

HP DLT Tape Library 15-Slot User's Guide

Model A4851A



November 1997

Printed in United States

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See Appendix B for important safety and regulatory information.

Printing History

New editions of this manual incorporate all material updated since the previous edition. The manual printing date and part number indicate the current edition. The printing date changes when a new edition is printed. (Minor corrections and updates incorporated at reprint do not cause this date to change.)

November 1997

Edition 1

Typographical Conventions

This manual uses the following typographical conventions:

Font	Used for
<i>Italics</i>	Document titles and statements that need to be emphasized.
Typewriter Font	Commands you type on your keyboard or screen menu items you can select.
COMMAND TEXT	Information displayed in the display window of the library.
KEYCAP TEXT	Keys on the library control panel.

NOTE

Notes provide information that can be helpful in understanding the operation of the product.

CAUTION

Cautions call attention to an operating procedure or practice that could result in damage to the product if not correctly performed. *Do not proceed beyond this box until you fully understand and meet the indicated conditions.*

WARNING

Warnings call attention to a procedure or practice that could result in personal injury if not correctly performed. *Do not proceed beyond this box until you fully understand and meet the indicated conditions.*



This warning symbol on a product label indicates that personal injury could result if the product is used improperly, and that more detailed information is given in the installation and/or user manuals.

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1 Product Description

Overview

- HP DLT Tape Library
- Product Matrix
- Supported Platforms
- Library Rear Panel Features
- Specifications

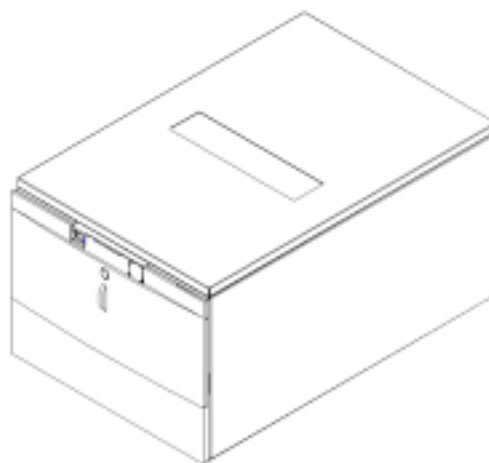
HP DLT Tape Library

- Fully automated
- State-of-the-art patented HP robotics
- Industry-leading data availability
- Industrial-strength durability
- User-maintenance-free library system

Available configurations are described in Table 1-1 on page 1-4.

Figure 1-1

HP DLT Tape Library



Product Matrix

Table 1-1 DLT Tape Library Offerings

	Library Model	HP Product Number	Mounting Option	Config. Option	Drives	Slots
Deskside Libraries	DLT4000 1/15	A4851A	#A6K	#401	One DLT4000	15
	DLT4000 2/15	A4851A	#A6K	#402	Two DLT4000	15
	DLT7000 1/15	A4851A	#A6K	#701	One DLT7000	15
	DLT7000 2/15	A4851A	#A6K	#702	Two DLT7000	15
Field Rack Libraries	DLT4000 1/15	A4851A	#A6L	#401	One DLT4000	15
	DLT4000 2/15	A4851A	#A6L	#402	Two DLT4000	15
	DLT7000 1/15	A4851A	#A6L	#701	One DLT7000	15
	DLT7000 2/15	A4851A	#A6L	#702	Two DLT7000	15

Table 1-2 Upgrade/Conversion Kits

Kit	HP Product Number	Upgrades/Converts	To
DLT4000 Upgrade Kit	A4842A	DLT4000 1/15	DLT4000 2/15
DLT7000 Upgrade/Conversion Kit	A4843A	DLT4000 1/15	DLT7000 1/15
		DLT7000 1/15	DLT7000 2/15

Table 1-3 DLT Tape Media

Media	HP Product Number
HP DLTtape Type III XT	C5141A
HP DLTtape Type IV	C5141F
Cleaning Cartridge	C5142A

Supported Platforms

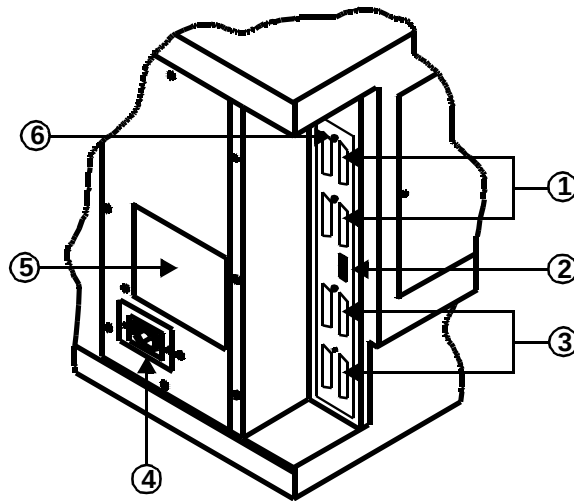
Table 1-4 DLT Tape Media

Servers	D-Class
	E-Class
	K-Class
	Nova
	T-Class
	V-Class
Workstation	J-Class

On supporting platforms, the library can be connected to an HP Fibre Channel SCSI multiplexer (HP A3308A and HP A3511A/Z) and thereby benefit from Fibre Channel speed and distance. The FC-SCSI multiplexer is supported on K, T, and V platforms running HP-UX 10.20 TFC or higher. (Consult an HP sales representative for the latest information.)

Library Rear Panel Features

Figure 1-2 **Rear Panel Features**



1. **Bus 1 SCSI ports** (single-ended and differential). Drive 1 and the robotics controller are internally connected to Bus 1.
2. **SCSI interface mode switches** specify term power, termination and differential settings for each SCSI bus.
3. **Bus 2 SCSI ports** (single-ended and differential). Drive 2 is internally connected to Bus 2 (two-drive library only)
4. **SCSI bus status indicator label** explains the SCSI bus status indicators.
5. **Power connector** connects the power cord to the library.
6. **SCSI bus indicators** indicate SCSI bus status. Each SCSI bus has an indicator.

Specifications

Product Description
Specifications

Quantum DLT4000 and DLT7000 Drive Mechanism Specifications

Table 1-5 **DLT Drive Specifications**

Characteristic	DLT4000	DLT7000
Performance		
Read/write transfer rate: maximum sustained (DLTtape Type IV)	non-compressed mode: 1.5 MB/second compressed (2:1 typical): 3.0 MB/second	non-compressed mode: 5.2 MB/second compressed (2:1 typical): 10.0 MB/second
Average access time	68 seconds	60 seconds
Rewind	45 seconds (average) 90 seconds (maximum)	60 seconds (average) 120 seconds (maximum)
Loading time to BOT (for previously written tape)	48 seconds (average)	48 seconds (average)
Unloading time to BOT	17 seconds (average)	17 seconds (average)
External Interface	8-bit SCSI-2, differential	16-bit fast/wide SCSI-2, differential
Internal Interface	8-bit SCSI-2, single-ended	16-bit fast/wide SCSI-2, single-ended
Read-write head	2-channel, ferrite w/MIG	4-channel, ferrite w/MIG

Product Description

Table 1-5 DLT Drive Specifications (Continued)

Characteristic	DLT4000	DLT7000
Recording format	128 track serial serpentine variable block (64 pairs) 256-tpi track density	208 track serpentine (52 quads) 416-tpi track density
Data compress algorithm	DLZ	DLZ
Reliability		
Soft read error rate	1 in 10^7 bytes minimum (read as one error maximum allowable in 10^7 of data read minimum)	1 in 10^7 bytes minimum (read as one error maximum allowable in 10^7 of data read minimum)
Soft write error rate	1×10^6 bytes minimum	1×10^6 bytes minimum
Hard read error rate	1×10^{17} bytes minimum	1×10^{17} bytes minimum
Hard write error rate	Not allowed	Not allowed
Undetected error rate	1×10^{30} bits read	1×10^{27} bits read
MTBF	80,000 hours	200,000 hours
Head life	10,000 hours	30,000 hours
Power Specifications		
Total Power consumption	22 W (average) 33 W (maximum)	37 W (average) 47 W (maximum)
5 volt supply	5.0 V +/- 5% (maximum) @2.5 A (average), 3.0 A (maximum)	5.0 V +/- 5% (maximum) @3.6 A (average), 3.8 A (maximum)
12 volt supply	12.0 V +/- 5% @ 0.8 A (average), 1.5 A (maximum)	12.0 V +/- 5% @ 1.6 A (average), 2.6 A (maximum)

Table 1-5 DLT Drive Specifications (Continued)

Characteristic	DLT4000	DLT7000
Physical Specifications		
Form factor	5 1/4 in. (height with modified depth)	5 1/4 in. (height with modified depth)
Height	3.25 in. (w/o bezel)	3.25 in. (w/o bezel)
Width	5.7 in. (behind bezel)	5.7 in. (behind bezel)
Depth	9.0 in. (measured from back of front bezel)	9.0 in. (measured from back of front bezel)
Weight (net)	6 lb 7 oz	6 lb 7 oz

DLT Tape Library Specifications

Table 1-6 Library Specifications

Characteristic	A4851A Library	
Performance		
Average tape access	<12 seconds	
Average tape exchange	24 seconds (mean time to eject tape from drive, robotically exchange tape from magazine and reload drive)	
Interface	SCSI-2 (single ended or differential)	
Reliability		
MTBF	100,000 hours	
MSBF (robotics)	1 million swaps	
Preventive maintenance	None required	
Power Requirements		
Total power consumption	140 W (typical) 150 W (maximum)	NOTE: After 30 minutes of non-operation, the library operates in reduced power mode.
Line voltage	100 - 127/ 200 - 240 Vac	
Line frequency	50 to 60 Hz	
Physical Specifications		
Height	348 mm (13.7 in.) w/o bezel 353.4 mm (13.9 in.) with bezel	
Width	442 mm (17.4 in.) w/o bezel 482.6 mm (19.0 in.) with bezel	
Depth	717.3 mm (28.2 in.) w/o bezel 752.6 mm (29.6 in.) with bezel (to tip of handle)	
Weight (net)	43.5 kg (96 lbs)	
Weight (packaged)	49 kg (108 lbs)	

DLTtape Specifications

Table 1-7 **Tape Specifications**

Characteristic	DLTtape Type III XT	DLTtape Type IV
Formatted capacity	15 GB (non-compressed)	20/35 GB (non-compressed)
	30 GB (2:1 typical compression)	40/70 GB (2:1 typical compression)
Basic description	0.5 in. (metal particle)	0.5 in. (metal particle)
Tape length	1167 ft	1778 ft
Cartridge dimensions	4.1 in. x 4.1 in. x 1.0 in.	4.1 in. x 4.1 in. x 1.0 in.
Shelf life	30 years (min) @ 20° C 40% RH (non-condensing)	30 years (min) @ 20° C 40% RH (non-condensing)
Usage	1,000,000 passes (min) 10,000 loads/unloads (min)	1,000,000 passes (min) 10,000 loads/unloads (min)

Environmental Specifications

Table 1-8 Environmental Specifications

Characteristic	Tape/Drive	DLT Tape Library
Temperature and Humidity		
Operating	10° to 40° C 20% to 80% RH (drive, non-condensing) 40% to 60% RH (tape, non-condensing)	10° to 40° C 10% to 90% RH
Non-operating w/o disk	0° to 55° C 10% to 95% RH	-40° to 70° C 10% to 90% RH
Storage/shipment	-40° to 66° C (drive) 16° to 32° C (tape) 10% to 95% RH	-30° to 60° C (<14 consecutive days)
Archive	18° to 28° C 40% to 60% RH	-30° to 60° C (<14 consecutive days)
Gradient		
	10° C/hour	15° C/hour
Altitude		
Operating	0 to 30,000 ft	N/A
Non-operating	0 to 50,000 ft	N/A
Shock		
Operating	60 half sine shock impulses of 5 g's for 11 sec in 3 axes	4-in. half sine edge drop, 4 faces
Non-operating	half sine, 55 g, 11 ms half sine, 140 g, 2 ms half sine, 15 g, 20 ms half sine, 150 g, 3 ms half sine, 40 g, 11.8 ms (all measured in 6 axes)	30 g (trapezoidal wave, edge drop)

Table 1-8 Environmental Specifications (Continued)

Characteristic	Tape/Drive	DLT Tape Library
Package shock		
Drop tests	42 in. (packaged drive dropped on six sides, three edges, one corner)	12-in. drop, 5 faces
Vibration		
Operating random	5 - 500 Hz @ 1 grms 10 minutes, 3 axes	0.21 grms
Operating sine	0.25 g peak 10 - 300 Hz 0.1 g peak 300 - 500 Hz 10 - 500 - 10 Hz @ 1/4 octave/minute in 3 axes	N/A
Non-operating random	5 - 500 Hz @ 2 grms 60 minutes, 6 axes	2.1 grms
Non-operating swept-sine	5 - 10 Hz @ 0.5 g peak 10 - 50 Hz @ 1 g peak 50 - 500 Hz @ 3 g peak 5 - 500 - 5 Hz @ 1/2 octave/minute in 6 axes	0.5 grms (0 to peak)
Non-operating random packaged	2 - 200 Hz @ 1.5 grms 6 axes, dwell = 30 m	1.49 grms, top-to-bottom
Non-operating swept sine packaged	5 - 150 Hz @ 0.5 g peak 5 - 150 - 5 Hz @ 1/2 oct/min, 6 axes with dwell at lowest natural resonance in each axes	0.5 G (0-pk), 3 - 200 - 3 Hz 1 oct/min, 1 axis (top-to-bottom)
Acoustic Emission		
Media exchange	N/A	6.5 Bels
Read/write operation	4.3 Bels (max) A-weighted	6.5 Bels

DLT Tape Library Product Certifications

Table 1-9

Product Certification

Safety	EN60950/IEC 950
Electromagnetic emissions	EN55022/CISPR - 22, Class B
	EN50082 - 1
	EN55024 - 2/IEC 1000 - 4 - 2, 4kV CD, 8kV AD
	EN55024 - 3/IEC 1000 - 4 - 3, 3 V/m
	EN55024 - 4/IEC 801 - 4, 1kV Peak Power lines 0.5 kV Signal lines
	FCC 47 CFR Part 15 - Class B
	VCCI Class B
	EN61000 - 3 - 2/IEC 1000 - 3 - 2
	EN61000 - 3 - 3/IEC 1000 - 3 - 3
Laser	EN60825 (1994)/IEC 825 (1993) +A1, Laser Class 1

2 Library Installation

Overview

To install the library:

1. Choose a location.
2. Prepare library components.
3. Install the host SCSI card(s).
4. Mount the library in a rack (rack mount configuration only).
5. Set the SCSI interface mode switch.
6. Connect the library to the host.
7. Connect power.
8. Configure the host.

This chapter also explains how to move or ship the library.

NOTE

Installation must be performed by HP qualified personnel.

Step 1: Choose a Location

Choose a location that meets the following criteria. Take the library there before unpacking it.

Table 2-1

Location Criteria

Room temperature	50-104° F (10-40° C)
Power source	AC power voltage: 100-127 V or 200-240 V
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.
Adequate clearance	Standalone configuration — free standing or against a wall/desk: Back 56 cm (22 in.) for cooling and service. Front 86 cm (34 in.) for operator access. Sides 56 cm (22 in.) for removal of the external cover.
	Rack mount configuration: Back Allow adequate room to open the rear door of the rack for service access, usually 46-61 cm (18-24 in.), depending on the rack. Front 86 cm (34 in.) for operator access. Height For ease of use, the bottom of the library should be 60-120 cm (24-48 in.) above the floor.

Step 2: Prepare Components

Make sure all required components are available.

Table 2-2 **Components Required for Installation and Use**

Component	Installation Notes
Library	Do not unpack the library until it is in the proper location.
SCSI card(s)	Required number of cards installed in host depends on library configuration. Connect drives and robotics controller to differential fast/wide SCSI cards.
SCSI cables	Required number of cables (68-pin) is one per drive and one for the robotics controller. Maximum cable length (total) is 25 meters.
Power cord	Power cord is included with library.
Rack mount kit	Rack mount kit is included with rack mount libraries.
Data cartridge	One HP DLTtape IV data cartridge is included with library.
Cleaning cartridge	Cleaning cartridge is included with library.

If any components are missing, contact a sales representative.

Step 3: Install the Host SCSI Card(s)

Refer to the host user manual and the SCSI card installation instructions for information on installing SCSI cards.

Step 4: Mount the Library in a Rack

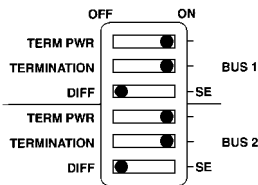
For rack mount configurations, refer to the installation instructions included in the rack mount kit.

Step 5: Set the SCSI Interface Mode Switch

Do not connect any cables yet.

The SCSI interface mode switch, shown below, is on the rear panel between the bus 1 and bus 2 SCSI ports.

Figure 2-1 SCSI Interface Mode Switch



To set the SCSI interface mode switch:

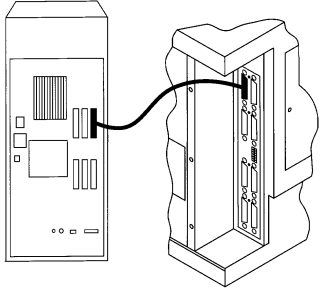
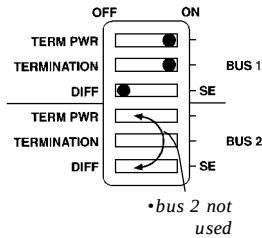
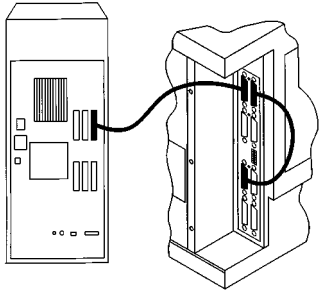
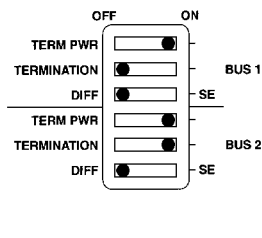
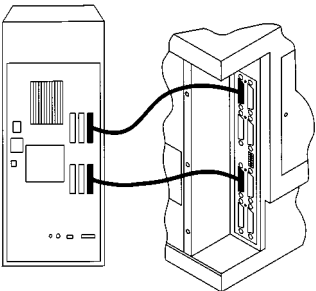
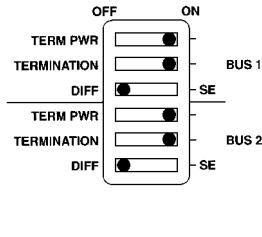
1. Determine how to connect the library according to:
 - Number of drives in the library and drive type (only DLT4000 drives are supported as daisy-chained)
 - Number of SCSI cards
2. Set the SCSI interface mode switch.

Table 2-3 SCSI Interface Mode Switch Settings

Setting	Purpose	Set to
Term Pwr	Sends power to the terminator	ON in most installations
Termination	Terminates the SCSI bus; functions the same as a physical terminator	ON if one port on the bus is open OFF if both ports on the bus are connected to a cable
DIFF/SE	Specifies interface mode	DIFF for differential

Table 2-4 shows three ways to connect the library and the corresponding SCSI interface mode switch settings.

Table 2-4 Library Connection Options

Configuration	Cabling	SCSI Interface Mode Switch Settings
One-Drive Library		 •bus 2 not used
Two-Drive Library Daisy chained (DLT4000 drives only) Minimum host I/O slots used		
Two-Drive Library Bus 1 and bus 2 connect to separate SCSI cards Maximum performance Additional card and cable required		

Step 6: Connect Library to Host

1. Ensure the host system has been properly shut down and powered off.
2. Connect the SCSI cables.

The SCSI bus configuration was determined when the SCSI interface mode switch was set (see the connection diagram on page 2-8). Using this configuration, connect the library to the host. Make sure:

- The differential port is used.
 - The last device in the SCSI bus is terminated.
3. Make sure the power switch on the library front panel is switched off (0 position).
 4. Plug the power cord into the power port on the back of the library.

Stand-alone installations: Go to “Step 7: Connect Power” on page 2-13.

Rack mount installations: Go to the next section, “Routing SCSI and Power Cables on Rack Mounted Libraries.”

Routing SCSI and Power Cables on Rack Mounted Libraries

CAUTION

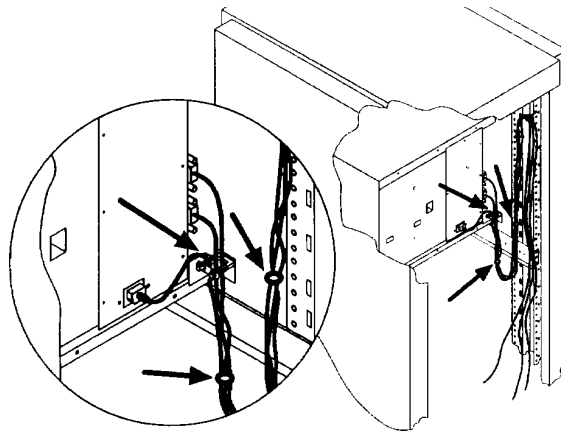
SCSI and power cables must be routed and secured properly on rack mounted libraries. Failure to properly route library cables could result in damage to the cables.

To properly route and secure rack mounted library power and SCSI cables:

1. Route the SCSI/power cables through the strain relief bracket:
 - a. Squeeze the two plastic ends of the cable strain relief bracket together.
 - b. Pull off the plastic strain relief clamp.
 - c. Route the SCSI cable(s) and the power cord through the cable strain relief bracket.
 - d. Slide the strain relief clamp back onto the bracket.
 - e. Attach a cable tie (included in the rack mount kit) to the SCSI and power cables about eight inches back from the strain relief bracket.
 - f. Attach another cable tie about eight inches back from the first cable tie.

Figure 2-2

SCSI/Power Cables and Strain Relief Bracket



2. Extend the rack's antitip rail and verify that the leveller feet are down.

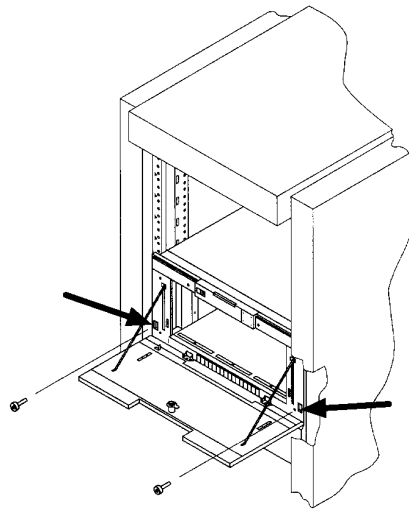
WARNING

Failure to extend the antitip rail could result in personal injury and/or damage to the library if the rack tips over.

3. Use the key to open the front access door. Remove the two screws that secure the library to the rack.

Figure 2-3

Front Access Door

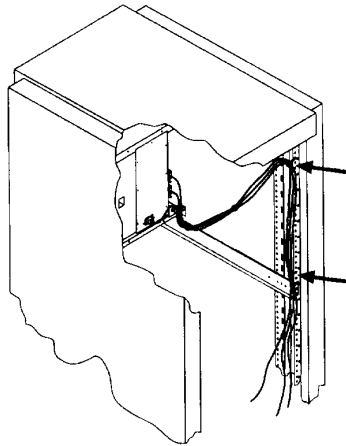


4. Slide the library out of the rack so that it is in the fully extended position.
5. Gently pull the SCSI and power cables back toward the rear of the rack. Use a cable tie to secure them to the rail at the back of the rack. The cable tie should be at about the same height as the top of the library.

6. Carefully route the cables down along the back rail. Use a cable tie to secure them to the rail just above the slide mounting bracket. Clip off the ends of all four cable ties.

Figure 2-4

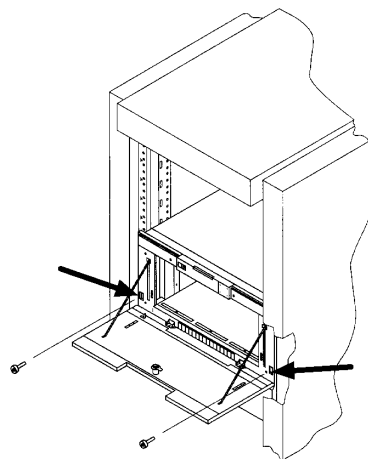
Secured SCSI and Power Cables



7. Close the back door on the rack.
8. Push the library back into the rack.
9. Open the front access door. Replace the two screws that secure the library to the rack, then relock the door.

Figure 2-5

Front Access Door



Step 7: Connect Power

1. Plug the power cord into a proper outlet.
2. Turn on the power switch.

SELF TEST and **NOT READY**, and then **NOT READY** and **INVENTORY CHECK** display alternately. After the power-on test completes (in about 3 minutes), the drive status information displays. (See “Understanding the Display Window” on page 4-4.)

NOTE

If the drive status information does not display, the power-on test was not successful and **DEVICE FAILED** displays. See “resolving Other Problems” on page 4-43.

3. Turn on the host system.

Step 8: Configure the Host

An HP qualified service representative must configure the library on the host. This procedure includes installing drives, creating device files and verifying the configuration.

Moving or Shipping the Library

This section explains how to move the library a short distance, such as to another office or to another floor in the building, and how to ship the library to another location.

WARNING

The library weighs nearly 100 pounds (45 kilograms). To avoid personal injury and possible damage to the library, at least two people must move the library.

To move or ship the library:

1. Properly shut down and power off the host.
2. Unmount (unreserve) any tape cartridges in the library if necessary. See your computer operating system documentation, or software application documentation for instructions on how to unmount tape cartridges.

3. Verify that all drives in the library are empty:

 displays after the drive number if the drive is empty.

 displays after the drive number if the drive is full.

If the drives are full, empty them before shipping the library. (For instructions, refer to the software documentation your host system uses to manage the library.)

4. Switch off the power switch on the library front panel.

CAUTION

Do not switch off power to the library until the SCSI bus is inactive.

Removing power from a SCSI peripheral when the bus is active can result in data loss and/or indeterminate bus states. (Check your host system manuals for information about checking the SCSI bus status.) If your computer is connected to a LAN, be sure to check with your system administrator before shutting off power to the library.

5. Remove the power cord and the SCSI cable connections from the library rear panel.

Library Installation
Moving or Shipping the Library

6. If the library is rack mounted:
 - a. Extend the antitip rail on the rack.

WARNING

Failure to extend the antitip rail could result in personal injury and/or damage to the library if the rack tips over.

- b. Slide the library out of the rack so that it is in the fully extended position.
 - c. Reattach the handles to the side of library using two screws. Make sure the handle flanges are on top of the slides. (The handles and hardware for reattaching them should have been saved with the original shipping materials. If they are missing, call your service representative for assistance in getting replacement handles.)
 - d. Remove the three 8-32 screws on each side of the library that secure the library to the rack slides.
7. **IMPORTANT** — two people needed: With a person on each side of the library, lift the library onto a cart.
8. Transport the library:
 - To move the library a short distance, roll the cart to the new location.
 - To ship the library, repackage the library in the same materials and ship it in the same manner in which it was received, then unpack it at its new destination.

CAUTION

The library can be seriously damaged if it is not shipped using appropriate shipping materials. A service representative can provide assistance or advice on how to best repackage and ship the library.

9. Re-install the library. Refer to installation steps 3 through 8 in this chapter.

3 **Tape Cartridges**

Overview

- Choosing Tape Cartridges
- Labeling Tape Cartridges
- Write-Protecting Tape Cartridges
- Maintaining Tape Cartridges
- Labeling Bulk Load Magazines

Choosing Tape Cartridges

Two tape cartridges are supported.

Table 3-1

Supported Tape Types

Cartridge Type	Available Densities
DLTtape IV Data Cartridge	20 GBytes (DLT4000 drive) 35 GBytes (DLT7000 drive)
DLTtape III XT Data Cartridge	15 GBytes

NOTE

Hewlett-Packard recommends using the HP DLTtape IV Data Cartridge. (See Appendix A for ordering information.)

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 (such as backup, old version of operating system)

If the host software does not keep track of this information, create a method of doing so.

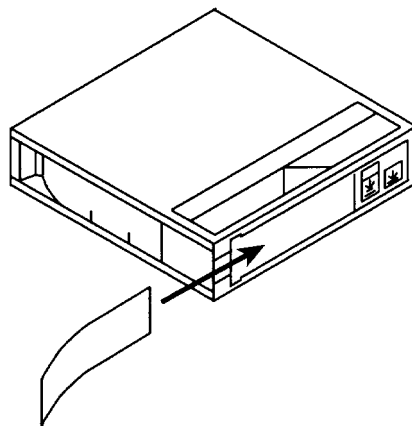
Slide the label into the slot on the face of the cartridge as illustrated in Figure 3-1.

NOTE

If bar code labels are not used and the Barcode On/Off configuration is set to On, the Inventory Check test performance can be significantly affected. This test runs when the library is powered on and whenever the front access door is used.

Figure 3-1

Proper Label Position



Write-Protecting Tape Cartridges

The use of the write protect switch ensures data safety for files that have been previously written to the tape and prevents any additional files from being written to the tape.

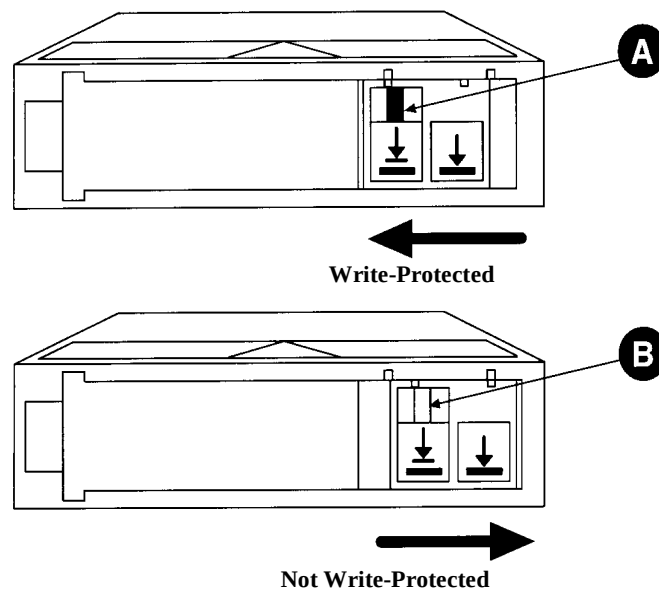
To change the write-protect setting, move the write-protect switch:

- Left to **prevent** data from being written to the cartridge. The orange indicator on the cartridge can be seen when the write-protect switch is in the “ON” position (see “A” in Figure 3-2).
- Right to **allow** data to be written to the cartridge. The orange indicator on the cartridge cannot be seen when the write-protect switch is in the “OFF” position (see “B” in Figure 3-2).

With the write-protect switch in either position, data can be read from the cartridge.

Figure 3-2

Write-Protect Button Settings



Maintaining Tape Cartridges

Table 3-2 **Tape Cartridge Maintenance**

DO NOT:	DO:
• Expose cartridges to magnetic fields. • Leave cartridges in the tape drive when library power is off. • Expose cartridges to extreme temperatures or extreme humidity. Acceptable operating temperatures range from 10-40° C (50-104° F). Acceptable storage temperatures range from 16-32° C (60-90° F). Acceptable operating humidity ranges from 20-80%; acceptable storage humidity ranges from 10-95%. • Expose cartridges to moisture or direct sunlight. • Drop the cartridges or carry them in a loose container that could submit the cartridges to any unnecessary physical shock. • Open cartridges lid, exposing the tape to possible contamination or physical damage. • Touch the tape surface. • Take cartridges apart. • Use graphite pencils, water soluble felt pens, or other debris-producing writing instruments to label cartridges. • Erase a label; replace it instead.	• Store cartridges in a clean, safe place in their protective plastic containers when not in use. • Remove dust on the <i>outside</i> of cartridges using a damp cloth. (Older, frequently used tapes may build up dust.) • Store cartridges vertically, not flat. • Store cartridges intended for archiving data in their plastic containers and in environmental conditions of 18-28° C (64-82° F) and 40-60% relative humidity. • Use labels like those included in the accessories kit or that meet the specifications listed in Appendix A, "Supplies and Accessories"

Labeling Bulk Load Magazines

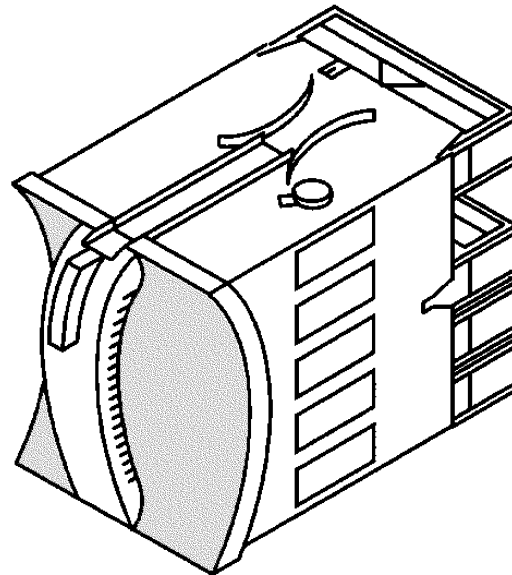
Bulk load magazines can be labeled in a manner similar to tape cartridges.

To label bulk load magazines:

1. Clean the magazine surface with isopropyl alcohol (optional, but recommended).
2. Remove the adhesive backing from the label pouch.
3. Apply the pouch to the magazine.
4. Slide the label into the pouch.

Figure 3-3

Magazine Label Position



Tape Cartridges
Labeling Bulk Load Magazines

4 Library Operation

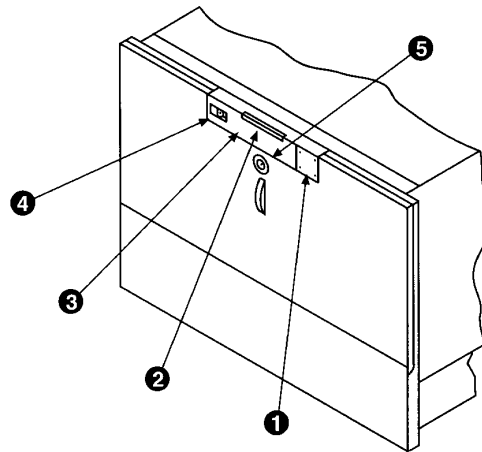
Overview

- Operating the Control Panel
- Understanding the Display Window
- Entering the Administration Menu Password
- Setting a New Administration Menu Password
- Specifying SCSI Addresses
- Setting Configuration Options
- Retrieving Performance Information
- Running an Internal Test
- Using Online Repair
- Loading Cartridges Into the Library
- Removing Tape Cartridges from the Library
- Cleaning the Tape Drives
- Clearing a Drive Cleaning Error
- Viewing Cartridge Bar Code Labels
- Troubleshooting

Operating the Control Panel

Figure 4-1

Tape Library Control Panel



1. **Selection buttons** perform the following operations:
 - **CANCEL** cancels the current operation or option.
 - **PREV** scrolls the display options backward by one. When held continuously, the options scroll quickly.
 - **NEXT** scrolls the display options forward by one. When held continuously, the options scroll quickly.
 - **ENTER** selects the displayed option.
2. **Activity light** indicates the following:
 - Steady Green – power is on.
 - Flashing Green – a tape cartridge is being accessed.
 - Amber – fault indicator.
3. **16-Character Display** displays information about the current operation or drive status.

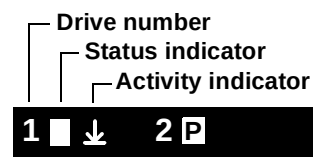
An asterisk (*) indicates there is a menu beneath the option. Press **ENTER** to access the menu. Press **NEXT** or **PREV** to display the menu options.
4. **Power switch** switches power to the unit on and off.
5. **Door latch** locks/unlocks door for access to bulk load magazines.

Understanding the Display Window

The display window displays drive status indicators and menu options.

Drive Status

Drive status displays when the library is in the “ready” state. For example:



The library has one or two drives, depending on the model number.

In this example:

- Drive 1 has a cartridge inserted and data is being written to the tape.
- Drive 2 has a write-protected cartridge inserted.

Status Indicators



The drive is full.



The drive is empty.



The drive needs to be cleaned.



The tape cartridge in the drive is write-protected.

Blank – The drive is offline.

Activity Indicators

The activity light flashes during the following operations:



Information is being written to the tape in the drive.



Information is being read from the tape in the drive.



The tape in the drive is being searched backward or is rewinding.



The tape in the drive is being searched forward.



The drive is being cleaned.

Control Panel Options

Press **PREV** or **NEXT** while the library is in the “ready” state to display first level options. Access second level options from **ADMIN*** (second level options require a password; see “Entering the Administration Menu Password” on page 4-7).

An asterisk (*) indicates that the option has multiple selections.

When a menu selection is flashing, press **ENTER** to select the option or display the option’s selections. Press **PREV** or **NEXT** to display other available options.

First Level Options

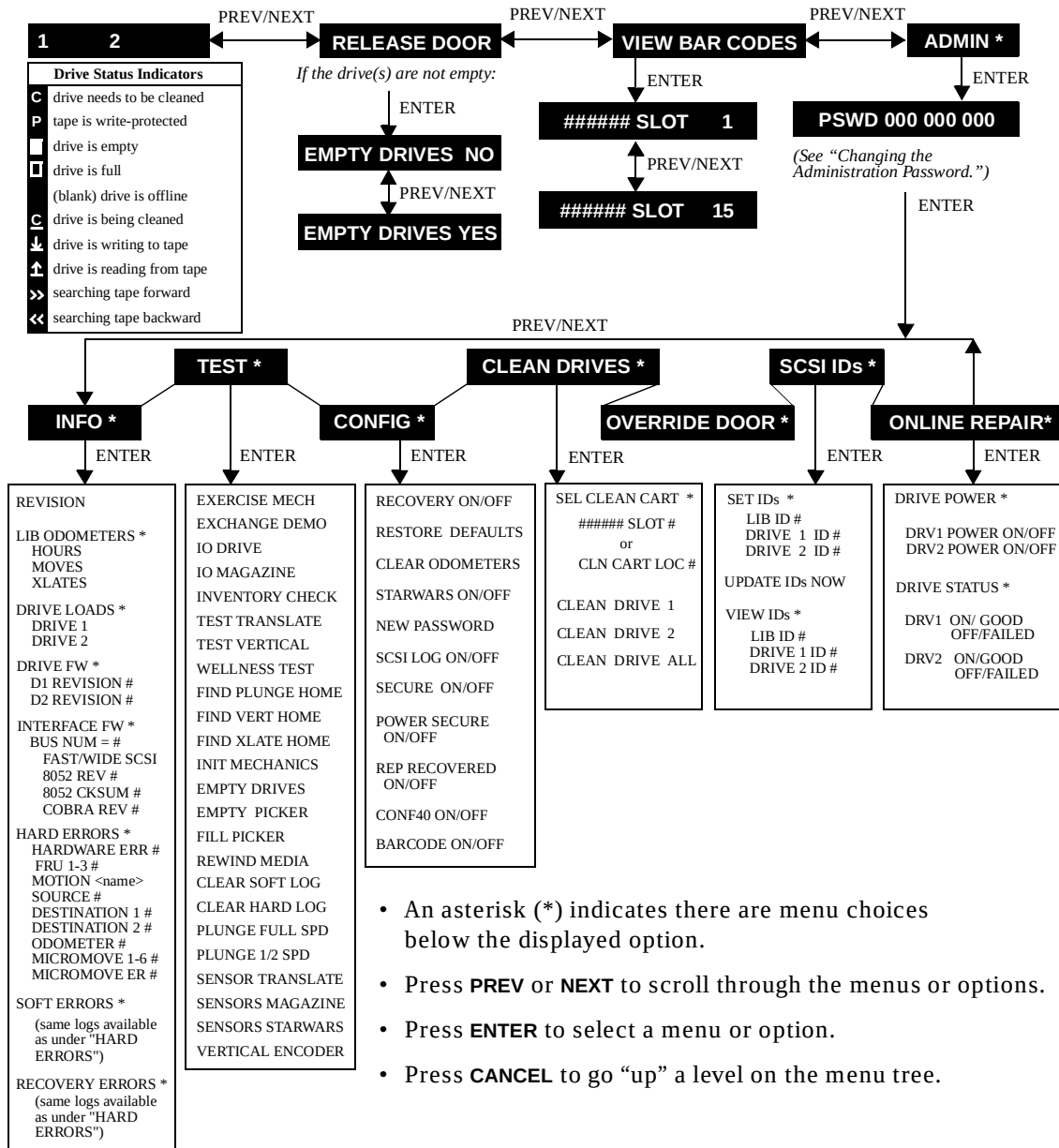
RELEASE DOOR	Allows the rear access door to be unlocked.
VIEW BAR CODES*	Displays the bar code labels on each tape cartridge by slot number.
ADMIN*	Accesses second-level options.

Second Level Options

INFO*	Displays performance information stored in the library.
TEST*	Runs internal library tests.
CONFIG*	Customizes the way the library functions.
CLEAN DRIVES*	Displays the drive numbers to clean.
OVERRIDE DOOR*	Opens door when media is in drives.
SCSI IDs*	Sets the SCSI addresses for the robotics and the library drives.
ONLINE REPAIR*	De-activates a drive for replacement.

Control Panel Menu Tree

Figure 4-2 Control Panel Menu Options



- An asterisk (*) indicates there are menu choices below the displayed option.
- Press **PREV** or **NEXT** to scroll through the menus or options.
- Press **ENTER** to select a menu or option.
- Press **CANCEL** to go "up" a level on the menu tree.

Entering the Administration Menu Password

1 2 → ADMIN* → PSWD 000-000-000 → CONFIG*

A numeric password is required to access options beneath **ADMIN*** menu of the library (see Figure 4-2 on page 4-6). A three-part password of 000-000-000 is set at the factory. To allow only authorized persons to access the library and change operation settings, the password must be changed.

NOTE

To change the password, see “Setting a New Administration Menu Password” on page 4-8.

Do not forget the password. Only an HP qualified service representative can reset the security code to the factory setting.

To enter the password:

1. Verify that the drive status displays (if not, press **CANCEL** until it does).
2. Press **NEXT** until **ADMIN*** displays, then press **ENTER**.
3. **PSWD 000-000-000** displays, and the first set of zeros flashes.

Press **ENTER** to accept this number (if no password has been set), or press **NEXT** or **PREV** until the set number displays. Press **ENTER**.

4. The middle set of zeros flashes.

Press **ENTER** to accept this number (if no password has been set), or press **NEXT** or **PREV** until the set number displays. Press **ENTER**.

5. The last set of zeros flashes.

Press **ENTER** to accept this number (if no password has been set), or press **NEXT** or **PREV** until the set number displays. Press **ENTER**. **INFO*** displays.

To access options under the **ADMIN*** menu, press **PREV** or **NEXT** until the desired option displays, then press **ENTER**.

Setting a New Administration Menu Password

1 2 → ADMIN* → PSWD 000 000 000 → CONFIG* → NEW PASSWORD

NOTE

Do not forget the password. Only an HP qualified service representative can reset the security code to the factory setting.

To set a new password:

1. Follow the steps on the previous page to enter the existing or factory-set password.
2. Press **NEXT** until **CONFIG*** displays, then press **ENTER**.
3. Press **NEXT** or **PREV** until **NEW PASSWORD** displays, then press **ENTER**.
4. **NEW 000-000-000** displays, and the first set of zeros flashes.

Press **NEXT** or **PREV** to display the desired first part of the password, then press **ENTER**.

5. The second set of zeros flashes.

Press **NEXT** or **PREV** to display the desired second part of the password, then press **ENTER**.

6. The last set of zeros flashes.

Press **NEXT** or **PREV** to display the desired third part of the password, then press **ENTER**.

7. **PASSWORD CHANGED** displays. Press **CANCEL** three times to return to the drive status ("ready" state).

NOTE

Save the new password to flash ROM by power cycling the library (turning the library off and then on). This allows the password to be recovered if the library is powered off for more than ten days.

Specifying SCSI Addresses

1 2 → ADMIN* → PSWD 00 000 000 → SCSI IDs

NOTE

The tape library has a Fast/Wide SCSI interface. SCSI addresses can be set from:

- 0 to 7 on a DLT4000-based library
- 0 to 15 on a DLT7000-based library

If connecting to a narrow host, use only addresses 0 to 7.

Table 4-1 SCSI ID Options

Option	Purpose	Explained in
SET IDs*	Assigns individual SCSI IDs to each drive and the robotics controller.	“Setting SCSI Addresses” on page 4-10
VIEW IDs*	Displays the current drive and robotics controller settings.	Viewing Current SCSI Addresses” on page 4-10

Table 4-2 Default SCSI Address Settings

DEVICE	SCSI ID	BUS #
LIB	6	Bus 1
DRV 1	5	Bus 1
DRV 2 (two-drive models only)	4	Bus 2

Viewing Current SCSI Address Settings

1 2 → ADMIN* → PSWD 000 000 000 → SCSI IDs → VIEW IDs

To view the current SCSI address settings:

- a. Verify that the drive status displays (if not, press **CANCEL** until it does).
 - b. Press **NEXT** until **ADMIN*** displays, then press **ENTER**.
 - c. Enter the three-part numerical password (see “Entering the Administration Menu Password” on page 4-7).
 - d. Press **NEXT** until **SCSI IDs*** displays, then press **ENTER**.
8. **SET IDs*** displays. Press **NEXT** until **VIEW IDs*** displays, then press **ENTER**.
9. **BUS1 LIB ID#** or **BUS# DRV * ID *** displays. (BUS1 LIB ID # stands for the current SCSI ID of the robotics controller. BUS# DRV # ID # is the current SCSI ID setting for the displayed drive number and its associated BUS#.)

Press **NEXT** or **PREV** to scroll through the current address settings.

- a. Press **CANCEL** until the next operation to perform displays, or until the drive status (library “ready” state) displays.

Setting SCSI Addresses

1 2 → ADMIN* → PSWD 000 000 000 → SCSI IDs → SET IDs

A SCSI address is required for the robotics controller and each drive. For more information, see Table 4-2, “Default SCSI Address Setting” on page 4-9, and the section “Viewing Current SCSI Addresses” on page 4-10.

When setting SCSI addresses, note that:

- On bus 1, drive 1 uses one address and the robotics controller uses one address.
- On bus 2, drive 2 uses one address (two-drive libraries only). If the drives are daisy-chained, the robotics and each drive use one address on the bus.

To change the current SCSI address settings:

1. Verify that the drive status displays (if not, press **CANCEL** until it does).
2. Press **NEXT** until **ADMIN*** displays, then press **ENTER**.

3. Enter the three-part numerical password (see “Entering the Administration Menu Password” on page 4-7).
4. Press **NEXT** until **SCSI IDs*** displays, then press **ENTER**.
5. **SET IDs*** displays. Press **ENTER**.
LIB BUS1 ID # or **DRV# BUS# ID #** displays. (LIB BUS1 ID # stands for the current SCSI ID of the robotics controller.
DRV# BUS# ID # is the current SCSI ID setting for the drive number and its associated bus #.)
6. Press **NEXT** until the setting to change displays, then press **ENTER**.
7. The current SCSI address setting flashes. Press **NEXT** or **PREV** until the desired address displays, then press **ENTER**.
8. Press **NEXT** until **UPDATE IDs NOW** displays, then press **ENTER**.
9. **WAIT FOR UPDATE** displays briefly, then **IDS SAVED** displays.
 - If the new settings do not conflict with other SCSI IDs on the bus, **SCSI IDs*** displays.
 - If the new settings conflict with other IDs on the SCSI bus, **CONFLICT ABORTED** displays briefly, then **SET IDs*** displays. Any changes entered are lost, and previous steps must be repeated to set a new address.
 - If any buses are daisy chained together, make sure the SCSI IDs are different for each device on the bus.
 - If a serial communications error is detected while trying to set the SCSI IDs, **DRV CONNECT ERR** displays, followed by **IDS NOT CHANGED**. Any changes entered are lost. The **SCSI IDs*** menu displays.
10. Press **CANCEL** three times to return to the drive status (“ready” state).
11. To save new settings can be saved to flash ROM, turn the library off, then turn it back on. This allows the settings to be recovered if the library is powered off for more than ten days.

NOTE

After changing an address, it may be necessary to reboot the host for the new SCSI IDs to be recognized.

Interpreting SCSI Bus Status Indicator LEDs

Each SCSI bus has an LED to indicate the bus status.

Table 4-3 **SCSI Status Indicators**

Indication	Status
Steady green	Port active and OK. Internal (on-board) termination enabled.
Flashing green	Port active and OK. Internal (on-board) termination disabled.
No light	Port not active or not configured.
Flashing red	Bus mismatch or loss of external termination power.
Flashing yellow	Bus offline for online drive replacement.

Loading Cartridges Into the Library

Inserting/Removing Cartridges with Software

If the software package requires that cartridges be inserted and removed using the software, check the software documentation before proceeding.

Label all cartridges before inserting them into the magazines. (See “Labeling Tape Cartridges” on page 3-4.)

The bar codes and storage slot locations are stored in library memory when the door is closed and the Inventory Check test is automatically run.

Keeping Cartridges in the Magazine

To prevent cartridges from sliding out of the bulk load magazines when inserting them into the library:

- DO NOT use excessive force when inserting the magazines. This can cause the magazine “latching” mechanisms to fail.
- DO NOT insert magazines when the library power is turned off. During normal library operation, the cartridge release button on top of the magazine is pushed down by a special mechanism inside the library. This “unlocks” the cartridges, allowing them to be inserted and removed from the storage slots as needed. When the control panel **RELEASE DOOR** option is enabled, the button on top of the magazine is released, which “relocks” the cartridges into the magazine slots. During a power failure, however, this button is not released, and cartridges can slide out of their storage slots if a magazine is inserted or removed from the library. (If no magazines are in a library, the special mechanism defaults to the position that keeps cartridges locked into the magazine storage slot.)

Loading Tapes

Tapes are bulk loaded into magazines, which are then inserted into the library through the front access door. The library holds from one to three 5-slot magazines.

To load tapes:

1. Verify that the drive status displays (if not, press **CANCEL** until it does).
2. Verify that all drives in the library are empty (see the note below).
 displays after the drive number if the drive is empty.
 displays after the drive number if the drive is full.
3. Press **NEXT** or **PREV** until **RELEASE DOOR** displays.
4. Press **ENTER**. **DOOR RELEASED** displays. (See the note below. If an error message displays, see “Resolving Other Problems” on page 4-43.)

NOTE	The drive(s) must be empty before the access door can be released. If the drive(s) are not empty, EMPTY DRIVES NO displays. Press NEXT or PREV until EMPTY DRIVES YES displays, then press ENTER .
NOTE	Some security configurations may prevent the access door from being released. If a security option is enabled, SECURITY ENABLED displays after the RELEASE DOOR option is chosen. In some situations it may be necessary to override a security option and open the access door. To open the access door when a security option prevents the door from being released, use the OVERRIDE DOOR option under the ADMIN* menu (see Figure 4-2 on page 4-6). 5. Unlock the access door using the key.

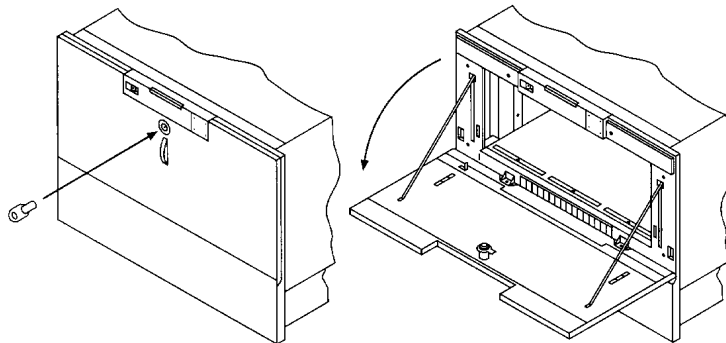
6. Open the access door by pulling the top of the door outward.

NOTE

Do not let the door fall open. The door straps may be damaged.

Figure 4-3

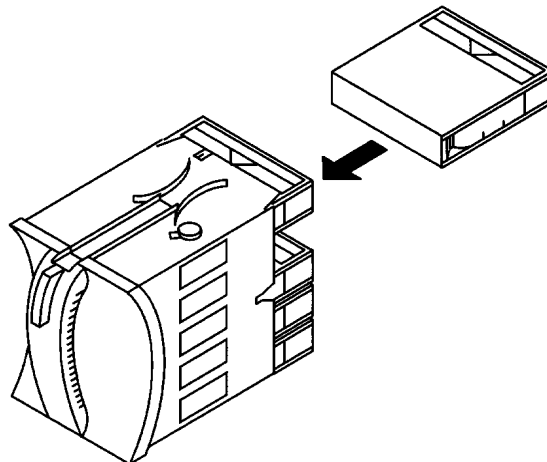
Opening the Front Access Door



7. Insert up to five tape cartridges into a magazine so that the tape brand name printed on the top of the cartridge is facing up and the tape label is facing out. The tapes should “click” into place.

Figure 4-4

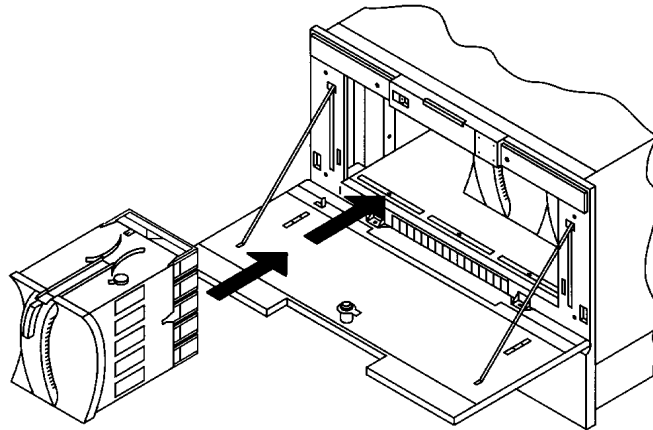
Loading Tape Cartridges into the Magazine



Library Operation
Loading Cartridges Into the Library

8. Insert the magazine so it lines up with the arrow on the label inside the library, the handle is facing the front of the library, and the tapes are facing the inside of the tape library. The magazine should “click” into place.

Figure 4-5 **Inserting Magazines**



9. Shut and lock the access door using the key lock. Make sure the door is shut completely.

NOTE

The library Inventory Check test runs when the access door is closed so that an inventory of tape bar code labels and storage slot locations can be stored into library memory. This process takes about one minute. The test fails if the door is not completely shut.

WARNING

Do not attempt to disable the interlocks. If the library is operating with fewer than three magazines inserted and the door open, the user can be exposed to Class II laser light emitted from the bar code reader.

Removing Tape Cartridges from the Library

Some software packages require that tape cartridges be inserted and removed using the software. If a software package manages files in the library, check the software documentation before proceeding.

All drives must be empty before the access door can be released. In addition, some security configurations may prevent the access door from being released. If a security option is enabled, **SECURITY ENABLED** displays after the **RELEASE DOOR** option is chosen.

To remove magazines from the library:

1. Verify that the drive status displays (if not, press **CANCEL** until it does).
2. Verify that all drives in the library are empty;
☐ displays after the drive number if the drive is empty
☒ displays after the drive number if the drive is full
3. Press **NEXT** or **PREV** until **RELEASE DOOR** displays.
4. Press **ENTER**. **DOOR RELEASED** displays. (See the following note. If an error message displays, see “Resolving Other Problems” on page 4-43.)

NOTE

The drive(s) must be empty before the access door can be released. If the drive(s) are not empty, **EMPTY DRIVE NO** displays. Press **NEXT** or **PREV** until **EMPTY DRIVE YES** display, then press **ENTER**.

Some security configurations may prevent the access door from being released. If a security option is enabled, **SECURITY ENABLED** displays after the **RELEASE DOOR** option is chosen.

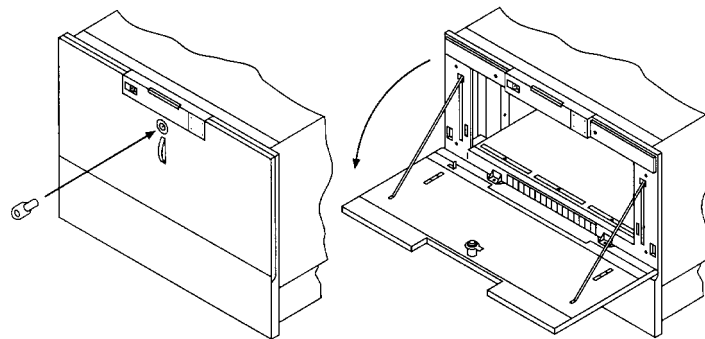
In some situations it may be necessary to override a security option and open the access door. To open the access door when a security option prevents the door from being released, use the **OVERRIDE DOOR** option under the **ADMIN*** menu (see Figure 4-2 on page 4-6).

5. Unlock the access door using the key, then open the door.

NOTE

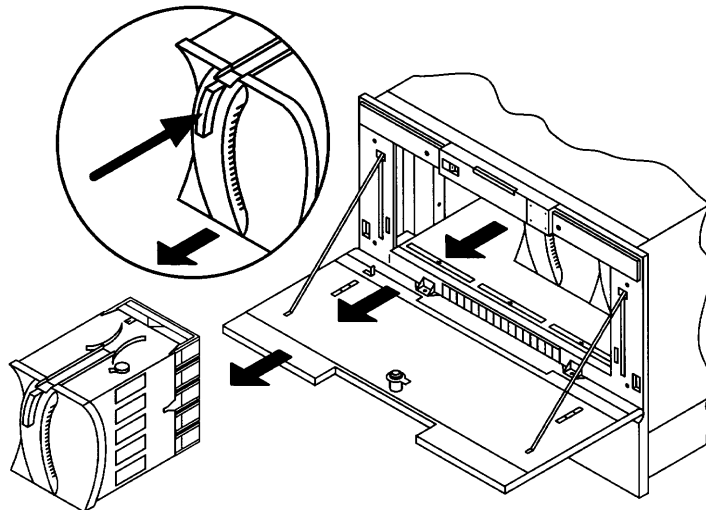
Do not let the door fall open. Damage to the door straps may occur.

Figure 4-6 **Opening the Front Access Door**



6. Remove the desired magazine by pushing the button at the top of the magazine handle (see Figure 4-7) and pulling out the magazine.

Figure 4-7 **Removing Magazines**



7. If necessary, remove tapes from the magazine. Press the button on top of the magazine, then pull out the tape.

WARNING

Do not attempt to disable the interlocks. If the library is operating with fewer than three magazines inserted and the door open, the user can be exposed to Class II laser light emitted from the bar code reader.

8. Shut and lock the access door using the key lock. Make sure the door is shut completely.

NOTE

The library Inventory Check test runs when the access door is completely closed so that an inventory of tape bar code labels and storage slot locations can be stored into library memory. This process takes about one minute.

Viewing Cartridge Bar Code Labels

Bar code label information can be viewed for each tape cartridge in the library using the control panel. Bar code information displays sequentially by storage slot number.

To view bar code information:

1. Verify that the drive status displays (if not, press **CANCEL** until it does).
2. Press **NEXT** until **VIEW BAR CODES*** displays, then press **ENTER**.

SLOT # displays. (“#####” represents the bar code information, and “#” represents the first storage slot that contains a bar coded tape cartridge.)

NOTE

If there are no bar coded tape cartridges in the library, **LIBRARY EMPTY** displays briefly, then **VIEW BAR CODES*** displays. Press **CANCEL** to return to the drive status indicators (“ready” state).

3. Press **NEXT** or **PREV** to scroll through the storage slot locations that contain bar coded tape cartridges.
4. Press **CANCEL** twice to return to the drive status indicators (“ready” state).

Cleaning the Tape Drives

1 2 → ADMIN* → PSWD 000 000 000 → CLEAN DRIVES*

Cleaning the drives, which takes about 5 minutes per drive, requires a special digital linear tape cleaning cartridge. (Typically, cleaning cartridges are light yellow and data cartridges are black, brown, or white. See Appendix A for a list of supplies.)

The drive mechanisms do not require scheduled cleanings and should be cleaned only if a “clean drive” status indicator () displays after the drive number.

If the cleaning cartridge needs to be replaced, **REPLACE CLEANING** displays, and the cleaning cartridge ejects through the mailslot.

NOTE

The software package may manage drive cleaning.

To clean one or more of the drives:

1. Verify that the drive status displays (if not, press **CANCEL** until it does).
2. Make sure all drives are empty () displays after the drive number). To empty the drives, refer to the documentation for the software package.
3. Press **NEXT** until **ADMIN*** displays, then press **ENTER**.
4. Enter the three-part numerical password (see “Entering the Administration Menu Password” on page 4-7).
5. **INFO*** displays. Press **NEXT** until **CLEAN DRIVES*** displays, then press **ENTER**.
 - If the library power has been turned off or the access door has been opened since a cleaning cartridge location was last selected, **SET CLEAN CART*** displays. Press **ENTER**.
 - If the library power has not been turned off or the access door has not been opened since a cleaning cartridge location was last selected, **CLN CART LOC #** displays (the number of the cleaning cartridge storage slot last selected is flashing.) If the storage slot location is correct, press **ENTER**. To select a different storage slot location, press **NEXT** until the correct storage slot location displays, then press **ENTER**.

SLOT # displays (“#####” is a barcode number or is blank if barcodes are not being used, and the storage slot location number is flashing). Press **ENTER** to select the displayed storage slot location or press **NEXT** or **PREV** to select a different storage slot location, then press **ENTER**.

6. **CLEAN DRIVE 1** displays. Press **NEXT** until the drive number to clean displays, then press **ENTER**.

To clean both drives, press **NEXT** or **PREV** until **CLEAN DRIVE ALL** displays, then press **ENTER**.

NOTE

If the drives are not empty, a **DRIVE FULL** message displays, and the drives must be emptied before they can be cleaned.

If the slot location chosen in Step 4 did not contain a cleaning cartridge, **NOT CLEAN CART** displays briefly, then **CLEAN FAIL #** displays. Press **CANCEL** to twice to return to the “ready” state. Check the bulk load magazines in the library to locate the cleaning cartridge. If no cleaning cartridge is present, insert one into an available slot.

In the event of a drive error, such as a serial communications failure, **FAILED** displays and the **CLEAN DRIVES*** menu displays.

CLEANING DRV # displays (# is the number of the drive being cleaned). When the drive has been cleaned, **CLEANED DRV #** displays briefly, then **CLEAN DRIVES*** is again displayed.

NOTE

If the software package controls drive cleaning, the drive status indicator  displays after the drive number(s) being cleaned and the activity indicator flashes until the drive(s) are clean.

NOTE

Cleaning takes about five minutes per drive.

7. Press **CANCEL** until the next operation to perform displays, or until the drive status indicators (library “ready” state) are displayed.

Drive Cleaning Issues

Table 4-7 lists circumstances that can cause a drive cleaning message, **C**, to appear when a tape cartridge may be at fault. Note that:

- Drives *do not require scheduled cleaning maintenance*. Excessive use of the cleaning cartridge can cause unnecessary wear on drive heads.
- After 20 cleaning cycles, the cleaning cartridge must be replaced.

Table 4-4 Drive Cleaning Issues Relating to Tape Cartridges

Problem	Cause	Solution
A new data tape cartridge is used and a drive cleaning message is received.	Debris from the tape manufacturing process was deposited on the drive head.	1. Clean the drive using the library cleaning procedure on page 4-21. 2. If the message is displayed again within a short amount of time, return the cartridge for warranty replacement.
An older, frequently-used data tape cartridge is loaded and a drive cleaning message is received.	Dust from frequent tape loads and unloads has most likely built up on the tape cartridge and was deposited on the drive head.	1. Clean the <i>outside</i> of the tape cartridge using a damp cloth. 2. Clean the tape drive using the tape drive cleaning procedure on page 4-21.
An older, frequently-used tape causes a cleaning message to be displayed for the second time.	The tape is most likely damaged. (Damaged cartridges can cause unnecessary use of the cleaning cartridge.)	1. Verify the tape is readable by clearing the error message. (Select the ONLINE REPAIR option from the control panel, and turn off power to the drive containing the tape, and then turn the drive power on again. See “Clearing a Drive Cleaning Error” on page 4-37.) 2. Try reading the tape again. If the tape can be read, back up data from the damaged cartridge to another tape cartridge and discard the damaged one.
Cleaning error remains after three cleaning cycles.	Debris is being deposited on the drive read/write heads.	Contact an HP qualified service representative. The drive may need to be replaced.

Setting Configuration Options

1 2 → ADMIN* → PSWD 000 000 000 → CONFIG*

Set certain options, called configurations, to customize the way the library operates.

To change a configuration:

1. Verify that the drive status displays (if not, press **CANCEL** until it does).
2. Press **NEXT** until **ADMIN*** displays, then press **ENTER**.
3. Enter the three-part numerical password (see “Entering the Administration Menu Password” on page 4-7).
4. **INFO*** displays. Press **NEXT** until **CONFIG*** displays, then press **ENTER**.
5. Press **NEXT** or **PREV** until the name of the configuration to set displays, then press **ENTER**. If the configuration has multiple settings, the current setting flashes. Otherwise, the configuration option is set and a confirmation message displays. (Configuration options are described on the following pages.)

If the current configuration setting is flashing, press **NEXT** or **PREV** until the desired setting displays, then press **ENTER**. **OPTION SAVED** displays.

6. Press **CANCEL** to return to the drive status (“ready” state).

The following table describes the available configurations.

Table 4-5 Configuration Options

Config Name	Description	Default
RECOVERY ON/OFF	ON Library attempts to recover from errors. OFF Library immediately stops moving if an error condition occurs. Default is RECOVERY ON, and recovery should remain ON under normal conditions.	ON
RESTORE DEFAULTS	Sets all library configurations back to their default settings.	—
CLEAR ODOMETERS	Used by service personnel only. Sets all library odometers back to zero.	—
STARWARS ON/OFF	Used by service personnel only. Set to ON during normal operation. ON Library runs with the vertical sensors enabled. OFF Library runs with the vertical sensors disabled.	ON
NEW PASSWORD	Changes the numerical password required to access ADMIN* options (configurations, tests, and information logs). To change the password, see “Setting a New Administration Menu Password” on page 4-8.	—
SECURE ON/OFF	Toggles between ON and OFF. If the configuration is set to ON, tape magazines cannot be loaded or removed. If the configuration is set to OFF, the library operates in its default state, which allows cartridges to be loaded and removed.	OFF
POWER SECURE ON/OFF	ON SECURE ON/OFF configuration setting is retained after a power outage. OFF Library returns to its default setting of POWER SECURE OFF when power is returned after being shut off.	OFF

Table 4-5 Configuration Options (Continued)

Config Name	Description	Default
REP RECOVERED ON/OFF	ON Recovered errors are reported. OFF Recovered errors are not reported.	ON
CONF40 ON/OFF	Used by service personnel only. Do not attempt to use this configuration – to do so may result in a service call.	—
BARCODE ON/OFF	ON Bar codes and slot locations are stored into library memory when the front access door is closed and the Inventory Check test automatically runs. OFF Bar codes are not recorded when the Inventory Check test runs.	ON

Retrieving Performance Information

1 2 → ADMIN* → PSWD 000 000 000 → INFO*

Use the **INFO*** option to dDisplay information about the operations of the library. This information is called a log.

To access an information log:

1. Verify that the drive status displays (if not, press **CANCEL** until it does).
2. Press **NEXT** until **ADMIN*** displays, then press **ENTER**.
3. Enter the three-part numerical password (see “Entering the Administration Menu Password” on page 4-7).
4. **INFO*** displays. Press **ENTER**.
5. Press **NEXT** until the name of the log to access displays, then press **ENTER**.
An asterisk (*) indicates that there are more choices beneath the displayed choice.
6. Press **CANCEL** to return to the drive status (“ready” state).

Table 4-6 Information Logs

	Problem	Solution
REVISION		Library firmware revision number.
LIB ODOMETERS * Press ENTER to select the odometer logs.	HOURS #	Number of operation hours (time during which power was on). Some time may have been spent in power reduction mode.
	MOVES #	Total number of moves and move attempts by the cartridge transport mechanism.
	XLATES #	Total number of cartridge transport mechanism horizontal moves.
DRIVE LOADS *	DRIVE 1	Number of tape cartridge loads for drive 1.
	DRIVE 2	Number of tape cartridge loads for drive 2 (two drive library only).

Table 4-6 Information Logs (Continued)

	Problem	Solution								
DRIVE FW*	D1 REVISION#	Firmware revision of drive 1.								
	D2 REVISION#	Firmware revision of drive 2 (two drive library only).								
INTERFACE FW*	BUS NUM =	Press NEXT or PREV to display the interface bus number to select, then view: <table><tr><td>FAST WIDE SCSI</td><td>Fast wide interface bus type.</td></tr><tr><td>8052 REV #</td><td>Displays the SCSI interface processor 8052 firmware revision.</td></tr><tr><td>8052 CKSUM #</td><td>Checksum of the 8052 code.</td></tr><tr><td>COBRA REV #</td><td>Revision of the cobra chip on the interface.</td></tr></table>	FAST WIDE SCSI	Fast wide interface bus type.	8052 REV #	Displays the SCSI interface processor 8052 firmware revision.	8052 CKSUM #	Checksum of the 8052 code.	COBRA REV #	Revision of the cobra chip on the interface.
FAST WIDE SCSI	Fast wide interface bus type.									
8052 REV #	Displays the SCSI interface processor 8052 firmware revision.									
8052 CKSUM #	Checksum of the 8052 code.									
COBRA REV #	Revision of the cobra chip on the interface.									
HARD ERROR *		Log of unrecoverable errors and commands that did not successfully complete. Returns either “NO HARD ENTRIES” or “ENTRY #”. (There may be multiple hard error numbers.) Press ENTER to view the log for the currently displayed error, or press NEXT to select the next error.								
Log entries are described after “RECOVERY ERROR” in this table.										
SOFT ERROR *		Log of recovered errors and commands successfully completed. Returns either “NO SOFT ENTRIES” or “ENTRY #”. (There may be multiple soft error numbers.) Press ENTER to view the log for the currently displayed error, or press NEXT to select the next error.								
Log entries are described after “RECOVERY ERROR” in this table.										
RECOVERY ERROR *		Log of errors during most recent move. Returns either “NO ENTRIES” or the number of recovery errors. Press ENTER to view the log for the currently displayed error, or press NEXT to select the next error.								
Log entries are described in the following rows.										

Table 4-6 Information Logs (Continued)

	Problem	Solution
Log Entries		
Log entries for HARD ERROR *, SOFT ERROR *, and RECOVERY ERROR * An asterisk <i>before</i> the log name indicates that pressing ENTER when an error number is displayed provides more information.	*HARDWARE ERR#	Indicates the cause of the failure.
	*FRU 1 #	Field replaceable unit most likely to be at fault.
	*FRU 2 #	Field replaceable unit second most likely to be at fault.
	*FRU 3 #	Field replaceable unit third most likely to be at fault.
	MOTION <name>	<name> indicates the type of movements taking place at the time of the failure: EXCHANGE MOVE POSITIONINIT ELEMREZERO ROTATEDIAGNOSTIC RESTORE
	SOURCE #	Element number to which the source refers. (Valid for MOVE, EXCHANGE, and POSITION movements only.)

Table 4-6 Information Logs (Continued)

	Problem	Solution
Log entries for error logs (continued) An asterisk <i>before</i> the log name indicates that pressing ENTER when an error number is displayed provides more information.	DESTINATION 1 #	Element to which the first destination refers. (Valid for MOVE and EXCHANGE movements only.)
	DESTINATION 2 #	Element to which the second destination refers. (Valid for EXCHANGE movement only.)
	ODOMETER #	Move number in which the error occurred.
	*MICROMOVE 1 #	First library micro-move for the original move command issued before the failure.
	*MICROMOVE 2 #	Second library micro-move for the original move command issued before the failure.
	*MICROMOVE 3 #	Third library micro-move for the original move command issued before the failure.
	*MICROMOVE 4 #	Fourth library micro-move for the original move command issued before the failure.
	*MICROMOVE 5 #	Fifth library micro-move for the original move command issued before the failure.
	*MICROMOVE 6 #	Last library micro-move for the original move command issued before the failure.
	*MICROMOVE ER #	Actual micro-move error that occurred.

Running an Internal Test

1 2 → ADMIN* → PSWD 000 000 000 → TEST*

WARNING

Class II laser light is generated in this library. If operating the library with access panels removed or with less than three tape magazines installed with the interlocks disabled and the front door open, do not stare into the light from the bar code reader.

Laser light warning labels are located adjacent to the side access panels and the top access panel.

CAUTION

Some diagnostic tests, such as Exchange Demo, may place tape cartridges in unexpected locations, which can cause problems with the software application being used.

NOTE

Some diagnostic tests can only be run through the SCSI interface. Refer to *Digital Linear Tape Drive and Library SCSI-2 Command Reference* (HP part number 5960-7674) for information about these tests.

To run self-diagnostic tests:

1. Verify that the drive status displays (if not, press **CANCEL** until it does).
2. Press **NEXT** until **ADMIN*** displays, then press **ENTER**.
3. Enter the three-part numerical password (see “Entering the Administration Menu Password” on page 4-7).
4. **INFO*** displays. Press **NEXT** or **PREV** until **TEST*** displays, then press **ENTER**.
5. Press **NEXT** until test to run displays, then press **ENTER**.
6. **NUM LOOPS #**, where “#” is flashing and represents the number of test cycles the test will go through.
7. Press **NEXT** to specify the number of cycles, then press **ENTER** to start the test.

NOTE

Press **CANCEL** at any time to abort a test. **TEST CANCEL - WAIT** displays while the current test loop completes.

The following table describes the internal tests available from the control panel. Tests are listed alphabetically according to function.

Table 4-7 Internal Tests

Test Name	Description
EXERCISE MECH	Runs the VERTICAL TEST, TRANSLATE TEST, MAGAZINE IO, and DRIVE IO tests. Each test is run one time per test loop. Drives and picker must be empty. Also requires one loaded tape cartridge and empty slots equal to the number of drives installed.
EXCHANGE DEMO	Used by service personnel only. Do not run this test if the library contains tape cartridges with customer data on them. This test moves randomly chosen cartridges to random storage slot locations. This test displays FAIL if there are no cartridges in the library or if all storage slots are full. For best results, the library should contain as many cartridges as there are drives, plus two additional cartridges. The transport and mailslot must be empty.
IO DRIVE	Makes a combination of moves with a PASS/FAIL result. If the drives are empty, a tape cartridge is moved from a randomly chosen full slot to a randomly chosen drive. If the drives are full, a tape cartridge is moved from a randomly chosen drive to a randomly chosen storage slot. It then moves the cartridge back to its original location. This test displays FAIL if there are no cartridges in the library or if all storage slots are full. The transport and mailslot must be empty.
IO MAGAZINE	Makes a combination of moves with a PASS/FAIL result. It moves a tape cartridge from a randomly chosen full slot to a randomly chosen empty slot. It then moves the tape cartridge back to its original storage slot. This test displays FAIL if there are no cartridges in the library or if all storage slots are full. The drives, transport, and mailslot must be empty.
INVENTORY CHECK	Functions the same as the SCSI Initialize Element Status command. This test physically scans the entire unit to determine which storage slots contain tape cartridges and if the drives contain cartridges. NOTE: This test appears as "ISTAT TEST" in all front panel error messages.
TEST TRANSLATE	Translates from side to side. No tape cartridges are required.
TEST VERTICAL	Moves the transport mechanism up and down the full length of the rail. Returns PASS/FAIL. No tape cartridges are required.

Table 4-7 Internal Tests (Continued)

Test Name	Description
WELLNESS TEST	Checks out the general capability of the library. Runs INIT MECHANICS and EXERCISE MECH. Each test is run one time per test loop.
FIND PLUNGE HOME	Runs mechanism recalibration, determines the reference points in the picker travel path, and tests the picker. This test assumes that the mechanics and servo system are functional. No tape cartridges are required.
FIND VERT HOME	Recalibrates the vertical position and verifies that the vertical path is clear. No tape cartridges are required.
FIND XLATE HOME	Calibrates the translate position. No tape cartridges are required.
INIT MECHANICS	Runs the FIND PLUNGE HOME, FIND VERTICAL HOME, FIND XLATE HOME, and INIT ELEM STATUS tests. Each test is run one time per test loop.
EMPTY DRIVES	Service personnel use only. Do not run this test if the library contains cartridges containing actual customer data. Moves cartridges out of the drive mechanisms and returns them to their home storage slot locations if the locations are known, otherwise the cartridges are placed into the first available empty storage slot.
EMPTY PICKER	Service personnel use only. Do not run this test if the library contains cartridges containing actual customer data. Moves a tape cartridge from the cartridge transport mechanism to its home storage slot location if that location is known, otherwise the cartridge is placed into the first available empty storage slot.
FILL PICKER	Service personnel use only. Do not run this test if the library contains tape cartridges containing actual customer data. Moves a tape cartridge into the cartridge transport mechanism from the first storage slot containing a cartridge.

Table 4-7 Internal Tests (Continued)

Test Name	Description
REWIND MEDIA	Service personnel use only. Do not run this test if the library contains tape cartridges containing actual customer data. Rewinds the tape in the drive(s) and opens the solenoid in the drive handle, which allows the tape to be removed from the drive by lifting the handles. This option removes tapes from the drives If the picker malfunctions.
CLEAR SOFT LOG	Sets the soft error log to zero.
CLEAR HARD LOG	Sets the hard error log to zero.
PLUNGE FULL SPD	Allows the cartridge transport mechanics to run at full speed. Always use under normal library operation.
PLUNGE 1/2 SPD	Service personnel use only. Allows the cartridge transport mechanics to run at half speed.
SENSOR TRANSLATE	Tests the horizontal path that the cartridge transport mechanism follows when moving from one stack of tape cartridges to another. Displays ON or OFF. If OFF displays, the sensor is blocked. (This display is automatically updated if the sensor status changes.) Requires the use of one tape cartridge.
SENSORS MAGAZINE	The display shows M1 1 M2 1 M3 1 . Each “1” indicates that the caddy is in place. If a “0” displays, the caddy has not been inserted into the library. (This display is automatically updated if the sensor status changes.)
SENSORS STARWARS	0 0 displays. Each 0 indicates one path that the cartridge transport mechanism follows in front of each stack of tape cartridges. If the path is clear, 0 displays; if the path is blocked (for example, because a cartridge is not inserted fully into its storage slot), * displays. (This display is automatically updated if the sensor status changes.)
VERTICAL ENCODER	Moves the cartridge transport mechanism down, back up a short distance, then back down. The last time the transport mechanism is moved down the number of encoder counts is verified. Returns PASS/FAIL. No tape cartridges are required.

Using Online Repair

1 2 → ADMIN* → PSWD 000 000 000 → ONLINE REPAIR

Online repair is a feature that allows:

- Authorized service representatives to replace a faulty drive while the library is active.
- Users to clear a drive cleaning error when the tape in the drive may be damaged.

Under normal conditions, this option should only be used by an HP qualified authorized service representative. However if an older, frequently-used tape causes a drive cleaning message to be displayed more than once and the administrator suspect the tape is damaged, the Online Repair option can be used to clear the drive error message so the administrator can attempt to recover data from the damaged tape.

CAUTION

The library drive mechanism(s) are inactive while this option is in use.

To use this option to clear a drive cleaning error:

1. With **CLEAN DRV #** displayed, press **CANCEL** until the drive status displays. (# is the drive number containing the damaged tape.)
2. Press **NEXT** until **ADMIN*** displays, then press **ENTER**.
3. Enter the three-part numerical password (see “Entering the Administration Menu Password” on page 4-7).
4. **INFO*** displays. Press **NEXT** or **PREV** until **ONLINE REPAIR*** displays, then press **ENTER**. **DRIVE POWER*** displays.
5. Press **NEXT** or **PREV** until **DRIVE STATUS** displays, then press **ENTER**. **DRV 1 ON GOOD** displays.
 - If the damaged tape is in drive 1, press **ENTER**.
 - If the damaged tape is in drive 2, press **NEXT** until **DRV 2 ON GOOD** displays, then press **ENTER**.

DRV # ON GOOD displays, where “#” is the drive number and **ON GOOD** is flashing.

6. Press **NEXT** until **DRV # OFF FAILED** displays then press **ENTER**.
7. **CHANGE CONFIRMED** displays briefly, then **ONLINE REPAIR*** displays. Press **ENTER**.
8. **DRIVE POWER*** displays.
9. Press **NEXT** or **PREV** until **DRIVE STATUS** displays, then press **ENTER**.
10. Press **NEXT** or **PREV** until **DRV # OFF FAILED** displays (where “#” is the number of the drive that was just taken offline) then press **ENTER**.
11. **DRV # OFF FAILED** displays, where “#” is the drive number and “OFF FAILED” is flashing.
12. Press **NEXT** until **DRV # ON GOOD** displays, then press **ENTER**.
13. **SETTING UP DRIVE** displays briefly while the drive communication tests run, then **CHANGE CONFIRMED** displays briefly, then **ONLINE REPAIR*** displays.
14. Press **CANCEL** twice to return to the drive numbers and status indicators (“ready” state).
15. Try reading the damaged tape again.
 - If the tape can be read, back up data from the damaged cartridge to another tape cartridge and discard the damaged one.
 - If the tape cannot be read, call a service representative.

Clearing a Drive Cleaning Error

1 2 → ADMIN* → PSWD 000 000 000 → ONLINE REPAIR

CAUTION

Using this option causes the library drive mechanism(s) to become inactive.

To use this option to clear a drive cleaning error:

1. With **CLEAN DRV #** displayed, press **CANCEL** until the drive status displays. (# is the drive number containing the damaged tape.)
2. Press **NEXT** until **ADMIN*** displays, then press **ENTER**.
3. Enter the three-part numerical password (see “Entering the Administration Menu Password” on page 4-7).
4. **INFO*** displays. Press **NEXT** or **PREV** until **ONLINE REPAIR*** displays, then press **ENTER**. **DRIVE POWER*** displays.
5. Press **NEXT** or **PREV** until **DRIVE STATUS** displays, then press **ENTER**. **DRV 1 ON GOOD** displays.
 - If the damaged tape is in drive 1, press **ENTER**.
 - If the damaged tape is in drive 2, press **NEXT** until **DRV 2 ON GOOD** displays, then press **ENTER**.

DRV # ON GOOD displays, where “#” is the drive number and **ON GOOD** is flashing.
6. Press **NEXT** until **DRV # OFF FAILED** displays then press **ENTER**.
7. **CHANGE CONFIRMED** displays briefly, then **ONLINE REPAIR*** displays. Press **ENTER**.
8. **DRIVE POWER*** displays.
9. Press **NEXT** or **PREV** until **DRIVE STATUS** displays, then press **ENTER**.
10. Press **NEXT** or **PREV** until **DRV # OFF FAILED** displays (where “#” is the number of the drive that was just taken offline) then press **ENTER**.
11. **DRV # OFF FAILED** displays, where “#” is the drive number and “OFF FAILED” is flashing.
12. Press **NEXT** until **DRV # ON GOOD** displays, then press **ENTER**.

13. **SETTING UP DRIVE** displays briefly while the drive communication tests run, then **CHANGE CONFIRMED** displays briefly, then **ONLINE REPAIR*** displays.
14. Press **CANCEL** twice to return to the drive numbers and status indicators (“ready” state).
15. Try reading the damaged tape again.

If the tape can be read, back up data from the damaged cartridge to another tape cartridge and discard the damaged one.

Troubleshooting

There are two ways to get information and run tests when errors occur in library operation.

Operating system-based support tools allow use of a consistent user interface that spans product lines, as well as remote access.

Library firmware-based diagnostics require use of the library's control panel and display window.

Operating System-based Support Tools

Several different types of operating system-based support tools exist. Not all are supported on all devices.

The following table provides a brief description of the types of tools.

Table 4-8 **Support Tool Characteristics**

Tool Type	Description	Self-maintainer license required	Supported for	
			Drives	Robotics
Information tools	Provides quick access to the most useful information about a device.			✓
Verifiers	Quickly verifies that a particular device is properly connected and functional.		✓	
Exercisers	Stresses the hardware and helps reproduce intermittent problems.		✓	
Diagnostics	Tests a device and isolate a failure down to the most suspect FRU.	✓	✓	
Expert tools	Assists HP service representatives in low-level troubleshooting.	✓	✓	✓
Firmware update tools	Update the firmware.	✓	✓	✓

Running Support Tools

The Support Tools Manager (STM) can be accessed through any of three interfaces:

- xstm (X Window graphical) — for X Windows terminals and workstations. Execute:
/usr/sbin/xstm or /usr/sbin/stm/ui/bin/stm -x
- mstm (menu-based) — for non-graphics terminals. Execute:
/usr/sbin/mstm or /usr/sbin/stm/ui/bin/stm -m
- cstm (command line) — for running scripts. Execute:
/usr/sbin/cstm or /usr/sbin/stm/ui/bin/stm -c

1. Select the device to test from the displayed system map. Each DLT tape mechanism within the library, as well as the robotics controller, is visible as a separate icon on the system map. (The robotics controller icon is labeled “SCSI Media Changer”).
2. Choose a support tool (for example, a verifier) to run on the selected device.

Results appear on the system map (for example, on xstm, a green icon indicates that a device successfully passed the test).
3. If the device fails, see the device Failure Log for the cause of the failure and suggested actions.
4. If a test result is anything other than Successful or Failure, look at the Test Activity Log for the device.

The specific steps depend on whether the interface being used is xstm, mstm, or cstm. For example, in xstm, commands are accessed by means of pull-down menus. In mstm, menus are traversed and commands are selected by pressing function keys. In cstm, the command name (or its abbreviated form) is entered at the prompt. For detailed instructions, use the STM online help system.

To obtain more information on STM, order the Support Media User's Manual (part number 92453-90010).

DLT Drive Expert Tools

The following table lists expert tool categories, and the specific commands available within each for the drives.

Table 4-9 Drive Expert Tool Commands

Category	Command	Effect
File	EXIT	Exits the Support Tools Manager.
Logs	VIEW LOGS	Displays the Read Error Counter Page, Write Error Counter Page, or Compression Log.
	CLEAR LOGS	Clears the Read Error Counter Page or the Write Error Counter Page.
Info	DESCRIBE	Displays the product ID, product revision level, and firmware revision level.
	DRIVE INFO	Displays power-on hours and tape motion hours.
Tests	TAPE VALIDATE	Reads a suspect tape until either an error is detected or end of data is encountered.
	SELFTEST	Executes the DLT device's built-in diagnostic selftest.
	TUR	Sends a Test Unit Ready command.
Utility	TAPE COPY	Performs a tape-to-tape copy.
	UNLOAD TAPE	Performs an unload sequence.
	LOAD TAPE	Performs a load sequence.
	REWIND	Rewinds to beginning of tape.
	MODE SENSE	Displays user selected mode pages.
	MEDIA REMOVAL	Prevents or allows medium removal.
	MODE SELECT	Configures user selected mode pages.
Options	DISPLAY FORMAT	Displays data as either raw hex, decoded formatted text, or both.

Robotics Controller Expert Tools

The following table lists expert tool categories, and the specific commands available within each for the robotics controller.

Table 4-10 **Robotics Controller Expert Tool Commands**

Category	Command	Effect
File	EXIT	Exits the Support Tools Manager.
Logs	VIEW LOGS	Displays the Error, Recovery, Drive, Odometer, and Runtime Logs.
Info	DESCRIBE	Displays the vendor ID, product ID, product revision level, and peripheral device type.
	READ ELEMENT STATUS	Displays the status of the Storage, Medium Transport, Data Transfer, or Import/Export Element.
	MODE SENSE	Displays the Device Capabilities or Element Address mode page.
Tests	TEST UNIT READY	Sends a Test Unit Ready command.
	SELFTEST	Runs the power up selftest, which calibrates the picker and inventories the library.
	WELLNESS	Runs the power up selftest, then performs the “Exercise Mechanism” test (see below).
	EXERCISE MECHANISM	Tests the picker’s ability to interact with a drive and storage slot (each randomly selected), and the mail slot. At least one drive and the mailslot must be empty at the outset for this test to execute properly.
	EMPTY DRIVES	Moves cartridges out of the drive mechanism(s) and returns them to their storage slots.
	FILL PICKER	Loads the picker with a cartridge from the first slot containing a cartridge.

Table 4-10 Robotics Controller Expert Tool Commands (Continued)

Category	Command	Effect
Tests (continued)	EMPTY PICKER	Unloads the picker. The cartridge is returned to its home location if it is known, otherwise to the first available empty slot.
	VERTICAL ENCODER	Moves the picker up and down its full course of travel.
Utility	REZERO	Initialize robotics controller.
	POSITION TO ELEMENT	Position picker in front of a selected slot.
	MOVE MEDIUM	Move medium from a selected source slot to a selected destination slot.
	EXCHANGE MEDIUM	Exchange medium between two selected slots.
	INITIALIZE ELEMENT STATUS	Inventories the library to determine the location of tape cartridges.
	DRIVE STATUS	For use with on-line drive repair. Gets and sets the status of drives in the library.
Options	DISPLAY FORMAT	Allows data to display as either raw hex, decoded formatted text, or both.

Resolving Other Problems

This section provides information on solutions to problems that may occur in the operation of the library. Table 4-11 on page 4-44 lists steps to take before consulting a service representative.

NOTE

If a service call is needed, write down the library serial number before calling. The serial number is located on a label towards the bottom of the library on the library rear panel.

For problems that may be related to the computer, refer to the host computer system documentation or library application software instructions.

Table 4-11 Troubleshooting

Problem	Solution
Library will not power on.	• Make sure the power cord connections are tight. • Make sure the power switch is switched on. (The power switch is located on the library control panel, see Figure 4-1 on page 4-3.) • Make sure the power outlet is operating. • Replace the power cord with a known good one. • If the library still won't power on, call a service representative.
Power on self test failed. DEVICE FAILED displays.	• Verify that all tapes in the bulk load magazines are fully inserted in the magazines, and that the magazines are securely locked into position inside the tape library. • Press the power switch off and then on again. (See the caution note at the end of this table.) • If the power on test continues to fail, press ENTER, write down the displayed error code, and call a service representative for assistance.
DEVICE FAILED displays. Hardware Error #61 (External SCSI cables) is reported.	• Make sure that only differential SCSI device type is used on the SCSI bus. • Verify that the library SCSI selector switch is set correctly (differential). • Verify that the bus is properly terminated.
The library's power failed while a cartridge was in the drive and did not return to the drive status indicators ("ready" state) after the power came back on.	• Press the power switch off and then on again. (See the caution note at the end of this table.) • If the power on test is unsuccessful, switch off the power. Call a service representative for assistance.

Table 4-11 Troubleshooting (Continued)

Problem	Solution
No display messages appear.	• Make sure the power cord is connected. • Make sure the power switch is on. • Power cycle the library. (See the caution note at the end of this table.) • If there is still no display, call a service representative for assistance.
An error message is received after bulk loading tape cartridges.	• Verify that cartridges are inserted into the magazine in the correct orientation. (See “Loading Cartridges Into the Library” on page 4-13.) • Verify that the correct tape type is used. (See “Choosing Tape Cartridges” on page 3-3.) • If the light bar on the display panel is orange, cycle power to the library and try to load the magazine again when the drive numbers and status indicators are displayed. (See the caution note at the end of this table.) • If SECURITY ENABLED displays, a security option has been set that prevents cartridges from being loaded into or removed from the library. See “Setting Configuration Options” on page 4-24. • If TRANSPORT FULL displays, the cartridge transport mechanism already contains a tape cartridge. Refer to the software package documentation. A service call may be needed. • If a LOAD ERROR or FAILED message still displays, this could indicate a library failure; call a service representative for assistance.
Changed drive address but the new address is not recognized by the host.	Try rebooting the host computer. Some computers require this for the new address to be recognized. (See the caution note at the end of this table.)

Table 4-11 Troubleshooting (Continued)

Problem	Solution
Cannot remember the administration menu password.	First, try the default password (000-000-000). If the default is not accepted, call a service representative for assistance.
Attempted to open the front access door, but a RESERVED message displays.	• The host may have reserved an element and must unreserve it. Refer to the host system documentation to unreserve a tape. • A security configuration was set to prevent cartridge removal. See “SECURE ON/OFF” in the list of configurations found in “Setting Configuration Options” on page 4-24.
Started a test and need to stop.	Press CANCEL . The current test loop continues until finished, then the test stops.
DO INVENTORY TEST displays (initialize element status).	• Power cycle the library by pressing the power switch off and then on again. (See the caution note at the end of this table.) • Run the INVENTORY CHECK test under the TEST* menu.
Cannot write to the tape.	• Check the host file system access permissions. • Check the write-protect tab on the cartridge to assure write-enabled status. • Check the application software.
Cannot read the tape.	• Check the host file system access permissions. • Verify that the correct tape type is used (See “Choosing Tape Cartridges” on page 3-3.) • Check the application software.

CAUTION

Do not press the library power switch until all SCSI peripherals connected to host are shut down. Pressing the power button when the SCSI system is active can cause data loss and/or problems with the SCSI interface.

A **Supplies and Accessories**

Supplies and Accessories

A full range of computer supplies can be ordered through a Hewlett-Packard authorized dealer or sales office, or by phoning or writing HP Direct.

Call 1-800-752-0900 for the location of your nearest authorized Hewlett-Packard dealer.

To phone HP Direct call 1-800-538-8787, or write to HP Direct at the following address:

HP Direct
Hewlett-Packard
attn: Mail Order
P.O. Box 1145
Roseville, California 95678

See Table A-1 for a list of basic supplies and accessories.

Table A-1 Basic Supplies and Accessories

Item	HP Product Number	HP Part Number
Bulk Load Tape Magazines		
5-slot removable magazine with 5 HP DLT tape IV data cartridges	C5148F	—
5-slot removable magazine, empty	C5149F	—
Tape Cartridges		
HP DLTtape IV Data Cartridge 35 Gbyte/20 GByte native capacity	C5141F	—
HP DLTtape III XT Data Cartridge 15 GByte native capacity	C5141A	—
Cleaning Tape Cartridge	C5142A	—
Bar Code Labels		
Bar code labels are not available through Hewlett-Packard, but can be ordered through other companies (see sample labels shipped in the accessories kit). When ordering, make sure the bar code labels meet the following specifications: Message: 6-character (2 alpha, 4 numeric) Dimensions: 2.2 in x .82 in Symbology: code 39 without check digit Start/Stop Characters: */* Narrow Bar: 0.014 in Ratio: 2.5:1 Print Quality: ANSI Grade "A"	—	—

Table A-1 Basic Supplies and Accessories (Continued)

Item	HP Product Number	HP Part Number
SCSI Cables (68-pin to 68-pin)		
.5m SCSI cable; high-density with thumb screws to high-density with thumb screws, m-m	C6509A	8120-6147
2.5m SCSI cable; high-density with thumb screws to high-density with thumb screws, m-m	C2924A	A1658-62020
5m SCSI cable; high-density with thumb screws to high-density with thumb screws, m-m	C6511A	A1658-62021
10m SCSI cable; high-density with thumb screws to high-density with thumb screws, m-m	C2925A	A1658-62022
20m (65.6 ft) SCSI cable; high-density with thumb screws to high-density with thumb screws, m-m	C2926A	A1658-62023
SCSI Cables for V-Class (68-pin to 68-pin)		
5m SCSI cable; high-density with thumb screws to high-density with thumb screws, m-m; with inline terminator for V-Class	—	A4801-63004
10m SCSI cable; high-density with thumb screws to high-density with thumb screws, m-m; with inline terminator for V-Class	—	A4801-63002
SCSI Cables (50-pin to 68-pin)		
1m SCSI cable; high-density with thumb screws to high-density with thumb screws, m-m;	C2961A	5181-7705
1.5m SCSI cable; high-density with thumb screws to high-density with thumb screws, m-m	C2962A	5181-7706
2m SCSI cable; high-density with thumb screws to high-density with thumb screws, m-m;	C2906A	5181-7707
5m SCSI cable; high-density with thumb screws to high-density with thumb screws, m-m	C2907A	5181-7708

Table A-1 Basic Supplies and Accessories (Continued)

Item	HP Product Number	HP Part Number
Drive Upgrade Kits		
DLT 4000 – 1 Drive upgrade kit (upgrades a DLT4000 1/15 to DLT4000 2/15)	A4842A	—
DLT 7000 – 1 Drive upgrade/conversion kit (upgrades a DLT4000 1/15 to DLT7000 2/15 or DLT4000 1/15 to DLT7000 2/15)	A4843A	—
User's Guide (replacement/additional)		A4851-90000

Supplies and Accessories
Supplies and Accessories

Overview

This section contains important safety and regulatory information for the United States, Finland, Sweden, European Union, and Japan.

Safety Information

Laser Safety

WARNING

Do not attempt to disable the interlocks or open the service panels while library power is turned on. If the library is operating with the service panels removed, or with fewer than three magazines inserted and the door is open, you can be exposed to Class II laser light emitted from the bar code reader.

CDRH Regulations (USA Only)

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States. The labels and artwork shown below indicate compliance with CDRH regulations and must be attached to laser products marketed in the United States.

Complies with 21 CFR Chapter 1 Subchapter J.

WARNING

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

Laser Class Information: A black on yellow label that reads, “Class 1 Laser Product” printed in English, French, German, Finnish, Japanese, and Spanish.

Regulatory Information

FCC Radio Frequency Interference Statement (USA Only)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of FCC Rules. 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 instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

EC Radio Frequency Interference Statement (Europe Only)

WARNING

This is a class B product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

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.

EC Declaration of Conformity

DECLARATION OF CONFORMITY according to ISO/IEC Guide 22 and EN 45014	
Manufacturer's Name:	Hewlett-Packard Company
Manufacturer's Address:	8000 Foothills Boulevard Roseville, California 95747 U.S.A.
declares, that the product	
Product Name:	HP Advanced DLT Library Systems
Model Number(s):	A4851x (x is any letter A-Z)
Product Options:	All
conforms to the following Product Specifications:	
Safety:	IEC 950:1991 + A1, A2, A3 / EN 60950:1992 + A1, A2, A3 IEC 825-1: 1993 / EN 60825-1: 1994, Laser Class 1
EMC:	CISPR 22:1993 / EN 55022:1994 - Class B ¹ EN 50082-1:1992 IEC 1000-4-2:1995 / prEN 55024-2:1992, 4 kV CD, 8 kV AD IEC 1000-4-3:1995 / prEN 55024-3:1991, 3 V/m IEC 801-4:1988 / prEN 55024-4:1993, 0.5 kV Signal Lines 1 kV Power Lines IEC 1000-3-2:1995 / EN 61000-3-2:1995, Class D, Harmonics IEC 1000-3-3:1994 / EN 61000-3-3:1995, Flicker FCC Title 47 CFR, Part 15, Class B ²
Supplementary Information:	
The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the CE marking accordingly.	
1) The Product was tested in a typical configuration with a Hewlett-Packard computer system.	
2) This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: 1) this device may not cause harmful interference, and 2) this device must accept any interference received, including interference that may cause undesired operation.	
 Frank D. Dembski Jr., Quality Manager	
Roseville, October 1, 1997	
USA Contact: ESY-Rosville Product Regulations Manager, Hewlett-Packard Company, 8000 Foothills Boulevard, Roseville, California 95747 USA (FAX: 916-785-5096) European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department TRE, Herrenberger Straße 130, D-71034 Böblingen (FAX: + 49-7031-14-3143)	

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)

Turvallisuusyhteenveto

Laserturvallisuus

LUOKAN 1 LASERLAITE

KLASS 1 LASER APPARAT

HP DLT Tape Library -nauhamuistiasemat ovat käyttäjän kannalta turvallisia luokan 1 laserlaitteita. Nauhamuistiasemien sisälle asennettu lasersädeä käyttävä viivakoodinlukija ei normaalissa käytössä aiheuta vaaraa käyttäjälle.

Laitteiden turvallisuusluokka on määritetty standardin EN 60825-1 (1994) mukaisesti.

VAROITUS !

Laitteen käyttäminen muulla kuin käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle lasersäteilylle.

VARNING !

Om apparaten används på annat sätt än i bruksanvisning specificerats, kan användaren utsättas för laserstrålning som överskrider gränsen för laserklass 1.

HUOLTO

HP DLT Tape Library -nauhamuistiasemien sisällä ei ole käyttäjän huollettavissa olevia kohteita. Laitteen saa avata ja huoltaa ainoastaan sen huoltamiseen koulutettu henkilö. Nauhamuistiaseman sisälle asennettua viivakoodinlukijaa ei tule avata eikä purkaa huoltotoimenpiteiden yhteydessä.

VARO !

Nauhamuistiaseman suojakotelon ollessa avattuna saatat altistua lasersäteilylle viivakoodinlukijan toimiessa. Älä tuijota säteeseen.

Safety and Regulatory Information
Regulatory Information

WARNING !

När skyddshöljet av magnetbandstationen är öppnad, kan användaren utsättas för laserstrålning då streckkodläsare är i funktion. Stirra ej in i strålen.

Tiedot viivakoodinlukijassa käytettävän laserdiodin säteilyominaisuuksista:

Aallonpituus	675 nm
Teho	0,5 mW
Turvallisuusluokka	Luokan 2 laser

English Translation of Finnish Regulatory Information

LASER SAFETY SUMMARY

LASER SAFETY

CLASS 1 LASER PRODUCT

HP DLT Tape Library Systems are for user safe class 1 laser products. In normal use the laser bar code reader installed inside the tape library units doesn't cause any hazard to the user.

The laser safety class of the libraries was defined in accordance with the standard EN 60825-1 (1994).

WARNING!

The use of the product otherwise than specified in the user's manual may expose the user to laser radiation exceeding safety class 1.

SERVICE

There are no user serviceable parts inside the HP DLT Tape Library units. The DLT units can be serviced only by qualified service personnel. The laser bar code reader installed inside the library units shall not be opened or disassembled during service.

WARNING!

If the enclosure of the tape library unit is opened, you may be exposed to laser radiation when the bar code reader is operating. Don't stare into the beam.

The information about the radiation characteristics of the laser diode used in the laser bar code reader:

Wavelength	675 nm
Power	0,5 mW
Laser safety class	Class 2 laser

Japanese VCCI 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。

高調波ガイドライン適合品

English Translation of Japanese VCCI Statement

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.

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