COMPAQ

Compaq DLT User Guide

User Guide

Second Edition (March 1998)
Part Number 185292-002
Compaq Computer Corporation

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Compaq DLT Drive User Guide

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Preface
About This Guide

This user guide provides information for installing, configuring, operating and cleaning the Compaq DLT Drive. For instructions on using the DLT Drive, please refer to the manual that came with your drive.

How This Guide is Organized

Chapter 1, "Introduction," provides an overview of the DLT Drive and installation requirements.

Chapter 2, "Installing an Internal DLT Drive," provides instructions for the installation of the Compaq DLT Drive in Compaq servers.

Chapter 3, "Connecting an External DLT Drive," provides instructions for the installation of the Compaq DLT Drive as an external unit.

Chapter 4, "Installing the Software Drivers," covers procedures for the installation of software drivers to complete the drive installation.

Chapter 5, "Tape Drive Operations," provides instructions for operating the DLT Drive efficiently.

Chapter 6, "Tape Drive Cleaning," describes the cleaning procedure.

Chapter 7, "Troubleshooting," provides suggestions for problem solving before and after tape drive installation.

Appendix A,"Power Cord Requirements," provides the power cord set requirements.

Appendix B, "Electrostatic Discharge," provides information on avoiding electrostatic damage and suggestions for grounding methods.

Appendix C, "Getting Help," has additional information on the Compaq Forum of CompuServe and QuickFind.

Appendix D, "Supplemental Information About SCO UNIX," covers SCO UNIX configuration requirements and using Legato under SCO UNIX.

Appendix E, "Regulatory Compliance Notices," contains the compliance statements from the various worldwide agencies regulating this product.

Conventions Used in This Guide

Conventions used in this guide are listed below.

WARNING: Indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

CAUTION: Indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Presents clarifying information or specific instructions.

NOTE: Presents commentary, sidelights, or interesting points of information.

Symbols on Equipment

These icons may be located on equipment in areas where hazardous conditions may exist.

Any surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.
WARNING: To avoid risk of injury from electrical shock hazards, do not open this enclosure.

Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.
WARNING: To avoid risk of injury from a hot component, allow the surface to cool before touching.

General Warnings and Cautions

WARNING: Compaq ProLiant 2000, 4000, 4500 and 5000 are capable of producing energy levels that are considered hazardous. Users should not remove enclosures nor should they bypass the interlocks provided for removal of these hazardous conditions.

Installation of accessories and options in areas other than front hot plug bays should be performed by individuals who are both qualified in the servicing of computer equipment and trained in the hazards associated with products capable of producing hazardous energy levels.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.

Disconnect power from the product by unplugging the power cord from either the electrical outlet or the computer or other product

WARNING: To reduce the risk of electric shock or damage to the equipment:

- Do not place anything on power cords or cables. Arrange them so that no one may accidentally step or trip over them.
- Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.

CAUTION: Placing a hand or object other than a tape cartridge into the DLT Drive may damage the tape drive.

Chapter 1
Overview

This chapter provides information on tape formats, data compression, and system and controller requirements for all Compaq DLT Drives and formats.

For information on tape software, refer to the “readme” card enclosed with the drive. More information may also be obtained by accessing the Compaq Web Site on the Internet at http://www. compaq.com.

Tape Formats

The Compaq DLT Drive is a high-capacity, high-performance streaming tape drive designed for use with Compaq servers. The DLT Drive is a full-height tape drive with a 5-1/4-inch form factor. The DLT Drive has a multi-channel read/write head, utilizes a Digital Lempel-Ziv (DLZ) high efficiency data compression algorithm, and has a filing system to maximize data and minimize data access time.

The DLT Drive uses a half-inch tape cartridge compatible with the DLT Tape, DLT Tape II, DLT Tape III, DLT Tape IIIXT and DLT Tape IV..

Data Compression

The DLT Drive reads and writes both uncompressed (native) and DLZ compressed data. The 15/30 DLT model features a native formatted capacity of 15 gigabytes and a sustained native data transfer rate of 1.25 megabytes per second (MB/s). The 35/70 DLT model has a native formatted capacity of 35 gigabytes and a sustained native data transfer rate of 5.0 MB/s.

When operating in compressed mode, data capacity is affected by how much the data can be compressed. Most data can be compressed at an approximate 2:1 ratio. For instance, data compressed at a 2:1 ratio would provide a total drive capacity of 30 GB for the 15/30 DLT Drive and 70 GB for the 35/70 DLT Drive.

The maximum transfer rate with data compression ranges from 2.50 MB/s for the 15/30 DLT Tape Drive to 10.0 MB/s for the 35/70 DLT Tape Drive. To achieve these maximum data transfer rates, the data compression ratio must be greater than 2:1 and you must have software that supports the higher transfer rate.

SCSI-2 Controller Requirements

Some servers require the installation of the Compaq 32-Bit Fast-SCSI-2 or higher controller for use with the 15/30 DLT Drive or the Fast-Wide SCSI-2 or higher controller for use with the 35/70 DLT Drive. Install the controller before beginning the drive installation using the documentation included with the controller.

Table 1-1 shows which controllers support DLT drives.

IMPORTANT: All SCSI devices on the same bus must either be internal (within the server) or in an external storage device, but not both. The exception is a CD-ROM drive which may be internal when other devices are external or vice versa.

Table 1-1
Supporting Controllers

Controller	15/30 DLT Drive	35/70 DLT Drive
32-Bit Fast-SCSI-2	Supported	Supported (not recommended)
32-Bit Fast-Wide SCSI-2	Supported	Supported
Wide-Ultra SCSI	Supported	Supported

Chapter 2
Installing an Internal DLT Drive

This chapter describes the procedure to install a Compaq DLT Drive in a Compaq Server.

Installation involves the following steps:

- Setting the SCSI ID
- Preparing the server
- Installing the DLT Drive
- Reassembling the server
- Completing the installation

SCSI-2 Controller Requirements

It is recommended that the server be equipped with a 32-Bit Fast-SCSI-2 or higher controller for a 10/15 or 15/30-GB DLT Drive.

A 32-Bit Fast-Wide SCSI Controller is recommended for the 35/70-GB DLT Drive.

Software and Tool Requirements

The following items are required for Compaq DLT Tape Drive installation:

- Torx-T15 screwdriver
- Compaq SmartStart and Support Software CD

Setting the SCSI ID

The first step in the installation process is setting the SCSI ID.

Each SCSI device on the same SCSI bus must have a unique SCSI ID. Use the jumper block on the back of the tape drive to set the SCSI ID. DLT drives ship with 6 as the default SCSI ID.

To set the SCSI ID for an internal DLT Drive, position the jumpers as shown in Figure 2-1.

NOTE: Your DLT Drive may look slightly different than the illustrations.

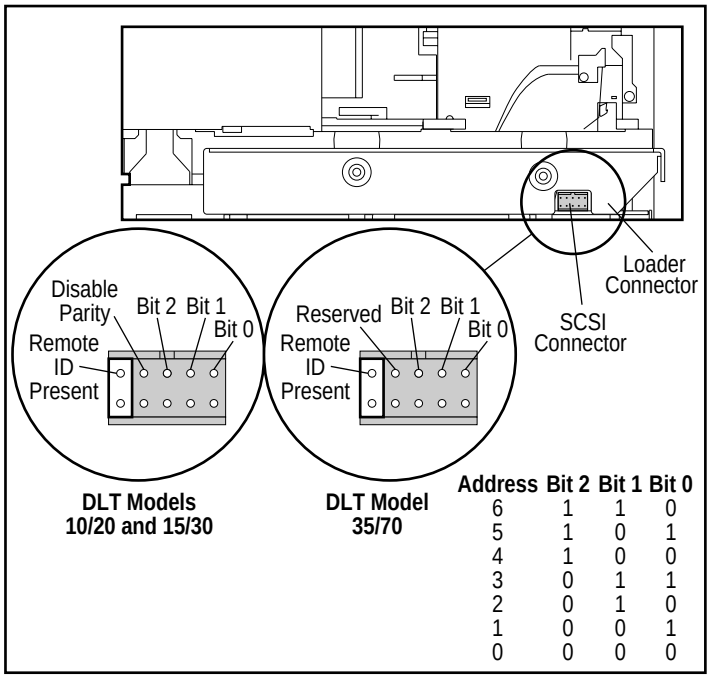

Figure 2-1. Setting the SCSI ID Jumpers on an internal GB DLT Drive

Preparing the Server

To prepare the server:

1. Perform a normal system shutdown according to your network and operating system requirements.
2. Turn OFF the server and then all peripheral devices.
3. Disconnect the AC power cord from the outlet, then from the server and all peripheral devices.

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure you are properly grounded before beginning this procedure. See Appendix B, "Electrostatic Discharge," for further information.

Installing the DLT Drive

Refer to the documentation included with your computer for instructions on accessing the removable media drive bays. Your computer may differ slightly from the following illustrations.

To install the DLT Drive:

1. Install tape drive in an available media bay.

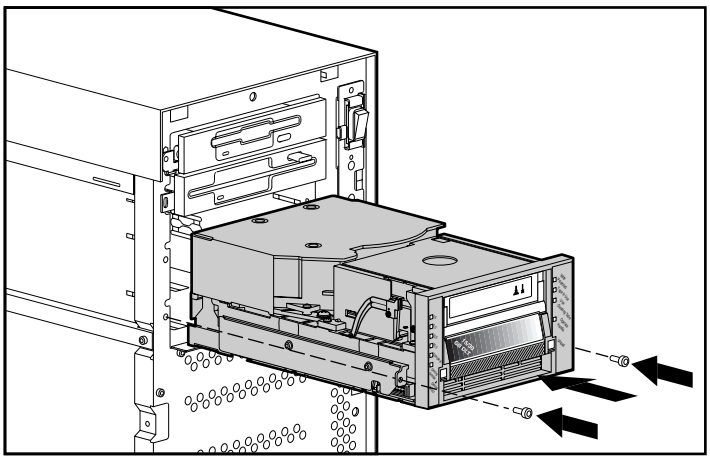

Figure 2-2. Installing the DLT Drive

2. Connect an available power cable and the SCSI signal cable.

IMPORTANT: The SCSI signal cable recommended for Compaq servers is terminated.

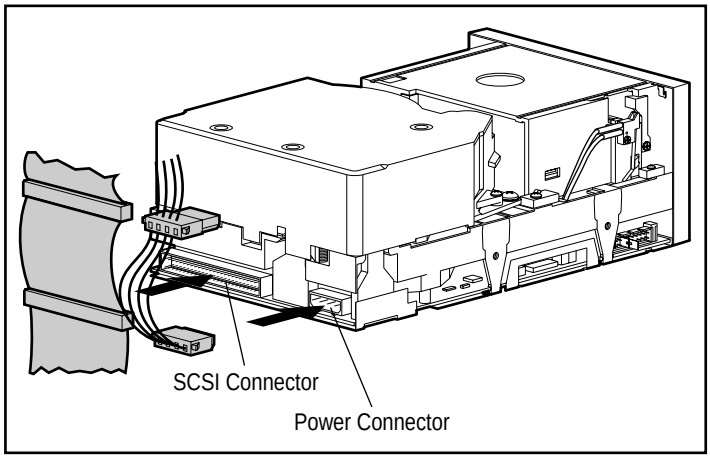

Figure 2-3. Attaching the Cables

Reassembling the Server

To reassemble the server:

1. Replace the side or top access panel.
2. Reconnect the peripheral devices to the server.

WARNING: To reduce the risk of electric shock or damage to your equipment, do not disable the power cord grounding feature. This equipment is designed for connection to a grounded (earthed) power outlet. The grounding plug is an important safety feature.

3. Plug the AC power cord into the server, then plug the cord into a grounded AC outlet.
4. Turn ON any peripheral devices connected to the server.
5. Turn ON the server.

Completing the Installation

Follow the procedure in Chapter 4, “Installing the Software Drivers,” to install the driver supported by your operating system.

Chapter 3
Connecting an External DLT Drive

This section describes how to connect an external DLT Drive to a SCSI controller.

Connecting the drive involves the following steps:

- Preparing the drive
- Setting the SCSI ID
- Connecting the drive

NOTE: Your External DLT Drive may look slightly different than the illustrations.

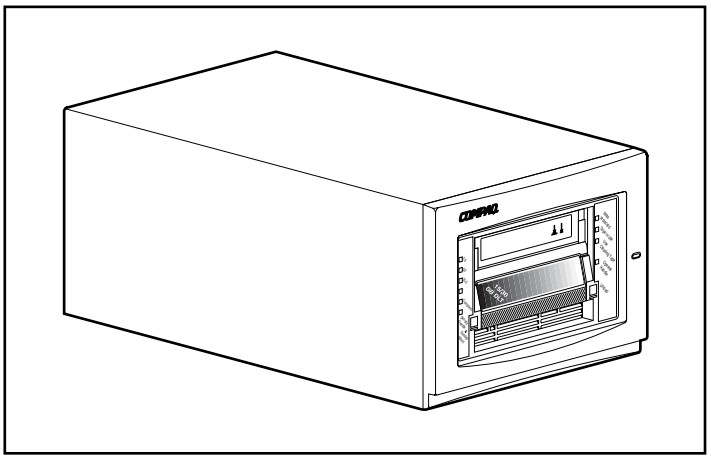

Figure 3-1. External DLT Drive

Preparing the Drive

NOTE: No tools are needed for installation of the DLT Drive.

1. Place the DLT Drive on a flat, sturdy surface such as a desk or tabletop.

NOTE: Do not place the unit on the floor. Allow enough space for proper ventilation and easy access to the front and rear of the DLT Drive. Allow at least 3 inches (7.6 cm) between rear of unit and wall.

2. Check the SCSI ID.

NOTE: The drive is factory set to SCSI ID 6.

SCSI-2 Controller Requirements

It is recommended that the server be equipped with a 32-Bit Fast-SCSI-2 or higher Controller for a 10/20-GB DLT or 15/30-GB DLT Drive.

A 32-Bit Fast-Wide SCSI-2 or higher controller is recommended for the 35/70-GB DLT Drive.

IMPORTANT: All SCSI devices on the same bus must either be internal (within the server) or in an external storage device, but not both. The exception is a CD-ROM drive which may be internal when other devices are external or vice versa.

Setting the SCSI ID

Each SCSI device on the same SCSI bus must have a unique SCSI ID. You must avoid duplicating SCSI ID when assigning the ID for the DLT Drive. Using the factory-set SCSI ID with Compaq storage devices is an effective way to prevent ID duplication. The DLT Drive ships with 6 as the default SCSI ID.

WARNING: Risk of electrical shock. Do not attempt to open this product. There are no user serviceable parts inside. Refer all service to an Authorized Service Provider.

1. To change the SCSI ID, press the switch on the rear panel of the DLT Drive. Press the switch button above or below the number display (0-6) to set the desired SCSI ID.

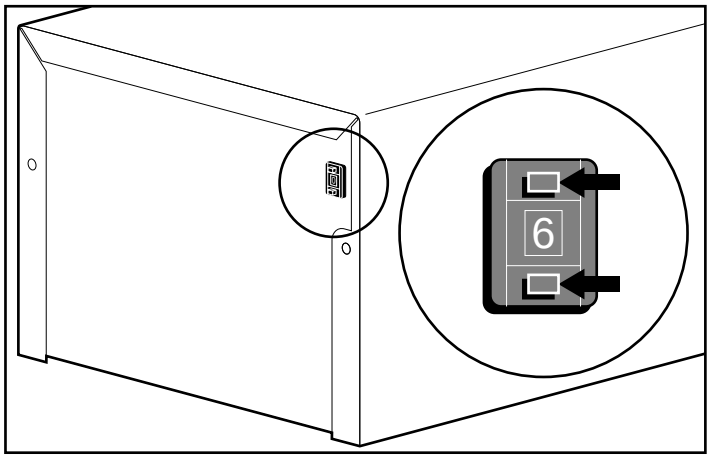

Figure 3-2. Setting the SCSI ID

IMPORTANT: Do not use SCSI ID 7, which is reserved for the controller.

NOTE: During installation, SCO UNIX requires that all SCSI devices be attached to the same SCSI bus and that only one SCSI controller be active.

Connecting the Drive

1. Turn off the server or any peripheral devices.
2. Locate the external SCSI-2 port on the rear of the server.

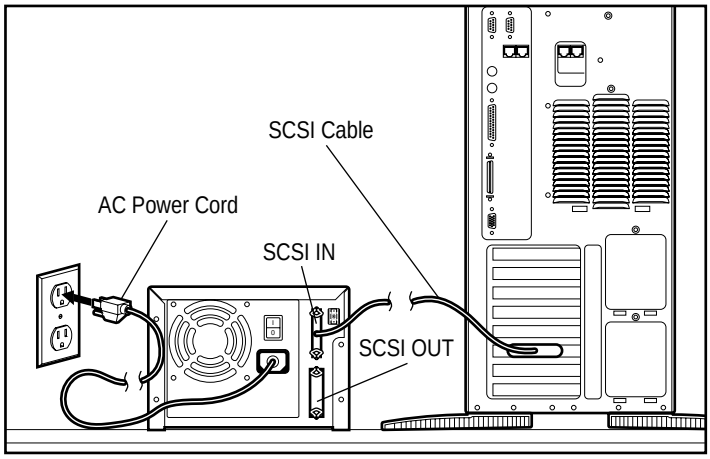

Figure 3-3. Connecting the DLT Drive

3. Attach the SCSI signal cable to one of the SCSI connectors located on the rear panel of the DLT drive and then to the external SCSI-2 port on the server.

   NOTE: A wide SCSI signal cable and a narrow SCSI signal cable have been included with this drive option kit. Select the cable that matches the SCSI connector on the rear of your server.

4. Snap the wire cable clamps into place to secure the cable to the connector.

WARNING: To reduce the risk of electric shock or damage to your equipment, do not disable the power cord grounding feature. This equipment is designed for connection to a grounded (earthed) power outlet. The grounding plug is an important safety feature.

5. Plug the drive's AC power cord first into the drive and then into a grounded AC outlet.

Daisy Chaining

Multiple DLT drives can be connected to the same SCSI channel at the same time using a SCSI cable purchased separately. Do not connect more than 4 units per SCSI Controller. It is recommended that a 6-ft cable be used to attach the initial unit; then use a 3-ft cable to daisy chain additional units.

Daisy-Chaining Storage Devices Together

1. Remove the cover from the SCSI OUT connector of the first drive in the chain.
2. Connect the storage devices together by placing a SCSI cable between the SCSI OUT connector to the SCSI IN connector of the next drive.

   NOTE: Each drive must have a unique SCSI ID.

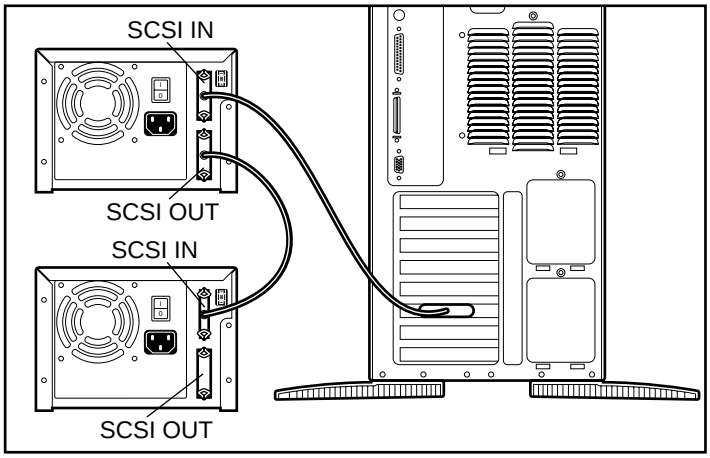

Figure 3-4. Daisy-chaining SCSI storage devices

Chapter 4
Installing the Software Drivers

The DLT Drives are supported by the following operating environments:

- NetWare
- Microsoft Windows NT
- Microsoft Windows 95
- SCO UNIX
- UnixWare
- OS/2
- Banyan VINES

Device Drivers

Drivers are located on the Support Software Diskettes and on the Compaq SmartStart and Support Software CD. The drivers on the Support Software Diskettes may be newer versions with new functionality and upgraded utilities. You can use SmartStart to create Support Software Diskettes for specific operating systems.

IMPORTANT: Always check "README" files on any software Support Diskettes or CDs. If present, these files may contain information about important software updates.

NetWare

Drivers for the SCSI controller and tape drive hardware are located on the Support Software Diskette or CD. The Support Software ships with each server or can be obtained on the Compaq Forum of CompuServe or QuickFind. Refer to Appendix C for more information on the Compaq Forum. The software tape device driver is located either with your tape backup software or with the operating system. Refer to your backup software application installation guide for more information regarding additional software that might be needed.

Table 4-1
NetWare

Controller	Software Driver Installation
32-Bit Fast-SCSI-2 Controllers (15/30 DLT Drive only) and 32-Bit Fast-Wide SCSI-2 Controllers and Wide-Ultra SCSI Controllers	Run the README.COM file on any of the Novell Software Support Diskettes (NSSD) for driver installation instructions.

If you are using one of the 32-Bit Fast SCSI-2 Controllers, the controller driver is *CPQS710.DSK*. This driver must be loaded on the server before installing the software for the tape drive.

ASPI Support

The README.COM on the Novell Software Support Diskette (NSSD) outlines the specific drivers you need to support ASPI tape backup applications.

If you are using a tape backup application that uses the Advanced SCSI Programming Interface (ASPI), such as ARCserve from Compaq, refer to the information provided with your application NLM to determine whether it uses ASPI.

The Compaq ASPI driver, *CPQSASPI.NLM*, provides ASPI support for the Compaq SCSI architecture for applications that require this interface. Figure 4-1 shows the relationship of the ASPI-based tape application, Compaq ASPI support, and components in the device hardware level.

All of the required drivers for ASPI tape support are provided on the Novell Software Support Diskette (NSSD). This diskette or CD ships with each server or can be obtained on the Compaq Forum of CompuServe or QuickFind (See Appendix C).

The SCSI.RDM file on the NSSD diskette gives complete instructions on how to load these drivers and troubleshoot any problems.

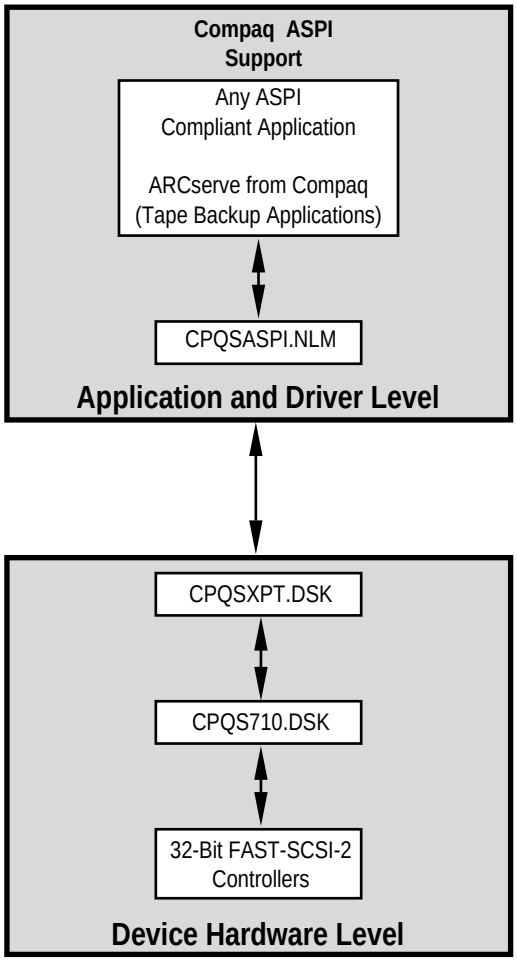

Figure 4-1. Overview of Tape Support

Microsoft Windows NT

Drivers for the SCSI controllers are located on the Support Software Diskette or CD. The Support Software ships with each server or can be obtained on the Compaq Forum of CompuServe or QuickFind. Refer to Appendix C for more information. The software tape device driver is located either with your tape backup software or with the operating system. Refer to your backup application installation guide for more information regarding additional software that might be needed.

Table 4-2
Microsoft Windows NT

Controller	Software Driver Installation
32-Bit Fast-SCSI-2 Controllers (15/30 DLT Drive only) and 32-Bit Fast-Wide SCSI-2 Controllers and Wide-Ultra SCSI Controllers	Refer to "Compaq SCSI Controller Support" in the NTREADME.HLP file on the Compaq Support Software for Microsoft Windows NT diskette, Version 1.21 or later.

IMPORTANT: If the SCSI controller to which your tape drive is attached was not present during your initial Windows NT installation, install the SCSI device driver for the controller before installing the tape class driver.

Refer to “Compaq Tape Support” in the NTREADME.HLP file on the Compaq Support Software for Microsoft Windows NT diskette.

Microsoft Windows 95

Drivers for the SCSI controllers are located on the Support Software Diskette. The Support Software Diskette or CD ships with each server or can be obtained on the Compaq Forum of CompuServe or QuickFind. Refer to Appendix C for more information. The software tape device driver is located either with your tape backup software or with the operating system. Refer to your backup application installation guide for more information regarding additional software that might be needed.

Table 4-3
Microsoft Windows 95

Controller	Software Driver Installation
32-Bit Fast-SCSI-2 Controllers (15/30 DLT Drive only) and 32-Bit Fast-Wide SCSI-2 Controllers and Wide-Ultra SCSI Controllers	Refer to "Compaq SCSI Controller Support" in the README.TXT file on the Compaq Support Software for Microsoft Windows 95 diskette, Version 1.03 or later.

IMPORTANT: If the SCSI controller to which your tape drive is attached was not present during your initial Windows 95 installation, install the SCSI device driver for the controller before installing the tape class driver.

SCO UNIX

The drivers required to support Compaq SCSI tape drives under SCO UNIX are the SCO SCSI tape (Stp) driver and an appropriate SCSI controller driver. The Stp driver is built into SCO UNIX. Consult the SCO System Administrator's Guide for directions on how to configure the SCSI tape driver. Appendix D of this guide contains additional configuration requirements for SCO UNIX

The table below describes the drivers required to support current Compaq SCSI controllers.

Table 4-4
SCO UNIX

Controller	Software Driver Installation
32-Bit Fast-SCSI-2 Controllers (15/30 DLT Drive only) and 32-Bit Fast-Wide SCSI-2 Controllers and Wide-Ultra SCSI Controllers	Refer to the documentation accompanying the Compaq Support Software for SCO UNIX, or the Compaq EFS 3.X or later for SCO Open Server 3.0, or Compaq EFS 5.1X or later for SCO Open Server 5.0X. The required driver is "cha".

The Compaq Extended Feature Supplement (EFS) for SCO UNIX is available on the Compaq Support Software CD and on Compaq SmartStart. The Compaq EFS for SCO UNIX is installed and configured automatically during a SmartStart installation.

Compaq SmartStart and Support Software CD is included with every Compaq Server computer product.

UnixWare

The table below lists sources of useful information about the software driver installation.

Table 4-5
UnixWare

Controller	Software Driver Installation
32-Bit Fast-SCSI-2 Controllers (15/30 DLT Drive only) and 32-Bit Fast-Wide SCSI-2 Controllers and Wide-Ultra SCSI Controllers	Refer to the UnixWare on-line documentation. The required driver is "cpqsc."

OS/2

Drivers for the SCSI controller and tape drive hardware are located on the Support Software Diskette. The Support Software CD ships with each server or can be obtained on the Compaq Forum of CompuServe or QuickFind (See to Appendix C). The software tape device driver is located either with your tape backup software or with the operating system. Refer to your backup application installation guide for more information regarding additional software that might be needed.

Table 4-6
OS/2

Controller	Software Driver Installation
32-Bit Fast-SCSI-2 Controllers (15/30 DLT Drive only) and 32-Bit Fast-Wide SCSI-2 Controllers and Ultra-Wide SCSI Controllers	For IBM OS/2 version 2.X, IBM OS/2 Warp and IBM OS/2 Warp Server, refer to file SCSI.RDM on the OS/2 2.X Support Software diskette from Compaq v2.00 or later. The support for this controller is provided by the IBM OS/2 2.x or 3.x base product.

Banyan VINES

The table below lists sources of useful information about the software driver installation.

Table 4-7
Banyan VINES

Controller	Software Driver Installation
32-Bit Fast-SCSI-2 (15/30 DLT Drive only)	Refer to the documentation from Banyan regarding the "Compaq Fast SCSI-2 / 53C710 EISA SCSI" driver.
Integrated 32-Bit Fast SCSI-2/P (15/30 DLT Drive only)	Refer to the documentation from Banyan regarding the "NCR 53C810 PCI-SCSI (Fast SCSI-2)" driver.
Integrated 32-Bit Fast-Wide SCSI-2 or 32-Bit Fast-Wide SCSI-2/E	Refer to the documentation from Banyan regarding the "Compaq Fast-Wide SCSI-2 / EISA 53C825" driver.
Integrated 32-Bit Fast-Wide SCSI-2/P or 32-Bit Fast-Wide SCSI-2/P	Refer to the documentation from Banyan regarding the "NCR 53C825 PCI-SCSI (Fast-Wide SCSI-2)" driver.
Integrated Wide-Ultra SCSI or Wide-Ultra SCSI	To ensure proper controller support, the Compaq Peripheral Adapter Support Software for Banyan VINES 6.0 and 7.0, version 2.03 or newer is required. Refer to the SSD documentation file, "README.SSD" regarding the "Compaq Wide-Ultra SCSI Controller" driver.

Chapter 5
Operating the DLT Drive

This section describes the DLT Drive and its operation.

Front Panel

The front panel of the DLT Drive contains multiple Light Emitting Diode (LED) indicators as described in Table 5-1, a cartridge insert/release handle, and two buttons.

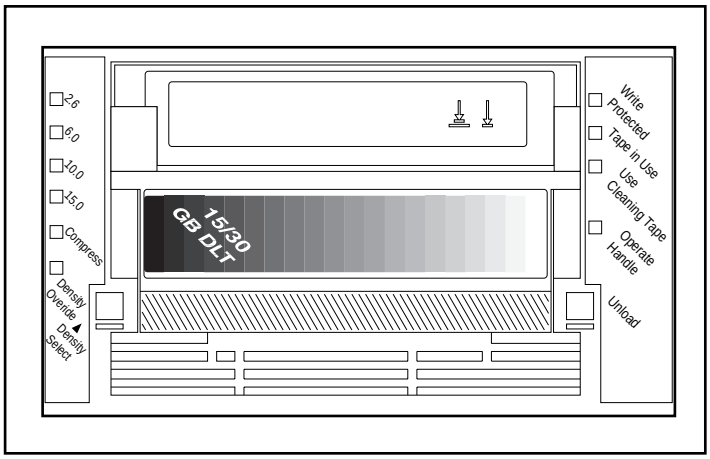

Figure 5-1. Front Panel View of Compaq 15/30-GB DLT Drive

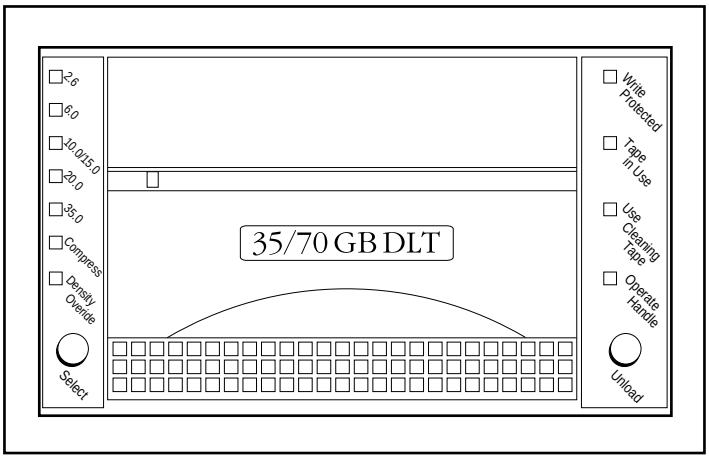

Figure 5-2. Front Panel View of Compaq 35/70-GB DLT Drive

Front Panel Indicators

The following table describes and explains the Front Panel indicators:

Table 5-1
Front Panel Indicators

Indicators	LED	Actions	Explanation
Write-Protected	Orange	ON	Tape is write-protected.
		OFF	Tape is write-enabled.
Tape in Use	Yellow	Blinking	Tape is moving.
		ON	Tape is loaded; ready for use.
Use Cleaning Tape	Yellow	ON	A Cleaning Tape cartridge is requested.
		OFF	No cleaning required.
Operate Handle	Green	ON	OK to operate the cartridge insert/release handle.
		Blinking	Power-up Self-test not complete. Do not insert tape cartridge. Place handle down.
		Off	Do not operate the cartridge insert/release handle.
2.6	Yellow	ON	Tape is recorded in 2.6 format.
		Blinking	Tape is recorded in another density. You selected this density for a write from Beginning of Tape (BOT).
6.0	Yellow	ON	Tape is recorded in 6.0 format
		Blinking	Tape is recorded in another density. You selected this density for a write from Beginning of Tape.
10.0*	Yellow	ON	Tape is recorded in.10.0 format.
		Blinking	Tape is recorded in another density. You selected this density for a write from Beginning of Tape (BOT).

continued

Front Panel Indicators *Continued*

Indicators	LED	Actions	Explanation
15.0*	Yellow	ON	Tape is recorded in 15.0 format. 15.0 format is the default format.
		Blinking	Tape is recorded in another density. You selected this density for a write from Beginning of Tape (BOT).
10.0/15.0**	Yellow	ON	Tape is recorded in either 10.0 or15.0 format.
		Blinking	Tape is recorded in another density. You selected this density for a write from Beginning of Tape (BOT).
20.0**	Yellow	ON	Tape is recorded in 20.0 format.
		Blinking	Tape is recorded in another density. You selected this density for a write from Beginning of Tape (BOT).
35.0**	Yellow	ON	Tape is recorded in 35.0 format
		Blinking	Tape is recorded in another density. You selected this density for a write from Beginning of Tape (BOT).
Compress	Yellow	ON	Compression mode is enabled. (Compression can be done in 10, 15, 20 and 35 densities.)
		OFF	Compression mode is disabled.
Density Override	Yellow	ON	You selected a density from the front panel.
		Blinking	You are in density selection mode.
		OFF	Density to be selected by the host. (default)
All four right-side lights or all left-side lights	N/A	ON	POST is starting.
		Blinking	An error has occurred. See Troubleshooting chapter.

*Compaq 15/30 DLT Drive

**Compaq 35/70 DLT Drive

Front Panel Controls

The following table describes the Front Panel Controls.

Table 5-2
Front Panel Controls

Control	Description
Unload Button	Starts the tape cartridge unload sequence. The tape must be completely rewound before the cartridge can be removed. When the Unload button is pressed, the DLT Drive waits until an active write to tape is completed before beginning the unload sequence. If the drive is in an error state (all right-side lights are flashing on the front panel), pushing the Unload button causes the drive to reset and unload the tape if possible. **NOTE:** The tape cartridge cannot be manually unloaded if there is no power to the DLT Tape Drive.
Density Select Button	Selects desired density. After density is selected, pressing this button turns compression on or off.
Cartridge Insert/Release Handle	The handle lifts to load or eject a Tape cartridge. Lowering the handle locks the tape cartridge into position. **IMPORTANT:** When the tape drive is first powered on, the Cartridge Insert/Release Handle must be in the down position. Operate the Handle only when the Operate Handle light is on and after the audible beep has sounded.

CAUTION: Inserting a tape while the Cartridge Insert/Release Handle indicator is flashing may damage the tape drive.

Power-On Self-Test (POST)

When power is initially applied, the DLT Tape Drive performs a Power-On Self-Test (POST). This starts a sequence of events indicated by the front panel LED indicators.

1. Turn the DLT Drive on.
2. All left-side indicators turn on for approximately three seconds, then turn off.
3. The green Operate Handle, the orange Write Protect, and the yellow Use Cleaning Tape lights turn off.
4. The yellow Tape in Use indicator blinks while the tape drive initializes.
5. After initializing, if a tape cartridge is not loaded, the yellow Tape in Use indicator turns off, the green Operate Handle indicator turns on, and an audible beep occurs.

   NOTE: POST will not complete until the Operate Handle is in the down position. If POST is waiting for the handle to be put down, the Operate Handle indicator will flash.

The drive is now ready for operation.

Loading and Unloading a Tape Cartridge

IMPORTANT: When loading or unloading a tape cartridge, the green Operate Handle indicator must be on.

To load a tape cartridge, follow these steps, referring to Figure 4-3:

1. When the green Operate Handle indicator is on, lift the cartridge insert/release handle up.
2. Insert the cartridge.
3. Push the cartridge completely into the drive.

4. Lower the handle to lock the tape cartridge in place.

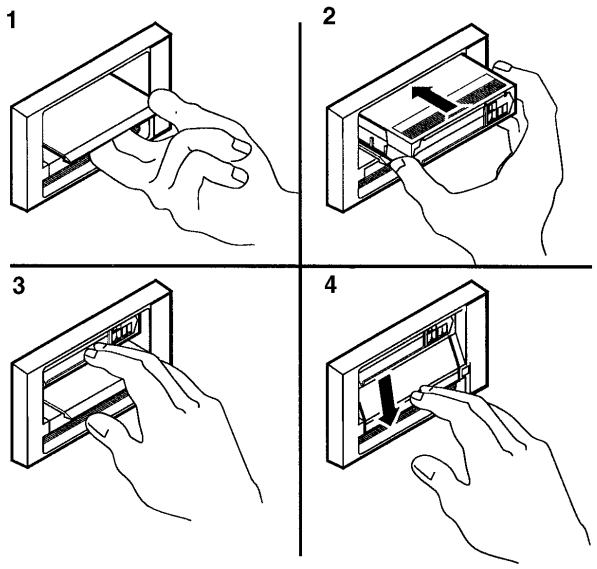

Figure 5-3. Loading a cartridge sequence

Once a tape is inserted, the tape initialization process begins and the Tape in Use indicator flashes. When the tape is at the Beginning of Tape (BOT) marker, the Tape in Use indicator turns on. The tape is now ready for use.

To unload a tape cartridge:

1. Press the Unload button or issue an eject in the software application.

2. When the green Operate Handle indicator comes on and a beep sounds, lift the handle up, remove the cartridge, and lower the handle.

Selecting Drive Density

You can select the density by using any of the following:

- On a write from Beginning of Tape (BOT), change the tape density by:
  - Pressing the Density Select button multiple times until the desired Density indicator flashes. Using the Density Select button always overrides a host selection.
  - Making a programmable host selection via your operating system. (The Density Override indicator is off, indicating automatic or host density selection.)
  - Allowing the drive to default to density of cartridge being loaded using compression (assuming the Density Select button or the host selection was not used.) If previous written tape is inserted, drive defaults to previous density.
- On a prerecorded tape, the drive uses the recorded density for all read operations and appended write operations.

CAUTION: If you reuse a prerecorded tape and write from the beginning of tape (BOT), all prerecorded data is lost. Density changes are also lost since they only occur when writing from BOT.

Refer to Table 5-3 for the results of density selection.

Table 5-3
Results of Density Selection

If ...	Then ...
You did not use the Density Select button,	The indicators show the actual density when the tape is reading and writing. The indicators are on steady and Density Override is off.
You used the Density Select button, and if the actual tape density is the same as the density you selected,	The actual density and the Density Override indicators are on. For example, if the actual tape density is 15.0 and the selected tape density is 15.0, then the 15.0 indicator will be on.
You used the Density Select button, and if the actual tape density differs from the density selected,	1. The indicator with the actual density is on steady. 2. The indicator with the selected density blinks. 3. Density Override indicator is on steady. For example, if the actual tape density is 15.0 and the selected density is 6.0, the 15.0 indicator is on steady, the 6.0 indicator blinks, and the Density Override indicator is on steady.

Density Select Example

If you have loaded a tape with a prerecorded 2.6 density and you use the Density Select button to select 10.0 density, the following will happen:

- The 2.6 indicator remains on pending the change in density.
- The 10.0 indicator flashes indicating a change in density is pending.
- Density Override indicator turns on.

When the write from BOT occurs, the following will happen:

- The 2.6 indicator turns off.
- The 10.0 indicator changes to on.
- Density Override indicator remains on.

Tape Cartridge Write-Protect Switch

The tape cartridge has a write-protect switch to prevent accidental erasure of data. Before loading the tape cartridge into the drive, position the write-protect switch on the front of the cartridge. By moving the switch to the left, the cartridge is write-protected and by moving the switch to the right, the cartridge is write-enabled.

If you move the cartridge write-protect switch to the left while the tape cartridge is in the DLT Drive, the drive turns on the write protect indicator immediately. If the drive is writing to the tape, write-protect does not begin until the current write command completes.

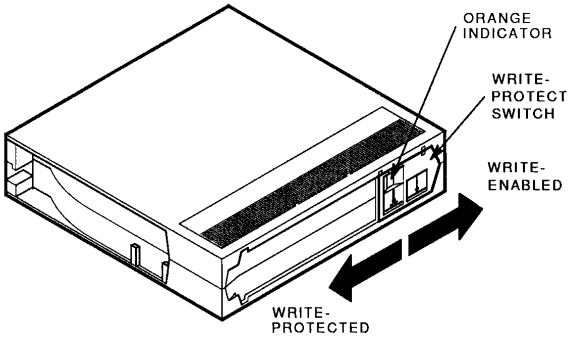

Figure 5-4. Cartridge Write/Protect Switch

Cartridge Compatibility

Tape cartridges can be used in the following formats:

Table 5-4
Cartridge and Format Compatibility

Tape Types	15/30 DLT Tape Formats	35/70 DLT Tape Formats
DLT Tape III	2.6, 6.0, 10.0	2.6, 6.0, 10.0
DLT Tape IIIXT	15.0	15.0
DLT Tape IV	Not Supported	20.0, 35.0

Cartridge Handling and Storage

For longer life of recorded or unrecorded cartridges, store cartridges in a clean environment with these conditions:

- Do not drop or bang the cartridge. This can displace the tape leader, making the cartridge unusable and possibly damaging the drive.
- Keep tape cartridges out of direct sunlight and away from heaters and other heat sources.
- Use tape cartridges in temperatures between 10°C and 40^0 C (50°F to 104°F).
- If the tape cartridge has been exposed to extreme heat or cold, stabilize the cartridge at room temperature for the same amount of time it was exposed — up to 24 hours.

- Do not place cartridges near electromagnetic interference sources, such as terminals, motors, and video or X-ray equipment. Data on the tape can be altered.
- Store tape cartridges in a dust-free environment where the relative humidity is between 20% and 80%. For longer cartridge life, store the cartridge at 20% to 40% relative humidity.

Place an identification label only in the slide-in slot on the front of the cartridge. Do not adhere labels to a cartridge anywhere except in the slide-in slot.

Chapter 6
Tape Drive Cleaning

When the yellow “Use Cleaning Tape” indicator turns on, the drive head needs cleaning. To clean the tape drive, insert the cleaning cartridge (Compaq kit PN 199704-001). When the cleaning is complete, a beep sounds and a green indicator located by the Operate Handle comes on alerting you to remove the cleaning cartridge.

To clean the drive:

1. Wait for the green indicator to be on, lift the cartridge insert/release handle up.
2. Insert the cartridge.
3. Push the cartridge completely into the drive.
4. Lower the handle to lock the cleaning cartridge in place.

NOTE: The green light turns off and the yellow light continues to blink until it automatically unloads the cleaning tape

If inserting a data cartridge again lights the cleaning indicator, it may mean a damaged data cartridge. However, the DLT Drive will still try to read the tape and may even be able to do so successfully. If you think the tape is damaged, back up the data onto another cartridge, and discard the old cartridge.

NOTE: A damaged cartridge may cause unnecessary use of the cleaning cartridge.

IMPORTANT: To clean the heads of the DLT Drive, use only cleaning cartridges compatible with the DLT Drives.

If the “Use Cleaning Tape” indicator stays lit after the cleaning cartridge has been used and unloaded, the cleaning has not been done and the cartridge has expired. Replace the cleaning cartridge and discard the old one.

NOTE: The cleaning cartridge expires after 20 uses.

If the “Use Cleaning Tape” indicator still lights after you have cleaned the drive head, your data cartridge may be causing the problem. Back up your data onto another data cartridge.

Chapter 7
Troubleshooting

If the DLT Drive fails during POST or operation, use Table 7-1 to determine the problem and the action to take.

Table 7-1
Troubleshooting Chart

If ...	Then ...	You should ...
Your system does not recognize the DLT Drive,	Your system might not be configured to see the SCSI ID.	Configure your system to see the ID.
	The SCSI ID might not be unique.	Change the SCSI ID and reconfigure the system. The new ID is effective at the next power-on.
	The parameters for your SCSI adapter might be incorrect.	Check your SCSI ID adapter installation.
	The SCSI signal cable might be loose.	Make sure the connector on each end of the cable is seated.
	The SCSI bus might not be correctly terminated.	1. If the DLT Drive is the last or only device on the bus, make sure the terminator is installed on the drive. 2. If the DLT Drive is not the last or only device on the bus, check the cable connections and make sure the terminator is installed at the end of the bus.
	The SCSI terminator might not be at the end of the bus, or more than two terminators might be present.	Be sure to install a terminator at each end of the bus. One terminator is usually installed at the system.

continued

Troubleshooting Chart *Continued*

If ...	Then ...	You should ...
Your system does not recognize the DLT TapeDrive,	The SCSI bus might be too long.	Limit the bus length to the ANSI SCSI standard of 6 meters (19 feet) for single ended (SE).
	Too many devices might be on the bus.	Limit the number of devices on the bus to eight, including the SCSI controller.
The DLT Drive does not power up,	The DLT Drive has no power.	With the DLT power switch off, check the DLT power connections.
All right- or left-side lights on the DLT Drive front panel blink,	A drive fault has occurred.	Try to unload the tape and reinitialize the drive by turning drive power off and then on again. The right- or left-side lights stop blinking and the drive tries to reinitialize. If re-initializing is successful, the lights turn on steady again and go off.
You find fatal or nonfatal errors for which you cannot determine cause,	The bus termination or SCSI signal cable connections might be incorrect.	Ensure the SCSI bus is terminated.
	The AC mains power source grounding might be incorrect.	Plug the DLT Drive into a grounded AC mains power outlet on the same line powering the server.

After taking the action listed in Table 7-1, power on the DLT Drive to rerun POST. If all right- or left-side lights blink again, you most likely have a hardware failure.

Updating the Firmware on the DLT TapeDrive

CAUTION: When doing a firmware update, take reasonable precautions to prevent a power failure. During the firmware update, when the new image is actually being programmed into the FLASH EEPROMs, a power failure (but not BUS RESET) causes the tape drive to be unusable.

Exit all tape applications before proceeding with a firmware upgrade.

Follow these steps to correctly update firmware on the DLT Drive.

1. Obtain the appropriate firmware upgrade tape from Compaq.
2. Put the DLT subsystem into the firmware update mode. To do this:
   a. Remove any cartridge that is in the target DLT Drive and close the handle (down position).
   b. Press the Unload button on the drive front panel and hold the button (about 6 seconds) until the Write Protect light blinks to indicate that the DLT subsystem has recognized your request for firmware update mode and is ready to proceed.

IMPORTANT: If Write Protect does not blink, make sure that:
1. The drive has powered up correctly without errors
2. The drive is unloaded
3. The drive handle is in the down position
4. Press the Unload button on the drive front panel and hold the button (about 6 seconds) until the Write Protect light blinks to indicate that the DLT subsystem has recognized your request for firmware update mode and is ready to proceed.

   c. If the Write Protect light blinks, release the Unload button and press it again within 4 seconds. The second press should take less than 1 second.

d. Tape in Use and Write Protect blink to indicate that the tape subsystem recognizes that the firmware update mode was selected.

IMPORTANT: If selecting the firmware update mode is not successful (for example, because pressing the button the second time takes longer than one second) Write Protect should stop blinking within several seconds. Try the procedure again.

---

3. After the firmware update mode has been selected, insert the firmware cartridge into the drive. This action:
   - ❑ Automatically reads the cartridge.
   - ❑ Examines the data.
   - ❑ Verifies the data is a valid DLT firmware image.
4. If the firmware is valid, the update then proceeds automatically.
   - ❑ If the drive code is the same as the tape to be updated, the drive code does not go through an update.
   - ❑ If the drive code is *different*, the drive code goes through an update, taking 2 to 3 minutes. While the drive code goes through the update, the Write Protect and Tape in Use lights flash alternately.
5. When the drive code update is complete, the drive resets and goes through initialization. The initialization process waits until the tape is reloaded at BOT.
6. The tape drive's flash EEPROM memory is also automatically updated with the new firmware image. The Write Protect and Tape in Use lights flash again during the controller firmware update.
7. Wait until the green Unload LED is lit.
8. Remove the firmware cartridge.

Interpreting the Results of Firmware Update

Two possible results can occur:

- The firmware update cartridge is unloaded – this means the update was successful. On the DLT Drive, the media is placed into the cartridge, the door is unlocked, and the green Operate Handle light turns on.
- The firmware update cartridge is *NOT* unloaded: this means the update was *unsuccessful*. The subsystem should still be usable, but this depends on why the update failed. Reasons for failure could be:
  - Power failure
  - Bad image on the tape
  - Bad tape drive

The following table gives additional details.

Table 7-2
Firmware Results

If ...	Then ....
The image is valid,	1. The Flash EEPROM containing the current firmware is erased. 2. The new image is programmed in. The subsystem completes the update in about 2 minutes. Then: • The tape drive resets itself. • POST takes place. • The drive automatically unloads the tape cartridge containing the firmware image, so you can remove the cartridge. This shows a successful firmware update.
The tape is NOT a valid firmware update tape,	No update is attempted. Write Protected and Tape In Use do not blink. The drive resets and the tape stays loaded to signal that the firmware update was unsuccessful.
The tape does not contain a valid image, or the tape contains a valid image, but for some reason the reprogramming of Flash memory fails,	The tape drive is probably unusable and needs to be replaced. The tape drive resets itself and reruns POST, which fails if the Flash memory does not contain a valid image.

CAUTION: Never turn off power if you think the firmware is being updated. This can damage the tape drive.

Appendix A
Power Cord Set Requirements

The wide-range input feature of your Compaq DLT Tape Drive permits it to operate from any line voltage between 100 to 240 volts AC.

The power cord set (appliance coupler, flexible cord, and wall plug) you received with your Compaq DLT Tape Drive meets the requirements for use in the country where you purchased your equipment.

Power cord sets for use in other countries must meet the requirements of the country where you use the Compaq DLT Tape Drive. For more information on power cord set requirements, contact your Authorized Compaq Dealer.

General Requirements

The requirements listed below are applicable to all countries:

1. The length of the power cord set must be at least 5.00 feet (1.5 m) and a maximum of 14.7 feet (4.5 m).
2. All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord set will be used.
3. The power cord set must have a minimum current capacity of 10A and a nominal voltage rating of 125 or 250 volts AC, as required by each country's power system.
4. The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector, for mating with the appliance inlet.

Country-Specific Requirements

The following table lists country-specific requirements.

Table A-1
Power Cord Set Requirements - By Country

Country	Accredited Agency	Applicable Note Numbers
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	SETI	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	JIS	3
Norway	NEMKO	1
Sweden	SEMKO	1
Switzerland	SEV	1
United Kingdom	BSI	1
United States	UL	2

NOTE 1: Flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 0.75 mm^2 minimum conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.

NOTE 2: Flexible cord must be Type SV or equivalent, No. 18 AWG, 3-conductor. Wall plug must be a two-pole grounding type with a NEMA 5-15P (15A, 125V) or NEMA 6-15P (15A, 250V) configuration.

NOTE 3: Appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. Flexible cord must be Type VCT or VCTF, 3 conductor, 0.75mm^2 conductor size. Wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (15A, 125V) configuration.

Appendix B
Electrostatic Discharge

A discharge of static electricity from a finger or other conductor can damage printed circuit boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

Preventing Electrostatic Damage

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing parts in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

You must be properly grounded when handling or installing electrostatic-sensitive parts. Use one or more of the following methods:

- Use a wrist strap connected by a ground cord to a grounded workstation or server chassis. Wrist straps are flexible straps with a minimum of one meg. ohm +/-10 percent resistance in the ground cords. To provide a proper ground, wear the strap snugly against your skin.
- If you are standing on conductive floors or dissipating floor mats, wear heelstraps, toestraps, or bootstraps on both feet.
- Use conductive field service tools.

Use a portable field service kit with a folding static-dissipating workmat.

Appendix C
Getting Help

If you have a problem and have exhausted the information in this guide, you can get further information and other help in the following locations.

Compaq Web Site

The Compaq Web Site has information on these products as well as the latest drivers and Flash ROM images. You can access the Compaq Web Site by logging on to the Internet at http://www.compaq.com.

Telephone Numbers

Contact your nearest Compaq Authorized Reseller or Service Provider for more information.

- For the name of your nearest Compaq Authorized Reseller:
  - In the United States, call 1-800-345-1518
  - In Canada, call 1-800-263-5868
- For Compaq technical support:
  - In the United States and Canada, call 1-800-386-2172
  - Elsewhere, call one of the numbers listed below

Compaq Worldwide Technical Support Telephone Numbers

Location	Voice	FAX
APD	65-7503030	65-7504909
Argentina	54-1 313 3100	54-1 313 3100 Ext 21
Australia	61-2-9911-1955	61-2-9911-1900
Austria	0222-87816-16	0222-87816-82
Bahrain	973-210-214	
Belgium	(02) 716-96-96	(02) 725-22-13
Brazil	55 11 5505-3600	55 11 5505-3922 Ext 4336
Canada	1-800-386-2172	
Caribbean	1-800-345-1518	
Central America	281-378-2206	

Continued

Compaq Worldwide Technical Support Telephone Numbers Continued

Location	Voice	FAX
Chile	562-274-3007	
China	86-10-834-6721	86-10-834-6713
Colombia	571-345-0266	571-312-0157
Czech Republic	42-2-232-8772	42-2-232-8773
Denmark	45-90-4545	45-90-4595
Equador	593-2504540	
Europe/Middle East/Africa	(49) 089-9933-2891	
Finland	9800-206-720 (+358-800-1-206720)	90-6155-9899 (+358-0-61559899
France	(33 1) 41-33-4455	(33 1) 41-33-4263
Germany	0180-5-212111	089-9933-3399
Hong Kong	852-90116633	852-28671734
Hungary	36-1-201-8776	36-1-201-9696
India	(91-80) 559-6023	
Italy	392-57-90300	392-575-00686
Japan	0120-101589	+81 3-5402-5959
Korea	82-2-523-3575	82-2-3471-0321
Malaysia	(603) 718-1636	
Mexico	(525) 229-7910	(525) 229-7988
Netherlands	06-91681616	06-8991116
New Zealand	649-307-3969	
Norway	22-072-020	22-072-021
Poland	48-2-630-3535	48-2-630-3553
Portugal	351-1-4120132	351-1-4120654
Singapore	65-7503030	65-7504909
South Africa	+27-11-728-6999	+27-11-728-3335
Spain	341-640-1302	341-640-0124
Sweden	(46) 8 703 5240	(46) 8 703 5222
Switzerland	411 838 410/2222	01-837-0969
Taiwan	(886) 2-3761170	(886) 2-7322660
Thailand	62-2-679-6222	62-2-679-6220
United Kingdom	44-81-332-3888	44-81-332-3409
United States	1-800-386-2172	1-800-345-1518
Venezuela	(582) 953.69.44	(582) 952.86.70

Appendix D
Supplemental Information About SCO UNIX

Configuration Requirements

For SCO UNIX, the SCSI ID of the tape drive must match the SCSI ID configured into the UNIX kernel for the SCSI tape driver. This ID is selected when 'mkdev tape' is used to add the tape drive to the kernel configuration. When using a generic or preconfigured kernel, such as the "N1" floppy used to initially load SCO UNIX, it is necessary to set the tape drive SCSI ID to match the kernel you are using. SCO uses SCSI ID 2 for tape, SCSI ID 0 for disk, and SCSI ID 5 for CD-ROM in the preconfigured kernel used to install SCO UNIX.

The SCSI ID configured into any SCO UNIX kernel for the SCSI tape drive appears on the console as the kernel starts up. The information will appear in a line such as:

```
%tape  -  -  -  type=s ha=0 id=2 lun=0 ht=...
```

The id=2 means that the tape is expected to be found at SCSI ID 2.

NOTE: The generic kernel will search for known SCSI controllers. The first SCSI controller this kernel finds will be the one used for SCSI disk, SCSI tape, and CD-ROM. Multiple SCSI controllers are supported in standard kernels configured for your system; however, only one should be used during SCO UNIX installation using the generic kernel.

Appendix E
Regulatory Compliance Notices

Federal Communications Commission Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Compaq Computer Corporation may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

Canadian Notice (Avis Canadien)

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

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

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 (in brackets are the equivalent international standards):

- EN55022 (CISPR 22) - Electromagnetic Interference
- EN50082-1 (IEC801-2, IEC801-3, IEC801-4) - Electromagnetic Immunity
- EN60950 (IEC950) - Product Safety

Japanese Notice

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