COMPAQ

SLR Tape Drive
User Guide

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Compaq SLR Tape Drive User Guide

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About This Guide

This guide is designed to be used as step-by-step instructions for installation, and as a reference for operation, troubleshooting, and future upgrades.

Text Conventions

This document uses the following conventions to distinguish elements of text:

Keys	Keys appear in boldface. A plus sign (+) between two keys indicates that they should be pressed simultaneously.
USER INPUT	User input appears in a different typeface and in uppercase.
FILENAMES	File names appear in uppercase italics.
Menu Options, Command Names, Dialog Box Names	These appear in initial capital letters.
COMMANDS, DIRECTORY NAMES, and DRIVE NAMES	These always appear in uppercase
Type	When you are instructed *to type* information, type the information **without** pressing the **Enter** key.
Enter	When you are instructed *to enter* information, type the information and then press the **Enter** key.

Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.

⚠ **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.

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 this product 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

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
For Compaq technical support phone numbers outside the United States and
Canada, visit the Compaq Web Site at http://www.compaq.com.

Chapter 1

Overview

This chapter provides information on:

■ The capacity of the drive

■ Drive performance

■ Data compression

■ Cartridge Specifications, Compatibility, and Formats

■ Drive duty cycle

■ Kit contents

Drive Capacity

The Compaq SLR Drive is a streaming quarter-inch tape cartridge drive that can read or write 8 GB of compressed data or 4 GB of uncompressed data. The drive provides low-cost data protection for workstations and entry-level servers.

Drive Performance

The maximum transfer rate of the Compaq SLR Drive is:

■ 760 kB/second for compressed data

■ 380 kB/second for uncompressed data

Data Compression

The drive employs the Lempel-Ziv data compression algorithm to compress data by up to 2 times. This feature is enabled by default but the user may turn off data compression through the applications software.

Cartridge Specifications, Compatibility, and Formats

IMPORTANT: We recommend that you use only tapes purchased from vendors that have been qualified by Compaq. The qualified vendors are Sony and Imation.

The drive supports the standard QIC formats listed in the following table .

Table 1-1
Supported QIC formats

QIC format	Cartridge Capacity	Imation Product	Sony Product
QIC-4GB	8.0 GB (compressed) or 4.0 GB (uncompressed)	Magnus 4.0	QD9400
QIC-2GB-DC	2.5 GB	Magnus 2.5	QD9250
	2.0 GB	Magnus 2.0	
QIC-1000	1.2 GB	Magnus 1.2	QD9120
	1.0 GB	Magnus 1.0	
QIC-525	525 MB	DC-6525	QD6525
	320 MB	DC-6320	
QIC-150	250 MB	DC-6250	QD6250
	150 MB	DC-6150	QD6150

NOTE: The Compaq SLR Tape drive features full read and write backwards-compatibility between the above formats.

Projected Duty Cycle

The user should track the amount of time that the drive is in use so that cleaning can be scheduled at the appropriate time.

See Chapter 4, "Operating and Cleaning the Drive" for more information on cleaning the drive.

Kit Contents

This kit contains the following items:

■   A Compaq SLR Drive with rails installed

■   Additional mounting screws

■   A data cartridge

■   A cleaning cartridge

■   A Wide-to-Narrow SCSI adapter

■   A power cable extender

Chapter 2
Drive Installation

This chapter provides instructions for installing the drive in:

■ The removable media bay of a workstation or server

■ An external storage unit

NOTE: For the remainder of this user guide, "system" will be used in place of "workstation" and/or "server".

Requirements

The user should be aware of the following installation requirements:

Tools

■ Torx T-15 screwdriver

■ Compaq SmartStart and Support CD

Controller

Compaq recommends equipping your system with either a 32-Bit Fast-SCSI-2 Controller or a more current device that provides full support for the Compaq SLR Drive.

Software

See Chapter 3, "Installing the Software Drivers" to obtain information on what software you need and where to obtain it.

Preparing the System

To prepare your system prior to the installation:

1. Perform a normal system shutdown.

2. Turn OFF the system.

3. Turn OFF all external peripheral devices attached to the system.

4. Disconnect all power cords - first from the AC mains outlets then from the system and the external peripheral devices.

5. Disconnect the signal cables from the external peripheral devices.

Setting the Drive's SCSI ID

Since each device on the same SCSI bus must have a unique ID, the user ma need to set the drive's ID before installation.

IMPORTANT: Your drive has been configured by Compaq with SCSI ID = 6 selected. For more information on setting the drive's SCSI ID in a SCO OpenServer environment, see Appendix C, "Drive Configuration Changes".

The drive's SCSI ID is selected using a jumper block located at the rear of the drive.

Locating the Jumper Block

Locate the jumper block at the rear of the drive.
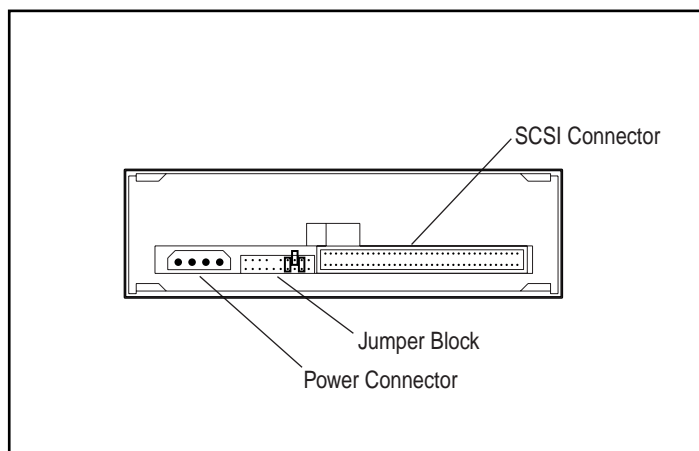
Figure 2-1. The Rear of the Compaq SLR Drive

Selecting the SCSI ID
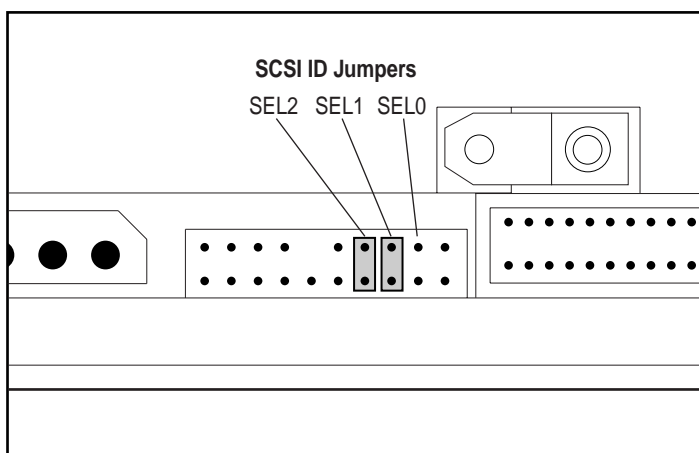
Figure 2-2. SCSI ID Selection Jumpers

IMPORTANT:	Do not use SCSI ID = 7. This is reserved for SCSI controllers.

Table 2-1
Selecting the SCSI ID

SEL2	SEL1	SEL0	SCSI ID
OPEN	OPEN	OPEN	0
OPEN	OPEN	CLOSED	1
OPEN	CLOSED	OPEN	2
OPEN	CLOSED	CLOSED	3
CLOSED	OPEN	OPEN	4
CLOSED	OPEN	CLOSED	5
CLOSED	CLOSED	OPEN	6
CLOSED	CLOSED	CLOSED	7

NOTE: In the above table, "CLOSED" indicates that a jumper has been installed.

Installing the Drive

Refer to the documentation supplied with your system for specific instructions on obtaining access to the removable media bay where you intend to install your drive.

⚠️ **WARNING:**   **:** To reduce the risk of electric shock or damage to the equipment, disconnect power from the server by unplugging all power cords from either the electrical outlet or the server.

⚠ **WARNING:** Some Compaq servers are capable of producing energy levels that are considered hazardous. To reduce the risk of personal injury:

■ Do not attempt to defeat the safety interlocks that prevent access to hazardous energy.

■ Do not repair accessories and options inside enclosed or interlocked areas of the system. Repair should be performed only by individuals who are qualified in servicing computer equipment and trained to deal with products capable of producing hazardous energy levels.

⚠ **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.

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

IMPORTANT: Your drive shipped with mounting rails attached. The removable media bays of some systems are configured such that you will need to remove these rails prior to installing the drive. Refer to the documentation supplied with your system.

Installing the Drive With Rails
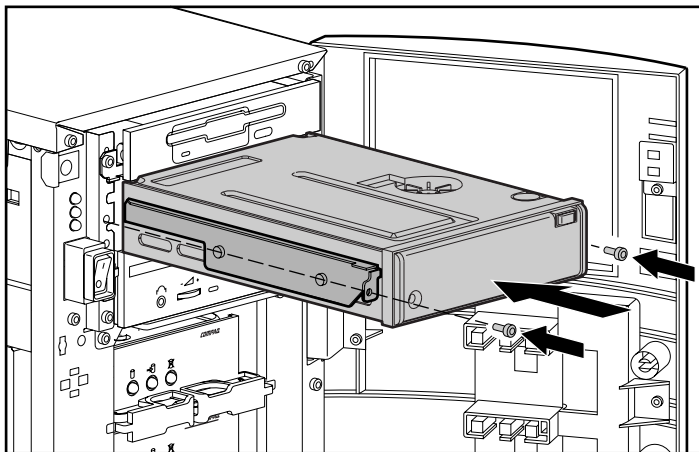
Figure 2-3.   Typical Media Bay - Rails Required

1.   Obtain access to the removable media bay.

2.   Install the drive.

3.   Secure the drive. (The screws supplied with this kit may be used.)

4.   Connect a power cable and a SCSI signal cable to the drive.
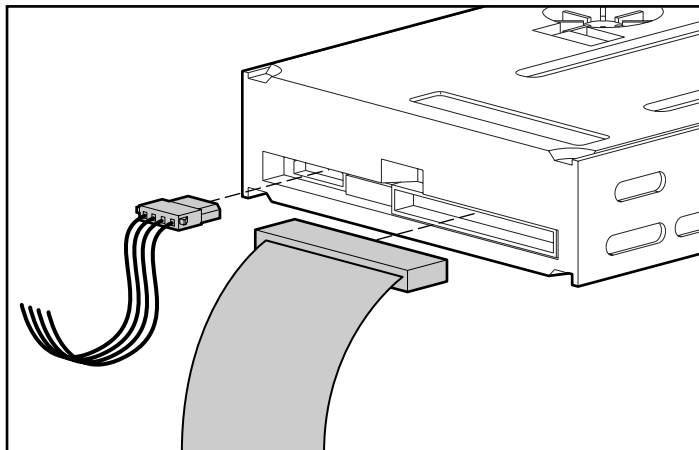
Figure 2-4. Installing Power and SCSI Cables

> **IMPORTANT:** If available, use the last connector on the power cable. Since the drive's power receptacle is recessed, you will require an extender cable to use an intermediate power cable connector. See "Installing the Power Cable Extender" for more information.

Installing the Drive Without Rails
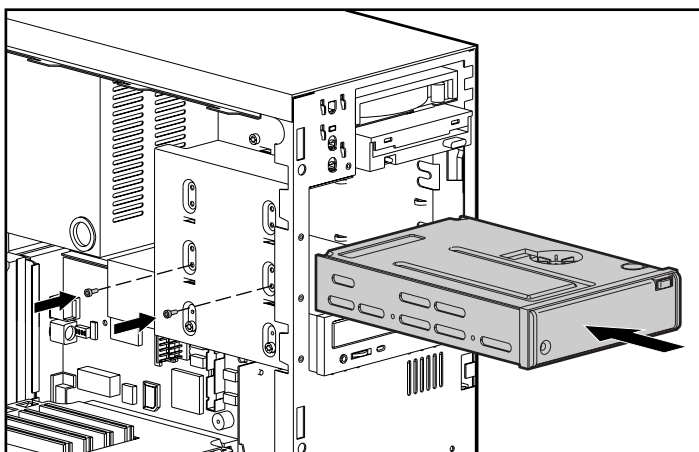
Figure 2-5. Typical Media Bay - No Rails Required

1. Obtain access to the removable media bay.

2. Remove the rails from the drive.

3. Slide the drive into the bay.

4. Secure the drive to the bay.

5. Connect a power cable and a SCSI signal cable to the drive.

IMPORTANT: If available, use the last connector on the power cable. Since the drive's power receptacle is recessed, you will require an extender cable to use an intermediate power cable connector. See "Installing the Power Cable Extender" for more information.

Installing the Power Cable Extender

You must install the power cable extender supplied with this kit if you wish to use one of the intermediate connectors on the power cable. The extender is not required if you use the last connector on the power cable.
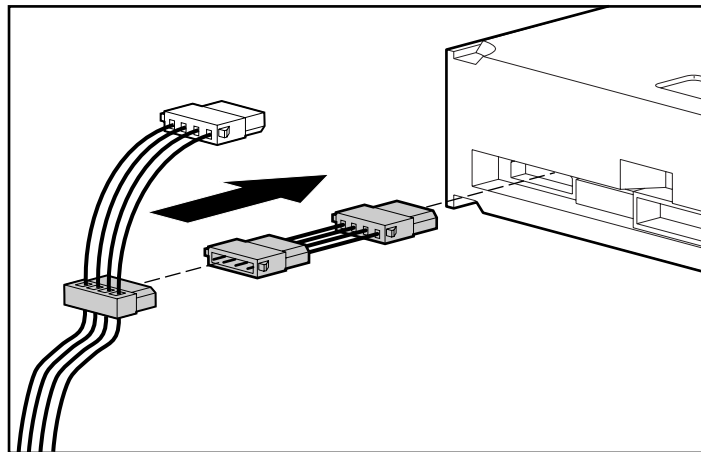
Figure 2-6. Installing the extender

Reassembling the System

Reassemble the system by reversing the steps of the procedure for "Preparing the System."

Completing the Installation

To complete the installation of the drive:

1. Install the appropriate software. See Chapter 3, "Installing the Software Drivers*"* for more information.

2. Clean the drive before using it for the first time. See Chapter 4, "Operating and Cleaning the Drive," for more information.

Chapter 3
Installing the Software Drivers

This chapter contains guidelines for installing software drivers and includes information on the following operating environments:

■ Novell IntranetWare/NetWare

■ Microsoft Windows NT

■ Microsoft Windows 95

■ SCO OpenServer

■ SCO UnixWare

■ IBM OS/2

■ SunSoft Solaris

■ Banyan VINES

Obtaining the Drivers

Unless the appropriate software drivers are inherent to the operating system, you will need to install the following:

■ A tape device driver

■ A driver for the Compaq SLR Drive

■ A driver for the optional SCSI controller

See the user guide supplied with your applications software for any additional requirements.

If the appropriate drivers are not inherent to your operating system, you can obtain them from one of the following sources:

■ The SmartStart and Support Software CD supplied with your system

■ The QuickFind database

■ Compaq's web site on the Internet: http:\\www.compaq.com

■ The Compaq Forum on CompuServe

■ Other electronic media services

See the "About This Guide" section at the beginning of this guide for electronic media addresses.

See the following sections of this chapter for information on drivers for specific operating environments.

Novell IntranetWare/NetWare

The following table provides information on identifying appropriate drivers for Compaq SCSI controllers:

Table 3-1
Novell IntranetWare/NetWare

Controller	Software Driver Information
32-Bit Fast-SCSI-2 Controller or or 32-Bit Fast-Wide SCSI-2 Controller or Wide-Ultra SCSI Controller	Refer to the **STORAGE.RDM** file on the Support Software for Novell Products (NSSD) diskette, version 3.13 or later, which was supplied with your system. Either of the following drivers can be used: ■ **CPQS710.DSK** ■ **CPQSCSI.HAM** - which supports the NWPA specification

There are additional driver issues if you wish to use applications requiring ASPI support. See the next section for more information.

ASPI Support

Certain applications require the use of the Advanced SCSI Programming
Interface (ASPI). The information supplied with your application will specify
whether or not ASPI support is required.

Figure 3-1 shows which NLMs and device drivers are required for different
applications. For example, if you have installed a Compaq SLR Drive with a
32-Bit Fast-Wide SCSI-2 Controller and you wish to use a NetWare version
4.x ASPI application, you can load the following drivers:

■ **CPQSCSI.HAM** for the controller

■ **NWPA.NLM** for the drive (automatically loaded when you load
CPQSCSI.HAM)

■ **NWASPI.CDM** to provide the ASPI interface

NOTE: Either of the following ASPI drivers can be used:

■ **CPQASPI.NLM**, version 1.14 or higher

■ **NWASPI.CDM**, version 1.00n - which supports the NWPA specification
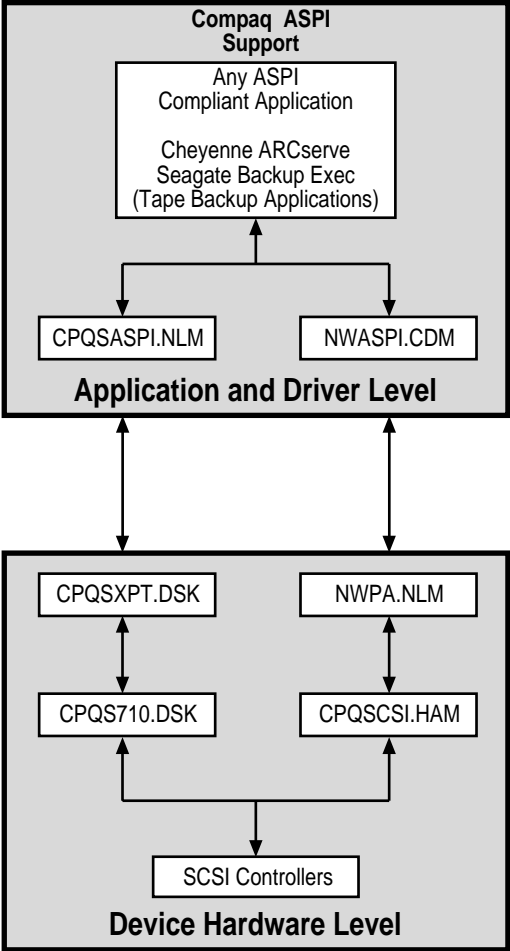
Figure 3-1.   Selecting drivers for your application

Microsoft Windows NT

The following table provides information on identifying appropriate drivers for
Compaq SCSI controllers:

Table 3-2
Microsoft Windows 95

Controller	Software Driver Information
32-Bit Fast-SCSI-2 Controller or 32-Bit Fast-Wide SCSI-2 Controller or Wide-Ultra SCSI Controller	Refer to **W95READ.HLP** for the list of controllers supported on Microsoft Windows 95.

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.

Microsoft Windows 95

The following table provides information on identifying appropriate drivers for Compaq SCSI controllers:

Table 3-3
Microsoft Windows 95

Controller	Software Driver Information
32-Bit Fast-SCSI-2 Controller or 32-Bit Fast-Wide SCSI-2 Controller or Wide-Ultra SCSI Controller	Refer to **W95READ.HLP** for the list of controllers supported on Microsoft Windows 95.

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 OpenServer

The drivers required to support the Compaq SLR Drive under SCO UNIX are:

■ The SCO SCSI tape driver **stp** which is built into SCO OpenServer; see the *SCO System Administrator's Guide* for information on how to configure the driver

■ An appropriate SCSI controller driver

The following table provides information on identifying appropriate drivers for Compaq SCSI controllers:

Table 3-4
SCO UnixWare

Controller	Software Driver Information
32-Bit Fast-SCSI-2 Controller or 32-Bit Fast-Wide SCSI-2 Controller or Wide-Ultra SCSI Controller	Refer to the appropriate **README** on the Compaq Support Software CD. The name of the driver is **cha**.

In addition, the appropriate version of the Compaq Extended Feature Supplement (EFS) for SCO UnixWare is required:

■ For SCO Open Server 3, use Compaq EFS version 3.16 or later

■ For SCO OpenServer 5, use Compaq EFS version 5.16 or later

EFS for SCO OpenServer is available on both the Compaq SmartStart and Support Software CD and on Compaq SmartStart CD and is installed and configured automatically during a SmartStart installation.

> **IMPORTANT:** See Appendix C, "Drive Configuration Changes" for information on configuring the SCSI ID for SCO OpenServer.

SCO UnixWare

The following table provides information on identifying appropriate drivers for Compaq SCSI controllers:

Table 3-5
SCO UnixWare

Controller	Software Driver Information
32-Bit Fast-SCSI-2 Controller or 32-Bit Fast-Wide SCSI-2 Controller or Wide-Ultra SCSI Controller	Refer to the SCO UnixWare on-line documentation on the Compaq SmartStart and Software CD. The name of the driver is **cpqsc**.

In addition, the appropriate version of the Compaq Extended Feature Supplement (EFS) for SCO UnixWare is required. Use EFS version 2.16 or higher for SCO UnixWare version 2.1x.

IBM OS/2

The following table provides information on identifying appropriate drivers for Compaq SCSI controllers:

Table 3-6
IBM OS/2

Controller	Software Driver Information
32-Bit Fast-SCSI-2 Controller	For IBM OS/2 version 2.x or higher, refer to **SCSI.RDM** on the OS/2 Support
or 32-Bit Fast-Wide SCSI-2 Controller	Software diskette from Compaq, version
or Wide-Ultra SCSI Controller	2.15 or higher.

SunSoft Solaris

The following table provides information on identifying appropriate drivers for Compaq SCSI controllers:

Table 3-7
SunSoft Solaris

Controller	Software Driver Information
32-Bit Fast-SCSI-2 Controller or 32-Bit Fast-Wide SCSI-2 Controller or Wide-Ultra SCSI Controller	For Solaris 2.5.x, refer to the online documentation on the Solaris 2.5.x OS CD and Compaq Driver Update (CDU) version 1.1 or higher.
	For Solaris 2.6, refer to the Solaris 2.6 Installation Manual. The required driver is **CPQncr**.

Banyan VINES

The following table provides information on identifying appropriate drivers for Compaq SCSI controllers:

Table 3-8
Banyan VINES

Controller	Software Driver Information
Fast-SCSI-2 Controller or 32-Bit Fast-SCSI-2/P Controller or 32-Bit Fast-Wide SCSI Controllers or Wide-Ultra SCSI Controller	For VINES 7.x, refer to the documentation supplied in *Banyan Supplemental Drivers for VINES 7.x, version 2.1* or higher.
	For VINES 6.x, refer to the documentation supplied in the *Banyan Supplemental Drivers for VINES 6.x, version 1.3* or higher.
	These driver packages can be downloaded from the Banyan web site at http://www.banyan.com.
	Compaq Peripheral Adapter Support Software for Banyan Vines 6.x and 7.x, version 2.05 or higher, is required. Refer to **README.SSD** for more information.

Chapter 4
Operating and Cleaning the Drive

This chapter contains guidelines for operating and cleaning the Compaq SLR Drive and includes information on the following topics:

- Operation
    - ❑ Front panel indicators
    - ❑ Front panel controls
    - ❑ Handling and storing a cartridge
    - ❑ Loading and unloading a cartridge
    - ❑ Retensioning a cartridge
    - ❑ Using the cartridge's write protect switch
    - ❑ Enabling data compression
- Cleaning
    - ❑ Cleaning guidelines
    - ❑ Cleaning procedure
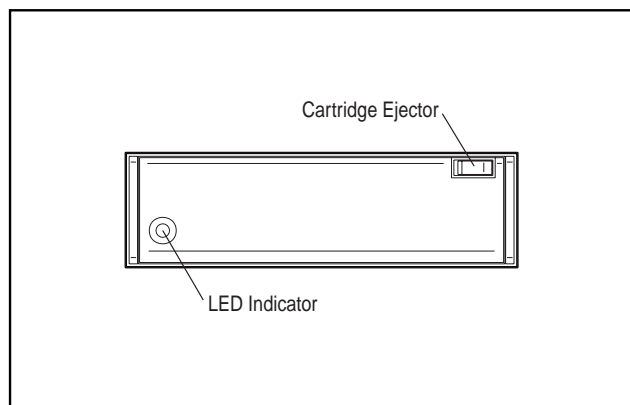
Operation

Front Panel Indicators

Figure 4-1. The Front Panel of the Compaq SLR Drive

There is a front panel LED display featuring green, amber, and red LEDs which may be OFF, STEADY ON, or BLINKING ON. See Table 4-1 for more information.

Table 4-1
Meaning of Front Panel LED Display

LED Display	Meaning
OFF	No cartridge is loaded.
STEADY GREEN	A cartridge is loaded.
BLINKING GREEN	The drive is busy - operating the capstan or stepper motor, or transferring data.

Meaning of Front Panel LED Display *continued*

LED Display	Meaning
STEADY AMBER	A media or hardware error has occurred.
	To recover from this error the user should remove the cartridge and reset the drive (either by using the application software or by toggling the drive's power OFF then back ON.)
	This error may indicate that the drive needs to be cleaned or that the cartridge is defective.
BLINKING AMBER	The drive has detected an exhausted cleaning cartridge.
	The user should remove and discard this cartridge.
STEADY RED	A fatal error has occurred.
	This error typically indicates that there is a problem with the drive. If this is a hard error, the user must replace the drive.
BLINKING RED	This is associated with drive selftests which are beyond the scope of this guide.

Front Panel Controls

The front panel includes the cartridge ejector button. (See Figure 4-1.) Use the ejector button to remove cartridges from the drive.

NOTE: The drive does not eject cartridges automatically.

Handling and Storing a Cartridge

Data reliability is a function of many variables and may be improved by suitable handling and storage. The user should follow these guidelines:

■ Do not drop cartridges.

■ Make sure that the air around the drive and the cartridge storage area is clean.

■ Expose a cartridge to the actual operating environment for at least four hours prior to use.

■ Do not expose a cartridge to high humidity for an extended period unless the cartridge can be dried out for three or four days outside its packaging box prior to use.

■ Reject worn or excessively noisy cartridges.

■ Reject cartridges which contain hard read or write errors.

■ Reject cartridges which repeatedly require large numbers of blocks per track to be rewritten.

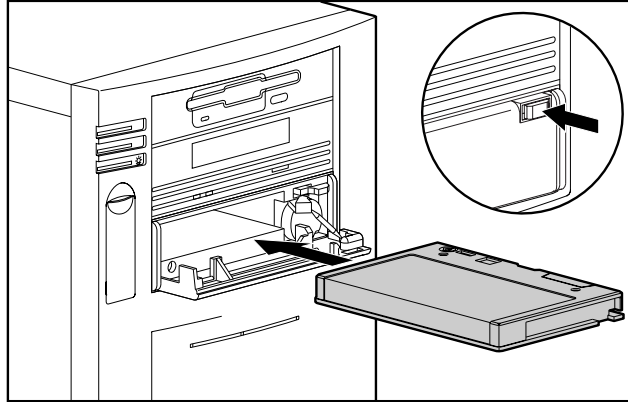## Loading and Unloading a Cartridge

Figure 4-2.   Loading a Cartridge

To load a cartridge:

1.   Press the cartridge ejector button to open the front of the drive.

2.   Insert the cartridge. Ensure that the cartridge is correctly oriented. (See Figure 4-2.)

3.   Push the cartridge until there is a click indicating that the cartridge is locked in place.

To unload a cartridge:

1.   If the drive is still in use, wait for the current operation to finish.

2.   Press the cartridge ejector button to open the front of the drive.

3.   When the front of the drive opens, remove the cartridge.

4.   Manually close the front of the drive.

Retensioning a Cartridge

> **IMPORTANT:** Use your software application to retension a cartridge.

Retensioning a cartridge consists of a complete wind/rewind operation.

The user should retension a cartridge in the following situations:

■ Prior to writing to a cartridge

■ After a read error has been detected. In this situation, use the following procedure:

 ❑ Clean the drive.

 ❑ Retension the cartridge.

 ❑ Repeat the read operation.

 ❑ If the read error is repeated, then the user should consider this to be a hard error. This may indicate that there is a problem with the cartridge: replace the cartridge and return to the beginning of this procedure.

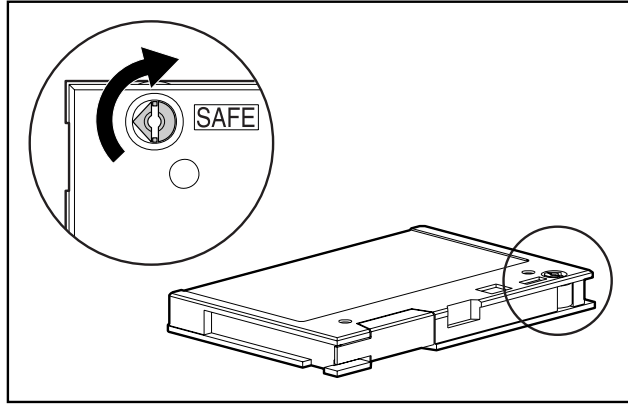## Using the Cartridge's Write Protect Switch

Figure 4-3.   The Write Protect Switch

Enabling Data Compression

Use your application software to enable or disable data compression.

Cleaning Guidelines

The drive should be cleaned in the following situations:

■   After the drive has been in operation for fifty hours or after the drive
      has been powered up for seven days - whichever occurs first

■   After using a new cartridge

■   If the drive reports read or write errors

Cleaning Procedure

1.   Insert the cleaning cartridge into the drive. The drive automatically
      loads the cartridge and cleans the drive's head. During the operation,
      the front panel display LED becomes blinking green.

2.   After a few seconds the cleaning operation is complete. The front panel
      display becomes steady green.

3. Manually unload the cleaning cartridge.

4. Record the cleaning date on the cartridge's label. Discard the cartridge after 50 cleaning cycles.

IMPORTANT: If the drive detects an exhausted cartridge (a cartridge which has been used fifty times), the front panel LED display becomes blinking amber. Remove and discard the exhausted cleaning cartridge.

Chapter 5
Troubleshooting

This chapter provides guidelines for troubleshooting your Compaq SLR Drive and includes information on the following topics:

- Quick checklists for hardware and software

- Checking for resource conflicts using the System Configuration Worksheet

- Checking power to the drive

- Checking the drive

- Checking software:

  - ❏ To make sure that the appropriate drivers have been loaded

  - ❏ To obtain more information on errors

- Verifying recent changes to make sure that these are not the cause of your trouble

- Correcting intermittent failures

- Upgrading the tape drive firmware using either a cartridge or a diskette

- For further assistance

Quick Checklist

Listed below are some checks that can be used to identify problems associated with your drive.

If these checklists fail to identify your problem, try the troubleshooting flowchart.

Hardware Checks

Check the following:

- Does your system recognize the drive during POST?

- Have you checked the drive's front panel LED display?

- Have you followed the suggested guidelines for drive cleaning?

- Does the drive pass the appropriate Compaq diagnostics?

- Has the drive has been configured correctly? If there are multiple drives, does each have a unique SCSI ID?

- Are the power and signal cables connected? Is the controller seated correctly?

Software Checks

Check the following:

- Have you checked your application to see if any errors have been reported?

- Have you checked for resource conflicts using the Compaq System Configuration Utility?

- Have the appropriate software drivers been installed?

NOTE: If you suspect that you have a software-related problem and have been unable to identify the problem by carrying out these checks, try reinstalling the software.
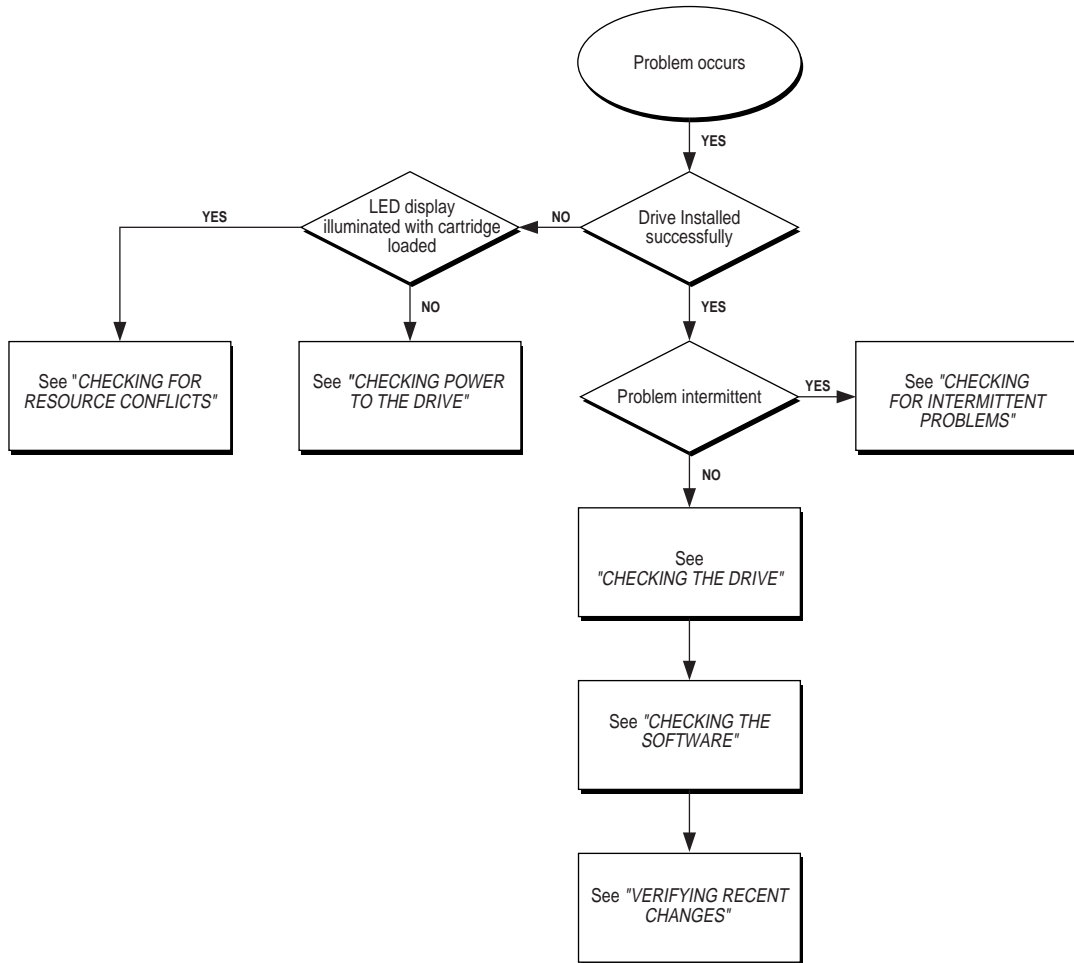
Figure 5-1.   Troubleshooting Flowchart

Checking for Resource Conflicts

Many of the problems that occur during installation are the result of resource conflicts between the drive, the controller, and the other devices in your system.

Complete the System Configuration Worksheet to identify then correct resource conflicts. (See Figure 5-1)

Completing the System Configuration Worksheet

1. Run the Compaq System Configuration Utility and select **Step 4**.

2. Record the switch settings for all option boards on the configuration worksheet.

3. Remove the appropriate covers or panels to obtain access to your option boards; record the actual switch settings of each option board on the configuration worksheet.

4. Compare the settings recorded on the worksheet. If there are any differences, set the board switches as recommended by the Compaq System Configuration Utility.

Table 5-1 System Configuration Worksheet					
Item			**Notes**		
Operating System					
Operating System Version					
Software Available Base Memory					
Tape Software Vendor					
Tape Software Version					
Compaq System Configuration Utility Version (EISA-based Compaq servers only)					
Recommended switch settings			**Actual option board switch settings**		
ADDR	**IRQ**	**DMA**	**ADDR**	**AIRQ**	**DMA**

Checking Power to the Drive

If the tape drive is not operational, make sure that power is connected to the drive.

1. Turn on your system and insert a tape cartridge.

2. If the front panel LED display is not illuminated:

    a. Make sure that the power cable is connected to the drive and is installed correctly.

    b. Remove the SCSI signal cable from the tape drive. If the LED display is now illuminated , check for a defective or incorrectly installed SCSI signal cable, or a defective controller

    c. Replace the tape drive.

Checking the Drive

If you have confirmed that power is connected to the drive and you still have a problem, try the following:

1. Verify that the SCSI cable is seated correctly.

2. Determine if your software application has reported any errors.

NOTE: See the *"Checking Software"* section of this chapter for information on investigating errors reported by software.

3. Restart the system and re-run the application.

4. Run the Compaq System Configuration Utility from the hard drive or from diskette.

5. Configure all boards in the system. Carry out the following checks:

    a. Verify that all installed EISA boards appear in the slot diagram. Add any missing EISA boards.

    b. Verify that the switch settings shown by the Compaq System Configuration Utility match the physical settings used on the boards. Ensure that the board settings match the settings shown by the utility.

6. Examine the list of installed devices. If the tape drive is not shown, try the following:

    a. Check the SCSI cable connections.

    b. Check the seating of the controller.

    c. If multiple tape drives are used, ensure that each tape drive has a unique SCSI ID.

7. If the problem still exists, replace the cables, the tape drive, and finally the controller.

Checking Software

This contains information on:

■ Checking errors (sense codes) reported by your software

■ Making sure that the appropriate software drivers have been installed

Sense Codes

The tape drive will report a sense code when it detects a hardware, firmware, or media problem. A sense code consists of six hexadecimal characters, for example: 03 31 00.

See below for information on how to display sense codes in specific software environments.

Interpreting sense codes is beyond the scope of this guide. If your drive has reported a sense code, contact Compaq on 1-800-OK-COMPAQ to obtain suggestions for corrective action.

Troubleshooting in Novell IntranetWare/NetWare

To obtain troubleshooting information, refer to the *STORAGE.RDM* file on the Support Software for Novell products (NSSD) diskette supplied with your system.

Troubleshooting in Microsoft Windows NT

This section applies to applications such as Arcada Backup Exec for NT, SQLServer for NT, and NT Backup running under Windows NT and contains information on:

■   Using the System Event Log to investigate errors

■   Verifying that the appropriate software drivers have been installed

Using the System Event Log

On detecting an error, the software driver will:

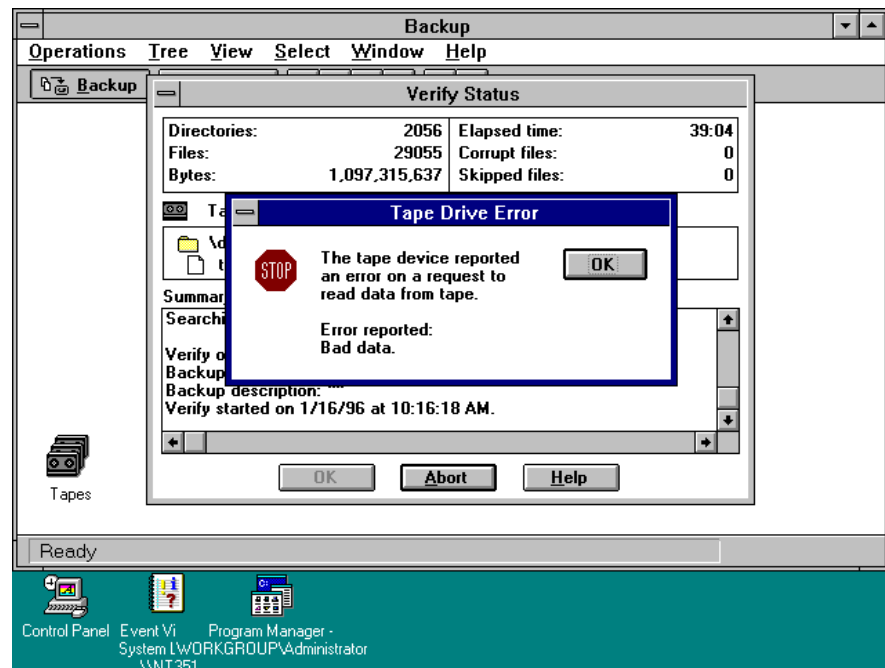■   Report the error to the System Event Log

■   Display a Stop message

Figure 5-2.   A typical Stop message

The following are examples of Stop messages:

■ 'The tape device reported an error on a request to read data from tape. Error reported: Bad data.'

■ 'Tape device "Archive 1" reported an error on a request to write data to tape. Error reported: Hardware error.'

■ 'The device, \Device\Tape0, is not ready for access yet.'

To obtain detailed information on an error reported to the System Event Log, use the following procedure:

1. Start the NT Event Viewer.

2. Select the Log drop-down menu.

3. Select System.

4. Highlight the entry for the tape drive to obtain the appropriate Event Detail display.
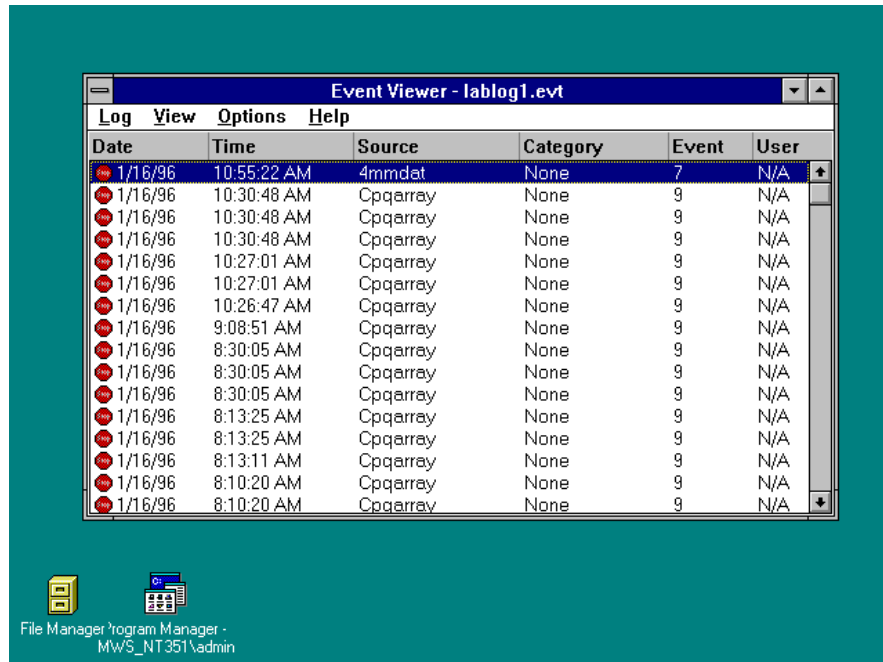
Figure 5-3. A typical Event Viewer display

NOTE: The device selected in the above Event Viewer display is a DAT drive: make sure that you select the 4/8 GB SLR Drive.

5. Switch the Data buttons from Bytes to Words to make the display easier to read.

6. Record the last three six characters of the display: these specify the sense code.
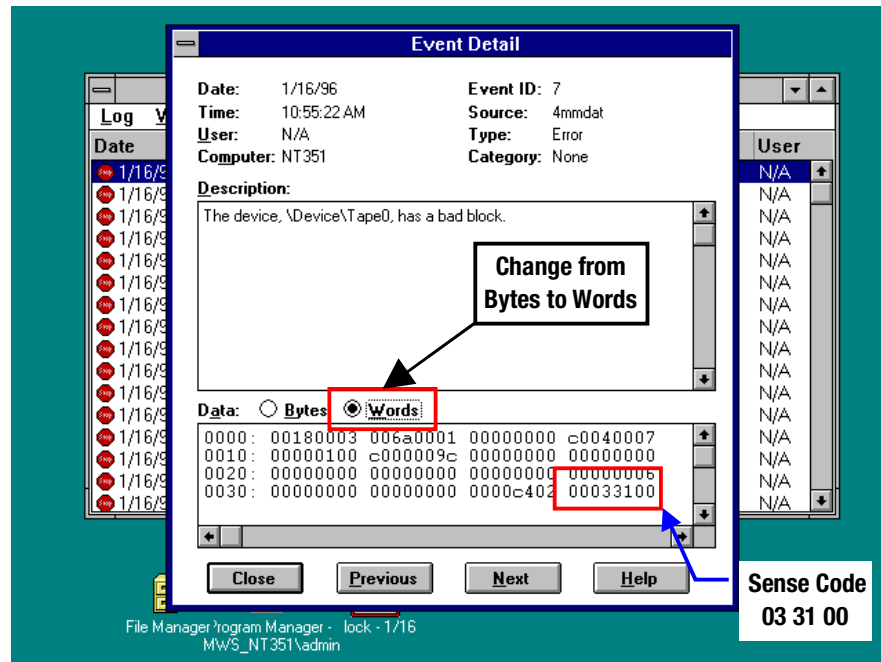
Figure 5-4. A typical Event Detail display

NOTE: If the last six characters are 00 00 00, this indicates that no sense code has been reported.

If you wish to save the System Event Log, use the following procedure:

1. Select the Log drop-down menu from the Event Viewer.

2. Select System.

3. Select Save As from the Log drop-down menu.

4. Enter a filename with a *.EVT* extension.

5. Select OK.

Verifying the software drivers

To verify that the appropriate software drivers have been installed, use the following procedure:

1. To verify that the software driver for the SCSI controller has been installed, use one of these methods:

   ❑ Run the Microsoft Windows NT setup program

   ❑ Use the Devices control panel applet

   ❑ Use the Tape Devices icon on the control panel

2. If required, reinstall the software driver for the SCSI controller.

3. To verify that the software driver for the Compaq SLR Drive has been installed, use one of these methods:

   ❑ Run the Microsoft Windows NT setup program

   ❑ Use the Devices control panel applet

   ❑ Use the Tape Devices icon on the control panel

4. If required, reinstall the software driver for the Compaq SLR Drive.

Troubleshooting in SCO OpenServer

Verify that the tape driver is configured in the kernel:

1. Determine if the driver is installed or identify the current tape parameters using one of these methods:

   ❏ Use the Hwconfig command

   ❏ View the */USR/ADM/MESSAGES* file

2. Install the driver in the kernel or modify the current tape parameters using the Mkdev Tape command.

Troubleshooting in IBM OS/2

The appropriate software driver must be installed for the drive to function correctly. If the drive does not function correctly:

1. Reinstall the software driver.

2. Verify that the appropriate statement was added to the *CONFIG.SYS* file during the installation of the software driver. Add the statement if it is missing.

3. Restart your system if you make any changes.

IMPORTANT: Refer to your IBM OS/2 software documentation for more information.

Troubleshooting in Banyan VINES

Backup jobs in Banyan can be configured by the user to report error information to the System Log.

NOTE: Banyan reports sense codes in decimal rather than hexadecimal.

See below for procedures for accessing the System Log:

■ From the Operator menu

■ From the Operate utility

Accessing the System Log from the Operator menu

Follow this procedure:

1. Select 10 to obtain the System Maintenance menu.

2. Select 4 to obtain the Save/Display Server Log Reports

3. Select 1 to specify Server Operating System.

4. Select N to omit the consistency check.

5. Press **Enter** to obtain the prompt.

6. Press **Return**.

7. Specify whether you wish to display or save the System Log.

Accessing the System Log from the Operate utility

Follow this procedure:

1. Select Manage Server Logs.

2. Select 1 to specify Generate.

3. Specify the System Log by:

      a.   highlighting System Log, and

      b.   pressing **Enter**

4. Press **F10**.

5. Enter the beginning and ending dates for the period you wish to examine.

6. Press **Enter** to omit the consistency check.

7. Specify whether you wish to display or save the System Log.

Troubleshooting in ArcServe for NT

ArcServe for Microsoft Windows NT records useful information in these logs:

Table 5-2
ArcServe for NT Logs

Name of Log	Contents
Activity Log *(ARCSERVE.LOG)*	This reports whether or not a backup has been performed successfully.
Tape Engine Log *(TAPE.LOG)*	If enabled by the user, this contains SCSI sense code information.

To enable the collection of sense code information, use the following procedure:

1. Launch the ArcServe Server Admin utility.

2. Select the Admin drop-down menu; select Configuration...\\.

3. Select the Tape engine tab from the Configuration screen.

4. Change the Message Level from None to Brief.

5. Change the Message Output to either File Only or Both Screen and File, as required.

6. Select either the tape drive or All Devices in Device to Monitor.

Follow this procedure to view information in the Activity Log and the Tape Engine Log:

1. Launch the ArcServe Server Admin utility.

2. Select the Manager icon.

3. Select Quick Status.

4. Select the appropriate tab to display either the Activity Log or the Tape Engine Log.
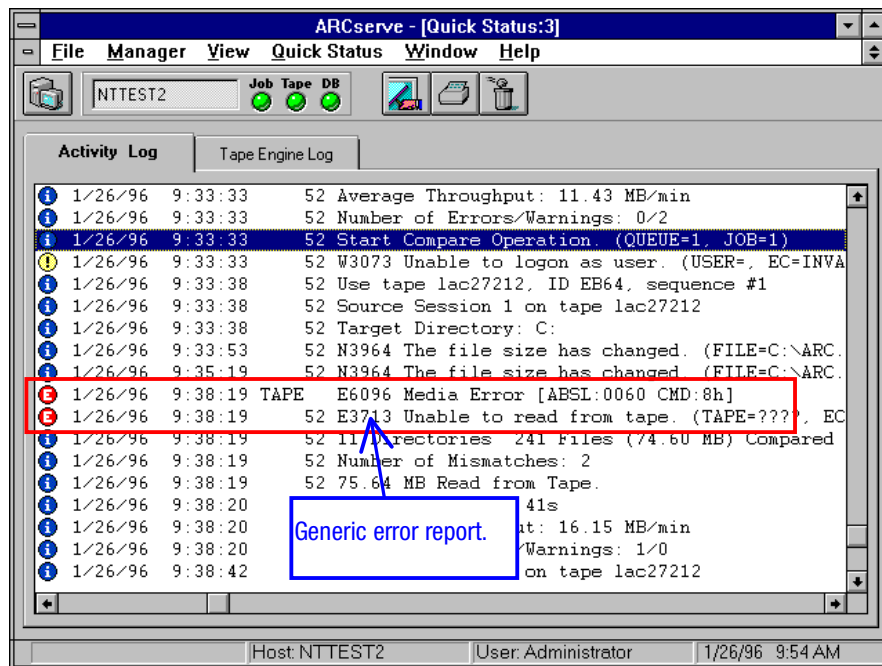
Figure 5-5. A typical Activity Log display
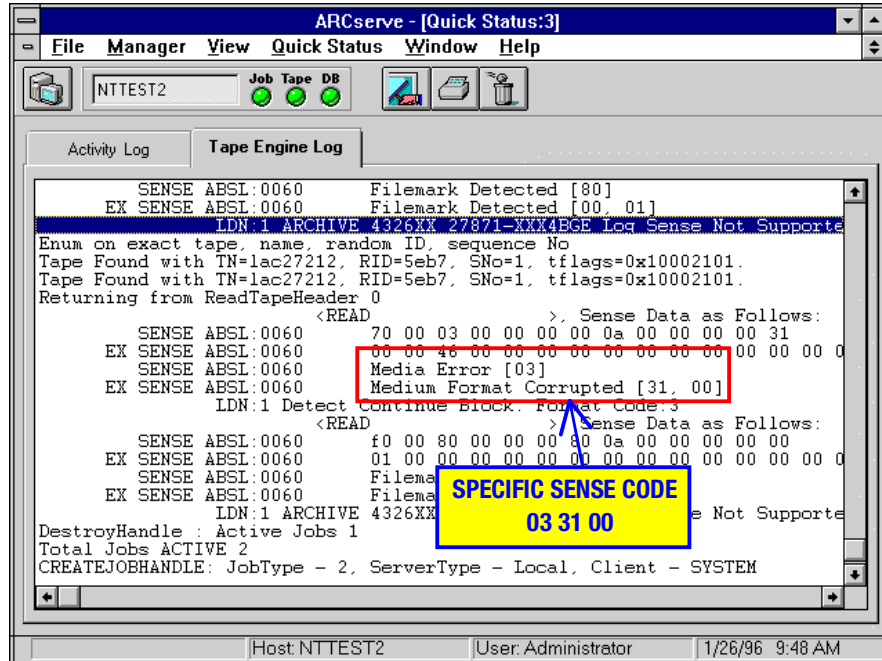
Figure 5-6. A typical Tape Engine Log display

IMPORTANT: While troubleshooting a problem the user should review these logs regularly. Delete or archive older information to keep the size of the logs manageable.

Troubleshooting with ArcServe for NetWare

ArcServe for Novell NetWare records useful information in these logs:

Table 5-3
ArcServe for NetWare Logs

Name of Log	Contents
Activity Log *(ARCH$SVR.LOG)*	This reports whether or not a backup has been performed successfully.
Tape Server Log *(TAPE$SVR.LOG)*	This contains SCSI sense code information.

Follow this procedure to view information in the Activity Log and the Tape Server Log:

1. Select Manager from the menu bar; select Reports.

2. Select Activity Log.

3. Review the Activity Log for any errors: these will typically be in red.

4. Record the date and time the errors occurred.

5. Select the Tape Server Log**.**

6. Review the Tape Server Log at the times that the errors occurred to obtain more information.
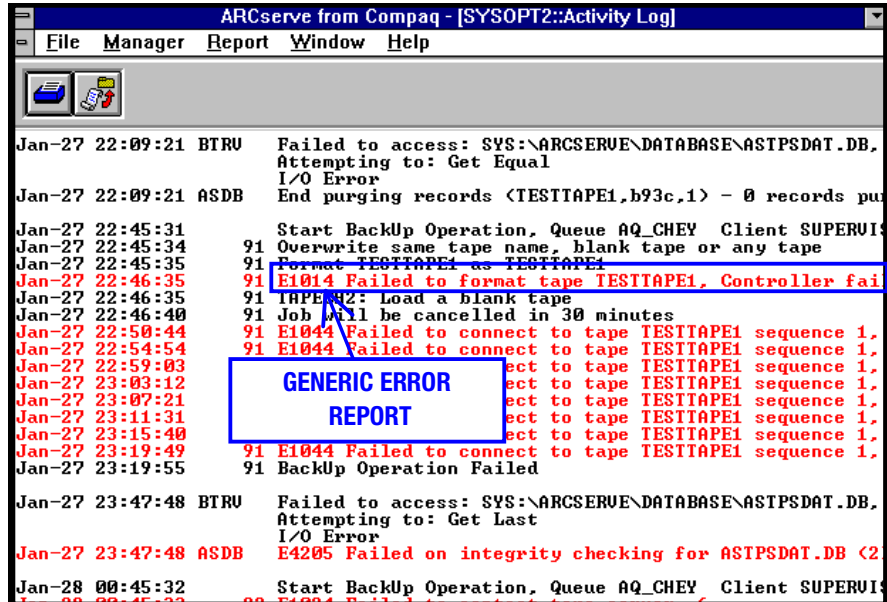
Figure 5-7.   A typical Activity Log display

Error messages in the Activity Log are in two parts, for example:

E1014   Failed to format tape TESTTAPE1

Controller failure

The first part of the error message specifies what sort of error occurred; the second part suggests the cause of the error.

IMPORTANT: The causes of errors suggested by the Activity Log may be inaccurate. For example, time-outs and drive lockups are also reported as controller failures.
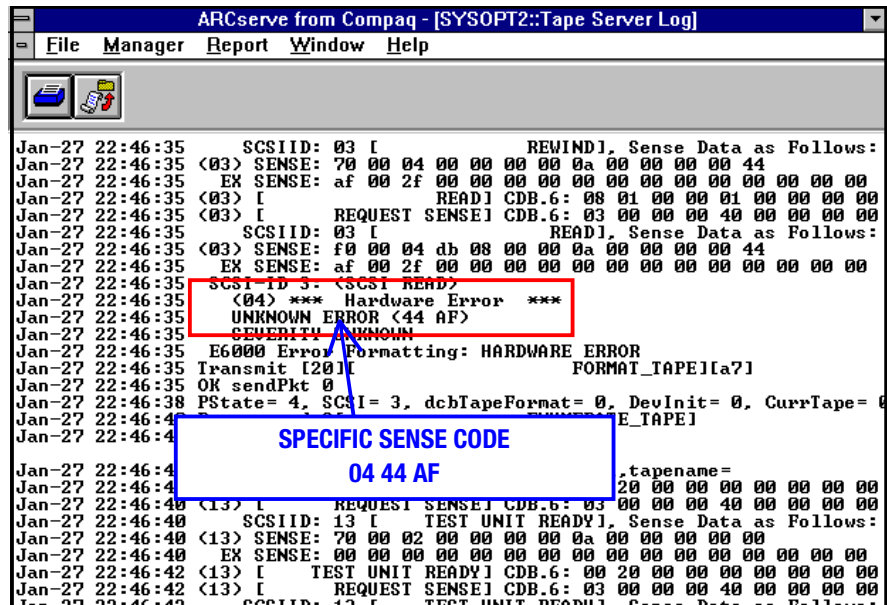
Figure 5-8. A typical Tape Server log display

Verifying Recent Changes

If the drive was installed correctly but a problem has since occurred, verify any recent changes to the system to ensure that these changes are not causing the problem. Try the following:

1. If the system configuration has changed, remove the change to see if it affected the drive.

2. If a board or option has been added, check its DMA, IRQ, and port address settings for conflicts. Try removing the board or option.

3. If a SCSI device has been added, check for SCSI ID conflicts. Check for the appropriate SCSI termination.

Correcting Intermittent Failures

If the drive fails intermittently:

1. Clean the drive.

2. Run the Compaq Diagnostics Utility and the tape drive Diagnostics Utility.

3. If a drive operation begins correctly but then stops with an error:

   a. Try a different cartridge.

   b. If the error occurs on the same file or directory each time, remove that file or directory from the backup list because it may be corrupted. Correct any errors that you find with the file system.

   c. Check the revision level of the drive's firmware by running lnspect to determine if you are using the latest revision. If not, install the latest firmware to see if this resolves the problem.

   d. Run System Configuration to check the DMA, IRQ, and port address settings for conflicts. If there is a conflict, change the particular setting or remove the conflicting device.

Upgrading the Firmware

Compaq occasionally releases upgraded firmware to correct specific problems so you should make sure that your drive's firmware is the latest revision. To identify the revision level of your current firmware, follow this procedure:

1. Launch Compaq's Inspect utility from one of these sources:

   ❑ The main menu of Compaq's System Configuration utility

   ❑ Compaq's Diagnostics program

2. Review the display. For example:

   System Storage:

   Wide SCSI Controller in slot 4, IRQ11

       Embedded Wide SCSI Controller, IRQ10

       Device .... Internal ProLiant - REV JM14

       Device .... 4/8 GB SLR SCSI Tape

       SCSI ID 6

       Revision 0912FY/0912

3. Record the revision level of the drive's firmware.

To determine if your firmware is the latest revision, check one of these sources:

■ 1-800-OK-COMPAQ

■ Compaq's web site on the Internet (See *"About This Guide"* for the address.)

Upgrading the Firmware with a Cartridge

If you have determined that your drive's firmware is not the latest revision, you can obtain an Upgrade Cartridge from one of these sources:

■ A Compaq Authorized Service Provider

■ 1-800-OK-COMPAQ

To upgrade your firmware with a cartridge, follow this procedure:

1. Exit all applications before proceeding.

2. Verify that the drive is not in use.

3. Insert the cartridge into the drive.

4. The upgrade process automatically takes place; the front panel LED display shows steady green.

> ⚠ **CAUTION:**   Do not interrupt the upgrade process. This can corrupt the firmware.

5. When the upgrade process is complete (after approximately three minutes) the LED display shows blinking green

6. Remove the cartridge.

Upgrading the Firmware by using the Option ROMPaq

If you have determined that your drive's firmware is not the latest revision, you can use a ROMPaq diskette to update the firmware.

Creating a ROMPaq diskette

To create the diskette, follow this procedure:

1. Boot your system from the Compaq SmartStart and Support Software CD version 3.10 or higher.

2. Select Create Support Software from the Compaq System Utilities screen.

3. Select the appropriate option for your system from the Diskette Builder screen.

4. Follow the instructions on the screen to create the diskette.

Upgrading the firmware

To carry out the upgrade, follow this procedure:

1. Boot your system using the diskette.

2. Select Enter from the Welcome screen.

3. Select the drive from the list of programmable devices displayed on the Select a Device screen.

4. Select Enter from the Select a Device screen.

5. Review the Select an Image screen:

Table 5-4
Select an Image screen

Item	Contents
Device to reprogram:	The name of the device
Current ROM revision:	The date of your current firmware
Select Firmware Images:	The date of the latest firmware on the diskette

6. If appropriate, select **Enter** from the Select an Image screen.

7. Review the Caution screen:

Table 5-5
Caution screen

Item	Contents
Device to reprogram:	The name of the device
Current ROM revision:	The date of your current firmware
Select Firmware Images:	The date of the latest firmware on the diskette

8. Determine whether or not to upgrade your firmware:

   ❑ If the information on the Caution screen is appropriate, press **Enter** to begin the upgrade

   ❑ If the information on the Caution screen is NOT appropriate, press **Esc** to return to the Select an Image screen without upgrading the firmware

9. The Reprogramming Firmware display indicates that your firmware is being upgraded.

   ⚠ **CAUTION:** Do not interrupt the upgrade process. This can corrupt the firmware.

10. The screen display indicates when the upgrade is complete.

11. Remove the diskette; reboot your system.

For Further Assistance

For Compaq technical support:
In the United States and Canada, call 1-800-386-2172
For Compaq technical support phone numbers outside the United States and Canada, visit the Compaq Web Site at http://www.compaq.com.

Appendix A
Regulatory Compliance Notices

Federal Communications Commission Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (i.e., personal computers). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

The rating label on the device shows which class (A or B) the equipment falls into. Class B devices have an FCC logo or FCC ID on the label. Class A devices do not have an FCC logo or ID on the label. Once the class of the device is determined, refer to the following corresponding statement.

Class B Equipment

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.

Declaration of Conformity for Products Marked with FCC Logo, United States Only

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. For questions regarding this declaration, contact:

Compaq Computer Corporation
P. O. Box 692000, Mail Stop 510101
Houston, Texas 77269-2000

Or call (281) 514-3333

To identify this product, refer to the Series number found on the product.

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)

Class B Equipment

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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み下さい。

この装置は、第二種情報装置（住宅地域又はその隣接した地域において使用
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しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、
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Australian Notice

This customer equipment is to be installed and maintained by service
personnel as defined by AS/NZS 3260 Clause 1.2.14.3. Service Personnel.
Incorrect connection of connected equipment to the General Purpose Outlet
could result in a hazardous situation.Safety requirements are not fulfilled
unless the equipment is connected to a wall socket outlet with protective earth
contact.

Appendix B
Electrostatic Discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage, observe the following precautions:

■ Avoid hand contact by transporting and storing products 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

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

■ Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.

■ Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.

■ Use conductive field service tools.

■ Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an Authorized Compaq Reseller install the part.

NOTE: For more information on static electricity, or assistance with product installation, contact your Authorized Compaq Reseller.

Appendix C
Drive Configuration Options

Your Compaq SLR SLR Drive has been configured by Compaq to meet the requirements of the typical user. This chapter contains information on changing the default configuration.

Most of the drive's options are controlled internally. However, the user has access to certain options via the jumper block located at the rear of the drive.

The options available to the user are:

■ Selecting the SCSI ID

■ Enabling/Disabling bus parity

■ Testing

Locating the Jumper Block

Locate the jumper block at the rear of the drive.
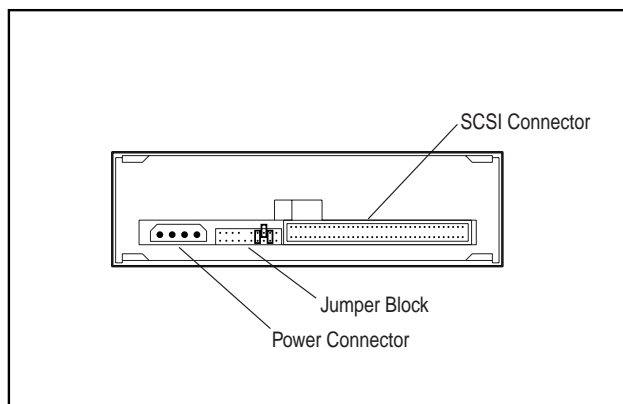
Figure C-1. Rear View of the Compaq SLR Drive

Identifying the Jumpers

The layout of the jumper block is as follows:
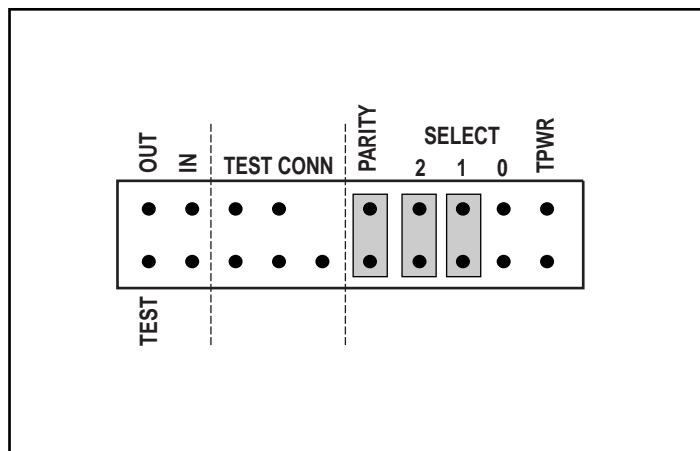
Figure C-2.   Layout of the Jumper Block

Selecting the SCSI ID

Since each device on the same SCSI bus must have a unique ID, the user may need to set the drive's ID before installation.

> **IMPORTANT:**   The drive has been configured by Compaq with SCSI ID = 6 selected. Do not use SCSI ID = 7: this is reserved for SCSI controllers

Use the following table to obtain the appropriate jumper settings:

Table C-1
Selecting the SCSI ID

SEL2	SEL1	SEL0	SCSI ID
OPEN	OPEN	OPEN	0
OPEN	OPEN	CLOSED	1
OPEN	CLOSED	OPEN	2
OPEN	CLOSED	CLOSED	3
CLOSED	OPEN	OPEN	4
CLOSED	OPEN	CLOSED	5
CLOSED	CLOSED	OPEN	6
CLOSED	CLOSED	CLOSED	7

NOTE: In the above table, "CLOSED" indicates that a jumper has been installed.

> **IMPORTANT:**   The drive reads the jumper block settings at power-on. For changes to be effective, either the user must turn the drive OFF then back ON or the drive must receive a SCSI Bus Reset.

Configuring the SCSI ID in a
SCO OpenServer environment

In the pre-configured kernel used to install SCO OpenServer, the following SCSI IDs are automatically set:

■ Disk = 0

■ Tape = 2

■ CD-ROM = 5.

If required, the user may reconfigure the ID for the Compaq SLR Drive using the **mkdev tape** command. To verify the ID, use the **hwconfig** command look for the same **%tape string** or check the **%tape string** as it appears on the console as the kernel starts up. The information will appear in a line such as this:

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

In the above example, "id=2" indicates that the drive's SCSI ID = 2.

IMPORTANT: SCO OpenServer's install kernel will only communicate with the first SCSI controller in the system. Remove the generic tape at SCSI ID = 2 then install the appropriate tape driver. Set the required SCSI ID, bus, and lun values.

Enabling/Disabling Bus Parity

Installing the **PARITY** jumper enables bus parity checking.

IMPORTANT: Compaq ships the drive with this jumper installed.

Testing

The **TEST** and **TEST CONN** jumpers enable selftest and off-line testing capabilities which are beyond the scope of this guide.

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