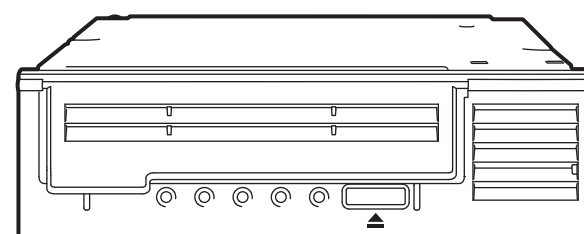# HP StorageWorks Ultrium 3000/1760/920/448 SAS

Internal tape drive

Start Here

IMPORTANT INFORMATION ABOUT YOUR NEW TAPE DRIVE

For the most up-to-date information about supported SAS HBAs and cabling configurations, refer to **www.hp.com/go/connect** and be sure to check the details of the specific tape drive and server combination that you require.

Your Ultrium tape drive is supplied with a split SAS cable with two mini-SAS connectors and integrated power connector. The recommended options for using this cable are:

• Connect to a spare SAS connector on the SAS controller.
• If the SAS controller does not have a spare SAS connector, install a new HBA and use the cable to connect to it.

NOTE: If both SAS ports are in use and you wish to connect to the host SAS controller, you can use the split cable to replace one of the existing SAS cables. However, caution is advised for this installation because it diverts one of the data paths from the hard disk drive bays to the tape drive. You may lose the use of one of the hard disk drives.

For detailed, step-by-step installation instructions, print the "User Guide" from the Documentation link on the HP StorageWorks CD-ROM.

This poster describes how to install an HP StorageWorks Ultrium 3000/1760/920/480 SAS tape drive on a SAS server.

⚠ **WARNING:** To avoid personal injury or damage to the server or tape drive, disconnect your server from the mains power supply before installing the tape drive. To avoid damage to server or tape drive observe all recommended anti-static and power-grounding precautions, as specified in your server and tape drive manuals.

For detailed safety information, see the Safety Booklet on the CD-ROM.

1 Refer to www.hp.com/go/connect

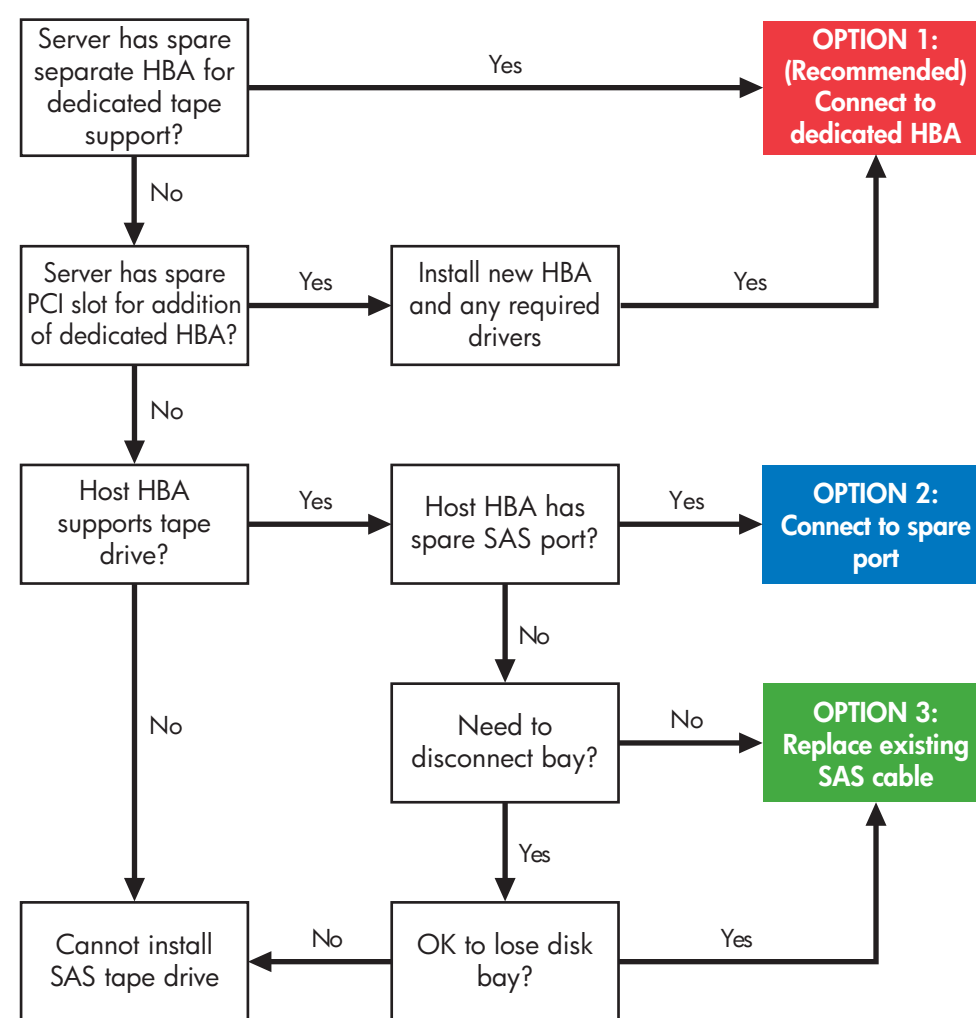Before you install your tape drive, always refer to **www.hp.com/go/connect** to find out:

• Is connection to your SAS server supported?
• Can you connect to the host SAS controller or do you need to purchase an additional HBA?

Not sure how to use go/connect?
Select **tape backup** and navigate down to the Hardware Compatibility table for your make of server. The server/tape drive matrix shows top-level compatibility, but be sure to click on the tick for your combination of server and tape drive to display a further page with detailed connectivity information.

2 Decide on your installation model

You may damage your server configuration, if you follow the wrong cabling instructions. Use the following diagram to determine which instructions on this poster are appropriate for your server.
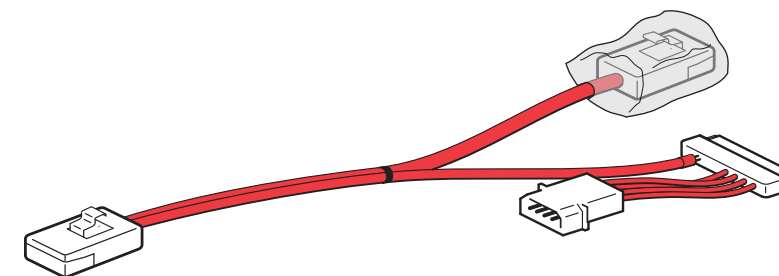

⚠ **CAUTION:** Option 3 normally disconnects the data path to the highest-numbered disk bay, but it is not always possible to identify which disk this is. For this reason, do not use option 3 with RAID configurations.
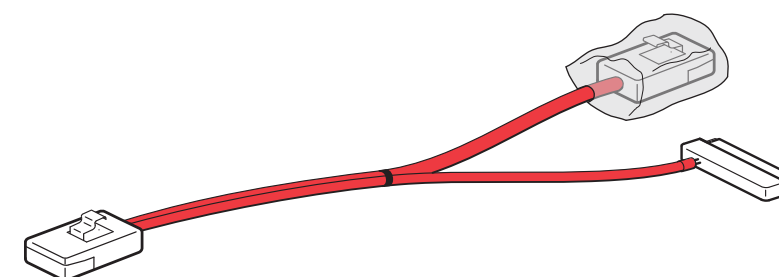
3 Supplied cable

The supplied cable connects to a mini-SAS (SFF-8086/8087) connector on the dedicated HBA or host SAS controller. This is a split cable, but the second branch is not normally required. Do **NOT** remove the tie wrap and cover on the spare connector.

Cable supplied with Ultrium 3000 tape drives

Cable supplied with Ultrium 1760/920/448 tape drives

📝 **NOTE:** If you wish to connect the tape drive to a SAS 4i (SFF-8484) connector, you must purchase the appropriate cable. See **http:\\www.hp.com\go\connect** for recommended cables.

4 Installing the tape drive

💡 **TIP:** The CD-ROM contains a driver install package for Windows. We recommend that you use the installer package to install the drivers **BEFORE** you connect the tape drive.
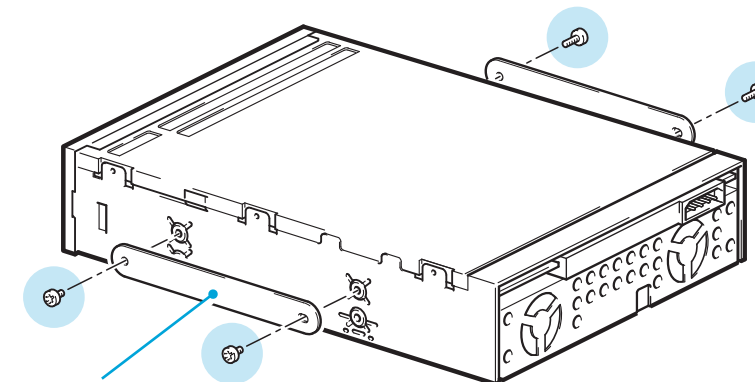
1. Install the new HBA

Follow the instructions supplied with the HBA to install the new SAS HBA and any required drivers. See **www.hp.com/go/connect** for supported HBAs.

2. Attach the mounting hardware

If required, appropriate mounting hardware may be supplied with your server or with the tape drive. Refer to your server documentation.

Screw packs are supplied with the tape drive and labeled according to server type; always use the specific screws for your server. Follow the instructions in the screw pack. You may damage your tape drive if you use screws that are too long.

Use shims with Proliant ML350 and ML370 servers only.
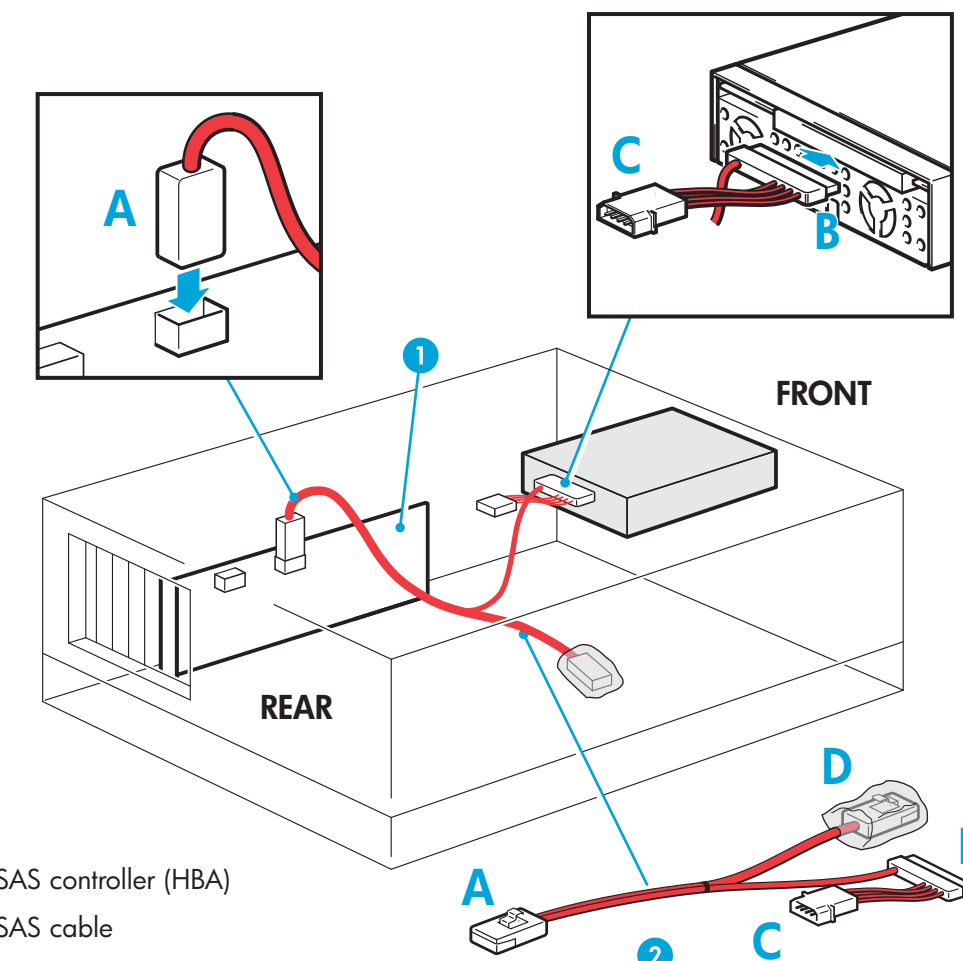
3. Install the tape drive

Install the tape drive, as described in the "User Guide" on the CD-ROM.

💡 **TIP:** If cable access for the tape drive bay is awkward, it may be easier to access power and other connections if the tape drive is installed in the top bay. You may need to move other devices to lower bays to achieve this.

5 Connect the SAS cable

Option 1: Connect to a separate HBA (recommended)
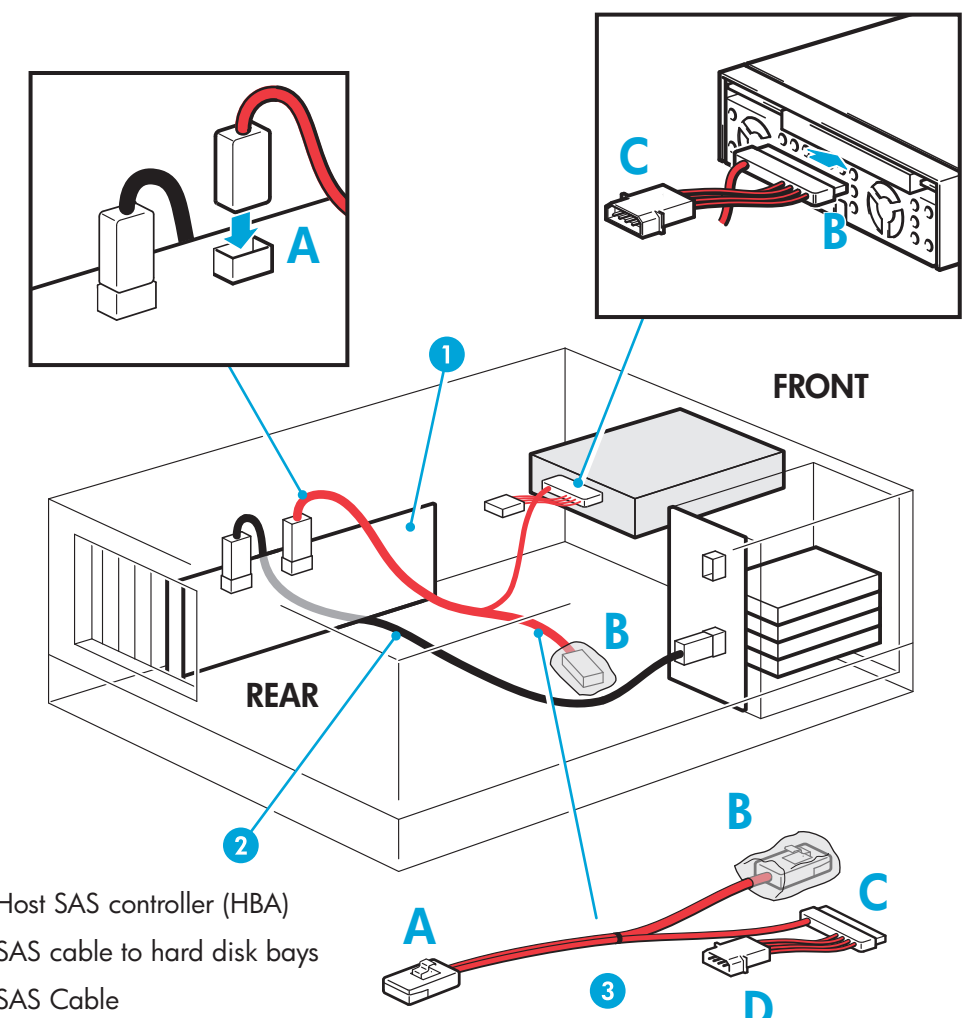
Connect the SAS cable to the new HBA.

1 SAS controller (HBA)
2 SAS cable

A = Mini-SAS connector on new HBA
B = SAS connector for tape drive
C = Power connector for tape drive (Ultrium 3000 only)
D = Unused branch of cable (do NOT remove tie wrap or cover on the spare connector)

Option 2: Connect to a spare port on the host controller (recommended)

Connect the SAS cable to the spare port on the host SAS controller.

1 Host SAS controller (HBA)
2 SAS cable to hard disk bays
3 SAS Cable

A = Connector on host SAS controller
B = Unused branch of cable (do NOT remove tie wrap or cover on the spare connector)
C = SAS Connector for tape drive
D = Power connector for tape drive (Ultrium 3000 only)
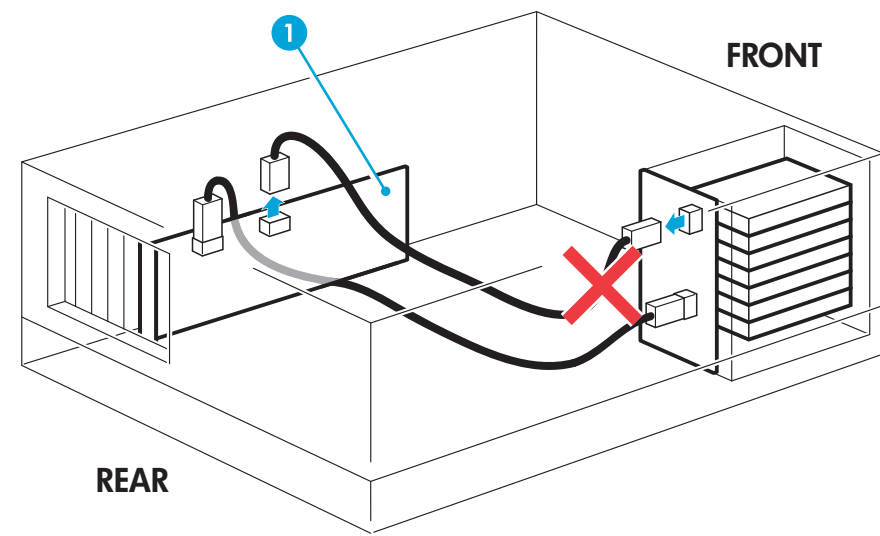
Option 3 is shown overleaf →

Option 3: Use supplied cable to replace existing cable to hard disk drives (not recommended)

⚠️ **CAUTION:** The SAS data cable has four data paths; this configuration diverts the wiring from one of the hard disk drive bays to the tape drive. In a very small number of server configurations, you will lose the use of a hard disk drive if the hard disk drive bay is already occupied (or will be required for future use). This does not mean there is a fault with either the hard disk or the server. Do **NOT** use this cabling option with RAID configurations.

1. Locate existing SAS cable and determine whether a hard disk drive bay will be lost

HP strongly recommends that the tape drive is connected to the second SAS port on the host controller (this is the port that connects to the hard disk drive bays with the highest numbers). Look at the front of the server and establish which SAS cable is connected to the hard disk drive bays with the highest numbers.
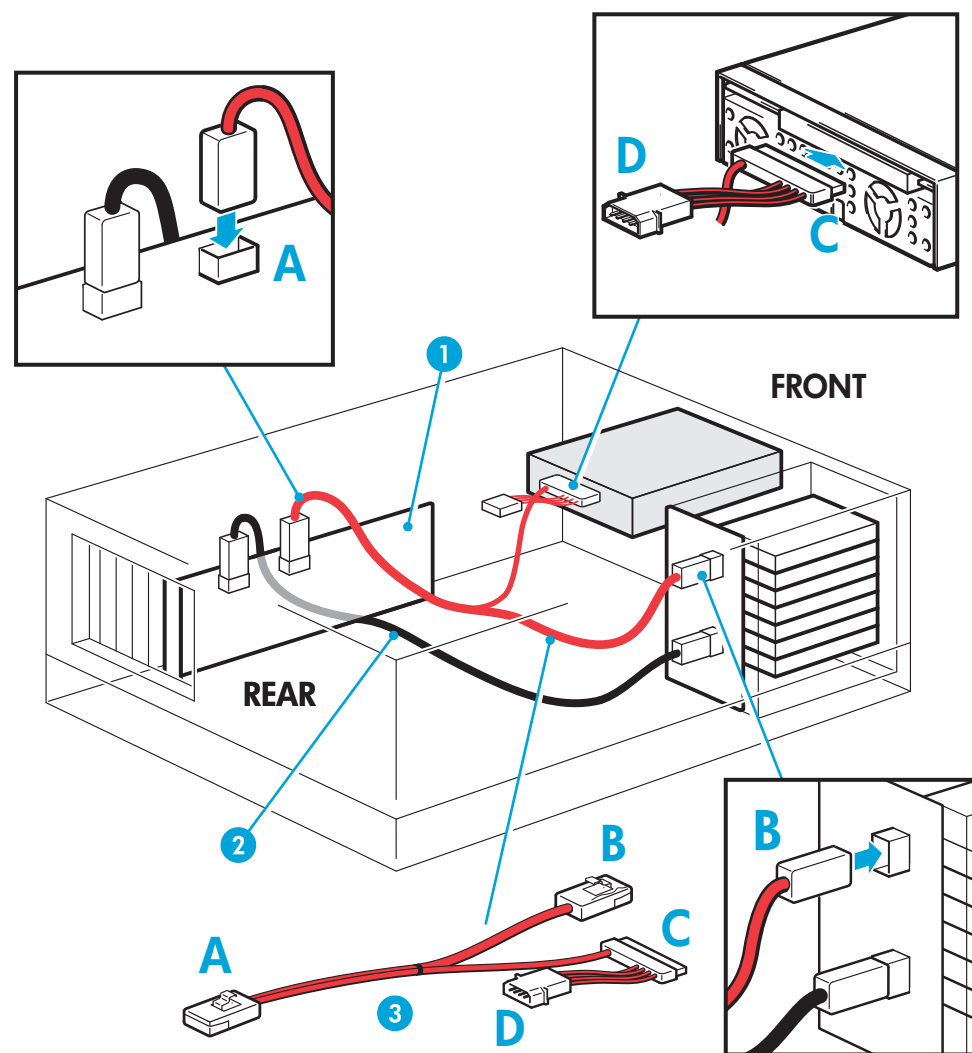

1 Host SAS controller (HBA)

💡 **TIP:** If cable access for the tape drive bay is awkward, it may be easier to access power and other connections if the tape drive is installed in the top bay. You may need to move other devices to lower bays to achieve this.

2. Connect the SAS cable to the server

Remove the tie wrap and dust cover on the second branch of the cable. You will need to use the second mini-SAS connector in this installation.

Connect the SAS cable to the spare port on the host SAS controller.

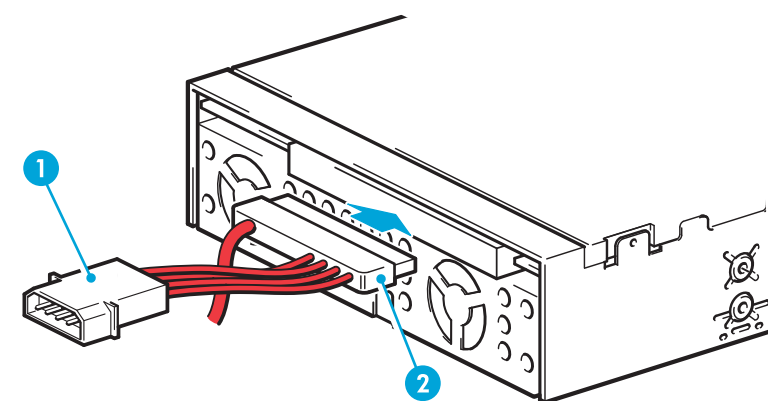**1** Host SAS controller (HBA)   **2** SAS cable to hard disk bays   **3** SAS Cable

A = Connector on host SAS controller
B = Spare SAS connector on cable, remove tie wrap and cover and connect to highest-numbered disk bays (for example slots 4-7)
C = SAS connector for tape drive
D = Power connector for tape drive (Ultrium 3000 only)

Always check the disk LEDS after completing this installation to ensure that you have not lost the use of a disk bay. If you have lost a disk bay, you may like to apply the supplied Disk bay disconnected sticker to identify that slot.

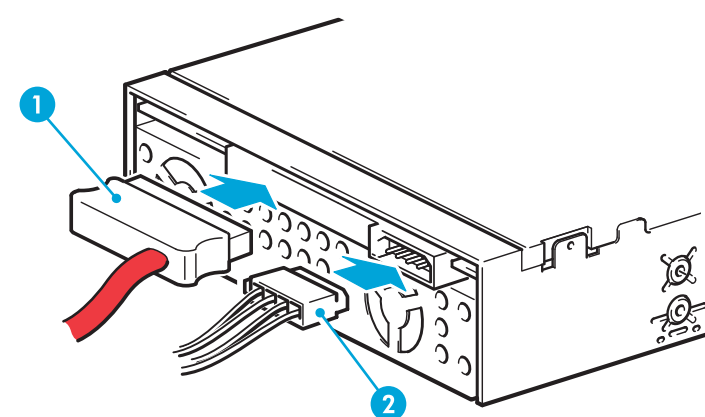## 6 Connect power to the tape drive

Ultrium 3000 tape drives

Connect the power connector on the SAS data cable to the server's internal power supply.

1 Power connector   **2** SAS connector

Ultrium 1760/920/448 tape drives

Connect a spare power cable from the server's internal power supply to the power connector on the back of the tape drive.

1 SAS connector   **2** Power connector

Power up the server

Replace server covers and power up the server.

Watch the boot screen carefully after installation. Check to see that the new SAS tape drive is listed in the boot sequence. If there are any error or unexpected messages go back and check the SAS cabling carefully.

7 Complete the installation

- Install drivers. The HP Tape driver (available on the CD-ROM or from **http: www.hp.com/support**) is recommended for use with Windows operating systems, but always check whether your software application requires you to use its own driver. For other operating systems patch to the latest version of the operating system and following the instructions in the patch documentation. See also the "UNIX Configuration Guide" on the CD-ROM.
- Upgrade your software application to ensure it works correctly with the tape drive. We do **NOT** recommend native backup applications, such as Windows Backup, because they do not support the full features of the tape drive and may not meet performance expectations.
- HP StorageWorks Library & Tape Tools (L&TT) is the recommended diagnostic and support tool for your HP tape drive. Use it to verify installation and confirm that your tape drive is functioning correctly before you use it for backup. It is available free at **www.hp.com/support/tapetools.**
- HP TapeAssure provides additional management tools for Windows users. It provides valuable information about tape drive and media utilization, performance and health. Visit **www.hp.com/go/tapeassure** for a free download.

8 Hardware encryption and your Ultrium 3000 and 1760 tape drive

Your HP Ultrium 3000 and 1760 tape drive provides the ability to hardware encrypt your data, applying the strongest level of AES industry-standard encryption and protecting the data from unauthorized access and use. Encryption is supported only on Ultrium 3TB and 1.6 TB media; media encrypted on an HP Ultrium 3000 and 1760 drive can only be read on a compatible Ultrium tape drive that supports hardware encryption.

To make use of this feature you need a backup application that supports hardware encryption and Ultrium 3 TB or Ultrium 1.6 TB media.

Hardware encryption can be used with or without compression and without speed or capacity penalties.

📝 **IMPORTANT:** Hardware encryption is a powerful feature, but should be used with care. If you need to import your media onto another machine or to recover after disaster you will be required to enter an encryption key.

For more information about AES encryption, encryption keys, and using hardware encryption with your HP Ultrium 3000 and 1760 tape drive, see the White Papers on **h18006.www.hp.com/storage/tapewhitepapers.html.**

9 Choosing and looking after media

Your high-performance tape drive works best with high-performance HP Ultrium media. Always use the recommended cartridges (see table).

Ultrium data cartridge compatibility

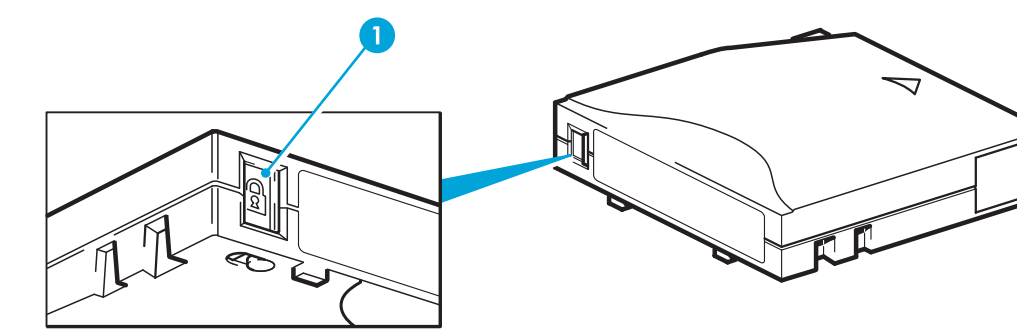|	Ultrium 3000 drives	Ultrium 1760 drives	Ultrium 920 drives	Ultrium 448 drives
Ultrium 3 TB* (C7975A)	Read/Write (Recommended)	not supported	not supported	not supported
Ultrium 3 TB* WORM (C7975W)	Write Once Read Many (Recommended)	not supported	not supported	not supported
Ultrium 1.6 TB* (C7974A)	Read/Write	Read/Write (Recommended)	not supported	not supported
Ultrium 1.6 TB* WORM (C7974W)	Write Once Read Many	Write Once Read Many (Recommended)	not supported	not supported
Ultrium 800 GB* (C7973A)	Read only	Read/Write	Read/Write (Recommended)	not supported
Ultrium 800 GB* WORM (C973W)	Read only	Write Once Read Many	Write Once Read Many (Recommended)	not supported
Ultrium 400 GB* (C7972A)	not supported	Read only	Read/Write	Read/Write (Recommended)
Ultrium 200 GB* (C7971A)	not supported	not supported	Read only	Read/Write

* Capacity assumes 2:1 compression.

It pays to look after your media

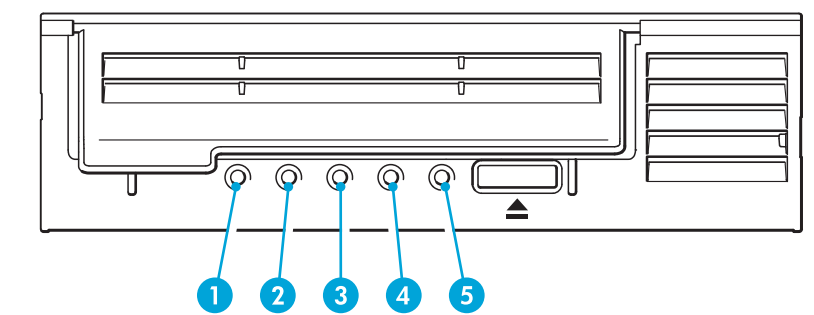Many tape drive and backup failures are caused by damaged or badly handled tape media.

- Keep media in the case provided.
- Follow the temperature, humidity and acclimitization guidelines on the media packaging.
- Avoid dropping it or rough handling, as this is likely to damage the cartridge.
- Inspect it regularly for damage.
- Do not exceed normal cartridge life (260 full volume backup or restore operations).

For detailed information on media care and best practice and to order online, refer to **www.hp.com/go/storagemedia/ultrium.**

1 Write-protect switch

10 Understanding the LEDs

Ultrium 3000 drives only

1 Encryption – blue/amber
- On (blue or amber): at power on
- Off: drive is idle with no encryption key
- Off with Ready LED flashing: drive is reading/writing unencrypted data or unloading cartridge
- On (blue): drive is idle with encryption key
- On (blue) with Ready LED flashing: drive is reading/writing encrypted data
- Blue and Amber flashing alternately: encryption or decryption error

📝 **NOTE:** The Encryption LED only appears on the Ultrium 3000 tape drive.

Ultrium 3000/1760/920/448 drives

2 Clean – amber
- On: cleaning cartridge in use
- Off: the drive does not require cleaning
- Flashing: the drive needs cleaning

3 Tape – amber
- Off: no fault has been detected
- Flashing: the cartridge currently in the drive is faulty (damaged or unsupported). Discard the cartridge.

4 Drive – amber
- Off: no fault has been detected
- Flashing: the drive mechanism has detected a hardware error

5 Ready – green
- On: the drive is ready for use
- Off: the drive power is off or there was a failure during self-test
- Flashing: the drive is busy
- Flashing repeated pattern: the drive is in OBDR (One-Button Disaster Recovery) mode

11 Other sources of information

- The HP StorageWorks Tape CD-ROM for HP StorageWorks Library & Tape Tools (L&TT) and full Installation and User instructions' in English and 12 other languages.
- **www.hp.com/support/tapetools** for updates, compatibility information and the latest version of L&TT.
- **www.hp.com/support/ultrium** for up-to-date product information.
- **www.hp.com/go/connect** for recommended products and configurations.
- **www.hp.com/support/pat** for further information about getting the best performance from your tape drive.
- **www.hp.com/go/obdr** for detailed information about HP One-Button Disaster Recovery.
- If necessary, specialist technical help can be obtained from the HP Customer Call Centers. Contact details can be found at **www.hp.com.**

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