

TANDBERG DATA

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Field Instruction: Installing or Replacing a Tape Drive

Magnum 448 LTO Library

Part Number 1017477 Rev. C - September 2009

This document explains how to install or replace a tape drive in the Magnum 448 LTO library. Please read the entire section that you are using prior to beginning the procedure.

PREPARING FOR INSTALLATION OR REPLACEMENT

Note: If your library is installed in a rack, it is *not* necessary to remove the library from the rack to complete this procedure. It is also not necessary to disconnect the Ethernet cable from the back of the library.

- ✓ **Obtain these items**—a #2 Phillips screwdriver and a small flat-blade screwdriver.
- ✓ **Ensure that the environment is free of conditions that could cause electrostatic discharge (ESD)**—If possible, use an antistatic mat and a grounded static protection wristband during installation. If a mat and wristband are not available, touch a known grounded surface, such as a computer's metal chassis.



Warning

Before performing any installation or maintenance procedures, be sure that the library's power switch is off and that the power cord is disconnected from the library and the outlet.



Warnung

Vor der Ausführung von Installations- oder Wartungsarbeiten ist darauf zu achten, daß der Library-Netzschalter auf "Aus" gestellt ist und daß das Anschlußkabel vom Library und der Steckdose entfernt ist.



Advertencia

Antes de realizar cualquier procedimiento de instalación o de mantenimiento, comprobar que el interruptor de alimentación de la biblioteca está apagado y que el cable de alimentación no está enchufado ni a la biblioteca ni a la toma de corriente.

GENERAL INFORMATION

The library accommodates Ultrium 3 (LTO-3) or Ultrium 2 (LTO-2) tape drives in half height (HH) or full height (FH) configurations. It will NOT accommodate LTO-1 tape drives.

! Important

The tape drives must be specially configured (at the factory) for use in the libraries. Purchase tape drive kits only from Tandberg Data or Tandberg Data-approved suppliers.

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Notes: The Magnum 448 library shipped with either a Rev "A" or a Rev "B" power supply installed. Refer to the instructions appropriate for your configuration. Rev B power supplies have a Rev B label, as shown in [Figure 3](#).

Most of the illustrations show SCSI configurations. Use the same steps to install Fibre Channel tape drives.

The library accommodates one or two full height tape drives, or one, two, three, or four half height tape drives.

Glossary of Abbreviations

FH = Full Height (tape drive)	TD = Tape Drive	Rev "A" = Revision A (power supply)
HH = Half Height	448 = Magnum 448 LTO Library	Rev "B" = Revision B (power supply)

REFERENCE ILLUSTRATIONS

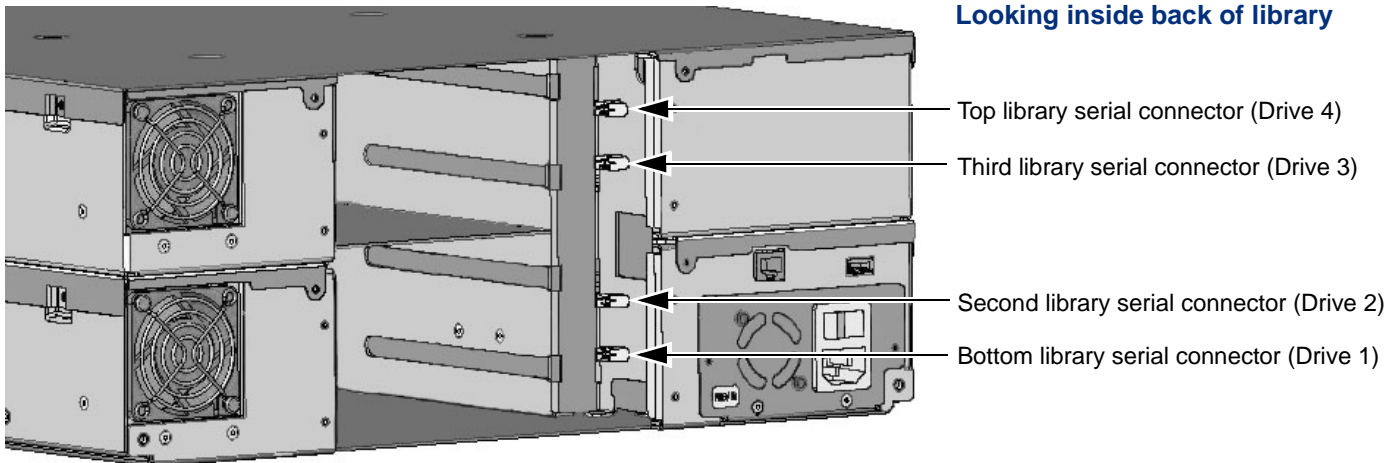
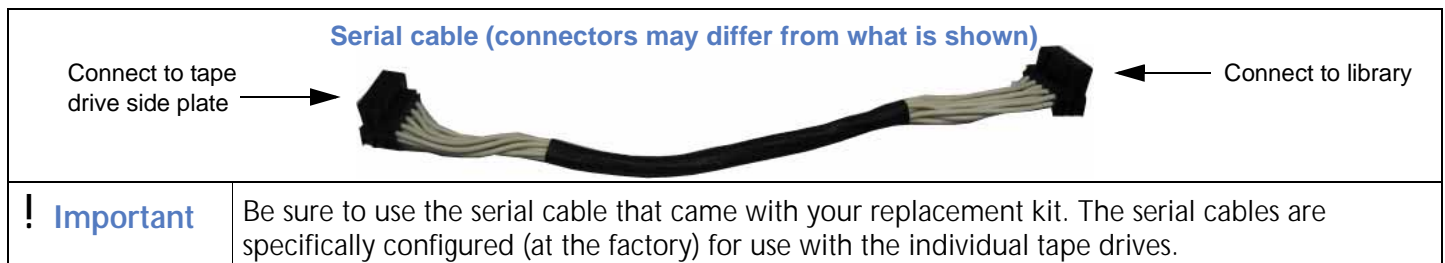
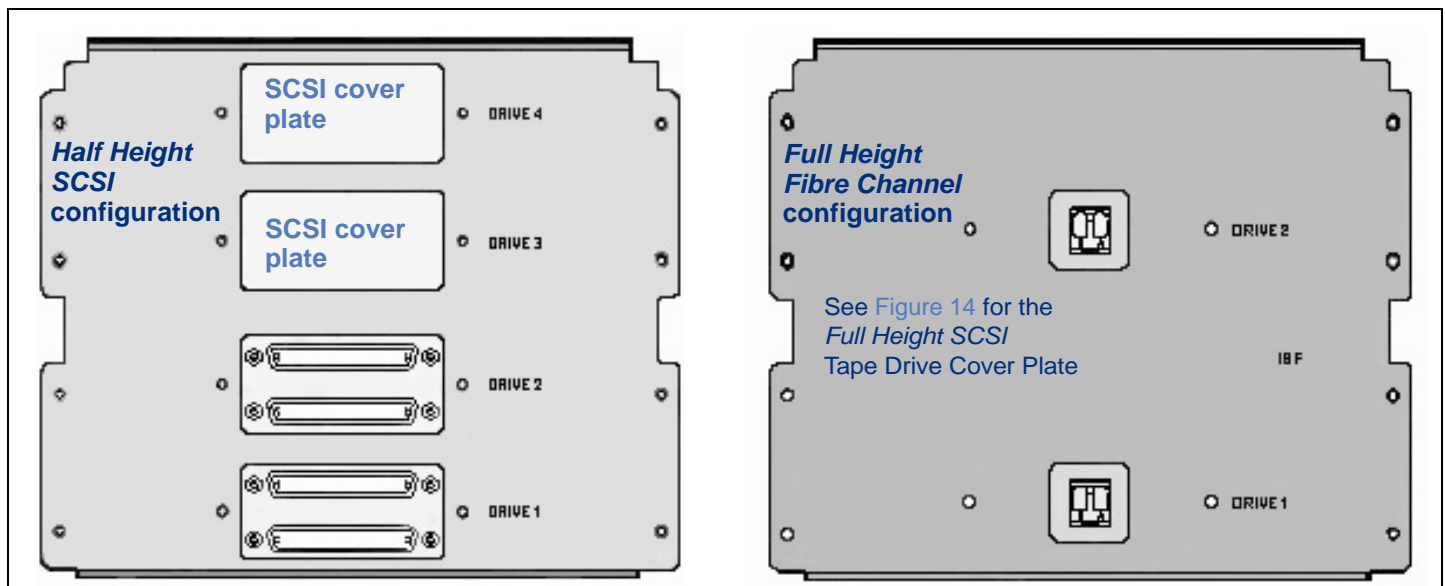


Figure 1 Internal library serial connectors

SERIAL CABLE



TAPE DRIVE COVER PLATES



SERIAL CABLE CONNECTIONS

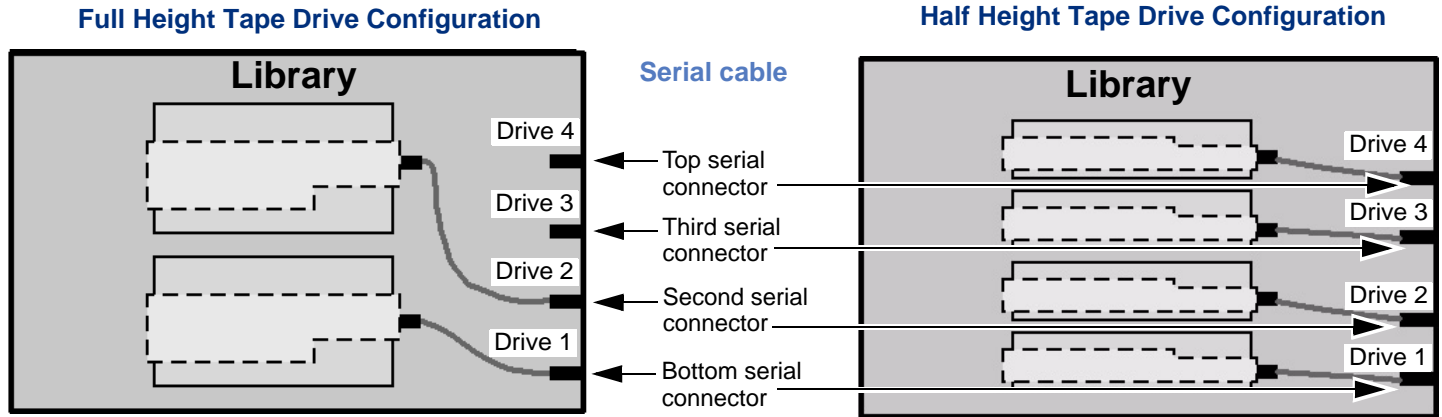


Figure 2 Serial cable routing—full height tape drives

Notes: Do not switch the internal connectors—the bottom tape drive must be connected to the bottom serial connector, the second tape drive (both HH and FH) must be connected to the second serial connector, and so forth. The top two connectors are not used with an FH configuration.

REVISION “B” POWER SUPPLY

Your library shipped with one of these power supplies installed at the factory:

- ▶ Revision “A” power supply (no label affixed)
- ▶ Revision “B” power supply (Rev “B” label affixed—see Figure 3 below)

! Important

When you add a third (or third *and* fourth) half height LTO-3 tape drive, you may need to upgrade your power supply. Contact Technical Support at www.tandbergdata.com for additional information.

If your power supply has this label affixed, you do NOT need a new power supply to support the additional tape drives.

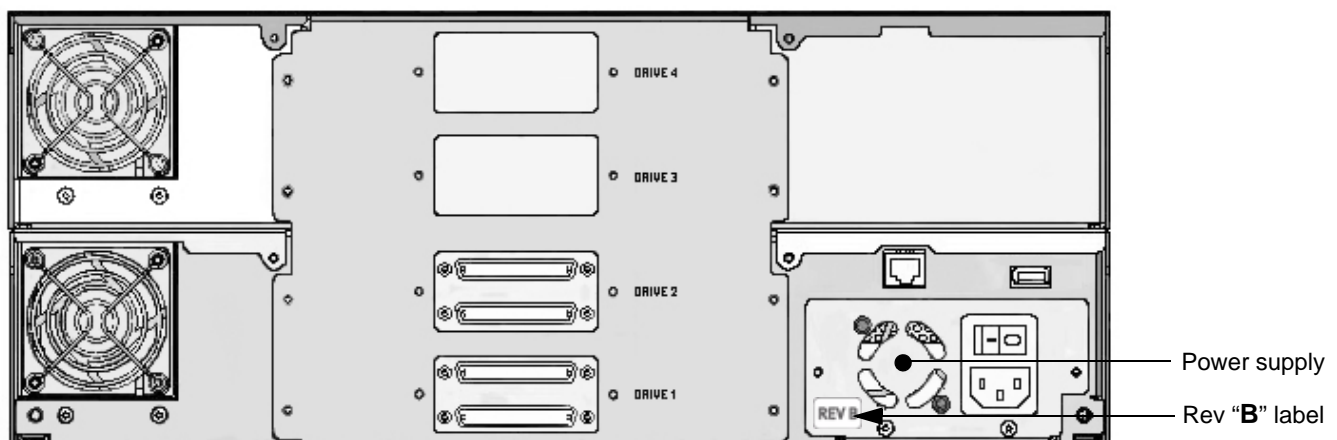


Figure 3 Rev “B” power supply label

POWER CABLE CONNECTIONS

Rev "A" power cable

Connectors are all in one row

Rev "B" power cable

Connectors are on two cables

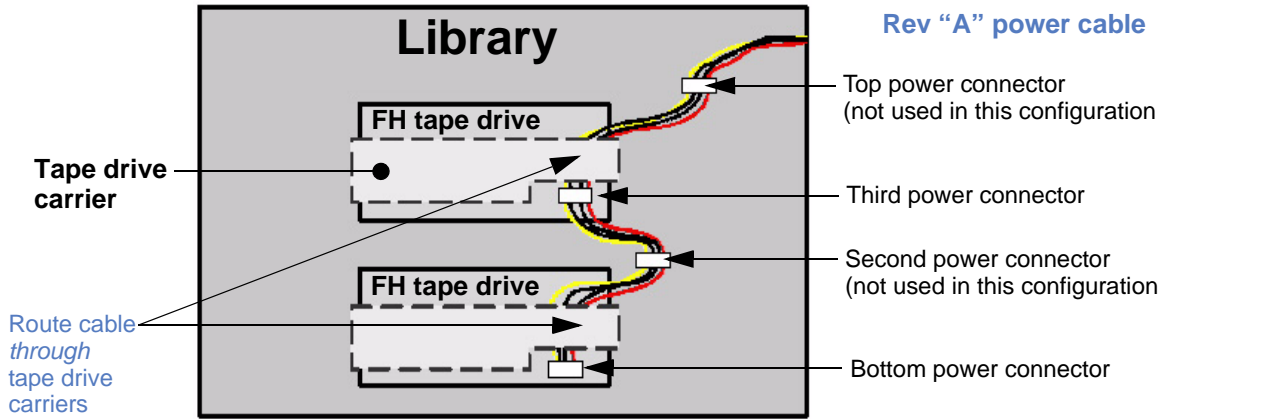
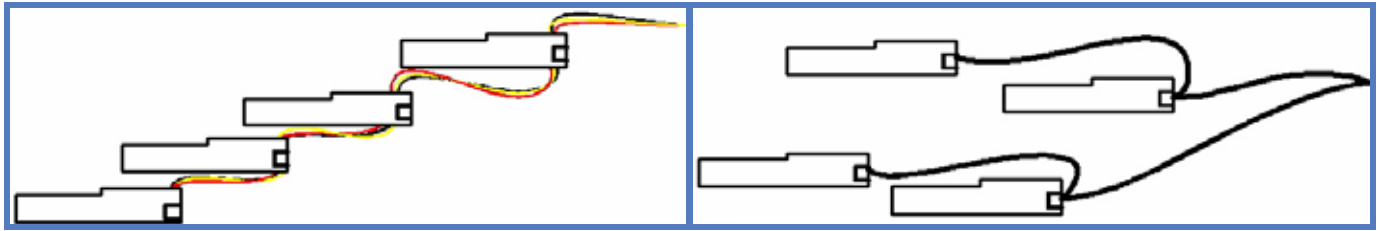


Figure 4 Rev "A" power cable routing—full height tape drives

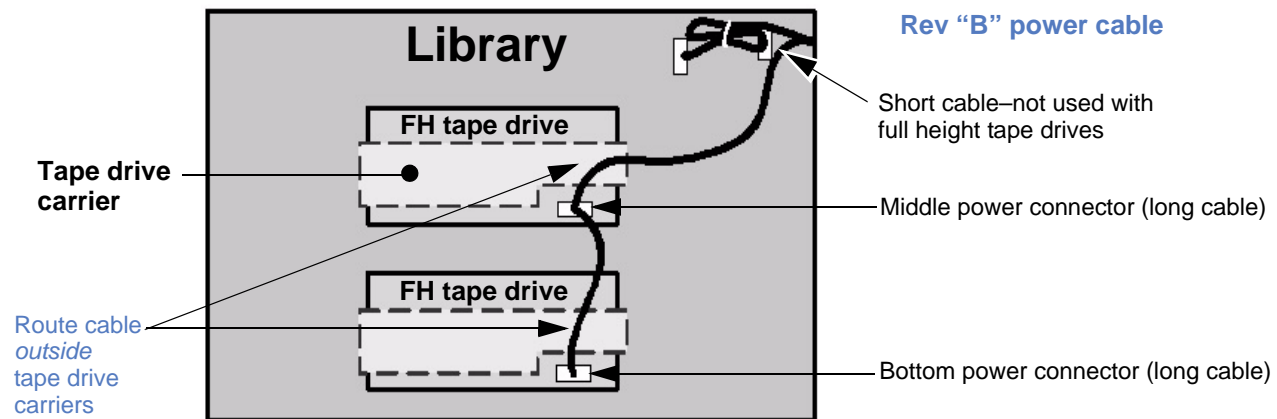


Figure 5 Rev "B" power cable routing—full height tape drives

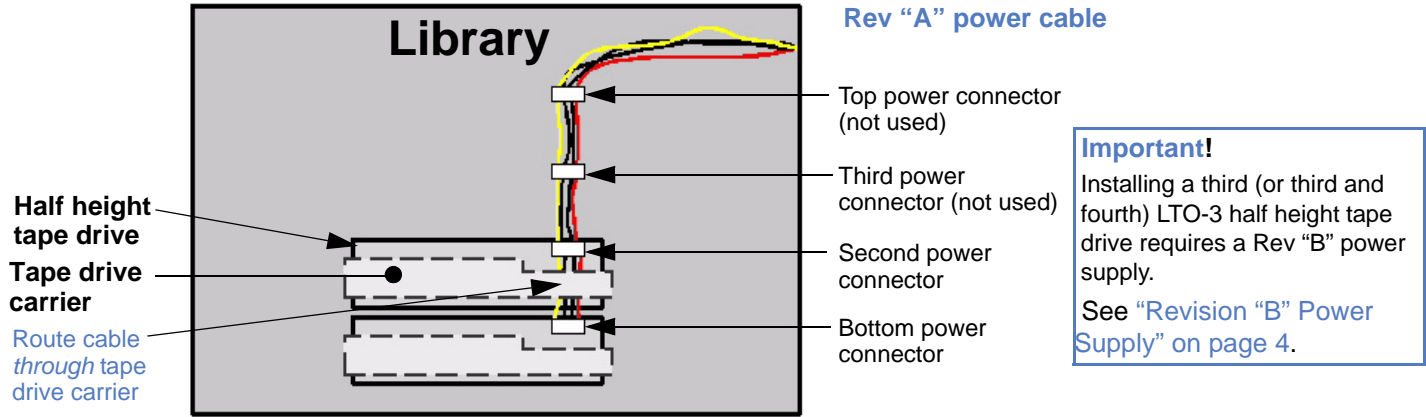


Figure 6 Rev "A" power cable routing—half height tape drives

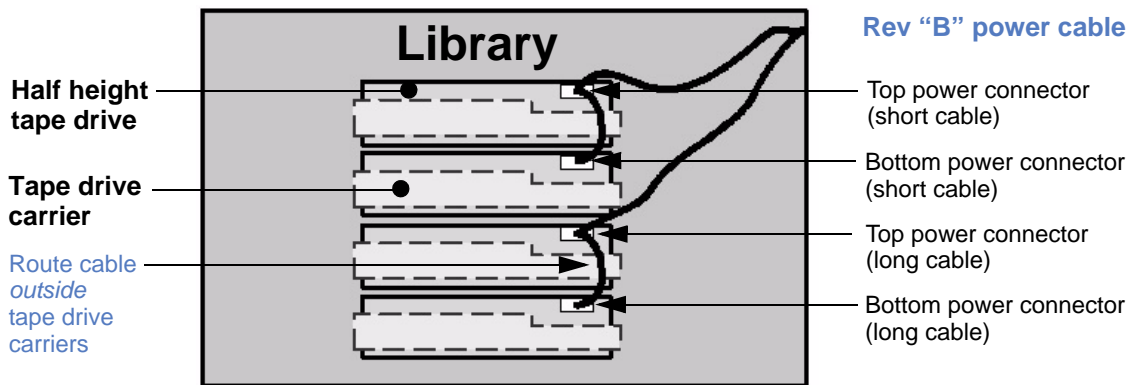


Figure 7 Rev "B" power cable routing—half height tape drives

INSTALLING ADDITIONAL TAPE DRIVES

! Important

You must update your Magnum 448 library to the current firmware (v. V1D181 or higher) before you install your new drive. The firmware allows the library to auto-configure the tape drive installation upon power up, eliminating the step of manually configuring the library after tape drive installation.

If your library code is not updated to v. V1D181 or higher, you will need to contact Tandberg Data technical support for manual configuration instructions.

To install an additional tape drive (or tape drives), follow these steps:

1. Preparing for replacement—

- a. Update library firmware to v. V1D181 or higher (see Important note above).
- b. Power off the host.
- c. Power off the library (press the 0 on the back of the unit).
- d. Disconnect the power cord, the SCSI or Fibre Channel cable(s), and the terminator (if one is installed).
- e. Remove the tape drive cover plate. Set the plate and the screws aside.

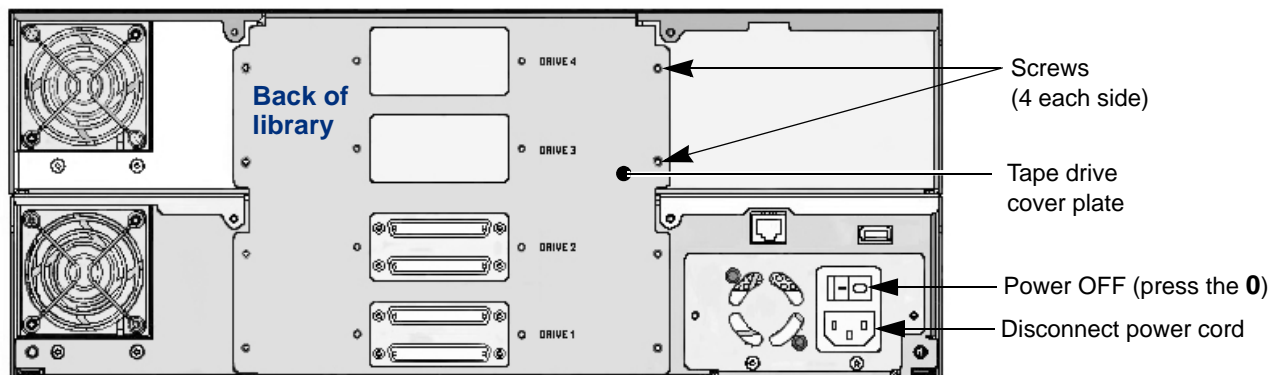


Figure 8 Tape drive cover plate (HH SCSI library)

2. Removing the internal cooling plates and disconnecting cables—

! Important

Remove as many internal cooling plates as necessary to add tape drives, but leave all empty tape drive bays covered. The plates are required for proper cooling.

- a. Remove the two screws (A) holding the tape drive cooling plate (B). Remove the plate, and discard it and the screws.

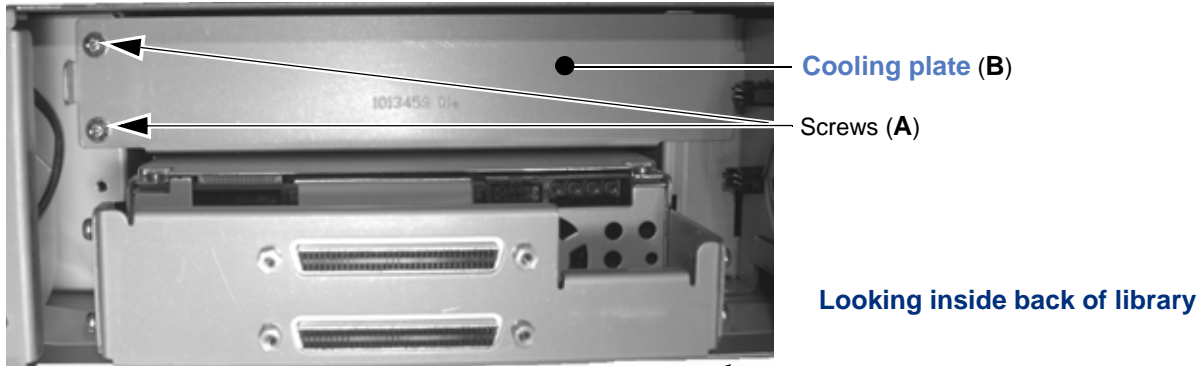


Figure 9 Tape drive cooling plate

- b. Disconnect the power cables as needed.
 - ▶ Rev “A” power supply installed (no Rev B label)—disconnect all cables.
 - ▶ Rev “B” power supply installed—disconnect from *only* the tape drive you are replacing.

3. Installing the tape drive—

! Important Do not mix full height and half height -or- SCSI and Fibre Channel tape drives in the Magnum 448 library, as it does not support mixed tape drive configurations.

- a. Locate the serial cable that came in your replacement kit and attach it to the appropriate serial connector *inside the library*.
 - ▶ **Library serial cable connections—**

Tape drive	Quantity	Install in this opening...	Serial connector	Internal label	Internal serial connector location
Full height	Second tape drive	<i>Top</i>	Second	Drive 2	Figure 1 on page 3
	Single tape drive	<i>Bottom</i>	Bottom	Drive 1	
Half height	Fourth tape drive	<i>Top</i>	Top	Drive 4	
	Third tape drive	<i>Third</i>	Third	Drive 3	
	Second tape drive	<i>Second</i>	Second	Drive 2	
	Single tape drive	<i>Bottom</i>	Bottom	Drive 1	

- b. While holding the cables to the side, slide the new tape drive directly into the library, leaving it a short distance out to access the cables. Use care not to damage the cables.
- c. Connect the supplied serial cable and the power cable *to the tape drives*.

▶ **Tape drive (FH configuration)**— Connect the supplied serial cable and the power cable to the tape drives.

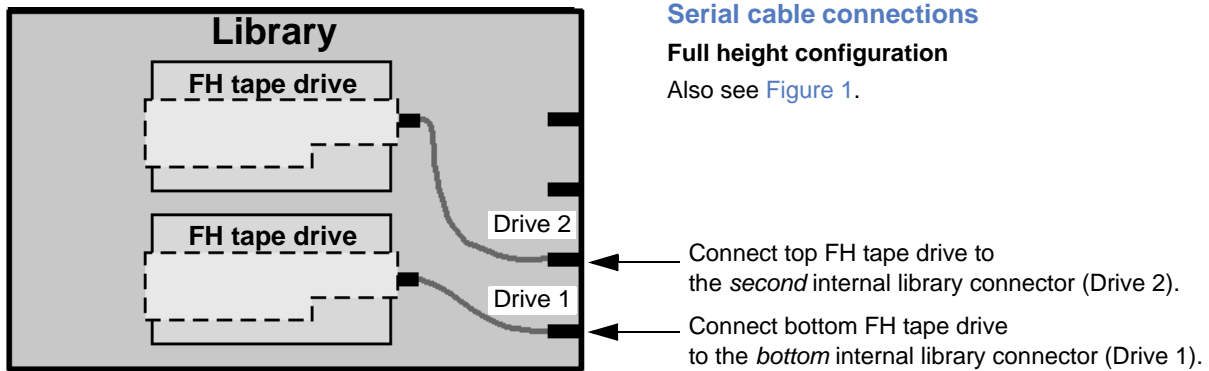


Figure 10 Installing additional tape drives: full height serial connectors

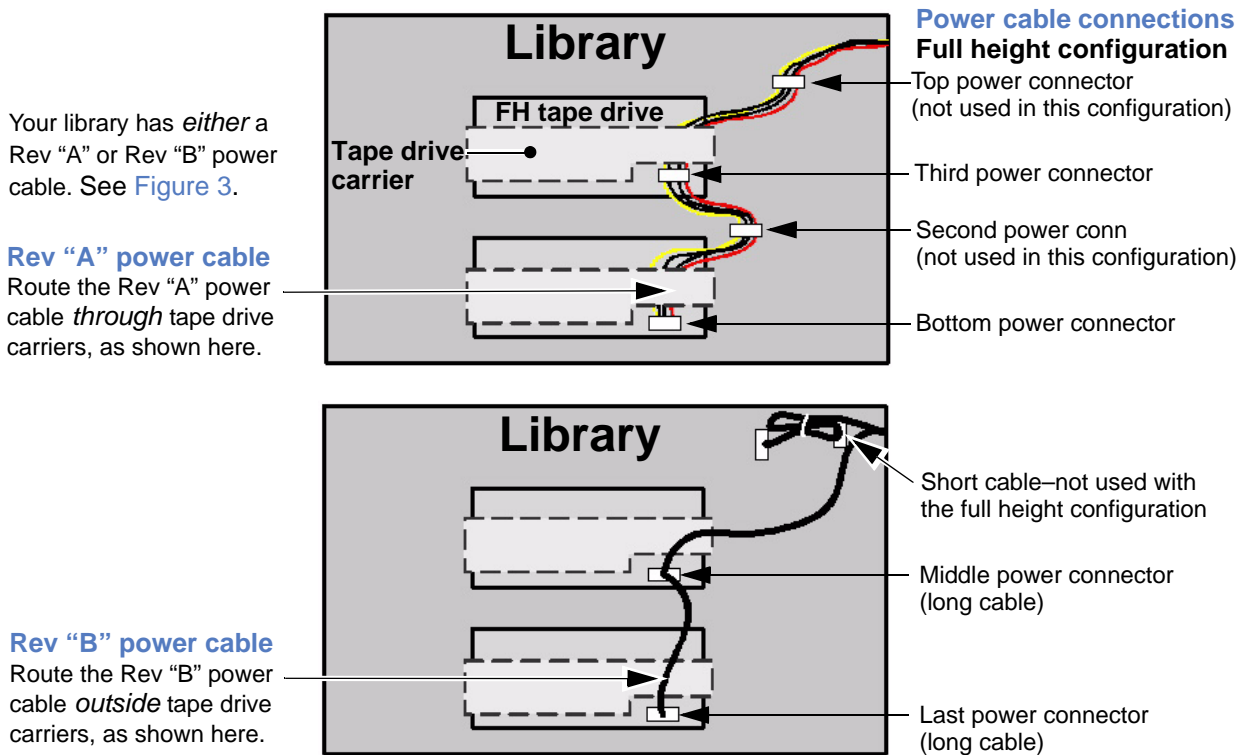


Figure 11 Installing additional tape drives: full height power connectors

▶ **Tape drive (HH configuration)**— Connect the supplied serial cable and the power cable to the tape drives.

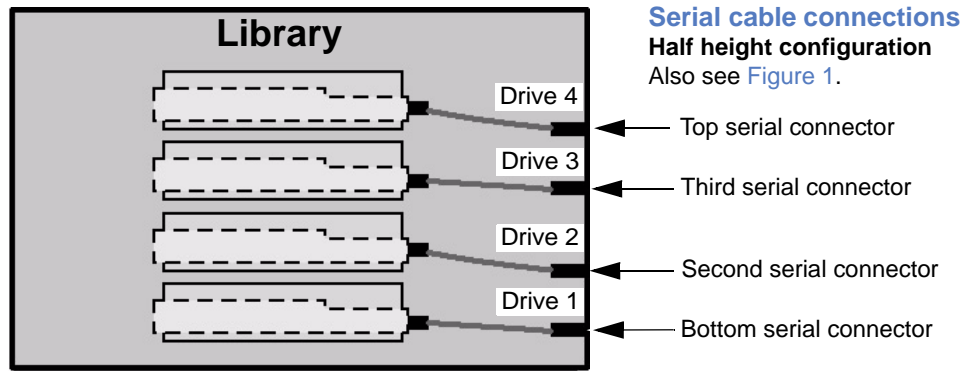


Figure 12 Installing additional tape drives: half height serial connectors

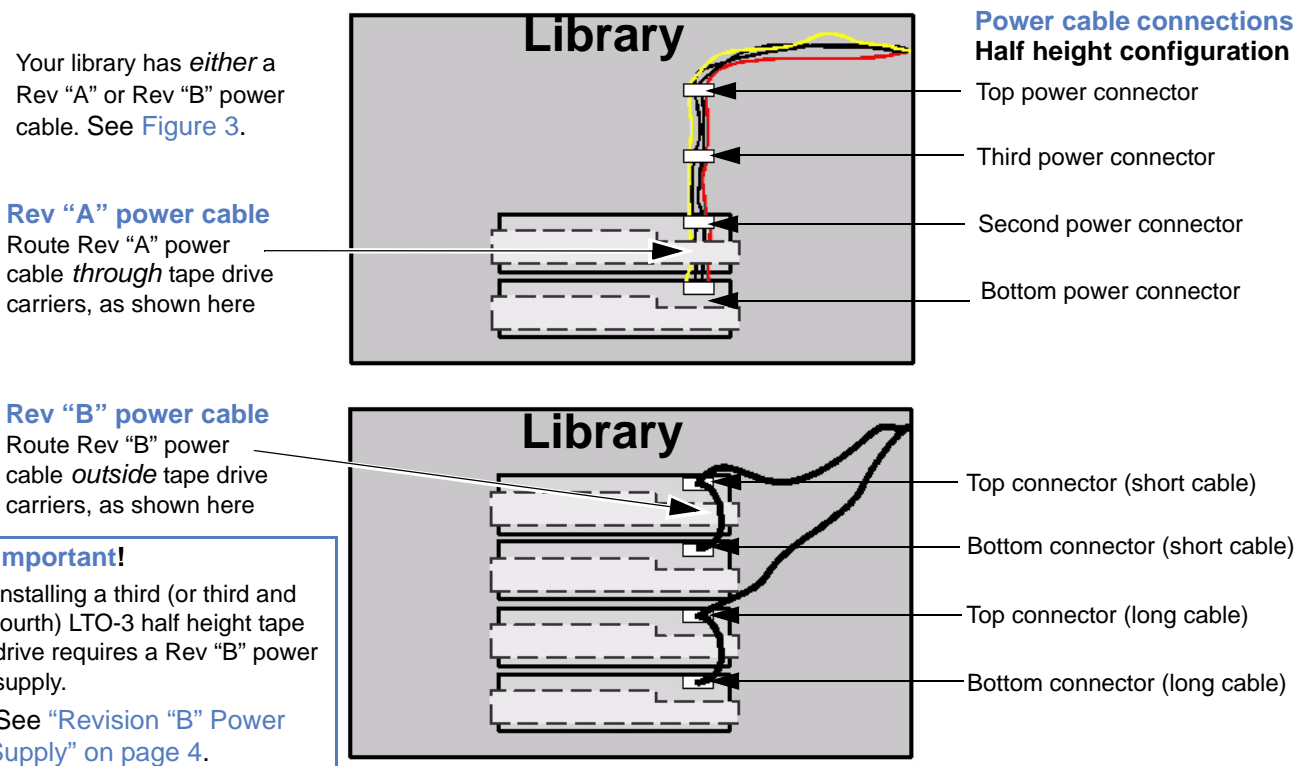


Figure 13 Installing additional tape drives: half height power connectors

d. Slide the tape drive the remaining distance into the library. Install the tape drives from bottom to top—fill the bottom slot first, the second slot next, and so forth. Do not skip slots. Continue adding tape drives, as needed.

4. Completing the installation—

a. Locate the tape drive cover plate (see “[Tape Drive Cover Plates](#)” on page 3 and [Figure 14](#) below). Remove the necessary SCSI plates, then attach the tape drive cover plate with the screws you removed earlier.

! Important The library requires both the SCSI cover plates and the tape drive cover plates for ESD protection. Do not leave any openings uncovered.

Library	If your library has...		Attach this SCSI cover plate...	
	Tape drive configuration	Quantity	Location	External drive label
Magnum448	Full height	Two	None	None
		One	Top	Drive 2 ^a
	Half height	Four	None	None
		Three	Top	Drive 4
		Two	Top and third	Drive 4 and 3
One	Top three	Drive 4, 3, and 2		

^a This applies to both SCSI and Fibre Channel library configurations.

REPLACING A TAPE DRIVE (SAME CONFIGURATION)

! Important

You must update your Magnum 448 library to the current firmware (v. V1D181 or higher) before you install your new drive. The firmware allows the library to auto-configure the tape drive installation upon power up, eliminating the step of manually configuring the library after tape drive installation.

If your library code is not updated to v. V1D181 or higher, you will need to contact Tandberg Data technical support for manual configuration instructions.

To replace a tape drive with a different tape drive of the same configuration (half height to half height, or full height to full height), follow these steps.

1. Preparing for replacement—

- a. Update library firmware to v. V1D181 or higher (see Important note above).
- b. Power off the host.
- c. Power off the library (press the **0** on the back of the unit).
- d. Disconnect the power cord, the SCSI or Fibre Channel cable(s), and the terminator (if present).
- e. Remove the tape drive cover plate. Set the plate and the screws aside.

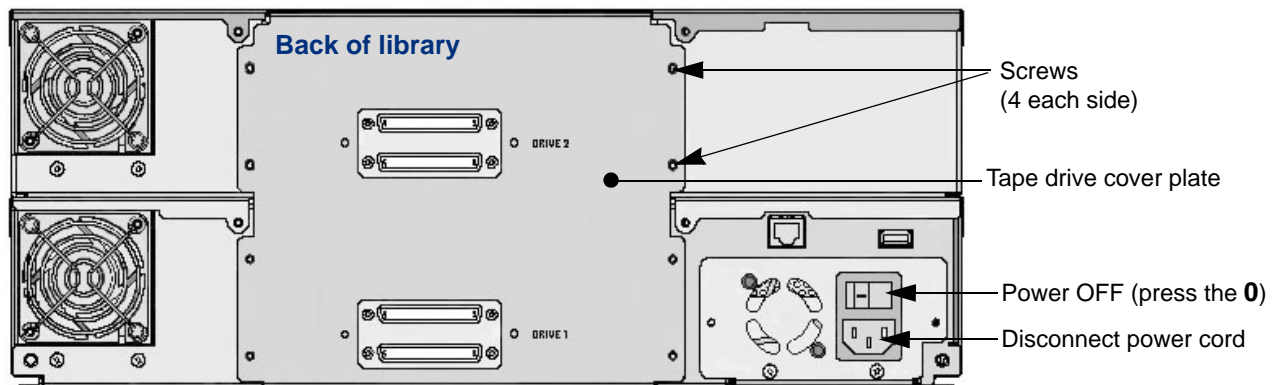


Figure 14 Tape drive cover plate (FH SCSI library)

2. Removing the tape drive—

- a. Pull the tape drive a short distance out of the library, then disconnect the serial cables (from the tape drive(s) that you are replacing).
- b. Disconnect the power cables as needed.
 - ▶ Rev “A” power supply installed (no Rev B label)—disconnect *all* cables.
 - ▶ Rev “B” power supply installed—disconnect from *only* the tape drive you are replacing.
- c. While holding the cables out of the way, pull the tape drive straight out of the library.



Caution

Be certain to support the tape drive as you remove it from the library. LTO Ultrium tape drives weigh several pounds each.

- d. Disconnect the serial cable from the library and discard it. **Do not reuse the serial cable.**

3. Installing the new tape drive—

- a. Locate the serial cable that came in your replacement kit and attach it to the appropriate serial connector *inside the library*.

Tape drive	Quantity	Install in this opening...	Serial connector	Internal label	Internal serial connector location
Full height	Second tape drive	<i>Top</i>	Second	Drive 2	Figure 1 on page 3
	Single tape drive	<i>Bottom</i>	Bottom	Drive 1	
Half height	Fourth tape drive	<i>Top</i>	Top	Drive 4	
	Third tape drive	<i>Third</i>	Third	Drive 3	
	Second tape drive	<i>Second</i>	Second	Drive 2	
	Single tape drive	<i>Bottom</i>	Bottom	Drive 1	

- b. While holding the cables out of the way, slide the new tape drive into the library, leaving it a short distance out to access the cables. Use care not to damage the cables.
- c. Connect the supplied serial cable and the power cable *to the tape drives*.
 - ▶ **Full Height tape drive—**

Cable	Cable routing	Connect as shown in...
Serial	to side of tape drive carrier bracket	Figure 10 on page 9
Rev “A” power	<i>through the tape drive carriers</i>	Figure 4 on page 5
Rev “B” power	<i>outside the tape drive carriers</i>	Figure 5 on page 5

- ▶ **Half Height tape drive—**

Cable	Cable routing	Connect as shown in...
Serial	to side of tape drive carrier bracket	Figure 12 on page 10
Rev “A” power	<i>through the tape drive carriers</i>	Figure 6 on page 6
Rev “B” power	<i>outside the tape drive carriers</i>	Figure 7 on page 6

Note: Installing a third and fourth Hewlett Packard LTO-3 half height tape drive requires a Rev “B” power supply. See “Revision “B” Power Supply” on page 4.

- d. Slide the tape drive the remaining distance into the library. Use care not to damage the cables during this step.

4. Completing the installation—

- a. Attach the SCSI cover plate and the tape drive cover plate that came with your replacement kit. See “Tape Drive Cover Plates” on page 3 and Figure 14 on page 11.

! Important

The library requires both the SCSI cover plates and the tape drive cover plates for ESD protection. Do not leave any openings uncovered.

REPLACING A TAPE DRIVE (HALF HEIGHT TO FULL HEIGHT)

! Important

You must update your Magnum 448 library to the current firmware (v. V1D181 or higher) before you install your new drive. The firmware allows the library to auto-configure the tape drive installation upon power up, eliminating the step of manually configuring the library after tape drive installation.

If your library code is not updated to v. V1D181 or higher, you will need to contact Tandberg Data technical support for manual configuration instructions.

To replace a half height tape drive with a full height tape drive, follow these steps.

1. Preparing for replacement—

- a. Update library firmware to v. V1D181 or higher (see Important note above).
- b. Power off the host.
- c. Power off the library (press the 0 on the back of the unit).
- d. Disconnect the power cord, the SCSI or Fibre Channel cable(s), and the terminator (if present).
- e. Remove the tape drive cover plate. Set the plate and the screws aside.

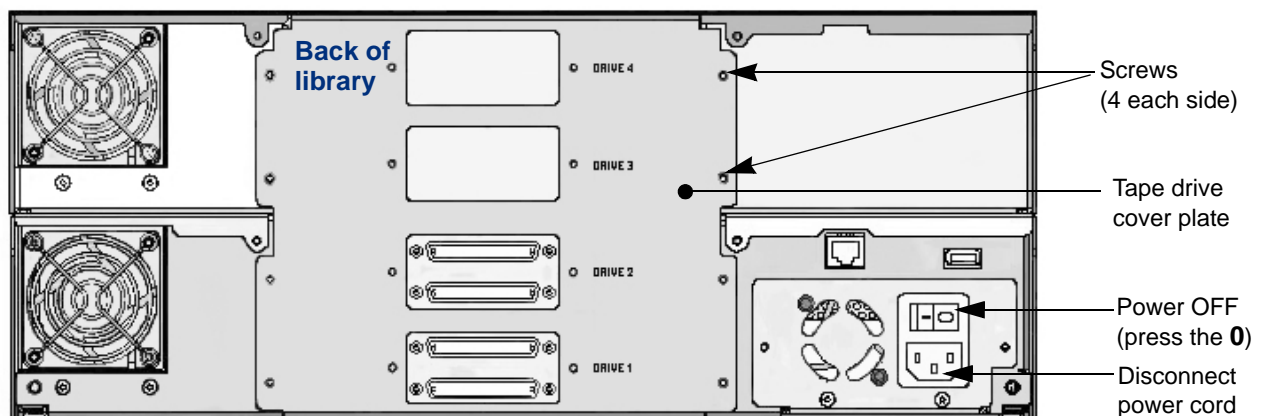


Figure 15 Tape drive cover plate (HH SCSI library)

2. Removing the cables, internal cooling plates, and tape drives—

- a. Pull the tape drive a short distance out of the library and disconnect the serial cable. Repeat for all the tape drives that you are replacing.
- b. Disconnect the power cables as needed.
 - ▶ Rev “A” power supply installed (no Rev B label)—disconnect all cables.
 - ▶ Rev “B” power supply installed—disconnect from *only* the tape drive (or tape drives) that you are replacing.
- c. Remove the screws (A) holding the tape drive cooling plate (B). Remove the plate, and discard it and the screws (see [Figure 9 on page 8](#)).

! Important Remove as many internal cooling plates as necessary to add tape drives, but leave all empty tape drive bays covered. The plates are required for proper cooling.

- d. While holding the cables out of the way, remove the tape drive(s).

! Caution Be certain to support the tape drive as you remove it from the library. LTO Ultrium tape drives weigh several pounds each.

- e. Disconnect the serial cable from the library. **Do not reuse this cable.** If you are replacing multiple tape drives, remove and discard the serial cables from all the tape drives you are replacing.

3. Installing the tape drive—

! Important Do not mix full height and half height or SCSI and Fibre Channel tape drives in the library. The Magnum 448 does not support mixed tape drive configurations.

- a. Locate the serial cable that came in your replacement kit and attach it to the appropriate serial connector *inside the library*.

Tape drive	Quantity	Install in this opening...	Serial connector	Internal label	See...
Full height	Second tape drive	<i>Top</i>	Second	Drive 2	Figure 1 on page 3
	Single tape drive	<i>Bottom</i>	Bottom	Drive 1	

While holding the cables to the side, slide the new tape drive directly into the library, leaving it a short distance out to access the cables. Use care not to damage the cables.

- b. Connect the supplied serial cable and the power cable *to the tape drives*.

▶ **Full Height tape drive—**

Cable	Cable routing	Connect as shown in...
Serial	to side of tape drive carrier bracket	Figure 10 on page 9
Rev “A” power	<i>through</i> the tape drive carriers	Figure 4 on page 5
Rev “B” power	<i>outside</i> the tape drive carriers	Figure 5 on page 5

- c. Slide the tape drive the remaining distance into the library.

4. Completing the installation—

- a. Attach the SCSI cover plates and the tape drive cover plate that came with your replacement kit. See “Tape Drive Cover Plates” on page 3 and Figure 14 on page 11.

If your library has...		Attach this SCSI cover plate...	
Tape drive configuration	Quantity	Location	External drive label
Full height	Two	None	None
	One	Top	Drive 2 ^a

^a This applies to both SCSI and Fibre Channel library configurations.

! Important The library requires both the SCSI cover plates and the tape drive cover plates for ESD protection. Do not leave any openings uncovered.

RESUMING OPERATION

1. Power the library off (press the **0** on the back of the unit).
2. Connect the interface cables.
 - ▶ Connect the Fibre Channel cable (or cables if you installed more than one Fibre Channel tape drive).
or...
 - ▶ Connect the SCSI cable (or cables if you installed more than one tape drive) and a terminator (if needed).

! Important Both LTO-2 and LTO-3 tape drives require an Ultra 3 or LVD 160 terminator to function properly on the SCSI bus. An inadequate terminator will result in various SCSI bus issues, including bus hangs and Read/Write failures. See the individual Product Manuals at www.tandbergdata.com for detailed information.

Notes: You must install a terminator on the device at the physical end of the SCSI bus. If one of the tape drives in the library terminates the SCSI bus, you must install the required terminator on one of the tape drive's SCSI connectors. If there are additional devices on the SCSI bus, ensure that only the device at the physical end of the bus is terminated.

The library communicates with the host through the SCSI interface of one of the tape drive via the Automation Drive Interface (ADI) serial interface.

See the tape drive's *Product Manual* for tape drive information.

IBM — www.storage.ibm.com/tape/lto/oem/index.html

Hewlett Packard — www1.hp.com/storage/tapestorage.html

See Automation/Drive Interface for ADI information: www.T10.org

3. Reconnect the power cord and power on the library (press the **1** on the back of the unit).
4. Power on the host.

The library is now ready to resume operation. The new tape drive defaults to the following SCSI IDs:

Library	Tape Drive Configuration		SCSI ID
Magnum 448	Single full height tape drive		3
	Two full height tape drives	Top tape drive	4
		Bottom tape drive	3
	Single half height tape drive		3
	Four half height tape drives	Top tape drive	6
		Third tape drive	5
		Second tape drive	4
Bottom tape drive		3	

! Important You may need to reconfigure your backup application to recognize the new tape drive. Refer to your application's documentation for instructions.

CONFIRMING THE INSTALLATION

You may want to perform a few load and unload operations and back up several megabytes of data to ensure that the library and the newly installed tape drive (or tape drives) are communicating correctly.

Use LibTool to	Detect the library
	View the library's cartridge inventory
	Move tapes into and out of the tape drive
Use LTOTool to	Detect the tape drive
	Perform a Read/Write test

Download and install the tools from www.tandbergdata.com. The readme file that accompanies the program (or the online help for the Windows version) provides instructions for using the tools.

For questions regarding software configuration, installation, or operation (including how to perform a backup operation)—contact your software provider.