

SL500 (M852x) Tape Library Installation and User's Guide

Abstract

This manual describes how to install and use an M852x tape library on HP NonStop™ servers.

Product Version

N.A.

Supported Release Version Updates (RVUs)

This publication supports G06.31 and all subsequent G-series RVUs and H06.11 and all subsequent H-series RVUs until otherwise indicated by its replacement publication.

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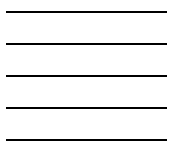
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What's New in This Manual

Manual Information

Abstract

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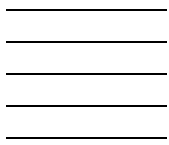
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New and Changed Information

The N1522A LTO generation 2 SCSI tape drive has been replaced by the N1523A LTO generation 3 SCSI tape drive.



About This Manual

Notation Conventions

Hypertext Links

Blue underline is used to indicate a hypertext link within text. By clicking a passage of text with a blue underline, you are taken to the location described. For example:

This requirement is described under [Backup DAM Volumes and Physical Disk Drives](#) on page 3-2.

computer type. *Computer type* letters within text indicate C and Open System Services (OSS) keywords and reserved words. Type these items exactly as shown. Items not enclosed in brackets are required. For example:

`myfile.c`

italic computer type. *Italic computer type* letters within text indicate C and Open System Services (OSS) variable items that you supply. Items not enclosed in brackets are required. For example:

pathname

Change Bar Notation

Change bars are used to indicate substantive differences between this manual and its preceding version. Change bars are vertical rules placed in the right margin of changed portions of text, figures, tables, examples, and so on. Change bars highlight new or revised information. For example:

The message types specified in the REPORT clause are different in the COBOL environment and the Common Run-Time Environment (CRE).

The CRE has many new message types and some new message type codes for old message types. In the CRE, the message type SYSTEM includes all messages except LOGICAL-CLOSE and LOGICAL-OPEN.

1 Overview of the Tape Library

This section includes:

Views and Locations	1-4
Physical Configurations	1-4
Robotics Unit	1-11
Electronics	1-14
Fans	1-14
Power System	1-15
Cartridge Access Port	1-15
Supported Tape Drives	1-16
Audit of Tape Library	1-17
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Interfaces	1-18

This section contains an overview of the major hardware components of the tape library.

The tape library provides a highly adaptable storage platform made to specifically consolidate, protect, and retain customer information. The tape library protects customer's investments by providing a cost-effective entry point and makes it easy to grow the unit with expansion modules.

The tape library is a self-contained, fully automated tape cartridge storage system. It is scalable and mounts into a 19-inch (483-millimeter) rack.

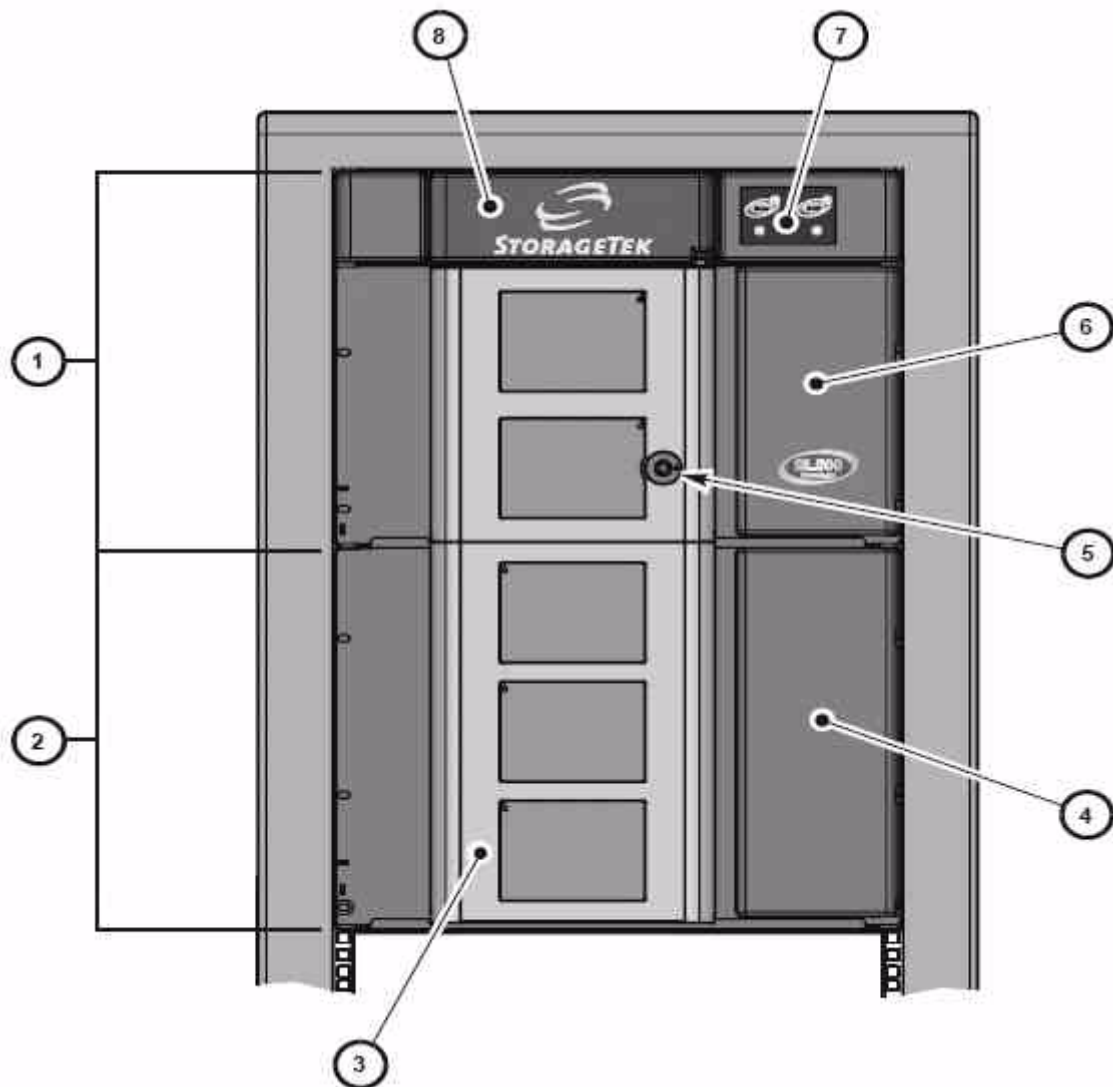
For each tape library:

- The base module contains the robotics unit and the base unit:
 - The robotics unit has the robotic components and the keypad.
 - The base unit has 50 cartridge slots (including the reserved slots), one or two tape drives, and a 5-slot cartridge access port (CAP).
- Drive expansion modules and cartridge expansion modules can be added to a standard rack to accommodate various slot and tape drive configurations.

Views and Locations

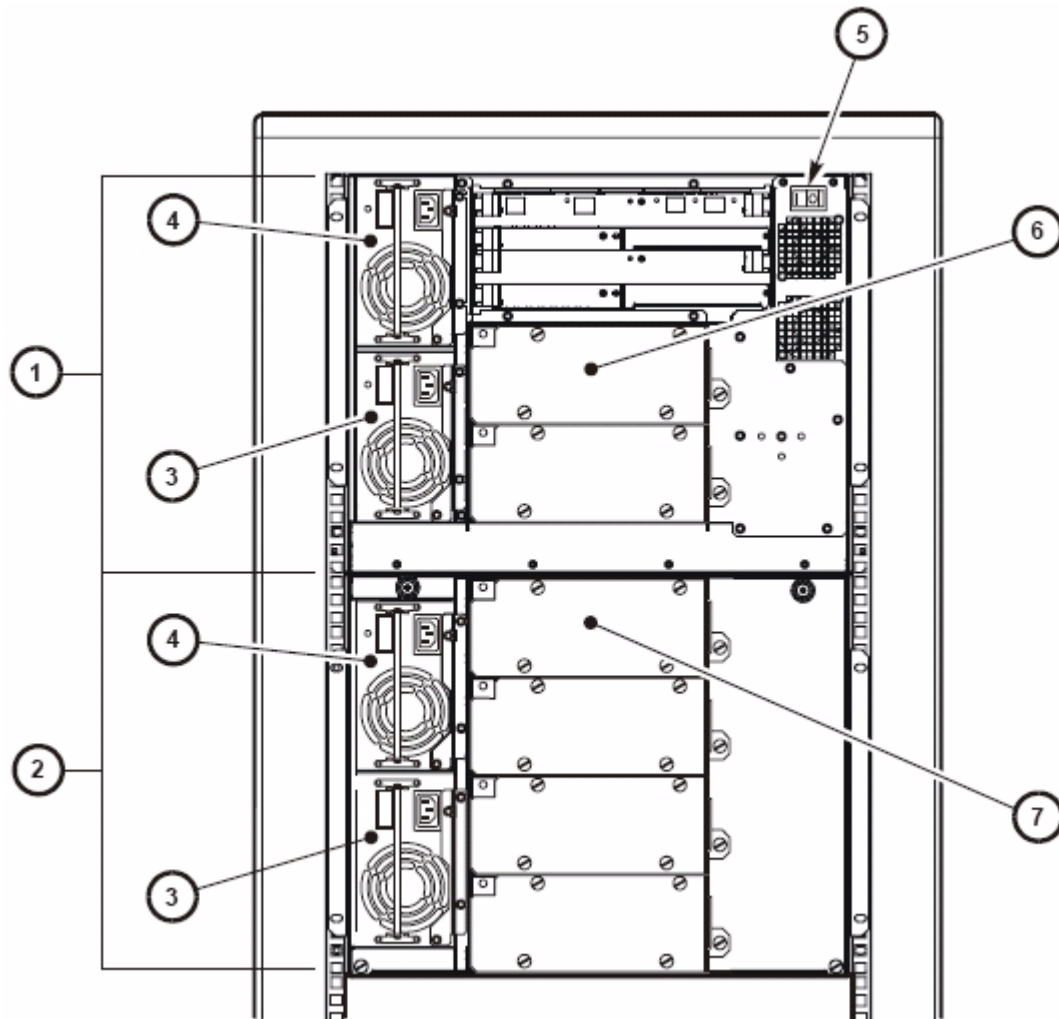
[Figure 1-1](#) and [Figure 1-2](#) show the tape library views and the locations of its components.

Figure 1-1. Front View of Tape Library Components



1. Base module
2. Drive expansion module
3. Library door
4. Drive expansion module cartridge access port (CAP)
5. Library door lock
6. Base unit cartridge access port (CAP)
7. Keypad assembly
8. Robotics unit

Figure 1-2. Back View of Tape Library Components



- 1. Base module
- 2. Drive expansion module
- 3. Redundant power supply
- 4. Standard power supply
- 5. Library power switch
- 6. Tape drive 1 in base unit
- 7. Tape drive 1 in expansion module

Physical Configurations

[Figure 1-3](#) on page 1-5 shows a tape library with only a base module. [Figure 1-4](#) on page 1-6 shows a tape library with a base module that has nine reserved slots, one drive expansion module, and one cartridge expansion module.

[Figure 1-5](#) on page 1-7 shows a tape library with a base module that has two reserved slots, one drive expansion module, and one cartridge expansion module.

Note. In [Figure 1-5](#) on page 1-7, all six tape drives are installed. When only some of the tape drives are installed, only those that are powered-on receive SCSI addresses, starting with the top-most tape drive.

The storage slot numbering begins with the first slot after the reserved slots in column 1. [Figure 1-5](#) on page 1-7 shows two reserved slots, but there could be more. If the reserved slots are configured as storage slots, the top slot (row 1) would be 1. If the CAP in module 1 is configured as storage slots, the top CAP slot (row 1) is 62 if there are two reserved slots as shown, or 64 if no slots are reserved.

[Figure 1-6](#) on page 1-8 shows the slot capacity of a cartridge expansion module according to which type of module is installed above and below it.

The numbering scheme uses the tape library, module, row and column scheme. Four integers are used to represent the cartridge and tape drive slots, as viewed from the front of the tape library.

1. Library number (always 0)
2. Library module number 1 (top of rack) through 5 (bottom of rack)
3. Row number 1 through 9 (base module) or 1 through 12 (expansion module)
4. Column number 1 through 9 for base module and drive expansion module, 1 through 11 for cartridge expansion module

Figure 1-3. Base Module Slots

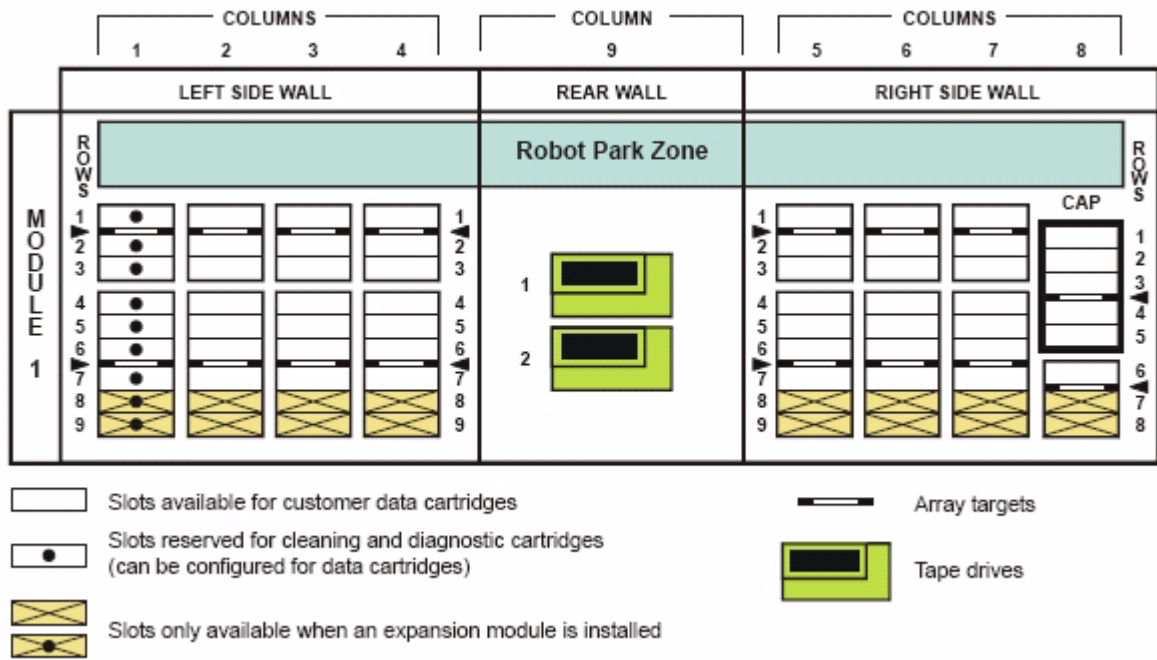


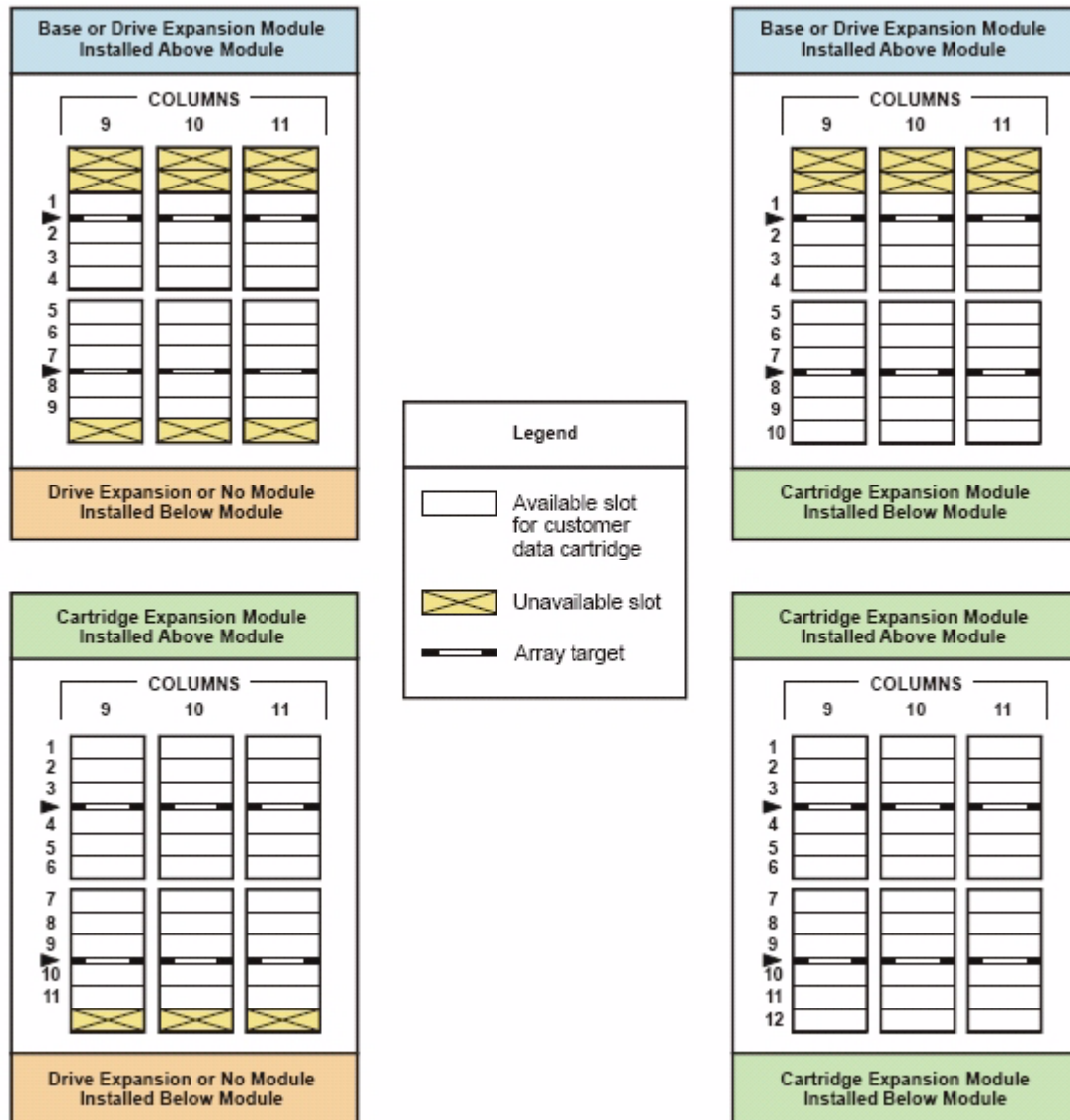
Figure 1-4. Slots Locations for Firmware Slot Mapping



Figure 1-5. Slots Locations for SCSI Element Numbering Mapping



Figure 1-6. Slot Capacity for Back Wall of Cartridge Expansion Module



Capacities

[Table 1-1](#) on page 1-10 shows the number of cartridge and tape drive slots available depending on the type and number of modules installed.

Slot counts are based on the following assumptions:

- Capacity includes reserved slots for diagnostic and cleaning cartridges.
- Reserved slots (for cleaning and diagnostic cartridges) are located only in the base module on the left side as you open the front door. These slots can be configured for data cartridges if desired.
- The base module has a 5-slot CAP; the drive expansion module (DEM) and cartridge expansion module (CEM) each have two 5-slot CAPs. These slots can be configured for data cartridges if desired.
- When DEMs and CEMs are installed in the same library, the DEMs are above all of the CEMs.

When you add an expansion module below an existing module, you increase the capacity of the module directly above it by:

- Base module: +16 slots
- CEM (when another CEM is below it): +10 slots
- CEM (when a DEM is below it): +7 slots
- DEM: +7 slots

When a CEM is installed below a base module or DEM, the top two rows on columns 9, 10, and 11 of the CEM are not accessible (-6 slots because of the tape drives).

The lowest module in the rack requires installation of the floor. The floor limits the distance the robot can travel, which makes the bottom row(s) in the lowest module inaccessible:

- Base module: -16 slots
- DEM: -7 slots
- CEM (below another CEM): -16 slots (-10 slots on the lowest CEM, -6 slots on the CEM above it)
- CEM (below base module or DEM): -16 slots

Cartridge access ports:

- Base module: 5 slots (one magazine)
- Each DEM: 10 slots (two magazines)
- Each CEM 10 slots (two magazines)

Table 1-1. Cartridge Slot and Tape Drive Capacities

Modules	Maximum Number of Tape Drives					CAP Slots	Total Number of Slots
	2	6	10	14	18		
Base Module	30					5	35
20 cartridge upgrade key	50					5	55

Adding one expansion module

Base module plus 1 limited DEM		100				15	115
Base module plus 1 DEM		143				15	158
Base module plus 1 CEM	170					15	185

Adding two expansion modules

Base module plus 2 limited DEMs			227			25	252
Base module plus 1 DEM, 1 CEM		254				25	279
Base module plus 2 CEMs	290					25	315

Adding three expansion modules

Base module plus 3 DEMs				311		35	346
Base module plus 2 DEMs, 1 CEM			338			35	373
Base module plus 1 DEM, 2 CEMs		374				35	409
Base module plus 3 CEMs	410					35	445

Adding four expansion modules

Base module plus 4 DEMs					395	45	440
Base module plus 3 DEMs, 1 CEM				422		45	467
Base module plus 2 DEMs, 2 CEMs			458			45	503
Base module plus 1 DEM, 3 CEMs		494				45	539
Base module plus 4 CEMs	530					45	575

Robotics Unit

The robotics unit provides movement of cartridges among the storage slots, tape drives, and cartridge access ports (CAPs). The three main robotic components are:

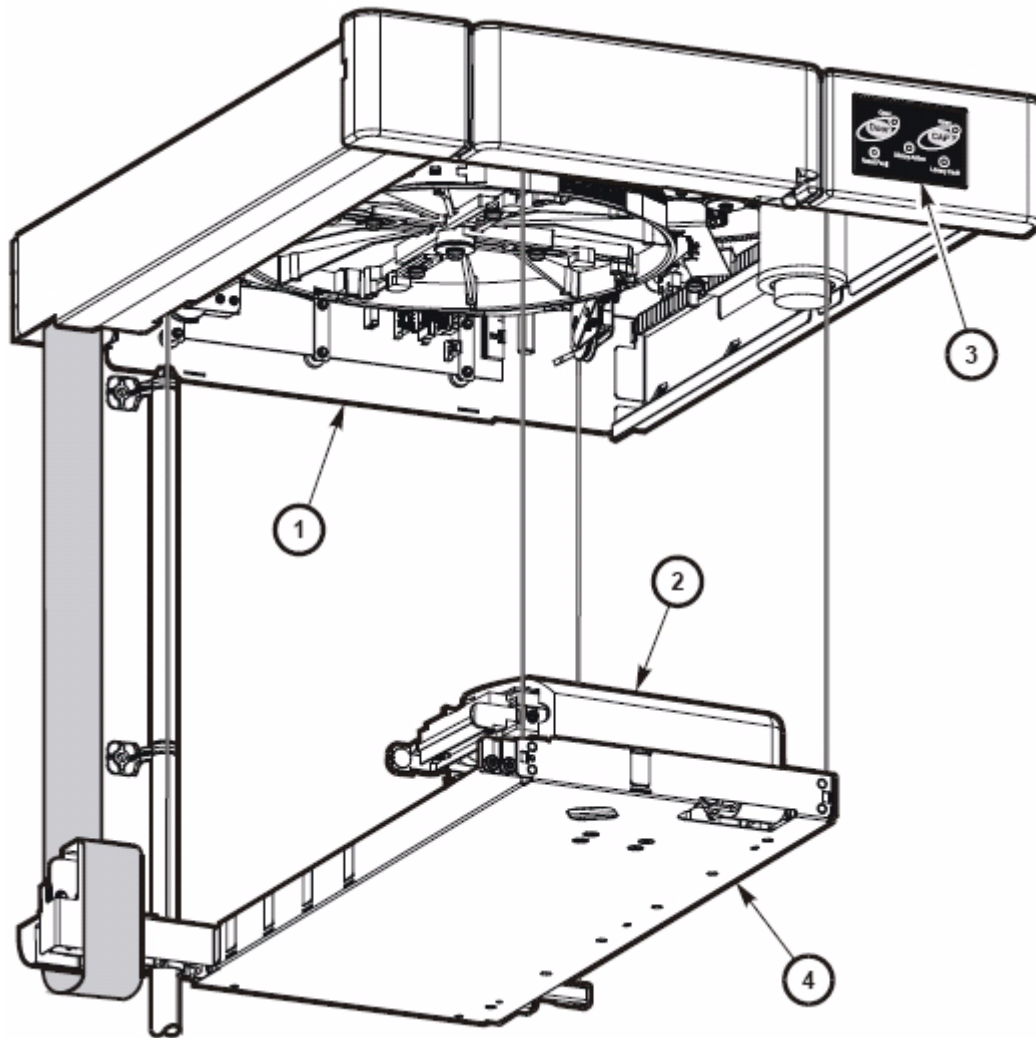
- Z drive assembly
- X table assembly
- Hand assembly

The Z drive assembly uses the Z drive pulley to move the X table up and down to the desired slot or tape drive. At the same time, the X carriage assembly (containing the hand) moves the hand forward and backward; the wrist motor rotates the hand right and left.

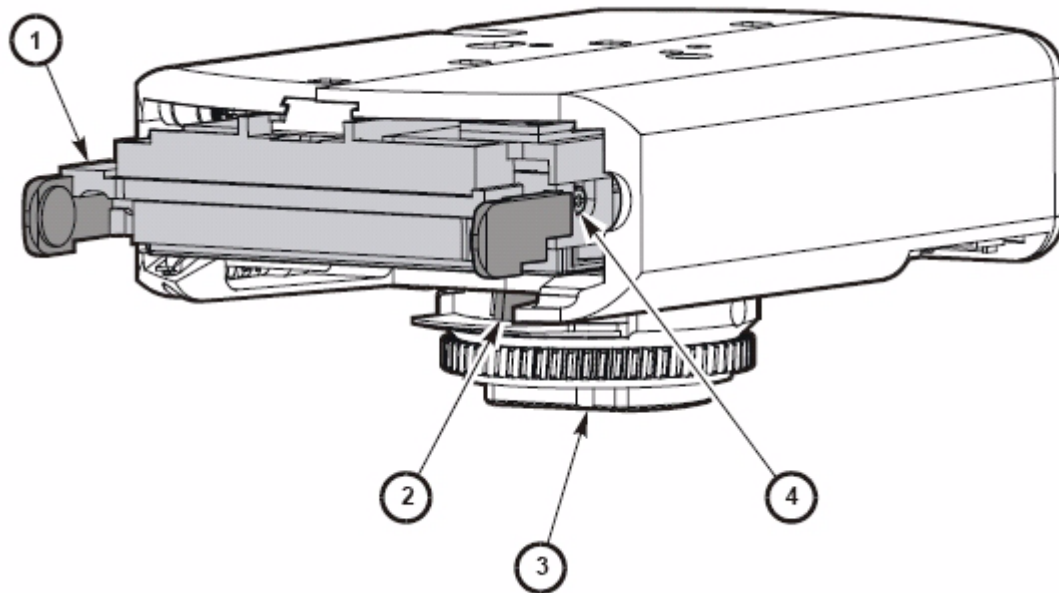
The hand assembly contains the wrist hub assembly, gripper assembly, and bar-code scanner. The gripper assembly has fingers that grasp the sides of the cartridge. If the library loses power while a cartridge is between the fingers, the manual release screw is used to remove the cartridge. A worm gear can be used to rotate the hand to the correct position to access the manual release screw.

For safety purposes, the robotics will be parked in the robotics unit when the front door is opened or when the **Open Door** button is pressed on the keypad. Parked means that the robotics components are fully retracted into the robotics unit at the top of the library. To verify the robot is parked, look at the lever in the cutout beneath the facade and to the bottom left of the keypad, the lever should be to the left.

The robotics unit is accessible from the front of the rack.

Figure 1-7. Robotics Components

1. Z drive assembly
2. Hand assembly
3. Keypad assembly
4. X table assembly

Figure 1-8. Hand Assembly

1. Gripper
 2. Bar-code scanner
 3. Wrist hub
 4. Finger release screw
-

Electronics

The electronics consists of the control path and robotic cards in the base unit.

Communications include:

- Command line interface (CLI) over an RS232 port
- Public Ethernet port (The private port is for future use)
- Point to point library/tape drive RS232 interface
- Control path card for LVD SCSI or SCSI over Fibre Channel

Sensors include:

- Card temperature
- Fan operational
- Power safe
- Tape drive present
- Tape drive fault LED

RLC Card

The RLC card is the processor card. It contains all the necessary hardware to maintain the robotics, interfaces, servo and vision control, and the door/CAP sensor status.

Interface Cards

The MPW card is the LVD SCSI interface card. The MPU2 card is the Fibre Channel interface card.

Fans

The fans provide cooling for the library electronics. The tape drives and power supplies contain their own fans.

Power System

The base unit has one standard power supply. A second supply can be ordered and installed to provide redundant power to the module components. Each supply should be plugged into a separate circuit and powered on to provide redundant power. If one supply fails, the second supply automatically provides power.

A single power switch on the back of the tape library is used to power on or power off all the power supplies in the rack:

- The ON position is 1.
- The OFF position is 0.

Cartridge Access Port

The cartridge access port (CAP) can be used to add cartridges to the tape library, or remove cartridges from the tape library without interrupting normal robotic operation. The CAP in the base module has one five slot magazine; the CAP in the drive expansion module has two five slot magazines.

Although the CAPs are not physically connected, they are logically connected. If any of the CAPs are open, the CAP LED on the keypad will be on, alerting the operator to take action to close the CAP. If all of the CAPs are closed, the CAP LED will be off.

You can use the keypad on the robotics unit to issue a command for the robot to unlock the CAP.

The CAP has two settings, ALLOW and PREVENT. ALLOW is the default setting after you power on or reset the tape library. The following table shows how these settings affect the CAPs.

CAP Condition	ALLOW	PREVENT
All of the CAPs are closed.	When you press the CAP button all of the CAPs in the rack will open. The library firmware turns on the CAP LED.	When you press the CAP button, the action is ignored and all the CAPs remain closed.
Any of the CAPs are open.	When you press the CAP button, any CAP that is not open in the rack will open.	When you press the CAP button, the action is ignored and all of the CAPs remain in their individual current state of open or closed.

Supported Tape Drives

The tape library can accommodate from 1 to 14 tape drives. The LTO generation 3 tape drives supports Ultrium 3 media, Ultrium 2 media, and Ultrium 1 media (read only).

Figure 1-9. Supported Tape Drives

Product Number	Description
N1523A	LTO Generation 3 tape drive with SCSI Interface for NonStop S-series servers
M8504	LTO Generation 3 tape drive with a Fibre Channel interface for Integrity NonStop NS-series servers

LTO Ultrium

Linear-Tape Open (LTO) is a set of tape data format standards created to enable data interchange among different LTO Ultrium tape drive vendors. These LTO Ultrium standards allow data cartridges to be shared.

Table 1-2. LTO Generation 3 Specifications

Specification	Performance
Capacity, native (uncompressed)	400 gigabytes
Capacity (compressed)	800 gigabytes
Data transfer rate, native (uncompressed)	80 megabytes per second

Audit of Tape Library

An audit is the method by which the tape library keeps track of all cartridge locations within the unit. An audit occurs when you:

- Power on the library
- Open and close the front door
- Close the CAP (CAP slots only)

Initialization occurs when the tape library is powered on or when the front door is opened and closed. During initialization, the RLC card applies voltage to the motors (gripper, reach, wrist, and Z drive). The robotic components ranges of motion are tested, the targets and labels are read for calibration purposes, and the slots are audited for cartridge VOLIDs. This information is stored on the RLC card.

Note.

- When an audit occurs, the tapes in the tape drives are not audited.
 - If you manually exchange a cartridge from a tape drive for one in storage, you must update the tape management database or an error will occur.
-

The bar code scanner on the hand assembly reads the labels on the cartridges.

Safety Features

The following subsections describe the safety features that are incorporated into the tape library.

Cards and Power Supply

The RLC card or SCSI (MPW) interface card, and the power supply are housed inside protective modules to prevent you from coming into contact with hazardous voltages and sensitive electronics.

Robotics

The software parks the robot by retracting it into the robotics unit module before the front door can be opened to prevent the robot from being damaged.

When the front door is opened, power is removed from the robot.

Front Door

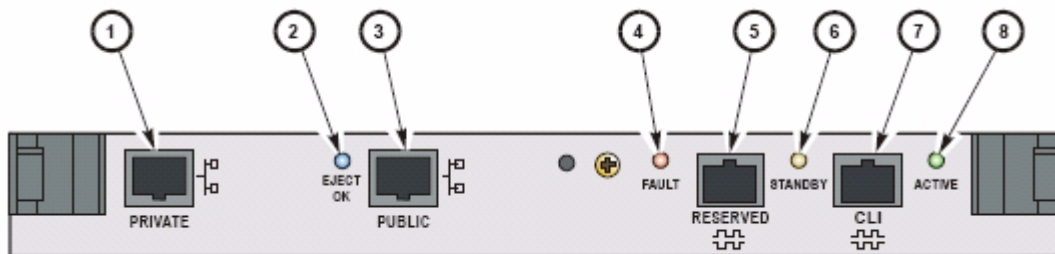
The front door must be opened with a key to ensure that the data is secure. If the door is not fully closed, a sensor relays the condition to the software and the robot remains disabled.

Interfaces

The major tape library interfaces are:

- Library control path support for LVD SCSI
- Public 100BaseT ethernet port
- CLI serial port for local access for service representative, manufacturing and engineering (Not for customer use).
- Environmental port for monitoring fans, tape drives, and power. This port is internal and cannot be accessed by the customer.
- Cartridge access ports and sensors for indicating a door open or closed condition.
- Front door opened button (on keypad), key for opening door, sensor LED that indicates door is closed and latched.

Figure 1-10. Tape Library Interfaces Locations



1. Private Ethernet port is for future use.
2. Eject OK (hot-swappable) LED, when on, indicates that the RLC card can be removed.
3. Public Ethernet port is for remote service access.
4. Fault LED indicates that the controller has detected a problem.
5. Reserved for future use.
6. Standby LED, when lit, indicates the RLC card (when two RLC cards are installed) is in standby mode (future feature).
7. CLI port is an RJ-45 serial port for service representatives.
8. Active LED, when lit, indicates this RLC card is active if two RLC cards are installed. If only one card is installed, the LED is always on (future feature).

Each installed tape drive contains the following interfaces:

- Tape Transport Interface (TTI) receives commands from the RLC card. Some examples of signals that are transferred over the TTI are “ready,” “unloading,” “busy,” and “sense” information.
- The data path can have a single-port SCSI.

2 Controls and Indicators

This section includes:

[Power Switch](#)

[2-1](#)

[Keypad](#)

[2-1](#)

Power Switch

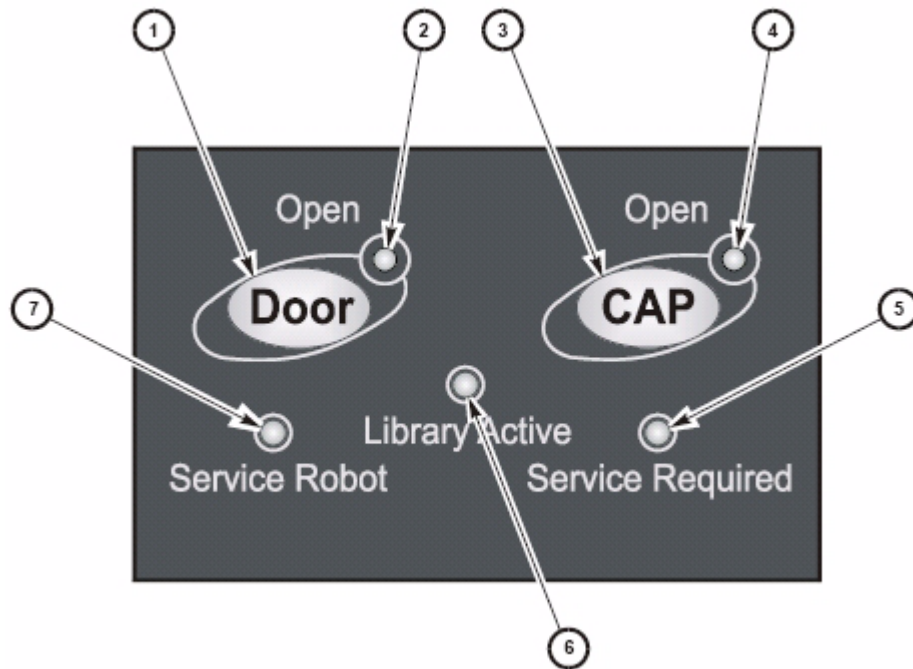
When the switch is in position 1 the tape library and tape drives are powered on. When the switch is in position 0 the tape library and tape drives are powered off.

Note. Earlier built tape libraries had power supplies that had individual power switches. Later tape libraries have one power switch that controls all power supplies in the rack.

Keypad

The keypad is used to open the door, open the CAP, and notify the user if service is required.

1. The Door Open button opens the tape library door. All doors function as one door and can not be opened individually.
2. The CAP Open button opens all CAP doors.
3. The Library Active LED, if on, indicates the tape library is functioning properly. If the Library Active LED is flashing, call your service representative.
4. If the Service Robot LED is on and flashing, call your service representative.
5. If the Service Required LED is on and flashing, call your service representative.

Figure 2-1. Buttons and Indicators

- | | |
|---------------------|-------------------------|
| 1. Door Open button | 5. Service Required LED |
| 2. Door Open LED | 6. Library Active LED |
| 3. CAP Open button | 7. Service Robot LED |
| 4. CAP Open LED | |

Table 2-1. Keypad Buttons and Indicators

Buttons/Indicators	Description
Service Robot	<p>Indicator</p> <p>LED is lit when the robot is not functioning. Replace the robotics unit.</p>
Library Active	<p>Indicator</p> <ul style="list-style-type: none"> ● LED is normally solid green. ● LED turns off when the tape library experiences a failure. If it never turns on, an initialization or power failure has occurred.
Service Required	<p>Indicator</p> <ul style="list-style-type: none"> ● LED is normally solid green. ● LED is lit when the tape library experiences a non-robotic failure.
Open Door	<p>Indicator</p> <ul style="list-style-type: none"> ● LED flashes amber when the Open Door button is pressed. ● LED is solid amber when the robot is parked in the robotics unit. ● LED flashes during initialization and audit. ● LED is not lit when the library is ready for customer use. <p>Button</p> <p>When pressed:</p> <ol style="list-style-type: none"> 1. Software allows the current job to complete. This could take awhile. 2. Software retracts the robot into the robotics unit so that it will not be damaged when you open the door with the key.
Open CAP	<p>Indicator</p> <ul style="list-style-type: none"> ● LED is amber when any CAP doors are open ● LED is not lit when all CAP doors are shut ● LED flashes during audit <p>Button</p> <p>Button is used to tell the robot to open the CAP doors.</p>

3 Library Operation

This section includes:

Automated Mode	3-1
Manual Mode	3-4

Automated Mode

Automated mode is the normal operating mode of the tape library. The controlling software instructs the hand assembly to move cartridges among the storage slots, tape drives, and cartridge access port (CAP) without operator intervention.

Opening the Front Door (With Power)

To open the front door when tape library power exists:

1. Press the Open Door button on the keypad.
 - a. The software allows the current job to complete.
 - b. The software retracts the robot into the robotic unit to prevent the robot from being damaged and to prepare it for servicing.
2. When the Open Door indicator turns on, use the key to open the door.

Securing the Front Door (With Power)

To secure the front door when tape library power exists, push it closed and use the key to lock it.

Entering a Cartridge Through the CAP

The base module CAP contains a standard five slot magazine. The expansion module CAP has two five slot magazines. The CAPs allow you to insert cartridges and remove cartridges from the tape library.

To enter a cartridge into the CAP:

1. Be sure that the CAP Prevent/Allow state is set to Allow.
2. Press the CAP Open button on the keypad.

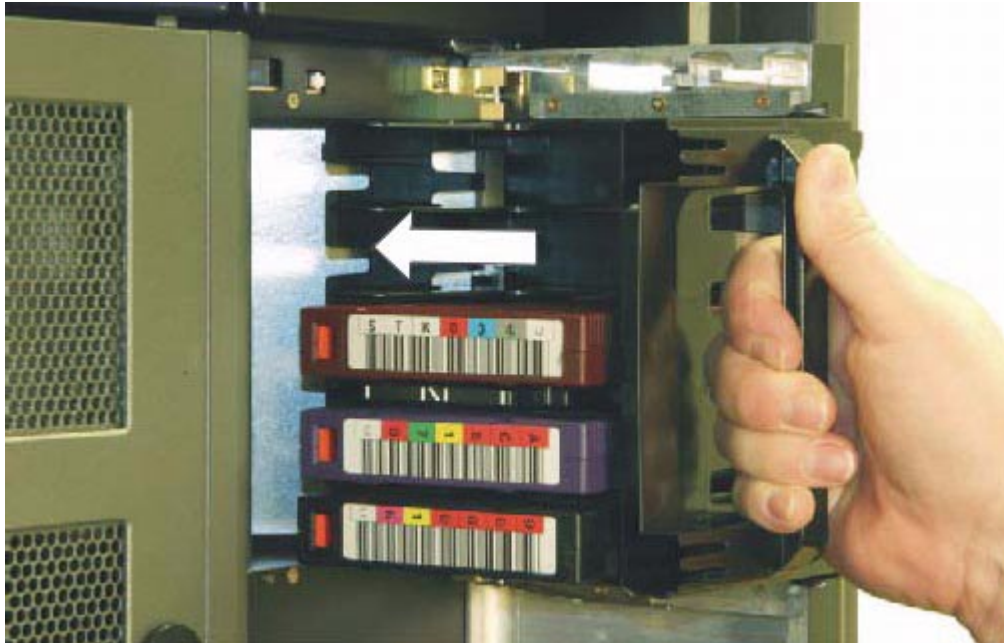
The robot opens the CAP door and the CAP Open LED is turned on.

3. Grip the handle of the magazine and slide it out of the CAP and onto the door.

Note. Do not remove the magazine from the door. Leaving the magazine on the door rails will allow the magazine to slide easier into the CAP.

4. Place the cartridge into one of the magazine slots, making sure that the VOLID label is visible and the hub of the cartridge is down.
5. Grip the handle and slide the magazine back into the CAP.

Figure 3-1. Sliding a Magazine Into a CAP



-
6. Close the CAP door making sure that the door is securely latched.

Powering On the Tape Library

To power on the library:

1. Close and lock the front door if the door is open.
2. Press the power switch (on the top right corner of the back of the library) to the ON (1) position.

Powering Off the Tape Library

△ **Caution.** If you power off the tape library without performing the following procedure, you risk possible equipment or cartridge damage or loss of data.

1. Make sure that all jobs have completed processing.
2. Make sure the tape library and tape drives are not in use.
3. Move the power on/off switch to the OFF position (0).

Manual Mode

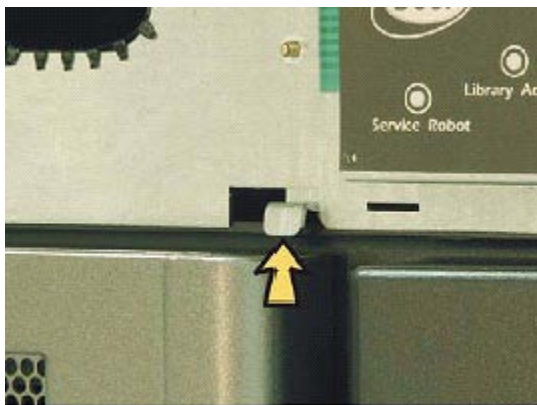
This section describes the operation of the tape library in manual mode. Manual mode occurs then the tape library is taken offline, or loses power, or the front door is opened.

Opening the Front Door (Without Power)

To open the front door when no tape library power exists:

Note. You must manually move the robotics park lever (beneath the facade and to the bottom left of the keypad) to the left position so that you can open the door with the key. Under normal conditions, the lever signifies that the robot is parked inside the robotics unit at the top of the tape library, and the door can be safely opened. When no power exists, the robot is not actually parked, but you will be able to open the door when you move the lever to the left.

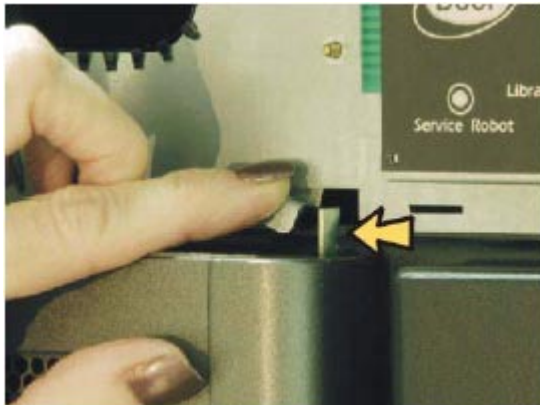
Figure 3-2. Lever Not in Parked Position



-
1. Press the power switch on the back of the tape library to the OFF position.
 2. Remove the robotic facade from the top of the library by gently pulling the facade from side to side to pull the ball studs away from the clips. You might have to use a screwdriver to gently pry it off.

-
- ▲ **WARNING.** Possible injury to finger: Make sure that your finger is completely to the left in the next step so that it will not be pinched when the door locking lever extends as shown in the lower picture.
-

Figure 3-3. Door Locking Lever Extended



-
3. While using one hand to move the robotics park lever to the left, use your other hand to unlock the door with the key.

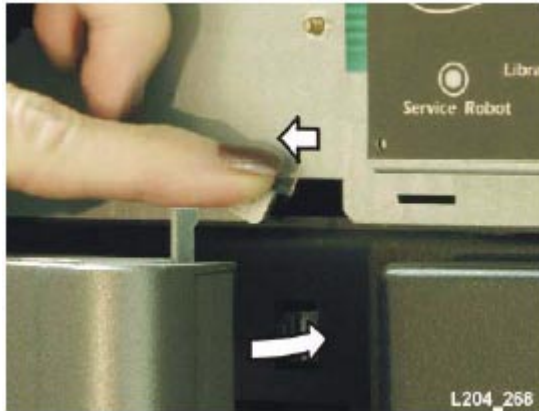
Securing the Front Door (Without Power)

To secure the front door when no tape library power exists:

1. Remove the robotic facade from the top of the tape library by gently pulling the facade from side to side to pull the ball studs away from the clips. You might have to use a screwdriver to gently pry it off.

-
- △ **Caution.** Possible component damage: Note the door locking lever protruding from the top of the door. Do not let it hit the robotics park lever when you close the door.
-

2. While using one hand to move the robotics park lever to the left, use your other hand to close the door.

Figure 3-4. Moving Robotics Park Lever

-
3. While still holding the door shut, release the robotics park lever.
 4. Use the key to lock the door. The robotics lever automatically moves to the right when the door locking lever retracts.

Locate and Remove Cartridge

To locate a particular cartridge inside the tape library:

1. Open the door.
2. Locate the particular cartridge by its VOLID (volume ID) label and slot.
3. Remove the cartridge from the slot by sliding the cartridge out.
4. Close the tape library door.

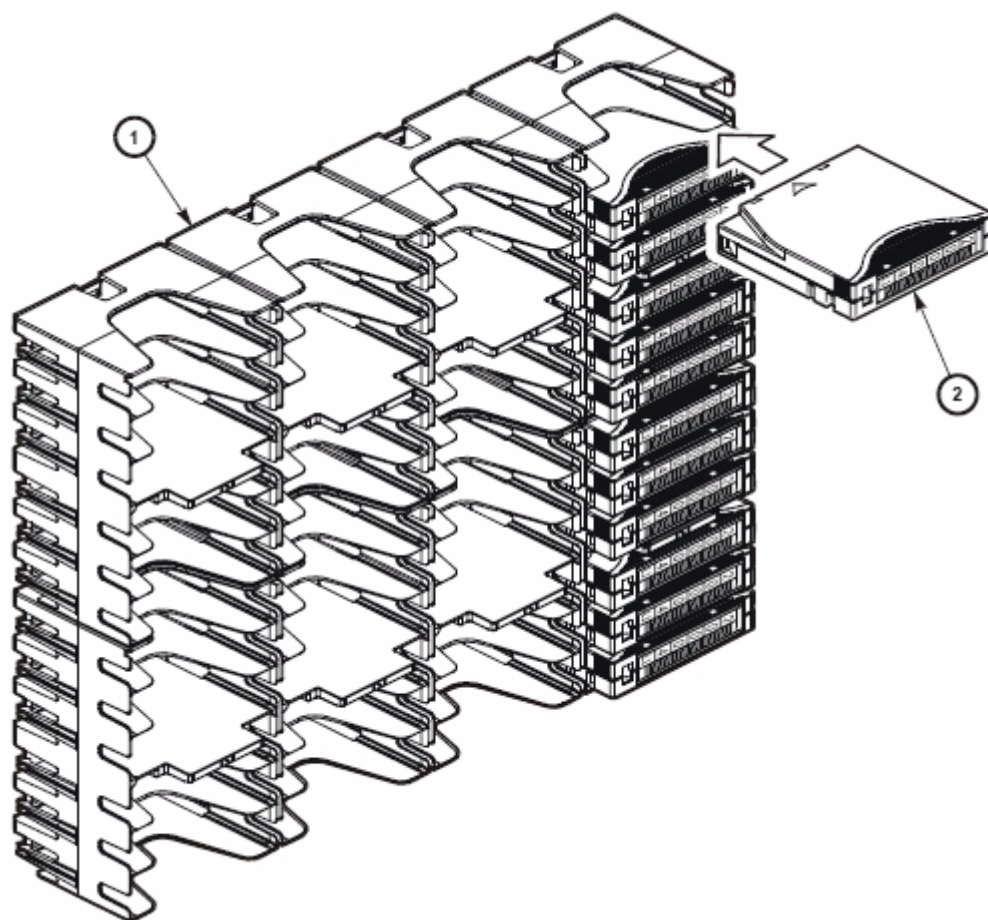
Insert Cartridges Into Slots

Depending on the version and configuration of your tape library, some storage slots cannot be used.

Note. You do not have to insert a cartridge into every storage slot. The tape library automatically audits cartridges and empty slots as part of its initialization routine.

△ Caution. Inserting the cartridges correctly is critical for library operation. If you do not orient the cartridges correctly or do not insert them all the way into the storage slots, the tape library might fail. Make sure you insert the cartridges into the magazine.

1. Check the cartridges to make sure they are correctly labeled.
2. Insert as many cartridges into the tape library as you want and as your configuration allows, making sure you seat them all the way into the storage slots.

Figure 3-5. Inserting Cartridges Into Slots

1. Wall of arrays slots
2. Cartridge

Inserting a Cartridge Into a Tape Drive

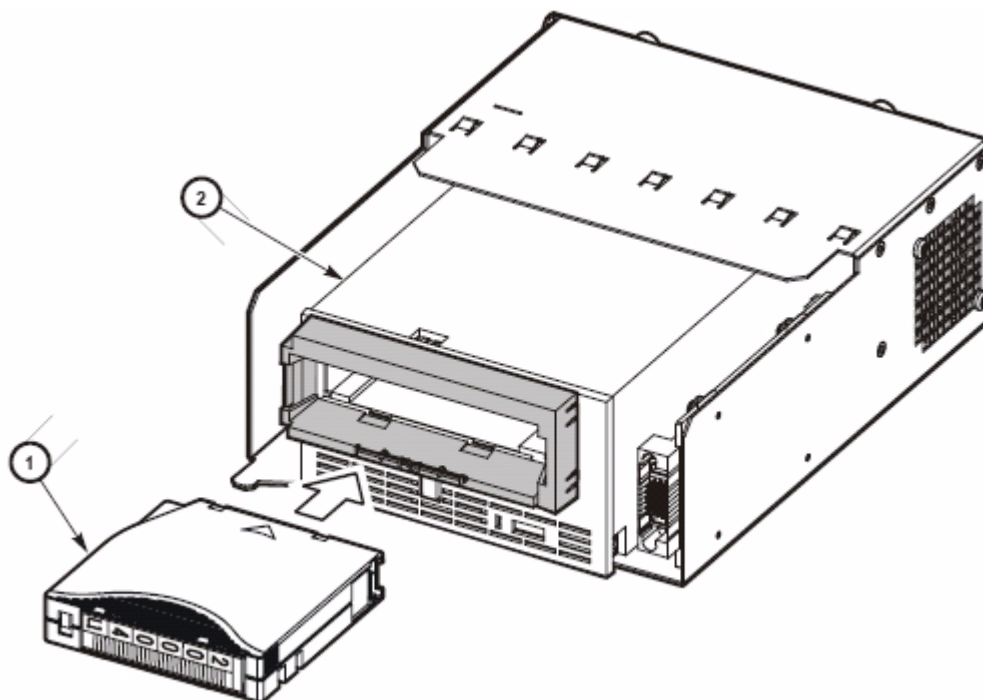
To manually insert a cartridge into a tape drive:

1. Obtain the VOLID label, location, and tape drive number from the server console.
2. Open the door.
3. Locate the cartridge.

△ **Caution.** Potential equipment damage. You must insert the cartridge properly or you will damage the tape drive.

4. Hold the cartridge so that the VOLID is facing you and can be read from right to left.
5. Insert the cartridge into the tape drive.
6. Close the tape library access door.

Figure 3-6. Inserting Cartridge Into Tape Drive



1. Cartridge
2. Drive

Removing a Cartridge From a Tape Drive

To manually remove a cartridge from a tape drive:

1. Open the door and locate the appropriate tape drive.

△ **Caution.** Possible data loss. Failure to perform and wait approximately 12 seconds until the operation completes.

2. Press the Unload button on the tape drive and wait approximately 12 seconds until the operation completes.

Figure 3-7. Location of Unload Button



-
3. Gently pull the cartridge from the tape drive.
 4. Store the cartridge in an empty slot or outside the tape library.

Note. If you store the cartridge in an empty slot, you must reinitialize the tape library.

5. Close the tape library door.

Removing a Cartridge From the Gripper Assembly

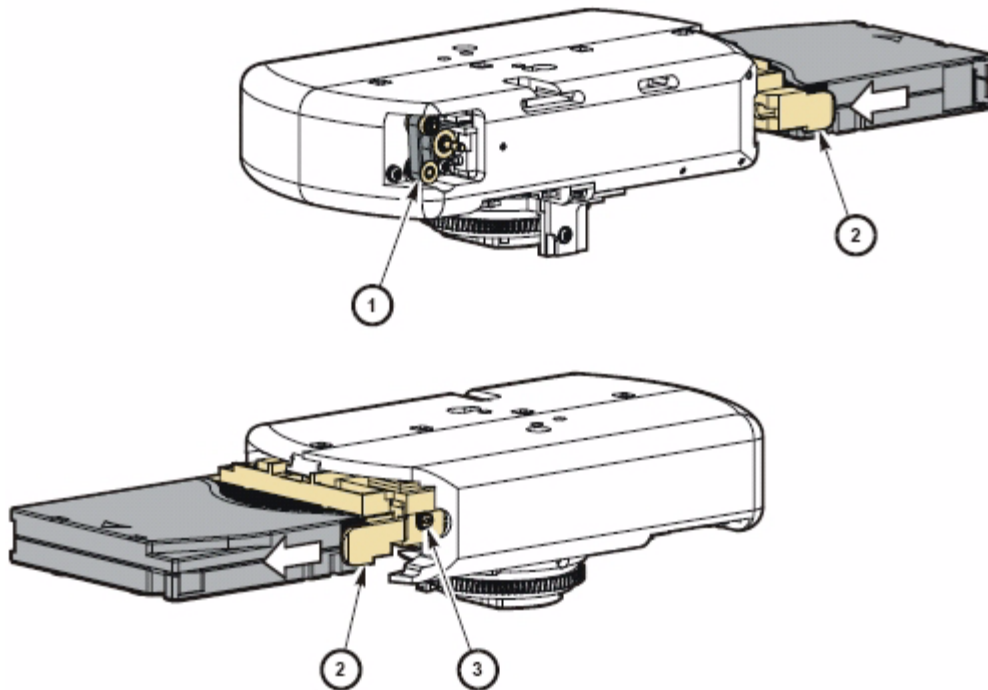
The hand assembly can be in any position when the tape library loses power. Before you can remove the cartridge, the hand assembly must be facing the front left arrays and aligned with an empty slot.

If the hand assembly is facing right:

1. Gently turn the hand to the left.
2. Slide the hand assembly along the rail until the gripper is positioned across from an empty slot and close to you.
3. Continue with the following steps.

If the hand assembly is facing left:

1. Turn the gripper belt to extend the gripper until the release screw is accessible.
2. Use a small, flat blade screwdriver to turn the screw 1/4 turn clockwise until the cartridge is released.
3. Push the cartridge into a slot.
4. Gently push the gripper back into the hand.
5. Slide the hand assembly toward the back of the tape library.
6. Remove the cartridge from the slot, or leave it there.

Figure 3-8. Manual Release Screw

1. Gripper belt and pulleys
2. Gripper
3. Release screw

Replacing a Cleaning Cartridge

Cleaning cartridges have a limited life span. When the usage count exceeds its limit, you must replace it with a new one.

To replace a cleaning cartridge:

1. Open the door.
2. Remove the expired cleaning cartridge from its reserved slot.
3. Insert the new cleaning cartridge into that slot.
4. Close the tape library door.
5. Wait until the initialization tests complete before performing another task.

4

Cartridge Information

This section includes:

Handle Cartridges	4-1
Inspect Cartridges	4-1
Maintain Cartridges	4-2
Ultrium Cartridges	4-3

Handle Cartridges

Improper handling of cartridges can result in loss of data or damage to a tape library component.

To handle a cartridge correctly:

- Make sure the leader is latched every time you pick up a cartridge.
- Keep cartridges clean.
- Inspect a cartridge before each use, and never put a damaged cartridge into a tape drive or tape library.
- Never pull tape from a cartridge.
- Never open a cartridge.
- Do not handle tape that is outside the cartridge; the tape edge might be damaged.
- Do not expose the tape or cartridge to direct sunlight or moisture.
- Do not expose a recorded cartridge to magnetic fields; this might destroy data on the tape.

Inspect Cartridges

A defective or dirty cartridge can damage a tape drive. Always inspect a cartridge before you insert it into a tape drive or a tape library. Look for:

- Cracked or broken cartridge
- Broken leader
- Broken leader latch
- Damaged write-protect switch
- Liquid in the cartridge
- Labels not firmly or neatly attached or extending over the cartridge edge
- Any other obvious damage

Maintain Cartridges

It is important to keep your tape cartridges in good condition. A defective or dirty cartridge can damage a tape drive.

When you store a cartridge:

- Leave it in its protective wrapping until you are ready to use it.
- Choose a clean environment that duplicates the conditions of the room in which it is used.
- Make sure the cartridge has been in its operating environment for at least 24 hours.

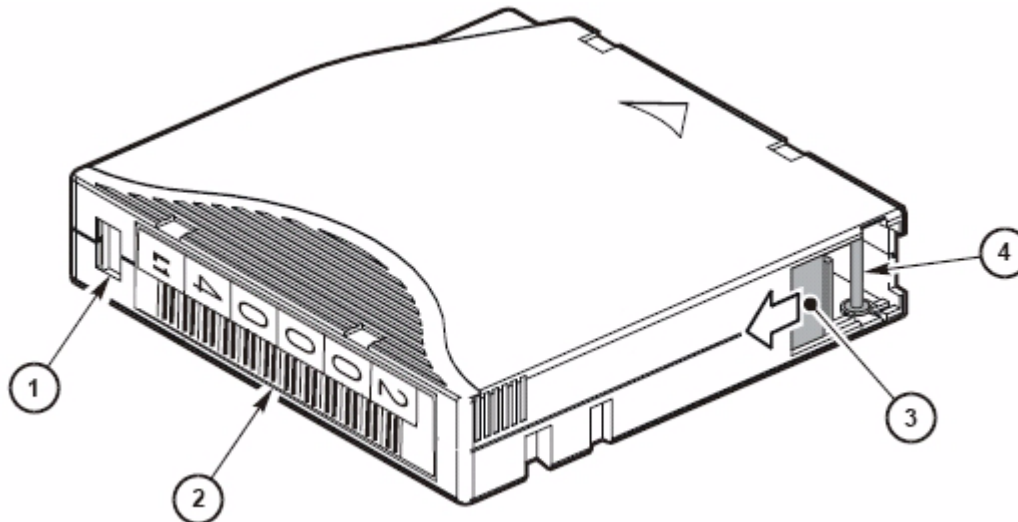
When you clean a cartridge exterior:

△ **Caution.** Do not use certain solvents to remove labels or to clean cartridges because they can damage the cartridges. Do not use acetone, trichloroethane, toluene, xylene, benzene, ketone, methylethyl ketone, methylene chloride, ethyldichloride, esters, ethyl acetate, or similar chemicals.

- Wipe all dust, dirt, and moisture from the cartridge with a lint free cloth.
- Use cleaning wipes that are saturated with isopropyl alcohol. Do not let any solution touch the tape or get inside the cartridge.

Ultrium Cartridges

Figure 4-1. Ultrium Cartridge Components



1. Write-protect switch (data cartridge has red switch, cleaning cartridge has gray switch)
2. Volume ID label (barcode to hub side of cartridge)
3. Access door
4. Leader pin

Apply Cartridge Labels

Cartridge labels reflect the cartridge media and usage. If your cartridges were not ordered with labels already applied, you must apply them yourself. You must correctly label all cartridges for tape library use.

- △ **Caution.** Possible misread of volume number label: Make sure the edges of the labels do not curl. Curling causes the cartridges to stick in the tape drive loader and the robot to misread the label.

Valid Labels

LTO cartridge labels have eight characters. The last two characters are the Media ID (C1, C2, CU, L1, L2, or L3). CLN or DG are the first characters on the cleaning or diagnostic label.

Table 4-1. LTO Cartridge Codes

Label	Type of Cartridge
CLN plus C1	Cleaning cartridge for tape drives
CLN plus CU	Universal cleaning cartridge
DG plus L	Diagnostic cartridge (Apply a DG label to a blank data cartridge to be used for diagnostic tests.)
L1	Generation 1 data cartridge
L2	Generation 2 data cartridge
L3	Generation 3 data cartridge

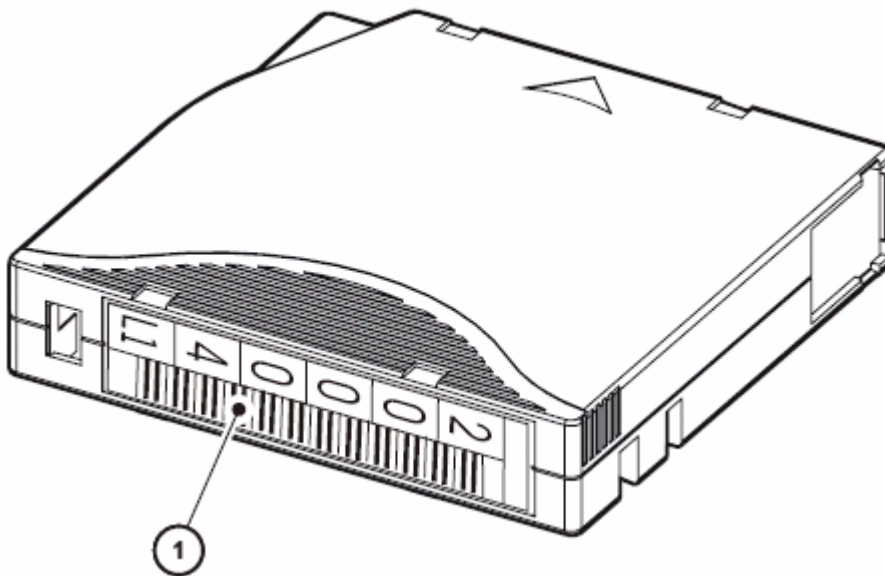
Figure 4-2. LTO Cartridge Labels

When an audit occurs the tapes in the tape drives are not audited. Unlabeled cartridges are not supported and will not be recognized by an audit.

Perform these steps before applying the label into the recessed area on the cartridge:

1. Make sure the cartridge has been at room temperature for at least 24 hours.
2. Clean the surface where the labels will be placed using a cleaning solution made for this purpose.
3. Locate the type of label that you require.
4. Hold the cartridge so that the write-protect switch is toward you.
5. Attach the label to the cartridge as shown in [Figure 4-3](#).

Figure 4-3. Ultrium Cartridge Label



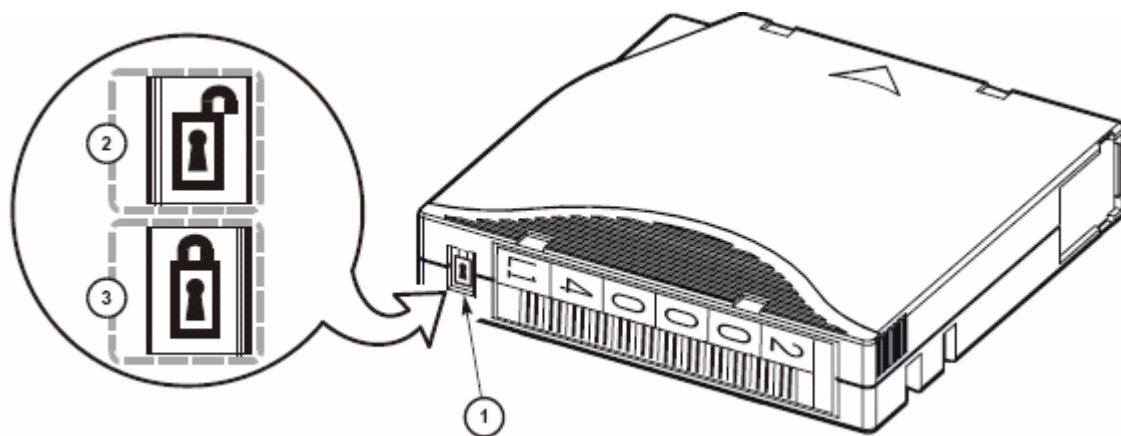
1. Volume number label
-

Setting the Write-Protect Switch

You can set the write-protect switch so the cartridge is write enabled. To write-enable the tapes, slide the switch to reveal the open lock symbol. In this position, the tape drive can write as well as read data. This setting is recommended when inserting cartridges into the tape library.

You can set the write-protect switch so that the cartridge is read only. Slide the switch to reveal the symbol of a closed lock. In this position, the tape drive can only read data from the tape but cannot write data to it.

Figure 4-4. Write-Protect Switch



1. Write-protect switch (Data cartridge has red switch. Cleaning cartridge has gray switch.)
 2. Write-enabled
 3. Write-protected
-

Table 4-2. LTO Gen 1, Gen 2, and Gen 3 Cartridge Specifications

Specification	L3 Cartridge	L2 Cartridge	L1 Cartridge
Capacity, native (uncompressed)	400 GB	200 GB	100 GB
Capacity (compressed)	800 GB	400 GB	200 GB
Read and write tape speed	5.9 m/s	5.9 m/s	4.0 m/s
Search and rewind speed	7.0 m/s	7.0 m/s	7.0 m/s
Archival life	15–30 years	15-30 years	15-30 years
Number of tracks	704 tracks	512 tracks	384 tracks
Dimensions			
Width	107 mm (4.2 in.)	107 mm (4.2 in.)	107 mm (4.2 in.)
Height	22.9 mm (0.9 in.)	22.9 mm (0.9 in.)	22.9 mm (0.9 in.)
Depth	102 mm (4.0 in.)	102 mm (4.0 in.)	102 mm (4.0 in.)
Weight	210.0 g (0.46 lb)	210.0 g (0.46 lb)	210.0 g (0.46 lb)
Temperature (noncondensing)			
Operating	10 to 40°C (50 to 104°F)	10 to 40°C (50 to 104°F)	10 to 40°C (50 to 104°F)
Shipping	-23 to 49°C (-10 to 120°F)	-23 to 49°C (-10 to 120°F)	-23 to 49°C (-10 to 120°F)
Wet bulb	26°C (78°F)	26°C (78°F)	26°C (78°F)
Humidity	20–80%	20-80%	20-80%

5

Configuring the M8520 Tape Library for the NonStop S-Series Server

The section covers:

[Supported Connections](#) [5-1](#)

[Adding the Control Path and the Data Path](#) [5-1](#)

Supported Connections

You can attach the M8520 tape library (control path and data path) to a NonStop S-series server using one of the following:

- ServerNet/DA
- IOMF CRU
- PMF CRU

Note. The control path is used to control the robot and the data path is used to control the tape drive or drives.

Adding the Control Path and the Data Path

ServerNet/DA

To add the control path to the server configuration database, use the SCF ADD SCSI command. Use the SCF ADD TAPE command to add the data path. Before issuing these commands, check that the tape drive(s) and tape library are installed properly.

To add the control path:

```
-> SCF
-> ADD SCSI $M8520, SENDTO STORAGE, PRIMARYLOCATION
(1,1,51), PRIMARYSAC 1, SCSIID 5, PRIMARYCPU 0, BACKUPCPU 1
-> START SCSI $M8520
-> STATUS SCSI $M8520, DETAIL
```

To add the data path:

```
-> SCF
-> ADD TAPE $N1523A, SENDTO STORAGE, LOCATION (1,1,55), SAC
1, DEVICEID 5, PRIMARYCPU 0, BACKUPCPU 1
-> START TAPE $N1523A
-> STATUS TAPE $N1523A, DETAIL
```

For complete details about the ADD and STATUS commands, including command syntax, see the *SCF Reference Manual for the Storage Subsystem*.

PMF CRU

To add the control path to the server configuration database, use the SCF ADD SCSI command. Use the SCF ADD TAPE command to add the data path. Before issuing these commands, check that the tape drive or drives and the tape library are installed properly.

To add the control path:

```
-> SCF
-> ADD SCSI $M8520, SENDTO STORAGE, PRIMARYLOCATION
(1,1,50), SCSIID 5, PRIMARYCPU 0, BACKUPCPU 1
-> START SCSI $M8520
-> INFO SCSI $M8520, DETAIL
```

To add the data path:

```
-> SCF
-> ADD TAPE $N1523A, SENDTO STORAGE, LOCATION (1,1,55),
DEVICEID 5, PRIMARYCPU 0, BACKUPCPU 1
-> START TAPE $N1523A
-> STATUS TAPE $N1523A, DETAIL
```

For more information on the ADD and STATUS commands, see the *SCF Reference Manual for the Storage Subsystem*.

6

Configuring the M8521 Tape Library for the Integrity NonStop NS-Series Server

The section covers:

Supported Connection	6-1
Adding the Control Path and Data Path	6-1

Supported Connection

You can attach the M8521 tape library (control path and data path) to a Fibre Channel ServerNet adapter (FCSA) on an Integrity NonStop NS-series server.

Note. The control path is used to control the robot, and the data path is used to control the tape drive or drives.

Adding the Control Path and Data Path

Note. To obtain the portname numbers for your control path and data path, contact a service representative from STK. The portname numbers used in this section are examples only.

To add the control path, issue this SCF command:

```
SCF> ADD SCSI $device, SENDTO STORAGE, PRIMARYLOCATION  
(group, module, slot), PRIMARYSAC sac-id, LUN lun-id,  
PRIMARYPORT 64-bit-portname
```

Example:

```
SCF> ADD SCSI $M8521, SENDTO STORAGE, PRIMARYLOCATION  
(110,2,2), PRIMARYSAC 2, LUN 0, PRIMARYPORT 1234567891234567
```

To add the data path:

Note. WWN (portname) for each port is labeled on the back of each tape drive.

1. In SCF, issue this command:

```
SCF> ADD TAPE $tape, SENDTO STORAGE, LOCATION (group, module,  
slot), SAC sac-id, PORTNAME 64-bit-portname, LUN lun-id
```

Example:

```
SCF> ADD TAPE $M8504, SENDTO STORAGE, LOCATION (110,2,2), SAC  
2, LUN 0, PORT 50060B00002E69CD
```

Note. The LUN (logical unit number) for all Fibre Channel tape storage devices directly attached to the NonStop NS-series server is 0.

2. To start the tape drive on the server, issue this command in SCF:

```
SCF> START TAPE $tape
```

Example:

```
SCF> START TAPE $M8504
```

For complete details about the ADD and STATUS commands, including command syntax, see the *SCF Reference Manual for the Storage Subsystem*.

7

Configuring the M8521 Tape Library for the NonStop S-Series Server

The section covers:

[Configuration Overview](#)

[7-1](#)

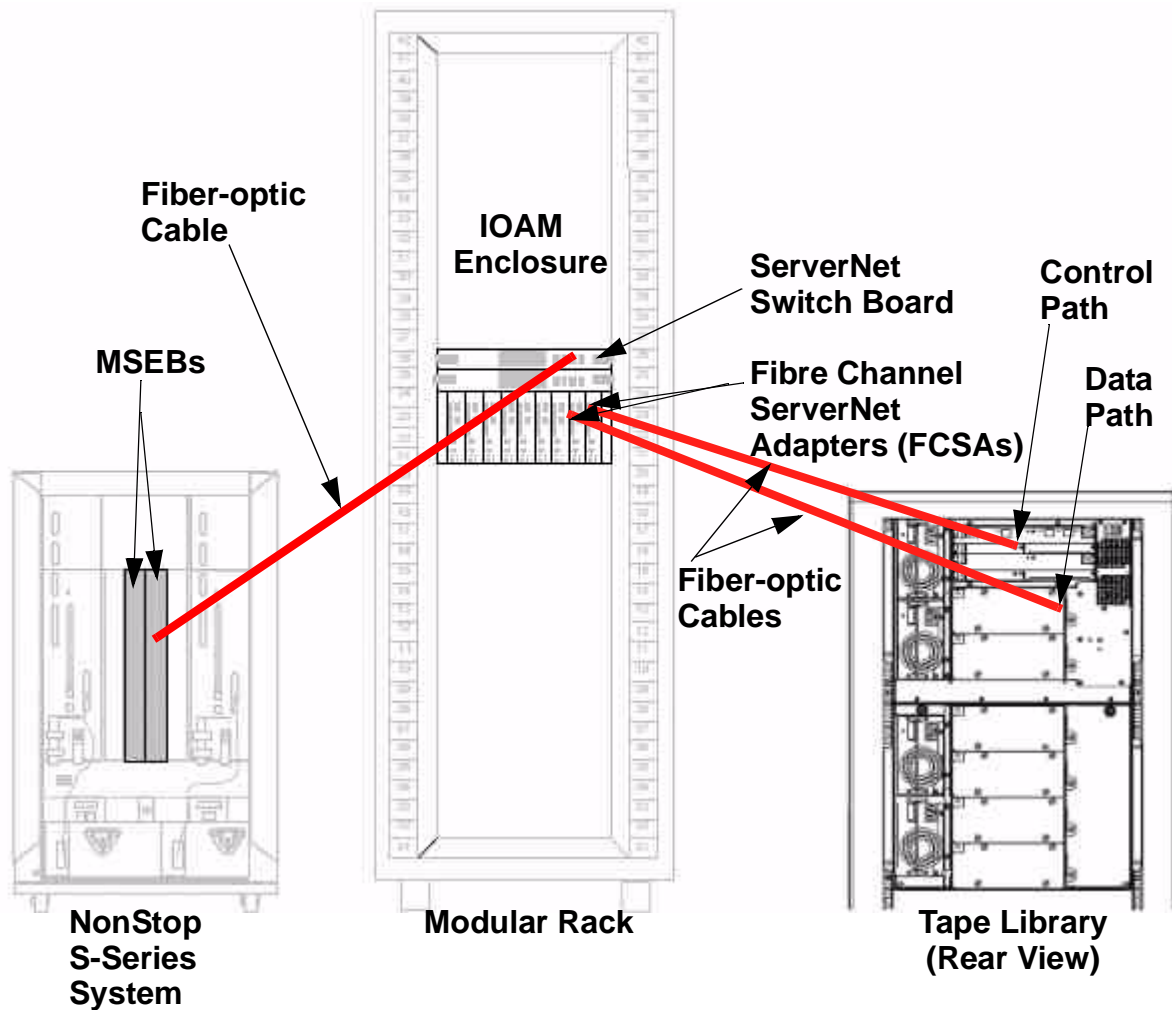
[Adding the Control Path and Data Path](#)

[7-3](#)

Configuration Overview

You can attach the tape library (control path and data path) to a NonStop S-series server via an IOAM enclosure. The tape library attaches to the FCSA (Fibre Channel ServerNet adapter) in the IOAM enclosure. The ServerNet switch board on the IOAM enclosure connects to a MSEB (Modular ServerNet Expansion Board) on a NonStop S-series server via a fiber-optic cable. [Figure 7-1](#) on page 7-2 shows a configuration example of the tape library connected to a NonStop S-series server via an IOAM enclosure.

Figure 7-1. Configuration Example



Note. The control path is used to control the robot, and the data path is used to control the tape drive (M8504).

For more information on the IOAM enclosure, see the *Modular I/O Installation and Configuration Guide*.

Adding the Control Path and Data Path

Note. To obtain the portname numbers for your control path and data path, contact a service representative from STK. The portname numbers used in this section are examples only.

To add the control path, issue this SCF command:

```
SCF> ADD SCSI $device, SENDTO STORAGE, PRIMARYLOCATION  
(group, module, slot), PRIMARYSAC sac-id, LUN lun-id,  
PRIMARYPORT 64-bit-portname
```

Example:

```
SCF> ADD SCSI $M8521, SENDTO STORAGE, PRIMARYLOCATION  
(110,2,2), PRIMARYSAC 2, LUN 0, PRIMARYPORT 1234567891234567
```

To add the data path:

Note. WWN (portname) for each port is labeled on the back of each tape drive.

1. In SCF, issue this command:

```
SCF> ADD TAPE $tape, SENDTO STORAGE, LOCATION (group, module,  
slot), SAC sac-id, PORTNAME 64-bit-portname, LUN lun-id
```

Example:

```
SCF> ADD TAPE $M8504, SENDTO STORAGE, LOCATION (110,2,2), SAC  
2, LUN 0, PORT 50060B00002E69CD
```

Note. The LUN (logical unit number) for all Fibre Channel tape storage devices directly attached to the IOAM enclosure is 0.

2. To start the tape drive on the server, issue this command in SCF:

```
SCF> START TAPE $tape
```

Example:

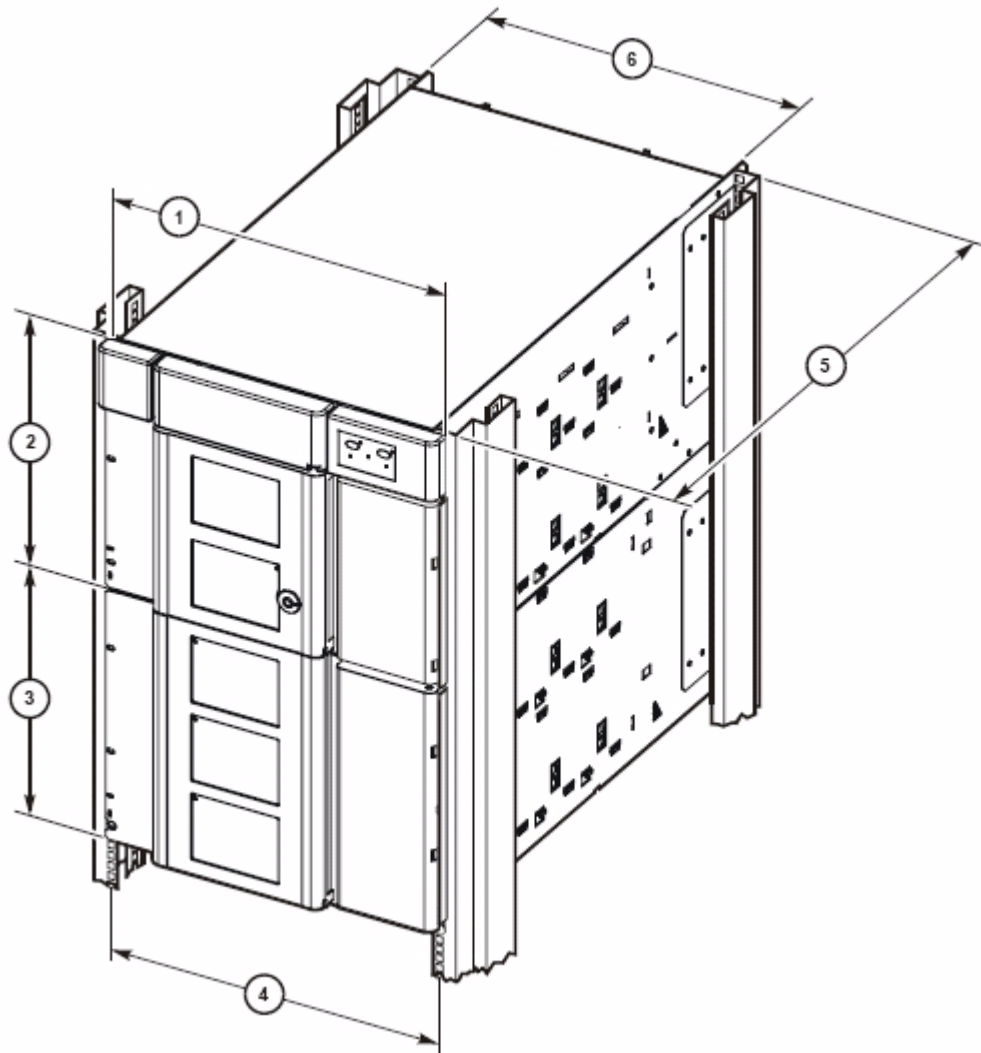
```
SCF> START TAPE $M8504
```

For complete details about the ADD and STATUS commands, including command syntax, see the *SCF Reference Manual for the Storage Subsystem*.

A Specifications

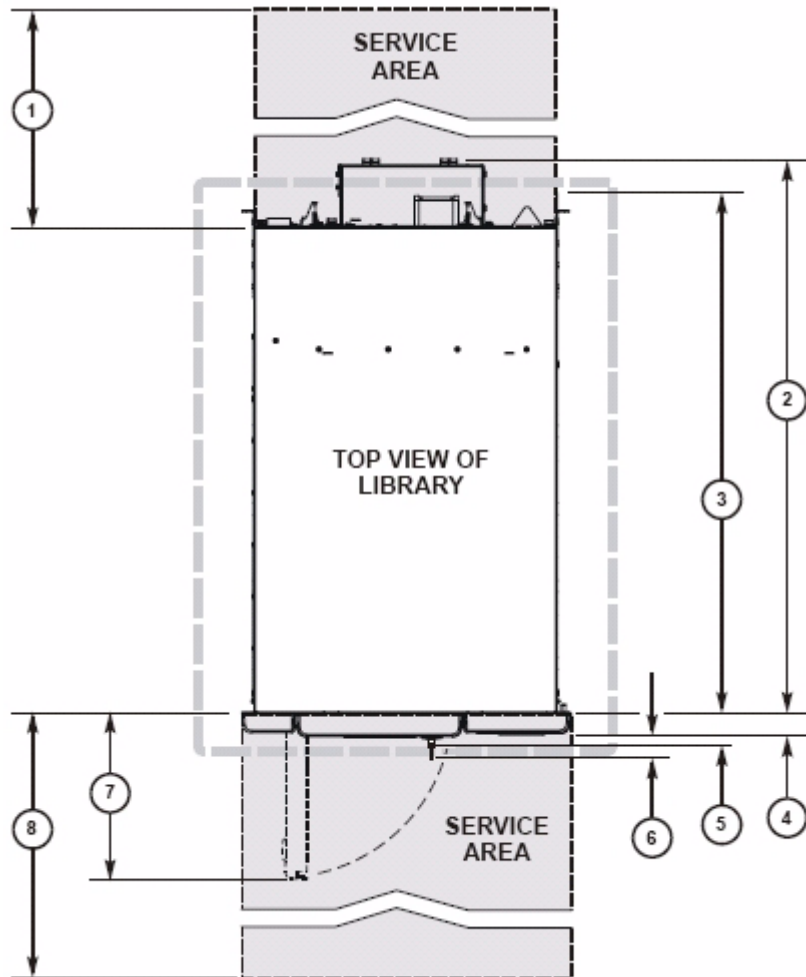
The next pages provide tape library, tape drive, and cartridge specifications.

Figure A-1. Library and Rack Dimensions



1. 48.3 cm (19.0 in.) width of front of base module with flange
2. 35.6 cm (14.0 in.) height of base module
3. 35.6 cm (14.0 in.) height of expansion module
4. 46.5 cm (18.3 in.) distance between rack holes
5. 60.9 cm (24.0 in.) to 86.4 cm (34.0 in.), optimally 74 cm (29 in.) front to rear rack mounting distance
6. 44.5 cm (17.5 in.) width of back of base module

Figure A-2. Tape Library and Rack Dimensions



1. 60.9 cm (2 ft) minimum service clearance behind the library or rack
2. 81.0 cm (31.9 in.) depth of base module from front mounting plane to back of tape drives
3. 76.2 cm (30.0 in.) depth of base module
4. 3.8 cm (1.5 in.) depth of front door, required clearance
5. 5.3 cm (2.1 in.) depth of front door and unique latch hardware
6. 5.9 cm (2.3 in.) key depth
7. 24.1 cm (9.5 in.) front door opening clearance
8. 60.9 cm (2 ft) minimum front service clearance

Tape Library Components Weights

This table lists the weights of the tape library, tape drives and trays, and cartridges.

Table A-1. Library Component Weights

Components	Weight
Base module with 1 power supply, 2 tape drives, and robotics unit	98 pounds (44.5 kilograms)
Drive expansion module (DEM) with 1 power supply and 4 tape drives	91 pounds (41.3 kilograms)
Cartridge expansion module (CEM)	44.2 pounds (20.1 kilograms)
Robotics unit	22.2 pounds (10.1 kilograms)
Power Supply	5.1 pounds (2.3 kilograms)
LTO Ultrium tape drive and tray assy	7.9 pounds (3.6 kilograms)
Tape drive tray assy without tape drive	3.4 pounds (1.5 kilograms)
LTO Ultrium cartridge	7.8 ounces (221 grams)

Tape Library Environment

This table lists the tape library environments specifications.

Table A-2. Library Environment Specifications

	Operating	Storage	Transporting
Temperature	+10 to +40°C (+50 to +104°F)	+10 to +40°C (+50 to +104°F)	-40 to +60°C (-40 to +140°F)
Humidity	20 to 80%	10 to 95%	10 to 95%
Wet bulb (maximum noncondensing)	+29.2°C (+84.5°F)	+35°C (+95°F)	+35°C (+95°F)
Altitude	-76 to 3,048 m (-250 to 10,000 ft)	-76 to 3,048 m (-250 to 10,000 ft)	-76 to 3,048 m (-250 to 10,000 ft)

Power

Note. The tape library is offered with redundant power in all the modules that have power supplies in them.

The power cords are shipped with the unit and are selected to match the geographical power requirements of that area.

Power Cord Numbers and Receptacles

Power cord part numbers are listed by country in the following table. All cords are 3 meters (9.81 feet).

Table A-3. Power Cord and Receptacles

Input Voltage	Country	Part Number	Receptacle Type
100 to 127 VAC	U.S./Canada	10083242	5-15R
	Japan	10083243	JIS C8303
200 to 240 VAC	Australia	10083244	AS 3112
	Denmark	10083248	DEMKO107 / 10-1973
	Europe	10083241	Schuko
	Italy	10083245	CEI 23-16/V11
	Korea	10083657	KSC 8305
	South Africa	10083636	BS546
	Switzerland	10083246	SEV 1011-S24507
	United Kingdom	10083247	BS 1363/A
U.S./Canada	10083547	6-15R	

Table A-4. Non-Country-Specific Cords

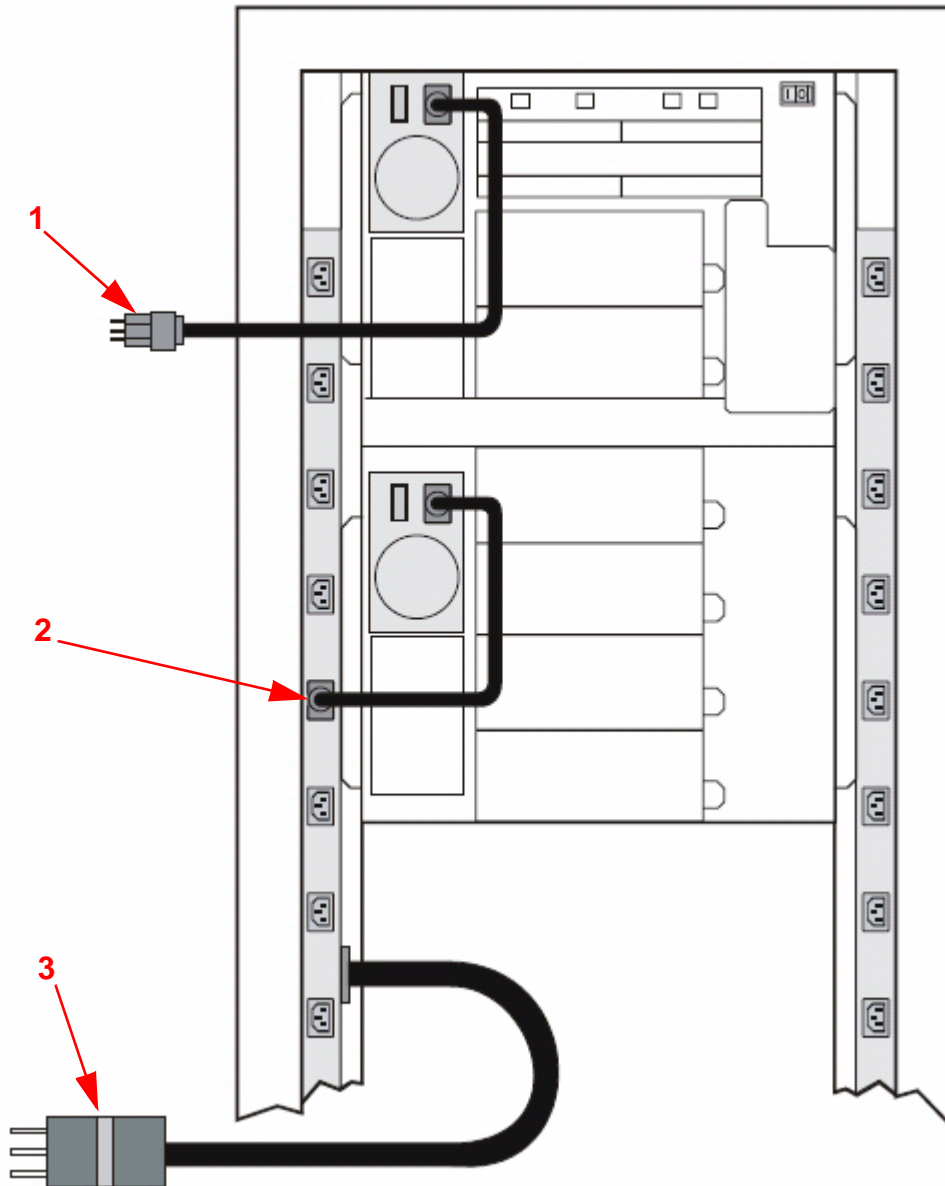
Description	Part Number
Cord, power, SJT, IEC320, 14AWG, 100 to 127 VAC	10083617
Cord, SJT, 16AWG, L6-15P, 250 VAC	10083639
Cord, 18, 3, SVT, 1mm, M/SH FRT	10083273
Cord, power, 3, F, IEC320 harmonized. The cord has a plug on one end that attaches to the library and bare wires on the other. Buy the correct end to match your normal wall outlet and attach it to the cord.	10083302

Installing the Power Cords

- ▲ **WARNING.** Possible bodily harm and equipment damage: The power cord must not be plugged in until the supply has been properly installed.
-

If your rack has a power distribution unit (PDU), plug each power cable from the power supply receptacle to the PDU, and then plug the PDU cable to the wall receptacle.

If your rack does not have a PDU, plug each power cable from the power supply receptacle to the wall receptacle.

Figure A-3. Power Cabling

- 1. To wall outlet or external power strip**
- 2. To rack PDU, if present**
- 3. From rack PDU (if present) to wall outlet**

Power Specifications

These tables list power specifications for the modules and tape drives.

Table A-5. Power for Library Without Tape Drives

Input voltage	100-240 VAC, single phase
Frequency	50/50 Hz
Maximum library power consumption	1.4 A @ 120 V 0.8 A @ 240 V
Maximum heat output	614 Btu/hr
Voltage-amperes	180 VA

Table A-6. Power for Base Unit and Two LTO Tape Drives

	Two LTO Tape Drives
Input power	219 watts
Input voltage-amperes	226 voltage-amperes
Input current (100 VAC)	2.3 amperes
Input current (120 VAC)	1.9 amperes
Input current (240 VAC)	0.9 amperes
Btu/hour	748 Btu/hr

Table A-7. Power for Drive Expansion Module and Four LTO Tape Drives

	Four LTO Tape Drives
Input power	288 watts
Input voltage-amperes	297 voltage-amperes
Input current (100 VAC)	3.0 amperes
Input current (120 VAC)	2.5 amperes
Input current (240 VAC)	1.2 amperes
Btu/hour	983 Btu/hr



Safety and Compliance

This section contains three types of required safety and compliance statements:

- Regulatory compliance
- Waste Electrical and Electronic Equipment (WEEE)
- Safety

Regulatory Compliance Statements

The following regulatory compliance statements apply to the products documented by this manual.

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Any changes or modifications not expressly approved by Hewlett-Packard Computer Corporation could void the user's authority to operate this equipment.

Canadian Compliance

This class A digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Korea MIC Compliance

A급 기기 (업무용 정보통신기기)

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약 잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Taiwan (BSMI) Compliance

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Japan (VCCI) Compliance

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A情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may occur, in which case the user may be required to take corrective actions.

European Union Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (the equivalent international standards are in parenthesis):

- EN55022 (CISPR 22)—Electromagnetic Interference
- EN55024 (IEC61000-4-2, 3, 4, 5, 6, 8, 11)—Electromagnetic Immunity
- EN61000-3-2 (IEC61000-3-2)—Power Line Harmonics
- EN61000-3-3 (IEC61000-3-3)—Power Line Flicker
- EN60950-1 (IEC60950-1)—Product Safety

Laser Compliance

This product may be provided with an optical storage device (that is, CD or DVD drive) and/or fiber optic transceiver. Each of these devices contains a laser that is classified as a Class 1 Laser Product in accordance with US FDA regulations and the IEC 60825-1. The product does not emit hazardous laser radiation.



WARNING: Use the controls or adjustments or performance of procedures other than those specified herein or in the laser product's installation guide may result in hazardous radiation exposure. To reduce the risk of exposure to hazardous radiation:

- **Do not try to open the module enclosure. There are no user-serviceable components inside.**
- **Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.**
- **Allow only HP Authorized Service technicians to repair the module.**

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.

SAFETY CAUTION

The following icon or caution statements may be placed on equipment to indicate the presence of potentially hazardous conditions:



DUAL POWER CORDS CAUTION:

"THIS UNIT HAS MORE THAN ONE POWER SUPPLY CORD. DISCONNECT ALL POWER SUPPLY CORDS TO COMPLETELY REMOVE POWER FROM THIS UNIT."

"ATTENTION: CET APPAREIL COMPORTE PLUS D'UN CORDON D'ALIMENTATION. DÉBRANCHER TOUS LES CORDONS D'ALIMENTATION AFIN DE COUPER COMPLÈTEMENT L'ALIMENTATION DE CET ÉQUIPEMENT".

DIESES GERÄT HAT MEHR ALS EIN NETZKABEL. VOR DER WARTUNG BITTE ALLE NETZKABEL AUS DER STECKDOSE ZIEHEN.



Any surface or area of the equipment marked with these symbols indicates the presence of electric shock hazards. The enclosed area contains no operator-serviceable parts.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure.

NOT FOR EXTERNAL USE

CAUTION: NOT FOR EXTERNAL USE. ALL RECEPTACLES ARE FOR INTERNAL USE ONLY.

ATTENTION: NE PAS UTILISER A L'EXTERIEUR DE L'EQUIPEMENT

IMPORTANT: TOUS LES RECIPIENTS SONT DESTINES UNIQUEMENT A UN USAGE INTERNE.

VORSICHT: ALLE STECKDOSEN DIENEN NUR DEM INTERNEN GEBRAUCH.

HIGH LEAKAGE CURRENT

To reduce the risk of electric shock due to high leakage currents, a reliable grounded (earthed) connection should be checked before servicing the power distribution unit (PDU).

Observe the following limits when connecting the product to AC power distribution devices: For PDUs that have attached AC power cords or are directly wired to the building power, the total combined leakage current should not exceed 5 percent of the rated input current for the device.

“HIGH LEAKAGE CURRENT, EARTH CONNECTION ESSENTIAL BEFORE CONNECTING SUPPLY”

“HOHER ABLEITSTROM. VOR INBETRIEBNAHME UNBEDINGT ERDUNGSVERBINDUNG HERSTELLEN”

“COURANT DE FUITE E’LEVE’. RACCORDEMENT A LA TERRE INDISPENSABLE AVANT LE RACCORDEMENT AU RESEAU”

FUSE REPLACEMENT

CAUTION – For continued protection against risk of fire, replace fuses only with fuses of the same type and the same rating. Disconnect power before changing fuses.

Waste Electrical and Electronic Equipment (WEEE)

Information about the Waste Electrical and Electronic Equipment (WEEE) directive can be accessed from the left navigation area of the NTL home page: select **NonStop Computing > Waste Electrical and Electronic Equipment (WEEE)**.

Safety

Safety information can be accessed from the left navigation area of the NTL home page: select **NonStop Computing>Important Safety Information**. A document window containing a binder of safety information, in several languages, appears. In the document window, click a document title to open the safety information in another language. Local HP support can also help direct you to your safety information.

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