits

Table 4

Rack Kit Parts

Callout Number	Description and Quantity	
1	Filler panel (Qty 1)	
2	Trim brackets (Qty 2)	
3	55-mm Spacer brackets (Qty 2, left and right)	
4	Hold-down bars (Qty 2)	
5	Tray (Qty 1)	
6	Mounting rails (Qty 2, left and right)	
7	Clip nut template (Qty 1)	
8	10-32 Machine screws (Qty 8)	
9	10-32 Clip nuts (Qty 12)	
10	10-32 Flat-head screws (Qty 2)	

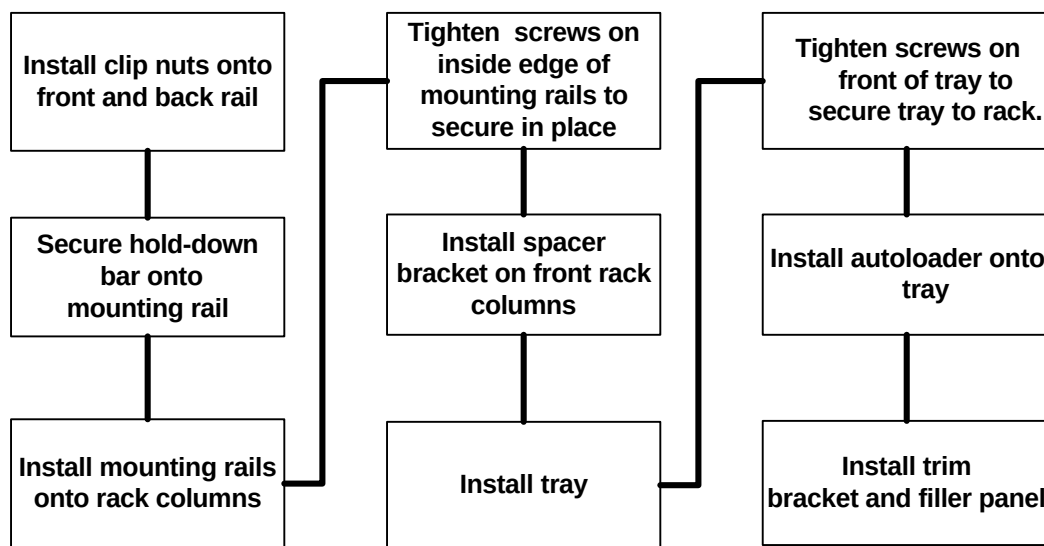
Rackmounting the Autoloader

Remember to:

- Remove the cosmetic enclosure and feet if you are installing a standalone autoloader into a rack (see [Installing a Standalone Autoloader in a Rack](#) on page 20).

Rackmounting Overview

Here is an overview of the rackmounting procedures that are described on the following pages.



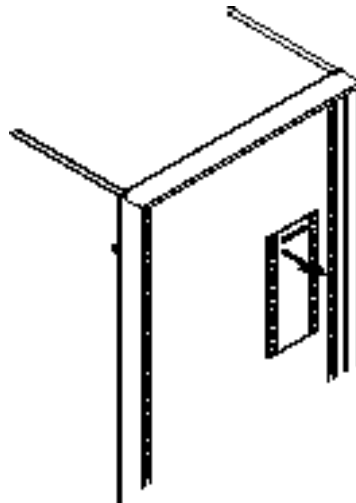
WARNING Before you begin, lower the rack's leveler feet, and extend the rack's anti-tip device. Failure to extend the anti-tip device could result in personal injury or damage to the tape autoloader if the rack tips over.

Caution Ensure that the rack and all equipment mounted in the rack have a reliable ground connection. Verify that the total current of the rack components does not exceed the current rating of the power distribution unit or outlet receptacles.

1. *If your rack does not have threaded screw holes*, install the clip nuts into the rack by following the steps below:
 - a. Using the clip nut template as a guide, install four clip nuts into each front column of the rack, ensuring that the clip nuts are in the same location on both columns (see [Figure 4](#)).
 - b. Using the same side of the clip nut template as a guide, install two clip nuts into each back column of the rack. The grey clip nuts on the template indicate the position for the back clip nuts.

Note Mount the top of the autoloader in the middle of the rack or 120 cm (48 inches) above the floor. Move the template so that the holes on the template align with the holes on the rack.

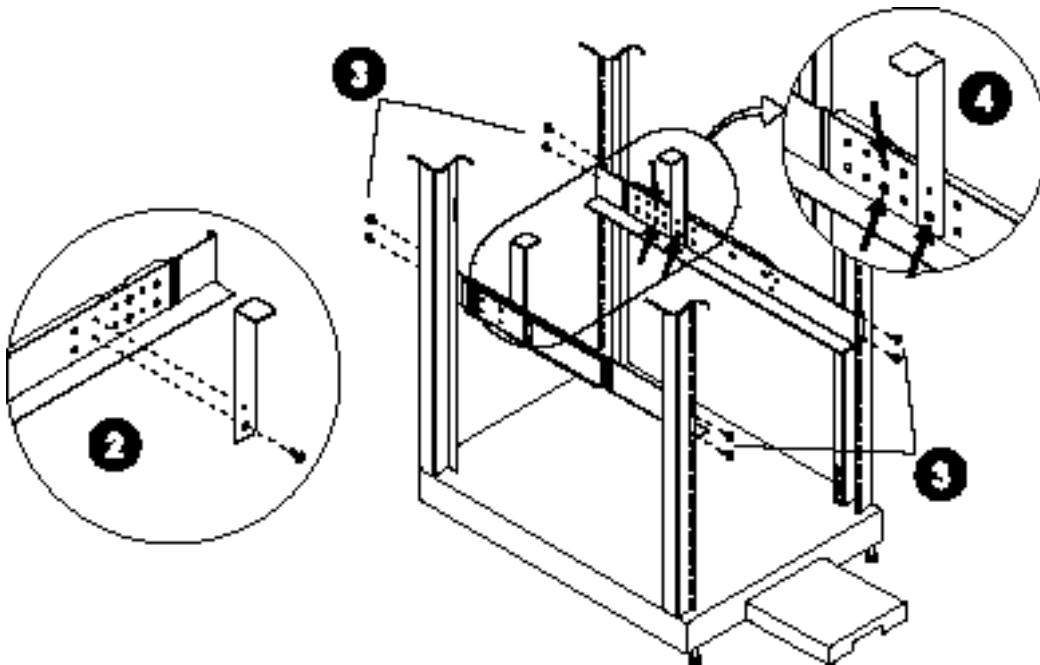
Figure 4 Using the Clip Nut Template



2. Secure the hold-down bar to the inside of the mounting rail by following the steps below (see [Figure 5](#)). *You will need one hold-down bar for each autoloader.*
 - a. Align the guide pin on the hold-down bar with the top hole on the inside edge of the mounting rail.
 - b. Loosely install one 10-32 flat-head screw below the guide pin.
3. Align the front of the mounting rail with the two bottom clip nuts, and install the 10-32 machine screws (see [Figure 5](#)).
 - a. Slide the rail out so that it equals the rack depth, and attach it to the back clip nuts using 10-32 machine screws.
 - b. Tighten the screws on the mounting rails.
4. Tighten the screws on the inside edge of the mounting rails and the hold-down bars using a Phillips #2 screwdriver.

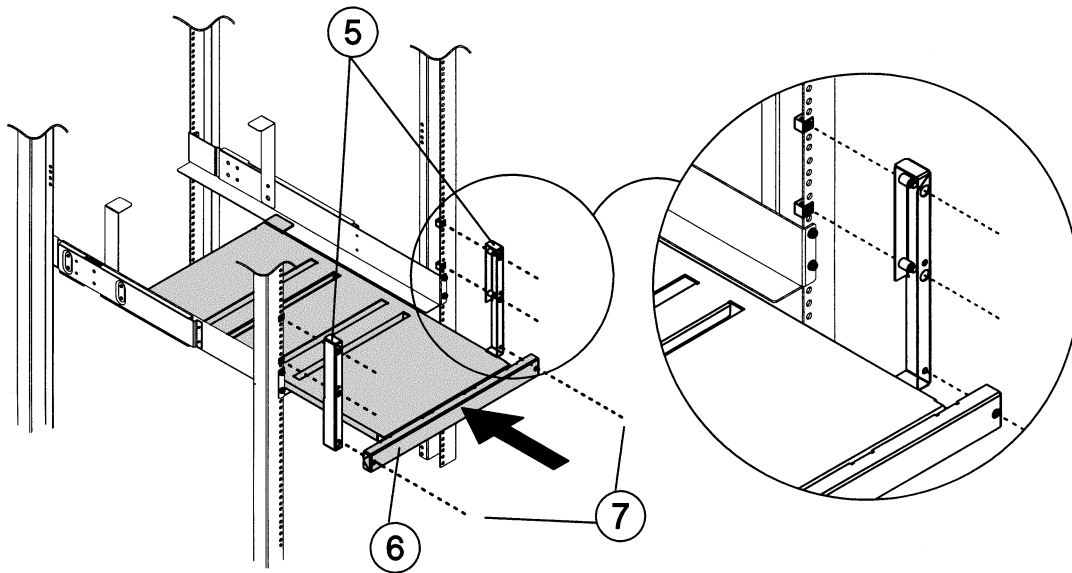
Figure 5

Securing the Mounting Rails and Hold-Down Bar



5. Install the 55-mm spacer bracket to each front rack column by aligning the top of the bracket with the top clip nut and tightening the two pre-installed Phillips screws (see [Figure 6](#)).
6. Slide the tray on top of the mounting rails to the back of the rack (see [Figure 6](#)).
7. Tighten the pre-installed T-20 screws on each side of the tray front to secure the tray to the installed spacer brackets on the rack. You might need to support the tray while you are tightening the screws.

Figure 6 Installing the Tray

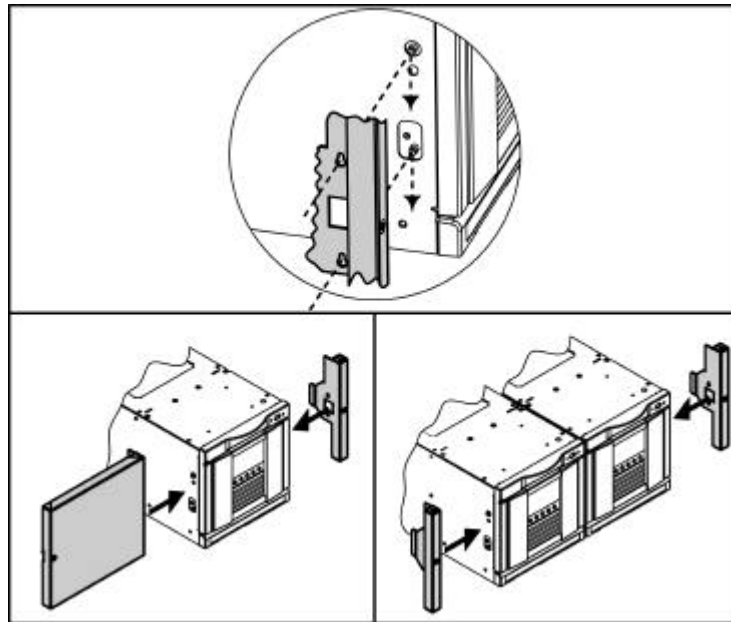


8. Using two people or an appropriately rated lift, install the autoloader onto the right side of the tray, gently sliding it toward the back of the rack. Ensure that the front edge of the autoloader is still accessible for the next step.

9. Install the trim brackets and filler panel by following these steps:
- Insert the right trim bracket on the right side of the autoloader by aligning the slotted holes on the trim bracket with the guide pins on the autoloader (the right and left trim brackets are different, (see [Figure 7](#) on page 26).
- *If you are only installing one autoloader*, install the filler panel on the left side of the autoloader by aligning the slotted holes on the filler panel with the guide pins on the autoloader (see [Figure 7](#)).
 - *If you are installing two autoloaders*, install the left trim bracket on the left side of the second autoloader (see [Figure 7](#)).

Figure 7

Installing the Trim Bracket and Filler Panel

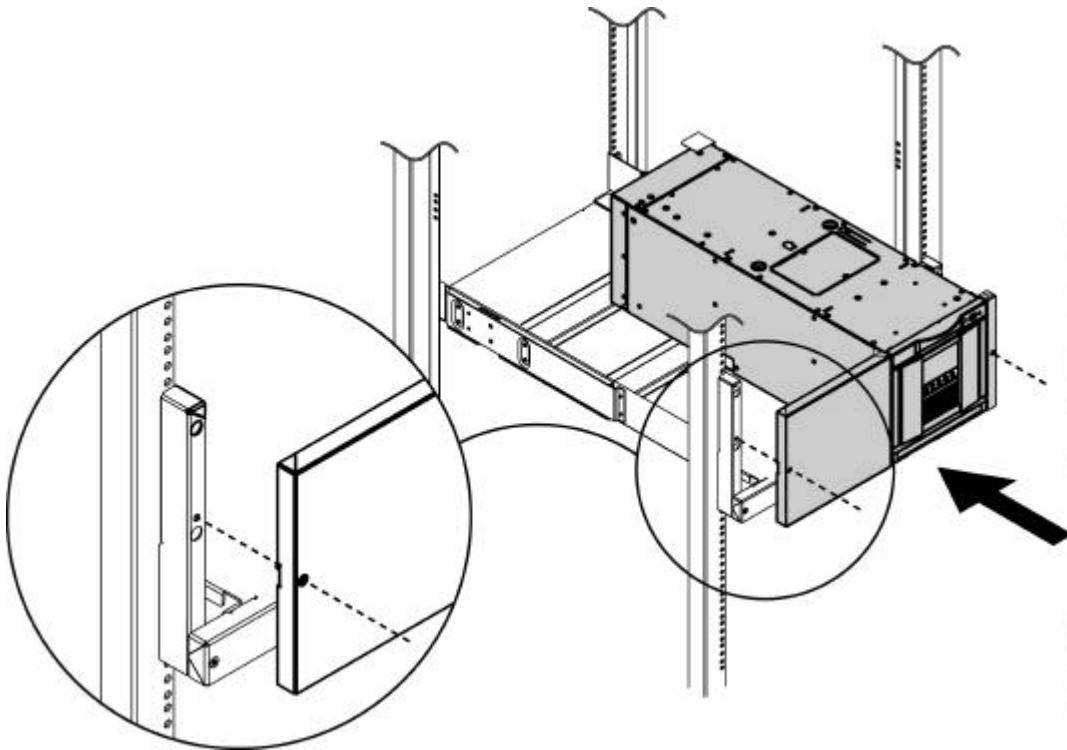


Installing One Autoloader

Installing Two Autoloaders

10. Check that the trim bracket (or filler panel) aligns with the 55-mm spacer bracket on the rack. Tighten the screw on the trim bracket and filler panel to secure the parts together and secure the autoloader to the rack.

Figure 8 Installing the Autoloader



Preparing the Host for Installation

Remember to:

- Review the contents at <http://www.hp.com/go/storage> for more information on obtaining and using backup software with the autoloader.
- Ensure you have a host SCSI bus adapter card that is compatible with the autoloader.

Install the SCSI host bus adapter card, software, and compatible drivers. Refer to the host computer user manual and SCSI bus adapter card instructions, and follow these general steps:

- When the host is powered on, install a driver and/or software into the host that is compatible with the autoloader. Refer to the documentation provided with the backup software for more information on installing software and drivers (if drivers are needed).
- If the host computer is connected to a network, check with the system administrator before turning off power.
- Properly power off all peripheral devices connected to the host computer.
- Power off the host.
- Use proper procedures to prevent electrostatic discharge (ESD). Use wrist-grounding straps and anti-static mats when removing internal components.
- Make sure that the host computer has a card expansion slot available.
- Ensure the host SCSI bus adapter card is supported by your software application.
- Do not connect the autoloader drive to the same SCSI bus as the hard drive because it will degrade the autoloader performance.
- Refer to [SCSI Cable Specifications](#) on page 116 for more information on SCSI cable length requirements.
- Check for available SCSI IDs if you are installing the autoloader onto the same SCSI bus as other devices. You might need to change the SCSI ID from the autoloader front panel if you think there will be an ID conflict with other devices.
- You can use HP Library & Tape Tools to identify available SCSI IDs. See [Using HP Library & Tape Tools](#) on page 107.

Connecting and Powering on the Autoloader

Remember to:

- Remove the internal packaging inside the autoloader (see [Figure 1](#) on page 17).
- Refer to the ANSI SCSI specification and [SCSI Cable Specifications](#) on page 116 for more information on cable length requirements.

Connect the autoloader as follows (see [Figure 9](#) on page 30 for a cabling illustration):

1. If the host computer is connected to a network, check with the system administrator before turning off power.
2. Properly power off all peripheral devices connected to the host computer.
3. Power off the host.

Caution When installing cables, do not damage the SCSI pins.

4. Install a 68-pin jumper cable from the bottom connector on the autoloader controller card to the left connector on the drive module (see [Figure 9](#) on page 30).
5. Install a SCSI terminator to the top connector of the controller card. Ensure you are using the correct terminator type for your autoloader (LVDS or HVDS).

Note For maximum performance, do not connect the autoloader to the same SCSI bus as the hard drive or another tape drive.

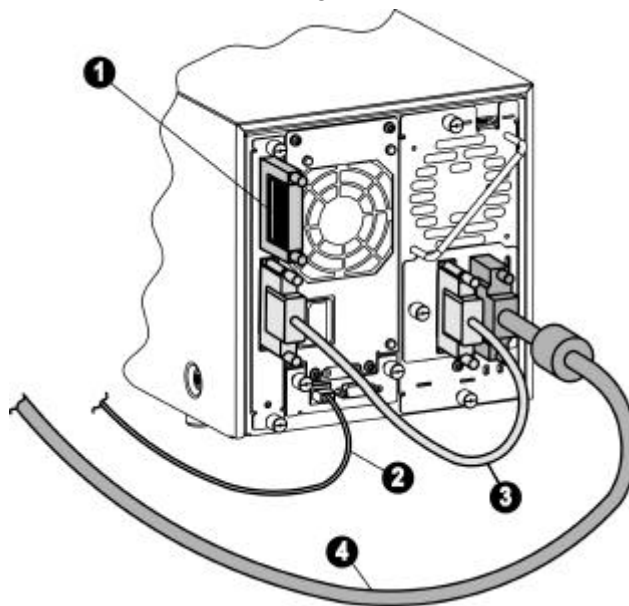
6. Install a 68-pin SCSI cable from the SCSI adapter card on the host to the remaining connector on the drive module.
7. If a remote management card is included with your autoloader, install a Category 5 Ethernet cable from the back of the card into an active network port.
8. Connect the power cord from the back of the power supply module to a properly grounded outlet.

Caution To disconnect all power from the autoloader, pull the power cord from the outlet.

9. Go to the front of the autoloader, and power it on by pressing the power (standby) switch in the top right corner. After the power-up test completes, you will see the default Home screen on the front panel display (see [Front Panel Overview](#) on page 36 for more information).
10. Set the SCSI IDs for the autoloader and drive if there will be a conflict with the default SCSI IDs (see [Setting SCSI IDs](#) on page 62 for more information).
11. Power on other peripherals and then the host.

Figure 9

Autoloader SCSI Cabling Connections



1	Terminator
2	Category 5 Ethernet cable (if RMC is installed)
3	SCSI jumper cable
4	SCSI interface cable to host

Verifying the Host Configuration

Remember to:

- Check that the autoloader is properly connected to the host (see [Figure 9](#) on page 30).
- Power on the autoloader and then the host (see [Figure 9](#) on page 30).
- Verify that your backup software package is compatible with your autoloader. Most backup software packages require an additional module to communicate with the autoloader robotics. You can view the software compatibility matrix at <http://www.hp.com/go/storage>.
- Install the HP Library & Tape Tools diagnostic/installation check utility available at <http://www.hp.com/support/TapeTools> onto your host system (if your operating system supports this tool). This utility verifies that the autoloader is connected and communicating with the host. It also verifies that the autoloader is functioning and provides diagnostic information. See [Running Autoloader Diagnostics Tests](#) on page 85 for more information on HP Library & Tape Tools.

Windows NT and 2000

For Window™ operating systems, perform the following operating system configurations:

- Install the appropriate host bus adapter(s)
- Install the corresponding drivers for the interface card(s)
- Install the backup software

To verify the installation, look for the library and drive after powering up the host.

- Go into Settings -> Control Panel -> SCSI Adapter
- Run a test backup to ensure that all components are properly configured.

Note Consult your software documentation for more information on installing, configuring, and operating your backup software.

Using HP Library & Tape Tools

You can also check the installation with HP Library & Tape Tools available from www.hp.com/support/TapeTools.

With HP Library & Tape Tools installed on your host computer, you can do the following and more:

- Identify all SCSI and Fibre Channel devices connected to your system
- View detailed configuration, identification, inventory, and drive information for the library.

Sun Solaris

For Sun Solaris™ operating systems, perform the following operating system configurations:

- Install the appropriate host bus adapter(s)
- Install the corresponding drivers for the interface card(s)
- Install the backup software

To verify the installation, look for the library and drive after powering up the host.

1. Close all open applications and exit the Common Desktop Environment (CDE).
2. Type `[init 0]` at any prompt. This will shut down all processes, and take you to the OpenBoot PROM.
3. Type `[reset]`.
4. At the OK prompt, type `[probe-scsi-all]`.
5. Run a test backup to ensure that all components are properly configured.

HP-UX and MPE/iX

For more information on configuring these operating systems and verifying the connection, see the online configuration and diagnostic guide at www.hp.com/go/support. Search for the library model and then select [Manuals].

You can also check that the autoloader is installed correctly by looking for the autoloader and drive devices after powering up the host (see [Setting SCSI IDs](#) on page 62 for the autoloader's default SCSI IDs).

- If you are using a Windows NT system, you can see if the autoloader is recognized by going into Settings -> Control Panel -> SCSI Adapter and expanding the device tree to view the autoloader's SCSI adapter.
- If you are using HP-UX, run an `ioscan` as root.
- For Sun Solaris:
 1. Close all open applications and exit the Common Desktop Environment (CDE).
 2. Type `[init 0]` at any prompt. This will shut down all processes, and take you to the OpenBoot PROM.
 3. Type `[reset]`.
 4. At the OK prompt, type `[probe-scsi-all]`.

Autoloader Operations

2

Chapter Overview

This chapter describes the following:

- **Front Panel Overview** on page 36
- **Understanding the Menu Structure** on page 40
- **Using Tapes** on page 41
- **Accessing Tapes in the Autoloader** on page 44
- **Drive and Tape Operations** on page 47

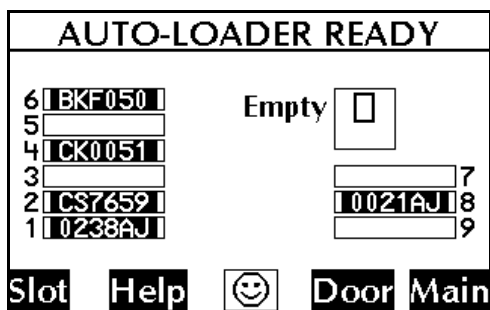
Front Panel Overview

The LCD display provides a drive and autoloader status line at the top, up to five lines of text, and five buttons under the display. The function of the buttons varies between screens.

The display defaults to the **Home** screen. The figure below shows a typical view of the **Home** screen.

Figure 10

Home Screen



The **Home** screen shows the following:

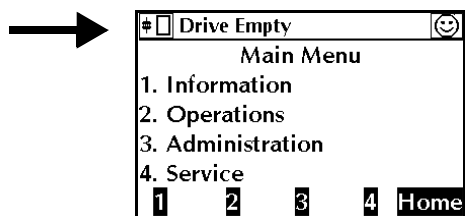
- Statement indicating the general condition of the autoloader.
- Drive and tape status.
- Tape bar codes (if applicable).
- **[Slot]** to display slot status, bar-code information, and tape locations.
- **[Help]** to display the icons with a description.
- An icon that indicates the general status of the autoloader. Press this button to obtain more information about the autoloader status.
- **[Door]** to open the door.
- **[Main]** to go to the **Information**, **Operations**, and **Administration** menus.

Icons

The status bar can display the following icons to describe autoloader and drive status (see the example in **Figure 11**).

Figure 11

Status Bar from Main Menu Screen



The status bar shows a reverse video reminder (icon background color is black) for drive, autoloader, or partial availability errors (see **Chapter 4**). You may clear this reminder by viewing either the **Drive Log** or **Loader Hard Error Log** screens or selecting the center icon button from the **Home** screen.

Figure 12

Drive Icons

	Power is off		Online
	Failed, offline		Full and idle
	Needs to be cleaned		Unloading a tape
	Offline		Seeking data on a tape
	Failed, online		Writing data to a tape
	Tape is cleaning a drive		Rewinding a tape
	Tape is write protected		Reading a tape
	Empty		Erasing a tape
	Loading a tape		

Figure 13

Library Icons

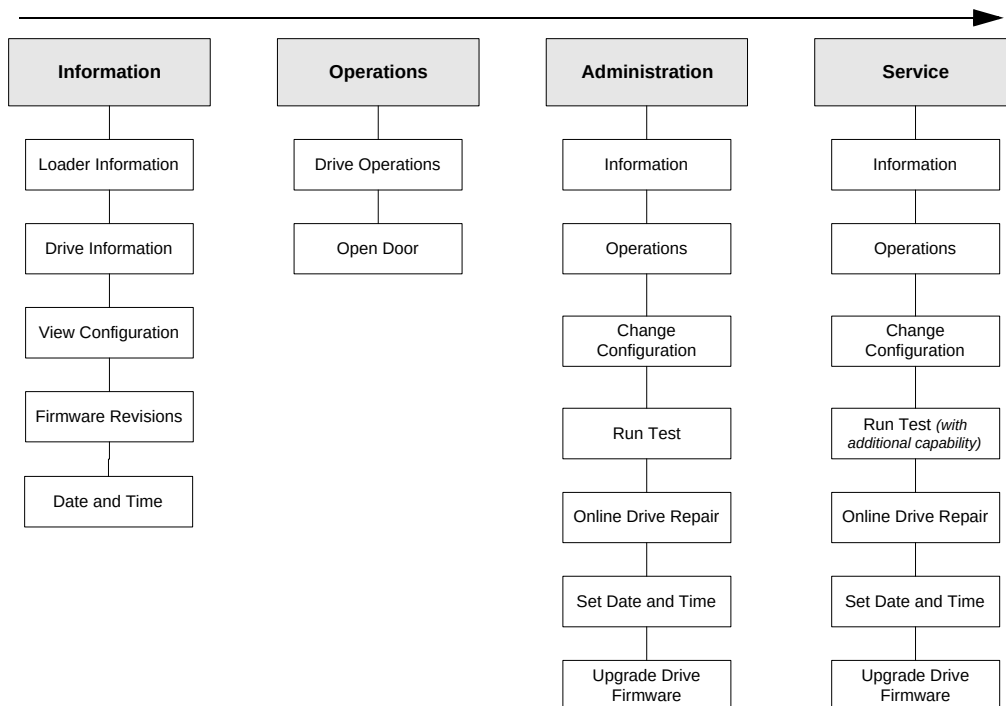
	Library status - failed		Library status - partially available
	Library status - healthy		

Nesting

Each level of password-protected menus (**Administration** and **Service**) includes all options available in the subordinate menu. For example, all options available in the **Administration** menu are also included in the **Service** menu. This functionality reduces the need to return to the **Main** menu or re-enter the password.

Figure 14

Nesting Menus



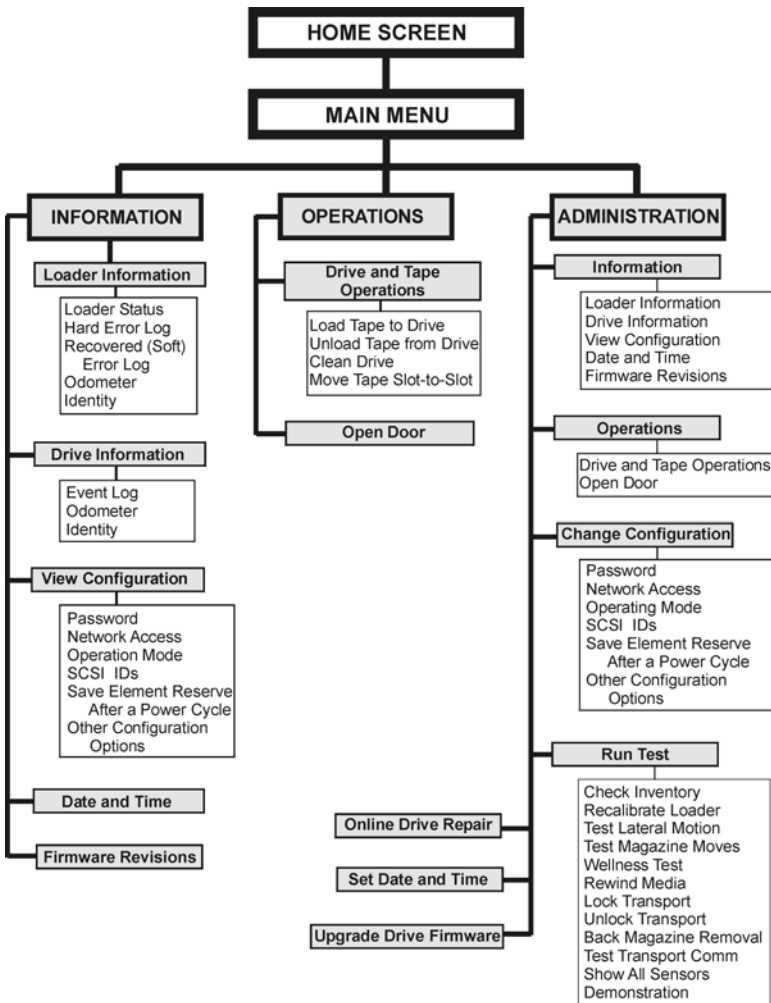
Note

The front panel display defaults back to the Home screen if a button is not pressed for three minutes.

Understanding the Menu Structure

Figure 15

Front Panel Menu Structure



Note

The **Service** menu includes the same menus as the **Administration** menu, but has additional diagnostic tests available.

Using Tapes

When using tapes in the autoloader, you need to ensure that the tape media is compatible with the drive. You can damage drives if you try loading incompatible media.

Note Refer to the *HP Tape Library and Drive Autoloader Manual* at <http://www.hp.com/support> for more information on using media. Enter the product number or model name and select **[Manuals]**.

Write-Protecting Tape Cartridges

The use of the write-protect switch ensures data safety for files that have been previously written to tape by preventing additional files from being written to that tape.

Refer to the documentation with your tape media or the *HP Tape Library and Autoloader Drive Manual* at <http://www.hp.com/support> for more information on write-protecting tapes.

Labeling Tape Cartridges

Make it a practice to use bar code labels on your tape cartridges. Your host software may need to keep track of the following information and the associated bar code:

- Date of format or initialization
- Cartridge owner (such as group or department)
- Storage purpose

Using Barcodes

There are different requirements on labeling tapes and using barcodes that are dependent on the drive and media type used with your autoloader. For more information on these requirements, refer to the *HP Tape Library and Autoloader Drive Manual* at <http://www.hp.com/support>.

Using Tapes

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- Storage purpose

Using Barcodes

There are different requirements on labeling tapes and using barcodes that are dependent on the drive and media type used with your autoloader. For more information on these requirements, refer to the *HP Tape Library and Autoloader Drive Manual* at <http://www.hp.com/support>.

Maintaining Tape Cartridges

Do Not:

- Expose tape cartridges to magnetic fields.
- Leave cartridges in the drive when autoloader power is off.
- Expose cartridges to extreme temperatures or humidity. Refer to the documentation with your tape media for appropriate operating and storage temperatures.
- Expose cartridges to moisture or direct sunlight.
- Drop the tape cartridges or subject the cartridges to any physical shock.
- Open the tape cartridge lid and expose the tape to possible contamination or physical damage.
- Touch the tape surface.
- Take the tape cartridges apart.
- Use graphite pencils, water soluble felt pens, or other debris-producing writing instruments to label tape cartridges.
- Erase a label; replace it instead.

Do:

- Remove dust on the outside of tape cartridges with a damp cloth.
- Store cartridges vertically, not horizontally.
- Store tape cartridges in their plastic containers and in the environmental conditions recommended in your tape media documentation.

Accessing Tapes in the Autoloader

Tapes in the autoloader may be accessed using the front magazine or the internal back slots.

Front Magazine Access

Home Screen -> Door

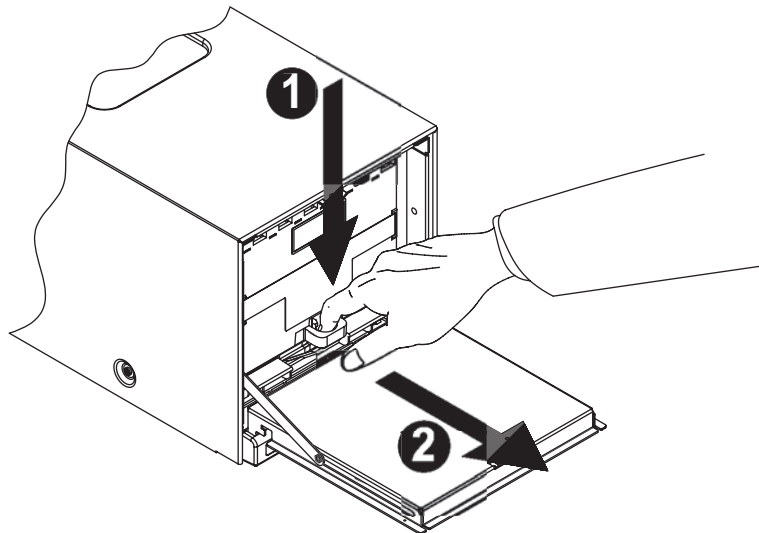
1. Pull the unlocked door down to access the magazine and tapes.

Note Select **[Lock]** to re-lock the door if it has been unlocked, but not opened. This feature will save time by not running the inventory check.

2. Remove the magazine by fully depressing the release button on the bottom of the magazine while pulling the magazine out with the tab (see **Figure 16**).

Figure 16

Removing the Magazine



3. Use the magazine carrying handle to lift it out from the autoloader.
4. To remove a tape, grasp the top and bottom corners of a tape, and pull the tape straight out of the magazine.

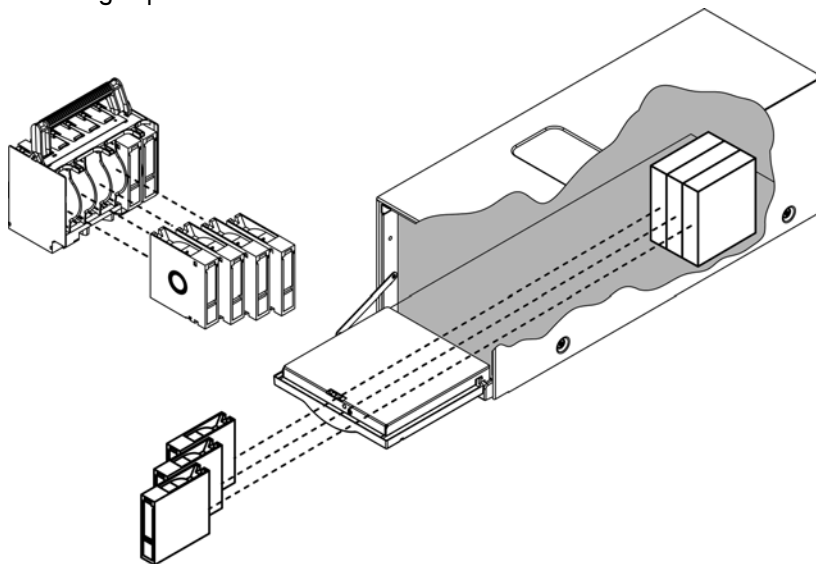
Note Do not hold the magazine handle down when you are removing tapes. When the handle is depressed, the tapes are locked in place.

5. If desired, insert tapes into the magazine, ensuring the write-protect switch faces out of the magazine. Push the tape into the slot until it “clicks” into place (see **Figure 17**).
6. Using the magazine tab, guide the magazine *back into* the autoloader by sliding it towards the inside of the autoloader until it aligns with the guide tracks and clicks into place. Close the door. The autoloader will run an inventory check.

Note If the tape is not positioned correctly inside the slot, try pushing the tape in again until it clicks into place.

Figure 17

Installing Tapes into the Autoloader



Internal Back Slot Access

Caution To prevent damaging the autoloader, avoid manually moving the internal transport. If the transport must be moved, unplug the autoloader, use ESD precautions, and avoid touching the internal circuitry.

1. Follow the steps on **page 44** to open the door and remove the front magazine. *If you are loading tapes for the first time or if the transport is locked, power cycle the autoloader before loading any tapes. Power cycling moves the transport away from the back slots.*
2. Unload tapes from the internal slots by pressing the tape in until it clicks and releases. Remove the tape after it partially ejects.

Caution Always remove back tapes by first pushing them in until they click and release. Do not remove back tapes by pulling them straight out.

3. With the write-protect switch facing out of the autoloader, load the internal slots by pushing the tape in until it clicks into place.

Drive and Tape Operations

Main Menu -> Operations -> Drive and Tape Operations

Loading a Tape Into a Drive

1. From the **Drive and Tape Operations** menu, select **[Load Tape to Drive]**.
2. Use the **[-]** or **[+]** key to select any full slot and **[OK]**.
3. Select **[Load]** to move the tape from a slot to the drive. The drive makes a clicking noise as the tape is being loaded.
A status screen indicates that the tape is being loaded.

Note The **Home** screen and **Figure 10** on page 36 illustrate the slot numbering scheme.

Unloading a Tape from the Drive

1. From the **Drive and Tape Operations** menu, select **[Unload Tape from Drive]** to move the tape from the drive to the tape's original location (the location it occupied before being loaded into the drive). If that slot is occupied, you will be asked to select another slot location.
The tape automatically rewinds before it is unloaded. A status screen displays the autoloader's progress as the tape is relocated.
2. From the **Drive and Tape Operations** menu, select **[Menu]** to return to the **Operations** menu.

Cleaning a Drive

Main Menu -> Operations -> Drive and Tape Operations

Note

Use a cleaning cartridge that is compatible with the drive. Refer to the *HP Tape Library and Autoloader Drive Manual* at <http://www.hp.com/support> for more information on cleaning cartridges.

Excessive use of the cleaning cartridge can cause unnecessary wear on the drive head. Refer to **Table 15** on page 89 for more information on cleaning issues.

1. Install a cleaning cartridge into any vacant slot, and note the location. See **Accessing Tapes in the Autoloader** on page 44 for more information.
2. From the **Drive and Tape Operations** menu, select **[Clean Drive]**.
3. From **Choose Cleaning Slot**, use the **[-]** or **[+]** key to select the slot location of the cleaning tape. Refer to **Internal Overview** on page 16, the label inside the autoloader door, or the **Home** screen for a list of slot numbers.
4. Select **[OK]**.
5. When the cleaning process is complete, the cleaning tape will be returned to the original slot location. The screen will display the appropriate status information.

Moving Tapes Between Slots

Main Menu -> Operations -> Drive and Tape Operations

1. From the **Drive and Tape Operations** menu, select [**Move Tape Slot-to-Slot**].
2. Select the slot where you want to move the tape *from* using the [+] or [-] keys, and press [**OK**].
3. Select the slot where you want to move the tape *to* using the [+] or [-] keys, and press [**OK**]. A message will display if the destination slot chosen is reserved or is the original **home** slot for a tape in the drive.

A status screen indicates the tape is being moved.

Autoloader Administration

3

Chapter Overview

This chapter describes the following:

- **Configuring the Autoloader** on page 52
- **Enabling and Changing the Password** on page 53
- **Using the Remote Management Card (RMC) Option** on page 54
- **Selecting the Operating Mode** on page 60
- **Setting SCSI IDs** on page 62
- **Setting the Date and Time** on page 63
- **Retrieving Autoloader Information** on page 65
- **Tape drive** on page 67

Note

After configuring the autoloader, you may need to power cycle the host computer for it to recognize the new configurations.

Power cycling the autoloader will cause the configurations to be saved to permanent memory, which allows the settings to be recovered if the unit is powered off for more than 8 days.

Configuring the Autoloader

Main Menu -> Administration -> Change Configuration

You can change the following configuration options for the autoloader:

Table 5 Configuration Options

Configuration	Description	Factory Default
Password	See Enabling and Changing the Password on page 53 for more information.	Off
Network Access	See Using the Remote Management Card (RMC) Option on page 54 for more information.	DHCP Off
Operating Mode	Allows you to select from one of the following operating modes (see Selecting the Operating Mode on page 60 for more information): ■ Autodetect ■ Random ■ Stacker	Autodetect
SCSI IDs	See Setting SCSI IDs on page 62 for more information.	Controller=0 Drive=1
Save Element Reserve After a Power Cycle	Allows you to retain an element reservation (drive or slots) by a host even if the autoloader is power cycled. This is typically used to ensure that only one host can access the autoloader.	Off
Other Configuration Options	■ Report Recovered Errors: Reports recovered errors over SCSI. ■ Restore Factory Defaults: Restores the factory default configuration settings as they appear in this table. ■ Prevent Media Access: Locks the autoloader door and prevents front panel operations.	On N/A Off

Enabling and Changing the Password

Main Menu -> Administration -> Change Configuration -> Password

When the autoloader is first installed, the password is inactive. Set a password to protect the system from unauthorized access and to fully use the remote management card.

1. Enter the **Password** menu. A status screen will indicate if a password is enabled.
 - If the password is turned off, select **[Set New Password]** to enter the new password.
 - If the password is enabled, select **[Change Password]** to enter the new password.
 - If the password is enabled, select **[Turn Password Off]** to clear the password.

Note The password must be exactly eight digits long. If you enter more than eight digits, the ninth digit will become the first digit of the new password.

2. Select **[OK]** to save your changes and exit or **[Back]** to exit without saving your changes.

Caution If you forget the password, only a service representative can restore it to the default settings.

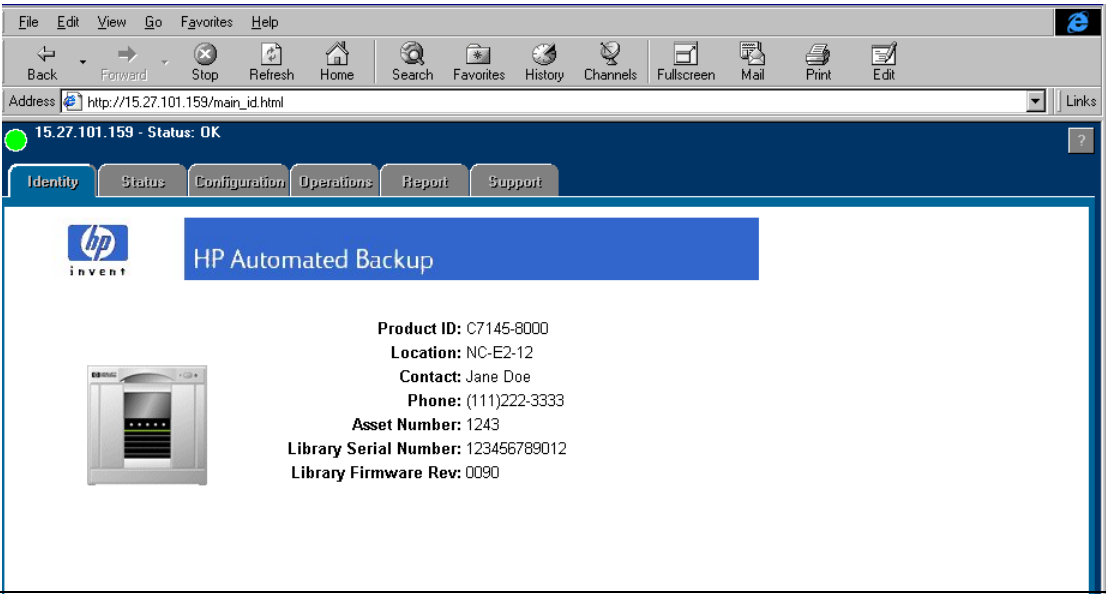
Using the Remote Management Card (RMC) Option

Overview

The remote management card is an optional internal card that includes a Web-Based Library Administrator, which allows management and monitoring of your autoloader through a network connection. This interface allows you to monitor your autoloader from anywhere on the network through comprehensive and user friendly web pages (like the example in **Figure 18**).

Online instructions are included on the web interface to describe how to use the tool. Simply select the **[?]** key in the upper right-hand corner to access the online help.

Figure 18 Remote Management Card Interface Example



The web-based remote management features allow you to obtain status reports and diagnostic information, as well as manage autoloader functions from a remote location. All remote operations are password protected to prevent unauthorized access.

For remote management, all you need is a network connection and a browser to:

- View the current status of the autoloader, drive, and tapes
- Manage multiple devices from any workstation within the intranet
- Manage and configure the autoloader on your network in a secure environment to:
 - Clean the drive
 - Load and unload tapes
 - Run diagnostics
 - Restart the autoloader
 - Dynamically assign the autoloader's IP address, gateway address, and subnet mask using DHCP or BOOTP mode
- View autoloader, drive, and tape error messages
- Generate error reports to fax or e-mail to your support representative
- Download and install firmware
- Access web-based support, web registration, documentation, and partner information

Dynamic Host Configuration Protocol (DHCP)

DHCP allows a DHCP server to dynamically assign IP addresses to any DHCP client that requests one. The DHCP server usually has a limited set of IP addresses, and assigns them on a first-come first-serve basis. When a DHCP client boots up, it will broadcast a DHCP request over TCP/IP. If a DHCP server is present, that server will respond with an IP address, subnet mask and gateway address. This response also includes a lease or expiration time for the IP address being assigned. If the client then wants to use this IP address, the client must acknowledge the server's response. If the lease expires, the DHCP server is free to re-issue that IP address to another DHCP client.

Note DHCP only manages dynamic allocation of all addresses. Assigning device names with DHCP is not recommended.

BOOTP

BOOTP is similar to DHCP since it dynamically assigns an IP address to any BOOTP client that requests one. The difference is that the BOOTP server must be pre-configured for the autoloader by the system administrator. The system administrator assigns a permanent IP address to the autoloader's MAC address. When the autoloader is powered on, the BOOTP server responds and assigns the permanent address to the autoloader. The IP address never expires and cannot be used with any other BOOTP client. The MAC address is available from the autoloader front panel:

Information -> View Configuration -> Network Access

Management Programs

In addition to using your browser to manage your autoloader, you can also use popular management programs, such as HP OpenView, HP Top Tools, and CA Unicenter TNG. In order to best use HP OpenView and CA Unicenter TNG, you must download a plug-in from the HP Customer Care website at <http://www.hp.com/go/automated>. HP Top Tools has built-in native support for your autoloader, so no plug-in is required.

Supported Browser Configurations

Description	Supported Configurations
Browsers	Windows 95/98/2000/NT: Internet Explorer™ 4.01 and higher, Netscape Communicator™ 4.5 and higher, and Netscape Navigator™ 4.08 and higher. HP-UX: Netscape Communicator™ 4.5 and higher and Netscape Navigator™ 4.08 and higher. Internet Explorer™ is not supported. Sun Solaris: Netscape Communicator™ 4.5 and higher and Netscape Navigator™ 4.08 and higher. Internet Explorer™ and HotJava™ are not supported.

Note

To correctly set caching for Internet Explorer™, go to the Windows Control Panel and select **[Internet]**. Click on the **General** tab. In the Temporary Internet Files section, click on the **[Settings]** button. Select **[Every Visit to the Page]**, and click on the **[OK]** buttons to exit. (Netscape Communicator™ and Netscape Navigator™ set caching automatically.)

Installing the Remote Management Card (If Needed)

Caution

Use proper procedures to prevent electrostatic discharge (ESD). Use wrist-grounding straps and anti-static mats.

1. Ensure that the autoloader is powered off by disconnecting the power cord, and install the card by gently easing it into the empty card slot (see **Figure 21** on page 99). There is some resistance as the card connector engages with the connector on the autoloader.
2. Tighten the two thumbscrews by hand to secure it into place.
3. Power on the autoloader.

Configuring the Remote Management Card

1. Install one end of a Category 5 Ethernet cable into the network port of the remote management card. Ensure the other end is connected to an active network port.
2. On the autoloader's back panel, verify that the link LED on the remote management card is green (see **Table 12** on page 83 for more information on LEDs). Ensure the network port is active by checking with your system administrator.
3. Enter the **Network Access** menu.

Main Menu -> Administration -> Change Configuration -> Network Access

4. If you would like to use DHCP/BOOTP to configure your remote management card, select **[Yes]**.
 - A message will display to confirm your configuration through DHCP/BOOTP, or alert you if DHCP/BOOTP failed.
 - If successful, note the IP address, and skip to step 8.
 - If DHCP/BOOTP was not successful or if you do not want to use DHCP/BOOTP, contact your system administrator to obtain an IP address, subnet mask, and gateway address. Continue to the next step.

Note	The MAC address is unique to each remote management card and is used for identification. This address cannot be configured. To successfully use BOOTP from the autoloader, you must first configure the BOOTP server using the MAC address.
-------------	---

5. Enter the IP address.
 - Use the **[+]** key to change the number.
 - Use the **[->]** key to move to the next number.
 - Use the **[Down]** key to move to the next address.
6. Enter the subnet mask using the same procedure.
7. Enter the gateway address.
8. Press **[OK]** when complete to save the changes, or press **[Quit]** to exit the menu and not save the changes.

A message will display to confirm the changes you have entered or alert you if the changes have not been saved.
9. Enter the designated IP address into the web browser to launch the browser.

Example 1 - All modes (Manual configuration, DHCP, or BOOTP):

IP address = 15.28.33.12

http://15.28.33.12

Example 2 - Manual configuration and BOOTP only:

Device name = library1

http://library1

Your system administrator must add the device name you select to the Domain Name Server (DNS).

Note

Instructions and online help screens are available from the web-based library administrator pages by selecting the [?] button at the top right-hand corner of any page.

Removing the Remote Management Card

If the remote management card is removed for an extended period of time (approximately 8 days), then the autoloader will display a partial availability message. This message can be suppressed by changing the setting in the **Network Access** menu. You can navigate to this menu by selecting the following:

Main Menu -> Administration -> Change Configuration -> Network Access

Selecting the Operating Mode

Main Menu -> Administration -> Change Configuration -> Operating Mode

When you enter the **Operating Mode** menu, the front panel indicates the mode currently selected. To change the operating mode, select one of the following:

- **Stacker Mode:** Stacker mode allows you to use the autoloader like a standalone drive, without using special automation software and not being able to access the autoloader using host SCSI commands. The autoloader automatically unloads and loads tapes from the drive until it unloads the last tape. With this operating mode, you must also select:

Note You must power cycle the autoloader for **Stacker** mode to take effect.

- **Circular Mode On/Off:** If the Circular mode option has been selected, the autoloader will reload the first tape cartridge after unloading the last tape cartridge. If Circular mode is disabled and the last tape cartridge has been unloaded, the autoloader stops operating until the user loads additional tape cartridges.
- **Autoload On/Off:** If the Autoload option is selected, the first available tape loads into the drive at power up. When the host issues a SCSI **Unload** command to the drive, the autoloader automatically removes the tape cartridges from the drive and inserts the next available tape.

If the autoloader encounters a cleaning cartridge during the cycle, it will be loaded into the drive as normal, but will be automatically unloaded after the cleaning cycle.

- **Random Mode:** Random mode enables you to use the autoloader with automation software in the host computer. Tapes can only be loaded to the drive from the front panel, host SCSI commands, or the optional remote management card. The autoloader will not automatically load tapes as it would in Stacker mode.

- **Autodetect Mode (Factory Default):** In Autodetect mode, the autoloader starts in Stacker mode until it receives a SCSI **changer** command. The autoloader then runs in Random mode. The **changer** commands include the following:

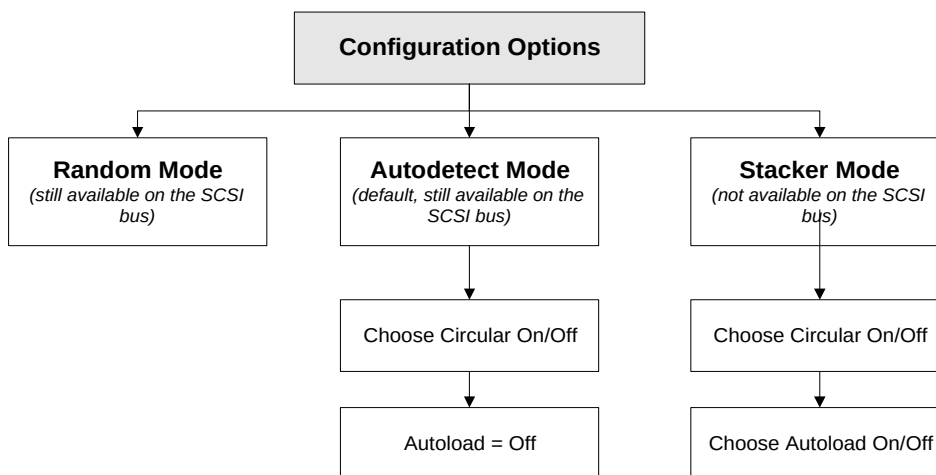
- INITIALIZE ELEMENT STATUS
- READ ELEMENT STATUS
- POSITION TO ELEMENT
- MOVE MEDIA
- EXCHANGE MEDIA

With this operating mode, you must also select **Circular Mode On/Off**. If the circular mode option is **ON**, the autoloader will reload the first tape cartridge after unloading the last tape cartridge. If circular mode is **OFF** and the last tape cartridge has been unloaded, the autoloader stops operating until the user loads additional tape cartridges.

Autoload will be set to OFF when in **Autodetect** mode.

Figure 19

Overview of Operating Modes



Setting SCSI IDs

Main Menu -> Administration -> Change Configuration -> SCSI IDs

Note All devices on the same SCSI bus must have their own unique SCSI ID.

Caution Changing SCSI ID settings from factory defaults may affect the backup software configuration. Consult your backup software manual for SCSI ID requirements.

Device	Default SCSI ID
Autoloader controller	0
Drive	1

1. Enter the **SCSI IDs** menu. A message warns you that devices with the same SCSI IDs must be connected to different SCSI buses. Select **[OK]**.
2. The Configure SCSI ID screen displays a message that indicates the device selected. Use the **[-]** or **[+]** key to select the drive or autoloader controller, then select **[OK]**.
3. The next screen displays the current SCSI ID. Use the **[-]** or **[+]** key to select the desired SCSI ID, then select **[OK]**.
4. Press **[Quit]** to exit and not save the changes.
5. A confirmation screen will indicate either a successful or failed operation. If the SCSI ID assignment failed, the screen will indicate the reason and then return to the Configure SCSI ID screen.

Note You can also change SCSI IDs using the optional RMC and HP Library & Tape Tools.

Setting the Date and Time

Main Menu -> Administration -> Set Date and Time

When the autoloader is initially set up, you must set the date and time. If the autoloader has been unplugged for an extended period of time and the autoloader displays a partial availability message, you must reset the date and time.

To set the date and time, enter the **Administration** menu. If you only want to view the date and time, enter the **Information** menu.

To set the date and time:

1. Enter the **Set Date & Time** menu.
2. Use the [-] or [+] keys to select the year, month, and day. Use the [->] to scroll to the next entry when complete.
3. Set the hour and minutes (00:00:00) using the [+] or [-] keys. Use the [->] key to scroll over to the next selection. The seconds are automatically set at 00.
4. Use the [+] or [-] keys to add or subtract hours for your time zone (see **Table 6** on page 64). UTC stands for Coordinated Universal Time.
5. Press **[OK]** to save your changes. Press **[Quit]** to exit this menu and not save your changes.

Note The time does not automatically adjust for time changes, like daylight savings time.

Table 6

World Time Zones

UTC -12	Eniwetok, Kwajalein
UTC -11	Midway Island, Samoa
UTC -10	Hawaii
UTC -9	Alaska
UTC -8	Pacific Time (US and Canada), Tijuana
UTC -7	Mountain Time (US and Canada), Arizona
UTC -6	Central Time (US and Canada), Saskatchewan, Mexico City, Tegucigalpa
UTC -5	Eastern Time (US and Canada), Bogota, Lima
UTC -4	Atlantic Time (Canada), Caracas, La Paz
UTC -3	Brasilia, Buenos Aires, Georgetown
UTC -2	Mid-Atlantic
UTC -1	Atlantic Ocean
UTC	Great Britain, Lisbon, Monrovia, Casablanca
UTC +1	Berlin, Stockholm, Rome, Bern, Brussels, Vienna, Paris, Madrid, Amsterdam, Prague, Warsaw, Budapest
UTC +2	Athens, Helsinki, Istanbul, Cairo, Eastern Europe, Harare, Pretoria, Israel
UTC +3	Baghdad, Kuwait, Nairobi, Riyadh, Moscow, St. Petersburg, Kazan, Volgograd
UTC +3:30	Tehran
UTC +4	Abu Dhabi, Muscat, Tbilisi
UTC +4:30	Kabul
UTC +5	Islamabad, Karachi, Ekaterinburg, Tashkent
UTC +5:30	Bombay, Calcutta, Madras, New Delhi, Colombo
UTC +6	Almaty, Dhaka
UTC +7	Bangkok, Jakarta, Hanoi
UTC +8	Beijing, Chongqing, Urumqi, Hong Kong, Perth, Singapore, Taipei
UTC +9	Tokyo, Osaka, Sapporo, Seoul, Yakutsk
UTC +9:30	Adelaide, Darwin
UTC +10	Brisbane, Melbourne, Sydney, Guam, Port Moresby, Vladivostok, Hobart
UTC +11	Magadan, Solomon Is., New Caledonia
UTC +12	Fiji, Kamchatka, Marshall Is., Auckland, Wellington

Retrieving Autoloader Information

The following information is available from the **Information** and **Administration** front panel menus, as well as from the remote management card:

- Autoloader information
- Drive information
- Configuration information
- Date and time
- Firmware revisions

Autoloader Information

Main Menu -> Information -> Loader Information

Use the following procedure to view information about the autoloader. **Table 7** on page 66 explains each option.

1. From the **Loader Information** menu, select one of the following options:
 - Loader Status
 - Hard Error Log
 - Recovered (Soft) Error Log
 - Odometer
 - Identity
2. Select **[Back]** to return to the **Loader Information** menu.

Table 7

Autoloader Information

Menu option	Information
Loader Status (see Partial Availability State on page 74)	Displays information about the overall status of the autoloader and any partial availability flags.
Hard Error Log (see Hard (Unrecoverable) Errors on page 77)	Displays a history of unrecoverable errors. Returns a message indicating that there are no hard errors or provides an error entry. Use the [Older] or [Newer] keys to select an entry.
Recovered (Soft) Error Log (see Soft (Recovered) Errors on page 72)	Displays a history of recovered errors. Returns a message indicating that there are no soft entries or supplies an error entry. Use the [Older] or [Newer] keys to select an entry.
Odometer	Displays the number of times tapes have been moved.
Identity	Displays the autoloader's serial number.

Drive Information

Main Menu -> Information -> Drive Information

Select one of the following options:

- **Event Log:** Displays significant events for the drive, including drive errors, online/offline transitions, and drive cleaning. This log is still available after removing the drive.
- **Odometer:** Displays a count of cumulative power-on hours, number of times tapes have been loaded into the drive, and power-on cycles.
- **Identity:** Displays the drive type, serial number, and firmware revision.

Configuration Information

Main Menu -> Information -> View Configuration

From the **View Configuration** menu, you can view current information about the following.

- Password enabled status
- Network access configuration
- Operating mode
- SCSI ID assignments
- Element (drive or slot) reservations
- Other configuration options (prevent media access, restore factory defaults, report recovered error logs, and diagnostic configurations for service only)

Date and Time

Main Menu -> Information -> Date and Time

Access this menu to view the autoloader's settings for the date, time, and time zone. Use the **[Powered]** key to display the date and time of the last power on.

Firmware Revisions

Main Menu -> Information -> Firmware Revisions

From the **Firmware Revisions** menu, you can view information about the following:

- Autoloader
- Tape drive

Understanding Errors and Troubleshooting

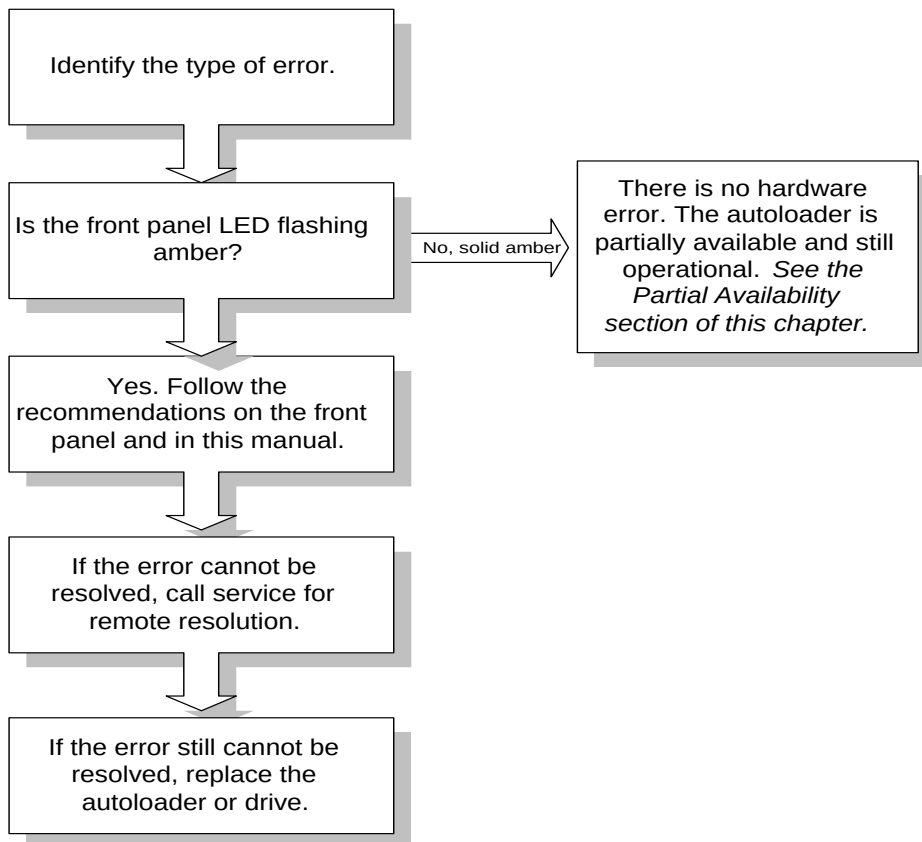
4

Chapter Overview

This chapter includes information on the following:

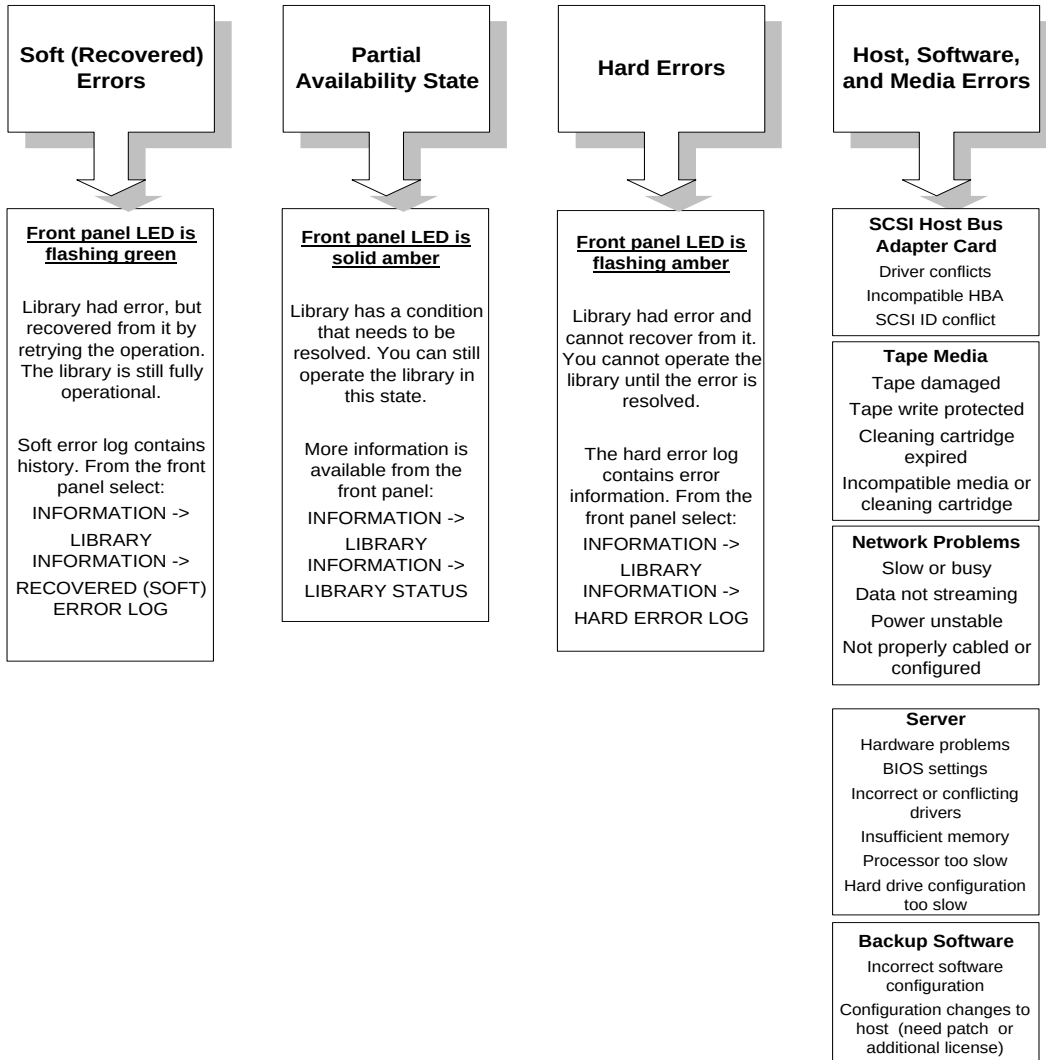
- **Understanding Error States** on page 72
- **Using LEDs to Diagnose Status** on page 80
- **Running Autoloader Diagnostics Tests** on page 85
- **Troubleshooting Common Problems** on page 89

Troubleshooting Overview



Understanding Types of Errors

There are several categories of errors that might occur when you are using your autoloader. Each error category has a different troubleshooting process, which is described in more detail later in this chapter.



Understanding Error States

This section describes the differences between the following types of errors:

- Soft (recovered) errors
- Partial availability: see **Partial Availability State** on page 74
- Hard (unrecoverable) errors: see **Hard (Unrecoverable) Errors** on page 77
- Host software and media errors: see **Host Software and Media Errors** on page 79

Soft (Recovered) Errors

Soft errors are hardware errors that the autoloader recovered from by retrying the operation.

Though soft errors are often transparent to a user, they are logged in the soft error log.

Main Menu -> Information -> Loader Information -> Soft (Recovered) Error Log
--

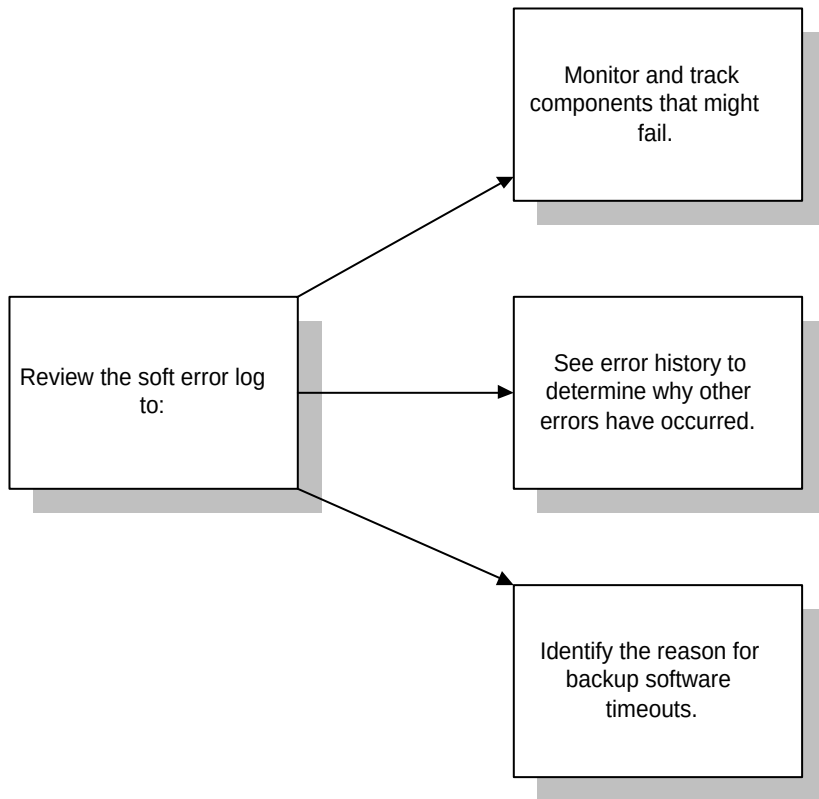
Periodically review the soft error log to monitor and track errors before they become serious. If you see that a component has many soft errors, it might indicate an autoloader component that is likely to fail. If the autoloader has a hard error (see **Hard (Unrecoverable) Errors** on page 77) and you are unsure what caused it, you can review the soft error log to help identify problem areas.

You can also use soft errors to identify the reason for backup software time-outs. The backup software on the host computer only allows a designated time for each operation. If the autoloader takes longer than the backup software allows, it may be due to the autoloader retrying a failed operation.

Note	The date and time stamp will help you identify errors.
-------------	--

Figure 20

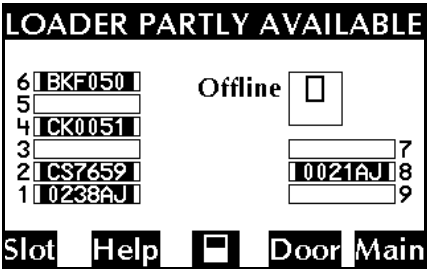
Using the Soft Error Log



Partial Availability State

When the autoloader is in the partial availability state, it is still functional, but has a condition that needs attention (see **Table 8** on page 75). *Partial availability does not necessarily indicate a hardware error.* With partial availability, the LED under the display is solid amber until you correct the problem.

A partial availability state from the default home screen will look similar to the following example. The front panel uses the term **Partly Available** because of display size limitations.



The middle icon button on the **Home** screen is a shortcut to the Loader Status menu and partial availability information.

To view more information about the partial availability error, you can also access the log by following this menu path:

Main Menu -> Information -> Loader Information -> Loader Status

The partial availability state is caused by one of the following errors:

Table 8

Partial Availability Conditions

Displayed Error Message	Causes	Recovery Suggestions
Drive not present	Autoloader could not detect the drive module.	Check that the drive is correctly installed and online.
Drive offline	Drive taken offline because of the following: — Taken offline from front panel. — Taken offline by host computer. — Failed power-on test. — Failed serial communication to autoloader. — Failed to load/unload tape.	1. Power cycle the autoloader. 2. Ensure that the drive is correctly installed and online. 3. Put drive back online from the front panel. 4. Check the error log from the front panel or remote management card.
Drive online pending	Drive is powered up, but has outdated firmware.	Download new drive firmware (see Upgrading Firmware on page 105).
Drive needs cleaning	Drive needs cleaning.	Clean the drive (see Cleaning a Drive on page 48).
Drive critical error	Critical error occurred on the drive.	Check the drive error logs (see Using LEDs to Diagnose Status on page 80).
Firmware update needed	Autoloader component has incompatible firmware with the rest of the autoloader.	Download new autoloader firmware (see Upgrading Firmware on page 105).
Incompatible magazine	The magazine is incompatible with the drive type.	Use the correct magazine for your autoloader's drive.
Fan failure	Fan has failed.	Power cycle the autoloader.
Magazine missing	Autoloader could not detect the magazine.	Ensure that the magazine is present and correctly installed.
Door open	Front door is open.	Close the door.

Table 8

Partial Availability Conditions

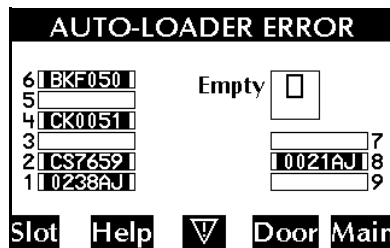
Displayed Error Message	Causes	Recovery Suggestions
Remote management card not present	Autoloader could not detect the remote management card.	Check that the remote management card is correctly installed.
Front panel not present	Autoloader could not detect the front panel display.	Power cycle the autoloader.
Remote management card failed	Remote management card failed power-up test.	Check that the remote management card is correctly installed.
Front panel failed	Front panel display failed power-up test.	Power cycle the autoloader.
Date and time not set	The date and time is not set on the front panel.	Set the date and time (see Setting the Date and Time on page 63).

Hard (Unrecoverable) Errors

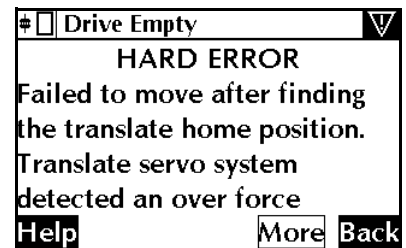
Note

The hard error codes are described on the front panel and in **Appendix B** of this manual.

When a hard error occurs, the front panel will display **Hard Error** and the LED bar will be flashing amber. The front panel will automatically display information about the error (as in the example below). You cannot operate the autoloader until this error is resolved.



Hard Error from Home Screen



Hard Error Message Example

Error information includes:

- Time stamp of error event
- Error code number
- Autoloader component that *potentially* caused the problem
- Error code description
- Recovery suggestions
- Error code qualifier that provides more information on the type of error
- Sequence numbers, which are used for factory diagnostics

View the hard error log to see the sequence of error events and more information on resolving the error condition. To view this log, access the following menu path or press the middle (shortcut) button:

Main Menu -> Information -> Loader Information -> Hard Error Log

Note When you are reviewing the error log, select **[Old]** to view error history and **[Newer]** to see more recent errors.

Note The date and time stamp will help you identify errors.

To retrieve more information about that error, follow these steps:

1. From the screen with the initial error message or from the **Hard Error Log** screen, select **[More]** to retrieve more information about that error.
2. Record all information from this screen for later reference.
3. Select **[More]**. Record the list of recommendations on this and any subsequent screens. *To retrieve the same information after you exit, view the latest entry in the hard error log.*

4. Perform the recovery recommendations in the order presented. Continue with each successive recommendation until the problem is isolated.

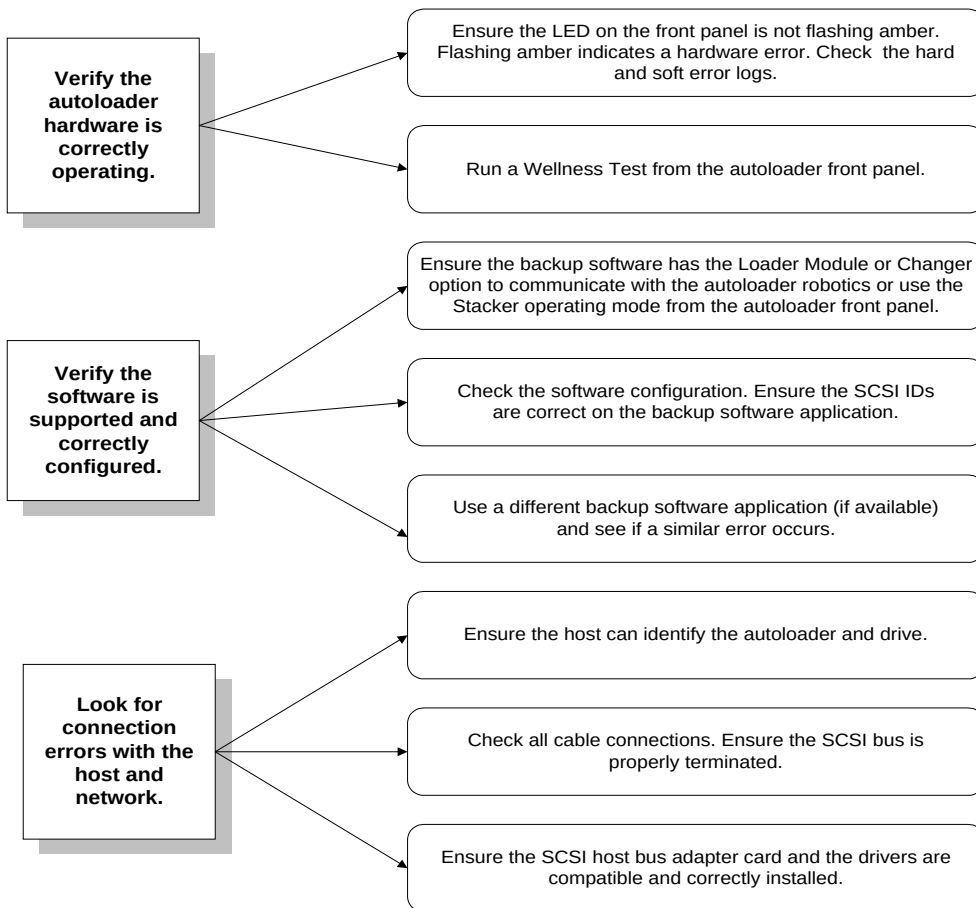
The front panel may display recovery recommendations like the following:

- Power cycle the autoloader.
 - Remove a tape from the drive.
 - Check the autoloader or host configuration.
 - Check the cable connections (data or power).
 - Run front panel diagnostic tests. Diagnostic tests are recommended to help identify and clear the error condition.
 - Reposition a tape or magazine.
 - Upgrade firmware.
5. If the problem persists after implementing all of the recommendations presented on the front panel display, contact your service representative (see **Appendix C**).

Host Software and Media Errors

The autoloader depends on several other components to operate correctly. Many errors that appear to be caused by the autoloader are often a result of errors on the host, the network, or with the backup software.

When troubleshooting the autoloader, you want to begin ruling out these other components. Here are some troubleshooting procedures to help determine if an error is caused by the autoloader hardware, host, or backup software.



Using LEDs to Diagnose Status

This section includes information on the following:

- Using LEDs to determine status (see **Using LEDs to Diagnose Status** on page 80).

LEDs communicate status and errors as they are occurring. Use the following LEDs for more information on how the autoloader is functioning.

- Front panel
- High voltage (HVDS) controller card
- Low voltage (LVDS) controller card
- Remote management card
- Drive module

Table 9 Front Panel LEDs

Color Description	Description
Green	The autoloader is ready.
Flashing Green	The autoloader is active and in the process of performing a function.
Solid Amber	The autoloader is partially available (the autoloader is not fully functional, but can still be used).
Flashing Amber	A hard error has occurred. You cannot operate the autoloader until you resolve the error.

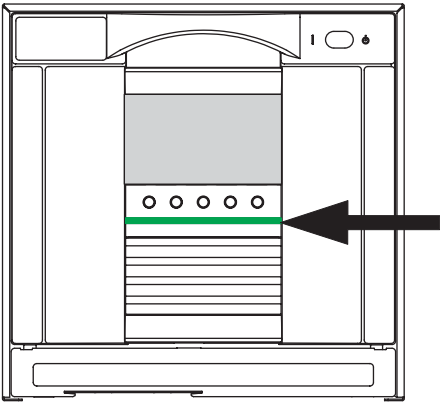


Table 10

HVDS Library Controller Card LED

1) Controller LED	
Color	Description
Flashing Green	Controller needs boot code.
Yellow	In the process of powering up.
Yellow (n) flashes Pause Yellow (n) flashes	Controller failed power-on test. n = 1; ROM error n = 3; microprocessor error n = 4; controlled RAM error n = 5; non-volatile RAM error n = 6; volatile RAM error
Green	Controller passed power-on test.
2) SCSI LED	
Color	Description
Yellow	Incorrect SCSI bus type. Single-ended, low-voltage SCSI device, or low voltage terminator attached.

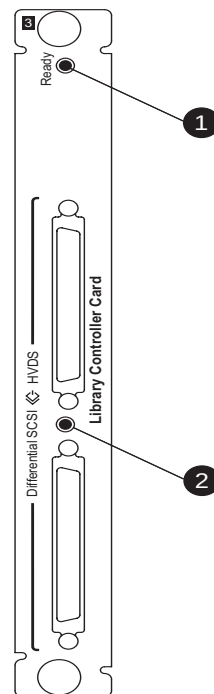


Table 11

LVDS Library Controller Card LED

1) Controller LED	
Color	Description
Flashing Green	Controller needs boot code.
Yellow	In the process of powering up.
Yellow (n) flashes pause Yellow (n) flashes	Controller failed power-on test. n = 1; ROM error n = 3; microprocessor error n = 4; controlled RAM error n = 5; non-volatile RAM error n = 6; volatile RAM error
Green	Controller passed power-on test.
2) SCSI LED	
Color	Description
Green	No bus connected or low voltage differential SCSI bus connected.
Flashing Green	Single-ended SCSI bus attached. SCSI performance may be reduced. SCSI cable length restrictions apply. See SCSI Cable Specifications on page 116.
Yellow	High voltage differential SCSI bus connected. Incorrect SCSI bus type.

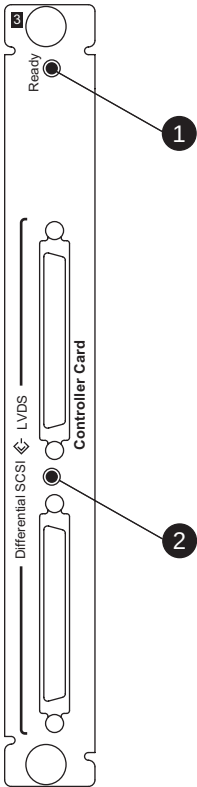


Table 12 Remote Management Card LEDs

1) Activity LED	
Color	Description
Flashing Green	Indicates transmission activity by the card's Ethernet port.
2) Link LED	
Color	Description
Flashing Green	Indicates valid network connection.
3) Ready LED	
Color	Description
Yellow	Powering up, failed power-on test, or fatal error was detected during operation.
Green	Card passed power-on test. Card ready.

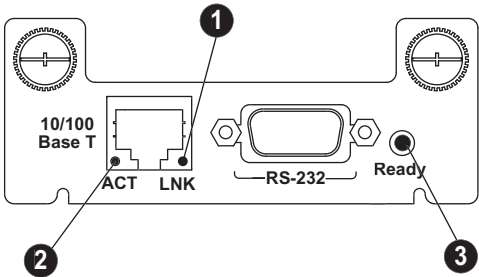
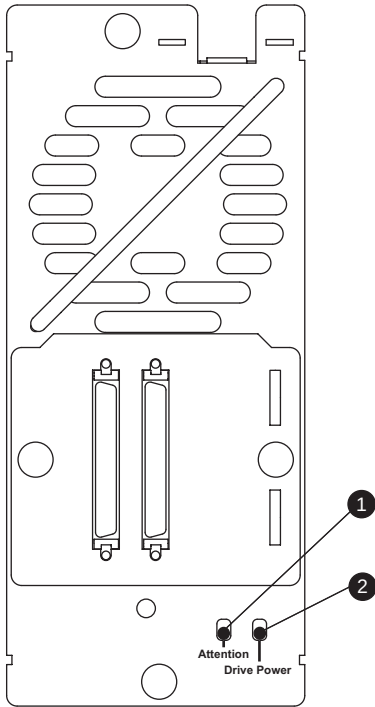


Table 13

Drive Module LEDs

1) Yellow	2) Green	Description
Off	On	Drive is online and available.
Flashing	Off	Drive is offline and may be replaced without powering of the autoloader.
On	Flashing	Drive is being brought online.
Flashing	On	Drive is offline. Internal communication to the controller has been lost.
On	On	Drive module controller is in reset.
On	Off	Power-on test in progress.

**Note**

Depending on your autoloader's drive type, the back of the drive module might look different from the illustration above.

Running Autoloader Diagnostics Tests

Main Menu -> Administration -> Run Test

Use the following procedure to run internal tests of autoloader functions. **Table 14** describes these tests.

1. From **Administration**, select **[More]** to display additional administrative options. Select the **Run Test** menu.
2. From **Run Test**, use the **[-]** or **[+]** key to view available tests.
3. Select **[OK]** to select the test.
4. Select the number of times this test will run (if more than one cycle is available and desired).
5. Select **[Run]** to start the test cycle. The test results will display at the conclusion of the test cycle.

Note Select **[Stop]** to abort a running test. The current test cycle completes and the test stops. Stopping the test may take a few minutes.

Table 14 Front Panel Diagnostic Tests

Test	Description
Check Inventory	Physically scans the entire autoloader to determine the location, status, and barcode information of tapes.
Recalibrate Loader	Performs the power-up self-tests. Each test runs one time per test loop. This test recalibrates the mechanics and clears hard errors, but not the hard error log.
Test Lateral Motion	Moves the transport assembly to a random slot. No tape is required.
Test Magazine Moves	Moves a tape from a random slot to an empty, random slot, and then returns it to the original location.

Table 14

Front Panel Diagnostic Tests

Test	Description
Wellness Test	Moves a tape from a random slot to an empty drive and back to its original location.
Rewind Media	Caution Do not run this test if the drive contains a tape that is receiving data from the host. Rewinds the tape in the drive.
Lock Transport	Locks the transport assembly in place to allow for shipping the autoloader. Note To unlock the transport after you run this test, run the Unlock Transport test or power cycle the autoloader.
Unlock Transport	Unlocks the transport assembly if you want to unlock the transport without power cycling the autoloader. The transport must have already been locked to use this test.
Test Transport Comm	Exercises the internal infrared communications path between the autoloader controller and the transport micro-controller. Reports the health of this link. If the test passes, the infra-red communication link is good.
Show All Sensors	Dynamically displays the state of the door sensor. To toggle the door sensor, open and close the door.
Demonstration	Caution Run an inventory check from the host backup application after performing this test since the tapes will be in a different order. Selects a random full storage slot and moves the tape to the drive. The test locates a full slot, a full drive, an empty slot, and then performs an exchange.
Additional Tests Available for Service Personnel	
Empty Drive *	Unloads a tape from the drive and returns it to its original location.
Fill Transport *	Caution Unload the tape from the transport, and run an inventory check from the backup software after performing this test. Moves a tape from a random storage slot into the transport.

Table 14**Front Panel Diagnostic Tests**

Test	Description
Empty Transport *	Caution Run an inventory check from the backup software after performing this test. Moves the tape in the transport back to the original slot, or a different slot if the original position is full. The test passes if the transport is successfully emptied.
Clear Soft Log *	Clears all historical data from the Soft Error (recoverable error) Log.
Clear Hard Log *	Clears all historical data from the Hard Error (unrecoverable error) Log. This test clears any Hard Error indicators on the front panel.
Find Plunge Home *	Moves the transport plunge mechanism to the back of the transport assembly.
Find Lateral Home *	Moves the transport to the extreme front right side of the autoloader and then locates slot 2.
Test Lateral Encoder *	Moves the transport to the extreme front right side of the autoloader and then to the extreme back right to check the distance and verify the mechanics are moving consistently.

* Indicates additional tests available for service personnel.

Using Diagnostic Support Tools

The following tools are available for the autoloader:

- HP Library & Tape Tools
- Front panel diagnostic tools
- Support Tools Manager (HP-UX only)

HP Library & Tape Tools

With HP Library & Tape Tools installed on your host computer, you can do the following:

- Identify all SCSI and Fibre Channel devices connected to your system
- View detailed configuration, identification, inventory, and drive information for the autoloader
- Easily update autoloader and drive firmware (see **Using HP Library & Tape Tools** on page 107)
- Run advanced diagnostic tests, including connectivity, read/write, media validation, and testing the functionality of the autoloader
- View autoloader and drive error logs
- Generate a detailed support file that can be emailed or faxed to your support representative for analysis

The HP Library & Tape Tools diagnostic provides an intuitive graphical user interface with integrated context-sensitive help. It can be downloaded free of charge from <http://www.hp.com/support/TapeTools>.

Troubleshooting Common Problems

Table 15 describes how to troubleshoot autoloader problems. For problems that may be related to the host or application software, refer to the host system documentation, the application software instructions, or **Host Software and Media Errors** on page 79.

Caution Consult the system administrator before cycling power. Never cycle power when active devices are connected to the SCSI bus. Cycling power when the SCSI bus is active can cause data loss or hang the host system.

Table 15 Troubleshooting Table

Problem	Recovery Suggestions
Power	
Autoloader will not power on.	■ Check the power cord connection. ■ Make sure the power (standby) switch is on. ■ Make sure there is power to the outlet. Try another working outlet. ■ Replace the power cord. ■ Check that the LEDs on the back of the autoloader are on and the fans are turning to ensure the autoloader is receiving power.
Power-on test failed. An error message appears in the front panel display.	■ Verify that all tapes are fully inserted in the magazine and that the magazine is fully installed inside the autoloader. ■ Check that the internal packaging has been removed. ■ Make sure the door is closed. ■ If the power-on test fails again, look at the error code and refer to Autoloader Error Codes on page 119 for more information.
The autoloader's power failed while a tape was in the drive and did not return to the ready state after the power came on.	■ Check that the LEDs on the back of the autoloader are on and the fans are turning. ■ Power cycle the autoloader.

Table 15

Troubleshooting Table

Problem	Recovery Suggestions
No display messages appear.	■ Make sure the power cord is connected to an active outlet. ■ Make sure the power switch is on. ■ Check that the LEDs on the back of the autoloader are on and the fans are turning. ■ Power cycle the unit.
Tape Movement	
An error message appears after inserting the magazine or loading tapes.	■ Verify that tapes are inserted correctly in the magazine. (See Accessing Tapes in the Autoloader on page 44.) ■ Verify that the correct tape type is used.
Tape stuck in drive.	■ Power cycle the unit and retry unloading the tape from the autoloader front panel. ■ Ensure the backup host software is not reserving the slot. The backup software needs to cancel the reservation. ■ Refer to the <i>HP Tape Library and Autoloader Drive Manual</i> at http://www.hp.com/support for a detailed procedure describing how to remove a stuck tape.
Tape stuck in transport.	■ Run the Recalibrate Loader test (see Tape drive on page 67). ■ Open the door. Remove the magazine, and gently ease the tape out of the transport. Do not grasp the back of the transport assembly. ■ Call your service representative.
Tape stuck in back storage slot.	■ Using the front panel display, open the door. Pull the door down, and remove the magazine. ■ Push the tape into the back slot until it clicks into the slot. Push the tape in again until it clicks and releases.

Table 15

Troubleshooting Table

Problem	Recovery Suggestions
Transport will not load/unload a tape.	■ Run the Recalibrate Loader test (see Tape drive on page 67). ■ Ensure you are using the correct tape type and magazine for your autoloader drive configuration. Refer to the <i>HP Tape Library and Autoloader Drive Manual</i> at http://www.hp.com/support for more information. ■ Call your service representative.
Media	
Tapes or cleaning cartridge incompatible with drive.	■ Ensure you are using media and a cleaning cartridge that is compatible with the drive. Refer to the <i>HP Tape Library and Autoloader Drive Manual</i> at http://www.hp.com/support for more information on media and drive compatibility.
Connections	
Host does not detect the autoloader.	■ Check that the autoloader is terminated and properly cabled. ■ Ensure the terminator and host bus adapter card are compatible with the autoloader and SCSI bus type (HVDS or LVDS). ■ Check that the autoloader is recognized by the operating system. ■ Check that the SCSI host bus adapter card and backup software are compatible with the autoloader. ■ Check that the device is properly installed and configured using the HP Library & Tape Tools utility available at http://www.hp.com/support/TapeTools.
Backup software application on the host does not detect the autoloader.	■ If the backup software detects the drive, but not the autoloader, check that the Autoloader Module or Changer Option is included with the backup software. Most software packages require an additional module to communicate with the autoloader robotics. ■ If the backup software detects the autoloader and not the drive, check that you have installed the correct backup software driver and that there are no conflicting drivers installed.

Table 15

Troubleshooting Table

Problem	Recovery Suggestions
Changed drive SCSI ID, but the new ID is not recognized by the host computer.	■ Check that all SCSI devices on the same bus have different ID numbers. ■ Reboot the host. ■ If the drive remains at SCSI ID 5, regardless of how it is set, then the drive is not communicating with the autoloader. Call your service representative.
Network Monitoring and Operations	
The Web-Based Library Administrator interface is slow in updating the web pages or does not display clearly.	■ Check your computer's display settings. For best results, make sure the display resolution is set to 800 x 600 and the color palette is set to 65535 colors or higher. ■ To speed up the display of pages, be sure to by-pass proxies for local access by listing the domains to exclude in the Connections/Advanced page of the browser options. ■ Check your browser's caching options. Ensure the browser is looking for newer versions of the stored pages under Internet Options / General / Temporary Internet Files.
Cannot navigate through the Web-Based Library Administrator interface.	■ Do not use the [Back] and [Forward] buttons on the browser to navigate. Instead, use the tabs and buttons on the actual interface page.

Table 15

Troubleshooting Table

Problem	Recovery Suggestions
Autoloader Performance	
HP-UX hosts respond slowly or crashes after connecting to the autoloader.	■ Check the SCSI IDs of all devices on the host to ensure there are no conflicts. ■ Check that the backup software does not require SCSI IDs to be in a certain order.
The autoloader is not efficiently backing up data.	■ Check that the autoloader drive is on its own SCSI bus and not daisy chained to another tape drive or the hard drive. ■ Ensure that the drive is clean. See Cleaning a Drive on page 48 for information on cleaning the drive. ■ Try a new tape. A marginal tape can cause performance problems because bad spots on the tape will require retries. ■ Ensure that the backup software is using fixed-length records (or blocks) to maximize throughput and has not defaulted to a smaller record size. ■ Check the compression ratios, file size, and network bandwidth from the host computer.
Operations	
Cannot remember the administration menu password.	■ Call your service representative.
Need to abort internal test cycle.	■ Press [STOP]. The current test loop completes, then the test stops. This may take a few minutes to stop the current test loop.

Table 15

Troubleshooting Table

Problem	Recovery Suggestions
Cannot write to the tape.	■ Check the host device file system access permissions. ■ Verify that you are using the correct tape type. ■ Check the write-protect tab on the tape to ensure write-enabled status. ■ Check the Media Event Log for the drive. ■ Try a new tape. ■ Ensure that the backup software does not have the write protect setting activated.
Cleaning	
Recurring cleaning message.	■ Replace the existing cleaning tape with a new tape. ■ Verify the tape is readable by: ■ Clearing the error message. ■ Reading the tape again. ■ If the data tape can be read, back up data from the damaged tape to another tape, and discard the damaged one.
A brand new tape is used and a drive cleaning icon is displayed.	■ Clean the drive using the drive cleaning procedure in Cleaning a Drive on page 48. ■ If the icon is displayed again within a short amount of time, replace the data tape.
Cannot load the cleaning cartridge.	■ Ensure you are using the correct cleaning cartridge for the drive type. Refer to the <i>HP Tape Library and Autoloader Drive Manual</i> at http://www.hp.com/support for more information.

Table 15

Troubleshooting Table

Problem	Recovery Suggestions
Firmware	
Cannot download firmware through the optional remote management card. Notes: This process is for qualified service personnel only. The download will take several minutes to complete. Do not abort the download while it is in process. The hash marks will indicate the download status, except the first 40 seconds when no status can be indicated. If the FTP download fails, the FTP client almost always reports "Error in Input File." This message is inherit with the FTP protocol and not the file itself. Try the <i>put</i> command again.	■ Check that the host or host software has not reserved the autoloader over SCSI. ■ Use the HP Library & Tape Tools utility to download firmware to the autoloader. See Using HP Library & Tape Tools on page 107. ■ Use the FTP procedure to download firmware. — Close the browser interface. — Power cycle the autoloader, and wait for it to complete the power-on self test. — At the DOS prompt, type: <i>ftp [your card's IP address]</i> — At the user prompt, type: <i>download</i> — At the password prompt, enter the administration password (the same password used for the autoloader). — At the ftp prompt, type: <i>bin</i> — At the ftp prompt, type: <i>hash</i> (hash marks will indicate the ftp download status) — At the ftp prompt, type: <i>put [firmware file path name] /firmware/chunker</i> — When the download is complete and the prompt returns, type: <i>bye</i> — The library will reboot itself using the newly downloaded firmware. This process will take a few minutes.

Removing and Replacing Parts

5

Chapter Overview

This chapter includes the following sections:

- **Removing and Replacing the Remote Management Card** on page 98
- **Removing and Replacing Drive Modules** on page 100s
- **Upgrading Firmware** on page 105
- **Moving or Shipping the Autoloader** on page 110

Removing and Replacing the Remote Management Card

Caution This autoloader contains very sensitive electronic components. It is important to prevent electrostatic discharge (ESD). Use wrist grounding straps and anti-static mats when removing and replacing cards and internal assemblies.

Removing the Remote Management Card

1. Ensure that the autoloader is powered off by disconnecting the power cord.
2. From the back of the autoloader, remove the Category 5 Ethernet cable from the network port of the remote management card.
3. Loosen the two thumbscrews at the top of the card with a screwdriver (see **Figure 21** on page 99).
4. Remove the card by gently pulling it straight out from the autoloader.

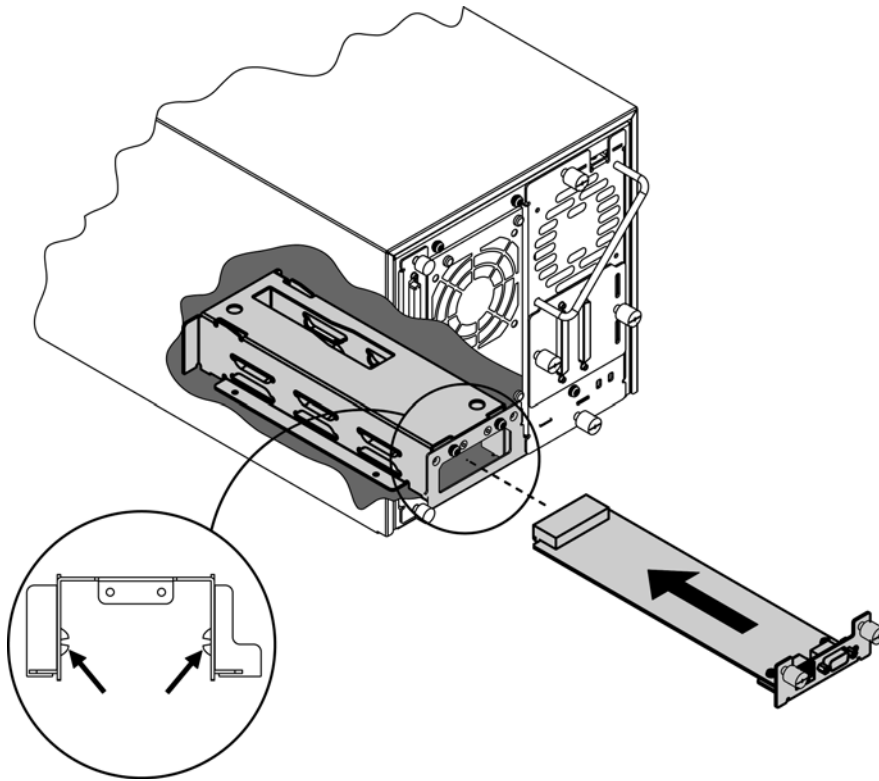
Replacing the Remote Management Card

1. Ensure that the autoloader is powered off by disconnecting the power cord.
2. Align the sides of the card with the recessed guide tracks inside the autoloader. The card fits between the top and bottom tracks (see **Figure 21** on page 99).
3. Gently slide the card in, ensuring that it remains aligned with the recessed guide tracks. There is some resistance as the card connector engages with the connector on the autoloader.
4. Tighten the thumbscrews on the card to secure it to the autoloader.
5. Power on the autoloader.

6. Download new firmware if the partial availability error appears. The front panel will display **Firmware Update Needed**. See **Upgrading Firmware** on page 105 for more information.
7. Check the remote management card configuration from the autoloader front panel. See **Configuring the Remote Management Card** on page 57.

Figure 21

Removing and Replacing a Remote Management Card



Removing and Replacing Drive Modules

This section explains how to replace a drive module in the following situations:

- The autoloader is powered off.
- The autoloader is powered on.

If the autoloader needs to remain powered on when you are replacing the drive, you need to check that the backup software supports this feature.

Unloading a Tape from a Drive

Before replacing a drive, unload any tape from the drive. From the **Drive and Tape Operations** menu, select **[Unload Tape from Drive]** to move the tape from the drive module to the original slot where the tape was located. The tape is automatically rewound before it is unloaded.

Taking a Drive Offline

If you want to replace the drive while the autoloader is powered on, you must take it offline. If the autoloader does not need to be powered on to replace the drive, proceed to **Removing the Drive Module** on page 101.

Note	Only take the drive offline if the host backup software supports online drive repair.
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To take the drive offline when the autoloader is powered on:

1. Verify the drive module's status by checking the LEDs on the back of the drive module (see **Using LEDs to Diagnose Status** on page 80).
2. If the drive module is not already offline, go to the **Administration** and then **Online Drive Repair** menus.
3. Select **[Put drive offline]**. The front panel indicates the success or failure of this operation.

Removing the Drive Module

Note

To preserve SCSI communications, do not loosen or remove the SCSI cable(s) connected to the outside of the drive module. *The connection to be removed is located inside the drive module.*

When the drive module has been successfully taken offline, the LED on the back of the drive will be flashing yellow. Remove the drive module using the steps below:

1. Verify the external SCSI cable(s) are tightened to the connector plate.
2. Using a screwdriver, loosen the thumbscrews on each side of the connector plate, located in the middle of the drive module (see **Figure 22** on page 101).
3. Gently remove the connector plate with SCSI cable(s) still connected.

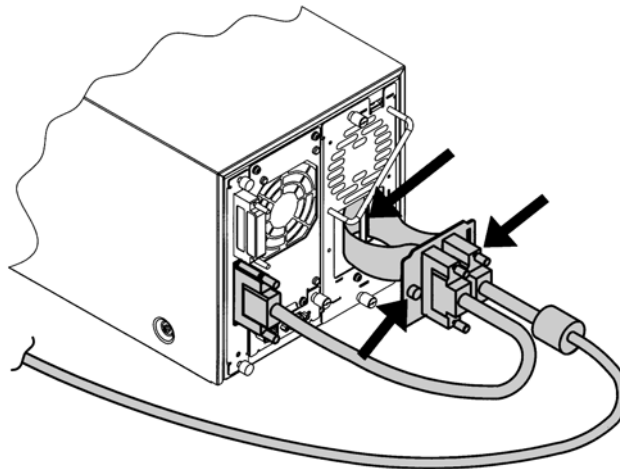
Caution

Use standard precautions for electro-static discharge (ESD) protection.

4. Grasp the ribbon cable that is plugged into the drive module. Remove the cable by pulling the connector to the left. See **Figure 22** on page 101 for the location of the ribbon cable and connector.

Figure 22

Ribbon Cable and Connector



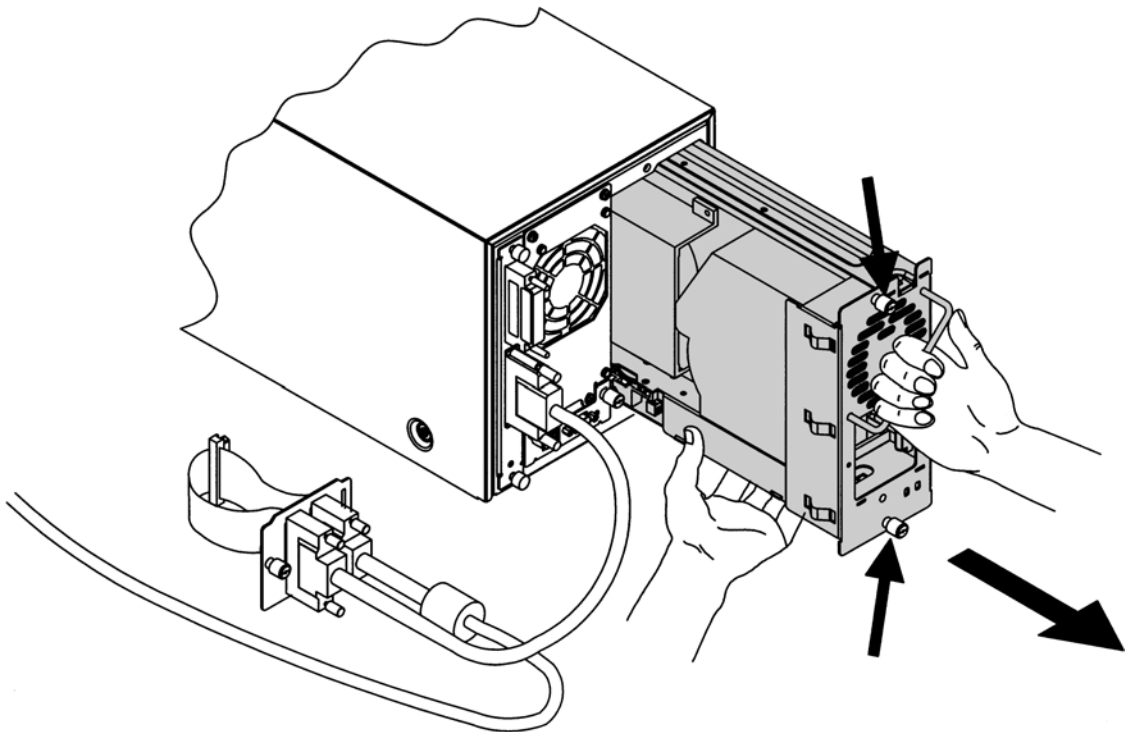
5. Lay the connector assembly to the side, allowing the external cables to hang from the connector. Do not disconnect external cables from the connector plate.
6. Loosen the top and bottom thumbscrews on the drive module (see **Figure 23** on page 102).

Caution As the drive module is pulled out, support the bottom of the drive module to avoid dropping or damaging it.

7. Using the handle that is mounted on the back of the drive module, pull the drive module straight out with one hand while supporting the bottom of the drive module with the other hand.

Figure 23

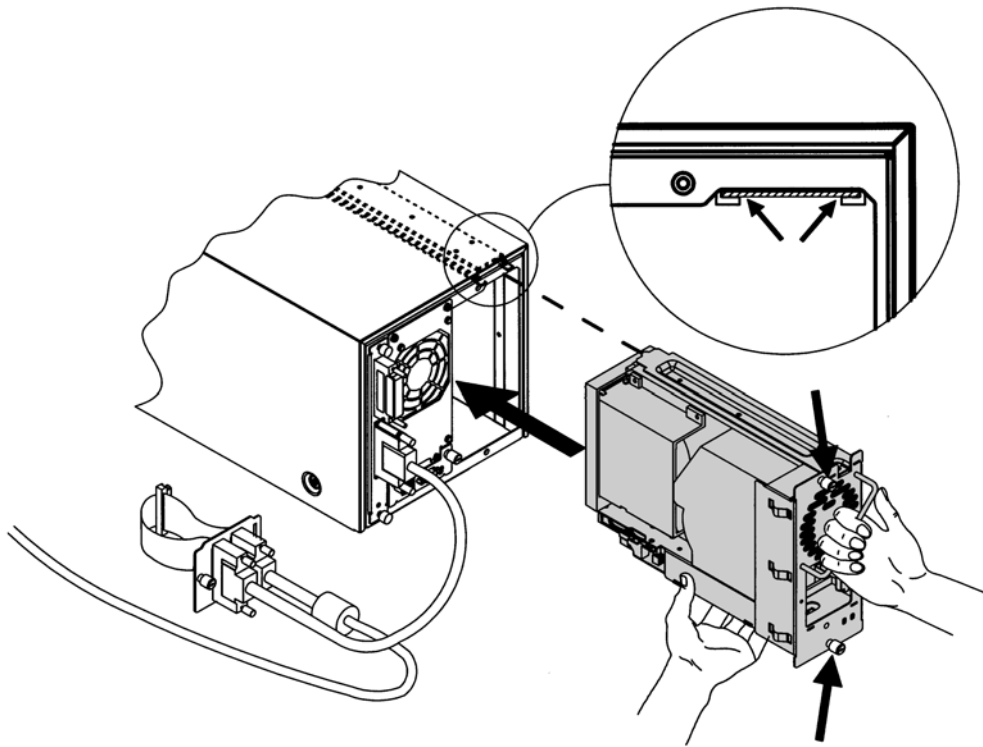
Removing a Drive



Installing a Drive Module

1. Hold the drive module with one hand on the drive module handle while the other hand supports the drive (see **Figure 24**).
2. Install the drive by inserting the rail at the top of the drive module into the slot at the top of the drive module opening. There is some resistance as the drive connector engages with the connector on the autoloader.

Figure 24 Installing a Drive Module



3. Using a screwdriver, tighten the top and bottom thumbscrews, securing the drive module into the autoloader.
4. Plug the ribbon connector into the back of the drive module (see **Figure 22** on page 101).
5. Gently fold the ribbon cable (attached to the plate and SCSI cable) into the back of the drive module.
6. Holding the connector plate in place, tighten the thumbscrews.

Bringing the Drive Online

1. To bring the new drive online, enter the Administration then the Online Drive Repair menus.
2. Select **[Put drive online]** to bring the drive back online.
The autoloader will automatically run a self-test when the drive has been brought online.

Note

You may need to use the host backup software to recognize the new drive when bringing it online. If the software does not have the capability to automatically detect the new drive, you may need to reboot the host.

Upgrading Firmware

This section details the processes for upgrading autoloader and drive firmware. Some of the processes used for upgrading autoloader firmware are different from those used to upgrade drive firmware.

Firmware can be downloaded by:

- Using the remote management card (*autoloader only*)
- Using HP Library & Tape Tools (*autoloader and drive*)
- Using a CE diagnostic tool
- Using a firmware upgrade tape (*drive only*)

Checking the Firmware Revision

Before downloading new firmware, check your current firmware revisions, and compare them to the latest available revisions at <http://www.hp.com/go/support>.

Note If the autoloader is in a partial availability state (solid amber LED) due to a firmware mismatch, download new firmware.

1. Ensure the autoloader is powered on.
2. Use the following menu from the front panel:

Main Menu -> Information -> Firmware Revisions

You can also check your current firmware revisions from the remote management card:

1. Enter the designated IP address into the web browser to launch the Web-Based Library Administrator pages.
2. Select the **[Report]** tab.
3. Scroll down to the **Firmware Revisions** section of the page to view your autoloader and drive firmware revisions.

Note Ensure that your backup software does not “SCSI reserve” the autoloader, as this can prevent a firmware download.

Using the Remote Management Card *(Autoloader Firmware Only)*

All autoloader components, except drives, can be easily downloaded from the remote management card.

Note The firmware file is available from HP Support at <http://www.hp.com/go/support>. These files must be loaded on the local host computer before downloading firmware. First select your product, and then select **Downloads & Drivers**.

1. Once the autoloader is configured for network access, enter the IP address within your web browser to launch the web-based library administrator pages. (See **Configuring the Remote Management Card** on page 57.)
2. Select the **[Configuration]** tab from the main screen.
3. Select the **[Firmware Download]**.
4. Enter the full pathname for the download file, or use the **[Browse]** button to locate the file.

Note The autoloader administrator password is required for this process. If the password is not set, you will not be permitted to download firmware.

5. Select **[Start Firmware Download]** to begin downloading the autoloader firmware.

Once the download process begins, the progress and status of the download will display on the lower half of your screen.

Note The firmware download may take several minutes to complete.

Using HP Library & Tape Tools

You can download autoloader and drive firmware using the HP Library & Tape Tools diagnostic utility. This utility may already be installed on your host. If not, you can download it from <http://www.hp.com/support/TapeTools>.

Online help and instructions are included with the HP Library & Tape Tools utility. However, the firmware download procedure involves these simple steps:

1. Run the HP Library & Tape Tools utility.
2. Select the firmware revisions for the autoloader and drive that you would like to firmware to be download to, and then select **[Download]**. The firmware file(s) will be copied into the firmware folder of the HP Library & Tape Tools utility.
3. Select the autoloader in the By Product device list.
4. Select the **[Firmware]** tool. The latest revisions available for the autoloader and drive will automatically be selected.
5. Select **[Start Update]** to update the firmware for the autoloader and/or drive.

Using CE Diagnostic Tools (For Service Personnel)

You can use HP Library & Tape Tools or third-party service tools to update autoloader and drive firmware from a laptop computer.

When using a narrow single-ended SCSI host adapter in the laptop, additional equipment will typically be needed:

- A 50-pin to 68-pin adapter cable (ideally with high-byte termination). If using the standard Adaptec PCMCIA to HD 50-pin male cable, the adapter cable will need a HD 50-pin female end.
- A single-ended/HVD SCSI converter box (if the autoloader/drive is HVDS).

- A single-ended SCSI terminator (if the autoloader/drive is LVDS).

Note An LVDS terminator cannot be used when connecting to a single-ended Adaptec PCMCIA card.

- An HVD SCSI terminator (if the autoloader/drive is HVDS).

The general procedure for using a CE diagnostic tool is as follows:

1. If necessary, install the diagnostic tool and firmware files onto the laptop.
2. Ensure that the autoloader is not being accessed by the host system.
3. Ensure that the autoloader is powered off.
4. Disconnect the device from the host system, noting the cabling and termination.
5. Connect the laptop SCSI interface to the device, using the appropriate equipment and appropriate termination at the device end.
6. Power on the autoloader. Wait for the autoloader to complete the power-on test and inventory check.
7. This step is for upgrading drive firmware only. If upgrading autoloader firmware, continue to step 8.

Ensure that the drive is online (green LED is on, and yellow LED is off). If not, place it online through the front panel.

- Enter the Service then the Online Drive Repair menus.
- Select **[Put Drive Online]**.

The autoloader will automatically run a self-test when the drive has been brought online. Wait until the self-test completes, and then scan the SCSI bus or restart the diagnostics program.

8. Download the firmware to the devices using the diagnostic tool.

Note If the autoloader is in a partial availability state (solid amber LED) due to a firmware mismatch, download new firmware.

9. Power off the autoloader.

Note When downloading drive firmware, you must power cycle the autoloader for the download to be completed.

10. Disconnect the laptop and reconnect to the host system. Be sure to match the original cabling and termination setup.
11. Power on the autoloader and verify the device can be accessed from the host.

Using a Firmware Upgrade Tape (*Drive Firmware Only*)

1. Call your service representative to get the drive upgrade tape.
2. Ensure the drive is empty.
3. If a tape is in the drive, use the front panel display to return the tape to a storage slot. See **Unloading a Tape from the Drive** on page 47.
4. Load the firmware upgrade tape into an empty slot on the autoloader. Note the slot number. See **Accessing Tapes in the Autoloader** on page 44.
5. Use the following menu to perform the firmware upgrade:

Main Menu -> Administration -> Upgrade Drive Firmware
--

6. From the **Upgrade Drive Firmware** menu, use the [-] or [+] key to select the slot containing the firmware upgrade tape. Select **[OK]**.
7. Watch the upgrade status on the autoloader's front panel. The tape will return to the original storage slot when the procedure is complete.
8. Remove the firmware upgrade tape from the autoloader.
9. Power cycle the autoloader.

Moving or Shipping the Autoloader

To move or ship the autoloader:

1. Verify that the drive is empty.
2. If the drive contains a tape, unload it. Refer to the backup software documentation, or use the front panel menu (see **Unloading a Tape from the Drive** on page 47).
3. Remove all tapes from the autoloader.
4. When shipping, lock the transport by running the Lock Transport front panel test to prevent damage (see **Tape drive** on page 67).

Caution	Do not power off the autoloader until the interface is inactive. Removing power from a SCSI peripheral when the bus is active can result in data loss and/or indeterminate bus states. If your computer is connected to a LAN, be sure to check with your system administrator before powering off.
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5. Power off the autoloader. The power standby switch is recessed to avoid accidental power cycles. Disconnect the power cable.
6. To ship the autoloader, remove all external cords, cables, and terminators. For an internal move, only disconnect the power cable, remote management card cable, and SCSI cable to the host.

Note	You do not need to remove the SCSI cable that connects the controller to the drive module unless the autoloader is being shipped.
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7. For autoloaders mounted in a rack:
 - a. Extend the rack's anti-tip foot.

WARNING Lower the rack's leveler feet, and extend the rack's anti-tip device. Failure to extend the anti-tip device could result in personal injury or damage to the tape autoloader if the rack tips over.

- b. Loosen the screws that secure the autoloader into place (see **Figure 8** on page 27). The screws are located in front of the trim bracket and filler panel.
 - c. Using two people or an appropriately rated mechanical lift, remove the autoloader from the rack tray by sliding it out and supporting it from the bottom.
8. Re-install the internal packaging to secure the magazine inside the autoloader (see **Removing Internal Packaging** on page 17).
9. Place the autoloader into the original packaging box. If you no longer have the original packaging, contact your service representative to purchase the packaging kit.

Technical Specifications



Environmental Specifications

Characteristic	Specification
Temperature/Humidity	
Operating	10° to 35° C
Non-operating	-35° to 60° C
Operating wet-bulb temperature (media)	25° C maximum
Non-operating wet-bulb temperature (drive)	46° C maximum
Gradient	10° C per hour
Transportation	-30 to 60° C (<14 consecutive days)
Humidity	
Operating	20% to 80% RH non-condensing
Non-operating	10% to 90% RH non-condensing
Shock	
Operating	4.0 g 11 ms (half-sine)
Non-operating	30 g/206 inches/second trapezoidal
Vibration (5-500 Hz)	
Operating	0.21g RMS (random)
Non-operating	2.1g RMS (random)

Characteristic	Specification
Operating	0.25g (0-peak, swept-sine)
Non-operating	0.5g (0-peak, swept-sine)
Non-operating	Half-sine 65 inches/second operating axis 48 ips (remaining faces)

Autoloader Specifications

Description	Specification
Average tape access time	15 seconds
Average tape exchange time (mean time to eject tape from drive, robotically exchange tape from magazine and reload drive)	35 seconds
Storage capacity	360 GB (native)
MTBF	100,000 hours (robotics only) 50,000 hours (including drives)
Mean Swap Between Failure (MSBF)	1,000,000 swaps (robotics)
Line voltage	100-127/200-240 VAC
Line frequency	50-60 HZ
Power consumption	Typical: 100W, Max: 120W

Physical Specifications

Description	Library
Standalone specifications: ■ Height ■ Width ■ Depth	■ 23 cm (9 inches) ■ 24.3 cm (9.5 inches) ■ 60 cm (27 inches)
Rackmount specifications: ■ Height ■ Width ■ Depth	■ 21.5 cm (8.5 inches) ■ 22.1 cm (8.7 inches) ■ 60 cm (27 inches)
Weight (net)	23 kg (50 lbs)
Weight (packaged)	24.5 kg (54 lbs)
Interface	■ Drive or controller; LVDS or HVDS ■ Remote management card: 10/100 BaseT

SCSI Cable Specifications

	Fast SCSI	Normal/Slow SCSI
	10 MB/second Narrow 20 MB/second Wide	5 MB/second Narrow 10 MB/second Wide
Single-Ended	3 meters	6 meters
Low Voltage Differential	12 meters	12 meters
High Voltage Differential	25 meters	25 meters

Note Ensure all cables conform to the ANSI SCSI specifications.

Drive, Media, and Barcode Specifications

Refer to the *HP Tape Library and Autoloader Drive Manual* at <http://www.hp.com/support> for specifications for your autoloader and drive configuration.

Error Code and Qualifier Reference Table



Autoloader Error Codes

Table 4 lists the hard error codes and suggestions for recovery. Use the recovery instructions from the front panel display or the table below to help troubleshoot the autoloader. If unsuccessful, contact your service representative.

Table 4 Error Codes and Recovery Procedures

Front Panel Decimal Error	Hex Error	Description	Recovery Method
0	00H	Error code not set.	■ Power cycle the autoloader. ■ Observe the LEDs on the back of the autoloader controller card and then review the LED strategy in Using LEDs to Diagnose Status on page 80.
1-8	01H - 08H	Failed autoloader controller self test.	01h through 08h are controller tests. These errors are possible only on power-up. ■ Power cycle the autoloader. ■ Observe the LEDs on the back of the autoloader controller card and then review the LED strategy in Using LEDs to Diagnose Status on page 80.

Table 4 Error Codes and Recovery Procedures

Front Panel Decimal Error	Hex Error	Description	Recovery Method
9	09H	Failed translate motor test.	Cannot translate the transport. ■ Check for a possible obstruction in the transport pathway and remove it. ■ If the transport moves a little, but cannot fully rotate around the assembly, a faulty motor is indicated.
11	0BH	Failed plunge motor test.	Power cycle.
12	0CH	Failed to find the translate home position.	■ Make sure that all tape cartridges are fully seated in their slots. ■ Upgrade autoloader firmware.
14	0EH	Transport failed to find the plunge home position.	■ Check for tape stuck in drive. ■ Power cycle.
15	0FH	Has wrong autoloader firmware.	Download new firmware.
18	12H	Failed because front door is open.	Close the front door.
21	15H	Chassis fan is disconnected or faulty.	Check the chassis fan cable connection.
23	17H	The front panel cable is disconnected or faulty.	Check the front panel cable connections.
24	18H	Transport bar code reader failed self test.	Power cycle the autoloader.
27	1BH	Controller unable to communicate with the transport controller.	Run the Recalibrate Loader diagnostic test.

Table 4 Error Codes and Recovery Procedures

Front Panel Decimal Error	Hex Error	Description	Recovery Method
28	1CH	Failed because transport controller needs firmware.	Update the autoloader's firmware.
29	1DH	Failed transport firmware download.	Retry downloading firmware.
50	32H	Test not run, an invalid test number was specified.	If incorrect test number was designated when initiating a test over the SCSI interface, select desired number and then re-initiate the test.
51	33H	Test not run, the tape locations are invalid.	■ The autoloader needs at least one tape and an empty slot to perform this test. ■ Power cycle, and run the Recalibrate Loader diagnostic test again.
52	34H	Test not run, an inventory check is needed.	■ Run the Inventory Check test. ■ Update the backup software to show the correct tape and slot configuration.
53	35H	Failed to complete the diagnostic test, refer to previous error.	■ Power cycle. ■ Check the error log.
54	36H	Test not run, some elements are reserved.	Check the backup software documentation to disable the reserved condition on the host.
56	38H	Test not run, the cartridge locations are invalid.	■ The autoloader needs at least one tape and an empty slot to perform this test. For a drive test, it cannot rewind the media. ■ Power cycle, and run the Recalibrate Loader diagnostic test again.
57	39H	Test not run, need more cartridges in the autoloader.	Load one additional tape into the autoloader.

Table 4 Error Codes and Recovery Procedures

Front Panel Decimal Error	Hex Error	Description	Recovery Method
58	3AH	Test not run, the transport contains a cartridge.	Run the Empty Transport test.
59	3BH	Failed to load a cartridge into a magazine slot.	■ Ensure there are no obstructions in the magazine and transport. ■ Run the Recalibrate Loader diagnostic test.
60	3CH	Failed to unload a cartridge from a magazine slot.	■ Ensure there are no obstructions in the magazine and transport. ■ Power cycle.
61	3DH	Failed inventory check on a magazine slot.	■ Note the error code qualifier to help determine appropriate testing (see Common Error Code Qualifiers on page 127). ■ Check magazine back slot for debris or marks. Clean if necessary.
62	3EH	Failed to load a cartridge into a drive.	■ Ensure there are no obstructions in the drive and transport. ■ Power cycle.
63	3FH	Failed to unload a cartridge from a drive.	■ Ensure there are no obstructions in the drive and transport. ■ Power cycle.
64	40H	Failed inventory check on a drive.	Power cycle the autoloader.
65	41H	Failed while checking for a cartridge in the transport.	Power cycle the autoloader.

Table 4 Error Codes and Recovery Procedures

Front Panel Decimal Error	Hex Error	Description	Recovery Method
66	42H	Transport stuck at the home position.	■ Ensure there are no obstructions in the magazine and transport. ■ Run the Recalibrate Loader diagnostic test.
69	45H	Transport unable to move to the end of the track.	Run the Recalibrate Loader diagnostic test.
70	46H	Failed inventory check, transport contains a cartridge.	Run the Recalibrate Loader diagnostic test.
72	48H	Unable to put a tape back into a slot after a power cycle.	Note the error code qualifier to help determine appropriate testing (see Common Error Code Qualifiers on page 127).
74	4AH	Failed because drive module is not connected or has failed.	■ Ensure that the drive module is fully inserted in the drive slot. ■ Note the LEDs on the drive modules. Then review the LED strategy in Using LEDs to Diagnose Status on page 80. If the LED indicates failure, replace the drive module.
75	4BH	Failed to detect drive fans.	Note the error code qualifier to help determine appropriate testing (see Common Error Code Qualifiers on page 127).
76	4CH	Failed to perform an inventory check.	Power cycle the autoloader.
80	50H	Drive tested reports hardware error on power-up.	■ Power cycle the autoloader and re-try. ■ Replace the drive module if unsuccessful.
81	51H	Autoloader failed during initialization.	Power cycle the autoloader.

Table 4 Error Codes and Recovery Procedures

Front Panel Decimal Error	Hex Error	Description	Recovery Method
82	52H	Autoloader connected to an incorrect external SCSI connection.	■ Check the cable configuration. ■ Ensure the cable supports your autoloader configuration (LVDS, HVDS, or single ended).
89	59H	Cleaning cartridge has expired.	Replace cleaning cartridge.
90	5AH	Not a cleaning cartridge.	Replace tape with an approved cleaning cartridge.
100	64H	Controller unable to communicate with the drive module.	Power cycle the autoloader.
101	65H	Drive module unable to communicate with the drive.	Power cycle the autoloader.
102	66H	I2C command drive time-out.	Command time-out to the drive. Retry the command.
103	67H	The drive module controller has failed.	■ Power cycle the autoloader and re-try. ■ Replace the drive module if unsuccessful.
104	68H	Failed drive module initialization.	Power cycle the autoloader.
105	69H	I2C command drive time-out.	■ Check the controller LEDs on the back of the autoloader (Using LEDs to Diagnose Status on page 80). ■ Power cycle the autoloader.
130	82H	Failed communication from autoloader controller to remote management card.	■ Ensure the remote management card is correctly installed. ■ Power cycle the autoloader.

Table 4 Error Codes and Recovery Procedures

Front Panel Decimal Error	Hex Error	Description	Recovery Method
131	83H	Failed to detect the remote management card.	■ Ensure the remote management card is correctly installed. ■ Power cycle the autoloader.
132	84H	I2C command remote management time-out.	Command time-out to the drive. Retry the command.
133	85H	Failed remote management card.	Power cycle the autoloader.
140	8CH	I2C command front panel send did not complete.	Retry the last operation.
141	8DH	I2C front panel board missing.	Check the front panel and front panel cable connections.
142	8EH	I2C command front panel board time-out.	Command time-out to the drive. Retry the command.
143	8FH	I2C command front panel board failed.	The controller has failed.
150-155	96H - 9BH	Failed transport controller self test.	Note the error code qualifier to help determine appropriate testing (see Common Error Code Qualifiers on page 127).
157	9DH	Failed to detect transport plunge motor cable.	Note the error code qualifier to help determine appropriate testing (see Common Error Code Qualifiers on page 127).
158	9EH	Failed to detect transport translate motor cable.	Note the error code qualifier to help determine appropriate testing (see Common Error Code Qualifiers on page 127).

Table 4 Error Codes and Recovery Procedures

Front Panel Decimal Error	Hex Error	Description	Recovery Method
159	9FH	Transport barcode reader cable is missing or faulty.	Note the error code qualifier to help determine appropriate testing (see Common Error Code Qualifiers on page 127).
160	A0H	Failed to detect transport illuminator cable.	Note the error code qualifier to help determine appropriate testing (see Common Error Code Qualifiers on page 127).

Common Error Code Qualifiers

Table 5 Error Code Qualifiers

Decimal Error	Hex Error	Description	Recovery Procedure
0	00H	Qualifier code is unknown.	Check the error code (see Autoloader Error Codes on page 119).
10	0AH	Plunge motion system detected an over voltage.	■ Check the error code. ■ Clear the transport path.
11	0BH	Plunge motion system detected an over force.	■ Power the unit down. ■ Clear the transport path. ■ Power the unit back on.
12	0CH	Plunge motion system detected an error.	■ Power cycle. ■ Clear the transport path.
13	0DH	Plunge motion system timed out.	Power cycle.
16	10H	Plunge control system detected an unknown error.	■ Update firmware. ■ Power cycle.
19	13H	Translate motion system detected an unknown error.	■ Check the error code. ■ Clear the transport path.
20	14H	Translate motion system detected an over voltage.	Clear the transport path.
21	15H	Translate motion system detected an over force.	■ Power the unit down. ■ Clear the transport path.
22	16H	Translate motion system detected an error.	■ Power cycle. ■ Clear the transport path.
25	19H	Plunge control system failed to detect a hardstop.	■ Check that drive is fully installed and screws are finger tight. ■ Power cycle.

Table 5 Error Code Qualifiers

Decimal Error	Hex Error	Description	Recovery Procedure
26	1AH	Translate motion system failed to detect a hardstop or the edge of the frame.	■ Run Recalibrate Loader test. ■ Run Test Lateral Encoder test.
28	1CH	Plunge control system not initialized.	■ Update firmware. ■ Run Recalibrate Library test.
29	1DH	The translate motion system attempted a move when it wasn't ready.	■ Update firmware. ■ Run Recalibrate Library test.
33	21H	Failed to detect a cartridge in the drive.	■ Run Recalibrate Loader test, followed by Check Inventory test. ■ Power cycle.
36	24H	Drive module failed to eject a tape.	■ Take the drive offline and back online. ■ Power cycle.
37	25H	Failed to detect the drive hardstop while loading a tape.	■ Make sure the drive is fully inserted and screws are finger tight. ■ Run Recalibrate Loader test, followed by Check Inventory test. ■ Power cycle.
38	26H	Plunge system went too far while unloading a tape.	■ Make sure the drive is fully inserted and screws are finger tight. ■ Run Recalibrate Loader test, followed by Check Inventory test. ■ Power cycle.

Table 5 Error Code Qualifiers

Decimal Error	Hex Error	Description	Recovery Procedure
42	2AH	Drive module is missing or not communicating.	Check that the drive is installed and online.
44	2CH	Failed to detect a magazine calibration target.	Replace magazine.
46	2FH	Drive module fan is not working properly.	■ Remove and reinstall the drive. ■ Power cycle.
47	2FH	Drive module fan is not working properly.	■ Check for obstructions in the drive fan. ■ Try bringing the drive back online. ■ Replace the drive.
48	30H	Failed to detect that the transport has loaded a tape.	Run Test Lateral Loader test, Recalibrate Loader test, followed by Check Inventory .
50	32H	Failed to detect the magazine hardstop while loading a tape.	■ Run Recalibrate Loader test, followed by Check Inventory test. ■ Power cycle.
54	36H	Failed to detect the magazine hardstop while removing a tape.	■ Run Recalibrate Loader test, followed by Check Inventory test. ■ Power cycle.
56	38H	Failed to empty the transport during an inventory check.	■ Ensure there is a vacant slot. ■ Run Recalibrate Loader test, followed by Check Inventory test.

Table 5 Error Code Qualifiers

Decimal Error	Hex Error	Description	Recovery Procedure
60	3CH	Internal communication on the I2C bus has failed.	■ Run Recalibrate Loader test, followed by Check Inventory test. ■ Power cycle.
83	53H	Failed during a diagnostic test.	■ Run Recalibrate Loader test, followed by Check Inventory test. ■ Run diagnostic test again.
86	56H	Timed out on a command sent to the transport controller.	■ Update firmware. ■ Run 100 loops of Full Sweep test. ■ Verify that the transport LEDs are on and green.
87	57H	A command to the transport controller was corrupted.	Power cycle.
88	58H	Attempted to overlap commands to the transport controller.	■ Run Recalibrate Loader test. ■ Clear the transport path. ■ Power cycle.
89	59H	Transport controller was reset.	■ Update firmware. ■ Run 100 loops of Full Sweep test. ■ Verify that the transport LEDs are on and green.
91	5BH	Infra-red transmission error from the transport controller.	Power cycle.

Table 5 Error Code Qualifiers

Decimal Error	Hex Error	Description	Recovery Procedure
92	5CH	Transport controller timed out while executing a command.	■ Verify that the transport LEDs are on and green. ■ Clear any obstructions from the transport path.
93	5DH	General infra-red communication error.	■ Verify that the transport LEDs are on and green. ■ Clear any obstructions from the transport path.
94	5EH	Failed to establish infra-red communication with transport.	■ Verify that the transport LEDs are on and green. ■ Clear any obstructions from the transport path.
95	5FH	Transport controller needs firmware downloaded.	Download new autoloader firmware.
96	60H	Bad infra-red data transfer transmission.	■ Verify that the transport LEDs are on and green. ■ Clear any obstructions from the transport path.
97	61H	Drive hardware - error detected during drive power up.	Replace the drive.
98	62H	Drives failed to return good, power fail.	Power cycle.
99	63H	Transport is in an unknown state.	■ Update firmware. ■ Power cycle.
100	64H	Transport cannot traverse entire translate path.	Clear any obstructions from the transport path.
101	65H	Drive rejected the load of a tape.	Retry loading tape. If unsuccessful, copy data from tape and replace it.

Table 5 Error Code Qualifiers

Decimal Error	Hex Error	Description	Recovery Procedure
102	66H	Command sent to drive timed out.	■ Check SCSI cables. ■ Check drive installation.
103	67H	Drive controller module hardware failed.	Replace drive.
104	68H	Drive controller module is busy.	■ Update firmware. ■ Retry command.
105	69H	Drive communications error.	■ Update firmware. ■ Retry command.
106	6AH	Command sent to drive failed.	Power cycle or use online drive repair to take the drive offline and then online to reset it.
107	6BH	Drive command is in progress.	■ Update firmware. ■ Power cycle.
108	6CH	Command sent to drive controller module timed out.	■ Update firmware. ■ Power cycle.
109	6DH	Drive controller module is single sourced.	Power cycle.
110	6EH	Status of the drive controller module is unknown.	Power cycle.
111	6FH	Drive controller module is missing from I2C bus.	Power cycle or use online drive repair to take the drive offline and then online to reset it.
112	70H	Drive controller module reported bad status.	Power cycle or use online drive repair to take the drive offline and then online to reset it.

Table 5 Error Code Qualifiers

Decimal Error	Hex Error	Description	Recovery Procedure
113	71H	Drive sensor does not report handle open.	Power cycle or use online drive repair to take the drive offline and then online to reset it.
114	72H	Drive handle open sensor set when handle closed.	Power cycle or use online drive repair to take the drive offline and then online to reset it.
115	73H	Drive sensor does not report handle closed.	Power cycle or use online drive repair to take the drive offline and then online to reset it.
116	74H	Drive handle close sensor set when handle closed.	Power cycle or use online drive repair to take the drive offline and then online to reset it.
117	75H	Drive not ready for command.	Power cycle or use online drive repair to take the drive offline and then online to reset it.
118	76H	Drive detected faulty media.	Replace the tape.
119	77H	Multiple IR checksum errors in transport communication.	Power cycle.
120	78H	DLT only. Drive may have broken tape or dropped leader.	Call service.
121	79H	DLT only. Drive failed to respond to unload request.	■ Attempt a front panel unload. ■ If unsuccessful, attempt a front panel emergency unload.
123	7BH	Drive module status good. No error.	A transient error occurred. Autoloader has recovered. Power cycle or recalibrate autoloader.
124	7CH	Failed to open or close drive handle.	Power cycle.

Customer Support



Registering Your Product

Registering your product ensures fast and easy access to Hewlett-Packard Customer Support. There are three ways to register.

- On our web site:
<http://www.hp.com/support>
- By fax:
U.S. 1-877-840-3638 (Toll Free)
International 970-350-5121

HP customers who register on our web site join a select group to receive:

- Special Hewlett-Packard offers
- Direct information on:
 - Ideas and ways to use your new HP SureStore Tape Autoloader
 - Other exciting HP products
 - News on emerging technologies

Support Contracts

Support contracts are available within 90 days of your purchase to upgrade your warranty. There are several ways to purchase support contracts.

- Contact the Reseller who sold your product.
- In the US, call 1-800-743-8305 to order by phone.
- Mail the support contract registration card included with your product.

Hewlett-Packard Customer Support

If your autoloader fails during the warranty period and the suggestions in the documentation do not solve the problem, you can receive support by doing the following:

- E-mail a support ticket to HP Support using the HP Library & Tape Tools (see [Using HP Library & Tape Tools](#) on page 32).
- Access HP Support on the World Wide Web at:
<http://www.hp.com/go/support>
- Contact your authorized HP dealer or Authorized Service Provider
- Call the HP Customer Care Center in your region

If you purchased a support contract through HP or an authorized reseller, make sure that you register immediately. Failure to register may result in slower response time. Registering allows the local repair office to prepare for the proper response level needed. If your autoloader fails while under the support contract period, contact the appropriate support number included with your contract.

If your autoloader fails after the warranty period, contact your authorized HP dealer/distributor or the nearest HP sales and service office. Customers in the US and Europe can use a credit card for phone assistance. For details, see [Telephone Support After HP Warranty](#) on page 139.

Information Needed for Hewlett-Packard Support

Before calling, please have the following information ready:

- Model number of your autoloader
- Serial number
- Brand and model of your host computer
- Brand and model of your SCSI host adapter
- Autoloader drivers and backup application software that you are using and the version number(s)
- Error codes and error code qualifiers
- Firmware revision number for autoloader

Telephone Support During HP Warranty

To obtain technical assistance, call the support representative nearest you.

North and South America

Argentina	(541) 778 8380
Brazil	(011) 829 6612
Canada	905-206-4663
Chile	800 360 999
Mexico	800 427 6684
United States	(970) 635-1500; Monday - Friday, 7 am - 5pm Mountain Time
Venezuela	800 47 888 (Caracas 207 8488)

European Customer Support Centers

Monday - Friday, 8:30 - 18:00 (C.E.T)

Note	Language support might not be available for all products.
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Austria	+ 43 (0) 7114 201080
Belgium, Dutch	+ 32 (0) 2 626 8806
Belgium, French	+ 32 (0) 2 626 8807
Denmark	+ 45 39 29 4099
English International	+ 44 (0) 171 512 52 02
Finland	+ 358 (0) 203 47 288
France	+ 33 (0) 1 43 62 34 34
Germany	+49 (0) 180 52 58 143
Ireland	+ 353 (0) 1 662 5525
Israel	+ 972 (0) 9 9524848
Italy	+ 39 02 264 10350
Netherlands	+ 31 (0) 20 606 8751
Norway	+ 47 22 11 6299

Portugal	+ 351 (0)1 318 00 65
Spain	+ 34 902 321 123
Sweden	+ 46 (0) 8 619 2170
Switzerland	+ 41 (0) 848 80 11 11
Turkey	+ 90 212 224 59 25
United Kingdom	+ 44 (0) 171 512 52 02

Asia Pacific Customer Support Centers

Australia	+ 61 3 8877 8000
China	+ 86 (0) 10 6564 5959
Hong Kong	800 96 7729
India	+ 91 11 682 6035
Indonesia	+ 62 21 350 3408
Japan	+ 81 3 3335 8333
Korea	+ 82 2 3270 0700
Outside Seoul	080 999 0700
Malaysia	+ 60 3 295 2566
New Zealand	+ 64 9 356 6640
Penang	1 300 88 00 28
Philippines	+ 63 2 867 3551
Singapore	+ 65 272 5300
Taiwan	+ 886 2 717 0055
Thailand	+ 66 2 661 4000
Vietnam	+ 84 (0) 8 823 4530

Elsewhere

Contact your authorized HP dealer/distributor or the nearest HP sales and service office.

Telephone Support After HP Warranty

US and Canada

Call one of the following:

- (800) 810-0130: Per incident fee of \$25.00 will be charged to your VISA or MasterCard.
- (900) 555-1800: \$2.50 per minute with a maximum of \$25.00 will be charged to your phone number.

Europe

Call the appropriate number listed under [European Customer Support Centers](#) on page 137. A per incident fee will be charged for after-warranty support. Please have a credit card, PO number, or billing number address ready.

Elsewhere

Contact your authorized HP dealer/distributor or the nearest HP sales and service office for after-warranty support.

HP Reseller Locator Numbers

US (800) 752-0900

Canada (800) 387-3867

Mexico and South America (305) 267-4220

ISV Software Support

While the autoloader itself is supported by Hewlett-Packard, all software products are supported by individual software vendors. When contacting the software vendor for support, you will need the following information:

- Your name and telephone number
- Product name, release number, operating system, build, and serial number
- Detailed list of error messages reported
- Configuration files and log files related to the problem
- Screen dumps, if applicable
- Explanation of how to reproduce the problem, if possible
- Events that may have contributed to the problem, including the following:
 - Recent operator actions
 - Recent events in the software or the system
 - Recent changes to the computer system, software, or network environment

Safety and Regulatory Information



Declaration of Conformity

Declaration of Conformity

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name:

Hewlett-Packard Co.

Manufacturer's Address:

NSSO/AS-PEC (Greeley)
700 71st Avenue
Greeley, CO. 80634 USA

declares, that the product

Product Name:

HP Surestore Tape Autoloader 1/9

Model Numbers:

N2724NAZ product family including associated Cxxxxxy and Axxxxxy models
Where x is any numeric character and y is any alpha character, 3600109, 24P2390

Product Options:

All Options

conforms to the following Product Specifications:

Safety:

IEC 60950:1991+A1+A2+A3+A4 / EN 60950:1992+A1+A2+A3+A4+A11
IEC 60825-1:1993+A1 / EN 60825-1:1994+A11 Laser/LED Class 1

EMC:

CISPR 22: 1997 / EN 55022: 1998 Class A (Emitted RF fields)
CISPR 24: 1997 / EN 55024: 1998 (Immunity to existing fields)
IEC 61000-4-2: 1995 / EN 61000-4-2: 1995+A14 (4 kV CD, 8 kV AD)
IEC 61000-4-3: 1994 / EN 61000-4-3: 1995 (3 v/m)
IEC 61000-4-4: 1988 / EN 61000-4-4: 1998 (1 kV Peak Power Lines/0.5 kV Signal Lines)
IEC 61000-4-5: 1995 / EN 61000-4-5: 1998 (Surge immunity)
IEC 61000-4-6: 1996 / EN 61000-4-6: 1998 (Conducted RF immunity)
IEC 61000-4-8: 1993 / EN 61000-4-8: 1998 (Powerline magnetic immunity)
IEC 61000-4-11: 1994 / EN61000-4-11: 1998 (voltage dips, interruptions, and variations)
IEC 61000-3-2: 1995 / EN 61000-3-2: 1995 (Harmonics)
IEC 61000-3-3: 1994 / EN 61000-3-3: 1995 (Flicker)

Supplementary Information:

The product herewith complies with the requirements of the following Directives and carries the CE marking accordingly:
the EMC Directive 89/336/EEC -the Low Voltage Directive 73/23/EEC (including 93/68/EEC)

The Manufacturer listed above declares that this product has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of CFR 47. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. There is no guarantee that interference will not occur in a particular installation.

Change or modification of this equipment not expressly approved by Hewlett-Packard could void the user's authority to operate this equipment. Only use the cables, connectors, power cords, and accessories supplied with this equipment or expressly approved by Hewlett-Packard.

NSSO/AS-PEC (Greeley) April, 2001 Greeley, Colorado, USA

For Regulatory Compliance Information ONLY, contact:

Australian: Product Regulations Manager, Hewlett-Packard, Australia Ltd., 31-41 Joseph Street, Blackburn, Victoria 3130, Australia

European: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department TRE, Herrenberger Strasse 130, D-71304 Boblingen (FAX: +49-7031-14 3143)

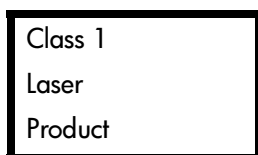
USA: Product Regulations Manager, Hewlett-Packard Company, 700 71st Avenue, Greeley, CO 80634 USA, (Phone: 970-350-5600).

Regulatory Information

United Kingdom Telecommunications Act 1984

The digital linear tape libraries are approved under Approval Number NS/G/1234/J/100003 for indirect connection to Public Telecommunication Systems within the United Kingdom.

Laser Warning



The LED Barcode Reader is classified as an AEL class 1 laser product. In accordance to EN60825-1 (+A11) safety of laser products.

WARNING Use of controls, adjustments, or performing procedures, other than those specified in this manual may result in hazardous laser radiation exposure.

Herstellerbescheinigung

Diese Information steht im Zusammenhang mit den Anforderungen der Maschinenlärn information sverordnung vom 18 Januar 1991.

Schalldruckpegel $L_p < 70 \text{ dB(A)}$

am arbeitsplatz

normaler betrieb

nach ISO 7779: 1988/EN 27779:1991 (Typprüfung)

English Translation of German Sound Emission Directive

This statement is provided to comply with the requirements of the German Sound Emission Directive, from 18 January 1991.

Sound pressure $L_p < 70 \text{ dB(A)}$

at operator position

normal operation

according to ISO 7779: 1988/EN 27779: 1991 (type test)

Japanese VCCI Class B Statement

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると受信障害を引き起こすことがあります。
取り扱い説明書に従って正しい取り扱いをして下さい。

English Translation

This equipment is in the Class B category information technology equipment based on the rules of Voluntary Control Council For Interference by Information Technology Equipment (VCCI). Although aimed for residential area operation, radio interference may be caused when used near a radio or TV receiver. Read the instructions for correct operation.

Japanese Harmonics Statement

高調波ガイドライン適合品

B

<i>backup software</i>	Software that runs on the host computer that is used to track data backups and execute autoloader functions.
<i>board</i>	A printed circuit assembly (PCA). Also called a card or adapter.
<i>bus</i>	A common data path over which data is transported.

C

<i>calibration</i>	A routine that is run immediately after a tape cartridge is loaded to determine if the tape is blank or written, compatible with the drive, and capable of being written and read.
<i>cleaning tape</i>	A tape that is used only for cleaning a drive.

D

<i>drive, tape drive</i>	The device that the autoloader uses to record data onto tapes.
<i>drive cleaning</i>	A autoloader feature that uses a cleaning tape to clean a tape drive.
<i>drive module</i>	The entire assembly that houses the drive, including the metal housing and connectors.
<i>differential SCSI</i>	One of the two types of SCSI interfaces. This interface can be high voltage differential (maximum of 25 meters) or low voltage differential SCSI (maximum of 12 meters).

E

<i>event</i>	A significant function of the autoloader displayed in the event log that reports drive errors, online/offline transitions, drive cleaning, and other information.
--------------	---

F

front panel display An LCD (liquid crystal display) display with five soft keys mounted on the front of the autoloader.

H

hard errors Electronic errors in autoloader functions that cannot be recovered. These errors are recorded in the hard error log.

HBA Host Bus Adapter - A circuit board residing in the host system that handles requests to and from the host system and the autoloader. May also be referred to as a host interface card.

home screen The view on the front panel display that provides status information after the autoloader has been powered on. Also, the default view to which the display returns after being left idle approximately three minutes.

host One or more computers that generate and communicate data to the autoloader.

HVDS High Voltage Differential SCSI

HVDS Cable A type of SCSI cable that can carry data a maximum of 25 meters.

I

identity A front panel display option that provides the autoloader's serial number.

IP Internet Protocol

J

jumper cables Cables used to connect the autoloader controller card to a drive. May also be referred to as daisy-chain cables.

L

LEDs Light-emitting diodes, also called lamps, found in various autoloader assemblies, including the drive module, power supply, autoloader cards, and other internal assemblies. An LED communicates status information about the assembly.

<i>LVDS</i>	Low Voltage Differential SCSI
<i>LVDS Cable</i>	A SCSI cable that can carry data a maximum of 12 meters.

M

<i>MAC address</i>	Media access control address - a unique hardware-based address that identifies each node on a network.
<i>magazine</i>	A slotted container that resides in the autoloader that provides individual slots for six tape cartridges.
<i>move</i>	A single autoloader action, such as loading a tape into a drive, or unloading a tape from a drive.

N

<i>nesting</i>	The menu approach implemented in the autoloader that uses increasing levels of autoloader control.
----------------	--

O

<i>odometer</i>	A front panel option that displays the odometer logs for power-on hours and moves.
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P

<i>partial availability</i>	When the front panel LED is solid amber to indicate that the autoloader needs attention. This does not indicate a hardware error. The front panel refers to this state as Partly Available .
<i>power cycle</i>	To turn the unit off and then back on again.
<i>power (stand-by) switch</i>	A low holding voltage remains in the autoloader even though autoloader has been powered off.

R

<i>RMC, remote management card</i>	A circuit card that provides the ability to gain access to the autoloader from a computer at a different location.
------------------------------------	--

S

<i>SCSI</i>	Small Computer Systems Interface - A bus that transfers data between the host system and the autoloader.
<i>SCSI ID</i>	The electronic identification number for each SCSI device in the autoloader. The autoloader SCSI devices are the drives and the autoloader interface controller card.
<i>single-ended SCSI</i>	One of the two type of SCSI interfaces that is limited to short distances.
<i>soft error</i>	Electronic errors in autoloader functions that the autoloader can automatically recover from. These errors are recorded in the soft error log.
<i>soft keys</i>	Five buttons located along the bottom edge of the front panel display that are used to execute commands on the display.
<i>swap</i>	Two related autoloader actions, or moves, such as moving a tape from a slot to the drive.

T

<i>tape, tape cartridge</i>	The media that the autoloader uses for recording data from the host computer(s).
<i>TCP/IP</i>	Transmission Control Protocol/Internet Protocol
<i>terminator</i>	An electronic device that connects to the end of the SCSI bus to stabilize bus signals.
<i>transport</i>	The mechanics in the autoloader that moves tapes.

U

<i>UTC</i>	Coordinated Universal Time used to set time zones.
------------	--

W

<i>web-based library administrator</i>	Describes the interface that allows you to monitor and manage the autoloader over the network.
<i>wide SCSI</i>	A 68-pin connector that can be single-ended or differential in implementation.

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